

Microwave Digital Archive

IEEE Microwave Theory and Techniques Society

1989-1990

Welcome

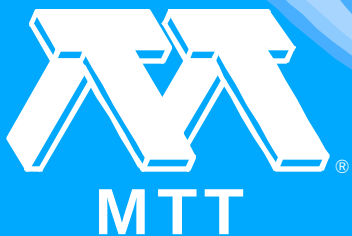
Getting Started

Publications

Issues

Papers

Authors



Welcome

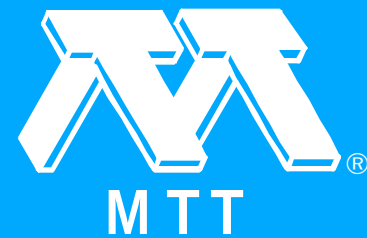
The Microwave Theory and Techniques Society of the IEEE has finished a complete archive of all reviewed and published material since 1953. Yearly updates of the published material will be compiled in the future. As digital media changes over the years, it will be necessary to update the format of the material, so this initial electronic release blazes a trail into the future.

The section "Getting Started" tells you how to optimize the Acrobat Reader Preferences to improve the readability of the document. If you need customer support before January 2001, call 831.657.2420 or 800.447.9100. If you find errors in the CD-ROM, e-mail a note to c.jackson@ieee.org, or mail a comment to the current President of the MTT Society.

Remember that the quality of the old journals is not perfect, and that some photographs will not be as clear as Technicolor. Also, the optical character recognition is good, but not perfect, so some spelling errors will occur. None the less, you can copy and paste the material for your own uses and personal study.

All papers were electronic files or images scanned from hard copy and converted to Adobe Acrobat PDF file format for cross-platform access. Since some of the papers were scanned from hard copy, the viewing quality will vary with the size and quality of fonts used. Even though the viewing quality on your monitor may vary, all papers print clearly.

Thank You and Enjoy!



IEEE
Contents



Welcome

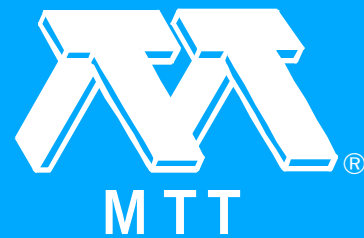
ACKNOWLEDGMENTS

This CD- ROM was assembled from the electronic files provided to us by Adam Philippidis at IEEE headquarters and from scanned originals provided by Ted Saad. Many people have contributed to the entire CD-ROM Archival effort. Most notably, Ted Saad provided nearly all the hard copy material, and sacrificed his entire collection of journals for the project. He also wrote a number of the original articles. Another notable contributor, Roger Pollard convinced the Society that this was a worthwhile project. The team at Sony Electronic Publishing Services, and Adam Philippidis, at the IEEE Headquarters, have also provided substantial amounts of help in completing this archival project.

REFERENCES

IEEE Catalog Number: JP-17-0-0-C-0

ISBN: 0-7803-9906-4



IEEE
Contents



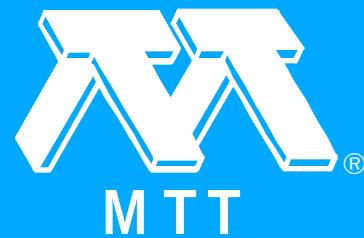
Welcome

COPYRIGHT

Copyright discussions are appropriate, although, at times they seem tedious. The amount of Intellectual Property contained in this Microwave Digital Archive is astounding. Please treat it with the respect that our profession demands.

Libraries are permitted to photocopy beyond the limits of U.S. copyright law, for private use of patrons, those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. For other copying, reprint, or republication permission, write to the Manager, IEEE Intellectual Property Rights, IEEE Operations Center, 445 Hoes Lane, Piscataway, NJ 08855-1331. All rights reserved.

Copyright © 1999 by The Institute of Electrical and Electronics Engineers, Inc.



IEEE

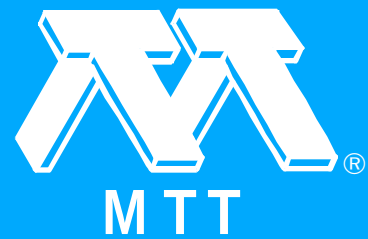
Contents



Welcome

TRADEMARKS

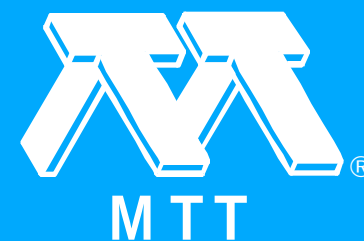
Sony is a registered trademark of Sony Corporation. Adobe, the Adobe logo, Acrobat and the Acrobat logo are trademarks of Adobe Systems Incorporated or its subsidiaries and may be registered in certain jurisdictions. Macintosh is a registered trademark of Apple Computer, Inc. HP is a registered trademark and HP-UX is a trademark of Hewlett-Packard Company. Motif is a trademark of Open Software Foundation, Inc. Solaris is a registered trademark of Sun Microsystems, Inc., Sun and OpenWindows are trademarks of Sun Microsystems, Inc. SPARC is a registered trademark of SPARC International, Inc. SPARCstation is a registered trademark of SPARC International, Inc., licensed exclusively to Sun Microsystems, Inc. and is based upon an architecture developed by Sun Microsystems, Inc. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company, Ltd. Windows is a trademark of Microsoft Corporation. X Window System is a trademark of the Massachusetts Institute of Technology. I386, 486 and Pentium are trademarks of Intel Corporation. All other products or name brands are trademarks of their respective holders.



IEEE
Contents



Getting Started



IEEE
Contents

INTRODUCTION

This Electronic Guide file contains hypertext links to separate article files. Links are represented by colored text (e.g. a name or title); clicking on the text activates the link.

Before you start browsing and using the information on this CD-ROM, you will need to install Adobe Acrobat Reader + Search 3.0. If you already have Acrobat Reader installed on your system, make sure it is version 3.0 or higher and includes the Search plug-in.

In many instances, we refer to the “menu bar”, shown here for reference.



ACROBAT PREFERENCES

To make viewing and searching easier, we recommend changing two default Acrobat Preferences (found under File > Preferences on the menu bar.)



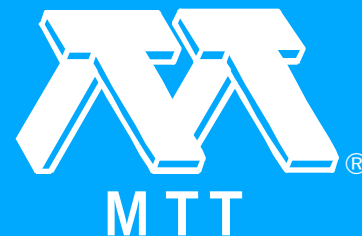
Getting Started

In the dialog box shown for **General** Preferences, turn OFF the “Open Cross-Document Links in Same Window” option; this will keep the Guide file open when you view article files and allows you to return to the same page in the Guide when you close an article.

In the dialog box shown for **Search** Preferences, turn ON the “Show Fields” option so that Title, Author, Keywords, and Subject fields are visible when specifying search criteria. If for some reason this preference option is not present on your system, check to see that you have the Search plug-in installed. The Search icon  will be present on the Acrobat Toolbar if the function is properly installed. Specifics of the Search function are described later in this section.

EXITING AN ARTICLE

To exit an article after viewing, and return to the electronic guide, select File > Close from the menu bar. To switch between the article and the electronic guide or any other PDF file that is open, select “Window” and pick the open file you wish to return to.



IEEE

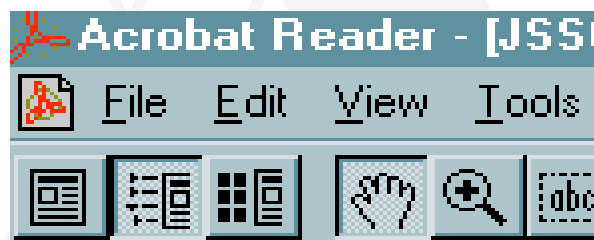
Contents



Getting Started

USING BOOKMARKS

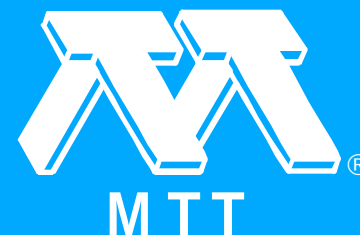
In addition to links, you can navigate through the Electronic Guide using Bookmarks. If they are not already visible, choose View > Bookmarks and Page from the menu bar or press the “Display Page and Bookmarks” button on the tool bar. A panel opens on the left side of the screen displaying Bookmarks in a hierarchy.



- Contents
- Welcome
- Getting Started
- ▷ □ Publications
- ▷ □ Authors
- ▷ □ Subjects
- ▷ □ Conferences

Each Bookmark corresponds to a page in the Guide. Click on the text in a Bookmark to go to that page.

Entries with lower level Bookmarks show an arrowhead, pointing down when subordinate Bookmarks are visible, pointing right when hidden. To view subordinate Bookmarks, click on the arrowhead. To hide them, click on the arrowhead again. Dragging the right margin of the bookmark panel resizes it.



IEEE

Contents



Getting Started

PRINTING ARTICLES

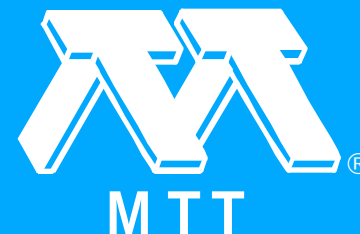
Articles may have text outside normal print-area defaults. We recommend selecting “Shrink to Fit” in the print menu (File > Print) to capture the complete image for your printout. This setting will become your new default.

SELECTING GRAPHICS

To copy graphics to the Clipboard, choose Tools > Select Graphics from the menu bar. The cursor changes to the cross-hair icon.

Drag a rectangle around the graphic to select it. When you release the mouse button, the selected graphic is highlighted.

Choose Edit > Copy from the menu bar to copy the selected graphic to the Clipboard. To view the graphic, choose Window > Show Clipboard. The graphic is copied in the WMF (Windows), PICT (Macintosh), or XPIXMAP (UNIX) format. With UNIX, the graphic is pasted in the primary selection.



IEEE

Contents



Getting Started

NAVIGATION BUTTONS

This Guide contains a variety of navigational aids to help you easily explore the contents.

Section Map

The Electronic Guide is constructed in sections: e.g. Sessions, Authors, Getting Started. The current section is shown at the top of each page. The “path” to this section is shown at the right. Clicking these text buttons moves you to the start of that section.

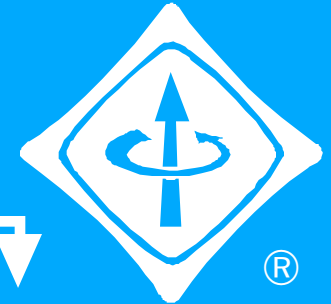
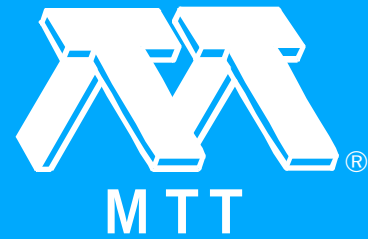
Next Page button

Click to advance to the next page in the section.

Previous Page button

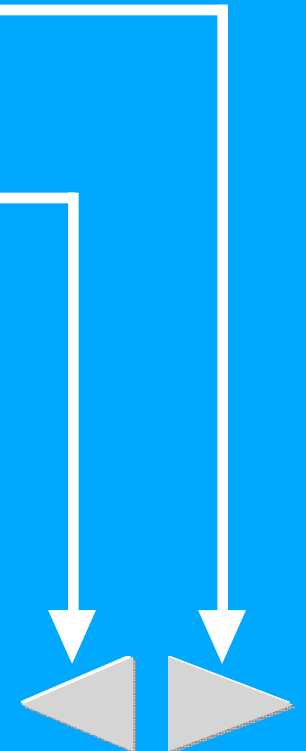
Click to go back to the previous page in the section. The first and last pages of a section show only one button.

The Page Up and Page Down keys perform the same functions.



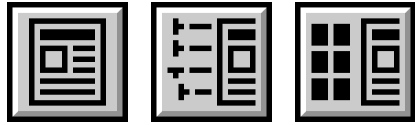
IEEE

Contents

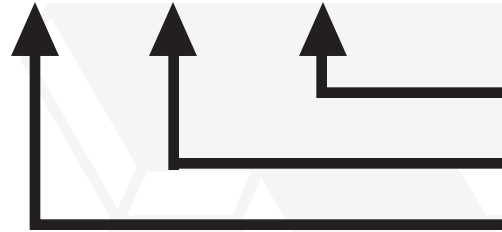


Getting Started

ACROBAT TOOLBAR



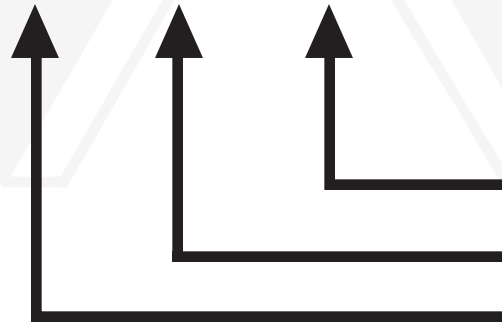
View Modes



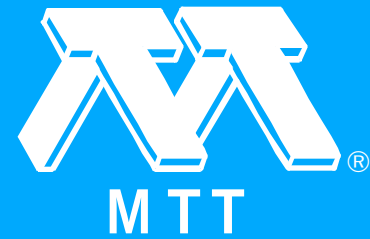
Display Thumbnails and Page
Display Bookmarks and Page
Display Page



Zoom/Selection



Select Text
Zoom In (Magnify)
Move Page Image



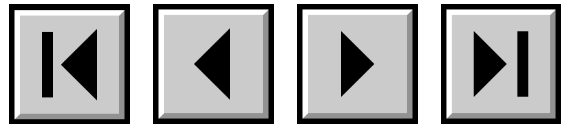
IEEE

Contents

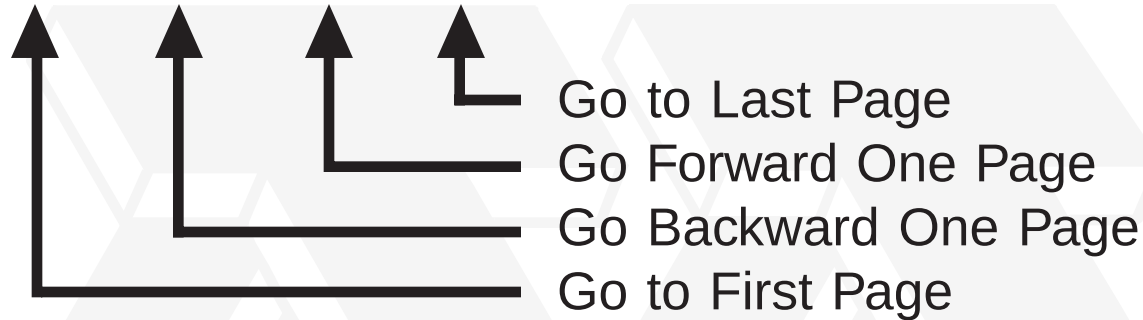


Getting Started

ACROBAT TOOLBAR (continued)



Navigation

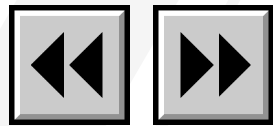


Go to Last Page

Go Forward One Page

Go Backward One Page

Go to First Page

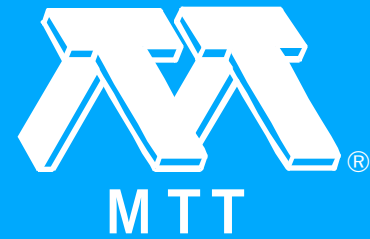


History



Next (One Link)

Previous (One Link)

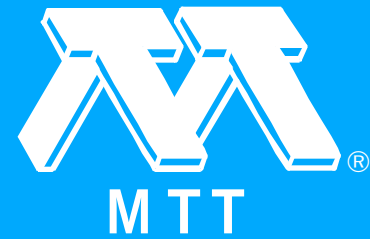


IEEE

Contents



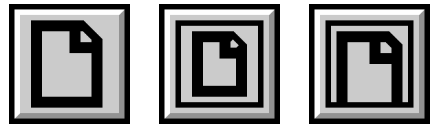
Getting Started



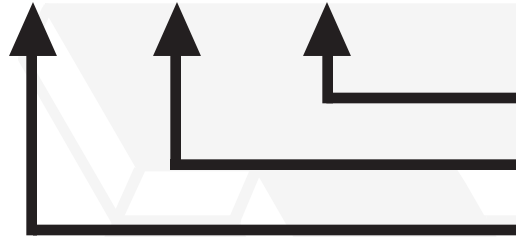
IEEE

Contents

ACROBAT TOOLBAR (continued)



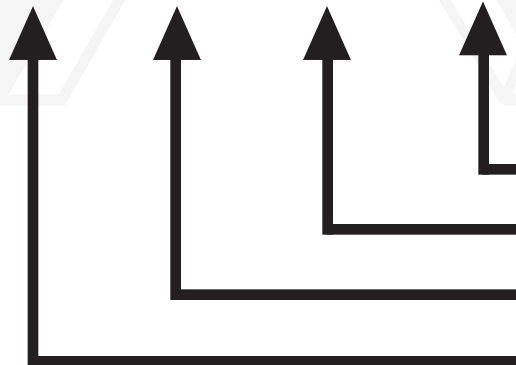
Page View



Fit Width
Fit Page
Actual Size



Find/Search



Next Hit
Previous Hit
View Search Results
Search
Find



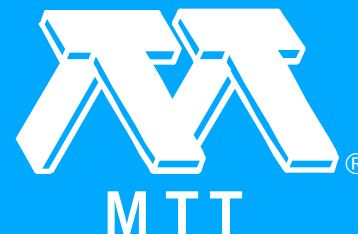
Getting Started

SEARCHING

Two types of searching are possible with Acrobat: Find and full-text Search. Choosing Find (from the Toolbar or Tools > Find) opens a dialog box. Type a search string in the field provided, check the appropriate options and press the “Find” button. Find searches linearly through the currently open Acrobat file (not necessarily the entire Electronic Guide) from the cursor forward.

Choosing the Search button or Search menu item (Tools > Search), selecting the Query item, opens a dialog box from which you can access the more powerful full-text search engine (if you installed Acrobat with the Search plug-in from this CD-ROM). Its dialog box is shown on the next page.

Typing a term in the text box at the top of the Search dialog box and pressing the “Search” button causes a full-text search of all words in the body of papers in the collection. Entering a term in one or more of the fixed fields (Title, Author, Subject or Keywords) will cause a search for hits in only those fields.



IEEE

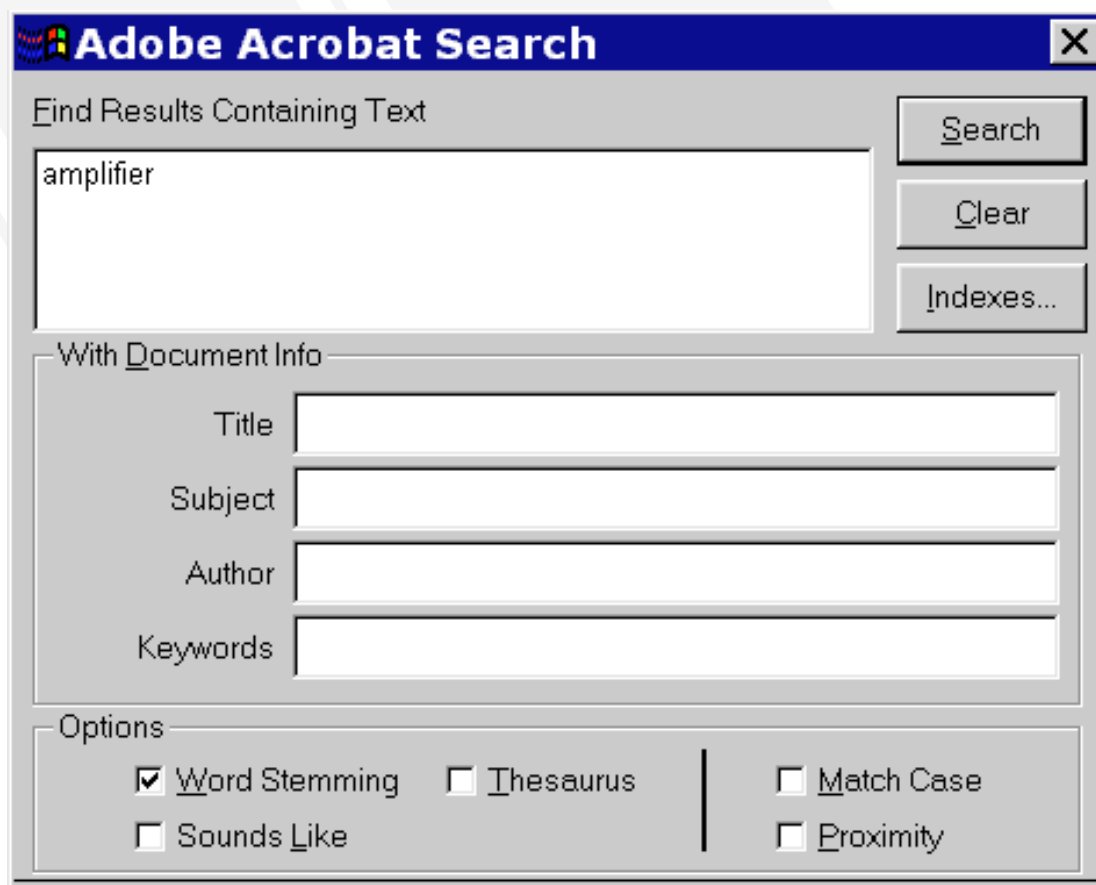
Contents



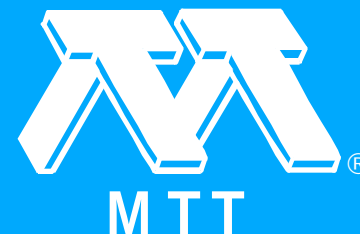
Getting Started

If you are not finding files you think should show in the results list, Acrobat may not be attached to the correct index file. To check, press the “Indexes...” button for a list of available indexes. If this title is not listed, press the “Add...” button and look in the root directory of the CD-ROM for a file called “index.pdx”. Click on that file to add it to the list. If none exists, this title was not indexed.

See the Search Online Guide (on Help menu) for more complete instructions on selecting appropriate options, constructing boolean queries, etc.



The screenshot shows the 'Adobe Acrobat Search' dialog box. It has a title bar with the Adobe logo and the text 'Adobe Acrobat Search'. The main area is titled 'Find Results Containing Text' and contains a text input field with the word 'amplifier'. To the right of this field are three buttons: 'Search', 'Clear', and 'Indexes...'. Below the main input field is a section titled 'With Document Info' containing four labeled text input fields: 'Title', 'Subject', 'Author', and 'Keywords'. At the bottom is an 'Options' section with five checkboxes: 'Word Stemming' (checked), 'Thesaurus' (unchecked), 'Match Case' (unchecked), 'Sounds Like' (unchecked), and 'Proximity' (unchecked).



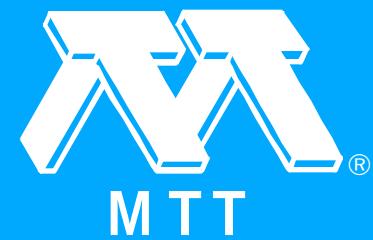
IEEE

Contents



Publications

- ❑ [1989 Transactions on Microwave Theory and Techniques](#)
- ❑ [1990 Transactions on Microwave Theory and Techniques](#)
- ❑ [1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest](#)



IEEE

Contents

Click on title for a list of issues.

Issues by Publication



IEEE

[Contents](#)

[Publications](#)

1989 Transactions on Microwave Theory and Techniques

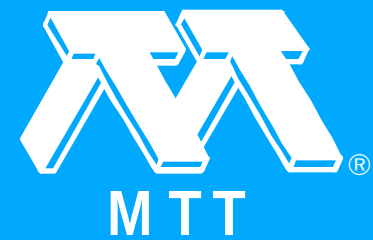
- ☐ [Jan. 1989 \[T-MTT\]](#)
- ☐ [Feb. 1989 \[T-MTT\] \(Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems\)](#)
- ☐ [Mar. 1989 \[T-MTT\]](#)
- ☐ [Apr. 1989 \[T-MTT\]](#)
- ☐ [May 1989 \[T-MTT\]](#)
- ☐ [Jun. 1989, Part I \[T-MTT\]](#)
- ☐ [Jun. 1989, Part II \[T-MTT\] \(8 Year Cumulative Index\)](#)
- ☐ [Jul. 1989 \[T-MTT\]](#)
- ☐ [Aug. 1989 \[T-MTT\]](#)
- ☐ [Sep. 1989 \[T-MTT\] \(Special Issue on FET Structures Modeling and Circuit Applications\)](#)
- ☐ [Oct. 1989 \[T-MTT\]](#)
- ☐ [Nov. 1989 \[T-MTT\]](#)

Click on issue for a list of papers.



Issues by Publication

- Dec. 1989 [T-MTT] (1989 Symposium Issue)



IEEE

Contents

Publications

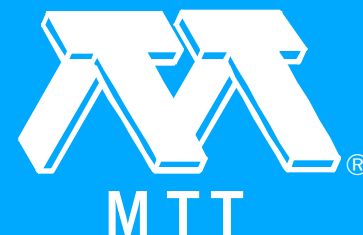
Click on issue for a list of papers.



Issues by Publication

1990 Transactions on Microwave Theory and Techniques

- ☐ Jan. 1990 [T-MTT]
- ☐ Feb. 1990 [T-MTT]
- ☐ Mar. 1990 [T-MTT]
- ☐ Apr. 1990 [T-MTT]
- ☐ May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)
- ☐ Jun. 1990 [T-MTT]
- ☐ Jul. 1990 [T-MTT]
- ☐ Aug. 1990 [T-MTT]
- ☐ Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)
- ☐ Oct. 1990 [T-MTT]
- ☐ Nov. 1990 [T-MTT]



IEEE

Contents

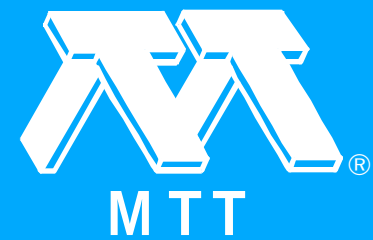
Publications

Click on issue for a list of papers.



Issues by Publication

- ▣ Dec. 1990 [T-MTT] (1990 Symposium Issue)



IEEE

Contents

Publications

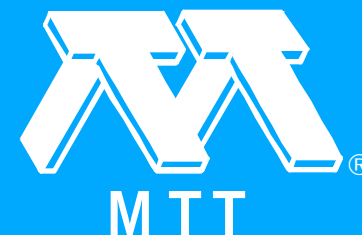
Click on issue for a list of papers.



Issues by Publication

1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest

▣ [1990 \[MCS\]](#)



IEEE

[Contents](#)

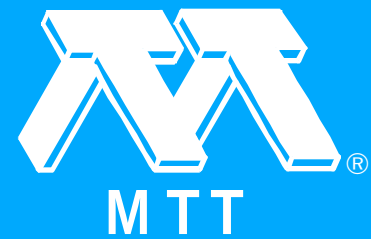
[Publications](#)

Click on issue for a list of papers.



Issues

- ❑ Jan. 1989 [T-MTT]
- ❑ Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)
- ❑ Mar. 1989 [T-MTT]
- ❑ Apr. 1989 [T-MTT]
- ❑ May 1989 [T-MTT]
- ❑ Jun. 1989, Part I [T-MTT]
- ❑ Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)
- ❑ Jul. 1989 [T-MTT]
- ❑ Aug. 1989 [T-MTT]
- ❑ Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)
- ❑ Oct. 1989 [T-MTT]
- ❑ Nov. 1989 [T-MTT]
- ❑ Dec. 1989 [T-MTT] (1989 Symposium Issue)
- ❑ Jan. 1990 [T-MTT]



Contents

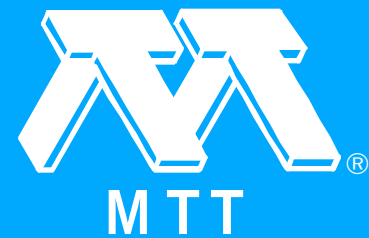
Publications

Click on issue for a list of papers.



Issues

- ❑ Feb. 1990 [T-MTT]
- ❑ Mar. 1990 [T-MTT]
- ❑ Apr. 1990 [T-MTT]
- ❑ May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)
- ❑ Jun. 1990 [T-MTT]
- ❑ Jul. 1990 [T-MTT]
- ❑ Aug. 1990 [T-MTT]
- ❑ Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)
- ❑ Oct. 1990 [T-MTT]
- ❑ Nov. 1990 [T-MTT]
- ❑ Dec. 1990 [T-MTT] (1990 Symposium Issue)
- ❑ 1990 [MCS]



IEEE

[Contents](#)

[Publications](#)

Click on issue for a list of papers.

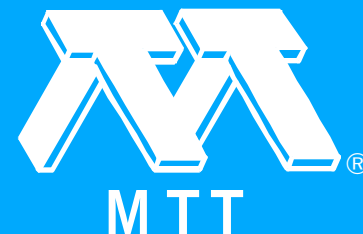


Papers by Issue

Jan. 1989 [T-MTT]

- ☐ [Front Cover \(Jan. 1989 \[T-MTT\]\)](#)
- ☐ [Editorial \(Jan. 1989 \[T-MTT\]\)](#)
- ☐ [A New Equivalent Network Method for Analyzing Discontinuity Properties of Open Dielectric Waveguides](#)
- ☐ [A CAD-Oriented Method for Noise Figure Computation of Two-Ports with Any Internal Topology](#)
- ☐ [Exact Solutions for Shielded Printed Microstrip Lines by the Carleman-Vekua Method](#)
- ☐ [A New Analytic Design Technique for Two-and Three-Way Warped Mode Combine Directional Couplers](#)
- ☐ [Generation of High-Power Broad-Band Microwave Pulses by Picosecond Optoelectronic Technique](#)
- ☐ [Transversely Anisotropic Curved Optical Fibers: Variational Analysis of a Nonstandard Eigenproblem](#)
- ☐ [Analysis of Dielectric Guiding Structures by the Iterative Eigenfunction Expansion Method](#)

Click on title for a paper summary.



IEEE

[Contents](#)

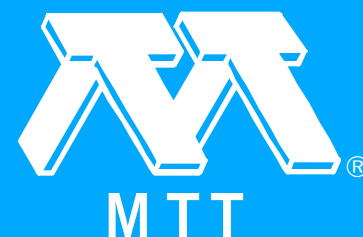
[Publications](#)

[Issues](#)



Papers by Issue

- ❑ Cutoff Spaces of Elliptical Gyromagnetic Planar Circuits and Waveguides Using Finite Elements
- ❑ Full-Wave, Finite Element Analysis of Irregular Microstrip Discontinuities
- ❑ Determination of the Correlation Spectrum of Oscillators with Low Noise
- ❑ Open-Ended Coaxial Exposure Device for Applying RF/Microwave Fields to Very Small Biological Preparations
- ❑ A Broad-Band Printed Circuit Hybrid Ring Power Divider
- ❑ Numerical Simulation of Annular Phased Arrays for Anatomically Based Models Using the FDTD Method
- ❑ Analysis of Transients in Nonuniform and Uniform Multiconductor Transmission Lines
- ❑ Optically CW-Induced Losses in Semiconductor Coplanar Waveguides
- ❑ Analysis and Measurement of Transducer End Radiation in SAW Filters on Strongly Coupling Substrates



IEEE

Contents

Publications

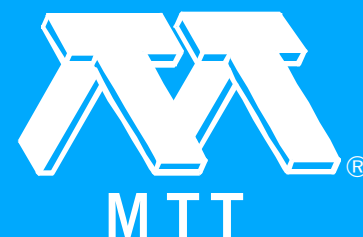
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ On the Mode Coupling in Longitudinally Magnetized Waveguiding Structures
- ❑ Intelligent Alignment of Waveguide Filters Using a Machine Learning Approach
- ❑ Electromagnetic Deposition in an Anatomically Based Model of Man for Leakage Fields of a Parallel-Plate Dielectric Heater
- ❑ On the Application of Complex Resistive Boundary Conditions to Model Transmission Lines Consisting of Very Thin Superconductors
- ❑ Variational Analysis of Dielectrically Loaded Multidepth Corrugated Waveguides
- ❑ A 2-18 GHz Low-Noise/High-Gain Amplifier Module
- ❑ A Partial Variational Approach for Arbitrary Discontinuities in Planar Dielectric Waveguides
- ❑ Spectral-Domain Computation of Characteristic Impedances and Multiport Parameters of Multiple Coupled Microstrip Lines



Contents

Publications

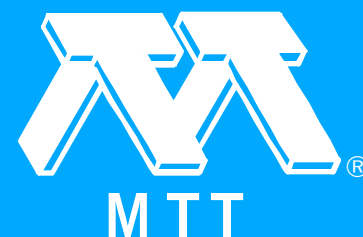
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Six-Port and Four-Port Reflectometers for Complex Permittivity Measurements at Submillimeter Wavelengths
- ❑ Spectral-Domain Analysis of Harmonic Effects in Superconducting Quasiparticle Mixers
- ❑ Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines
- ❑ Reflection Coefficient of a Waveguide with Slightly Uneven Walls
- ❑ Damping of the Resonant Modes of a Rectangular Metal Package (Short Papers)
- ❑ Finite Element Formulation for Guided-Wave Problems Using Transverse Electric Field Component (Short Papers)
- ❑ An Improved Algorithm for the Computer-Aided Design of Coupled Slab Lines (Short Papers)
- ❑ Analysis of Nonreciprocal Coupled Image Lines (Comments and Reply) (Jan. 1989 [T-MTT])
- ❑ Patent Abstracts (Jan. 1989 [T-MTT])
- ❑ Copyright Form (Jan. 1989 [T-MTT])



IEEE

Contents

Publications

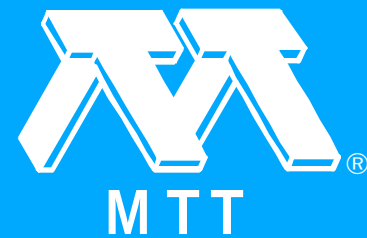
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Oliver Heaviside: Sage in Solitude \(Advertisement\) \(Jan. 1989 \[T-MTT\]\)](#)
- ❑ [1988 IEEE Membership Directory \(Advertisement\) \(Jan. 1989 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Jan. 1989 \[T-MTT\]\)](#)



[Contents](#)

[Publications](#)

[Issues](#)

Click on title for a paper summary.

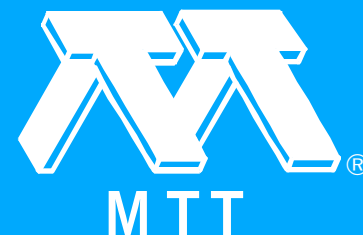


Papers by Issue

Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)

- ☐ [Front Cover \(Feb. 1989 \[T-MTT\]\)](#)
- ☐ [Foreword \(Feb. 1989 \[T-MTT\]\)](#)
- ☐ [Overview of Quasi-Planar Transmission Lines](#)
- ☐ [Coupled Mode Analysis of a Finline](#)
- ☐ [Asymmetrical Finline for Space Applications Using Millimeter Waves](#)
- ☐ [Finlines in Rectangular and Circular Waveguide Housings Including Substrate Mounting and Bending Effects--Finite Element Analysis](#)
- ☐ [p-i-n Diode Control Devices in E-Plane Technique](#)
- ☐ [The Design of Millimeter-Wave Control Components](#)
- ☐ [Quasi-Planar Filters for Millimeter-Wave Applications](#)
- ☐ [Computer-Aided Design of E-Plane Waveguide Passive Components](#)

Click on title for a paper summary.



[Contents](#)

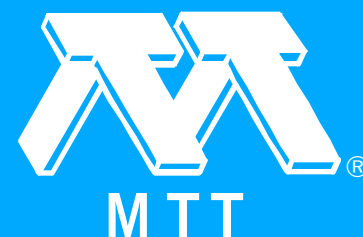
[Publications](#)

[Issues](#)



Papers by Issue

- ❑ Rigorous Field Theory Design of Millimeter-Wave E-Plane Integrated Circuit Multiplexer
- ❑ Oscillators and Amplifiers in Integrated E-Plane Technique
- ❑ The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications
- ❑ Investigation of Planar Antennas for Submillimeter Receivers
- ❑ Study of Modal Solution Procedures for Microstrip Step Discontinuities
- ❑ Spectral-Domain Analysis of E-Plane Waveguide to Microstrip Transitions
- ❑ Monolithic IMPATT Oscillator Characterization
- ❑ A Novel Exponential Power Combiner/Divider
- ❑ Double-Sided MIC's and Their Applications
- ❑ Reflection and Transmission Characteristics of an Uncoincidental Junction on Rectangular Dielectric Waveguides



Contents

Publications

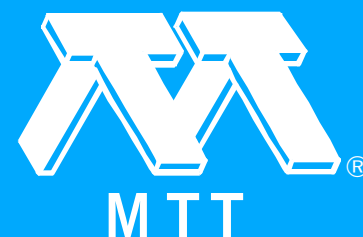
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Circuit Parameters for Single and Coupled Microstrip Lines by a Rigorous Full-Wave Space-Domain Analysis \(Short Papers\)](#)
- ❑ [A FET Amplifier in Finline Technique \(Short Papers\)](#)
- ❑ [A Quasi-Planar FET Amplifier in Integrated Finline and Microstrip Technique \(Short Papers\)](#)
- ❑ [Dielectric Resonators Suitable for Use in Planar Integrated Circuits at Short Millimeter Wavelengths \(Short Papers\)](#)
- ❑ [Patent Abstracts \(Feb. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems \(Feb. 1989 \[T-MTT\]\)](#)
- ❑ [Principles of Computerized Tomographic Imaging \(Advertisement\) \(Feb. 1989 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Feb. 1989 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

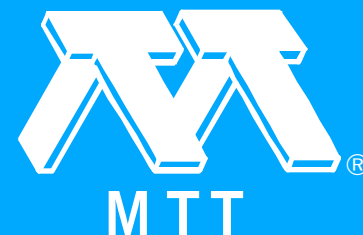
Click on title for a paper summary.



Papers by Issue

Mar. 1989 [T-MTT]

- ☐ [Front Cover \(Mar. 1989 \[T-MTT\]\)](#)
- ☐ [Modeling of Multiconductor Buses and Analysis of Crosstalk, Propagation Delay, and Pulse Distortion in High-Speed GaAs Logic Circuits](#)
- ☐ [Physical Modeling of GaAs MESFET's in an Integrated CAD Environment: From Device Technology to Microwave Circuit Performance](#)
- ☐ [Modeling of Picosecond Pulse Propagation in Microstrip Interconnections on Integrated Circuits](#)
- ☐ [A Simple Broad-Band Device De-Embedding Method Using an Automatic Network Analyzer with Time-Domain Option](#)
- ☐ [Variational Method for Multiconductor Coupled Striplines with Stratified Anisotropic Media](#)
- ☐ [Analysis of Step Discontinuities on Planar Dielectric Waveguide Containing a Gyrotropic Layer](#)



IEEE

[Contents](#)

[Publications](#)

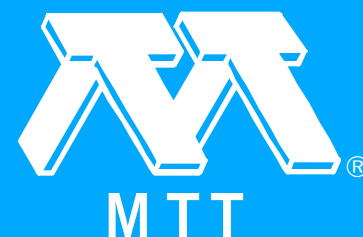
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ [A Cylindrical Multiconductor Stripline-Like Microstrip Transmission Line](#)
- ❑ [Generalized Spectral Analysis of Planar Lines on Layered Media Including Uniaxial and Biaxial Dielectric Substrates](#)
- ❑ [Full-Wave Analysis of a Perfectly Conducting Wire Transmission Line in a Double-Layered Conductor-Backed Medium](#)
- ❑ [Surface-to-Surface Transition via Electromagnetic Coupling of Microstrip and Coplanar Waveguide](#)
- ❑ [Vectorial Wave Analysis of Uniform-Core Optical Fibers Using a Novel Boundary Integral Method](#)
- ❑ [Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part I: Rigorous Network Formulations](#)
- ❑ [Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part II: Small-Aperture and Small-Obstacle Solutions](#)



IEEE

Contents

Publications

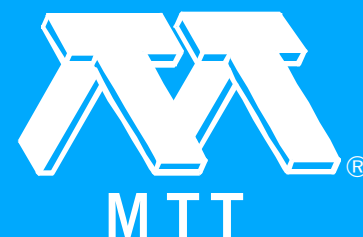
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Field Solution and Propagation Characteristics of Monofilar-Bifilar Modes of Axially Slotted Coaxial Cable
- ❑ Large-Signal Computer-Aided Analysis and Design of Silicon Bipolar MMIC Oscillators and Self-Oscillating Mixers
- ❑ A GaAs Monolithic 6 GHz Low-Noise Amplifier for Satellite Receivers (Mar. 1989 [T-MTT])
- ❑ A Multi-IMPATT Injection-Locked Oscillator at 35 GHz
- ❑ An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions
- ❑ Printed Circuit Antennas with Integrated FET Detectors for Millimeter-Wave Quasi Optics
- ❑ An Accurate Measurement Technique for Line Properties, Junction Effects, and Dielectric and Magnetic Material Parameters
- ❑ Deterministic Approach to Full-Wave Analysis of Discontinuities in MIC's Using the Method of Lines
- ❑ Microwave Power Combination Using a Bifurcated Waveguide and a Reflecting Plate



IEEE

Contents

Publications

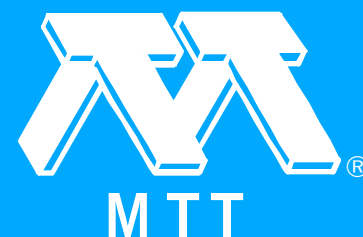
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ A Novel Cavity Resonator Measurement Method for Leaky Waveguides (Mar. 1989 [T-MTT])
- ❑ A Generalized Theory for Asymmetrical Coupled Lines (Short Papers)
- ❑ Improved Theory for E-Plane Symmetrical Tee Junctions (Short Papers)
- ❑ Effect of a Cochannel Signal on the Electrical Tuning Characteristics of a Gunn Oscillator (Short Papers)
- ❑ Accurate Characterization of Microstrip Resonator Open End with New Current Expression in Spectral-Domain Approach (Short Papers)
- ❑ Analysis of the Oscillation Conditions in Distributed Amplifiers (Short Papers)
- ❑ Lower Bound on the Eigenvalues of the Characteristic Equation for an Arbitrary Multilayered Gyromagnetic Structure with Perpendicular Magnetization (Short Papers)



IEEE

Contents

Publications

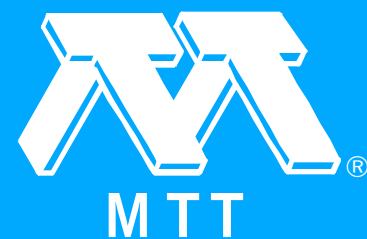
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Effects of Gain Compression, Bias Conditions, and Temperature on the Flicker Phase Noise of an 8.5 GHz GaAs MESFET Amplifier (Short Papers)
- ❑ Determination of the Scattering Matrix of Ring-Loaded Corrugated Waveguide Mode Converters (Short Papers)
- ❑ Attenuation Measurement of Very Low Loss Dielectric Waveguides by the Cavity Resonator Method Applicable in the Millimeter/Submillimeter Wavelength Range (Comments and Reply)
- ❑ Patent Abstracts (Mar. 1989 [T-MTT])
- ❑ Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Mar. 1989 [T-MTT])
- ❑ Kalman Filtering Ordering Form (Advertisement) (Mar. 1989 [T-MTT])
- ❑ Principles of Computerized Tomographic Imaging (Advertisement) (Mar. 1989 [T-MTT])
- ❑ Back Cover (Mar. 1989 [T-MTT])



Contents

Publications

Issues

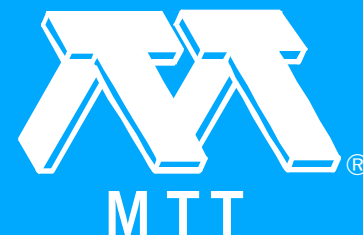
Click on title for a paper summary.



Papers by Issue

Apr. 1989 [T-MTT]

- ☐ [Front Cover \(Apr. 1989 \[T-MTT\]\)](#)
- ☐ [A Variational Analysis of Anisotropic, Inhomogeneous Dielectric Waveguides](#)
- ☐ [Efficient Analysis of Planar Microstrip Geometries Using a Closed-Form Asymptotic Representation of the Grounded Dielectric Slab Green's Function](#)
- ☐ [Evaluation of Loss Factor of Multilayered Inhomogeneous Waveguides for Magnetostatic Waves Using Efficient Finite Element Formalism](#)
- ☐ [Effect of Transition Waveguides on Dielectric Waveguide Directional Couplers](#)
- ☐ [Resonant Modes in Shielded Cylindrical Ferrite and Single-Crystal Dielectric Resonators](#)
- ☐ [Centimeter-Wave Microstrip Phase Shifter on a Ferrite-Dielectric Substrate](#)
- ☐ [Wide-Band Superconductive Chirp Filters](#)



IEEE

[Contents](#)

[Publications](#)

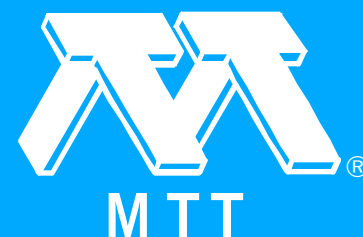
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Propagation in Layered Biased Semiconductor Structures Based on Transport Analysis
- ❑ A Compact Full MMIC Module for Ku-Band Phase-Locked Oscillators
- ❑ Phase and Amplitude Characteristics of InP: Fe Modified Interdigitated Gap Photoconductive Microwave Switches
- ❑ Measurement and Calibration of a Universal Six-Port Network Analyzer
- ❑ Magnetic Tuning of Cylindrical H/sub 01delta/-Mode Dielectric Resonators
- ❑ A Quasi-TEM Analysis for Curved and Straight Planar Multiconductor Systems
- ❑ Wire and Strip Conductors Over a Dielectric-Coated Conducting or Dielectric Half-Space
- ❑ Analysis of Discontinuities in an Open Dielectric Slab Waveguide by Combination of Finite and Boundary Elements



IEEE

Contents

Publications

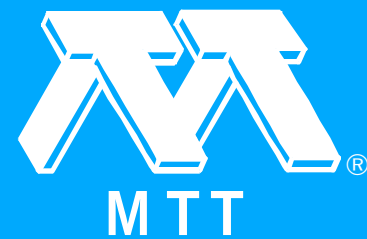
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Metallization Thickness Effect of Striplines with Anisotropic Media: Quasi-Static and Hybrid-Mode Analysis
- ❑ Propagation Properties of Striplines Periodically Loaded with Crossing Strips
- ❑ The Frequency-Dependent Impedance of p-i-n Diodes (Short Papers)
- ❑ Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications (Short Papers)
- ❑ Frequency-Dependent Characteristics of Open Microstrip Lines with Finite Strip Thickness (Short Papers)
- ❑ An Improved Design of Systems Based on Three Coupled Microstrip Lines (Short Papers)
- ❑ Frequency-Dependent Characteristics of Current Distributions on Microstrip Lines (Short Papers)
- ❑ Shift of the Complex Resonance Frequency of a Dielectric-Loaded Cavity Produced by Small Sample Insertion Holes (Short Papers)



IEEE

Contents

Publications

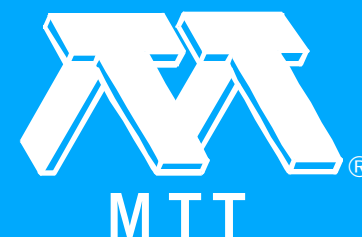
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Conductor Geometry Independence of Phase Velocity in TEM-Mode Transmission Lines (Letters)
- ❑ Numerical Analysis of H-Plane Waveguide Junctions by Combination of Finite and Boundary Elements (Comments)
- ❑ Multiple Dielectric Posts in a Rectangular Waveguide (Corrections)
- ❑ Patent Abstracts (Apr. 1989 [T-MTT])
- ❑ Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Apr. 1989 [T-MTT])
- ❑ Call for Papers - 1989 IEEE Gallium Arsenide Integrated Circuit Symposium (Apr. 1989 [T-MTT])
- ❑ MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (Apr. 1989 [T-MTT])
- ❑ 1989 IEEE Membership Directory (Advertisement) (Apr. 1989 [T-MTT])
- ❑ Back Cover (1989 [T-MTT])



IEEE

Contents

Publications

Issues

Click on title for a paper summary.

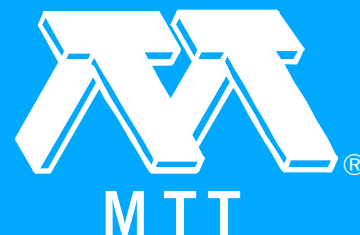


Papers by Issue

May 1989 [T-MTT]

- ☐ [Front Cover \(May 1989 \[T-MTT\]\)](#)
- ☐ [A New Approach to the RF Power Operation of MESFET's](#)
- ☐ [Transient Analysis of Multiple-Tuned Injection-Locked Amplifiers with Modulated Input Signal](#)
- ☐ [High-Frequency MESFET Noise Modeling Including Distributed Effects](#)
- ☐ [Fast and Accurate Analytic Formulas for Calculating the Parameters of a General Broadside-Coupled Coplanar Waveguide for \(M\)MIC Applications](#)
- ☐ [Theory of Magnetostatic Waves in Moving Ferrite Films and Applications to Rotation Rate Sensing](#)
- ☐ [Modeling Ferrimagnetic Resonators](#)
- ☐ [The Complete Spectrum of Image Line](#)
- ☐ [Full Vectorial Finite Element Formalism for Lossy Anisotropic Waveguides](#)
- ☐ [Analysis of a Centered-Inclined Waveguide Slot Coupler](#)

Click on title for a paper summary.



IEEE

[Contents](#)

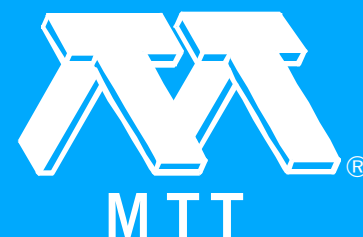
[Publications](#)

[Issues](#)



Papers by Issue

- ❑ [Characterization of Microstrip Lines Near a Substrate Edge and Design Formulas of Edge-Compensated Microstrip Lines](#)
- ❑ [Time-Domain Method of Lines Applied to Planar Guided Wave Structures](#)
- ❑ [Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part III: Rigorous Solution](#)
- ❑ [Equivalent Current Density Reconstruction for Microwave Imaging Purposes](#)
- ❑ [Bandwidth Properties of Rectangular T-Septum Waveguides \(Short Papers\)](#)
- ❑ [On the Bandwidth of T-Septum Waveguide \(Short Papers\)](#)
- ❑ [Optimized Method for Obtaining Permittivity and Conductivity Profiles of Microwave Materials \(Short Papers\)](#)
- ❑ [Transmission Properties of a Right-Angle Microstrip Bend with and without a Miter \(Short Papers\)](#)



IEEE

[Contents](#)

[Publications](#)

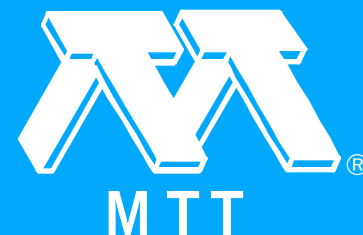
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ☐ The Use of a Single Source to Drive a Binary Peak Power Multiplier (Short Papers)
- ☐ Mutual Impedance Between Probes in a Waveguide (Corrections)
- ☐ Patent Abstracts (May 1989 [T-MTT])
- ☐ Microwave Week (Advertisement) (May 1989 [T-MTT])
- ☐ Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (May 1989 [T-MTT])
- ☐ MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (May 1989 [T-MTT])
- ☐ Back Cover (May 1989 [T-MTT])



Contents

Publications

Issues

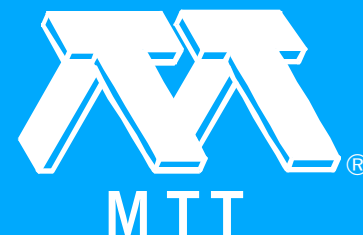
Click on title for a paper summary.



Papers by Issue

Jun. 1989, Part I [T-MTT]

- ☐ [Front Cover \(Jun. 1989, Part I \[T-MTT\]\)](#)
- ☐ [TM Waves Guided by Nonlinear Planar Waveguides](#)
- ☐ [New Type of Spectral-Domain Analysis of a Microstrip Line](#)
- ☐ [Computation of Complex Resonance Frequencies of Isolated Composite Objects](#)
- ☐ [Two Cylindrical Obstacles in a Rectangular Waveguide--Resonances and Filter Applications](#)
- ☐ [Synthesis, Design, and Construction of Ultra-Wide-Band Nonuniform Quadrature Directional Couplers in Inhomogeneous Media](#)
- ☐ [An Approximate Variational Solution to the Step Discontinuity in Finline](#)
- ☐ [Microwave Complex Conductivity of a Square Post in Rectangular Waveguide](#)
- ☐ [Waveguide Discontinuity Analysis with a Coupled Finite-Boundary Element Method](#)



[Contents](#)

[Publications](#)

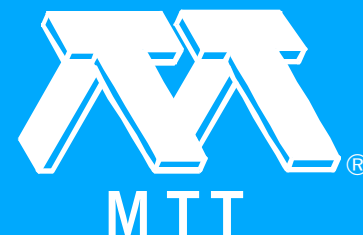
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Finite Element Solution of Longitudinally Magnetized Elliptical Gyromagnetic Waveguides
- ❑ Mutual Impedance Between Probes in a Circular Waveguide
- ❑ Nonreciprocal Operation of Structures Comprising a Section of Coupled Ferrite Lines with Longitudinal Magnetization
- ❑ Bandwidth Characteristics of Inhomogeneous T-Septum Waveguides
- ❑ Traveling-Wave Inverted-Gate Field-Effect Transistors: Concept, Analysis, and Potential
- ❑ FET Up-Converter Design Using Load-Dependent Mixing Transconductance
- ❑ Selected Technology Summaries for Microwave Theory and Techniques--1988
- ❑ A Proposed Microwave and Millimeter-Wave Spectrum Analyzer (Short Papers)
- ❑ Modeling of Arbitrarily Shaped Signal Lines and Discontinuities (Short Papers)



IEEE

Contents

Publications

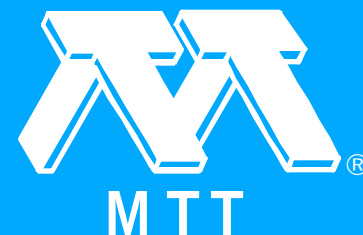
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [An Analytical Solution for the Coupled Stripline-Like Microstrip Line Problem \(Corrections\)](#)
- ❑ [Patent Abstracts \(Jun. 1989, Part I \[T-MTT\]\)](#)
- ❑ [Microwave Week \(Advertisement\) \(Jun. 1989, Part I \[T-MTT\]\)](#)
- ❑ [Call for Papers - Application of Lightwave Technology to Microwave Device, Circuits, and Systems \(Jun. 1989, Part I \[T-MTT\]\)](#)
- ❑ [Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broad-Band Networks \(Jun. 1989, Part I \[T-MTT\]\)](#)
- ❑ [Back Cover \(Jun. 1989, Part I \[T-MTT\]\)](#)



[Contents](#)

[Publications](#)

[Issues](#)

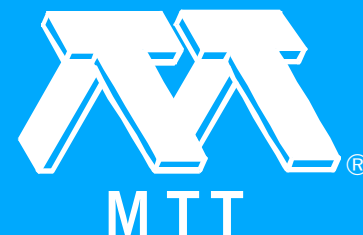
Click on title for a paper summary.



Papers by Issue

Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)

- ☐ [Front Cover \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ☐ [Editor's Preface \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ☐ [The MTT Transactions and Symposia Update \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ☐ [1981-1988 Cumulative Index - Guide to the Index \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ☐ [Index of Authors, Cumulative, 1981-1988 \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ☐ [Index of Subjects, Cumulative, 1981-1988 \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ☐ [MTT Society Series of Home Video Tutorials - Emerging Technologies \(Advertisement\) \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ☐ [Back Cover \(Jun. 1989, Part II \[T-MTT\]\)](#)



IEEE

Contents

Publications

Issues

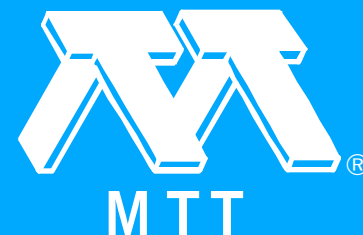
Click on title for a paper summary.



Papers by Issue

Jul. 1989 [T-MTT]

- ☐ [Front Cover \(Jul. 1989 \[T-MTT\]\)](#)
- ☐ [On the Design and Performance of a 6-18 GHz Three-Tier Matrix Amplifier](#)
- ☐ [Experiments on Injection Locking of Active Antenna Elements for Active Phased Arrays and Spatial Power Combiners](#)
- ☐ [Distributed Scaling Approach of MESFET's and its Comparison with the Lumped-Element Approach](#)
- ☐ [A Rigorous Analysis of a Coaxial to Shielded Microstrip Line Transition](#)
- ☐ [A Rigorous and Computationally Efficient Analysis of Microstrip for Use as an Electro-Optic Modulator](#)
- ☐ [Two-Path Cutoff Waveguide Dielectric Resonator Filters \(Jul. 1989 \[T-MTT\]\)](#)
- ☐ [Electromagnetic Field Analysis and Calculation of the Resonance Characteristics of the Loop-Gap Resonator](#)



IEEE

[Contents](#)

[Publications](#)

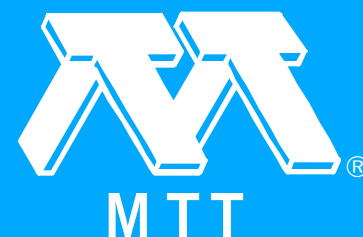
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Computation of Fields in an Arbitrarily Shaped Heterogeneous Dielectric or Biological Body by an Iterative Conjugate Gradient Method
- ❑ Performance Comparison of Available Interstitial Antennas for Microwave Hyperthermia
- ❑ Modeling the Gate I/V Characteristic of a GaAs MESFET for Volterra-Series Analysis (Short Papers)
- ❑ Note on the Impedance of a Wire Grid Parallel to a Homogeneous Interface (Short Papers)
- ❑ Analysis of Wide Transverse Inductive Metal Strips in a Rectangular Waveguide (Short Papers)
- ❑ On Microwave Imagery Using Bojarski's Identity (Short Papers)
- ❑ The Input Impedance of a Hollow-Probe-Fed, Semi-Infinite Rectangular Waveguide (Short Papers)
- ❑ dc to 40 GHz Coaxial-to-Microstrip Transition for 100- μ m-Thick GaAs Substrates (Short Papers)



Contents

Publications

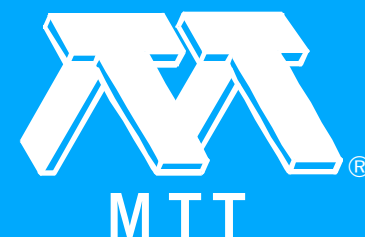
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ A Note on the Mixed Potential Representation of Electric Fields in Layered Media (Short Papers)
- ❑ Dominance of Resistive Losses Over Hysteretic Losses in Ferromagnetic Conductors (Short Papers)
- ❑ GaAs MESFET Baseband-to-Microwave Passive Switches (Comments and Reply)
- ❑ Broad-Band Monolithic Microwave Active Inductor and its Application to Miniaturized Wide-Band Amplifiers (Correction)
- ❑ Patent Abstracts (Jul. 1989 [T-MTT])
- ❑ Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Jul. 1989 [T-MTT])
- ❑ Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks (Jul. 1989 [T-MTT])
- ❑ Back Cover (Jul. 1989 [T-MTT])



IEEE

Contents

Publications

Issues

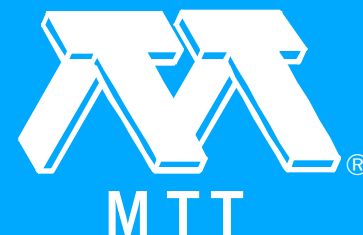
Click on title for a paper summary.



Papers by Issue

Aug. 1989 [T-MTT]

- ☐ [Front Cover \(Aug. 1989 \[T-MTT\]\)](#)
- ☐ [Determination of the Resonant Frequencies in a Complex Cavity Using the Scattering Matrix Formulation](#)
- ☐ [Characteristics of a Longitudinal/Transverse Coupling Slot in Crossed Rectangular Waveguides](#)
- ☐ [Elimination of Ringing Signals for a Lossless, Multiple-Section Transmission Line](#)
- ☐ [A Generalized Theory of Tapered Transmission Line Matching Transformers and Asymmetric Couplers Supporting Non-TEM Modes](#)
- ☐ [Three-Dimensional SAR Distributions Computed in a Multilayered Cylindrical Model for Electromagnetic Hyperthermia](#)
- ☐ [Theoretical and Experimental SAR Distributions for Interstitial Dipole Antenna Arrays Used in Hyperthermia](#)



[Contents](#)

[Publications](#)

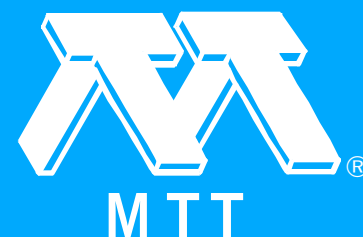
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ On the Imaging of Hot Spots Using Correlation Radiometers and a Circular Aperture
- ❑ Optical Receiver and Modulator Frequency Response Measurement with a Nd:YAG Ring Laser Heterodyne Technique
- ❑ Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique
- ❑ Planar FET Oscillators Using Periodic Microstrip Patch Antennas
- ❑ Novel Linearize Using Balanced Circulators and its Application to Multilevel Digital Radio Systems
- ❑ On Higher Order Mode Cutoff Frequencies in Elliptical Step Index Fibers
- ❑ Uniplanar Monolithic Frequency Doublers
- ❑ Laser-Activated p-i-n Diode Switch for RF Application (Short Papers)
- ❑ Analysis of Rectangular Spiral Transformers for MMIC Applications (Short Papers)



Contents

Publications

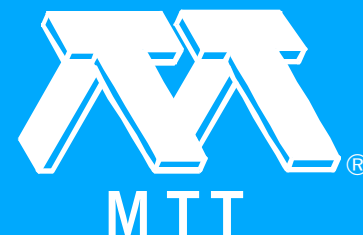
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Analysis of Edge-Coupled Elliptical \(Oval\) Rods Between Infinite Ground Planes \(Short Papers\)](#)
- ❑ [Numerical Conformal Transformation of Three-Magnetic-Wall Structures \(Short Papers\)](#)
- ❑ [Alternate Forms of the Generalized Composite Scattering Matrix \(Letters\)](#)
- ❑ [Patent Abstracts \(Aug. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks \(Aug. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1990 IEEE MTT-S International Microwave Symposium \(Aug. 1989 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Aug. 1989 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

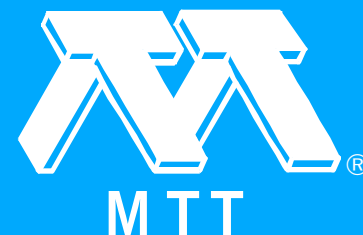
Click on title for a paper summary.



Papers by Issue

Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)

- ☐ [Front Cover \(Sep. 1989 \[T-MTT\]\)](#)
- ☐ [Foreword \(Sep. 1989 \[T-MTT\]\)](#)
- ☐ [The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications](#)
- ☐ [GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications](#)
- ☐ [Single-Interface and Quantum-Well Heterostructure MISFET's](#)
- ☐ [Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency](#)
- ☐ [Ion-Implanted High Microwave Power Indium Phosphide Transistors](#)
- ☐ [35 GHz GaAs Power MESFET's and Monolithic Amplifiers](#)



IEEE

[Contents](#)

[Publications](#)

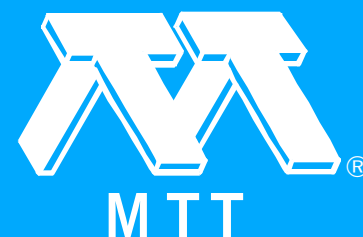
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ A New GaAs Power MESFET Structure for Improved Power Capabilities
- ❑ Modeling of Noise Parameters of MESFET's and MODFET's and Their Frequency and Temperature Dependence (Sep. 1989 [T-MTT])
- ❑ Distributed Numerical Modeling of Dual-Gate GaAs MESFET's
- ❑ DC and Transmission Line Models for a High Electron Mobility Transistor
- ❑ Numerical Simulation of GaAs MESFET's with a p-Buffer Layer on the Semi-Insulating Substrate Compensated by Deep Traps
- ❑ RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures
- ❑ A Linear Statistical FET Model Using Principal Component Analysis
- ❑ An Analytical Model for I-V and Small-Signal Characteristics of Planar-Doped HEMT's



Contents

Publications

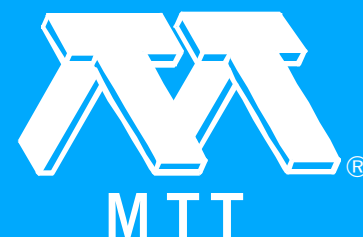
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Computer-Aided Noise Analysis of MESFET and HEMT Mixers
- ❑ Minimization of Intermodulation Distortion in GaAs MESFET Small-Signal Amplifiers
- ❑ Design Concepts for Microwave GaAs FET Active Filters
- ❑ Attenuation Compensation in Distributed Amplifier Design
- ❑ A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions
- ❑ A Process-Dependent Worst-Case Analysis for MMIC Design Based on a Handy MESFET Simulator
- ❑ FET-Based Planar Circuits for Quasi-Optical Sources and Transceivers
- ❑ Large-Signal Model of Picosecond FET's and Measurement of the Step Response
- ❑ A New Self-Alignment Technology for Sub-Quarter-Micron-Gate FET's Operating in the Ka-Band
- ❑ A Large-Signal HSPICE Model for the Heterojunction Bipolar Transistor (Short Papers)



IEEE

Contents

Publications

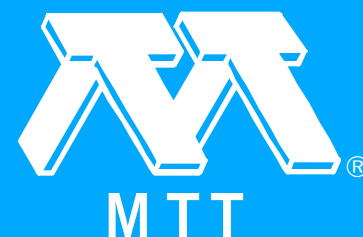
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers (Short Papers)
- ❑ Output Conductance Frequency Dispersion and Low-Frequency Noise in HEMT's and MESFET's (Short Papers)
- ❑ Optimal Computer-Aided Design of Monolithic Microwave Integrated Oscillators (Short Papers)
- ❑ An Analytical Two-Dimensional Perturbation Method to Model Submicron GaAs MESFET's (Short Papers)
- ❑ Lumped Lossy Circuit Synthesis and its Application in Broad-Band FET Amplifier Design in MMIC's (Short Papers)
- ❑ Patent Abstracts (Sep. 1989 [T-MTT])
- ❑ Call for Papers - 1990 IEEE MTT-S International Microwave Symposium (Sep. 1989 [T-MTT])
- ❑ Call for Papers - Multifunction MMICs and Their System Applications (Sep. 1989 [T-MTT])
- ❑ Back Cover (Sep. 1989 [T-MTT])



IEEE

Contents

Publications

Issues

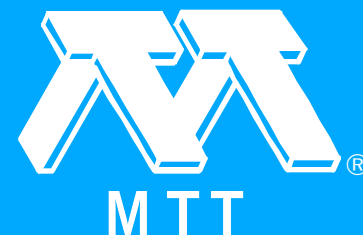
Click on title for a paper summary.



Papers by Issue

Oct. 1989 [T-MTT]

- ☐ [Front Cover \(Oct. 1989 \[T-MTT\]\)](#)
- ☐ [A New Model for the Dual-Gate GaAs MESFET](#)
- ☐ [Measurement of Magnitude and Phase of Harmonics Generated in Nonlinear Microwave Two-Ports](#)
- ☐ [Optical Phase Control of an Optically Injection-Locked FET Microwave Oscillator](#)
- ☐ [An Improved Analytical AC Large-Signal Model for the GaAs MESFET](#)
- ☐ [Lumped Capacitance and Open End Effects of Striplike Structures in Multilayered and Anisotropic Substrates](#)
- ☐ [Insertion Loss of Electronically Variable Magnetostatic Wave Delay Lines](#)
- ☐ [Accurate Determination of Modes in Dielectric-Loaded Cylindrical Cavities Using a One-Dimensional Finite Element Method](#)



IEEE

[Contents](#)

[Publications](#)

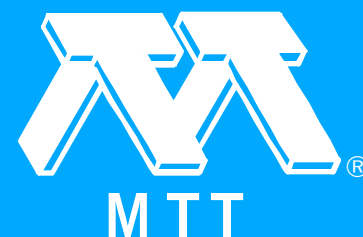
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Microstrip Open-End and Gap Discontinuities in a Substrate-Superstrate Structure
- ❑ Propagation Properties of Ferromagnetic Insular Guide
- ❑ Mode Charts for Magnetized Ferrite Cylinders
- ❑ Space-Domain Green's Function Approach to the Capacitance Calculation of Multiconductor Lines in Multilayered Dielectrics with Improved Surface Charge Modeling
- ❑ Very Small Wide-Band MMIC Magic T's Using Microstrip Lines on a Thin Dielectric Film
- ❑ A Mathematical Formulation of the Equivalence Principle
- ❑ Mode Conversion at Discontinuities in Finite-Width Conductor-Backed Coplanar Waveguide
- ❑ Narrow Wall Axial-Slot-Coupled T Junction Between Rectangular and Circular Waveguides
- ❑ Improving the Characteristics of Rectangular Waveguide Branchings by Cylindrical Obstacles



IEEE

Contents

Publications

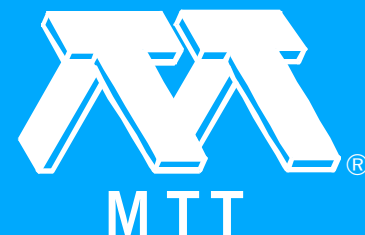
Issues

Click on title for a paper summary.



Papers by Issue

- ☐ Electromagnetic Model of a Radial-Resonator Waveguide Diode Mount
- ☐ Optoelectronic Measurements of Picosecond Electrical Pulse Propagation in Coplanar Waveguide Transmission Lines
- ☐ Pulse Distortion on Multilayer Coupled Microstrip Lines
- ☐ Gain Optimization of a Near-Field Focusing Array for Hyperthermia Applications
- ☐ Wide-Band GaInAs MISFET Amplifiers (Short Papers)
- ☐ Reactance of Slotline Short and Open Circuits on Alumina Substrate (Short Papers)
- ☐ A Moment Method Solution of a Volume-Surface Integral Equation Using Isoparametric Elements and Point Matching (Short Papers)
- ☐ Characteristic Impedance of a Tubular Dielectric Cylinder Covered with Conducting Arc Strips (Short Papers)



Contents

Publications

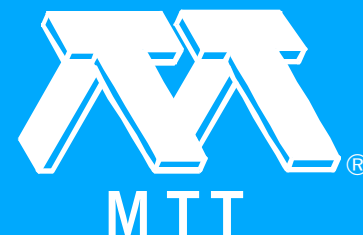
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Spectral-Domain Immittance Approach for the Propagation Constants of Unilateral Finline with Magnetized Ferrite Substrate (Short Papers)
- ❑ Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T_c/Superconducting Thin Films (Short Papers)
- ❑ Determination of the Cutoff of the First Higher Order Mode in a Coaxial Line by the Transverse Resonance Technique (Short Papers)
- ❑ Properties of Dielectric-Loaded T-Septum Waveguides (Short Papers)
- ❑ Computer-Aided Design Models for Broadside-Coupled Striplines and Millimeter-Wave Suspended Substrate Microstrip Lines (Corrections)
- ❑ p-i-n Diode Attenuator with Small Phase Shift (Additional Comments and Reply)
- ❑ Patent Abstracts (Oct. 1989 [T-MTT])



IEEE

Contents

Publications

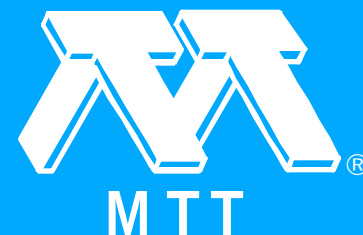
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Call for Papers - 1990 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium \(Oct. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1990 IEEE MTT-S International Microwave Symposium \(Oct. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Multifunction MMICs and Their System Applications \(Oct. 1989 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Oct. 1989 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

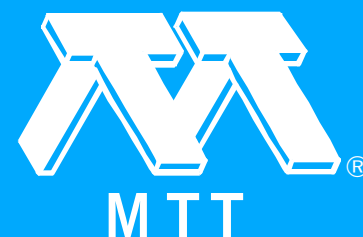
Click on title for a paper summary.



Papers by Issue

Nov. 1989 [T-MTT]

- ☐ [Front Cover \(Nov. 1989 \[T-MTT\]\)](#)
- ☐ [A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications](#)
- ☐ [Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits](#)
- ☐ [Frequency-Domain Spectral Balance Using the Arithmetic Operator Method](#)
- ☐ [Nonlinear Analysis of Microwave FET Oscillators Using Volterra Series](#)
- ☐ [Millimeter-Wave Planar InP Schottky Diodes and Their Small-Signal Equivalent Circuit](#)
- ☐ [Parallel Running System of Three Oscillators Coupled Through a Six-Port Magic Junction](#)
- ☐ [A Numerically Efficient Finite-Element Formulation for the General Waveguide Problem without Spurious Modes](#)



IEEE

[Contents](#)

[Publications](#)

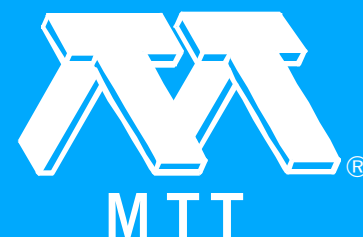
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ [A Mixed Spectral-Domain Approach for Dispersion Analysis of Suspended Planar Transmission Lines with Pedestals](#)
- ❑ [Infinite Elements for the Analysis of Open Dielectric Waveguides](#)
- ❑ [Direct and Inverse Resonance Problems for Shielded Composite Objects Treated by Means of the Null-Field Method](#)
- ❑ [Analysis of Dielectric Resonator Cavities Using the Finite Integration Technique](#)
- ❑ [Variational Method for Planar Transmission Lines with Anisotropic Magnetic Media](#)
- ❑ [Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures](#)
- ❑ [A Generalized Method for deriving the Space-Domain Green's Function in a Shielded, Multilayer Substrate Structure with Applications to MIS Slow-Wave Transmission Lines](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

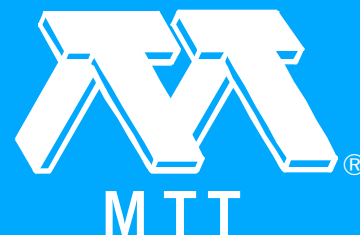
Click on title for a paper summary.



Papers by Issue

- ❑ Finite-Element Analysis of Magnetostatic Wave Propagation in a YIG Film of Finite Dimensions
- ❑ Resonance in Cylindrical-Rectangular and Wraparound Microstrip Structures
- ❑ An Equivalent Circuit Model for Terminated Hybrid-Mode Multiconductor Transmission Lines
- ❑ Analysis of the Power Coupling from a Waveguide Hyperthermia Applicator into a Three-Layered Tissue Model
- ❑ Numerical Solution of the Continuous Waveguide Transition Problem
- ❑ On-Wafer Verification of a Large-Signal MESFET Model (Short Papers)
- ❑ A Low-Noise Microwave Oscillator Employing a Self-Aligned AlGaAs/GaAs HBT (Short Papers)
- ❑ Integral Numerical Technique for the Study of Axially Symmetric Resonant Devices (Short Papers)
- ❑ An Experimental Investigation of the Microstrip Step Discontinuity (Short Papers)

Click on title for a paper summary.



IEEE

Contents

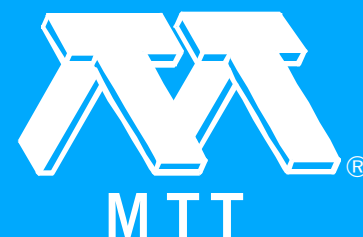
Publications

Issues



Papers by Issue

- ❑ [The Lossy Waveguide as a Problem in Perturbation Theory \(Short Papers\)](#)
- ❑ [Expansions for the Capacitance of a Cross Concentric with a Circle with an Application \(Short Papers\)](#)
- ❑ [Equivalent Circuits for Dielectric Posts in a Rectangular Waveguide \(Short Papers\)](#)
- ❑ [A Statistical Method for Calibrating the Six-Port Reflectometer Using Nonideal Standards \(Short Papers\)](#)
- ❑ [Results of Phase and Injection Locking of an Orotron Oscillator \(Short Papers\)](#)
- ❑ [Patent Abstracts \(Nov. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Multifunction MMICs and Their System Applications \(Nov. 1989 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Nov. 1989 \[T-MTT\]\)](#)



[Contents](#)

[Publications](#)

[Issues](#)

Click on title for a paper summary.



Papers by Issue



IEEE

Contents

Publications

Issues

Dec. 1989 [T-MTT] (1989 Symposium Issue)

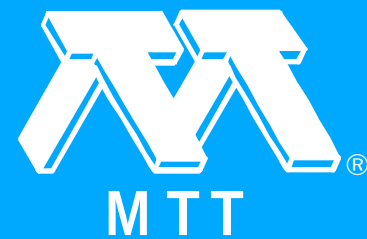
- ☐ [Front Cover \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Table of Contents \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Editors' Overview \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Reviewers for this Special Issue \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [1989 MTT-S International Microwave Symposium \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Awards \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Special Session in Honor of Dr. Seymour B. Cohn \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Microwave Radiometry: Its Importance to the Detection of Cancer](#)
- ☐ [Broad-Band Distributed Amplifier Impedance-Matching Techniques](#)
- ☐ [A Two-Dimensional Transmission Line Matrix Microwave Field Simulator Using New Concepts and Procedures](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Measurement and Simulation of Memory Effects in Predistortion Linearizers
- ❑ Investigations of Complex Modes in a Generalized Bilateral Finline with Mounting Grooves and Finite Conductor Thickness (Dec. 1989 [T-MTT])
- ❑ State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Dec. 1989 [T-MTT])
- ❑ Phenomenological Loss Equivalence Method for Planar Quasi-TEM Transmission Lines with a Thin Normal Conductor or Superconductor
- ❑ Electromagnetic Coupling of Coplanar Waveguides and Microstrip Lines to Highly Lossy Dielectric Media
- ❑ Computation of Electromagnetic Fields in Large Biological Bodies by an Iterative Moment Method with a Restart Technique
- ❑ Analysis of Waveguides with Metal Inserts (Dec. 1989 [T-MTT])



Contents

Publications

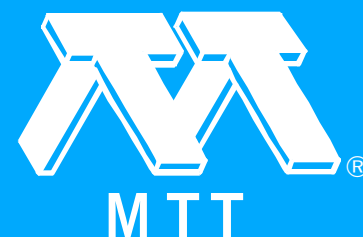
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Microwave and Millimeter-Wave QWITT Diode Oscillators](#)
- ❑ [High-Dynamic-Range Airborne Tracking and Fire Control Radar Subsystems](#)
- ❑ [Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method](#)
- ❑ [The Method of Lines Applied to Planar Transmission Lines in Circular and Elliptical Waveguides](#)
- ❑ [An Integral Equation Method for the Evaluation of Conductor and Dielectric Losses in High-Frequency Interconnects](#)
- ❑ [Accuracy Improvements in Microwave Noise Parameter Measurements](#)
- ❑ [Lossless Broad-Band Monolithic Microwave Active Inductors \(Dec. 1989 \[T-MTT\] \)](#)
- ❑ [Very Small Ultra-Wide-Band MMIC Magic T and Applications to Combiners and Dividers](#)
- ❑ [Miniaturized Hairpin Resonator Filters and Their Application to Receiver Front-End MIC's \(Dec. 1989 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

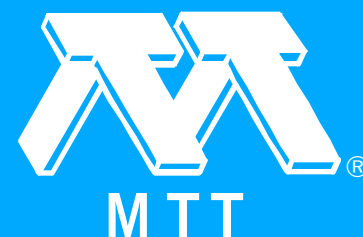
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Computer-Aided Design of Evanescent Mode Waveguide Bandpass Filter with Nontouching E-Plane Fins
- ❑ Rigorous Analysis of Open Microstrip Lines of Arbitrary Cross Section in Bound and Leaky Regimes (Dec. 1989 [T-MTT])
- ❑ Filter Design Using In-Line Triple-Mode Cavities and Novel Iris Couplings
- ❑ Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter-Wave Circuits (Dec. 1989 [T-MTT])
- ❑ The Generalized Method of Characteristics for Waveform Relaxation Analysis of Lossy Coupled Transmission Lines (Dec. 1989 [T-MTT])
- ❑ A Large-Signal Physical MESFET Model for Computer-Aided Design and its Applications
- ❑ Modeling of Ge-Si Heterojunction Bipolar Transistors for Use in Silicon Monolithic Millimeter-Wave Integrated Circuits



IEEE

Contents

Publications

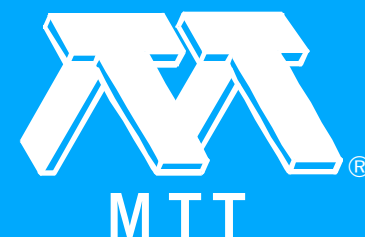
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Characterization of Uniform Microstrip Line and its Discontinuities Using the Time-Domain Method of Lines
- ❑ Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses
- ❑ Parallel Processing Application to Nonlinear Microwave Network Design (Dec. 1989 [T-MTT])
- ❑ Dielectric Receiving Filter with Sharp Stopband Using an Active Feedback Resonator Method for Cellular Base Stations (Dec. 1989 [T-MTT])
- ❑ Unified Solution of Various Dielectric-Loaded Ridge Waveguides with a Mixed Spectral-Domain Method
- ❑ Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's (Dec. 1989 [T-MTT])
- ❑ MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron (FECTED) Oscillators
- ❑ Efficient Large-Signal FET Parameter Extraction Using Harmonics (Dec. 1989 [T-MTT])



IEEE

Contents

Publications

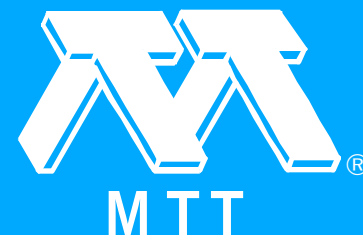
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Recent European Developments in Active Microwave Imaging for Industrial, Scientific, and Medical Applications
- ❑ Foreword (Dec. 1989 [T-MTT])
- ❑ A Multioctave Active GaAs MMIC Quadrature Phase Shifter
- ❑ Nonlinear Modeling and Verification of MMIC Amplifiers Using the Waveform-Balance Method
- ❑ Monolithic FET Structures for High-Power Control Component Applications
- ❑ A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology
- ❑ A Novel MMIC Active Filter with Lumped and Transversal Elements (Dec. 1989 [T-MTT])
- ❑ C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process
- ❑ Monolithic 2-18 GHz Matrix Amplifiers (Short Papers)
- ❑ Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications (Short Papers)



IEEE

Contents

Publications

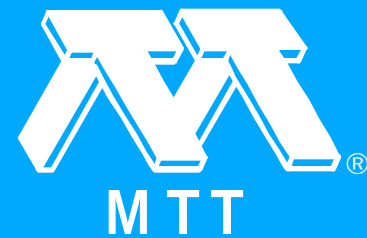
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Ka-Band MMIC Beam-Steered Transmitter Array (Short Papers)
- ❑ Sensitivity of a 40 GHz HEMT Low-Noise Amplifier to Material and Processing Variations (Short Papers)
- ❑ Index, IEEE [T-MTT] 1989, Volume 37, and MTT-S Sponsored Conferences
- ❑ Back Cover (Dec. 1989 [T-MTT])



Contents

Publications

Issues

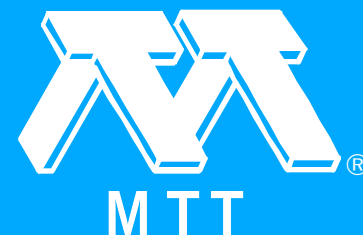
Click on title for a paper summary.



Papers by Issue

Jan. 1990 [T-MTT]

- ☐ [Front Cover \(Jan. 1990 \[T-MTT\]\)](#)
- ☐ [Broad-Band Simultaneous Measurement of Complex Permittivity and Permeability Using a Coaxial Discontinuity](#)
- ☐ [Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique](#)
- ☐ [Low-Parasitic, Planar Schottky Diodes for Millimeter-Wave Integrated Circuits](#)
- ☐ [Coupled-Wave Small-Signal Transient Analysis of GaAs Distributed Amplifier](#)
- ☐ [Capacitance Computation of Elliptic Microstrip Disks in Biaxial Anisotropic Multilayered Substrates](#)
- ☐ [Lateral Electromagnetic Waves and Pulses on Open Microstrip](#)
- ☐ [Optimization of Planar Devices by the Finite Element Method](#)



IEEE

[Contents](#)

[Publications](#)

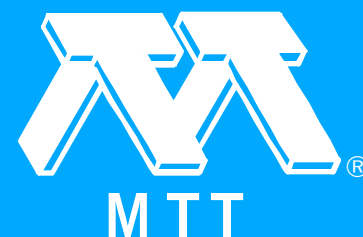
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ A Millimeter-Wave Six-Port Reflectometer Using Dielectric Waveguide
- ❑ Precisely Calibrated Coaxial-to-Microstrip Transitions Yield Improved Performance in GaAs FET Characterization
- ❑ The Calculated and Measured Temperature Distribution of a Phased Interstitial Antenna Array
- ❑ Domain Integral Equation Analysis of Integrated Optical Channel and Ridge Waveguides in Stratified Media
- ❑ A Periodic Planar Gunn Diode Power Combining Oscillator (Short Papers)
- ❑ Analysis and Design of Kemp-Type 3 dB Quadrature Couplers (Short Papers)
- ❑ Percutaneous Transluminal Microwave Balloon Angioplasty (Short Papers)
- ❑ A Rigorous Variational Formulation of an H Plane Slot-Coupled Tee Junction (Short Papers)
- ❑ Explicit Microwave Rotary Phase Shifter Calibration Algorithm (Letters)



IEEE

Contents

Publications

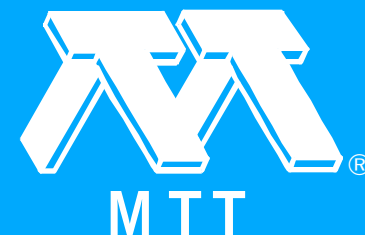
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [High-Frequency MESFET Noise Modeling Including Distributed Effects \(Corrections\)](#)
- ❑ [Patent Abstracts \(Jan. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Jan. 1990 \[T-MTT\]\)](#)
- ❑ [IEEE Copyright Form \(Jan. 1990 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Jan. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

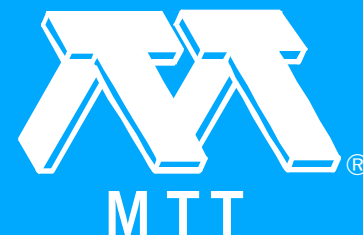
Click on title for a paper summary.



Papers by Issue

Feb. 1990 [T-MTT]

- ☐ [Front Cover \(Feb. 1990 \[T-MTT\]\)](#)
- ☐ [Modeling and Design of GaAs MESFET Control Devices for Broad-Band Applications](#)
- ☐ [A Graphic Design Method for Matched Low-Noise Amplifiers](#)
- ☐ [Characterization of Spurious-Response Suppression in Double-Balanced Mixers](#)
- ☐ [A More Accurate Analysis and Design of Coaxial-to-Rectangular Waveguide End Launcher](#)
- ☐ [The Equivalent Circuit of a Microstrip Crossover in a Dielectric Substrate](#)
- ☐ [Losses of Tapered Dielectric Slab Waveguides with Axial Variations in Index of Refraction](#)
- ☐ [Computation of Frequency-Dependent Propagation Characteristics of Microstriplike Propagation Structures with Discontinuous Layers](#)



[Contents](#)

[Publications](#)

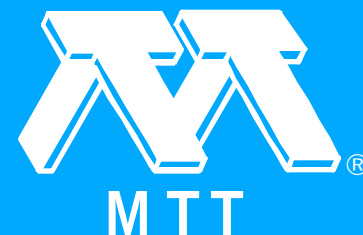
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation
- ❑ Microwave Detectors Based on Granular High-Tc Thin Films (Feb. 1990 [T-MTT])
- ❑ A Dielectric-Free Superconducting Coaxial Cable
- ❑ Comparison of Three Integral Formulations for the 2-D TE Scattering Problem
- ❑ Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen
- ❑ Integral Equation Solution to the Guidance and Leakage Properties of Coupled Dielectric Strip Waveguides
- ❑ Three-Dimensional Computer Simulation in Deep Regional Hyperthermia Using the Finite-Difference Time-Domain Method
- ❑ Feedback in Distributed Amplifiers (Short Papers)



Contents

Publications

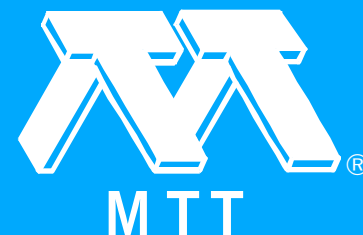
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Enhanced Through-Reflect-Line Characterization of Two-Port Measuring Systems Using Free-Space Capacitance Calculation \(Short Papers\)](#)
- ❑ [Microwave Hyperthermia Induced by a Phased Interstitial Antenna Array \(Short Papers\)](#)
- ❑ [Patent Abstracts \(Feb. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Feb. 1990 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Feb. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

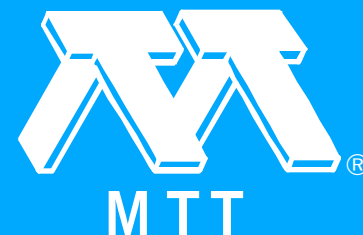
Click on title for a paper summary.



Papers by Issue

Mar. 1990 [T-MTT]

- ☐ [Front Cover \(Mar. 1990 \[T-MTT\]\)](#)
- ☐ [Bar-Grid Oscillators](#)
- ☐ [Measuring Adapter Efficiency Using a Sliding Short Circuit](#)
- ☐ [A Dual Six-Port Automatic Network Analyzer Incorporating a Biphase-Bimodulation Element](#)
- ☐ [Propagation Modes and Dispersion Characteristics of Coplanar Waveguides](#)
- ☐ [New High-Frequency Circuit Model for Coupled Lossless and Lossy Waveguide Structures](#)
- ☐ [Numerical Analysis of Arbitrarily Shaped Discontinuities Between Planar Dielectric Waveguides with Different Thicknesses](#)
- ☐ [Coupling of Crossed Planar Multiconductor Systems](#)
- ☐ [Reduced-Size Branch-Line and Rat-Race Hybrids for Uniplanar MMIC's](#)



IEEE

[Contents](#)

[Publications](#)

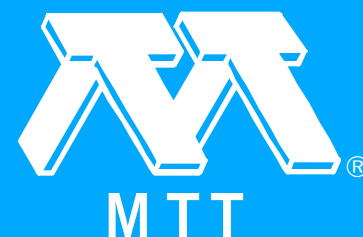
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Analysis and Design of Microstrip-Slot Line for Phase Shifting Applications
- ❑ A Self-Calibration Concept for Establishing the Complex Measurement Ability of Homodyne Network Analyzers
- ❑ A Complete E-Plane Analysis of Waveguide Junctions Using the Finite Element Method
- ❑ Boundary Condition Expansion of Basis Functions Method Implemented by Fast Fourier Transform Algorithms
- ❑ A Finite-Difference Transmission Line Matrix Method Incorporating a Nonlinear Device Model
- ❑ Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media
- ❑ Noise Parameter Transformations for Three-Terminal Amplifiers (Short Papers)
- ❑ Microwave Shielding Effectiveness of EC-Coated Dielectric Slabs (Short Papers)
- ❑ Flexible Circular Waveguides at Millimeter Wavelengths from Metallized Teflon Tubing (Short Papers)



IEEE

Contents

Publications

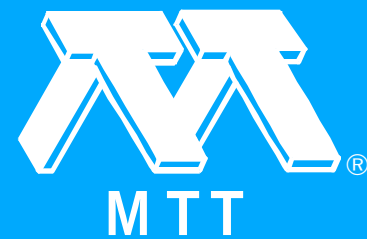
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Experimental Evaluation of Existing CAD Models for Microstrip Dispersion (Short Papers)
- ❑ A New Wire Node for Modeling Thin Wires in Electromagnetic Field Problems Solved by Transmission Line Modeling (Short Papers)
- ❑ Anisotropic Measurements of Rubber Sheets with an X-Band Three-Wave Interferometer (Short Papers)
- ❑ Input Impedance of a Coaxial Line Probe Feeding a Circular Waveguide in the TM/sub 01/ Mode (Short Papers)
- ❑ An Experimental Technique for In Vivo Permittivity Measurement of Materials at Microwave Frequencies (Short Papers)
- ❑ Patent Abstracts (Mar. 1990 [T-MTT])
- ❑ Call for Papers - Directions in Design and Applications of Microwave Systems (Mar. 1990 [T-MTT])
- ❑ Back Cover (Mar. 1990 [T-MTT])



Contents

Publications

Issues

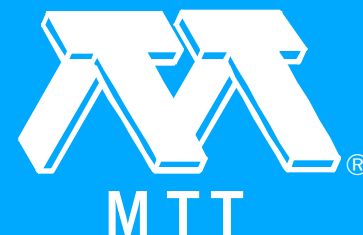
Click on title for a paper summary.



Papers by Issue

Apr. 1990 [T-MTT]

- ☐ [Front Cover \(Apr. 1990 \[T-MTT\]\)](#)
- ☐ [Computer-Aided Design of Monolithic MESFET Distributed Amplifiers](#)
- ☐ [An MMAC C-Band FET Feedback Power Amplifier](#)
- ☐ [Error-Corrected Large-Signal Waveform Measurement System Combining Network Analyzer and Sampling Oscilloscope Capabilities](#)
- ☐ [Read Versus Flat Doping Profile Structures for the Realization of Reliable High-Power, High-Efficiency 94 GHz IMPATT Sources](#)
- ☐ [Conservation of Complex Power Technique for Waveguide Junctions with Finite Wall Conductivity](#)
- ☐ [Transmission Line Matrix Modeling of Dispersive Wide-Band Absorbing Boundaries with Time-Domain Diakoptics for S-Parameter Extraction](#)



IEEE

[Contents](#)

[Publications](#)

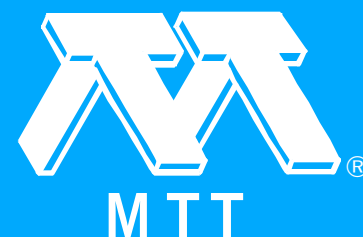
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Attenuation and Dispersion for High-T/sub c/ Superconducting Microstrip Lines
- ❑ Isolation Effects in Single- and Dual-Plane VLSI Interconnects
- ❑ Characterization of a 90° Microstrip Bend with Arbitrary Miter via the Time-Domain Finite Difference Method
- ❑ Improved Design of Multihole Directional Couplers Using an Iterative Technique
- ❑ The Scattering Parameters and Directional Coupler Analysis of Characteristically Terminated Asymmetric Coupled Transmission Lines in an Inhomogeneous Medium
- ❑ MESFET Simulation Oriented Toward Computer-Aided Microwave Circuit Design (Short Papers)
- ❑ Jacobian Calculation Using the Multidimensional Fast Fourier Transform in the Harmonic Balance Analysis of Nonlinear Circuits (Short Papers)



IEEE

Contents

Publications

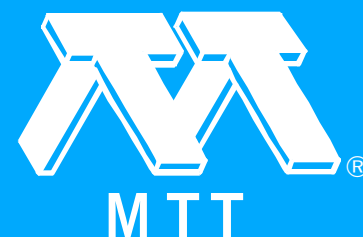
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Harmonic Balance and Frequency-Domain Simulation of Nonlinear Microwave Circuits Using the Block Newton Method (Short Papers)
- ❑ A New Resistance Measurement Technique Applicable to High-Temperature Superconducting Materials at Microwave Frequencies (Short Papers)
- ❑ Modal Analysis of Open Groove Waveguide (Short Papers)
- ❑ Stripline to Microstrip Line Aperture Coupler (Short Papers)
- ❑ Additional Approximate Formulas and Experimental Data on Micro-Coplanar Striplines (Short Papers)
- ❑ Reflection of Electromagnetic Waves from Rough Waveguides (Short Papers)
- ❑ Spectral Estimation for the Transmission Line Matrix Method (Short Papers)
- ❑ Refraction at a Curved Dielectric Interface Geometrical Optics Solution (Comments) (Apr. 1990 [T-MTT])



IEEE

Contents

Publications

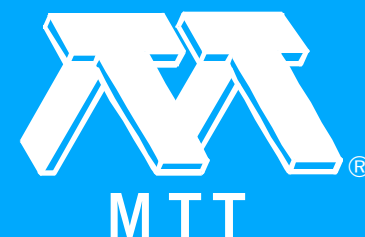
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits (Comments and Reply)
- ❑ Patent Abstracts (Apr. 1990 [T-MTT])
- ❑ Call for Papers - 1990 IEEE GaAs IC Symposium (Apr. 1990 [T-MTT])
- ❑ Call for Papers - Directions in Design and Applications of Microwave Systems (Apr. 1990 [T-MTT])
- ❑ Call for Papers - Microwave Applications of Superconductors (Apr. 1990 [T-MTT])
- ❑ Back Cover (Apr. 1990 [T-MTT])



Contents

Publications

Issues

Click on title for a paper summary.

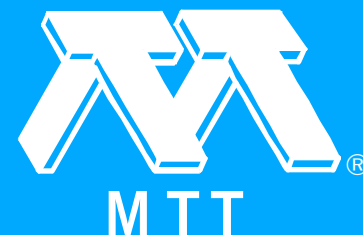


Papers by Issue

May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)

- ☐ [Front Cover \(May 1990 \[T-MTT\]\)](#)
- ☐ [Guest Editorial \(May 1990 \[T-MTT\]\)](#)
- ☐ [Optical Synchronization of Millimeter-Wave Oscillators for Distributed Architectures](#)
- ☐ [Integrated Optic Devices for Microwave Applications](#)
- ☐ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)
- ☐ [Frequency Division Multiplexed Microwave and Baseband Digital Optical Fiber Link for Phased Array Antennas](#)
- ☐ [An Analytic and Experimental Comparison of Direct and External Modulation in Analog Fiber-Optic Links](#)
- ☐ [High-Speed Fiber-Optic Links for Distribution of Satellite Traffic](#)
- ☐ [Microwave Packaging of Optoelectronic Components](#)

Click on title for a paper summary.



IEEE

[Contents](#)

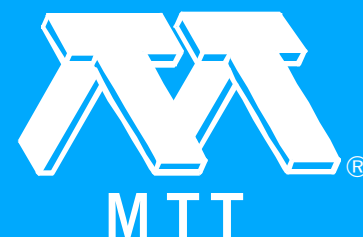
[Publications](#)

[Issues](#)



Papers by Issue

- ❑ [Lightwave Subcarrier CATV Transmission Systems](#)
- ❑ [Applications of Traveling-Wave Laser Amplifiers in Subcarrier Multiplexed Lightwave Systems](#)
- ❑ [Tuned Optical Receivers for Microwave Subcarrier Multiplexed Lightwave Systems](#)
- ❑ [Optical Test Set for Microwave Fiber-Optic Network Analysis](#)
- ❑ [Magnetostatic-Forward-Volume-Wave-Based Guided-Wave Magneto-Optic Bragg Cells and Applications to Communications and Signal Processing](#)
- ❑ [Optoelectronic Isolator for Microwave Applications](#)
- ❑ [Optical Control of Microwave Semiconductor Devices](#)
- ❑ [Optically Controlled Coplanar Waveguide Phase Shifters](#)
- ❑ [Picosecond Optics and Microwave Technology](#)
- ❑ [Millimeter-Wave Generation and Characterization of a GaAs FET by Optical Mixing](#)



[Contents](#)

[Publications](#)

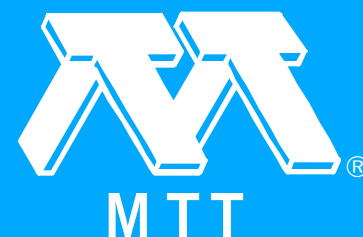
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Broad-Band Microwave Measurements with Transient Radiation from Optoelectronically Pulsed Antennas
- ❑ Generation and Shaping of Megawatt High-Voltage Pulses by Optoelectronic Technique
- ❑ Electromagnetic and Transport Considerations in Subpicosecond Photoconductive Switch Modeling
- ❑ Periodic-Structure Photoexcitation of a Silicon Coplanar Waveguide for Selective Optoelectronic Microwave Control
- ❑ Optical Fiber Fabry-Perot Cavities and Recirculating Delay Lines as Tunable Microwave Filters
- ❑ Dispersion Characteristics of Optically Excited Coplanar Striplines: Pulse Propagation
- ❑ Reduced Insertion Loss of X-Band RF Fiber-Optic Links (Short Papers)
- ❑ Long Microwave Delay Fiber-Optic Link for Radar Testing (Short Papers)
- ❑ Optical Generation, Distribution, and Control of Microwaves Using Laser Heterodyne (Short Papers)



IEEE

Contents

Publications

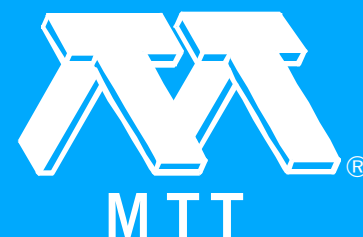
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Distortion Characteristics of Optical Directional Coupler Modulators (Short Papers)
- ❑ Novel Wide-Bandwidth Matching Technique for Laser Diodes (Short Papers)
- ❑ An Infrared Fiber-Optic Radiometer for Controlled Microwave Heating (Short Papers)
- ❑ InGaAsP DC-PBH Semiconductor Laser Diode Frequency Response Model (Short Papers)
- ❑ Design and Applications of Optically Controllable Finline Structures (Short Papers)
- ❑ Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT (Short Papers)
- ❑ Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect (Short Papers)
- ❑ Back Cover (May 1990 [T-MTT])



IEEE

Contents

Publications

Issues

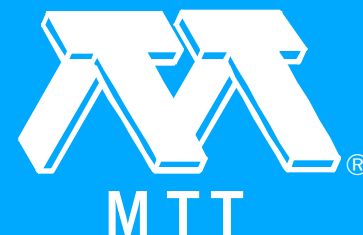
Click on title for a paper summary.



Papers by Issue

Jun. 1990 [T-MTT]

- ☐ [Front Cover \(Jun. 1990 \[T-MTT\]\)](#)
- ☐ [Editorial \(Jun. 1990 \[T-MTT\]\)](#)
- ☐ [Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide](#)
- ☐ [An Improved Model for Noise Characterization of Microwave GaAs FET's](#)
- ☐ [X-Band 0.5, 1, and 2 Watt Power Amplifiers with Marked Improvement in Power-Added Efficiency](#)
- ☐ [Compact Quasi-Periodic and Aperiodic TE/sub 0n/ Mode Converters in Overmoded Circular Waveguides for Use with Gyrotrons](#)
- ☐ [Finite-Difference Method without Spurious Solutions for the Hybrid-Mode Analysis of Diffused Channel Waveguides](#)
- ☐ [Full-Wave Analysis of an Infinitely Long Magnetic Surface Wave Transducer](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

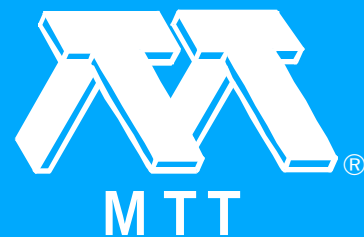
Click on title for a paper summary.



Papers by Issue

- ☐ Analysis of TEM Mode on a Curved Coaxial Transmission Line
- ☐ Semidistributed Model of Millimeter-Wave FET for S-Parameter and Noise Figure Predictions
- ☐ Perturbed-TEM Analysis of Transmission Lines with Imperfect Conductors
- ☐ Even-Mode Characteristics of the Bilateral Slotline
- ☐ An Analytical Solution to the Microstrip Line Problem
- ☐ Three-Dimensional Analysis of a Through Hole with Radiation Characteristics by the Spatial Network Method
- ☐ S Matrix of Slot-Coupled H-Plane Tee Junction Using Rectangular Waveguides (Short Papers)
- ☐ Analysis of Transmission Line Structures Using a New Image-Mode Green's Function (Short Papers)
- ☐ The Design of an Ultra-Broad-Band 3 dB Coupler in Dielectric Waveguide (Short Papers)
- ☐ De-Embedding and Underterminating Microwave Fixtures with Nonlinear Least Squares (Short Papers)

Click on title for a paper summary.



IEEE

Contents

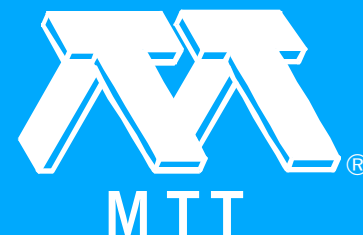
Publications

Issues



Papers by Issue

- ❑ Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors (Short Papers)
- ❑ Capacitance Parameters of Coupled Elliptic Microstrip Disks in Layered Anisotropic Media (Short Papers)
- ❑ Reflection and Transmission Coefficients of Rectangular Dielectric Waveguide Discontinuity with an Air Gap (Short Papers)
- ❑ Analysis of the Junction Between Smooth and Corrugated Cylindrical Waveguides in Mode Converters (Short Papers)
- ❑ Resonant Frequency of Cylindrical Dielectric Resonator Placed in an MIC Environment (Short Papers)
- ❑ Wide-Band Ground-Plane dc Block and Bias Feed (Short Papers)
- ❑ Electromagnetic Modeling of Waveguides Involving Finite-Size Dielectric Regions (Short Papers)
- ❑ A Local Mesh Refinement Algorithm for the Time Domain Finite Difference Method Using Maxwell's Curl Equations (Short Papers)



IEEE

Contents

Publications

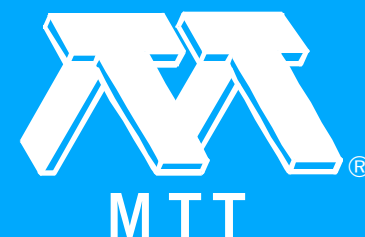
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Frequency-Domain Bivariate Generalized Power Series Analysis of Nonlinear Analog Circuits \(Short Papers\)](#)
- ❑ [Modeling of Asymmetric and Offset Gaps in Shielded Microstrips and Slotlines \(Short Papers\)](#)
- ❑ [An Improved GaAs MESFET Model for SPICE \(Short Papers\)](#)
- ❑ [Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses \(Corrections\)](#)
- ❑ [Patent Abstracts \(Jun. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Jun. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Microwave Applications of Superconductors \(Jun. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Jun. 1990 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Jun. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

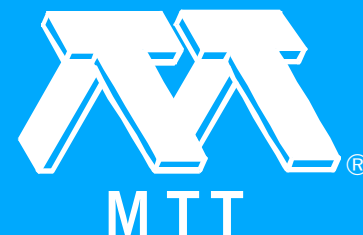
Click on title for a paper summary.



Papers by Issue

Jul. 1990 [T-MTT]

- ☐ Front Cover (Jul. 1990 [T-MTT])
- ☐ Application of the Three-Dimensional Finite-Difference Time-Domain Method to the Analysis of Planar Microstrip Circuits
- ☐ Use of a Microwave Cavity for Sensing Dielectric Properties of Arbitrarily Shaped Biological Objects
- ☐ Power and Stability Limitations of Resonant Tunneling Diodes
- ☐ An Integral Equation Analysis of an Infinite Array of Rectangular Dielectric Waveguides
- ☐ Characterization of MIS Structure Coplanar Transmission Lines for Investigation of Signal Propagation in Integrated Circuits
- ☐ Broad-Band Determination of the FET Small-Signal Equivalent Circuit
- ☐ A 30 GHz MMIC Receiver for Satellite Transponders



IEEE

Contents

Publications

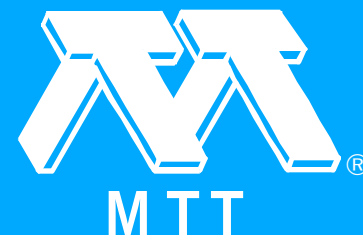
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Resonance Characteristics of a Cavity-Operated Electrodeless High-Pressure Microwave Discharge System
- ❑ Three-Dimensional Analysis of a Cylindrical Waveguide Converter for Circular Polarization by the Spatial Network Method
- ❑ Improvements to the Finite-Difference Time-Domain Method for Calculating the Radar Cross Section of a Perfectly Conducting Target
- ❑ Analysis of a Microwave Power Amplifier Using a Combiner/Divider with Circular Cavities
- ❑ Power-Handling Capability of the Rhombic Waveguide
- ❑ Machined Waveguide Twist (Short Papers)
- ❑ An Exact Solution for the Nonuniform Transmission Line Problem (Short Papers)
- ❑ Finding Initial Estimates Needed for the Engen Method of Calibrating Single Six-Port Reflectometers (Short Papers)
- ❑ A Basic Concept to Reduce the Frequency Distortion of Distributed Amplifiers (Letters)



Contents

Publications

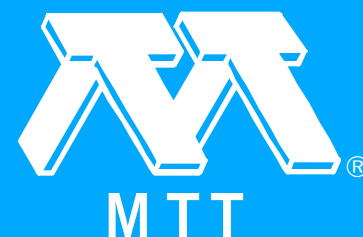
Issues

Click on title for a paper summary.



Papers by Issue

- ☐ Asian Abstracts (Jul. 1990 [T-MTT])
- ☐ Patent Abstracts (Jul. 1990 [T-MTT])
- ☐ Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Jul. 1990 [T-MTT])
- ☐ Call for Papers - IEEE Microwave and Guided Wave Letters (Jul. 1990 [T-MTT])
- ☐ Information for Authors (Jul. 1990 [T-MTT])
- ☐ Author Check List (Jul. 1990 [T-MTT])
- ☐ Call for Papers - Directions in Design and Applications of Microwave Systems (Jul. 1990 [T-MTT])
- ☐ Call for Papers - Microwave Applications of Superconductors (Jul. 1990 [T-MTT])
- ☐ Back Cover (Jul. 1990 [T-MTT])



IEEE

Contents

Publications

Issues

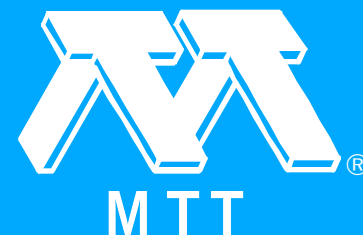
Click on title for a paper summary.



Papers by Issue

Aug. 1990 [T-MTT]

- ☐ [Front Cover \(Aug. 1990 \[T-MTT\]\)](#)
- ☐ [Two-Dimensional Microwave Imaging by a Numerical Inverse Scattering Solution](#)
- ☐ [Electromagnetic Energy Deposition Inside a Three-Layer Cylindrical Human Body Model Caused by Near-Field Radiators](#)
- ☐ [Formulas Useful for the Synthesis and Optimization of General, Uniform Contradirectional Couplers](#)
- ☐ [An Analytic Algorithm for Unbalanced Stripline Impedance](#)
- ☐ [An Analysis of Microstrip with Rectangular and Trapezoidal Conductor Cross Sections](#)
- ☐ [Transient Analysis of Nonuniform, High-Pass Transmission Lines](#)
- ☐ [The Nature of the Charges, Currents, and Fields in and About Conductors Having Cross-Sectional Dimensions of the Order of a Skin Depth](#)



IEEE

[Contents](#)

[Publications](#)

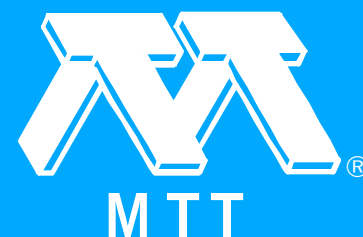
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Modal Analysis of Radial-Resonator Waveguide Diode Mounts
- ❑ Tunable, Temperature-Compensated Dielectric Resonators and Filters
- ❑ Three-Dimensional Electromagnetic Scattering from Inhomogeneous Objects by the Hybrid Moment and Finite Element Method
- ❑ Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses
- ❑ Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies
- ❑ Stable Broad-Band Microwave Amplifier Design
- ❑ Numerical Solution of Transmission Line Problems by a Network Model Decomposition Method Based on Polygon Discretization



Contents

Publications

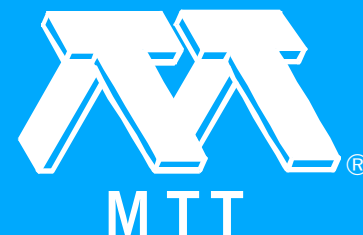
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Application of Least-Squares Boundary Residual Method to the Analysis of a Circular Waveguide Loaded with a Nonconcentric Dielectric Rod
- ❑ Improved Technique for Determining Complex Permittivity with the Transmission/Reflection Method
- ❑ Transverse Resonance, Standing Wave, and Resonator Formulations of the Ridge Waveguide Eigenvalue Problem and its Application to the Design of E-Plane Finned Waveguide Filters
- ❑ Equivalent Transformations for the Mixed Lumped Brune-Type Section and Uniform Transmission Line
- ❑ A Configuration-Oriented Spice Model for Multiconductor Transmission Lines with Homogeneous Dielectrics
- ❑ Analysis of a Shielded Microstrip Line with Finite Metallization Thickness by the Boundary Element Method (Short Papers)
- ❑ Analog Avalanche Diode Frequency Division (Short Papers)



Contents

Publications

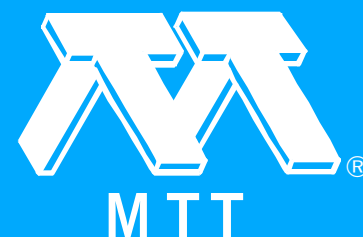
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [A Parametric Study of the Attenuation Constant of Lossy Microstrip Lines \(Short Papers\)](#)
- ❑ [Frequency-Domain Nonlinear Microwave Circuit Simulation Using the Arithmetic Operator Method \(Short Papers\)](#)
- ❑ [A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications \(Comments and Reply\)](#)
- ❑ [Patent Abstracts \(Aug. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Aug. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - IEEE Microwave and Guided Wave Letters \(Aug. 1990 \[T-MTT\]\)](#)
- ❑ [Information for Authors \(Aug. 1990 \[T-MTT\]\)](#)
- ❑ [Author Check List \(Aug. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Microwave Applications of Superconductors \(Aug. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Special Issue on Microwaves in Space \(Aug. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

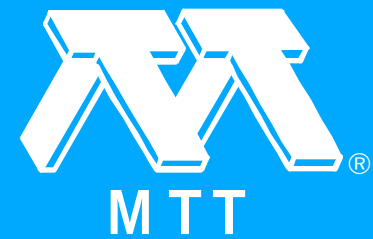
[Issues](#)

Click on title for a paper summary.



Papers by Issue

❑ [Back Cover \(Aug. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

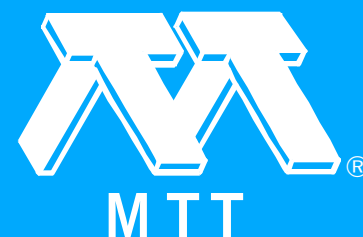
Click on title for a paper summary.



Papers by Issue

Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)

- ☐ [Front Cover \(Sep. 1990 \[T-MTT\]\)](#)
- ☐ [Guest Editorial \(Sep. 1990 \[T-MTT\]\)](#)
- ☐ [Multifunction MMIC History from a Process Technology Perspective](#)
- ☐ [MIMIC from the Department of Defense Perspective](#)
- ☐ [Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits](#)
- ☐ [Integration of High-Q GaAs Varactor Diodes and 0.25 \$\mu\text{m}\$ GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications](#)
- ☐ [Multifunction Silicon MMIC's for Frequency Conversion Applications](#)
- ☐ [2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si](#)



[Contents](#)

[Publications](#)

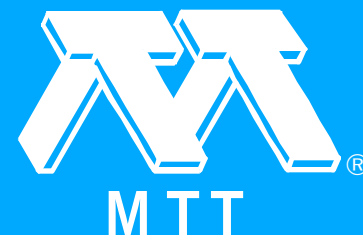
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer
- ❑ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part I
- ❑ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part II
- ❑ Monolithic Integrated Blanking Up-Converter
- ❑ GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications
- ❑ Considerations in Producibility Engineering of MMIC's
- ❑ A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter (Short Papers)
- ❑ A 225 GHz Polarimetric Radar
- ❑ Analysis of Energy Coupling into Spheroidal Ferritic Implants for Hyperthermia Applications



Contents

Publications

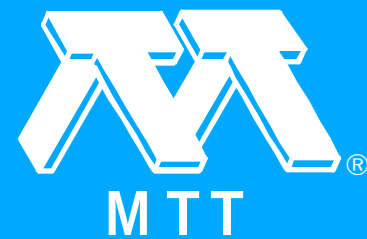
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ The Current Distribution and AC Resistance of a Microstrip Structure
- ❑ Complex Modes in Shielded Suspended Coupled Microstrip Lines
- ❑ Spectral and Variational Analysis of Generalized Cylindrical and Elliptical Strip and Microstrip Lines
- ❑ A New Formulation of the Boundary Condition at Infinity for a Hybrid Radiation Mode and its Application to the Analysis of Radiation Modes of Microstrip Lines
- ❑ Three-Dimensional Analysis of Electromagnetic Fields in Rectangular Waveguides by the Boundary Integral Equation Method
- ❑ A New Method of Modeling Three-Dimensional MIC/MMIC Circuits: The Space-Spectral Domain Approach
- ❑ Hermitian Finite-Element Method for Inhomogeneous Waveguides
- ❑ Absorbing Boundary Conditions for the Finite-Element Analysis of Planar Devices



IEEE

Contents

Publications

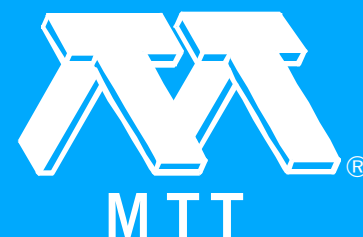
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Analysis of Dielectric-Loaded Waveguide](#)
- ❑ [Full-Wave Analysis of Coplanar Waveguides by Variational Conformal Mapping Technique](#)
- ❑ [Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron](#)
- ❑ [Three-Dimensional Finite-Element Solution of Dielectric Scattering Obstacles in a Rectangular Waveguide](#)
- ❑ [A New Way to Optically Control a Millimeter-Wave Oscillator \(Short Papers\)](#)
- ❑ [Wave Propagation in a Double-Sided Exponentially Tapered Rectangular Waveguide \(Short Papers\)](#)
- ❑ [Dispersion Characteristics of Curved Microstrip Transmission Lines \(Short Papers\)](#)
- ❑ [Patent Abstracts \(Sep. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Sep. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - IEEE Microwave and Guided Wave Letters \(Sep. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

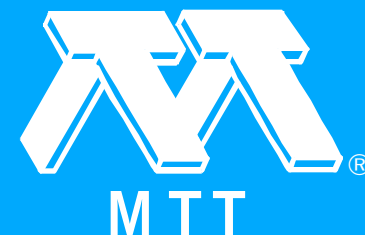
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ☐ Information for Authors (Sep. 1990 [T-MTT])
- ☐ Author Check List (Sep. 1990 [T-MTT])
- ☐ Call for Papers - Microwave Applications of Superconductors (Sep. 1990 [T-MTT])
- ☐ Call for Papers - Special Issue on Microwaves in Space (Sep. 1990 [T-MTT])
- ☐ Back Cover (Sep. 1990 [T-MTT])



IEEE

Contents

Publications

Issues

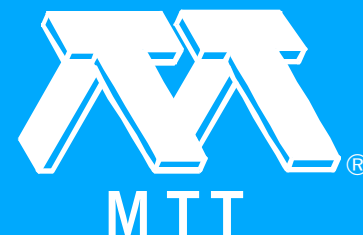
Click on title for a paper summary.



Papers by Issue

Oct. 1990 [T-MTT]

- ☐ Front Cover (Oct. 1990 [T-MTT])
- ☐ Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz
- ☐ Simulation of the Superconducting Quasiparticle Mixer Using a Five-Port Model
- ☐ Novel Unilateral Circuits for MMIC Circulators
- ☐ Inductance of Perfectly Conducting Foils Including Spiral Inductors
- ☐ Tapered Transmission Lines with a Controlled Ripple Response
- ☐ Compact Planar Microstrip-Slotline Symmetrical Ring Eight-Port Comparator Circuits
- ☐ Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities



IEEE

Contents

Publications

Issues

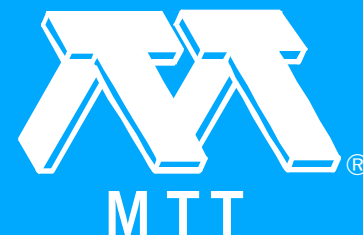
Click on title for a paper summary.



Papers by Issue

- ❑ Higher Order Asymptotic Boundary Condition for the Finite Element Modeling of Two-Dimensional Transmission Line Structures
- ❑ Full-Wave Analysis of a Strip Crossover
- ❑ Perturbation Analysis and Modeling of Curved Microstrip Bends
- ❑ Low-Cost Microwave/Millimeter-Wave Impedance Measuring Scheme Using a Three-Probe Microstrip Circuit
- ❑ Microstrip Lines Using Yttrium Iron Garnet Film
- ❑ Full-Wave Analysis of Conductor Losses on MMIC Transmission Lines (Oct. 1990 [T-MTT])
- ❑ The Method of Lines for the Analysis of Lossy Planar Waveguides
- ❑ Time-Domain Analysis of Lossy Coupled Transmission Lines
- ❑ Propagation Analysis of Chirowaveguides Using the Finite-Element Method
- ❑ Slotted Waveguide Directional Coupler Characteristics

Click on title for a paper summary.



Contents

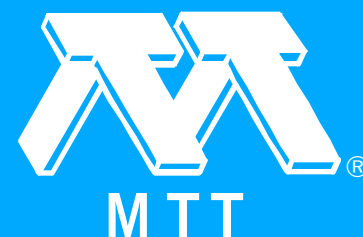
Publications

Issues



Papers by Issue

- ❑ Mode Conversion Losses in Highly Overmoded Waveguide Cavities
- ❑ Full-Wave Analysis of Discontinuities in Planar Waveguides by the Method of Lines Using a Source Approach (Short Papers)
- ❑ Arbitrary Pulse Shape Synthesis via Nonuniform Transmission Lines (Short Papers)
- ❑ Electromagnetic Wave Transmission in a Well Logging Cable--Theory (Short Papers)
- ❑ Expansions for the Capacitance of a Cross Concentric with a Square with an Identity (Short Papers)
- ❑ A Realization of a GaAs FET Microwave Active Filter (Short Papers)
- ❑ Impedance and Switching of GaAs p-i-n Diodes (Short Papers)
- ❑ Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Comments)



Contents

Publications

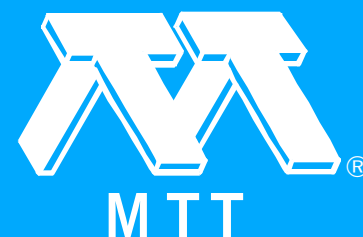
Issues

Click on title for a paper summary.



Papers by Issue

- ☐ Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Corrections)
- ☐ A Novel MMIC Active Filter with Lumped and Transversal Elements (Comments and Reply)
- ☐ State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Comments and Reply)
- ☐ Patent Abstracts (Oct. 1990 [T-MTT])
- ☐ Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Oct. 1990 [T-MTT])
- ☐ Call for Papers - IEEE Microwave and Guided Wave Letters (Oct. 1990 [T-MTT])
- ☐ Information for Authors (Oct. 1990 [T-MTT])
- ☐ Author Check List (Oct. 1990 [T-MTT])
- ☐ Call for Papers - Microwave Applications of Superconductors (Oct. 1990 [T-MTT])
- ☐ Call for Papers - Special Issue on Microwaves in Space (Oct. 1990 [T-MTT])



IEEE

Contents

Publications

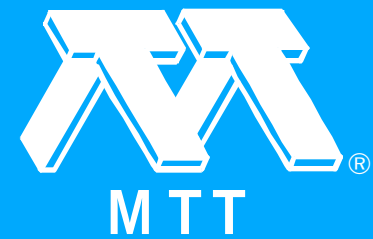
Issues

Click on title for a paper summary.



Papers by Issue

■ [Back Cover \(Oct. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

Click on title for a paper summary.

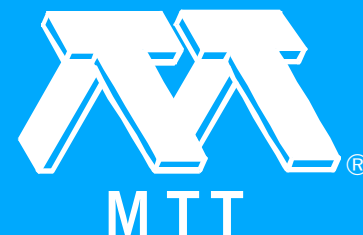


Papers by Issue

Nov. 1990 [T-MTT]

- ☐ [Front Cover \(Nov. 1990 \[T-MTT\]\)](#)
- ☐ [Microwave Technology and Careers in Transition: The Interests and Activities of Visitors to the Sperry Gyroscope Company's Klystron Plant in 1939-1940](#)
- ☐ [Investigation of Tapered Multiple Microstrip Lines for VLSI Circuits \(Nov. 1990 \[T-MTT\]\)](#)
- ☐ [Electromagnetic Scattering and Radiation from Finite Microstrip Structures](#)
- ☐ [Full-Wave Perturbation Theory Based Upon Electric Field Integral Equations for Coupled Microstrip Transmission Lines](#)
- ☐ [Shunt Posts in Microstrip Transmission Lines](#)
- ☐ [The Resonance Method for Evaluating the Impedances of the Equivalent Network for Dielectric Posts in a Rectangular Waveguide](#)
- ☐ [Modes of Elliptical Waveguides: A Correction](#)

Click on title for a paper summary.



IEEE

[Contents](#)

[Publications](#)

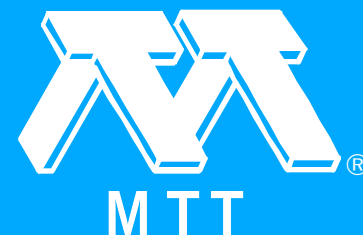
[Issues](#)



Papers by Issue

- ❑ Finite Difference Frequency-Domain Treatment of Open Transmission Structures
- ❑ Theoretical Evaluation of Nonlinear Tapers for a High-Power Gyrotron
- ❑ Gaussian Beam Representation of Aperture Fields in Layered, Lossy Media: Simulation and Experiment
- ❑ Mode Orthogonality in Chirowaveguides
- ❑ Propagation and Circuit Characteristics of Inductively Coupled Superconducting Microstrip
- ❑ First-Order Symmetric Modes for a Slightly Lossy Coaxial Transmission Line
- ❑ Rigorous, Multimode Equivalent Network Representation of Inductive Discontinuities
- ❑ Electromagnetic Scattering from an Infinite Elliptic Metallic Cylinder Coated by a Circular Dielectric One
- ❑ Whispering Gallery Dielectric Resonator Modes for W-Band Devices
- ❑ A Novel, Linear Voltage Variable MMIC Attenuator

Click on title for a paper summary.



IEEE

Contents

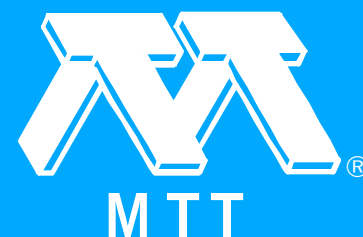
Publications

Issues



Papers by Issue

- ❑ Characterization of an Optoelectronic Terahertz Beam System
- ❑ On Power Distribution in Additive Amplifiers
- ❑ FAST Gradient Based Yield Optimization of Nonlinear Circuits
- ❑ Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing
- ❑ Dispersion Characteristics of Optically Excited Coplanar Striplines: Comprehensive Full-Wave Analysis
- ❑ A Quasi-TEM Design Method for 3 dB Hybrid Couplers Using a Semi-Reentrant Coupling Section (Short Papers)
- ❑ A Flexible Design Procedure for Microstrip Planar Disk 3 dB Quadrature Hybrids (Short Papers)
- ❑ Scattering Parameters of E-Plane Printed Opposite Fin in Waveguide (Short Papers)
- ❑ Characteristic Impedance and Electromagnetic Field Distribution in Metal-Insulator-Semiconductor Microstrip (Short Papers)



Contents

Publications

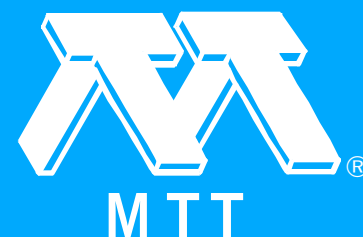
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ [Low-Frequency Location of the Leaky-Wave Poles for a Dielectric Layer \(Short Papers\)](#)
- ❑ [Application of Transforms to Accelerate the Summation of Periodic Free-Space Green's Functions \(Short Papers\)](#)
- ❑ [Determining Adapter Efficiency by Envelope Averaging Swept Frequency Reflection Data \(Short Papers\)](#)
- ❑ [Comparison of Approximations for Effective Parameters of Artificial Dielectrics \(Short Papers\)](#)
- ❑ [Combining Modal Analysis and the Finite-Difference Time-Domain Method in the Study of Dielectric Waveguide Problems \(Short Papers\)](#)
- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation \(Comments and Reply\)](#)
- ❑ [Patent Abstracts \(Nov. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Nov. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

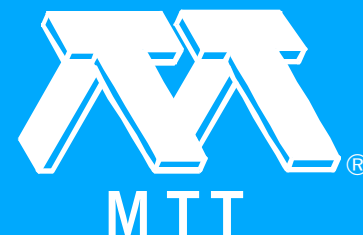
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ [Call for Papers - 1991 IEEE Microwave and Millimeter Wave Monolithic Circuits Symposium \(Nov. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Special Issue on Microwaves in Space \(Nov. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - IEEE Microwave and Guided Wave Letters \(Nov. 1990 \[T-MTT\]\)](#)
- ❑ [Information for Authors \(Nov. 1990 \[T-MTT\]\)](#)
- ❑ [Author Check List \(Nov. 1990 \[T-MTT\]\)](#)
- ❑ [Back Cover \(Nov. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

Click on title for a paper summary.



Papers by Issue



IEEE

Contents

Publications

Issues

Dec. 1990 [T-MTT] (1990 Symposium Issue)

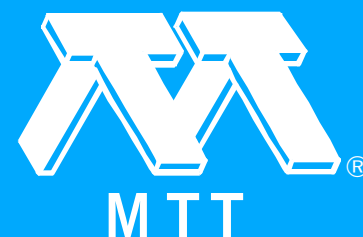
- ☐ [Front Cover \(Dec. 1990 \[T-MTT\]\)](#)
- ☐ [Table of Contents \(Dec. 1990 \[T-MTT\]\)](#)
- ☐ [Editor's Note \(Dec. 1990 \[T-MTT\]\)](#)
- ☐ [Guest Editors' Overview \(Dec. 1990 \[T-MTT\]\)](#)
- ☐ [1990 MTT-S International Microwave Symposium \(Dec. 1990 \[T-MTT\]\)](#)
- ☐ [1990 MTT-S Awards \(Dec. 1990 \[T-MTT\]\)](#)
- ☐ [Full-Wave Analysis of Lossy Quasi-Planar Transmission Line Incorporating the Metal Modes](#)
- ☐ [A Generalized Method for Distinguishing Between Radiation and Surface-Wave Losses in Microstrip Discontinuities](#)
- ☐ [Equivalent Capacitances of Coplanar Waveguide Discontinuities and Interdigitated Capacitors Using a Three-Dimensional Finite Difference Method](#)
- ☐ [Characterization of a Class of Waveguide Discontinuities Using a Modified TE/ \$x\$ /sub \$m\$ / Mode Approach](#)

Click on title for a paper summary.



Papers by Issue

- ❑ [An Analysis of an N-Port Microstrip Planar Disk Device with an Arbitrarily Located Short Circuit Post of Arbitrary Radius](#)
- ❑ [The Transition Region Between Bound-Wave and Leaky-Wave Ranges for a Partially Dielectric-Loaded Open Guiding Structure \(Dec. 1990 \[T-MTT\]\)](#)
- ❑ [A Rigorous Dispersive Characterization of Microstrip Cross and T Junctions](#)
- ❑ [An Automated 60 GHz Open Resonator System for Precision Dielectric Measurement](#)
- ❑ [Optimum Field Theory Design of Broad-Band E-Plane Branch Guide Phase Shifters and 180° Couplers](#)
- ❑ [Multiplexing and Double Band Filtering with Common-Multimode Cavities](#)
- ❑ [Propagation Characteristics of MIS Transmission Lines with Inhomogeneous Doping Profile](#)
- ❑ [Microwave Active Filters Based on Coupled Negative Resistance Method](#)



IEEE

[Contents](#)

[Publications](#)

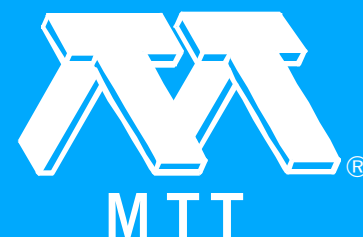
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ A Novel Coupling Method for Dual-Mode Dielectric Resonators and Waveguide Filters
- ❑ Transient Analysis of Distortion and Coupling in Lossy Coupled Microstrips (Dec. 1990 [T-MTT])
- ❑ A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver (Dec. 1990 [T-MTT])
- ❑ Nonlinear Circuit Analysis of Harmonic and Intermodulation Distortions in Laser Diodes Under Microwave Direct Modulation
- ❑ Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers
- ❑ Intermoding Optical and Microwave Signals in GaAs Microstrip Circuits for Phase-Locking Applications
- ❑ A Miniaturized Broad-Band MMIC Frequency Doubler
- ❑ Establishing the Minimum Reverse Bias for a p-i-n Diode in a High-Power Switch
- ❑ A New Low-Noise FET Structure



IEEE

Contents

Publications

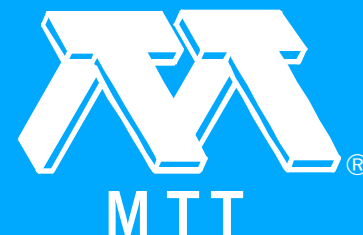
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Miniature Hybrid Microwave IC's Using a Novel Thin-Film Technology (Dec. 1990 [T-MTT])
- ❑ Losses in GaAs Microstrip (Dec. 1990 [T-MTT])
- ❑ Modeling MESFET's for Intermodulation Analysis of Mixers and Amplifiers (Dec. 1990 [T-MTT])
- ❑ Design Technique for MESFET Mixers for Maximum Conversion Gain
- ❑ Monolithic Sampling Head IC
- ❑ 5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier
- ❑ A Novel Aperture Isolation Circuit for Use in Phased Array Systems
- ❑ Design and Performance of an Octave Band 11 Watt Power Amplifier MMIC
- ❑ Multifunction Small-Signal Chip Set for Transmit/Receive Modules
- ❑ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz (Short Papers)



Contents

Publications

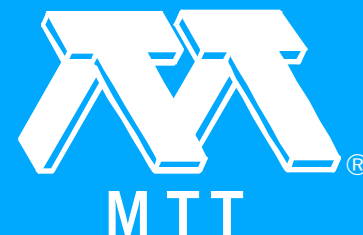
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ Patent Abstracts (Dec. 1990 [T-MTT])
- ❑ Call for Papers - Special Issue on Microwaves in Space (Dec. 1990 [T-MTT])
- ❑ Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Dec. 1990 [T-MTT])
- ❑ Call for Papers - 37th ARFTG Conference (Dec. 1990 [T-MTT])
- ❑ Call for Papers - 1991 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium (Dec. 1990 [T-MTT])
- ❑ Index, IEEE [T-MTT] 1990, Volume 38, and MTT-S Sponsored Conferences
- ❑ Back Cover (Dec. 1990 [T-MTT])



IEEE

Contents

Publications

Issues

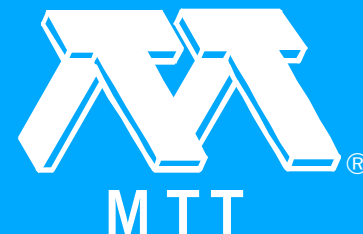
Click on title for a paper summary.



Papers by Issue

1990 [MCS]

- ☐ [Front Cover \(1990 \[MCS\]\)](#)
- ☐ [Copyright \(1990 \[MCS\]\)](#)
- ☐ [Message from the General Chairman \(1990 \[MCS\]\)](#)
- ☐ [Committees \(1990 \[MCS\]\)](#)
- ☐ [Message from the Technical Program Chairman \(1990 \[MCS\]\)](#)
- ☐ [Committee Photographs \(1990 \[MCS\]\)](#)
- ☐ [Table of Contents \(1990 \[MCS\]\)](#)
- ☐ [GaAs Devices and the MIC Applications in Satellite Broadcasting](#)
- ☐ [A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception](#)
- ☐ [A Highly Integrated Two Channel MMIC Down Converter with Gain Control](#)



IEEE

[Contents](#)

[Publications](#)

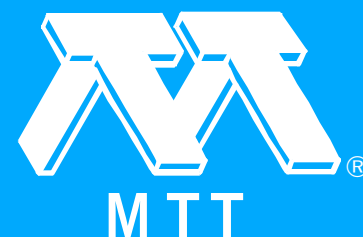
[Issues](#)

Click on title for a paper summary.



Papers by Issue

- ❑ High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz
- ❑ GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz
- ❑ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz
- ❑ Monolithic 9 to 70 GHz Distributed Amplifier
- ❑ 5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier
- ❑ Octave Band Eleven Watt Power Amplifier MMIC
- ❑ A 2.5 Watt X-Band High Efficiency MMIC Amplifier
- ❑ 5 W Monolithic HBT Amplifier for Broadband X-Band Applications
- ❑ Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation
- ❑ A Novel Aperture-Isolation Circuit for Use in Phased Array Systems
- ❑ Miniature Monolithic Microwave Frequency Diplexers



Contents

Publications

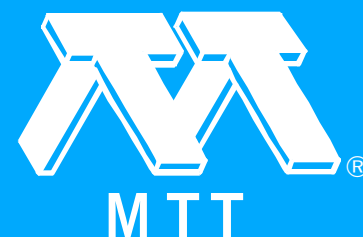
Issues

Click on title for a paper summary.



Papers by Issue

- ❑ A New Concept to Cancel Insertion Phase Variation in MMIC Amplitude Controller
- ❑ Design and Fabrication of Two-Pole Monolithic Bulk Acoustic Filters
- ❑ Implementation of RF/Microwave Receiver Components on a Semi-Custom Silicon Bipolar Array
- ❑ An MMIC Amplifier for Automatic Level Control Applications
- ❑ A Monolithic GaAs HBT Upconverter
- ❑ Three Channel I.F. Multiplexers
- ❑ European MMIC Activities (1990 [MCS])
- ❑ MIMIC Technology Transportability (1990 [MCS])
- ❑ Multifunction Chip Set for T/R Module Receive Path (1990 [MCS])
- ❑ A Single Chip 2-20 GHz T/R Module
- ❑ Monolithic Ka Band VCO Using Quarter Micron GaAs MESFETs and Integrated High-Q Varactors (1990 [MCS])



Contents

Publications

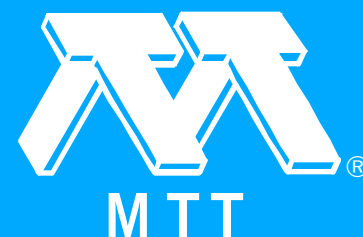
Issues

Click on title for a paper summary.



Papers by Issue

- ☐ K/sub u/- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Burried-Layer Back Contacts (1990 [MCS])
- ☐ A Monolithic 94 GHz Balanced Mixer
- ☐ An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application
- ☐ A High Power 2-18 GHz T/R Switch (1990 [MCS])
- ☐ A Compact Broadband, Six-Bit MMIC Phasor with Integrated Digital Drivers (1990 [MCS])
- ☐ Broad Band Monolithic Cross Point Switch Matrices
- ☐ A 10-14 GHz Linear MMIC Vector Modulator with Less Than 0.1dB and 0.8° Amplitude and Phase Error (1990 [MCS])
- ☐ Index of Authors (1990 [MCS])
- ☐ Back Cover (1990 [MCS])



Contents

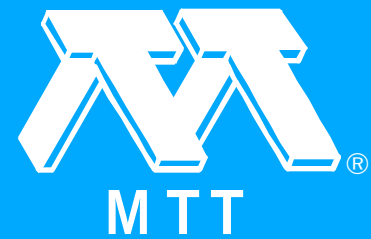
Publications

Issues

Click on title for a paper summary.



Paper Index



IEEE

Contents

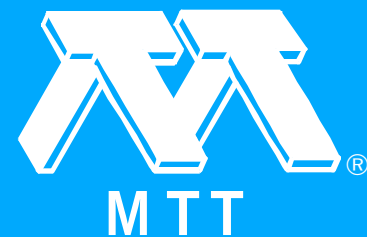
Publications

Issues

A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z
0 1 2 3 4
5 6 7 8 9

Colored letters and/or numbers are active links to the index.

Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

1

- ❑ [1981-1988 Cumulative Index - Guide to the Index \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ❑ [1988 IEEE Membership Directory \(Advertisement\) \(Jan. 1989 \[T-MTT\]\)](#)
- ❑ [1989 IEEE Membership Directory \(Advertisement\) \(Apr. 1989 \[T-MTT\]\)](#)
- ❑ [1989 MTT-S International Microwave Symposium \(Dec. 1989 \[T-MTT\]\)](#)
- ❑ [1990 MTT-S Awards \(Dec. 1990 \[T-MTT\]\)](#)
- ❑ [1990 MTT-S International Microwave Symposium \(Dec. 1990 \[T-MTT\]\)](#)

2

- ❑ [2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si](#)

3

- ❑ [35 GHz GaAs Power MESFET's and Monolithic Amplifiers](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

5

- ☐ 5 W Monolithic HBT Amplifier for Broadband X-Band Applications
- ☐ 5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier
- ☐ 5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier

A

- ☐ A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver (Dec. 1990 [T-MTT])
- ☐ A 10-14 GHz Linear MMIC Vector Modulator with Less Than 0.1dB and 0.8° Amplitude and Phase Error (1990 [MCS])
- ☐ A 2-18 GHz Low-Noise/High-Gain Amplifier Module
- ☐ A 2.5 Watt X-Band High Efficiency MMIC Amplifier
- ☐ A 225 GHz Polarimetric Radar
- ☐ A 30 GHz MMIC Receiver for Satellite Transponders
- ☐ A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

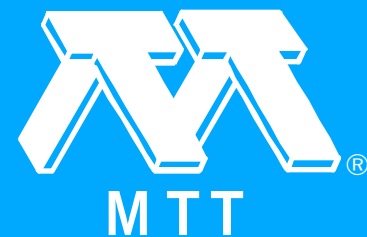
Issues

- ❑ [A Basic Concept to Reduce the Frequency Distortion of Distributed Amplifiers \(Letters\)](#)
- ❑ [A Broad-Band Printed Circuit Hybrid Ring Power Divider](#)
- ❑ [A CAD-Oriented Method for Noise Figure Computation of Two-Ports with Any Internal Topology](#)
- ❑ [A Compact Broadband, Six-Bit MMIC Phasor with Integrated Digital Drivers \(1990 \[MCS\]\)](#)
- ❑ [A Compact Full MMIC Module for Ku-Band Phase-Locked Oscillators](#)
- ❑ [A Complete E-Plane Analysis of Waveguide Junctions Using the Finite Element Method](#)
- ❑ [A Configuration-Oriented Spice Model for Multiconductor Transmission Lines with Homogeneous Dielectrics](#)
- ❑ [A Cylindrical Multiconductor Stripline-Like Microstrip Transmission Line](#)
- ❑ [A Dielectric-Free Superconducting Coaxial Cable](#)
- ❑ [A Dual Six-Port Automatic Network Analyzer Incorporating a Biphas-Bimodulation Element](#)
- ❑ [A FET Amplifier in Finline Technique \(Short Papers\)](#)

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [A Finite-Difference Transmission Line Matrix Method Incorporating a Nonlinear Device Model](#)
- ❑ [A Flexible Design Procedure for Microstrip Planar Disk 3 dB Quadrature Hybrids \(Short Papers\)](#)
- ❑ [A GaAs Monolithic 6 GHz Low-Noise Amplifier for Satellite Receivers \(Mar. 1989 \[T-MTT\]\)](#)
- ❑ [A Generalized Method for deriving the Space-Domain Green's Function in a Shielded, Multilayer Substrate Structure with Applications to MIS Slow-Wave Transmission Lines](#)
- ❑ [A Generalized Method for Distinguishing Between Radiation and Surface-Wave Losses in Microstrip Discontinuities](#)
- ❑ [A Generalized Theory for Asymmetrical Coupled Lines \(Short Papers\)](#)
- ❑ [A Generalized Theory of Tapered Transmission Line Matching Transformers and Asymmetric Couplers Supporting Non-TEM Modes](#)
- ❑ [A Graphic Design Method for Matched Low-Noise Amplifiers](#)
- ❑ [A High Power 2-18 GHz T/R Switch \(1990 \[MCS\]\)](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

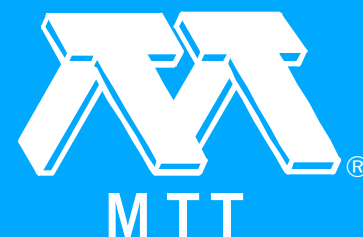
Issues

- ❑ A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter (Short Papers)
- ❑ A Highly Integrated Two Channel MMIC Down Converter with Gain Control
- ❑ A Large-Signal HSPICE Model for the Heterojunction Bipolar Transistor (Short Papers)
- ❑ A Large-Signal Physical MESFET Model for Computer-Aided Design and its Applications
- ❑ A Linear Statistical FET Model Using Principal Component Analysis
- ❑ A Local Mesh Refinement Algorithm for the Time Domain Finite Difference Method Using Maxwell's Curl Equations (Short Papers)
- ❑ A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception
- ❑ A Low-Noise Microwave Oscillator Employing a Self-Aligned AlGaAs/GaAs HBT (Short Papers)
- ❑ A Mathematical Formulation of the Equivalence Principle

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ A Millimeter-Wave Six-Port Reflectometer Using Dielectric Waveguide
- ❑ A Miniaturized Broad-Band MMIC Frequency Doubler
- ❑ A Mixed Spectral-Domain Approach for Dispersion Analysis of Suspended Planar Transmission Lines with Pedestals
- ❑ A Moment Method Solution of a Volume-Surface Integral Equation Using Isoparametric Elements and Point Matching (Short Papers)
- ❑ A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology
- ❑ A Monolithic 94 GHz Balanced Mixer
- ❑ A Monolithic GaAs HBT Upconverter
- ❑ A More Accurate Analysis and Design of Coaxial-to-Rectangular Waveguide End Launcher
- ❑ A Multi-IMPATT Injection-Locked Oscillator at 35 GHz
- ❑ A Multioctave Active GaAs MMIC Quadrature Phase Shifter
- ❑ A New Analytic Design Technique for Two-and Three-Way Warped Mode Compline Directional Couplers
- ❑ A New Approach to the RF Power Operation of MESFET's

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [A New Concept to Cancel Insertion Phase Variation in MMIC Amplitude Controller](#)
- ❑ [A New Equivalent Network Method for Analyzing Discontinuity Properties of Open Dielectric Waveguides](#)
- ❑ [A New Formulation of the Boundary Condition at Infinity for a Hybrid Radiation Mode and its Application to the Analysis of Radiation Modes of Microstrip Lines](#)
- ❑ [A New GaAs Power MESFET Structure for Improved Power Capabilities](#)
- ❑ [A New Low-Noise FET Structure](#)
- ❑ [A New Method of Modeling Three-Dimensional MIC/MMIC Circuits: The Space-Spectral Domain Approach](#)
- ❑ [A New Model for the Dual-Gate GaAs MESFET](#)
- ❑ [A New Resistance Measurement Technique Applicable to High-Temperature Superconducting Materials at Microwave Frequencies \(Short Papers\)](#)
- ❑ [A New Self-Alignment Technology for Sub-Quarter-Micron-Gate FET's Operating in the Ka-Band](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ [A New Way to Optically Control a Millimeter-Wave Oscillator \(Short Papers\)](#)
- ❑ [A New Wire Node for Modeling Thin Wires in Electromagnetic Field Problems Solved by Transmission Line Modeling \(Short Papers\)](#)
- ❑ [A Note on the Mixed Potential Representation of Electric Fields in Layered Media \(Short Papers\)](#)
- ❑ [A Novel Aperture Isolation Circuit for Use in Phased Array Systems](#)
- ❑ [A Novel Aperture-Isolation Circuit for Use in Phased Array Systems](#)
- ❑ [A Novel Cavity Resonator Measurement Method for Leaky Waveguides \(Mar. 1989 \[T-MTT\]\)](#)
- ❑ [A Novel Coupling Method for Dual-Mode Dielectric Resonators and Waveguide Filters](#)
- ❑ [A Novel Exponential Power Combiner/Divider](#)
- ❑ [A Novel MMIC Active Filter with Lumped and Transversal Elements \(Comments and Reply\)](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

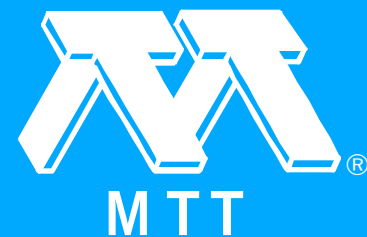
Issues

- ❑ A Novel MMIC Active Filter with Lumped and Transversal Elements (Dec. 1989 [T-MTT])
- ❑ A Novel, Linear Voltage Variable MMIC Attenuator
- ❑ A Numerically Efficient Finite-Element Formulation for the General Waveguide Problem without Spurious Modes
- ❑ A Parametric Study of the Attenuation Constant of Lossy Microstrip Lines (Short Papers)
- ❑ A Partial Variational Approach for Arbitrary Discontinuities in Planar Dielectric Waveguides
- ❑ A Periodic Planar Gunn Diode Power Combining Oscillator (Short Papers)
- ❑ A Process-Dependent Worst-Case Analysis for MMIC Design Based on a Handy MESFET Simulator
- ❑ A Proposed Microwave and Millimeter-Wave Spectrum Analyzer (Short Papers)
- ❑ A Quasi-Planar FET Amplifier in Integrated Finline and Microstrip Technique (Short Papers)
- ❑ A Quasi-TEM Analysis for Curved and Straight Planar Multiconductor Systems

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ A Quasi-TEM Design Method for 3 dB Hybrid Couplers Using a Semi-Reentrant Coupling Section (Short Papers)
- ❑ A Realization of a GaAs FET Microwave Active Filter (Short Papers)
- ❑ A Rigorous Analysis of a Coaxial to Shielded Microstrip Line Transition
- ❑ A Rigorous and Computationally Efficient Analysis of Microstrip for Use as an Electro-Optic Modulator
- ❑ A Rigorous Dispersive Characterization of Microstrip Cross and T Junctions
- ❑ A Rigorous Variational Formulation of an H Plane Slot-Coupled Tee Junction (Short Papers)
- ❑ A Self-Calibration Concept for Establishing the Complex Measurement Ability of Homodyne Network Analyzers
- ❑ A Simple Broad-Band Device De-Embedding Method Using an Automatic Network Analyzer with Time-Domain Option
- ❑ A Single Chip 2-20 GHz T/R Module
- ❑ A Statistical Method for Calibrating the Six-Port Reflectometer Using Nonideal Standards (Short Papers)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ A Two-Dimensional Transmission Line Matrix Microwave Field Simulator Using New Concepts and Procedures
- ❑ A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications
- ❑ A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications (Comments and Reply)
- ❑ A Variational Analysis of Anisotropic, Inhomogeneous Dielectric Waveguides
- ❑ Absorbing Boundary Conditions for the Finite-Element Analysis of Planar Devices
- ❑ Accuracy Improvements in Microwave Noise Parameter Measurements
- ❑ Accurate Characterization of Microstrip Resonator Open End with New Current Expression in Spectral-Domain Approach (Short Papers)
- ❑ Accurate Determination of Modes in Dielectric-Loaded Cylindrical Cavities Using a One-Dimensional Finite Element Method

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [Additional Approximate Formulas and Experimental Data on Micro-Coplanar Striplines \(Short Papers\)](#)
- ❑ [Alternate Forms of the Generalized Composite Scattering Matrix \(Letters\)](#)
- ❑ [An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions](#)
- ❑ [An Accurate Measurement Technique for Line Properties, Junction Effects, and Dielectric and Magnetic Material Parameters](#)
- ❑ [An Analysis of an N-Port Microstrip Planar Disk Device with an Arbitrarily Located Short Circuit Post of Arbitrary Radius](#)
- ❑ [An Analysis of Microstrip with Rectangular and Trapezoidal Conductor Cross Sections](#)
- ❑ [An Analytic Algorithm for Unbalanced Stripline Impedance](#)
- ❑ [An Analytic and Experimental Comparison of Direct and External Modulation in Analog Fiber-Optic Links](#)
- ❑ [An Analytical Model for I-V and Small-Signal Characteristics of Planar-Doped HEMT's](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ [An Analytical Solution for the Coupled Stripline-Like Microstrip Line Problem \(Corrections\)](#)
- ❑ [An Analytical Solution to the Microstrip Line Problem](#)
- ❑ [An Analytical Two-Dimensional Perturbation Method to Model Submicron GaAs MESFET's \(Short Papers\)](#)
- ❑ [An Approximate Variational Solution to the Step Discontinuity in Finline](#)
- ❑ [An Automated 60 GHz Open Resonator System for Precision Dielectric Measurement](#)
- ❑ [An Equivalent Circuit Model for Terminated Hybrid-Mode Multiconductor Transmission Lines](#)
- ❑ [An Exact Solution for the Nonuniform Transmission Line Problem \(Short Papers\)](#)
- ❑ [An Experimental Investigation of the Microstrip Step Discontinuity \(Short Papers\)](#)
- ❑ [An Experimental Technique for In Vivo Permittivity Measurement of Materials at Microwave Frequencies \(Short Papers\)](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ [An Improved Algorithm for the Computer-Aided Design of Coupled Slab Lines \(Short Papers\)](#)
- ❑ [An Improved Analytical AC Large-Signal Model for the GaAs MESFET](#)
- ❑ [An Improved Design of Systems Based on Three Coupled Microstrip Lines \(Short Papers\)](#)
- ❑ [An Improved GaAs MESFET Model for SPICE \(Short Papers\)](#)
- ❑ [An Improved Model for Noise Characterization of Microwave GaAs FET's](#)
- ❑ [An Infrared Fiber-Optic Radiometer for Controlled Microwave Heating \(Short Papers\)](#)
- ❑ [An Integral Equation Analysis of an Infinite Array of Rectangular Dielectric Waveguides](#)
- ❑ [An Integral Equation Method for the Evaluation of Conductor and Dielectric Losses in High-Frequency Interconnects](#)
- ❑ [An MMAC C-Band FET Feedback Power Amplifier](#)
- ❑ [An MMIC Amplifier for Automatic Level Control Applications](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

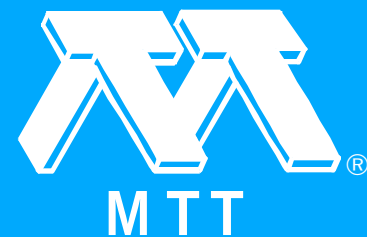
Issues

- ❑ An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application
- ❑ Analog Avalanche Diode Frequency Division (Short Papers)
- ❑ Analysis and Design of Kemp-Type 3 dB Quadrature Couplers (Short Papers)
- ❑ Analysis and Design of Microstrip-Slot Line for Phase Shifting Applications
- ❑ Analysis and Measurement of Transducer End Radiation in SAW Filters on Strongly Coupling Substrates
- ❑ Analysis of a Centered-Inclined Waveguide Slot Coupler
- ❑ Analysis of a Microwave Power Amplifier Using a Combiner/Divider with Circular Cavities
- ❑ Analysis of a Shielded Microstrip Line with Finite Metallization Thickness by the Boundary Element Method (Short Papers)
- ❑ Analysis of Dielectric Guiding Structures by the Iterative Eigenfunction Expansion Method
- ❑ Analysis of Dielectric Resonator Cavities Using the Finite Integration Technique

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Analysis of Dielectric-Loaded Waveguide
- ☐ Analysis of Discontinuities in an Open Dielectric Slab Waveguide by Combination of Finite and Boundary Elements
- ☐ Analysis of Edge-Coupled Elliptical (Oval) Rods Between Infinite Ground Planes (Short Papers)
- ☐ Analysis of Energy Coupling into Spheroidal Ferritic Implants for Hyperthermia Applications
- ☐ Analysis of Nonreciprocal Coupled Image Lines (Comments and Reply) (Jan. 1989 [T-MTT])
- ☐ Analysis of Rectangular Spiral Transformers for MMIC Applications (Short Papers)
- ☐ Analysis of Step Discontinuities on Planar Dielectric Waveguide Containing a Gyrotropic Layer
- ☐ Analysis of TEM Mode on a Curved Coaxial Transmission Line
- ☐ Analysis of the Junction Between Smooth and Corrugated Cylindrical Waveguides in Mode Converters (Short Papers)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

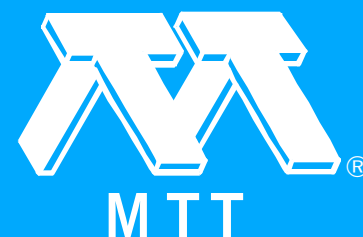
Issues

- ❑ Analysis of the Oscillation Conditions in Distributed Amplifiers (Short Papers)
- ❑ Analysis of the Power Coupling from a Waveguide Hyperthermia Applicator into a Three-Layered Tissue Model
- ❑ Analysis of Transients in Nonuniform and Uniform Multiconductor Transmission Lines
- ❑ Analysis of Transmission Line Structures Using a New Image-Mode Green's Function (Short Papers)
- ❑ Analysis of Waveguides with Metal Inserts (Dec. 1989 [T-MTT])
- ❑ Analysis of Wide Transverse Inductive Metal Strips in a Rectangular Waveguide (Short Papers)
- ❑ Anisotropic Measurements of Rubber Sheets with an X-Band Three-Wave Interferometer (Short Papers)
- ❑ Application of Least-Squares Boundary Residual Method to the Analysis of a Circular Waveguide Loaded with a Nonconcentric Dielectric Rod
- ❑ Application of the Three-Dimensional Finite-Difference Time-Domain Method to the Analysis of Planar Microstrip Circuits

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Application of Transforms to Accelerate the Summation of Periodic Free-Space Green's Functions (Short Papers)
- ❑ Applications of Traveling-Wave Laser Amplifiers in Subcarrier Multiplexed Lightwave Systems
- ❑ Arbitrary Pulse Shape Synthesis via Nonuniform Transmission Lines (Short Papers)
- ❑ Asian Abstracts (Jul. 1990 [T-MTT])
- ❑ Asymmetrical Finline for Space Applications Using Millimeter Waves
- ❑ Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities
- ❑ Attenuation and Dispersion for High-T/sub c/ Superconducting Microstrip Lines
- ❑ Attenuation Compensation in Distributed Amplifier Design
- ❑ Attenuation Measurement of Very Low Loss Dielectric Waveguides by the Cavity Resonator Method Applicable in the Millimeter/Submillimeter Wavelength Range (Comments and Reply)
- ❑ Author Check List (Aug. 1990 [T-MTT])

Click on title for a paper summary.

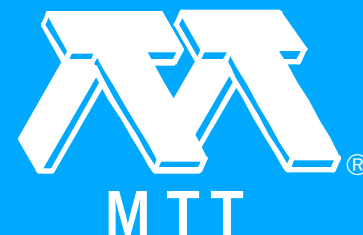


Paper Index

- ☐ [Author Check List \(Jul. 1990 \[T-MTT\]\)](#)
- ☐ [Author Check List \(Nov. 1990 \[T-MTT\]\)](#)
- ☐ [Author Check List \(Oct. 1990 \[T-MTT\]\)](#)
- ☐ [Author Check List \(Sep. 1990 \[T-MTT\]\)](#)
- ☐ [Awards \(Dec. 1989 \[T-MTT\]\)](#)

B

- ☐ [Back Cover \(1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(1990 \[MCS\]\)](#)
- ☐ [Back Cover \(Apr. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Aug. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Aug. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Dec. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Feb. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Feb. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Jan. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Jan. 1990 \[T-MTT\]\)](#)



IEEE

[Contents](#)

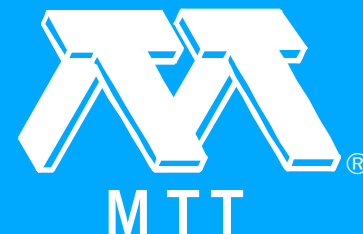
[Publications](#)

[Issues](#)

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

- ☐ [Back Cover \(Jul. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Jul. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Jun. 1989, Part I \[T-MTT\]\)](#)
- ☐ [Back Cover \(Jun. 1989, Part II \[T-MTT\]\)](#)
- ☐ [Back Cover \(Jun. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Mar. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Mar. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(May 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(May 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Nov. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Nov. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Oct. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Oct. 1990 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Sep. 1989 \[T-MTT\]\)](#)
- ☐ [Back Cover \(Sep. 1990 \[T-MTT\]\)](#)
- ☐ [Bandwidth Characteristics of Inhomogeneous T-Septum Waveguides](#)

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

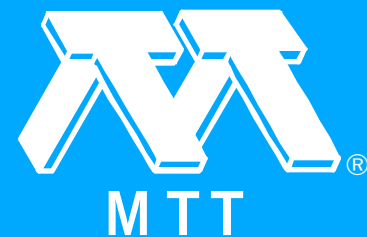
[Issues](#)

- ❑ [Bandwidth Properties of Rectangular T-Septum Waveguides \(Short Papers\)](#)
- ❑ [Bar-Grid Oscillators](#)
- ❑ [Boundary Condition Expansion of Basis Functions Method Implemented by Fast Fourier Transform Algorithms](#)
- ❑ [Broad Band Monolithic Cross Point Switch Matrices](#)
- ❑ [Broad-Band Determination of the FET Small-Signal Equivalent Circuit](#)
- ❑ [Broad-Band Distributed Amplifier Impedance-Matching Techniques](#)
- ❑ [Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers](#)
- ❑ [Broad-Band Microwave Measurements with Transient Radiation from Optoelectronically Pulsed Antennas](#)
- ❑ [Broad-Band Monolithic Microwave Active Inductor and its Application to Miniaturized Wide-Band Amplifiers \(Correction\)](#)
- ❑ [Broad-Band Simultaneous Measurement of Complex Permittivity and Permeability Using a Coaxial Discontinuity](#)

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

C

- ☐ [C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process](#)
- ☐ [Call for Papers - 1989 IEEE Gallium Arsenide Integrated Circuit Symposium \(Apr. 1989 \[T-MTT\]\)](#)
- ☐ [Call for Papers - 1990 IEEE GaAs IC Symposium \(Apr. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - 1990 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium \(Oct. 1989 \[T-MTT\]\)](#)
- ☐ [Call for Papers - 1990 IEEE MTT-S International Microwave Symposium \(Aug. 1989 \[T-MTT\]\)](#)
- ☐ [Call for Papers - 1990 IEEE MTT-S International Microwave Symposium \(Oct. 1989 \[T-MTT\]\)](#)
- ☐ [Call for Papers - 1990 IEEE MTT-S International Microwave Symposium \(Sep. 1989 \[T-MTT\]\)](#)
- ☐ [Call for Papers - 1991 IEEE Microwave and Millimeter Wave Monolithic Circuits Symposium \(Nov. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

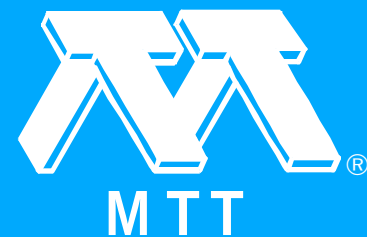
[Issues](#)

- ❑ [Call for Papers - 1991 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium \(Dec. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Aug. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Dec. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Jul. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Jun. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Nov. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Oct. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 1991 IEEE MTT-S International Microwave Symposium \(Sep. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - 37th ARFTG Conference \(Dec. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Call for Papers - Application of Lightwave Technology to Microwave Device, Circuits, and Systems (Jun. 1989, Part I [T-MTT])
- ❑ Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broad-Band Networks (Jun. 1989, Part I [T-MTT])
- ❑ Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks (Aug. 1989 [T-MTT])
- ❑ Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks (Jul. 1989 [T-MTT])
- ❑ Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Apr. 1989 [T-MTT])
- ❑ Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Feb. 1989 [T-MTT])

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

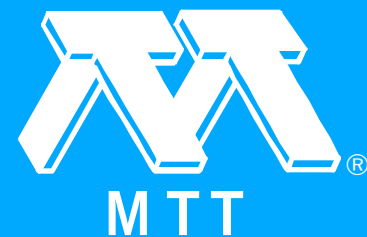
Issues

- ❑ [Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems \(Jul. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems \(Mar. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems \(May 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Apr. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Feb. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Jan. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Jul. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Jun. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

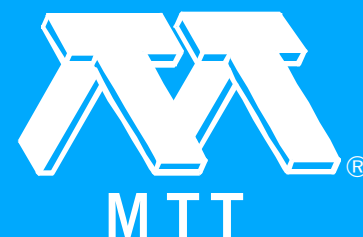
- ☐ [Call for Papers - Directions in Design and Applications of Microwave Systems \(Mar. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - IEEE Microwave and Guided Wave Letters \(Aug. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - IEEE Microwave and Guided Wave Letters \(Jul. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - IEEE Microwave and Guided Wave Letters \(Nov. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - IEEE Microwave and Guided Wave Letters \(Oct. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - IEEE Microwave and Guided Wave Letters \(Sep. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - Microwave Applications of Superconductors \(Apr. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - Microwave Applications of Superconductors \(Aug. 1990 \[T-MTT\]\)](#)
- ☐ [Call for Papers - Microwave Applications of Superconductors \(Jul. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Paper Index

- ❑ [Call for Papers - Microwave Applications of Superconductors \(Jun. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Microwave Applications of Superconductors \(Oct. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Microwave Applications of Superconductors \(Sep. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Multifunction MMICs and Their System Applications \(Nov. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Multifunction MMICs and Their System Applications \(Oct. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Multifunction MMICs and Their System Applications \(Sep. 1989 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Special Issue on Microwaves in Space \(Aug. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Special Issue on Microwaves in Space \(Dec. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Special Issue on Microwaves in Space \(Nov. 1990 \[T-MTT\]\)](#)



[Contents](#)

[Publications](#)

[Issues](#)

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

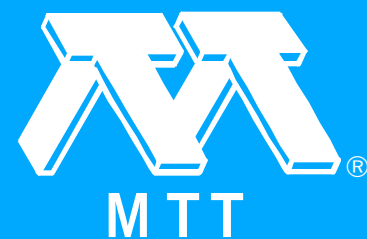
[Issues](#)

- ❑ [Call for Papers - Special Issue on Microwaves in Space \(Oct. 1990 \[T-MTT\]\)](#)
- ❑ [Call for Papers - Special Issue on Microwaves in Space \(Sep. 1990 \[T-MTT\]\)](#)
- ❑ [Capacitance Computation of Elliptic Microstrip Disks in Biaxial Anisotropic Multilayered Substrates](#)
- ❑ [Capacitance Parameters of Coupled Elliptic Microstrip Disks in Layered Anisotropic Media \(Short Papers\)](#)
- ❑ [Centimeter-Wave Microstrip Phase Shifter on a Ferrite-Dielectric Substrate](#)
- ❑ [Characteristic Impedance and Electromagnetic Field Distribution in Metal-Insulator-Semiconductor Microstrip \(Short Papers\)](#)
- ❑ [Characteristic Impedance of a Tubular Dielectric Cylinder Covered with Conducting Arc Strips \(Short Papers\)](#)
- ❑ [Characteristics of a Longitudinal/Transverse Coupling Slot in Crossed Rectangular Waveguides](#)
- ❑ [Characterization of a 90° Microstrip Bend with Arbitrary Miter via the Time-Domain Finite Difference Method](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Characterization of a Class of Waveguide Discontinuities Using a Modified TE/sup x//sub mn/ Mode Approach
- ❑ Characterization of an Optoelectronic Terahertz Beam System
- ❑ Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses
- ❑ Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses (Corrections)
- ❑ Characterization of Microstrip Lines Near a Substrate Edge and Design Formulas of Edge-Compensated Microstrip Lines
- ❑ Characterization of MIS Structure Coplanar Transmission Lines for Investigation of Signal Propagation in Integrated Circuits
- ❑ Characterization of Spurious-Response Suppression in Double-Balanced Mixers
- ❑ Characterization of Uniform Microstrip Line and its Discontinuities Using the Time-Domain Method of Lines

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Circuit Parameters for Single and Coupled Microstrip Lines by a Rigorous Full-Wave Space-Domain Analysis (Short Papers)
- ❑ Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency
- ❑ Combining Modal Analysis and the Finite-Difference Time-Domain Method in the Study of Dielectric Waveguide Problems (Short Papers)
- ❑ Committee Photographs (1990 [MCS])
- ❑ Committees (1990 [MCS])
- ❑ Compact Planar Microstrip-Slotline Symmetrical Ring Eight-Port Comparator Circuits
- ❑ Compact Quasi-Periodic and Aperiodic TE/sub 0n/ Mode Converters in Overmoded Circular Waveguides for Use with Gyrotrons
- ❑ Comparison of Approximations for Effective Parameters of Artificial Dielectrics (Short Papers)
- ❑ Comparison of Three Integral Formulations for the 2-D TE Scattering Problem

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ [Complex Modes in Shielded Suspended Coupled Microstrip Lines](#)
- ❑ [Computation of Complex Resonance Frequencies of Isolated Composite Objects](#)
- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation](#)
- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation \(Comments and Reply\)](#)
- ❑ [Computation of Electromagnetic Fields in Large Biological Bodies by an Iterative Moment Method with a Restart Technique](#)
- ❑ [Computation of Fields in an Arbitrarily Shaped Heterogeneous Dielectric or Biological Body by an Iterative Conjugate Gradient Method](#)
- ❑ [Computation of Frequency-Dependent Propagation Characteristics of Microstriplike Propagation Structures with Discontinuous Layers](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Computer-Aided Design Models for Broadside-Coupled Striplines and Millimeter-Wave Suspended Substrate Microstrip Lines (Corrections)
- ❑ Computer-Aided Design of E-Plane Waveguide Passive Components
- ❑ Computer-Aided Design of Evanescent Mode Waveguide Bandpass Filter with Nontouching E-Plane Fins
- ❑ Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers (Short Papers)
- ❑ Computer-Aided Design of Monolithic MESFET Distributed Amplifiers
- ❑ Computer-Aided Noise Analysis of MESFET and HEMT Mixers
- ❑ Conductor Geometry Independence of Phase Velocity in TEM-Mode Transmission Lines (Letters)
- ❑ Conservation of Complex Power Technique for Waveguide Junctions with Finite Wall Conductivity
- ❑ Considerations in Producibility Engineering of MMIC's

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

- ❑ Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect (Short Papers)
- ❑ Copyright (1990 [MCS])
- ❑ Copyright Form (Jan. 1989 [T-MTT])
- ❑ Coupled Mode Analysis of a Finline
- ❑ Coupled-Wave Small-Signal Transient Analysis of GaAs Distributed Amplifier
- ❑ Coupling of Crossed Planar Multiconductor Systems
- ❑ Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures
- ❑ Cutoff Spaces of Elliptical Gyromagnetic Planar Circuits and Waveguides Using Finite Elements

D

-
- ❑ Damping of the Resonant Modes of a Rectangular Metal Package (Short Papers)
 - ❑ DC and Transmission Line Models for a High Electron Mobility Transistor

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

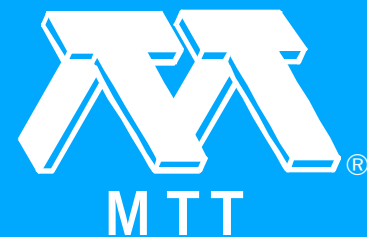
Issues

- ❑ dc to 40 GHz Coaxial-to-Microstrip Transition for 100- μ m-Thick GaAs Substrates (Short Papers)
- ❑ De-Embedding and Unterminating Microwave Fixtures with Nonlinear Least Squares (Short Papers)
- ❑ Design and Applications of Optically Controllable Finline Structures (Short Papers)
- ❑ Design and Fabrication of Two-Pole Monolithic Bulk Acoustic Filters
- ❑ Design and Performance of an Octave Band 11 Watt Power Amplifier MMIC
- ❑ Design Concepts for Microwave GaAs FET Active Filters
- ❑ Design Technique for MESFET Mixers for Maximum Conversion Gain
- ❑ Determination of the Correlation Spectrum of Oscillators with Low Noise
- ❑ Determination of the Cutoff of the First Higher Order Mode in a Coaxial Line by the Transverse Resonance Technique (Short Papers)

Click on title for a paper summary.



Paper Index



[Contents](#)
[Publications](#)
[Issues](#)

- ❑ [Determination of the Resonant Frequencies in a Complex Cavity Using the Scattering Matrix Formulation](#)
- ❑ [Determination of the Scattering Matrix of Ring-Loaded Corrugated Waveguide Mode Converters \(Short Papers\)](#)
- ❑ [Determining Adapter Efficiency by Envelope Averaging Swept Frequency Reflection Data \(Short Papers\)](#)
- ❑ [Deterministic Approach to Full-Wave Analysis of Discontinuities in MIC's Using the Method of Lines](#)
- ❑ [Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications \(Short Papers\)](#)
- ❑ [Dielectric Receiving Filter with Sharp Stopband Using an Active Feedback Resonator Method for Cellular Base Stations \(Dec. 1989 \[T-MTT\]\)](#)
- ❑ [Dielectric Resonators Suitable for Use in Planar Integrated Circuits at Short Millimeter Wavelengths \(Short Papers\)](#)
- ❑ [Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Direct and Inverse Resonance Problems for Shielded Composite Objects Treated by Means of the Null-Field Method
- ❑ Dispersion Characteristics of Curved Microstrip Transmission Lines (Short Papers)
- ❑ Dispersion Characteristics of Optically Excited Coplanar Striplines: Comprehensive Full-Wave Analysis
- ❑ Dispersion Characteristics of Optically Excited Coplanar Striplines: Pulse Propagation
- ❑ Distortion Characteristics of Optical Directional Coupler Modulators (Short Papers)
- ❑ Distributed Numerical Modeling of Dual-Gate GaAs MESFET's
- ❑ Distributed Scaling Approach of MESFET's and its Comparison with the Lumped-Element Approach
- ❑ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part I
- ❑ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part II

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Domain Integral Equation Analysis of Integrated Optical Channel and Ridge Waveguides in Stratified Media
- ❑ Dominance of Resistive Losses Over Hysteretic Losses in Ferromagnetic Conductors (Short Papers)
- ❑ Double-Sided MIC's and Their Applications
- ❑ Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer

E

- ❑ Editor's Note (Dec. 1990 [T-MTT])
- ❑ Editor's Preface (Jun. 1989, Part II [T-MTT])
- ❑ Editorial (Jan. 1989 [T-MTT])
- ❑ Editorial (Jun. 1990 [T-MTT])
- ❑ Editors' Overview (Dec. 1989 [T-MTT])
- ❑ Effect of a Cochannel Signal on the Electrical Tuning Characteristics of a Gunn Oscillator (Short Papers)
- ❑ Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

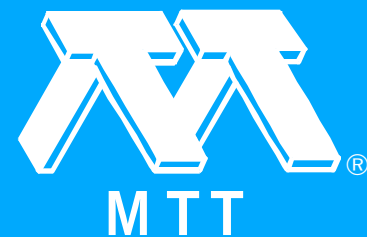
Issues

- ❑ Effect of Transition Waveguides on Dielectric Waveguide Directional Couplers
- ❑ Effects of Gain Compression, Bias Conditions, and Temperature on the Flicker Phase Noise of an 8.5 GHz GaAs MESFET Amplifier (Short Papers)
- ❑ Efficient Analysis of Planar Microstrip Geometries Using a Closed-Form Asymptotic Representation of the Grounded Dielectric Slab Green's Function
- ❑ Efficient Large-Signal FET Parameter Extraction Using Harmonics (Dec. 1989 [T-MTT])
- ❑ Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen
- ❑ Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Comments)
- ❑ Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Corrections)
- ❑ Electromagnetic and Transport Considerations in Subpicosecond Photoconductive Switch Modeling

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Electromagnetic Coupling of Coplanar Waveguides and Microstrip Lines to Highly Lossy Dielectric Media
- ❑ Electromagnetic Deposition in an Anatomically Based Model of Man for Leakage Fields of a Parallel-Plate Dielectric Heater
- ❑ Electromagnetic Energy Deposition Inside a Three-Layer Cylindrical Human Body Model Caused by Near-Field Radiators
- ❑ Electromagnetic Field Analysis and Calculation of the Resonance Characteristics of the Loop-Gap Resonator
- ❑ Electromagnetic Model of a Radial-Resonator Waveguide Diode Mount
- ❑ Electromagnetic Modeling of Waveguides Involving Finite-Size Dielectric Regions (Short Papers)
- ❑ Electromagnetic Scattering and Radiation from Finite Microstrip Structures
- ❑ Electromagnetic Scattering from an Infinite Elliptic Metallic Cylinder Coated by a Circular Dielectric One

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Electromagnetic Wave Transmission in a Well Logging Cable--Theory (Short Papers)
- ❑ Elimination of Ringing Signals for a Lossless, Multiple-Section Transmission Line
- ❑ Enhanced Through-Reflect-Line Characterization of Two-Port Measuring Systems Using Free-Space Capacitance Calculation (Short Papers)
- ❑ Equivalent Capacitances of Coplanar Waveguide Discontinuities and Interdigitated Capacitors Using a Three-Dimensional Finite Difference Method
- ❑ Equivalent Circuits for Dielectric Posts in a Rectangular Waveguide (Short Papers)
- ❑ Equivalent Current Density Reconstruction for Microwave Imaging Purposes
- ❑ Equivalent Transformations for the Mixed Lumped Brune-Type Section and Uniform Transmission Line
- ❑ Error-Corrected Large-Signal Waveform Measurement System Combining Network Analyzer and Sampling Oscilloscope Capabilities

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

[Issues](#)

- ❑ Establishing the Minimum Reverse Bias for a p-i-n Diode in a High-Power Switch
- ❑ European MMIC Activities (1990 [MCS])
- ❑ Evaluation of Loss Factor of Multilayered Inhomogeneous Waveguides for Magnetostatic Waves Using Efficient Finite Element Formalism
- ❑ Even-Mode Characteristics of the Bilateral Slotline
- ❑ Exact Solutions for Shielded Printed Microstrip Lines by the Carleman-Vekua Method
- ❑ Expansions for the Capacitance of a Cross Concentric with a Circle with an Application (Short Papers)
- ❑ Expansions for the Capacitance of a Cross Concentric with a Square with an Identity (Short Papers)
- ❑ Experimental Evaluation of Existing CAD Models for Microstrip Dispersion (Short Papers)
- ❑ Experiments on Injection Locking of Active Antenna Elements for Active Phased Arrays and Spatial Power Combiners

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Explicit Microwave Rotary Phase Shifter Calibration Algorithm (Letters)
- ❑ Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing

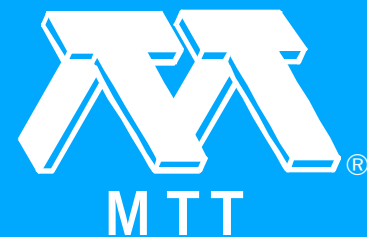
F

- ❑ Fast and Accurate Analytic Formulas for Calculating the Parameters of a General Broadside-Coupled Coplanar Waveguide for (M)MIC Applications
- ❑ FAST Gradient Based Yield Optimization of Nonlinear Circuits
- ❑ Feedback in Distributed Amplifiers (Short Papers)
- ❑ FET Up-Converter Design Using Load-Dependent Mixing Transconductance
- ❑ FET-Based Planar Circuits for Quasi-Optical Sources and Transceivers
- ❑ Field Solution and Propagation Characteristics of Monofilar-Bifilar Modes of Axially Slotted Coaxial Cable

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Filter Design Using In-Line Triple-Mode Cavities and Novel Iris Couplings
- ❑ Finding Initial Estimates Needed for the Engen Method of Calibrating Single Six-Port Reflectometers (Short Papers)
- ❑ Finite Difference Frequency-Domain Treatment of Open Transmission Structures
- ❑ Finite Element Formulation for Guided-Wave Problems Using Transverse Electric Field Component (Short Papers)
- ❑ Finite Element Solution of Longitudinally Magnetized Elliptical Gyromagnetic Waveguides
- ❑ Finite-Difference Method without Spurious Solutions for the Hybrid-Mode Analysis of Diffused Channel Waveguides
- ❑ Finite-Element Analysis of Magnetostatic Wave Propagation in a YIG Film of Finite Dimensions
- ❑ Finlines in Rectangular and Circular Waveguide Housings Including Substrate Mounting and Bending Effects--Finite Element Analysis
- ❑ First-Order Symmetric Modes for a Slightly Lossy Coaxial Transmission Line

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Flexible Circular Waveguides at Millimeter Wavelengths from Metallized Teflon Tubing (Short Papers)
- ❑ Foreword (Dec. 1989 [T-MTT])
- ❑ Foreword (Feb. 1989 [T-MTT])
- ❑ Foreword (Sep. 1989 [T-MTT])
- ❑ Formulas Useful for the Synthesis and Optimization of General, Uniform Contradirectional Couplers
- ❑ Frequency Division Multiplexed Microwave and Baseband Digital Optical Fiber Link for Phased Array Antennas
- ❑ Frequency-Dependent Characteristics of Current Distributions on Microstrip Lines (Short Papers)
- ❑ Frequency-Dependent Characteristics of Open Microstrip Lines with Finite Strip Thickness (Short Papers)
- ❑ Frequency-Domain Bivariate Generalized Power Series Analysis of Nonlinear Analog Circuits (Short Papers)
- ❑ Frequency-Domain Nonlinear Microwave Circuit Simulation Using the Arithmetic Operator Method (Short Papers)
- ❑ Frequency-Domain Spectral Balance Using the Arithmetic Operator Method

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

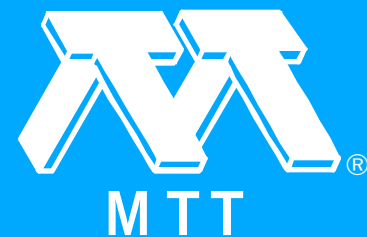
Issues

- ☐ Front Cover (1990 [MCS])
- ☐ Front Cover (Apr. 1989 [T-MTT])
- ☐ Front Cover (Apr. 1990 [T-MTT])
- ☐ Front Cover (Aug. 1989 [T-MTT])
- ☐ Front Cover (Aug. 1990 [T-MTT])
- ☐ Front Cover (Dec. 1989 [T-MTT])
- ☐ Front Cover (Dec. 1990 [T-MTT])
- ☐ Front Cover (Feb. 1989 [T-MTT])
- ☐ Front Cover (Feb. 1990 [T-MTT])
- ☐ Front Cover (Jan. 1989 [T-MTT])
- ☐ Front Cover (Jan. 1990 [T-MTT])
- ☐ Front Cover (Jul. 1989 [T-MTT])
- ☐ Front Cover (Jul. 1990 [T-MTT])
- ☐ Front Cover (Jun. 1989, Part I [T-MTT])
- ☐ Front Cover (Jun. 1989, Part II [T-MTT])
- ☐ Front Cover (Jun. 1990 [T-MTT])
- ☐ Front Cover (Mar. 1989 [T-MTT])
- ☐ Front Cover (Mar. 1990 [T-MTT])

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Front Cover (May 1989 [T-MTT])
- ☐ Front Cover (May 1990 [T-MTT])
- ☐ Front Cover (Nov. 1989 [T-MTT])
- ☐ Front Cover (Nov. 1990 [T-MTT])
- ☐ Front Cover (Oct. 1989 [T-MTT])
- ☐ Front Cover (Oct. 1990 [T-MTT])
- ☐ Front Cover (Sep. 1989 [T-MTT])
- ☐ Front Cover (Sep. 1990 [T-MTT])
- ☐ Full Vectorial Finite Element Formalism for Lossy Anisotropic Waveguides
- ☐ Full-Wave Analysis of a Perfectly Conducting Wire Transmission Line in a Double-Layered Conductor-Backed Medium
- ☐ Full-Wave Analysis of a Strip Crossover
- ☐ Full-Wave Analysis of an Infinitely Long Magnetic Surface Wave Transducer
- ☐ Full-Wave Analysis of Conductor Losses on MMIC Transmission Lines (Oct. 1990 [T-MTT])

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method
- ❑ Full-Wave Analysis of Coplanar Waveguides by Variational Conformal Mapping Technique
- ❑ Full-Wave Analysis of Discontinuities in Planar Waveguides by the Method of Lines Using a Source Approach (Short Papers)
- ❑ Full-Wave Analysis of Lossy Quasi-Planar Transmission Line Incorporating the Metal Modes
- ❑ Full-Wave Perturbation Theory Based Upon Electric Field Integral Equations for Coupled Microstrip Transmission Lines
- ❑ Full-Wave, Finite Element Analysis of Irregular Microstrip Discontinuities

G

- ❑ GaAs Devices and the MIC Applications in Satellite Broadcasting
- ❑ GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications
- ❑ GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications
- ❑ GaAs MESFET Baseband-to-Microwave Passive Switches (Comments and Reply)
- ❑ Gain Optimization of a Near-Field Focusing Array for Hyperthermia Applications
- ❑ Gaussian Beam Representation of Aperture Fields in Layered, Lossy Media: Simulation and Experiment
- ❑ Generalized Spectral Analysis of Planar Lines on Layered Media Including Uniaxial and Biaxial Dielectric Substrates
- ❑ Generation and Shaping of Megawatt High-Voltage Pulses by Optoelectronic Technique
- ❑ Generation of High-Power Broad-Band Microwave Pulses by Picosecond Optoelectronic Technique
- ❑ Guest Editorial (May 1990 [T-MTT])

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Guest Editorial (Sep. 1990 [T-MTT])
- ☐ Guest Editors' Overview (Dec. 1990 [T-MTT])

H

- ☐ Harmonic Balance and Frequency-Domain Simulation of Nonlinear Microwave Circuits Using the Block Newton Method (Short Papers)
- ☐ Hermitian Finite-Element Method for Inhomogeneous Waveguides
- ☐ High-Dynamic-Range Airborne Tracking and Fire Control Radar Subsystems
- ☐ High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals
- ☐ High-Frequency MESFET Noise Modeling Including Distributed Effects
- ☐ High-Frequency MESFET Noise Modeling Including Distributed Effects (Corrections)
- ☐ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

[Issues](#)

- ☐ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz (Short Papers)
- ☐ High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz
- ☐ High-Speed Fiber-Optic Links for Distribution of Satellite Traffic
- ☐ Higher Order Asymptotic Boundary Condition for the Finite Element Modeling of Two-Dimensional Transmission Line Structures
- ☐ Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies

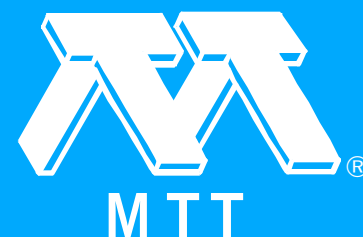
I

-
- ☐ IEEE Copyright Form (Jan. 1990 [T-MTT])
 - ☐ Impedance and Switching of GaAs p-i-n Diodes (Short Papers)
 - ☐ Implementation of RF/Microwave Receiver Components on a Semi-Custom Silicon Bipolar Array

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

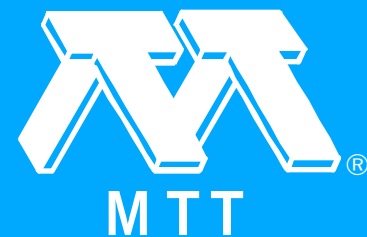
Issues

- ❑ Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits
- ❑ Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits (Comments and Reply)
- ❑ Improved Design of Multihole Directional Couplers Using an Iterative Technique
- ❑ Improved Technique for Determining Complex Permittivity with the Transmission/Reflection Method
- ❑ Improved Theory for E-Plane Symmetrical Tee Junctions (Short Papers)
- ❑ Improvements to the Finite-Difference Time-Domain Method for Calculating the Radar Cross Section of a Perfectly Conducting Target
- ❑ Improving the Characteristics of Rectangular Waveguide Branchings by Cylindrical Obstacles
- ❑ Index of Authors (1990 [MCS])
- ❑ Index of Authors, Cumulative, 1981-1988 (Jun. 1989, Part II [T-MTT])

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

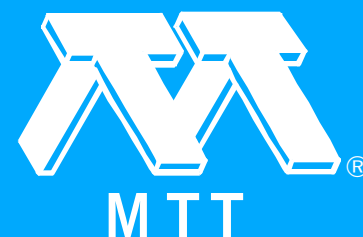
Issues

- ☐ Index of Subjects, Cumulative, 1981-1988 (Jun. 1989, Part II [T-MTT])
- ☐ Index, IEEE [T-MTT] 1989, Volume 37, and MTT-S Sponsored Conferences
- ☐ Index, IEEE [T-MTT] 1990, Volume 38, and MTT-S Sponsored Conferences
- ☐ Inductance of Perfectly Conducting Foils Including Spiral Inductors
- ☐ Infinite Elements for the Analysis of Open Dielectric Waveguides
- ☐ Information for Authors (Aug. 1990 [T-MTT])
- ☐ Information for Authors (Jul. 1990 [T-MTT])
- ☐ Information for Authors (Nov. 1990 [T-MTT])
- ☐ Information for Authors (Oct. 1990 [T-MTT])
- ☐ Information for Authors (Sep. 1990 [T-MTT])
- ☐ InGaAsP DC-PBH Semiconductor Laser Diode Frequency Response Model (Short Papers)
- ☐ Input Impedance of a Coaxial Line Probe Feeding a Circular Waveguide in the TM/sub 01/ Mode (Short Papers)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

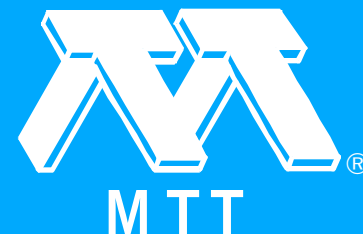
Issues

- ❑ Insertion Loss of Electronically Variable Magnetostatic Wave Delay Lines
- ❑ Integral Equation Solution to the Guidance and Leakage Properties of Coupled Dielectric Strip Waveguides
- ❑ Integral Numerical Technique for the Study of Axially Symmetric Resonant Devices (Short Papers)
- ❑ Integrated Optic Devices for Microwave Applications
- ❑ Integration of High-Q GaAs Varactor Diodes and 0.25 μm GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications
- ❑ Intelligent Alignment of Waveguide Filters Using a Machine Learning Approach
- ❑ Intermixing Optical and Microwave Signals in GaAs Microstrip Circuits for Phase-Locking Applications
- ❑ Investigation of Planar Antennas for Submillimeter Receivers
- ❑ Investigation of Tapered Multiple Microstrip Lines for VLSI Circuits (Nov. 1990 [T-MTT])

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Investigations of Complex Modes in a Generalized Bilateral Finline with Mounting Grooves and Finite Conductor Thickness (Dec. 1989 [T-MTT])
- ❑ Ion-Implanted High Microwave Power Indium Phosphide Transistors
- ❑ Isolation Effects in Single- and Dual-Plane VLSI Interconnects

J

- ❑ Jacobian Calculation Using the Multidimensional Fast Fourier Transform in the Harmonic Balance Analysis of Nonlinear Circuits (Short Papers)

K

- ❑ K/sub u/- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts (1990 [MCS])
- ❑ Ka-Band MMIC Beam-Steered Transmitter Array (Short Papers)

Click on title for a paper summary.



Paper Index



Contents

Publications

Issues

- ❑ Kalman Filtering Ordering Form (Advertisement) (Mar. 1989 [T-MTT])

L

- ❑ Large-Signal Computer-Aided Analysis and Design of Silicon Bipolar MMIC Oscillators and Self-Oscillating Mixers
- ❑ Large-Signal Model of Picosecond FET's and Measurement of the Step Response
- ❑ Laser-Activated p-i-n Diode Switch for RF Application (Short Papers)
- ❑ Lateral Electromagnetic Waves and Pulses on Open Microstrip
- ❑ Lightwave Subcarrier CATV Transmission Systems
- ❑ Long Microwave Delay Fiber-Optic Link for Radar Testing (Short Papers)
- ❑ Losses in GaAs Microstrip (Dec. 1990 [T-MTT])
- ❑ Losses of Tapered Dielectric Slab Waveguides with Axial Variations in Index of Refraction

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [Lossless Broad-Band Monolithic Microwave Active Inductors \(Dec. 1989 \[T-MTT\] \)](#)
- ❑ [Low-Cost Microwave/Millimeter-Wave Impedance Measuring Scheme Using a Three-Probe Microstrip Circuit](#)
- ❑ [Low-Frequency Location of the Leaky-Wave Poles for a Dielectric Layer \(Short Papers\)](#)
- ❑ [Low-Parasitic, Planar Schottky Diodes for Millimeter-Wave Integrated Circuits](#)
- ❑ [Lower Bound on the Eigenvalues of the Characteristic Equation for an Arbitrary Multilayered Gyromagnetic Structure with Perpendicular Magnetization \(Short Papers\)](#)
- ❑ [Lumped Capacitance and Open End Effects of Striplike Structures in Multilayered and Anisotropic Substrates](#)
- ❑ [Lumped Lossy Circuit Synthesis and its Application in Broad-Band FET Amplifier Design in MMIC's \(Short Papers\)](#)

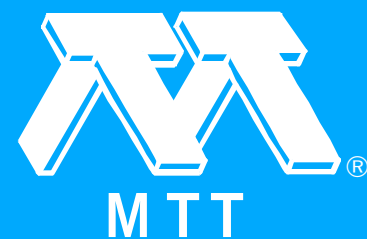
M

- ❑ [Machined Waveguide Twist \(Short Papers\)](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

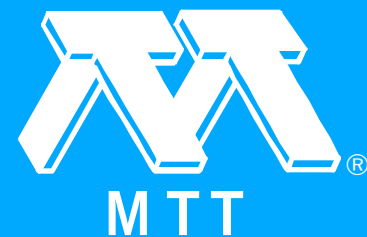
Issues

- ❑ Magnetic Tuning of Cylindrical H/sub 01delta/-Mode Dielectric Resonators
- ❑ Magnetostatic-Forward-Volume-Wave-Based Guided-Wave Magneto-Optic Bragg Cells and Applications to Communications and Signal Processing
- ❑ Measurement and Calibration of a Universal Six-Port Network Analyzer
- ❑ Measurement and Simulation of Memory Effects in Predistortion Linearizers
- ❑ Measurement of Magnitude and Phase of Harmonics Generated in Nonlinear Microwave Two-Ports
- ❑ Measuring Adapter Efficiency Using a Sliding Short Circuit
- ❑ MESFET Simulation Oriented Toward Computer-Aided Microwave Circuit Design (Short Papers)
- ❑ Message from the General Chairman (1990 [MCS])
- ❑ Message from the Technical Program Chairman (1990 [MCS])
- ❑ Metallization Thickness Effect of Striplines with Anisotropic Media: Quasi-Static and Hybrid-Mode Analysis

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

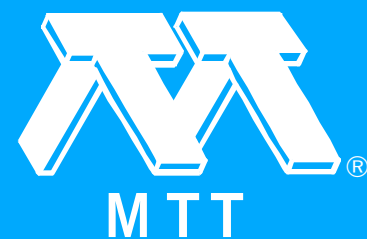
[Issues](#)

- ❑ [Microstrip Lines Using Yttrium Iron Garnet Film](#)
- ❑ [Microstrip Open-End and Gap Discontinuities in a Substrate-Superstrate Structure](#)
- ❑ [Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T_c/Superconducting Thin Films \(Short Papers\)](#)
- ❑ [Microwave Active Filters Based on Coupled Negative Resistance Method](#)
- ❑ [Microwave and Millimeter-Wave QWITT Diode Oscillators](#)
- ❑ [Microwave Complex Conductivity of a Square Post in Rectangular Waveguide](#)
- ❑ [Microwave Detectors Based on Granular High-T_c Thin Films \(Feb. 1990 \[T-MTT\]\)](#)
- ❑ [Microwave Hyperthermia Induced by a Phased Interstitial Antenna Array \(Short Papers\)](#)
- ❑ [Microwave Packaging of Optoelectronic Components](#)
- ❑ [Microwave Power Combination Using a Bifurcated Waveguide and a Reflecting Plate](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors (Short Papers)
- ☐ Microwave Radiometry: Its Importance to the Detection of Cancer
- ☐ Microwave Shielding Effectiveness of EC-Coated Dielectric Slabs (Short Papers)
- ☐ Microwave Technology and Careers in Transition: The Interests and Activities of Visitors to the Sperry Gyroscope Company's Klystron Plant in 1939-1940
- ☐ Microwave Week (Advertisement) (Jun. 1989, Part I [T-MTT])
- ☐ Microwave Week (Advertisement) (May 1989 [T-MTT])
- ☐ Millimeter-Wave Generation and Characterization of a GaAs FET by Optical Mixing
- ☐ Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique
- ☐ Millimeter-Wave Planar InP Schottky Diodes and Their Small-Signal Equivalent Circuit
- ☐ MIMIC from the Department of Defense Perspective

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

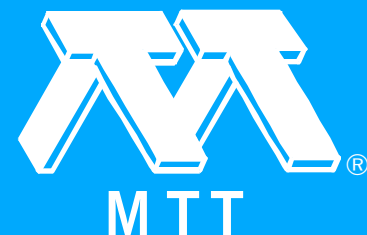
Issues

- ❑ MIMIC Technology Transportability (1990 [MCS])
- ❑ MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron (FECTED) Oscillators
- ❑ Miniature Hybrid Microwave IC's Using a Novel Thin-Film Technology (Dec. 1990 [T-MTT])
- ❑ Miniature Monolithic Microwave Frequency Diplexers
- ❑ Miniaturized Hairpin Resonator Filters and Their Application to Receiver Front-End MIC's (Dec. 1989 [T-MTT])
- ❑ Minimization of Intermodulation Distortion in GaAs MESFET Small-Signal Amplifiers
- ❑ Modal Analysis of Open Groove Waveguide (Short Papers)
- ❑ Modal Analysis of Radial-Resonator Waveguide Diode Mounts
- ❑ Mode Charts for Magnetized Ferrite Cylinders
- ❑ Mode Conversion at Discontinuities in Finite-Width Conductor-Backed Coplanar Waveguide
- ❑ Mode Conversion Losses in Highly Overmoded Waveguide Cavities
- ❑ Mode Orthogonality in Chirowaveguides

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

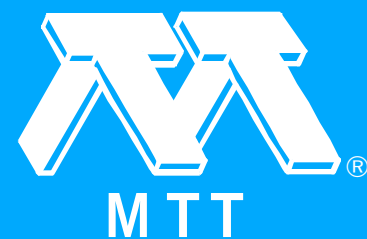
Issues

- ❑ Modeling and Design of GaAs MESFET Control Devices for Broad-Band Applications
- ❑ Modeling Ferrimagnetic Resonators
- ❑ Modeling MESFET's for Intermodulation Analysis of Mixers and Amplifiers (Dec. 1990 [T-MTT])
- ❑ Modeling of Arbitrarily Shaped Signal Lines and Discontinuities (Short Papers)
- ❑ Modeling of Asymmetric and Offset Gaps in Shielded Microstrips and Slotlines (Short Papers)
- ❑ Modeling of Ge-Si Heterojunction Bipolar Transistors for Use in Silicon Monolithic Millimeter-Wave Integrated Circuits
- ❑ Modeling of Multiconductor Buses and Analysis of Crosstalk, Propagation Delay, and Pulse Distortion in High-Speed GaAs Logic Circuits
- ❑ Modeling of Noise Parameters of MESFET's and MODFET's and Their Frequency and Temperature Dependence (Sep. 1989 [T-MTT])
- ❑ Modeling of Picosecond Pulse Propagation in Microstrip Interconnections on Integrated Circuits

Click on title for a paper summary.



Paper Index



[Contents](#)
[Publications](#)
[Issues](#)

- ❑ [Modeling the Gate I/V Characteristic of a GaAs MESFET for Volterra-Series Analysis \(Short Papers\)](#)
- ❑ [Modes of Elliptical Waveguides: A Correction](#)
- ❑ [Monolithic 2-18 GHz Matrix Amplifiers \(Short Papers\)](#)
- ❑ [Monolithic 9 to 70 GHz Distributed Amplifier](#)
- ❑ [Monolithic FET Structures for High-Power Control Component Applications](#)
- ❑ [Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications \(Short Papers\)](#)
- ❑ [Monolithic IMPATT Oscillator Characterization](#)
- ❑ [Monolithic Integrated Blanking Up-Converter](#)
- ❑ [Monolithic Ka Band VCO Using Quarter Micron GaAs MESFETs and Integrated High-Q Varactors \(1990 \[MCS\]\)](#)
- ❑ [Monolithic Sampling Head IC](#)
- ❑ [MTT Society Series of Home Video Tutorials - Emerging Technologies \(Advertisement\) \(Apr. 1989 \[T-MTT\]\)](#)
- ❑ [MTT Society Series of Home Video Tutorials - Emerging Technologies \(Advertisement\) \(Jun. 1989, Part II \[T-MTT\]\)](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

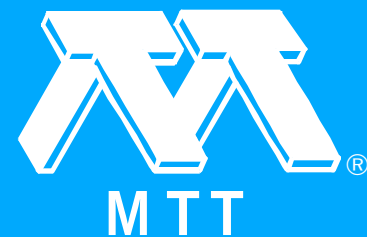
Issues

- ❑ MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (May 1989 [T-MTT])
- ❑ Multifunction Chip Set for T/R Module Receive Path (1990 [MCS])
- ❑ Multifunction MMIC History from a Process Technology Perspective
- ❑ Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits
- ❑ Multifunction Silicon MMIC's for Frequency Conversion Applications
- ❑ Multifunction Small-Signal Chip Set for Transmit/Receive Modules
- ❑ Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part I: Rigorous Network Formulations
- ❑ Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part II: Small-Aperture and Small-Obstacle Solutions

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part III: Rigorous Solution
- ❑ Multiple Dielectric Posts in a Rectangular Waveguide (Corrections)
- ❑ Multiplexing and Double Band Filtering with Common-Multimode Cavities
- ❑ Mutual Impedance Between Probes in a Circular Waveguide
- ❑ Mutual Impedance Between Probes in a Waveguide (Corrections)

N

- ❑ Narrow Wall Axial-Slot-Coupled T Junction Between Rectangular and Circular Waveguides
- ❑ New High-Frequency Circuit Model for Coupled Lossless and Lossy Waveguide Structures
- ❑ New Type of Spectral-Domain Analysis of a Microstrip Line

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

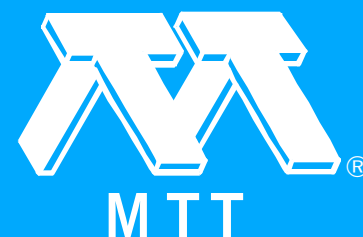
[Issues](#)

- ❑ [Noise Parameter Transformations for Three-Terminal Amplifiers \(Short Papers\)](#)
- ❑ [Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique](#)
- ❑ [Nonlinear Analysis of Microwave FET Oscillators Using Volterra Series](#)
- ❑ [Nonlinear Circuit Analysis of Harmonic and Intermodulation Distortions in Laser Diodes Under Microwave Direct Modulation](#)
- ❑ [Nonlinear Modeling and Verification of MMIC Amplifiers Using the Waveform-Balance Method](#)
- ❑ [Nonreciprocal Operation of Structures Comprising a Section of Coupled Ferrite Lines with Longitudinal Magnetization](#)
- ❑ [Note on the Impedance of a Wire Grid Parallel to a Homogeneous Interface \(Short Papers\)](#)
- ❑ [Novel Linearize Using Balanced Circulators and its Application to Multilevel Digital Radio Systems](#)
- ❑ [Novel Unilateral Circuits for MMIC Circulators](#)

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

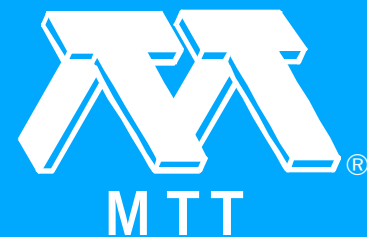
[Issues](#)

- ❑ [Novel Wide-Bandwidth Matching Technique for Laser Diodes \(Short Papers\)](#)
- ❑ [Numerical Analysis of Arbitrarily Shaped Discontinuities Between Planar Dielectric Waveguides with Different Thicknesses](#)
- ❑ [Numerical Analysis of H-Plane Waveguide Junctions by Combination of Finite and Boundary Elements \(Comments\)](#)
- ❑ [Numerical Conformal Transformation of Three-Magnetic-Wall Structures \(Short Papers\)](#)
- ❑ [Numerical Simulation of Annular Phased Arrays for Anatomically Based Models Using the FDTD Method](#)
- ❑ [Numerical Simulation of GaAs MESFET's with a p-Buffer Layer on the Semi-Insulating Substrate Compensated by Deep Traps](#)
- ❑ [Numerical Solution of the Continuous Waveguide Transition Problem](#)
- ❑ [Numerical Solution of Transmission Line Problems by a Network Model Decomposition Method Based on Polygon Discretization](#)

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

O

- ☐ [Octave Band Eleven Watt Power Amplifier MMIC](#)
- ☐ [Oliver Heaviside: Sage in Solitude \(Advertisement\) \(Jan. 1989 \[T-MTT\]\)](#)
- ☐ [On Higher Order Mode Cutoff Frequencies in Elliptical Step Index Fibers](#)
- ☐ [On Microwave Imagery Using Bojarski's Identity \(Short Papers\)](#)
- ☐ [On Power Distribution in Additive Amplifiers](#)
- ☐ [On the Application of Complex Resistive Boundary Conditions to Model Transmission Lines Consisting of Very Thin Superconductors](#)
- ☐ [On the Bandwidth of T-Septum Waveguide \(Short Papers\)](#)
- ☐ [On the Design and Performance of a 6-18 GHz Three-Tier Matrix Amplifier](#)
- ☐ [On the Imaging of Hot Spots Using Correlation Radiometers and a Circular Aperture](#)

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [On the Mode Coupling in Longitudinally Magnetized Waveguiding Structures](#)
- ❑ [On-Wafer Verification of a Large-Signal MESFET Model \(Short Papers\)](#)
- ❑ [Open-Ended Coaxial Exposure Device for Applying RF/Microwave Fields to Very Small Biological Preparations](#)
- ❑ [Optical Control of Microwave Semiconductor Devices](#)
- ❑ [Optical Fiber Fabry-Perot Cavities and Recirculating Delay Lines as Tunable Microwave Filters](#)
- ❑ [Optical Generation, Distribution, and Control of Microwaves Using Laser Heterodyne \(Short Papers\)](#)
- ❑ [Optical Phase Control of an Optically Injection-Locked FET Microwave Oscillator](#)
- ❑ [Optical Receiver and Modulator Frequency Response Measurement with a Nd:YAG Ring Laser Heterodyne Technique](#)
- ❑ [Optical Synchronization of Millimeter-Wave Oscillators for Distributed Architectures](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Optical Test Set for Microwave Fiber-Optic Network Analysis
- ☐ Optically Controlled Coplanar Waveguide Phase Shifters
- ☐ Optically CW-Induced Losses in Semiconductor Coplanar Waveguides
- ☐ Optimal Computer-Aided Design of Monolithic Microwave Integrated Oscillators (Short Papers)
- ☐ Optimization of Planar Devices by the Finite Element Method
- ☐ Optimized Method for Obtaining Permittivity and Conductivity Profiles of Microwave Materials (Short Papers)
- ☐ Optimum Field Theory Design of Broad-Band E-Plane Branch Guide Phase Shifters and 180° Couplers
- ☐ Optoelectronic Isolator for Microwave Applications
- ☐ Optoelectronic Measurements of Picosecond Electrical Pulse Propagation in Coplanar Waveguide Transmission Lines
- ☐ Oscillators and Amplifiers in Integrated E-Plane Technique

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines
- ☐ Output Conductance Frequency Dispersion and Low-Frequency Noise in HEMT's and MESFET's (Short Papers)
- ☐ Overview of Quasi-Planar Transmission Lines

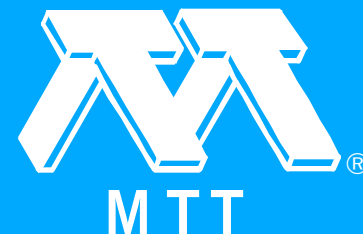
P

- ☐ p-i-n Diode Attenuator with Small Phase Shift (Additional Comments and Reply)
- ☐ p-i-n Diode Control Devices in E-Plane Technique
- ☐ Parallel Processing Application to Nonlinear Microwave Network Design (Dec. 1989 [T-MTT])
- ☐ Parallel Running System of Three Oscillators Coupled Through a Six-Port Magic Junction
- ☐ Patent Abstracts (Apr. 1989 [T-MTT])
- ☐ Patent Abstracts (Apr. 1990 [T-MTT])
- ☐ Patent Abstracts (Aug. 1989 [T-MTT])
- ☐ Patent Abstracts (Aug. 1990 [T-MTT])
- ☐ Patent Abstracts (Dec. 1990 [T-MTT])

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Patent Abstracts (Feb. 1989 [T-MTT])
- ☐ Patent Abstracts (Feb. 1990 [T-MTT])
- ☐ Patent Abstracts (Jan. 1989 [T-MTT])
- ☐ Patent Abstracts (Jan. 1990 [T-MTT])
- ☐ Patent Abstracts (Jul. 1989 [T-MTT])
- ☐ Patent Abstracts (Jul. 1990 [T-MTT])
- ☐ Patent Abstracts (Jun. 1989, Part I [T-MTT])
- ☐ Patent Abstracts (Jun. 1990 [T-MTT])
- ☐ Patent Abstracts (Mar. 1989 [T-MTT])
- ☐ Patent Abstracts (Mar. 1990 [T-MTT])
- ☐ Patent Abstracts (May 1989 [T-MTT])
- ☐ Patent Abstracts (Nov. 1989 [T-MTT])
- ☐ Patent Abstracts (Nov. 1990 [T-MTT])
- ☐ Patent Abstracts (Oct. 1989 [T-MTT])
- ☐ Patent Abstracts (Oct. 1990 [T-MTT])
- ☐ Patent Abstracts (Sep. 1989 [T-MTT])
- ☐ Patent Abstracts (Sep. 1990 [T-MTT])

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)
- ❑ [Performance Comparison of Available Interstitial Antennas for Microwave Hyperthermia](#)
- ❑ [Periodic-Structure Photoexcitation of a Silicon Coplanar Waveguide for Selective Optoelectronic Microwave Control](#)
- ❑ [Perturbation Analysis and Modeling of Curved Microstrip Bends](#)
- ❑ [Perturbed-TEM Analysis of Transmission Lines with Imperfect Conductors](#)
- ❑ [Phase and Amplitude Characteristics of InP: Fe Modified Interdigitated Gap Photoconductive Microwave Switches](#)
- ❑ [Phenomenological Loss Equivalence Method for Planar Quasi-TEM Transmission Lines with a Thin Normal Conductor or Superconductor](#)
- ❑ [Physical Modeling of GaAs MESFET's in an Integrated CAD Environment: From Device Technology to Microwave Circuit Performance](#)
- ❑ [Picosecond Optics and Microwave Technology](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT (Short Papers)
- ❑ Planar FET Oscillators Using Periodic Microstrip Patch Antennas
- ❑ Power and Stability Limitations of Resonant Tunneling Diodes
- ❑ Power-Handling Capability of the Rhombic Waveguide
- ❑ Precisely Calibrated Coaxial-to-Microstrip Transitions Yield Improved Performance in GaAs FET Characterization
- ❑ Principles of Computerized Tomographic Imaging (Advertisement) (Feb. 1989 [T-MTT])
- ❑ Principles of Computerized Tomographic Imaging (Advertisement) (Mar. 1989 [T-MTT])
- ❑ Printed Circuit Antennas with Integrated FET Detectors for Millimeter-Wave Quasi Optics
- ❑ Propagation Analysis of Chirowaveguides Using the Finite-Element Method

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

[Issues](#)

- ❑ Propagation and Circuit Characteristics of Inductively Coupled Superconducting Microstrip
- ❑ Propagation Characteristics of MIS Transmission Lines with Inhomogeneous Doping Profile
- ❑ Propagation in Layered Biased Semiconductor Structures Based on Transport Analysis
- ❑ Propagation Modes and Dispersion Characteristics of Coplanar Waveguides
- ❑ Propagation Properties of Ferromagnetic Insular Guide
- ❑ Propagation Properties of Striplines Periodically Loaded with Crossing Strips
- ❑ Properties of Dielectric-Loaded T-Septum Waveguides (Short Papers)
- ❑ Pulse Distortion on Multilayer Coupled Microstrip Lines

Q

- ❑ Quasi-Planar Filters for Millimeter-Wave Applications

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses

R

- ❑ Reactance of Slotline Short and Open Circuits on Alumina Substrate (Short Papers)
- ❑ Read Versus Flat Doping Profile Structures for the Realization of Reliable High-Power, High-Efficiency 94 GHz IMPATT Sources
- ❑ Recent European Developments in Active Microwave Imaging for Industrial, Scientific, and Medical Applications
- ❑ Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation
- ❑ Reduced Insertion Loss of X-Band RF Fiber-Optic Links (Short Papers)
- ❑ Reduced-Size Branch-Line and Rat-Race Hybrids for Uniplanar MMIC's

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [Reflection and Transmission Characteristics of an Uncoincidental Junction on Rectangular Dielectric Waveguides](#)
- ❑ [Reflection and Transmission Coefficients of Rectangular Dielectric Waveguide Discontinuity with an Air Gap \(Short Papers\)](#)
- ❑ [Reflection Coefficient of a Waveguide with Slightly Uneven Walls](#)
- ❑ [Reflection of Electromagnetic Waves from Rough Waveguides \(Short Papers\)](#)
- ❑ [Refraction at a Curved Dielectric Interface Geometrical Optics Solution \(Comments\) \(Apr. 1990 \[T-MTT\]\)](#)
- ❑ [Resonance Characteristics of a Cavity-Operated Electrodeless High-Pressure Microwave Discharge System](#)
- ❑ [Resonance in Cylindrical-Rectangular and Wraparound Microstrip Structures](#)
- ❑ [Resonant Frequency of Cylindrical Dielectric Resonator Placed in an MIC Environment \(Short Papers\)](#)

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

[Issues](#)

- ☐ Resonant Modes in Shielded Cylindrical Ferrite and Single-Crystal Dielectric Resonators
- ☐ Results of Phase and Injection Locking of an Orotron Oscillator (Short Papers)
- ☐ Reviewers for this Special Issue (Dec. 1989 [T-MTT])
- ☐ RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures
- ☐ Rigorous Analysis of Open Microstrip Lines of Arbitrary Cross Section in Bound and Leaky Regimes (Dec. 1989 [T-MTT])
- ☐ Rigorous Field Theory Design of Millimeter-Wave E-Plane Integrated Circuit Multiplexer
- ☐ Rigorous, Multimode Equivalent Network Representation of Inductive Discontinuities

S

-
- ☐ S Matrix of Slot-Coupled H-Plane Tee Junction Using Rectangular Waveguides (Short Papers)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Scattering Parameters of E-Plane Printed Opposite Fin in Waveguide (Short Papers)
- ☐ Selected Technology Summaries for Microwave Theory and Techniques--1988
- ☐ Semidistributed Model of Millimeter-Wave FET for S-Parameter and Noise Figure Predictions
- ☐ Sensitivity of a 40 GHz HEMT Low-Noise Amplifier to Material and Processing Variations (Short Papers)
- ☐ Shift of the Complex Resonance Frequency of a Dielectric-Loaded Cavity Produced by Small Sample Insertion Holes (Short Papers)
- ☐ Shunt Posts in Microstrip Transmission Lines
- ☐ Simulation of the Superconducting Quasiparticle Mixer Using a Five-Port Model
- ☐ Single-Interface and Quantum-Well Heterostructure MISFET's
- ☐ Six-Port and Four-Port Reflectometers for Complex Permittivity Measurements at Submillimeter Wavelengths
- ☐ Slotted Waveguide Directional Coupler Characteristics

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

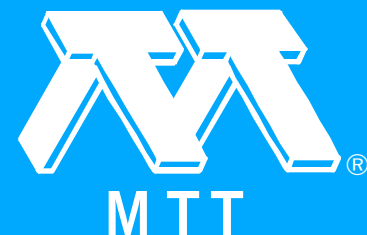
[Issues](#)

- ❑ [Space-Domain Green's Function Approach to the Capacitance Calculation of Multiconductor Lines in Multilayered Dielectrics with Improved Surface Charge Modeling](#)
- ❑ [Special Session in Honor of Dr. Seymour B. Cohn \(Dec. 1989 \[T-MTT\]\)](#)
- ❑ [Spectral and Variational Analysis of Generalized Cylindrical and Elliptical Strip and Microstrip Lines](#)
- ❑ [Spectral Estimation for the Transmission Line Matrix Method \(Short Papers\)](#)
- ❑ [Spectral-Domain Analysis of E-Plane Waveguide to Microstrip Transitions](#)
- ❑ [Spectral-Domain Analysis of Harmonic Effects in Superconducting Quasiparticle Mixers](#)
- ❑ [Spectral-Domain Computation of Characteristic Impedances and Multiport Parameters of Multiple Coupled Microstrip Lines](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Spectral-Domain Immittance Approach for the Propagation Constants of Unilateral Finline with Magnetized Ferrite Substrate (Short Papers)
- ❑ Stable Broad-Band Microwave Amplifier Design
- ❑ State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Comments and Reply)
- ❑ State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Dec. 1989 [T-MTT])
- ❑ Stripline to Microstrip Line Aperture Coupler (Short Papers)
- ❑ Study of Modal Solution Procedures for Microstrip Step Discontinuities
- ❑ Surface-to-Surface Transition via Electromagnetic Coupling of Microstrip and Coplanar Waveguide
- ❑ Synthesis, Design, and Construction of Ultra-Wide-Band Nonuniform Quadrature Directional Couplers in Inhomogeneous Media

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

T

- ☐ [Table of Contents \(1990 \[MCS\]\)](#)
- ☐ [Table of Contents \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Table of Contents \(Dec. 1990 \[T-MTT\]\)](#)
- ☐ [Tapered Transmission Lines with a Controlled Ripple Response](#)
- ☐ [The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications](#)
- ☐ [The Calculated and Measured Temperature Distribution of a Phased Interstitial Antenna Array](#)
- ☐ [The Complete Spectrum of Image Line](#)
- ☐ [The Current Distribution and AC Resistance of a Microstrip Structure](#)
- ☐ [The Design of an Ultra-Broad-Band 3 dB Coupler in Dielectric Waveguide \(Short Papers\)](#)
- ☐ [The Design of Millimeter-Wave Control Components](#)
- ☐ [The Equivalent Circuit of a Microstrip Crossover in a Dielectric Substrate](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ The Frequency-Dependent Impedance of p-i-n Diodes (Short Papers)
- ❑ The Generalized Method of Characteristics for Waveform Relaxation Analysis of Lossy Coupled Transmission Lines (Dec. 1989 [T-MTT])
- ❑ The Input Impedance of a Hollow-Probe-Fed, Semi-Infinite Rectangular Waveguide (Short Papers)
- ❑ The Lossy Waveguide as a Problem in Perturbation Theory (Short Papers)
- ❑ The Method of Lines Applied to Planar Transmission Lines in Circular and Elliptical Waveguides
- ❑ The Method of Lines for the Analysis of Lossy Planar Waveguides
- ❑ The MTT Transactions and Symposia Update (Jun. 1989, Part II [T-MTT])
- ❑ The Nature of the Charges, Currents, and Fields in and About Conductors Having Cross-Sectional Dimensions of the Order of a Skin Depth

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [The Resonance Method for Evaluating the Impedances of the Equivalent Network for Dielectric Posts in a Rectangular Waveguide](#)
- ❑ [The Scattering Parameters and Directional Coupler Analysis of Characteristically Terminated Asymmetric Coupled Transmission Lines in an Inhomogeneous Medium](#)
- ❑ [The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications](#)
- ❑ [The Transition Region Between Bound-Wave and Leaky-Wave Ranges for a Partially Dielectric-Loaded Open Guiding Structure \(Dec. 1990 \[T-MTT\]\)](#)
- ❑ [The Use of a Single Source to Drive a Binary Peak Power Multiplier \(Short Papers\)](#)
- ❑ [Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter-Wave Circuits \(Dec. 1989 \[T-MTT\]\)](#)
- ❑ [Theoretical and Experimental SAR Distributions for Interstitial Dipole Antenna Arrays Used in Hyperthermia](#)

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

Issues

- ❑ Theoretical Evaluation of Nonlinear Tapers for a High-Power Gyrotron
- ❑ Theory of Magnetostatic Waves in Moving Ferrite Films and Applications to Rotation Rate Sensing
- ❑ Three Channel I.F. Multiplexers
- ❑ Three-Dimensional Analysis of a Cylindrical Waveguide Converter for Circular Polarization by the Spatial Network Method
- ❑ Three-Dimensional Analysis of a Through Hole with Radiation Characteristics by the Spatial Network Method
- ❑ Three-Dimensional Analysis of Electromagnetic Fields in Rectangular Waveguides by the Boundary Integral Equation Method
- ❑ Three-Dimensional Computer Simulation in Deep Regional Hyperthermia Using the Finite-Difference Time-Domain Method
- ❑ Three-Dimensional Electromagnetic Scattering from Inhomogeneous Objects by the Hybrid Moment and Finite Element Method

Click on title for a paper summary.



Paper Index



IEEE

Contents

Publications

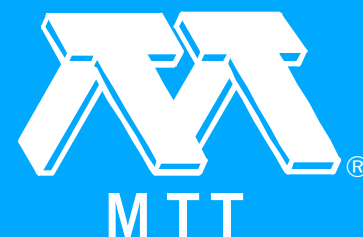
Issues

- ❑ Three-Dimensional Finite-Element Solution of Dielectric Scattering Obstacles in a Rectangular Waveguide
- ❑ Three-Dimensional SAR Distributions Computed in a Multilayered Cylindrical Model for Electromagnetic Hyperthermia
- ❑ Time-Domain Analysis of Lossy Coupled Transmission Lines
- ❑ Time-Domain Method of Lines Applied to Planar Guided Wave Structures
- ❑ TM Waves Guided by Nonlinear Planar Waveguides
- ❑ Transient Analysis of Distortion and Coupling in Lossy Coupled Microstrips (Dec. 1990 [T-MTT])
- ❑ Transient Analysis of Multiple-Tuned Injection-Locked Amplifiers with Modulated Input Signal
- ❑ Transient Analysis of Nonuniform, High-Pass Transmission Lines
- ❑ Transmission Line Matrix Modeling of Dispersive Wide-Band Absorbing Boundaries with Time-Domain Diakoptics for S-Parameter Extraction

Click on title for a paper summary.



Paper Index



IEEE

[Contents](#)

[Publications](#)

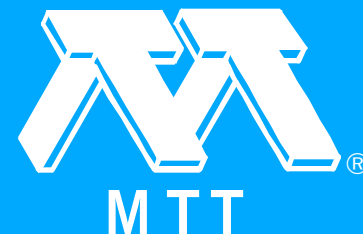
[Issues](#)

- ❑ [Transmission Properties of a Right-Angle Microstrip Bend with and without a Miter \(Short Papers\)](#)
- ❑ [Transverse Resonance, Standing Wave, and Resonator Formulations of the Ridge Waveguide Eigenvalue Problem and its Application to the Design of E-Plane Finned Waveguide Filters](#)
- ❑ [Transversely Anisotropic Curved Optical Fibers: Variational Analysis of a Nonstandard Eigenproblem](#)
- ❑ [Traveling-Wave Inverted-Gate Field-Effect Transistors: Concept, Analysis, and Potential](#)
- ❑ [Tunable, Temperature-Compensated Dielectric Resonators and Filters](#)
- ❑ [Tuned Optical Receivers for Microwave Subcarrier Multiplexed Lightwave Systems](#)
- ❑ [Two Cylindrical Obstacles in a Rectangular Waveguide--Resonances and Filter Applications](#)
- ❑ [Two-Dimensional Microwave Imaging by a Numerical Inverse Scattering Solution](#)

Click on title for a paper summary.



Paper Index



[Contents](#)

[Publications](#)

[Issues](#)

- ❑ [Two-Path Cutoff Waveguide Dielectric Resonator Filters \(Jul. 1989 \[T-MTT\]\)](#)

U

- ❑ [Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's \(Dec. 1989 \[T-MTT\]\)](#)
- ❑ [Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz](#)
- ❑ [Unified Solution of Various Dielectric-Loaded Ridge Waveguides with a Mixed Spectral-Domain Method](#)
- ❑ [Uniplanar Monolithic Frequency Doublers](#)
- ❑ [Use of a Microwave Cavity for Sensing Dielectric Properties of Arbitrarily Shaped Biological Objects](#)
- ❑ [Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media](#)

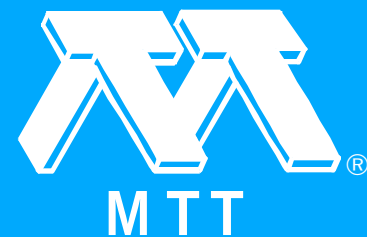
V

- ❑ [Variational Analysis of Dielectrically Loaded Multidepth Corrugated Waveguides](#)

[Click on title for a paper summary.](#)



Paper Index



IEEE

Contents

Publications

Issues

- ☐ Variational Method for Multiconductor Coupled Striplines with Stratified Anisotropic Media
- ☐ Variational Method for Planar Transmission Lines with Anisotropic Magnetic Media
- ☐ Vectorial Wave Analysis of Uniform-Core Optical Fibers Using a Novel Boundary Integral Method
- ☐ Very Small Ultra-Wide-Band MMIC Magic T and Applications to Combiners and Dividers
- ☐ Very Small Wide-Band MMIC Magic T's Using Microstrip Lines on a Thin Dielectric Film

W

-
- ☐ Wave Propagation in a Double-Sided Exponentially Tapered Rectangular Waveguide (Short Papers)
 - ☐ Waveguide Discontinuity Analysis with a Coupled Finite-Boundary Element Method
 - ☐ Whispering Gallery Dielectric Resonator Modes for W-Band Devices
 - ☐ Wide-Band GaInAs MISFET Amplifiers (Short Papers)

Click on title for a paper summary.

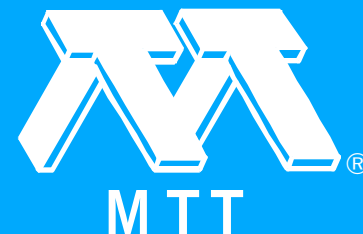


Paper Index

- ❑ [Wide-Band Ground-Plane dc Block and Bias Feed \(Short Papers\)](#)
- ❑ [Wide-Band Superconductive Chirp Filters](#)
- ❑ [Wire and Strip Conductors Over a Dielectric-Coated Conducting or Dielectric Half-Space](#)

X

- ❑ [X-Band 0.5, 1, and 2 Watt Power Amplifiers with Marked Improvement in Power-Added Efficiency](#)



IEEE

[Contents](#)

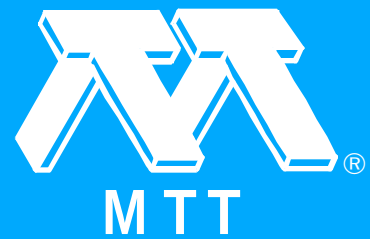
[Publications](#)

[Issues](#)

Click on title for a paper summary.



Author Index



IEEE

Contents

Authors

A B C D E F G H I
J K L M N O P Q R
S T U V W X Y Z

Colored letters are active links to the index.

Author Index



IEEE

[Contents](#)

[Authors](#)

A

- ☐ [Abid, Z.](#)
- ☐ [Abouzahra, M.D.](#)
- ☐ [Ackerman, E.](#)
- ☐ [Adde, R.](#)
- ☐ [Adelman, J.](#)
- ☐ [Adelseck, B.](#)
- ☐ [Adlerstein, M.G.](#)
- ☐ [Affandi, A.M.](#)
- ☐ [Afsar, M.N.](#)
- ☐ [Aghvami, H.](#)
- ☐ [Agosti, G.](#)
- ☐ [Agoston, A.](#)
- ☐ [Agrawal, A.K.](#)
- ☐ [Aikawa, M.](#)
- ☐ [Ajose, S.O.](#)
- ☐ [Akaike, M.](#)
- ☐ [Akyel, C.](#)
- ☐ [Alameh, K.E.](#)
- ☐ [Alberti, S.](#)
- ☐ [Albinsson, B.M.](#)
- ☐ [Alcorn, T.](#)
- ☐ [Alcorn, T.S.](#)
- ☐ [Alessandri, F.](#)
- ☐ [Alexopoulos, N.G.](#)
- ☐ [Ali, S.M.](#)
- ☐ [Allen, B.R.](#)
- ☐ [Allen, C.K.](#)
- ☐ [Ames, E.E.](#)
- ☐ [Anders, P.](#)
- ☐ [Andersen, J.B.](#)
- ☐ [Anderson, A.C.](#)
- ☐ [Anderson, J.L.](#)
- ☐ [Andersson, I.L.](#)
- ☐ [Andricos, C.](#)

Click on author name for a list of papers.



Author Index



MTT



IEEE

Contents

Authors

- ☐ Anthes, J.P.
- ☐ Araki, K.
- ☐ Archer, J.
- ☐ Archer, J.W.
- ☐ Arjavalasingam, G.
- ☐ Arndt, F.
- ☐ Arvas, E.
- ☐ Asahara, T.
- ☐ Asbeck, P.M.
- ☐ Atsuki, K.
- ☐ Auda, H.A.
- ☐ Auxemery, P.
- ☐ Ayasli, Y.

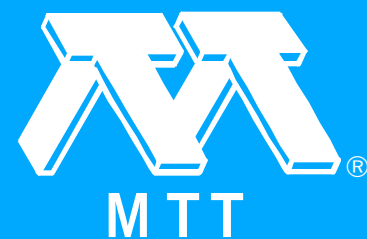
B

- ☐ Bacon, J.W.
- ☐ Baeten, R.J.
- ☐ Baghai-Wadji, A.R.
- ☐ Bahl, I.
- ☐ Bahl, I.J.
- ☐ Bajpai, S.N.
- ☐ Baken, N.H.G.
- ☐ Baker-Jarvis, J.
- ☐ Balana, A.
- ☐ Balanis, C.A.
- ☐ Bandla, S.
- ☐ Bandler, J.W.
- ☐ Bandy, S.
- ☐ Bandy, S.G.
- ☐ Barkeshli, S.
- ☐ Bartle, D.C.
- ☐ Basile, P.
- ☐ Batchelor, R.A.
- ☐ Bates, B.D.
- ☐ Baudrand, H.
- ☐ Bayraktaroglu, B.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

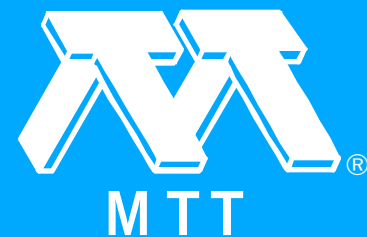
[Authors](#)

- ☐ Bayruns, J.
- ☐ Bayuk, F.J.
- ☐ Beaubien, R.S.
- ☐ Bechtle, D.
- ☐ Bechtle, D.W.
- ☐ Becker, P.
- ☐ Beckwith, B.
- ☐ Bedair, S.S.
- ☐ Belhadj-Tahar, N.-E.
- ☐ Bellantoni, J.V.
- ☐ Ben-Michael, R.
- ☐ Bendett, M.
- ☐ Benedek, M.
- ☐ Benzina, H.
- ☐ Berroth, M.
- ☐ Bertrand, A.M.
- ☐ Bertrand, S.
- ☐ Betts, G.E.
- ☐ Beyer, A.
- ☐ Beyer, J.B.
- ☐ Bhartia, P.
- ☐ Bhasin, K.B.
- ☐ Bialkowski, M.E.
- ☐ Biedenbender, M.D.
- ☐ Biernacki, R.M.
- ☐ Bierwirth, K.
- ☐ Bilbro, G.L.
- ☐ Binari, S.C.
- ☐ Birkeland, J.
- ☐ Biswas, A.
- ☐ Biswas, B.N.
- ☐ Blakey, P.A.
- ☐ Blauvelt, H.
- ☐ Blok, H.
- ☐ Blundell, R.
- ☐ Bocquet, B.

Click on author name for a list of papers.



Author Index



IEEE

Contents

Authors

- ☐ Bodeep, G.E.
- ☐ Boesch, R.D.
- ☐ Boix, R.R.
- ☐ Bolioli, S.
- ☐ Bollen, W.M.
- ☐ Bolomey, J.-C.
- ☐ Booth, M.
- ☐ Booth, M.S.
- ☐ Borelli, J.J.
- ☐ Bornemann, J.
- ☐ Bosch, R.
- ☐ Bosch, W.
- ☐ Boulouard, A.
- ☐ Branco, M.G.C.
- ☐ Brand, M.
- ☐ Brehm, G.E.
- ☐ Bockerhoff, W.
- ☐ Broumas, A.D.

- ☐ Brown, A.S.
- ☐ Brukiewa, T.F.
- ☐ Bryant, J.H.
- ☐ Buckley, M.J.
- ☐ Bui, S.
- ☐ Burdette, E.C.
- ☐ Burke, J.J.
- ☐ Burke, J.M.
- ☐ Burkhart, S.C.
- ☐ Buswell, M.

C

- ☐ Calandra, E.F.
- ☐ Callsen, H.
- ☐ Camilleri, N.
- ☐ Camisa, R.L.
- ☐ Camou, J.
- ☐ Camou, J.B.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Campbell, S.A.
- ☐ Cangellaris, A.C.
- ☐ Cantos, B.D.
- ☐ Caorsi, S.
- ☐ Caplan, M.
- ☐ Capsalis, C.N.
- ☐ Carin, L.
- ☐ Carr, K.L.
- ☐ Carter, W.L.
- ☐ Caspi, S.
- ☐ Castaneda, J.A.
- ☐ Catoe, W.
- ☐ Caverly, R.H.
- ☐ Cazaux, J.-L.
- ☐ Cazaux, J.L.
- ☐ Cecchetti, C.
- ☐ Cetas, T.C.
- ☐ Chabbra, M.
- ☐ Chakraborty, A.
- ☐ Chamberlain, A.
- ☐ Chan, B.
- ☐ Chan, C.H.
- ☐ Chang, A.P.
- ☐ Chang, C.-N.
- ☐ Chang, C.-R.
- ☐ Chang, C.-Y.
- ☐ Chang, F.-Y.
- ☐ Chang, I.S.
- ☐ Chang, J.-S.
- ☐ Chang, K.
- ☐ Chang, M.F.
- ☐ Chang, T.-N.
- ☐ Chatterjee, S.
- ☐ Chatzarakis, G.E.
- ☐ Chauchard, E.A.
- ☐ Chaudhuri, S.K.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ [Chen, C.-D.](#)
- ☐ [Chen, C.-L.](#)
- ☐ [Chen, C.H.](#)
- ☐ [Chen, J.-Y.](#)
- ☐ [Chen, K.-M.](#)
- ☐ [Chen, S.-W.](#)
- ☐ [Chen, S.H.](#)
- ☐ [Chen, T.H.](#)
- ☐ [Chen, Z.](#)
- ☐ [Chenkin, J.](#)
- ☐ [Cheung, P.](#)
- ☐ [Chew, W.](#)
- ☐ [Chew, W.C.](#)
- ☐ [Chi, H.](#)
- ☐ [Chi, T.Y.](#)
- ☐ [Chiba, J.](#)
- ☐ [Chicon, R.](#)
- ☐ [Ching, L.Y.](#)

- ☐ [Chou, J.-S.](#)
- ☐ [Chow, Y.L.](#)
- ☐ [Chowdhury, D.Q.](#)
- ☐ [Chowdhury, S.K.](#)
- ☐ [Chramiec, J.](#)
- ☐ [Christianson, S.B.](#)
- ☐ [Christopoulos, C.](#)
- ☐ [Chronopoulos, C.P.](#)
- ☐ [Chu, A.](#)
- ☐ [Chu, B.H.](#)
- ☐ [Chu, J.](#)
- ☐ [Chu, S.L.](#)
- ☐ [Chu, S.T.](#)
- ☐ [Chu, T.-H.](#)
- ☐ [Chung, S.-J.](#)
- ☐ [Chye, P.](#)
- ☐ [Cioffi, K.R.](#)
- ☐ [Claspy, P.C.](#)

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Cloud, M.J.
- ☐ Cobb, M.
- ☐ Coget, P.
- ☐ Cohen, E.D.
- ☐ Cohen, J.D.
- ☐ Collier, R.J.
- ☐ Colquhoun, A.
- ☐ Coluzzi, M.
- ☐ Coluzzi, M.E.
- ☐ Combes, P.F.
- ☐ Compton, R.C.
- ☐ Connolly, J.C.
- ☐ Cooper, R.K.
- ☐ Costache, G.I.
- ☐ Costamagna, E.
- ☐ Cottis, P.G.
- ☐ Cotton, Jr., J.M.
- ☐ Counas, G.

- ☐ Courtney, W.E.
- ☐ Cowan, C.F.N.
- ☐ Cox, III, C.H.
- ☐ Crawford, T.M.
- ☐ Cros, D.
- ☐ Crosmun, A.
- ☐ Crosmun, A.M.
- ☐ Crosnier, Y.
- ☐ Crozat, P.
- ☐ Curtice, W.R.
- ☐ Curtis, D.D.

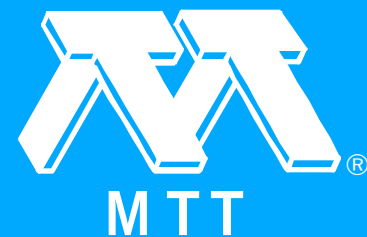
D

- ☐ da Silva, L.C.
- ☐ Dagli, N.
- ☐ Dalle, C.
- ☐ Darcie, T.E.
- ☐ Darling, R.B.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

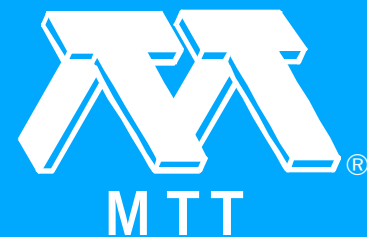
[Authors](#)

- ☐ Daryoush, A.S.
- ☐ Das, B.N.
- ☐ Das, N.K.
- ☐ Dautriche, P.
- ☐ Davidson, A.C.
- ☐ Davis, L.E.
- ☐ Dawe, G.
- ☐ Dawson, D.
- ☐ Day, M.
- ☐ Daywitt, W.C.
- ☐ de Chanterac, H.
- ☐ de Salles, A.A.A.
- ☐ De Zutter, D.
- ☐ Defonzo, A.P.
- ☐ DeHaan, R.L.
- ☐ Deibele, S.
- ☐ Deitrich, H.
- ☐ Delaney, M.J.
- ☐ Delannoy, J.
- ☐ Delbare, W.
- ☐ Delisle, G.Y.
- ☐ Delmaster, J.
- ☐ Delvaley, D.
- ☐ Diestel, H.
- ☐ Dieudonne, J.-M.
- ☐ Dieudonne, J.M.
- ☐ Dilorio, M.S.
- ☐ Diskus, C.G.
- ☐ Dittloff, J.
- ☐ Dixit, R.
- ☐ Djordjevic, A.R.
- ☐ Dobashi, M.
- ☐ Dobrowolski, J.A.
- ☐ Donkor, E.
- ☐ Dow, G.S.
- ☐ Drinkwine, M.J.

Click on author name for a list of papers.



Author Index



IEEE

Contents

Authors

- ☐ Drizlikh, S.
- ☐ Dropkin, H.
- ☐ Dubberley, J.R.
- ☐ Duffy, L.
- ☐ Dupuis, M.

E

- ☐ East, J.R.
- ☐ Eastin, R.I.
- ☐ Eastman, L.F.
- ☐ Ebert, G.
- ☐ Eda, K.
- ☐ Eguchi, M.
- ☐ Eimertenbrink, R.
- ☐ Eisenstadt, W.R.
- ☐ Ekholm, E.B.
- ☐ El-Deeb, N.A.
- ☐ El-Ghazaly, S.M.
- ☐ El-Sawy, Y.A.R.
- ☐ El-Sharawy, E.-B.
- ☐ Ellena, G.
- ☐ Elliott, R.S.
- ☐ Elliott, S.S.
- ☐ Ellison, W.J.
- ☐ Enders, A.
- ☐ Eng, S.T.
- ☐ Engheta, N.
- ☐ Epstein, B.R.
- ☐ Escarmant, J.-F.
- ☐ Escotte, L.
- ☐ Esfandiari, R.
- ☐ Esman, R.D.
- ☐ Espes, P.
- ☐ Eswarappa
- ☐ Eul, H.-J.
- ☐ Ezzeddine, A.K.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

F

- ☐ Fache, N.
- ☐ Fan, D.
- ☐ Fan, P.
- ☐ Fang, D.G.
- ☐ Faraji-Dana, R.
- ☐ Feldman, M.J.
- ☐ Fenderson, G.L.
- ☐ Feng, I.-J.
- ☐ Feng, S.
- ☐ Fetterman, H.
- ☐ Fetterman, H.R.
- ☐ Fikart, J.L.
- ☐ Fikioris, G.J.
- ☐ Fikioris, J.G.
- ☐ Filicori, F.
- ☐ Finch, K.L.

- ☐ Fines, J.
- ☐ Flynn, E.J.
- ☐ Follot, G.
- ☐ Foster, K.R.
- ☐ Fourier-Lamer, A.
- ☐ Freire, J.C.
- ☐ Frey, J.
- ☐ Frezza, F.
- ☐ Fricke, K.
- ☐ Froelich, R.K.
- ☐ Fukai, I.
- ☐ Fukui, K.
- ☐ Furse, C.M.
- ☐ Fuseya, Y.

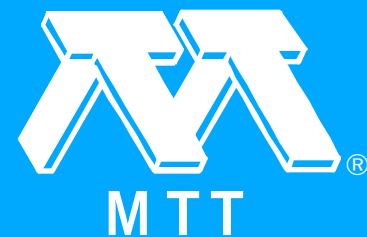
G

- ☐ Gajda, G.B.
- ☐ Gallagher, W.J.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Gamand, P.
- ☐ Gandhi, O.P.
- ☐ Gans, M.J.
- ☐ Ganss-Puchstein, R.
- ☐ Gao, B.
- ☐ Garcia, P.
- ☐ Garcia-Molina, R.
- ☐ Gardner, P.D.
- ☐ Gatti, G.
- ☐ Gauthier, S.
- ☐ Gee, C.M.
- ☐ Geissberger, A.E.
- ☐ Gerard, H.
- ☐ German, F.J.
- ☐ Gesche, R.
- ☐ Geyi, W.
- ☐ Ghiasi, A.
- ☐ Ghione, G.
- ☐ Giaux, G.
- ☐ Gibbs, A.J.
- ☐ Gibson, A.A.P.
- ☐ Gierlowski, P.
- ☐ Gilb, J.P.
- ☐ Gilb, J.P.K.
- ☐ Glenn, M.
- ☐ Gluckstern, R.L.
- ☐ Goebel, U.
- ☐ Goel, J.
- ☐ Goldberg, D.A.
- ☐ Goldberg, L.
- ☐ Goldfarb, M.E.
- ☐ Goldhar, J.
- ☐ Goldsmith, P.F.
- ☐ Golio, J.M.
- ☐ Goloubkoff, M.
- ☐ Gombar, A.

Click on author name for a list of papers.



Author Index



[Contents](#)

[Authors](#)

- ☐ Goossen, K.W.
- ☐ Gopal, M.K.
- ☐ Gopinath, A.
- ☐ Gorman, G.M.
- ☐ Goth, P.
- ☐ Goutoule, J.-M.
- ☐ Gouzien, P.
- ☐ Goyal, R.
- ☐ Graffeuil, J.
- ☐ Gragnani, G.L.
- ☐ Green, H.E.
- ☐ Gregory, P.
- ☐ Greiling, P.T.
- ☐ Griffin, E.
- ☐ Griffin, E.J.
- ☐ Griffin, E.L.
- ☐ Griffith, J.R.
- ☐ Grischkowsky, D.R.

- ☐ Gronau, G.
- ☐ Grondin, R.O.
- ☐ Grutzmacher, D.
- ☐ Grzyb, J.A.
- ☐ Guffey, W.
- ☐ Guglielmi, M.
- ☐ Guillon, P.
- ☐ Guillory, D.M.
- ☐ Gunn, J.M.F.
- ☐ Gustafson, G.
- ☐ Gutmann, R.J.
- ☐ Gutscher, W.D.

H

- ☐ Habashy, T.M.
- ☐ Haddad, G.I.
- ☐ Hafizi, M.E.
- ☐ Hagen, J.B.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Halbout, J.-M.
- ☐ Halemane, T.R.
- ☐ Halkias, G.
- ☐ Hammond, R.B.
- ☐ Han, K.
- ☐ Hansen, R.K.
- ☐ Hara, S.
- ☐ Hardy, W.N.
- ☐ Harokopus, Jr., W.P.
- ☐ Harokopus, Jr., WP.
- ☐ Harrington, R.F.
- ☐ Hartnagel, H.L.
- ☐ Hashimoto, K.
- ☐ Hassan, E.E.
- ☐ Hata, S.
- ☐ Hattori, J.
- ☐ Hay, R.G.
- ☐ Hayama, N.
- ☐ Hayata, K.
- ☐ Hechtman, C.D.
- ☐ Heim, P.J.
- ☐ Heime, K.
- ☐ Heinrich, W.
- ☐ Helszajn, J.
- ☐ Herczfeld, P.R.
- ☐ Heron, P.L.
- ☐ Heston, D.D.
- ☐ Higgins, J.A.
- ☐ Hill, D.A.
- ☐ Hill, S.C.
- ☐ Hiller, G.
- ☐ Hindy, M.A.
- ☐ Hiraoka, T.
- ☐ Hirayama, K.
- ☐ Hirota, T.
- ☐ Hiruma, K.

Click on author name for a list of papers.



Author Index



[Contents](#)

[Authors](#)

- ☐ Hji pieris, G.
- ☐ Ho, T.Q.
- ☐ Ho, W.J.
- ☐ Hochstadt, H.
- ☐ Hoefer, W.J.R.
- ☐ Hogan, K.M.
- ☐ Holloway, C.L.
- ☐ Homentcovschi, D.
- ☐ Honjo, K.
- ☐ Hopfer, S.
- ☐ Horio, K.
- ☐ Horng, T.-S.
- ☐ Horno, M.
- ☐ Horton, J.B.
- ☐ Houston, D.E.
- ☐ Howes, M.J.
- ☐ Hsu, C.G.
- ☐ Hsue, C.-W.

- ☐ Hu, Y.
- ☐ Huang, C.
- ☐ Huang, D.-H.
- ☐ Huang, H.C.
- ☐ Huang, J.
- ☐ Huang, S.-Y.
- ☐ Hudgens, R.D.
- ☐ Huff, D.B.
- ☐ Hummer, K.A.
- ☐ Hung, H.-L.A.
- ☐ Hurwitz, R.
- ☐ Huting, W.A.
- ☐ Hwang, V.D.
- ☐ Hyde, J.S.

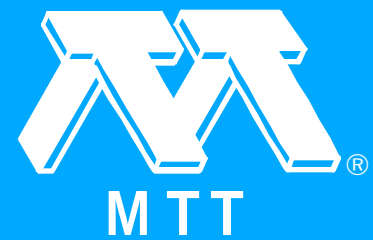
I

- ☐ Iezekiel, S.
- ☐ Iijima, T.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Imai, N.
- ☐ In, Y.-A.
- ☐ Ino, M.
- ☐ Inoue, K.
- ☐ Ise, K.
- ☐ Ishibashi, K.
- ☐ Ishii, T.K.
- ☐ Ishikawa, Y.
- ☐ Ishitsuka, F.
- ☐ Ishizaki, T.
- ☐ Iskander, M.F.
- ☐ Islam, S.
- ☐ Israel, M.
- ☐ Itoh, T.
- ☐ Iwashita, K.
- ☐ Izutsu, M.

J

- ☐ Jablonski, D.G.
- ☐ Jablonski, T.F.
- ☐ Jachim, S.P.
- ☐ Jackson, D.R.
- ☐ Jackson, R.W.
- ☐ Jacomb-Hood, A.W.
- ☐ Jain, F.C.
- ☐ Jain, N.
- ☐ Janaswamy, R.
- ☐ Jansen, N.
- ☐ Janton, W.
- ☐ Jarem, J.M.
- ☐ Jarry, P.
- ☐ Jean, P.
- ☐ Jeng, S.-K.
- ☐ Jiao, X.H.

Click on author name for a list of papers.



Author Index



IEEE

Contents

Authors

- ☐ Jin, J.-M.
- ☐ Joachimowicz, N.
- ☐ Jogiraju, G.V.
- ☐ Johansson, J.F.
- ☐ Johnson, L.M.
- ☐ Joines, W.T.
- ☐ Jones, K.M.
- ☐ Jorgenson, J.
- ☐ Jorgenson, J.D.
- ☐ Joshi, R.P.
- ☐ Jovicevic, S.
- ☐ Judah, S.R.
- ☐ Jung, G.
- ☐ Jung, W.-L.
- ☐ Jungerman, R.L.

K

- ☐ Kaertner, F.X.

- ☐ Kajfez, D.
- ☐ Kakogiannos, N.B.
- ☐ Kamada, H.
- ☐ Kaneko, T.
- ☐ Kanellopoulos, V.N.
- ☐ Kapoor, V.J.
- ☐ Kashiwa, T.
- ☐ Kasten, J.S.
- ☐ Katehi, P.B.
- ☐ Kato, H.
- ☐ Katsura, K.
- ☐ Katzin, P.J.
- ☐ Katzir, A.
- ☐ Kaufman, I.
- ☐ Kazior, T.E.
- ☐ Kenney, C.S.
- ☐ Kerr, A.R.
- ☐ Kesan, V.P.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Khanna, A.S.
- ☐ Khatibzadeh, M.A.
- ☐ Khebir, A.
- ☐ Kiang, J.-F.
- ☐ Kidner, C.
- ☐ Kiehl, R.A.
- ☐ Kihata, Y.
- ☐ Kikuchi, H.
- ☐ Kim, B.
- ☐ Kim, I.S.
- ☐ Kim, M.
- ☐ Kim, M.E.
- ☐ Kim, Y.-S.
- ☐ Kim, Y.U.
- ☐ Kimura, T.
- ☐ King, R.W.P.
- ☐ Kipnis, I.
- ☐ Kishi, N.
- ☐ Kissick, W.A.
- ☐ Kitazawa, T.
- ☐ Kiziloglu, K.
- ☐ Klein, C.A.
- ☐ Klein, J.L.
- ☐ Kleinsasser, A.W.
- ☐ Ko, A.
- ☐ Ko, Y.
- ☐ Kobayashi, K.
- ☐ Kobayashi, K.W.
- ☐ Kobayashi, M.
- ☐ Kobayashi, S.
- ☐ Kobrin, P.
- ☐ Kolk, E.W.
- ☐ Kollberg, E.L.
- ☐ Komiak, J.J.
- ☐ Kompa, G.
- ☐ Kong, J.A.

Click on author name for a list of papers.



Author Index



IEEE

Contents

Authors

- ☐ Kong, K.-S.
- ☐ Konishi, Y.
- ☐ Konopka, A.
- ☐ Konopka, J.
- ☐ Kopcsay, G.V.
- ☐ Korotky, S.K.
- ☐ Korzeniowski, T.L.
- ☐ Koscica, T.E.
- ☐ Koshiba, M.
- ☐ Kosman, Z.
- ☐ Koster, U.
- ☐ Kot, J.S.
- ☐ Kother, D.
- ☐ Kotthaus, U.
- ☐ Kouki, A.B.
- ☐ Krall, A.D.
- ☐ Kraszewski, A.W.
- ☐ Kreindler, L.

- ☐ Krempasky, J.J.
- ☐ Krowne, C.M.
- ☐ Krozer, V.
- ☐ Krumm, C.F.
- ☐ Krupka, J.
- ☐ Kuester, E.F.
- ☐ Kula, W.
- ☐ Kumar, M.
- ☐ Kunath, R.
- ☐ Kuo, J.-T.
- ☐ Kusuki, H.

L

- ☐ L'Ecuyer, J.
- ☐ La Tourrette, P.M.
- ☐ Lacon, M.
- ☐ Lampariello, P.
- ☐ Laslett, L.J.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Latham, P.E.
- ☐ Lauer, R.B.
- ☐ Lawson, W.G.
- ☐ Le Rouzic, M.
- ☐ Le, H.M.
- ☐ Leake, B.W.
- ☐ Lebaric, J.E.
- ☐ Lecours, M.
- ☐ Lee, A.
- ☐ Lee, C.H.
- ☐ Lee, H.
- ☐ Lee, H.-Y.
- ☐ Lee, K.S.H.
- ☐ Lee, M.J.
- ☐ Lee, R.E.
- ☐ Lee, S.-W.
- ☐ Lee, T.-P.
- ☐ Legaud, P.
- ☐ Lemnios, Z.
- ☐ Lenzing, H.F.
- ☐ Leroy, Y.
- ☐ Lesage, S.R.
- ☐ Leviatan, Y.
- ☐ Levy, R.
- ☐ Lewandowski, S.J.
- ☐ Li, G.
- ☐ Li, M.-y.
- ☐ Li, M.G.
- ☐ Li, R.
- ☐ Li, X.
- ☐ Liang, G.-C.
- ☐ Licqurish, C.
- ☐ Liepa, V.V.
- ☐ Lin, D.-B.
- ☐ Lin, H.C.
- ☐ Lin, T.S.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ [Lin, W.](#)
- ☐ [Lind, T.S.](#)
- ☐ [Lindell, I.V.](#)
- ☐ [Ling, C.](#)
- ☐ [Ling, H.](#)
- ☐ [Lipson, J.](#)
- ☐ [Liu, Y.-W.](#)
- ☐ [Livernois, T.G.](#)
- ☐ [Lo, K.W.](#)
- ☐ [Loane, III, J.T.](#)
- ☐ [Lochel, N.](#)
- ☐ [Lomax, R.J.](#)
- ☐ [Long, S.I.](#)
- ☐ [Long, Y.](#)
- ☐ [Lord, J.L.M.](#)
- ☐ [Lott, U.](#)
- ☐ [Lowery, G.](#)
- ☐ [Lu, I.T.](#)

- ☐ [Lubecke, V.](#)
- ☐ [Lubke, K.](#)
- ☐ [Lumori, M.L.D.](#)
- ☐ [Lunsford, II, P.J.](#)
- ☐ [Lusher, C.P.](#)

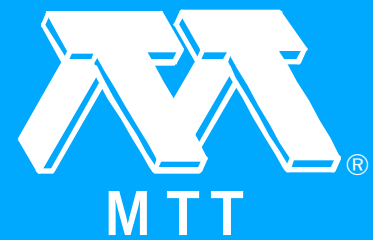
M

- ☐ [Maas, S.A.](#)
- ☐ [MacPhie, R.H.](#)
- ☐ [Madihian, M.](#)
- ☐ [Madjar, A.](#)
- ☐ [Madni, A.M.](#)
- ☐ [Magarshack, J.](#)
- ☐ [Mahmoud, S.F.](#)
- ☐ [Mahon, J.P.](#)
- ☐ [Mahoney, L.J.](#)
- ☐ [Maio, I.](#)
- ☐ [Majidi-Ahy, R.](#)

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Makimoto, M.
- ☐ Mamouni, A.
- ☐ Manela, M.
- ☐ Manet, P.
- ☐ Manheimer, W.M.
- ☐ Manner, O.
- ☐ Manolescu, A.
- ☐ Manolescu, A.M.
- ☐ Mansour, R.R.
- ☐ Maoz, B.
- ☐ Marchildon, L.
- ☐ Marchionna, E.
- ☐ Maricevic, Z.A.
- ☐ Marin, M.
- ☐ Marks, R.
- ☐ Marques, R.
- ☐ Martin, E.
- ☐ Martinez-Hernandez, A.
- ☐ Marx, K.D.
- ☐ Mastri, F.
- ☐ Mathews, H.-G.
- ☐ Mathur, S.P.
- ☐ Matloubian, M.
- ☐ Matsumura, H.
- ☐ Matsumura, K.
- ☐ Matsunaga, T.
- ☐ Matsuno, C.T.
- ☐ Matthaei, G.L.
- ☐ Mautz, J.R.
- ☐ Mawhinney, D.
- ☐ Mazumder, G.G.
- ☐ Mazur, J.
- ☐ McAdoo, J.H.
- ☐ McCamant, A.J.
- ☐ McClay, C.P.
- ☐ McCormack, G.D.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

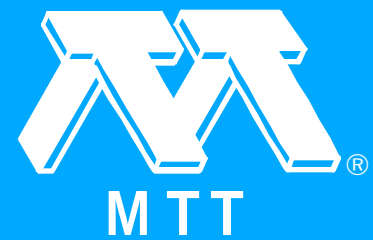
[Authors](#)

- ☐ McDermott, G.
- ☐ McDermott, M.G.
- ☐ McDonald, P.T.
- ☐ McDougall, M.J.
- ☐ McGeehan, J.P.
- ☐ McGrath, C.J.
- ☐ McIntosh, R.E.
- ☐ McKnight, S.W.
- ☐ McMillan, R.W.
- ☐ McNally, P.J.
- ☐ McQuiddy, Jr., D.N.
- ☐ Mead, J.B.
- ☐ Mechling, J.A.
- ☐ Medina, F.
- ☐ Mehalic, M.A.
- ☐ Mehdi, I.
- ☐ Mehdizadeh, M.
- ☐ Mei, K.K.
- ☐ Meinel, H.H.
- ☐ Melai, F.
- ☐ Melas, A.I.
- ☐ Menna, R.J.
- ☐ Mesa, F.L.
- ☐ Meschede, H.
- ☐ Messick, L.J.
- ☐ Michalski, K.A.
- ☐ Michels, R.
- ☐ Midford, T.A.
- ☐ Mikucki, G.F.
- ☐ Miller, D.R.
- ☐ Miller, M.
- ☐ Milyani, A.M.
- ☐ Minakawa, A.
- ☐ Minasian, R.A.
- ☐ Miniowitz, R.
- ☐ Mirotznik, M.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ [Mirshekar-Syahkal, D.](#)
- ☐ [Mirzai, A.R.](#)
- ☐ [Mishra, U.K.](#)
- ☐ [Misra, D.](#)
- ☐ [Mittra, R.](#)
- ☐ [Miura, A.](#)
- ☐ [Miura, K.](#)
- ☐ [Miwa, T.](#)
- ☐ [Miyagawa, Y.](#)
- ☐ [Moglie, F.](#)
- ☐ [Mollier, J.-C.](#)
- ☐ [Mondal, J.P.](#)
- ☐ [Mongia, R.K.](#)
- ☐ [Moore, J.](#)
- ☐ [Mori, M.](#)
- ☐ [Morini, A.](#)
- ☐ [Mortazawi, A.](#)
- ☐ [Moss, S.](#)

- ☐ [Mott, R.C.](#)
- ☐ [Moye, C.](#)
- ☐ [Mrozowski, M.](#)
- ☐ [Muggli, P.](#)
- ☐ [Mukherjee, A.](#)
- ☐ [Muraguchi, M.](#)
- ☐ [Murase, T.](#)
- ☐ [Murphy, R.A.](#)
- ☐ [Myung, J.-S.](#)

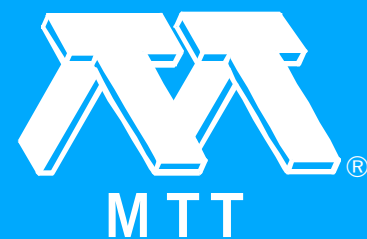
N

- ☐ [Naber, J.F.](#)
- ☐ [Naghed, M.](#)
- ☐ [Nagy, C.](#)
- ☐ [Nakajima, M.](#)
- ☐ [Nakao, T.](#)
- ☐ [Nakhla, M.S.](#)
- ☐ [Naldi, C.U.](#)

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

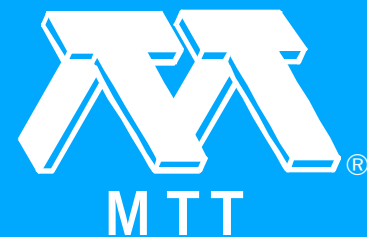
[Authors](#)

- ☐ Nam, S.
- ☐ Narayan, S.Y.
- ☐ Narayanan, V.
- ☐ Nary, K.R.
- ☐ Nasir, M.A.
- ☐ Navarro, A.
- ☐ Naylor, P.
- ☐ Ndujiuba, C.N.
- ☐ Negus, K.J.
- ☐ Neidert, R.E.
- ☐ Neikirk, D.P.
- ☐ Neilson, D.
- ☐ Neilson, J.M.
- ☐ Nelson, B.L.
- ☐ Nelson, S.O.
- ☐ Nelson, W.
- ☐ Nemoto, Y.
- ☐ Newberg, I.L.
- ☐ Newport, C.
- ☐ Ng, K.T.
- ☐ Nguyen, R.
- ☐ Ni, D.C.
- ☐ Niclas, K.B.
- ☐ Niehaus, W.C.
- ☐ Niehenke, E.C.
- ☐ Nikita, K.S.
- ☐ Nishikawa, T.
- ☐ Nishimoto, C.
- ☐ Nishimoto, C.K.
- ☐ Nitzsche, P.M.
- ☐ Noda, T.
- ☐ Nogii, S.
- ☐ Nojima, T.
- ☐ Norton, R.H.
- ☐ Nunez, M.J.
- ☐ Nwoke, C.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

☐ [Nyquist, D.P.](#)

O

☐ [Obata, T.](#)

☐ [Obregon, J.J.](#)

☐ [Obrzut, J.](#)

☐ [Offermanns, S.](#)

☐ [Ogawa, H.](#)

☐ [Ogawa, K.](#)

☐ [Ogusu, K.](#)

☐ [Ohashi, H.](#)

☐ [Ohba, Y.I](#)

☐ [Ohira, T.](#)

☐ [Ohta, I.](#)

☐ [Oka, S.](#)

☐ [Oki, A.](#)

☐ [Oki, A.K.](#)

☐ [Okoniewski, M.](#)

☐ [Okoshi, T.](#)

☐ [Oksanen, M.I.](#)

☐ [Olesen, R.L.](#)

☐ [Oleson, J.R.](#)

☐ [Oliner, A.A.](#)

☐ [Olley, C.A.](#)

☐ [Omar, A.S.](#)

☐ [Onodera, K.](#)

☐ [Onojima, T.](#)

☐ [Opie, M.](#)

☐ [Ortuno, M.](#)

☐ [Osafune, K.](#)

☐ [Osgood, Jr., R.M.](#)

☐ [Oshita, F.K.](#)

☐ [Ouslimani, A.](#)

☐ [Overfelt, P.L.](#)

Click on author name for a list of papers.



Author Index



[Contents](#)

[Authors](#)

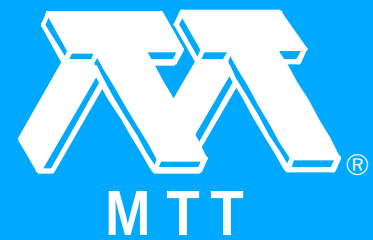
P

- ☐ [Page, M.J.](#)
- ☐ [Pak, S.](#)
- ☐ [Palusinski, O.A.](#)
- ☐ [Pan, S.-K.](#)
- ☐ [Pandharipande, V.M.](#)
- ☐ [Pantoja, R.R.](#)
- ☐ [Pao, Y.-C.](#)
- ☐ [Pao, Y.C.](#)
- ☐ [Papatheodorou, S.](#)
- ☐ [Pastol, Y.](#)
- ☐ [Pastorino, M.](#)
- ☐ [Patel, M.](#)
- ☐ [Pathak, P.H.](#)
- ☐ [Pauker, V.](#)
- ☐ [Paulter, N.G.](#)
- ☐ [Pauplis, B.E.](#)
- ☐ [Pawlowicz, L.M.](#)
- ☐ [Payne, D.](#)
- ☐ [Pelet, P.](#)
- ☐ [Peng, S.-T.](#)
- ☐ [Peng, S.T.](#)
- ☐ [Pereira, R.R.](#)
- ☐ [Perennec, A.](#)
- ☐ [Perkins, W.H.](#)
- ☐ [Perrenoud, A.](#)
- ☐ [Perry, C.B.](#)
- ☐ [Petzold, M.C.](#)
- ☐ [Phatak, D.S.](#)
- ☐ [Phelleps, F.R.](#)
- ☐ [Philippe, P.](#)
- ☐ [Pichot, C.](#)
- ☐ [Platte, W.](#)
- ☐ [Platzker, A.](#)
- ☐ [Poddar, D.R.](#)

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Podlesnik, D.V.
- ☐ Polak-Dingels, P.
- ☐ Pollard, R.D.
- ☐ Politi, M.
- ☐ Pollard, R.D.
- ☐ Pollman, M.
- ☐ Pollman, M.D.
- ☐ Pomerleau, R.
- ☐ Pond, J.M.
- ☐ Popovic, Z.B.
- ☐ Pospieszalski, M.W.
- ☐ Potratz, C.
- ☐ Potter, K.A.
- ☐ Pouysegur, M.
- ☐ Powell, S.
- ☐ Power, D.C.
- ☐ Pramanick, P.
- ☐ Prasad, S.

- ☐ Pregla, R.
- ☐ Presser, A.
- ☐ Prince, J.L.
- ☐ Prost, W.
- ☐ Purchase, K.G.
- ☐ Purviance, J.E.
- ☐ Pyndiah, R.

Q

- ☐ Qian, Y.

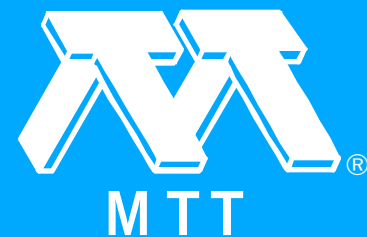
R

- ☐ Raffaelli, L.
- ☐ Railton, C.J.
- ☐ Ramdani, Y.
- ☐ Rao, K.V.S.
- ☐ Rao, P.V.D.S.
- ☐ Rao, S.M.
- ☐ Rao, T.C.

Click on author name for a list of papers.



Author Index



[Contents](#)

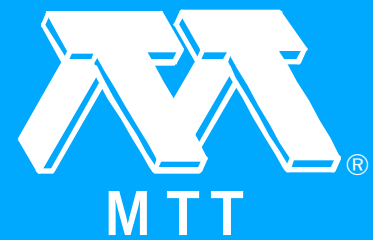
[Authors](#)

- ☐ Rascoe, D.L.
- ☐ Raue, J.E.
- ☐ Rautio, J.C.
- ☐ Reddy, V.K.
- ☐ Reep, D.H.
- ☐ Regev, D.
- ☐ Rengarajan, S.R.
- ☐ Reynoso-Hernandez, J.A.
- ☐ Rhyne, G.W.
- ☐ Riaziat, M.
- ☐ Riblet, G.P.
- ☐ Riblet, H.J.
- ☐ Richard, M.A.
- ☐ Richardson, J.R.
- ☐ Ries, C.R.
- ☐ Riggs, L.S.
- ☐ Riley, A.L.
- ☐ Rimmer, R.A.
- ☐ Rizzoli, V.
- ☐ Robbio, T.
- ☐ Robrish, P.
- ☐ Rolland, P.-A.
- ☐ Rolland, P.A.
- ☐ Rollins, J.M.
- ☐ Romanofsky, R.R.
- ☐ Roques, D.
- ☐ Rosario, M.J.
- ☐ Rose, C.
- ☐ Rosen, A.
- ☐ Rosen, H.
- ☐ Rosenbaum, J.
- ☐ Rosenberg, U.
- ☐ Rosloniec, S.
- ☐ Roumeliotis, J.A.
- ☐ Roxlo, C.B.
- ☐ Roy, J.S.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Rozzi, T.
- ☐ Ruan, C.
- ☐ Rubin, B.J.
- ☐ Ruiz, J.
- ☐ Russenschuck, S.
- ☐ Rutledge, D.B.
- ☐ Ruxton, J.
- ☐ Rycroft, C.M.D.

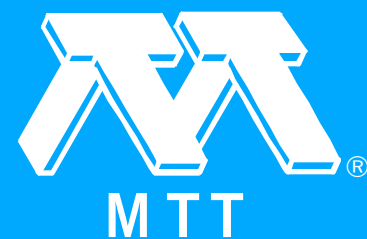
S

- ☐ Saad, S.M.
- ☐ Saad, T.S.
- ☐ Sachse, K.
- ☐ Sadler, R.A.
- ☐ Saedi, R.
- ☐ Sagawa, M.
- ☐ Saha, P.K.
- ☐ Saint-Christophe, E.
- ☐ Saito, S.
- ☐ Sakakura, M.
- ☐ Sakamoto, G.
- ☐ Saleeb, A.A.
- ☐ Salmer, G.
- ☐ Sandborn, P.A.
- ☐ Sandstrom, R.L.
- ☐ Sano, E.
- ☐ Sardos, R.
- ☐ Sarkar, S.
- ☐ Sarkar, T.K.
- ☐ Sarma, N.V.S.N.
- ☐ Sato, R.
- ☐ Sauerer, B.
- ☐ Sauter, T.H.
- ☐ Sawado, E.
- ☐ Sayadian, H.A.
- ☐ Scarmozzino, R.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Schaefer, M.S.
- ☐ Schaller, G.
- ☐ Scheiber, H.
- ☐ Scheinberg, N.
- ☐ Schieblich, C.
- ☐ Schiek, B.
- ☐ Schindler, M.
- ☐ Schindler, M.J.
- ☐ Schlafer, J.
- ☐ Schlapp, W.
- ☐ Schlechtweg, M.
- ☐ Schmegner, K.-E.
- ☐ Schmegner, K.E.
- ☐ Schmuckle, F.J.
- ☐ Schulz, N.
- ☐ Schunemann, K.F.
- ☐ Schwab, W.
- ☐ Schwering, F.K.
- ☐ Seaman, R.L.
- ☐ Seeds, A.J.
- ☐ Seeley, R.
- ☐ Seely, W.
- ☐ Selders, J.
- ☐ Sellberg, F.
- ☐ Sethares, J.C.
- ☐ Shalkhauser, K.
- ☐ Sharma, A.K.
- ☐ Sheaffer, G.S.
- ☐ Sheen, D.M.
- ☐ Shen, Y.
- ☐ Sheng, C.
- ☐ Sheng, N.H.
- ☐ Shi, Y.
- ☐ Shibata, T.
- ☐ Shifrin, M.B.
- ☐ Shigesawa, H.

Click on author name for a list of papers.



Author Index



MTT



IEEE

[Contents](#)

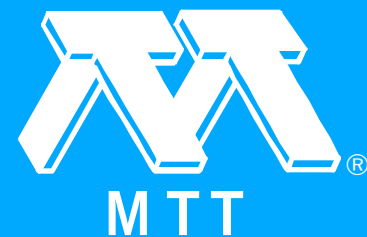
[Authors](#)

- ☐ Shih, C.
- ☐ Shih, H.-D.
- ☐ Shih, Y.-C.
- ☐ Shih, Y.C.
- ☐ Shimabukuro, F.I.
- ☐ Sieverding, T.
- ☐ Sillars, D.B.
- ☐ Silverman, S.
- ☐ Simon, K.
- ☐ Simon, K.M.
- ☐ Simonis, G.J.
- ☐ Singh, H.P.
- ☐ Singh, R.
- ☐ Singh, S.
- ☐ Sinha, D.N.
- ☐ Skaggs, S.G.
- ☐ Skrehot, M.K.
- ☐ Smith, B.
- ☐ Smith, B.M.
- ☐ Smith, C.E.
- ☐ Smith, C.J.
- ☐ Smith, D.
- ☐ Smith, D.H.
- ☐ Smith, T.
- ☐ Snowden, C.M.
- ☐ So, P.P.M.
- ☐ Soares, R.
- ☐ Soares, R.A.
- ☐ Soares, R.A.
- ☐ Sobhy, M.I.
- ☐ Sobolewski, R.
- ☐ Sokolov, V.
- ☐ Somlo, P.L.
- ☐ Sommariva, A.M.
- ☐ Song, J.
- ☐ Sorrentino, R.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

- ☐ Sovero, E.
- ☐ Sovero, E.A.
- ☐ Sowinski, M.J.
- ☐ Stabile, P.
- ☐ Staebell, K.F.
- ☐ Staecker, P.
- ☐ Stancil, D.D.
- ☐ Stankovic, L.
- ☐ Starski, J.P.
- ☐ Stasiak, J.W.
- ☐ Staudinger, J.
- ☐ Steer, M.B.
- ☐ Stern, G.J.
- ☐ Sterzer, F.
- ☐ Stolt, K.S.
- ☐ Streit, D.C.
- ☐ Strid, E.
- ☐ Strifler, W.A.

- ☐ Strohbehn, J.W.
- ☐ Stumper, U.
- ☐ Subbarao, S.N.
- ☐ Sueta, T.
- ☐ Sullivan, D.
- ☐ Sullivan, G.J.
- ☐ Sussman-Fort, S.E.
- ☐ Suzuki, H.
- ☐ Svedin, J.A.M.
- ☐ Swaminathan, M.
- ☐ Sweeney, C.
- ☐ Sweeney, C.N.
- ☐ Swift, C.W.

T

- ☐ Taguchi, Y.
- ☐ Taheri, M.M.
- ☐ Tait, G.B.

Click on author name for a list of papers.



Author Index



[Contents](#)

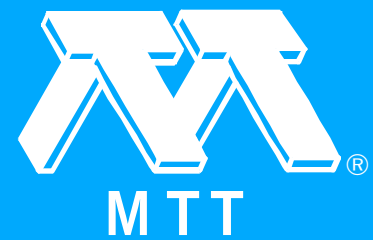
[Authors](#)

- ☐ [Tajima, Y.](#)
- ☐ [Takachio, N.](#)
- ☐ [Takahashi, K.](#)
- ☐ [Takahashi, S.](#)
- ☐ [Takemoto, J.H.](#)
- ☐ [Takenaka, T.](#)
- ☐ [Takiyama, K.](#)
- ☐ [Tan, C.-H.](#)
- ☐ [Tan, T.S.](#)
- ☐ [Tan, Z.](#)
- ☐ [Tan, Z.C.H.](#)
- ☐ [Tanaka, S.](#)
- ☐ [Tanaka, T.](#)
- ☐ [Taniguchi, I.](#)
- ☐ [Tantod, S.](#)
- ☐ [Tantod, S.S.](#)
- ☐ [Tarusawa, Y.](#)
- ☐ [Tayrani, R.](#)
- ☐ [Tenedorio, J.](#)
- ☐ [Theron, B.](#)
- ☐ [Thiel, D.V.](#)
- ☐ [Thim, H.W.](#)
- ☐ [Thompson, J.A.](#)
- ☐ [Thompson, S.](#)
- ☐ [Thorburn, M.](#)
- ☐ [Thornber, K.K.](#)
- ☐ [Thurmond, G.D.](#)
- ☐ [Tokumitsu, T.](#)
- ☐ [Tomabechei, Y.](#)
- ☐ [Ton, T.N.](#)
- ☐ [Tong, C.-Y.E.](#)
- ☐ [Toulios, P.P.](#)
- ☐ [Tran, L.](#)
- ☐ [Tran, M.Q.](#)
- ☐ [Trembly, B.S.](#)
- ☐ [Trew, R.J.](#)

Click on author name for a list of papers.



Author Index



[Contents](#)

[Authors](#)

- ☐ [Tripathi, V.K.](#)
- ☐ [Truitt, G.A.](#)
- ☐ [Tsai, C.S.](#)
- ☐ [Tsai, I.-S.](#)
- ☐ [Tsalamengas, J.L.](#)
- ☐ [Tserng, H.Q.](#)
- ☐ [Tsuji, M.](#)
- ☐ [Tsutsumi, M.](#)
- ☐ [Tucker, R.S.](#)
- ☐ [Tumeh, A.M.](#)
- ☐ [Tzuang, C.-K.C.](#)

U

- ☐ [Uchida, K.](#)
- ☐ [Uchida, S.](#)
- ☐ [Uhde, K.](#)
- ☐ [Umeda, A.Y.](#)
- ☐ [Umemoto, D.K.](#)

- ☐ [Upadhyayula, L.C.](#)
- ☐ [Uwano, T.](#)
- ☐ [Uysal, S.](#)
- ☐ [Uzunoglu, N.K.](#)

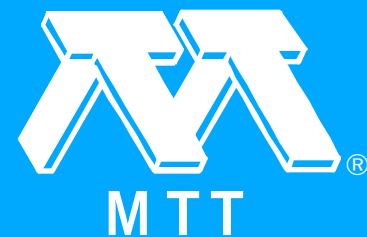
V

- ☐ [Vahldieck, R.](#)
- ☐ [Vai, M.-K.](#)
- ☐ [Vakanas, L.P.](#)
- ☐ [van de Velde, J.C.](#)
- ☐ [van den Bogaart, F.L.M.](#)
- ☐ [van Deventer, T.E.](#)
- ☐ [Van Exter, M.](#)
- ☐ [van Raay, F.](#)
- ☐ [Van Tuyl, R.L.](#)
- ☐ [Vanzura, E.J.](#)
- ☐ [Varian, K.](#)
- ☐ [Vecchi, G.](#)

Click on author name for a list of papers.



Author Index



[Contents](#)

[Authors](#)

- ☐ [Veit, W.](#)
- ☐ [Vernet, G.](#)
- ☐ [Vernon, R.J.](#)
- ☐ [Vickes, H.-O.](#)
- ☐ [Vittoria, C.](#)
- ☐ [Voelker, R.H.](#)
- ☐ [Volakis, J.L.](#)
- ☐ [Vowinkel, B.](#)
- ☐ [Vu, T.B.](#)

W

- ☐ [Wade, J.D.](#)
- ☐ [Wait, J.R.](#)
- ☐ [Wakino, K.](#)
- ☐ [Walinsky, P.](#)
- ☐ [Walker, J.L.B.](#)
- ☐ [Wallace, P.](#)
- ☐ [Walters, W.](#)
- ☐ [Wan, L.A.](#)
- ☐ [Wang, B.-S.](#)
- ☐ [Wang, C.-Q.](#)
- ☐ [Wang, D.C.](#)
- ☐ [Wang, G.-W.](#)
- ☐ [Wang, J.](#)
- ☐ [Wang, J.J.H.](#)
- ☐ [Wang, M.](#)
- ☐ [Wang, N.-L.](#)
- ☐ [Wang, N.L.](#)
- ☐ [Wang, R.](#)
- ☐ [Wang, T.-H.](#)
- ☐ [Wang, W.-K.](#)
- ☐ [Wassel, J.](#)
- ☐ [Way, W.I.](#)
- ☐ [Weaver, G.R.](#)
- ☐ [Weaver, P.F.](#)
- ☐ [Webb, C.](#)

Click on author name for a list of papers.



Author Index



IEEE

Contents

Authors

- ☐ Webb, J.P.
- ☐ Webb, K.J.
- ☐ Weikle, II, R.M.
- ☐ Weimann, G.
- ☐ Weisshaar, A.
- ☐ Weller, J.F.
- ☐ Weng, S.
- ☐ Weng, S.-L.
- ☐ West, Jr., M.
- ☐ West, R.G.
- ☐ White, D.J.
- ☐ Wholey, J.N.
- ☐ Wilcox, R.B.
- ☐ Willems, D.
- ☐ Willems, D.A.
- ☐ Williams, D.
- ☐ Williams, D.F.
- ☐ Wills, J.D.
- ☐ Withers, R.S.
- ☐ Withington, S.
- ☐ Wolff, I.
- ☐ Wolk, D.
- ☐ Wong, H.
- ☐ Wong, T.T.Y.
- ☐ Wong, Y.-C.
- ☐ Worm, S.B.
- ☐ Wortman, D.E.
- ☐ Wright, A.S.
- ☐ Wu, B.
- ☐ Wu, J.
- ☐ Wu, K.
- ☐ Wu, K.L.
- ☐ Wu, R.-B.
- ☐ Wu, S.-C.
- ☐ Wurtele, M.

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

X

- ☐ [Xia, J.](#)
- ☐ [Xu, D.-M.](#)
- ☐ [Xu, Q.](#)
- ☐ [Xu, S.](#)
- ☐ [Xuan, Y.](#)
- ☐ [Xun, P.](#)

Y

- ☐ [Yakihara, T.](#)
- ☐ [Yamashita, E.](#)
- ☐ [Yanai, H.](#)
- ☐ [Yang, D.](#)
- ☐ [Yang, H.-Y.](#)
- ☐ [Yanokura, E.](#)
- ☐ [Ye, S.](#)
- ☐ [Yee, H.-Y.](#)
- ☐ [Yeh, C.](#)

- ☐ [Yen, H.W.](#)
- ☐ [Yeo, S.-P.](#)
- ☐ [Yngvesson, K.S.](#)
- ☐ [Yonemura, J.Y.](#)
- ☐ [York, R.A.](#)
- ☐ [Yoshida, N.](#)
- ☐ [Yoshikado, S.](#)
- ☐ [You, T.-S.](#)
- ☐ [Young, D.](#)
- ☐ [Young, J.L.](#)
- ☐ [Yu, C.-C.](#)
- ☐ [Yu, Z.](#)
- ☐ [Yuan, X.](#)
- ☐ [Yuan, Y.](#)
- ☐ [Yuen, C.](#)
- ☐ [Yun, S.W.](#)

Click on author name for a list of papers.



Author Index



IEEE

[Contents](#)

[Authors](#)

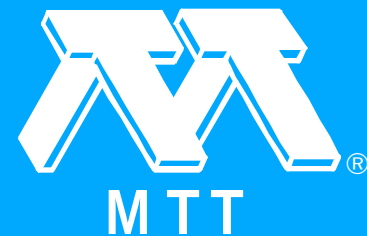
Z

- [□ Zah, C.-E.](#)
- [□ Zaki, K.A.](#)
- [□ Zargari, V.](#)
- [□ Zdasiuk, G.](#)
- [□ Zdasiuk, G.A.](#)
- [□ Zhang, Q.-J.](#)
- [□ Zhang, Y.](#)
- [□ Zheng, D.](#)
- [□ Zheng, W.](#)
- [□ Zhu, L.](#)
- [□ Zieniutycz, W.](#)
- [□ Zur, A.](#)

Click on author name for a list of papers.



Papers by Author



Contents

Authors

Abid, Z.

- ☐ [Impedance and Switching of GaAs p-i-n Diodes \(Short Papers\)](#)

Abouzahra, M.D.

- ☐ [Application of the Three-Dimensional Finite-Difference Time-Domain Method to the Analysis of Planar Microstrip Circuits](#)

Ackerman, E.

- ☐ [High-Speed Fiber-Optic Links for Distribution of Satellite Traffic](#)

Adde, R.

- ☐ [Large-Signal Model of Picosecond FET's and Measurement of the Step Response](#)

Adelman, J.

- ☐ [The Design of Millimeter-Wave Control Components](#)

Click on title for a paper summary.



Papers by Author



IEEE

[Contents](#)

[Authors](#)

Adelseck, B.

- ☐ [A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology](#)
- ☐ [A Monolithic 94 GHz Balanced Mixer](#)

Adlerstein, M.G.

- ☐ [A Multi-IMPATT Injection-Locked Oscillator at 35 GHz](#)

Affandi, A.M.

- ☐ [A Novel Exponential Power Combiner/Divider](#)

Afsar, M.N.

- ☐ [An Automated 60 GHz Open Resonator System for Precision Dielectric Measurement](#)

Aghvami, H.

- ☐ [Synthesis, Design, and Construction of Ultra-Wide-Band Nonuniform Quadrature Directional Couplers in Inhomogeneous Media](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Agosti, G.

- ☐ [Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron](#)

Agoston, A.

- ☐ [Computation of Frequency-Dependent Propagation Characteristics of Microstriplike Propagation Structures with Discontinuous Layers](#)

Agrawal, A.K.

- ☐ [A Broad-Band Printed Circuit Hybrid Ring Power Divider](#)

Aikawa, M.

- ☐ [Broad-Band Monolithic Microwave Active Inductor and its Application to Miniaturized Wide-Band Amplifiers \(Correction\)](#)
- ☐ [Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part I](#)

Click on title for a paper summary.



Papers by Author

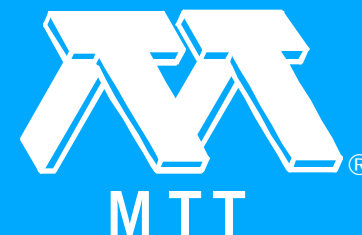
- ❑ [Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part II](#)
- ❑ [Double-Sided MIC's and Their Applications](#)
- ❑ [Lossless Broad-Band Monolithic Microwave Active Inductors \(Dec. 1989 \[T-MTT\] \)](#)
- ❑ [Novel Unilateral Circuits for MMIC Circulators](#)
- ❑ [Very Small Ultra-Wide-Band MMIC Magic T and Applications to Combiners and Dividers](#)
- ❑ [Very Small Wide-Band MMIC Magic T's Using Microstrip Lines on a Thin Dielectric Film](#)

Ajose, S.O.

- ❑ [Wave Propagation in a Double-Sided Exponentially Tapered Rectangular Waveguide \(Short Papers\)](#)

Akaike, M.

- ❑ [A Miniaturized Broad-Band MMIC Frequency Doubler](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Akyel, C.

- ❑ Shift of the Complex Resonance Frequency of a Dielectric-Loaded Cavity Produced by Small Sample Insertion Holes (Short Papers)

Alameh, K.E.

- ❑ Tuned Optical Receivers for Microwave Subcarrier Multiplexed Lightwave Systems

Alberti, S.

- ❑ Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron

Albinsson, B.M.

- ❑ A Graphic Design Method for Matched Low-Noise Amplifiers
- ❑ p-i-n Diode Attenuator with Small Phase Shift (Additional Comments and Reply)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Alcorn, T.

- ☐ [A Novel Aperture Isolation Circuit for Use in Phased Array Systems](#)

Alcorn, T.S.

- ☐ [A Novel Aperture-Isolation Circuit for Use in Phased Array Systems](#)

Alessandri, F.

- ☐ [Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter-Wave Circuits \(Dec. 1989 \[T-MTT\]\)](#)

Alexopoulos, N.G.

- ☐ [A Generalized Method for Distinguishing Between Radiation and Surface-Wave Losses in Microstrip Discontinuities](#)
- ☐ [A Rigorous Dispersive Characterization of Microstrip Cross and T Junctions](#)

Click on title for a paper summary.



Papers by Author

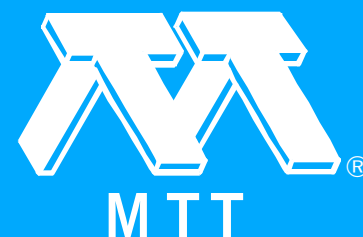
- ❑ An Integral Equation Analysis of an Infinite Array of Rectangular Dielectric Waveguides
- ❑ Microstrip Open-End and Gap Discontinuities in a Substrate-Superstrate Structure
- ❑ Shunt Posts in Microstrip Transmission Lines

Ali, S.M.

- ❑ Application of the Three-Dimensional Finite-Difference Time-Domain Method to the Analysis of Planar Microstrip Circuits
- ❑ Integral Equation Solution to the Guidance and Leakage Properties of Coupled Dielectric Strip Waveguides
- ❑ Propagation Properties of Striplines Periodically Loaded with Crossing Strips
- ❑ Resonance in Cylindrical-Rectangular and Wraparound Microstrip Structures

Allen, B.R.

- ❑ High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Allen, C.K.

- ☐ Inductance of Perfectly Conducting Foils Including Spiral Inductors

Ames, E.E.

- ☐ Optical Test Set for Microwave Fiber-Optic Network Analysis

Anders, P.

- ☐ Optimum Field Theory Design of Broad-Band E-Plane Branch Guide Phase Shifters and 180° Couplers

Andersen, J.B.

- ☐ Gaussian Beam Representation of Aperture Fields in Layered, Lossy Media: Simulation and Experiment

Anderson, A.C.

- ☐ Wide-Band Superconductive Chirp Filters

Click on title for a paper summary.



Papers by Author

Anderson, J.L.

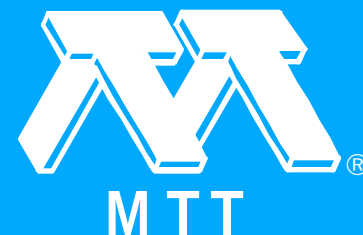
- ☐ [The Lossy Waveguide as a Problem in Perturbation Theory \(Short Papers\)](#)

Andersson, I.L.

- ☐ [Phase and Amplitude Characteristics of InP: Fe Modified Interdigitated Gap Photoconductive Microwave Switches](#)

Andricos, C.

- ☐ [C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process](#)
- ☐ [Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency](#)
- ☐ [Multifunction Chip Set for T/R Module Receive Path \(1990 \[MCS\]\)](#)
- ☐ [Multifunction Small-Signal Chip Set for Transmit/Receive Modules](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Anthes, J.P.

- ☐ [Optoelectronic Isolator for Microwave Applications](#)

Araki, K.

- ☐ [A Compact Full MMIC Module for Ku-Band Phase-Locked Oscillators](#)

Archer, J.

- ☐ [Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications \(Short Papers\)](#)

Archer, J.W.

- ☐ [Low-Parasitic, Planar Schottky Diodes for Millimeter-Wave Integrated Circuits](#)

Arjavalingham, G.

- ☐ [Broad-Band Microwave Measurements with Transient Radiation from Optoelectronically Pulsed Antennas](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Arndt, F.

- ❑ [Finite-Difference Method without Spurious Solutions for the Hybrid-Mode Analysis of Diffused Channel Waveguides](#)
- ❑ [Optimum Field Theory Design of Broad-Band E-Plane Branch Guide Phase Shifters and 180° Couplers](#)
- ❑ [Rigorous Field Theory Design of Millimeter-Wave E-Plane Integrated Circuit Multiplexer](#)
- ❑ [Transverse Resonance, Standing Wave, and Resonator Formulations of the Ridge Waveguide Eigenvalue Problem and its Application to the Design of E-Plane Finned Waveguide Filters](#)

Arvas, E.

- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation](#)

Click on title for a paper summary.



Papers by Author

- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation \(Comments and Reply\)](#)

Asahara, T.

- ❑ [Microstrip Lines Using Yttrium Iron Garnet Film](#)

Asbeck, P.M.

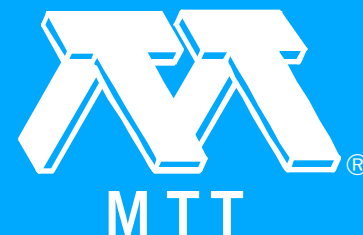
- ❑ [Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz](#)

Atsuki, K.

- ❑ [Characterization of Microstrip Lines Near a Substrate Edge and Design Formulas of Edge-Compensated Microstrip Lines](#)

Auda, H.A.

- ❑ [Multiple Dielectric Posts in a Rectangular Waveguide \(Corrections\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

- ❑ [The Resonance Method for Evaluating the Impedances of the Equivalent Network for Dielectric Posts in a Rectangular Waveguide](#)

Auxemery, P.

- ❑ [Dielectric Resonators Suitable for Use in Planar Integrated Circuits at Short Millimeter Wavelengths \(Short Papers\)](#)

Ayasli, Y.

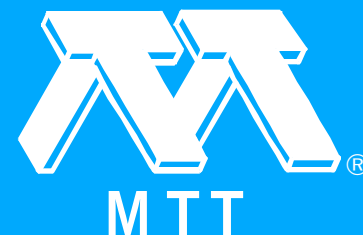
- ❑ [Monolithic FET Structures for High-Power Control Component Applications](#)

Bacon, J.W.

- ❑ [Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's \(Dec. 1989 \[T-MTT\]\)](#)

Baeten, R.J.

- ❑ [p-i-n Diode Attenuator with Small Phase Shift \(Additional Comments and Reply\)](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Baghai-Wadji, A.R.

- ☐ [Analysis and Measurement of Transducer End Radiation in SAW Filters on Strongly Coupling Substrates](#)

Bahl, I.

- ☐ [Multifunction Chip Set for T/R Module Receive Path \(1990 \[MCS\]\)](#)

Bahl, I.J.

- ☐ [C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process](#)
- ☐ [Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency](#)
- ☐ [GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications](#)
- ☐ [Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits](#)

Click on title for a paper summary.



Papers by Author

- ❑ Multifunction Small-Signal Chip Set for Transmit/Receive Modules

Bajpai, S.N.

- ❑ Insertion Loss of Electronically Variable Magnetostatic Wave Delay Lines

Baken, N.H.G.

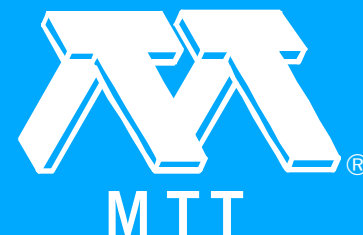
- ❑ Domain Integral Equation Analysis of Integrated Optical Channel and Ridge Waveguides in Stratified Media

Baker-Jarvis, J.

- ❑ Improved Technique for Determining Complex Permittivity with the Transmission/Reflection Method

Balana, A.

- ❑ Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



Contents

Authors

Balanis, C.A.

- ☐ [Pulse Distortion on Multilayer Coupled Microstrip Lines](#)
- ☐ [Transient Analysis of Distortion and Coupling in Lossy Coupled Microstrips \(Dec. 1990 \[T-MTT\]\)](#)

Bandla, S.

- ☐ [Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications \(Short Papers\)](#)

Bandler, J.W.

- ☐ [Efficient Large-Signal FET Parameter Extraction Using Harmonics \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [FAST Gradient Based Yield Optimization of Nonlinear Circuits](#)

Bandy, S.

- ☐ [5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier](#)
- ☐ [Feedback in Distributed Amplifiers \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author

- ❑ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz
- ❑ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz (Short Papers)
- ❑ Sensitivity of a 40 GHz HEMT Low-Noise Amplifier to Material and Processing Variations (Short Papers)

Bandy, S.G.

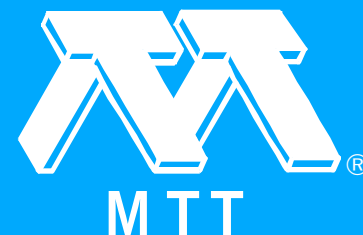
- ❑ 5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier

Barkeshli, S.

- ❑ Efficient Analysis of Planar Microstrip Geometries Using a Closed-Form Asymptotic Representation of the Grounded Dielectric Slab Green's Function

Bartle, D.C.

- ❑ Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications (Short Papers)



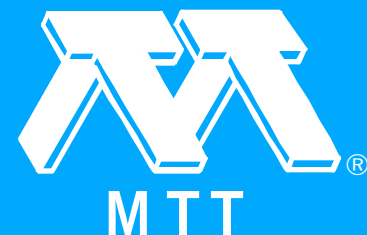
Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Basile, P.

- ☐ [Laser-Activated p-i-n Diode Switch for RF Application \(Short Papers\)](#)

Batchelor, R.A.

- ☐ [Low-Parasitic, Planar Schottky Diodes for Millimeter-Wave Integrated Circuits](#)

Bates, B.D.

- ☐ [Modal Analysis of Radial-Resonator Waveguide Diode Mounts](#)

Baudrand, H.

- ☐ [Centimeter-Wave Microstrip Phase Shifter on a Ferrite-Dielectric Substrate](#)
- ☐ [Generalized Spectral Analysis of Planar Lines on Layered Media Including Uniaxial and Biaxial Dielectric Substrates](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bayraktaroglu, B.

- ☐ [5 W Monolithic HBT Amplifier for Broadband X-Band Applications](#)

Bayruns, J.

- ☐ [A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception](#)

Bayuk, F.J.

- ☐ [Editors' Overview \(Dec. 1989 \[T-MTT\]\)](#)

Beaubien, R.S.

- ☐ [Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's \(Dec. 1989 \[T-MTT\]\)](#)

Bechtle, D.

- ☐ [Wide-Band GaInAs MISFET Amplifiers \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bechtle, D.W.

- ☐ [2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si](#)

Becker, P.

- ☐ [Broad Band Monolithic Cross Point Switch Matrices](#)

Beckwith, B.

- ☐ [A Highly Integrated Two Channel MMIC Down Converter with Gain Control](#)

Bedair, S.S.

- ☐ [Fast and Accurate Analytic Formulas for Calculating the Parameters of a General Broadside-Coupled Coplanar Waveguide for \(M\)MIC Applications](#)

Belhadj-Tahar, N.-E.

- ☐ [Broad-Band Simultaneous Measurement of Complex Permittivity and Permeability Using a Coaxial Discontinuity](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bellantoni, J.V.

- ❑ [Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications \(Short Papers\)](#)

Ben-Michael, R.

- ❑ [The Design of Millimeter-Wave Control Components](#)

Bendett, M.

- ❑ [Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect \(Short Papers\)](#)

Benedek, M.

- ❑ [Integration of High-Q GaAs Varactor Diodes and 0.25 \$\mu\text{m}\$ GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications](#)
- ❑ [Monolithic Ka Band VCO Using Quarter Micron GaAs MESFETs and Integrated High-Q Varactors \(1990 \[MCS\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Benzina, H.

- ☐ [Centimeter-Wave Microstrip Phase Shifter on a Ferrite-Dielectric Substrate](#)

Berroth, M.

- ☐ [Broad-Band Determination of the FET Small-Signal Equivalent Circuit](#)

Bertrand, A.M.

- ☐ [A Single Chip 2-20 GHz T/R Module](#)
- ☐ [Miniature Monolithic Microwave Frequency Diplexers](#)

Bertrand, S.

- ☐ [A Process-Dependent Worst-Case Analysis for MMIC Design Based on a Handy MESFET Simulator](#)

Betts, G.E.

- ☐ [An Analytic and Experimental Comparison of Direct and External Modulation in Analog Fiber-Optic Links](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Beyer, A.

- ☐ [A Generalized Theory for Asymmetrical Coupled Lines \(Short Papers\)](#)

Beyer, J.B.

- ☐ [Attenuation Compensation in Distributed Amplifier Design](#)

Bhartia, P.

- ☐ [A Generalized Theory of Tapered Transmission Line Matching Transformers and Asymmetric Couplers Supporting Non-TEM Modes](#)
- ☐ [Analysis of Edge-Coupled Elliptical \(Oval\) Rods Between Infinite Ground Planes \(Short Papers\)](#)
- ☐ [Computer-Aided Design Models for Broadside-Coupled Striplines and Millimeter-Wave Suspended Substrate Microstrip Lines \(Corrections\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bhasin, K.B.

- ☐ [Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect \(Short Papers\)](#)

Bialkowski, M.E.

- ☐ [Electromagnetic Model of a Radial-Resonator Waveguide Diode Mount](#)

Biedenbender, M.D.

- ☐ [Ion-Implanted High Microwave Power Indium Phosphide Transistors](#)

Biernacki, R.M.

- ☐ [FAST Gradient Based Yield Optimization of Nonlinear Circuits](#)

Bierwirth, K.

- ☐ [Finite-Difference Method without Spurious Solutions for the Hybrid-Mode Analysis of Diffused Channel Waveguides](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bilbro, G.L.

- ☐ [Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing](#)

Binari, S.C.

- ☐ [Millimeter-Wave Planar InP Schottky Diodes and Their Small-Signal Equivalent Circuit](#)

Birkeland, J.

- ☐ [FET-Based Planar Circuits for Quasi-Optical Sources and Transceivers](#)
- ☐ [Planar FET Oscillators Using Periodic Microstrip Patch Antennas](#)

Biswas, A.

- ☐ [Modeling of Asymmetric and Offset Gaps in Shielded Microstrips and Slotlines \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Biswas, B.N.

- ❑ [Effect of a Cochannel Signal on the Electrical Tuning Characteristics of a Gunn Oscillator \(Short Papers\)](#)

Blakey, P.A.

- ❑ [MESFET Simulation Oriented Toward Computer-Aided Microwave Circuit Design \(Short Papers\)](#)

Blauvelt, H.

- ❑ [Reduced Insertion Loss of X-Band RF Fiber-Optic Links \(Short Papers\)](#)

Blok, H.

- ❑ [Domain Integral Equation Analysis of Integrated Optical Channel and Ridge Waveguides in Stratified Media](#)

Blundell, R.

- ❑ [Simulation of the Superconducting Quasiparticle Mixer Using a Five-Port Model](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bocquet, B.

- ☐ [Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors \(Short Papers\)](#)

Bodeep, G.E.

- ☐ [Lightwave Subcarrier CATV Transmission Systems](#)

Boesch, R.D.

- ☐ [X-Band 0.5, 1, and 2 Watt Power Amplifiers with Marked Improvement in Power-Added Efficiency](#)

Boix, R.R.

- ☐ [Capacitance Computation of Elliptic Microstrip Disks in Biaxial Anisotropic Multilayered Substrates](#)
- ☐ [Capacitance Parameters of Coupled Elliptic Microstrip Disks in Layered Anisotropic Media \(Short Papers\)](#)
- ☐ [Lumped Capacitance and Open End Effects of Striplike Structures in Multilayered and Anisotropic Substrates](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bolioli, S.

- ☐ [Centimeter-Wave Microstrip Phase Shifter on a Ferrite-Dielectric Substrate](#)

Bollen, W.M.

- ☐ [Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation](#)

Bolomey, J.-C.

- ☐ [Recent European Developments in Active Microwave Imaging for Industrial, Scientific, and Medical Applications](#)

Booth, M.

- ☐ [A Novel Aperture-Isolation Circuit for Use in Phased Array Systems](#)

Booth, M.S.

- ☐ [A Novel Aperture Isolation Circuit for Use in Phased Array Systems](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Borelli, J.J.

- ❑ Integration of High-Q GaAs Varactor Diodes and 0.25 μm GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications

Bornemann, J.

- ❑ Characterization of a Class of Waveguide Discontinuities Using a Modified TE/sup x//sub mn/ Mode Approach
- ❑ Transverse Resonance, Standing Wave, and Resonator Formulations of the Ridge Waveguide Eigenvalue Problem and its Application to the Design of E-Plane Finned Waveguide Filters

Bosch, R.

- ❑ Broad-Band Determination of the FET Small-Signal Equivalent Circuit

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bosch, W.

- ☐ [Measurement and Simulation of Memory Effects in Predistortion Linearizers](#)

Boulouard, A.

- ☐ [Analysis of Rectangular Spiral Transformers for MMIC Applications \(Short Papers\)](#)

Branco, M.G.C.

- ☐ [Analysis of the Junction Between Smooth and Corrugated Cylindrical Waveguides in Mode Converters \(Short Papers\)](#)

Brand, M.

- ☐ [A Compact Broadband, Six-Bit MMIC Phasor with Integrated Digital Drivers \(1990 \[MCS\]\)](#)

Brehm, G.E.

- ☐ [Multifunction MMIC History from a Process Technology Perspective](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Brockhoff, W.

- ☐ [RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures](#)

Broumas, A.D.

- ☐ [Transmission Properties of a Right-Angle Microstrip Bend with and without a Miter \(Short Papers\)](#)

Brown, A.S.

- ☐ [The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications](#)

Brukiewa, T.F.

- ☐ [Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency](#)
- ☐ [Multifunction Small-Signal Chip Set for Transmit/Receive Modules](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Bryant, J.H.

- ❑ [Microwave Technology and Careers in Transition: The Interests and Activities of Visitors to the Sperry Gyroscope Company's Klystron Plant in 1939-1940](#)

Buckley, M.J.

- ❑ [Compact Quasi-Periodic and Aperiodic TE/sub 0n/ Mode Converters in Overmoded Circular Waveguides for Use with Gyrotrons](#)

Bui, S.

- ❑ [An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application](#)

Burdette, E.C.

- ❑ [Open-Ended Coaxial Exposure Device for Applying RF/Microwave Fields to Very Small Biological Preparations](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Burke, J.J.

- ☐ [Surface-to-Surface Transition via Electromagnetic Coupling of Microstrip and Coplanar Waveguide](#)

Burke, J.M.

- ☐ [Mode Conversion Losses in Highly Overmoded Waveguide Cavities](#)

Burkhart, S.C.

- ☐ [Arbitrary Pulse Shape Synthesis via Nonuniform Transmission Lines \(Short Papers\)](#)

Buswell, M.

- ☐ [Modeling Ferrimagnetic Resonators](#)

Calandra, E.F.

- ☐ [Transient Analysis of Multiple-Tuned Injection-Locked Amplifiers with Modulated Input Signal](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Callsen, H.

- ☐ [p-i-n Diode Control Devices in E-Plane Technique](#)

Camilleri, N.

- ☐ [35 GHz GaAs Power MESFET's and Monolithic Amplifiers](#)
- ☐ [Monolithic 9 to 70 GHz Distributed Amplifier](#)

Camisa, R.L.

- ☐ [2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si](#)

Camou, J.

- ☐ [Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT \(Short Papers\)](#)

Camou, J.B.

- ☐ [GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz](#)

Click on title for a paper summary.



Papers by Author

- ❑ GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications

Campbell, S.A.

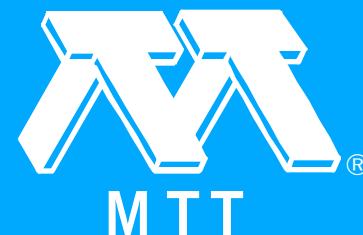
- ❑ Modeling of Ge-Si Heterojunction Bipolar Transistors for Use in Silicon Monolithic Millimeter-Wave Integrated Circuits

Cangellaris, A.C.

- ❑ A Parametric Study of the Attenuation Constant of Lossy Microstrip Lines (Short Papers)
- ❑ An Integral Equation Method for the Evaluation of Conductor and Dielectric Losses in High-Frequency Interconnects

Cantos, B.D.

- ❑ Monolithic 2-18 GHz Matrix Amplifiers (Short Papers)



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Caorsi, S.

- ☐ [Equivalent Current Density Reconstruction for Microwave Imaging Purposes](#)
- ☐ [Two-Dimensional Microwave Imaging by a Numerical Inverse Scattering Solution](#)

Caplan, M.

- ☐ [Determination of the Resonant Frequencies in a Complex Cavity Using the Scattering Matrix Formulation](#)

Capsalis, C.N.

- ☐ [A Rigorous Analysis of a Coaxial to Shielded Microstrip Line Transition](#)

Carin, L.

- ☐ [An Equivalent Circuit Model for Terminated Hybrid-Mode Multiconductor Transmission Lines](#)
- ☐ [Isolation Effects in Single- and Dual-Plane VLSI Interconnects](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Carr, K.L.

- ☐ [Microwave Radiometry: Its Importance to the Detection of Cancer](#)

Carter, W.L.

- ☐ [On the Application of Complex Resistive Boundary Conditions to Model Transmission Lines Consisting of Very Thin Superconductors](#)

Caspi, S.

- ☐ [The Design of Millimeter-Wave Control Components](#)

Castaneda, J.A.

- ☐ [An Integral Equation Analysis of an Infinite Array of Rectangular Dielectric Waveguides](#)

Catoe, W.

- ☐ [Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Caverly, R.H.

- ☐ [Establishing the Minimum Reverse Bias for a p-i-n Diode in a High-Power Switch](#)
- ☐ [The Frequency-Dependent Impedance of p-i-n Diodes \(Short Papers\)](#)

Cazaux, J.-L.

- ☐ [A Process-Dependent Worst-Case Analysis for MMIC Design Based on a Handy MESFET Simulator](#)

Cazaux, J.L.

- ☐ [A New Concept to Cancel Insertion Phase Variation in MMIC Amplitude Controller](#)

Cecchetti, C.

- ☐ [Computer-Aided Noise Analysis of MESFET and HEMT Mixers](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Cetas, T.C.

- ☐ Gaussian Beam Representation of Aperture Fields in Layered, Lossy Media: Simulation and Experiment

Chabbra, M.

- ☐ Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique

Chakraborty, A.

- ☐ A Rigorous Variational Formulation of an H Plane Slot-Coupled Tee Junction (Short Papers)
- ☐ Narrow Wall Axial-Slot-Coupled T Junction Between Rectangular and Circular Waveguides
- ☐ S Matrix of Slot-Coupled H-Plane Tee Junction Using Rectangular Waveguides (Short Papers)

Chamberlain, A.

- ☐ Three Channel I.F. Multiplexers

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chan, B.

- ☐ Centimeter-Wave Microstrip Phase Shifter on a Ferrite-Dielectric Substrate

Chan, C.H.

- ☐ A Mixed Spectral-Domain Approach for Dispersion Analysis of Suspended Planar Transmission Lines with Pedestals
- ☐ Unified Solution of Various Dielectric-Loaded Ridge Waveguides with a Mixed Spectral-Domain Method

Chang, A.P.

- ☐ A 2-18 GHz Low-Noise/High-Gain Amplifier Module
- ☐ Monolithic 2-18 GHz Matrix Amplifiers (Short Papers)
- ☐ On Power Distribution in Additive Amplifiers

Chang, C.-N.

- ☐ Full-Wave Analysis of Coplanar Waveguides by Variational Conformal Mapping Technique

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chang, C.-R.

- ☐ Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing
- ☐ Frequency-Domain Nonlinear Microwave Circuit Simulation Using the Arithmetic Operator Method (Short Papers)
- ☐ Frequency-Domain Spectral Balance Using the Arithmetic Operator Method
- ☐ Harmonic Balance and Frequency-Domain Simulation of Nonlinear Microwave Circuits Using the Block Newton Method (Short Papers)

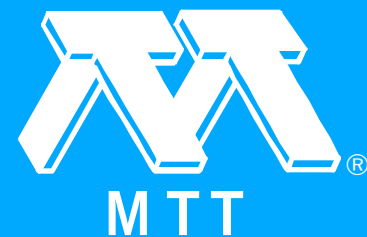
Chang, C.-Y.

- ☐ Microwave Active Filters Based on Coupled Negative Resistance Method

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chang, F.-Y.

- ❑ The Generalized Method of Characteristics for Waveform Relaxation Analysis of Lossy Coupled Transmission Lines (Dec. 1989 [T-MTT])

Chang, I.S.

- ❑ Analysis of Step Discontinuities on Planar Dielectric Waveguide Containing a Gyrotropic Layer

Chang, J.-S.

- ❑ Investigations of Complex Modes in a Generalized Bilateral Finline with Mounting Grooves and Finite Conductor Thickness (Dec. 1989 [T-MTT])

Chang, K.

- ❑ A New Resistance Measurement Technique Applicable to High-Temperature Superconducting Materials at Microwave Frequencies (Short Papers)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

- ❑ Analysis of Wide Transverse Inductive Metal Strips in a Rectangular Waveguide (Short Papers)
- ❑ Experiments on Injection Locking of Active Antenna Elements for Active Phased Arrays and Spatial Power Combiners
- ❑ Low-Cost Microwave/Millimeter-Wave Impedance Measuring Scheme Using a Three-Probe Microstrip Circuit

Chang, M.F.

- ❑ Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz

Chang, T.-N.

- ❑ Analysis of a Shielded Microstrip Line with Finite Metallization Thickness by the Boundary Element Method (Short Papers)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chatterjee, S.

- ❑ [Effect of a Cochannel Signal on the Electrical Tuning Characteristics of a Gunn Oscillator \(Short Papers\)](#)

Chatzarakis, G.E.

- ❑ [Electromagnetic Energy Deposition Inside a Three-Layer Cylindrical Human Body Model Caused by Near-Field Radiators](#)

Chauchard, E.A.

- ❑ [Intermixing Optical and Microwave Signals in GaAs Microstrip Circuits for Phase-Locking Applications](#)

Chaudhuri, S.K.

- ❑ [Combining Modal Analysis and the Finite-Difference Time-Domain Method in the Study of Dielectric Waveguide Problems \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chen, C.-D.

- ☐ [Full-Wave Analysis of Lossy Quasi-Planar Transmission Line Incorporating the Metal Modes](#)

Chen, C.-L.

- ☐ [Optical Fiber Fabry-Perot Cavities and Recirculating Delay Lines as Tunable Microwave Filters](#)
- ☐ [Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines](#)

Chen, C.H.

- ☐ [A Partial Variational Approach for Arbitrary Discontinuities in Planar Dielectric Waveguides](#)
- ☐ [Frequency-Dependent Characteristics of Open Microstrip Lines with Finite Strip Thickness \(Short Papers\)](#)
- ☐ [Full-Wave Analysis of Coplanar Waveguides by Variational Conformal Mapping Technique](#)

Click on title for a paper summary.



Papers by Author

- ❑ Perturbed-TEM Analysis of Transmission Lines with Imperfect Conductors

Chen, J.-Y.

- ❑ Electromagnetic Deposition in an Anatomically Based Model of Man for Leakage Fields of a Parallel-Plate Dielectric Heater

Chen, K.-M.

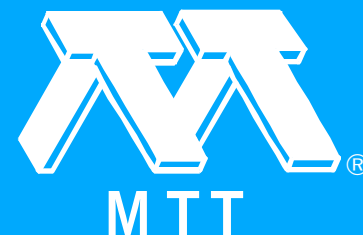
- ❑ A Mathematical Formulation of the Equivalence Principle

Chen, S.-W.

- ❑ A Novel Coupling Method for Dual-Mode Dielectric Resonators and Waveguide Filters
- ❑ Tunable, Temperature-Compensated Dielectric Resonators and Filters

Chen, S.H.

- ❑ Efficient Large-Signal FET Parameter Extraction Using Harmonics (Dec. 1989 [T-MTT])



Contents

Authors

Click on title for a paper summary.



Papers by Author

Chen, T.H.

- ☐ [An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application](#)

Chen, Z.

- ☐ [Deterministic Approach to Full-Wave Analysis of Discontinuities in MIC's Using the Method of Lines](#)

Chenkin, J.

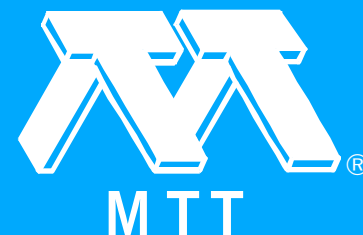
- ☐ [dc to 40 GHz Coaxial-to-Microstrip Transition for 100- \$\mu\$ m-Thick GaAs Substrates \(Short Papers\)](#)

Cheung, P.

- ☐ [Optically Controlled Coplanar Waveguide Phase Shifters](#)

Chew, W.

- ☐ [Millimeter-Wave Generation and Characterization of a GaAs FET by Optical Mixing](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

- ❑ Printed Circuit Antennas with Integrated FET Detectors for Millimeter-Wave Quasi Optics

Chew, W.C.

- ❑ A Variational Analysis of Anisotropic, Inhomogeneous Dielectric Waveguides

Chi, H.

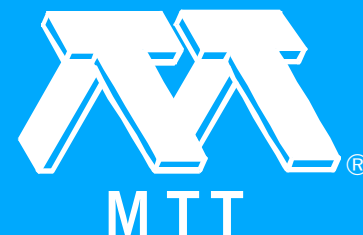
- ❑ An Automated 60 GHz Open Resonator System for Precision Dielectric Measurement

Chi, T.Y.

- ❑ A 2.5 Watt X-Band High Efficiency MMIC Amplifier

Chiba, J.

- ❑ Improved Theory for E-Plane Symmetrical Tee Junctions (Short Papers)



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chicon, R.

- ☐ [Reflection of Electromagnetic Waves from Rough Waveguides \(Short Papers\)](#)

Ching, L.Y.

- ☐ [Feedback in Distributed Amplifiers \(Short Papers\)](#)

Chou, J.-S.

- ☐ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Chow, Y.L.

- ☐ [The Current Distribution and AC Resistance of a Microstrip Structure](#)

Chowdhury, D.Q.

- ☐ [Three-Dimensional SAR Distributions Computed in a Multilayered Cylindrical Model for Electromagnetic Hyperthermia](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chowdhury, S.K.

- ☐ Dispersion Characteristics of Curved Microstrip Transmission Lines (Short Papers)

Chramiec, J.

- ☐ Reactance of Slotline Short and Open Circuits on Alumina Substrate (Short Papers)

Christianson, S.B.

- ☐ A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception

Christopoulos, C.

- ☐ A New Wire Node for Modeling Thin Wires in Electromagnetic Field Problems Solved by Transmission Line Modeling (Short Papers)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chronopoulos, C.P.

- ☐ [A Rigorous Analysis of a Coaxial to Shielded Microstrip Line Transition](#)

Chu, A.

- ☐ [Foreword \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [Message from the General Chairman \(1990 \[MCS\]\)](#)
- ☐ [Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines](#)

Chu, B.H.

- ☐ [Analysis of Wide Transverse Inductive Metal Strips in a Rectangular Waveguide \(Short Papers\)](#)

Chu, J.

- ☐ [Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Chu, S.L.

- ☐ [A Single Chip 2-20 GHz T/R Module](#)

Chu, S.T.

- ☐ [Combining Modal Analysis and the Finite-Difference Time-Domain Method in the Study of Dielectric Waveguide Problems \(Short Papers\)](#)

Chu, T.-H.

- ☐ [Analysis of Dielectric-Loaded Waveguide](#)
- ☐ [On Microwave Imagery Using Bojarski's Identity \(Short Papers\)](#)

Chung, S.-J.

- ☐ [A Partial Variational Approach for Arbitrary Discontinuities in Planar Dielectric Waveguides](#)

Chye, P.

- ☐ [Monolithic 9 to 70 GHz Distributed Amplifier](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Cioffi, K.R.

- ☐ [Broad-Band Distributed Amplifier Impedance-Matching Techniques](#)

Claspy, P.C.

- ☐ [Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect \(Short Papers\)](#)

Cloud, M.J.

- ☐ [A Note on the Mixed Potential Representation of Electric Fields in Layered Media \(Short Papers\)](#)

Cobb, M.

- ☐ [Monolithic IMPATT Oscillator Characterization](#)

Coget, P.

- ☐ [A Multioctave Active GaAs MMIC Quadrature Phase Shifter](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Cohen, E.D.

- ☐ [MIMIC from the Department of Defense Perspective](#)

Cohen, J.D.

- ☐ [A Proposed Microwave and Millimeter-Wave Spectrum Analyzer \(Short Papers\)](#)

Collier, R.J.

- ☐ [A Millimeter-Wave Six-Port Reflectometer Using Dielectric Waveguide](#)

Colquhoun, A.

- ☐ [A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology](#)
- ☐ [A Monolithic 94 GHz Balanced Mixer](#)

Coluzzi, M.

- ☐ [Multifunction Chip Set for T/R Module Receive Path \(1990 \[MCS\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Coluzzi, M.E.

- ☐ [Multifunction Small-Signal Chip Set for Transmit/Receive Modules](#)

Combes, P.F.

- ☐ [Asymmetrical Finline for Space Applications Using Millimeter Waves](#)

Compton, R.C.

- ☐ [Experimental Evaluation of Existing CAD Models for Microstrip Dispersion \(Short Papers\)](#)

Connolly, J.C.

- ☐ [2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si](#)

Cooper, R.K.

- ☐ [Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen](#)

Click on title for a paper summary.



Papers by Author

- ❑ [Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen \(Corrections\)](#)

Costache, G.I.

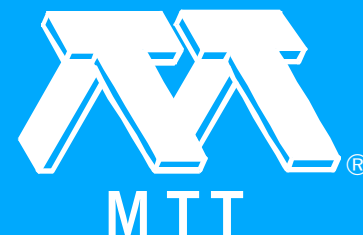
- ❑ [Finelines in Rectangular and Circular Waveguide Housings Including Substrate Mounting and Bending Effects--Finite Element Analysis](#)
- ❑ [Transmission Line Matrix Modeling of Dispersive Wide-Band Absorbing Boundaries with Time-Domain Diakoptics for S-Parameter Extraction](#)

Costamagna, E.

- ❑ [Numerical Conformal Transformation of Three-Magnetic-Wall Structures \(Short Papers\)](#)

Cottis, P.G.

- ❑ [Analysis of Energy Coupling into Spheroidal Ferritic Implants for Hyperthermia Applications](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

- ❑ Electromagnetic Energy Deposition Inside a Three-Layer Cylindrical Human Body Model Caused by Near-Field Radiators

Cotton, Jr., J.M.

- ❑ Results of Phase and Injection Locking of an Orotron Oscillator (Short Papers)

Counas, G.

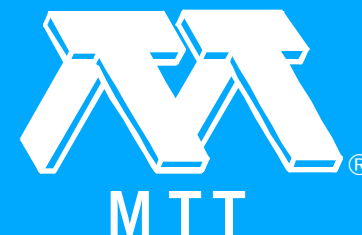
- ❑ Measuring Adapter Efficiency Using a Sliding Short Circuit

Courtney, W.E.

- ❑ Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines

Cowan, C.F.N.

- ❑ Intelligent Alignment of Waveguide Filters Using a Machine Learning Approach



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Cox, III, C.H.

- ☐ [An Analytic and Experimental Comparison of Direct and External Modulation in Analog Fiber-Optic Links](#)

Crawford, T.M.

- ☐ [Intelligent Alignment of Waveguide Filters Using a Machine Learning Approach](#)

Cros, D.

- ☐ [Dielectric Resonators Suitable for Use in Planar Integrated Circuits at Short Millimeter Wavelengths \(Short Papers\)](#)
- ☐ [Whispering Gallery Dielectric Resonator Modes for W-Band Devices](#)

Crosmun, A.

- ☐ [Modeling the Gate I/V Characteristic of a GaAs MESFET for Volterra-Series Analysis \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Crosmun, A.M.

- ☐ [Minimization of Intermodulation Distortion in GaAs MESFET Small-Signal Amplifiers](#)

Crosnier, Y.

- ☐ [A New Approach to the RF Power Operation of MESFET's](#)

Crozat, P.

- ☐ [Large-Signal Model of Picosecond FET's and Measurement of the Step Response](#)

Curtice, W.R.

- ☐ [On-Wafer Verification of a Large-Signal MESFET Model \(Short Papers\)](#)

Curtis, D.D.

- ☐ [Optical Test Set for Microwave Fiber-Optic Network Analysis](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

da Silva, L.C.

- ☐ Analysis of the Junction Between Smooth and Corrugated Cylindrical Waveguides in Mode Converters (Short Papers)
- ☐ Determination of the Scattering Matrix of Ring-Loaded Corrugated Waveguide Mode Converters (Short Papers)

Dagli, N.

- ☐ The Nature of the Charges, Currents, and Fields in and About Conductors Having Cross-Sectional Dimensions of the Order of a Skin Depth

Dalle, C.

- ☐ Analog Avalanche Diode Frequency Division (Short Papers)
- ☐ Read Versus Flat Doping Profile Structures for the Realization of Reliable High-Power, High-Efficiency 94 GHz IMPATT Sources

Darcie, T.E.

- ☐ Lightwave Subcarrier CATV Transmission Systems

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Darling, R.B.

- ☐ [Distributed Numerical Modeling of Dual-Gate GaAs MESFET's](#)

Daryoush, A.S.

- ☐ [High-Speed Fiber-Optic Links for Distribution of Satellite Traffic](#)
- ☐ [Optical Synchronization of Millimeter-Wave Oscillators for Distributed Architectures](#)

Das, B.N.

- ☐ [A Rigorous Variational Formulation of an H Plane Slot-Coupled Tee Junction \(Short Papers\)](#)
- ☐ [Narrow Wall Axial-Slot-Coupled T Junction Between Rectangular and Circular Waveguides](#)
- ☐ [S Matrix of Slot-Coupled H-Plane Tee Junction Using Rectangular Waveguides \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Das, N.K.

- ☐ Dispersion Characteristics of Optically Excited Coplanar Striplines: Comprehensive Full-Wave Analysis

Dautriche, P.

- ☐ A Multioctave Active GaAs MMIC Quadrature Phase Shifter

Davidson, A.C.

- ☐ Accuracy Improvements in Microwave Noise Parameter Measurements

Davis, L.E.

- ☐ Analysis of Nonreciprocal Coupled Image Lines (Comments and Reply) (Jan. 1989 [T-MTT])

Dawe, G.

- ☐ Integration of High-Q GaAs Varactor Diodes and 0.25 μm GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications

Click on title for a paper summary.



Papers by Author

- ❑ Monolithic Ka Band VCO Using Quarter Micron GaAs MESFETs and Integrated High-Q Varactors (1990 [MCS])

Dawson, D.

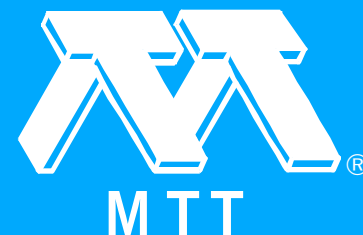
- ❑ Design and Fabrication of Two-Pole Monolithic Bulk Acoustic Filters

Day, M.

- ❑ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz (Short Papers)

Daywitt, W.C.

- ❑ Determining Adapter Efficiency by Envelope Averaging Swept Frequency Reflection Data (Short Papers)
- ❑ First-Order Symmetric Modes for a Slightly Lossy Coaxial Transmission Line
- ❑ Measuring Adapter Efficiency Using a Sliding Short Circuit



Contents

Authors

Click on title for a paper summary.



Papers by Author

de Chanterac, H.

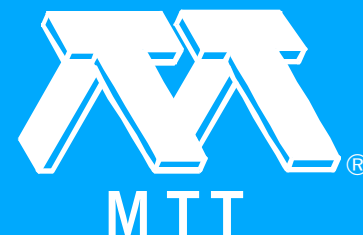
- ☐ [Broad-Band Simultaneous Measurement of Complex Permittivity and Permeability Using a Coaxial Discontinuity](#)

de Salles, A.A.A.

- ☐ [InGaAsP DC-PBH Semiconductor Laser Diode Frequency Response Model \(Short Papers\)](#)
- ☐ [Optical Control of Microwave Semiconductor Devices](#)

De Zutter, D.

- ☐ [Circuit Parameters for Single and Coupled Microstrip Lines by a Rigorous Full-Wave Space-Domain Analysis \(Short Papers\)](#)
- ☐ [Full-Wave Analysis of a Perfectly Conducting Wire Transmission Line in a Double-Layered Conductor-Backed Medium](#)
- ☐ [New High-Frequency Circuit Model for Coupled Lossless and Lossy Waveguide Structures](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

- ❑ Space-Domain Green's Function Approach to the Capacitance Calculation of Multiconductor Lines in Multilayered Dielectrics with Improved Surface Charge Modeling

Defonzo, A.P.

- ❑ Dispersion Characteristics of Optically Excited Coplanar Striplines: Comprehensive Full-Wave Analysis
- ❑ Dispersion Characteristics of Optically Excited Coplanar Striplines: Pulse Propagation

DeHaan, R.L.

- ❑ Open-Ended Coaxial Exposure Device for Applying RF/Microwave Fields to Very Small Biological Preparations

Deibele, S.

- ❑ Attenuation Compensation in Distributed Amplifier Design

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Deitrich, H.

- ☐ [K/sub u/- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts \(1990 \[MCS\]\)](#)

Delaney, M.J.

- ☐ [The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications](#)

Delannoy, J.

- ☐ [Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors \(Short Papers\)](#)

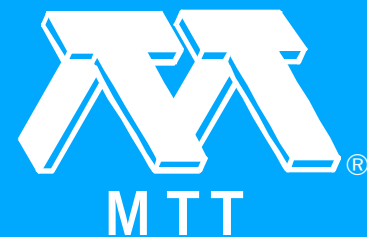
Delbare, W.

- ☐ [Space-Domain Green's Function Approach to the Capacitance Calculation of Multiconductor Lines in Multilayered Dielectrics with Improved Surface Charge Modeling](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Delisle, G.Y.

- ☐ [Waveguide Discontinuity Analysis with a Coupled Finite-Boundary Element Method](#)

Delmaster, J.

- ☐ [Laser-Activated p-i-n Diode Switch for RF Application \(Short Papers\)](#)

Delvaley, D.

- ☐ [Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors \(Short Papers\)](#)

Diestel, H.

- ☐ [A Quasi-TEM Analysis for Curved and Straight Planar Multiconductor Systems](#)
- ☐ [Coupling of Crossed Planar Multiconductor Systems](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Dieudonne, J.-M.

- ☐ [A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology](#)

Dieudonne, J.M.

- ☐ [A Monolithic 94 GHz Balanced Mixer](#)

Dilorio, M.S.

- ☐ [Wide-Band Superconductive Chirp Filters](#)

Diskus, C.G.

- ☐ [MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron \(FECTED\) Oscillators](#)

Dittloff, J.

- ☐ [Rigorous Field Theory Design of Millimeter-Wave E-Plane Integrated Circuit Multiplexer](#)

Click on title for a paper summary.



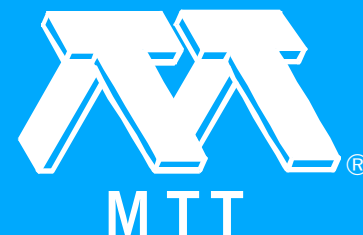
Papers by Author

Dixit, R.

- ❑ [High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz](#)

Djordjevic, A.R.

- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation](#)
- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation \(Comments and Reply\)](#)
- ❑ [Electromagnetic Scattering and Radiation from Finite Microstrip Structures](#)
- ❑ [Finite Difference Frequency-Domain Treatment of Open Transmission Structures](#)
- ❑ [Inductance of Perfectly Conducting Foils Including Spiral Inductors](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Dobashi, M.

- ☐ [Monolithic Sampling Head IC](#)

Dobrowolski, J.A.

- ☐ [A CAD-Oriented Method for Noise Figure Computation of Two-Ports with Any Internal Topology](#)

Donkor, E.

- ☐ [An Analytical Two-Dimensional Perturbation Method to Model Submicron GaAs MESFET's \(Short Papers\)](#)

Dow, G.S.

- ☐ [A Monolithic GaAs HBT Upconverter](#)
- ☐ [An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application](#)

Drinkwine, M.J.

- ☐ [Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Drizlikh, S.

- ☐ [An Infrared Fiber-Optic Radiometer for Controlled Microwave Heating \(Short Papers\)](#)

Dropkin, H.

- ☐ [Results of Phase and Injection Locking of an Orotron Oscillator \(Short Papers\)](#)

Dubberley, J.R.

- ☐ [Computation of Electromagnetic Fields in Large Biological Bodies by an Iterative Moment Method with a Restart Technique](#)
- ☐ [Computation of Fields in an Arbitrarily Shaped Heterogeneous Dielectric or Biological Body by an Iterative Conjugate Gradient Method](#)

Duffy, L.

- ☐ [Ka-Band MMIC Beam-Steered Transmitter Array \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Dupuis, M.

- ☐ [Broad Band Monolithic Cross Point Switch Matrices](#)

East, J.R.

- ☐ [Power and Stability Limitations of Resonant Tunneling Diodes](#)

Eastin, R.I.

- ☐ [A Configuration-Oriented Spice Model for Multiconductor Transmission Lines with Homogeneous Dielectrics](#)

Eastman, L.F.

- ☐ [An Analytical Model for I-V and Small-Signal Characteristics of Planar-Doped HEMT's](#)

Ebert, G.

- ☐ [A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology](#)
- ☐ [A Monolithic 94 GHz Balanced Mixer](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Eda, K.

- ☐ [Miniature Hybrid Microwave IC's Using a Novel Thin-Film Technology \(Dec. 1990 \[T-MTT\]\)](#)

Eguchi, M.

- ☐ [Finite Element Formulation for Guided-Wave Problems Using Transverse Electric Field Component \(Short Papers\)](#)

Eimertenbrink, R.

- ☐ [Design and Applications of Optically Controllable Finline Structures \(Short Papers\)](#)

Eisenstadt, W.R.

- ☐ [Optoelectronic Measurements of Picosecond Electrical Pulse Propagation in Coplanar Waveguide Transmission Lines](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ekholm, E.B.

- ☐ [Attenuation and Dispersion for High-T/sub c/
Superconducting Microstrip Lines](#)

El-Deeb, N.A.

- ☐ [An Improved Design of Systems Based on Three Coupled
Microstrip Lines \(Short Papers\)](#)

El-Ghazaly, S.M.

- ☐ [Electromagnetic and Transport Considerations in
Subpicosecond Photoconductive Switch Modeling](#)
- ☐ [Traveling-Wave Inverted-Gate Field-Effect Transistors:
Concept, Analysis, and Potential](#)

El-Sawy, Y.A.R.

- ☐ [Parallel Processing Application to Nonlinear Microwave
Network Design \(Dec. 1989 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

El-Sharawy, E.-B.

- ☐ Analysis and Design of Microstrip-Slot Line for Phase Shifting Applications
- ☐ Full-Wave Analysis of an Infinitely Long Magnetic Surface Wave Transducer

Ellena, G.

- ☐ Analog Avalanche Diode Frequency Division (Short Papers)

Elliott, R.S.

- ☐ Improved Design of Multihole Directional Couplers Using an Iterative Technique
- ☐ Tapered Transmission Lines with a Controlled Ripple Response

Elliott, S.S.

- ☐ Optical Receiver and Modulator Frequency Response Measurement with a Nd:YAG Ring Laser Heterodyne Technique

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ellison, W.J.

- ☐ [Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media](#)

Enders, A.

- ☐ [An Accurate Measurement Technique for Line Properties, Junction Effects, and Dielectric and Magnetic Material Parameters](#)

Eng, S.T.

- ☐ [Phase and Amplitude Characteristics of InP: Fe Modified Interdigitated Gap Photoconductive Microwave Switches](#)

Engheta, N.

- ☐ [Mode Orthogonality in Chirowaveguides](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Epstein, B.R.

- ❑ [Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique](#)

Escarmant, J.-F.

- ❑ [Anisotropic Measurements of Rubber Sheets with an X-Band Three-Wave Interferometer \(Short Papers\)](#)
- ❑ [Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media](#)

Escotte, L.

- ❑ [Semidistributed Model of Millimeter-Wave FET for S-Parameter and Noise Figure Predictions](#)

Esfandiari, R.

- ❑ [GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz](#)

Click on title for a paper summary.



Papers by Author

Esman, R.D.

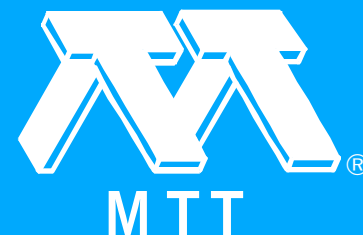
- ☐ [Optical Phase Control of an Optically Injection-Locked FET Microwave Oscillator](#)

Espes, P.

- ☐ [Asymmetrical Finline for Space Applications Using Millimeter Waves](#)

Eswarappa

- ☐ [A Two-Dimensional Transmission Line Matrix Microwave Field Simulator Using New Concepts and Procedures](#)
- ☐ [Finline in Rectangular and Circular Waveguide Housings Including Substrate Mounting and Bending Effects--Finite Element Analysis](#)
- ☐ [Transmission Line Matrix Modeling of Dispersive Wide-Band Absorbing Boundaries with Time-Domain Diakoptics for S-Parameter Extraction](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Eul, H.-J.

- ☐ [A Self-Calibration Concept for Establishing the Complex Measurement Ability of Homodyne Network Analyzers](#)
- ☐ [A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications \(Comments and Reply\)](#)

Ezzeddine, A.K.

- ☐ [An MMAC C-Band FET Feedback Power Amplifier](#)

Fache, N.

- ☐ [Circuit Parameters for Single and Coupled Microstrip Lines by a Rigorous Full-Wave Space-Domain Analysis \(Short Papers\)](#)
- ☐ [Full-Wave Analysis of a Perfectly Conducting Wire Transmission Line in a Double-Layered Conductor-Backed Medium](#)
- ☐ [New High-Frequency Circuit Model for Coupled Lossless and Lossy Waveguide Structures](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Fan, D.

- ☐ [Computer-Aided Design of E-Plane Waveguide Passive Components](#)

Fan, P.

- ☐ [Computer-Aided Design of E-Plane Waveguide Passive Components](#)

Fang, D.G.

- ☐ [Waveguide Discontinuity Analysis with a Coupled Finite-Boundary Element Method](#)

Faraji-Dana, R.

- ☐ [The Current Distribution and AC Resistance of a Microstrip Structure](#)

Feldman, M.J.

- ☐ [An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions](#)

Click on title for a paper summary.



Papers by Author

Fenderson, G.L.

- ❑ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)

Feng, I.-J.

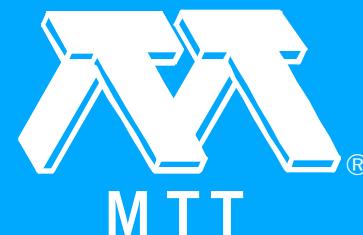
- ❑ [Propagation Modes and Dispersion Characteristics of Coplanar Waveguides](#)

Feng, S.

- ❑ [Generation and Shaping of Megawatt High-Voltage Pulses by Optoelectronic Technique](#)

Fetterman, H.

- ❑ [Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT \(Short Papers\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Fetterman, H.R.

- ☐ [Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T/sub c/ Superconducting Thin Films \(Short Papers\)](#)
- ☐ [Millimeter-Wave Generation and Characterization of a GaAs FET by Optical Mixing](#)
- ☐ [Printed Circuit Antennas with Integrated FET Detectors for Millimeter-Wave Quasi Optics](#)

Fikart, J.L.

- ☐ [FET Up-Converter Design Using Load-Dependent Mixing Transconductance](#)

Fikioris, G.J.

- ☐ [Exact Solutions for Shielded Printed Microstrip Lines by the Carleman-Vekua Method](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Fikioris, J.G.

- ❑ [Exact Solutions for Shielded Printed Microstrip Lines by the Carleman-Vekua Method](#)

Filicori, F.

- ❑ [Physical Modeling of GaAs MESFET's in an Integrated CAD Environment: From Device Technology to Microwave Circuit Performance](#)

Finch, K.L.

- ❑ [Shunt Posts in Microstrip Transmission Lines](#)

Fines, J.

- ❑ [A Multi-IMPATT Injection-Locked Oscillator at 35 GHz](#)

Flynn, E.J.

- ❑ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Follot, G.

- ☐ [A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications](#)

Foster, K.R.

- ☐ [Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique](#)

Fourrier-Lamer, A.

- ☐ [Broad-Band Simultaneous Measurement of Complex Permittivity and Permeability Using a Coaxial Discontinuity](#)

Freire, J.C.

- ☐ [Design Technique for MESFET Mixers for Maximum Conversion Gain](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Frey, J.

- ☐ [Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation](#)

Frezza, F.

- ☐ [The Transition Region Between Bound-Wave and Leaky-Wave Ranges for a Partially Dielectric-Loaded Open Guiding Structure \(Dec. 1990 \[T-MTT\]\)](#)

Fricke, K.

- ☐ [A New GaAs Power MESFET Structure for Improved Power Capabilities](#)

Froelich, R.K.

- ☐ [An Improved Model for Noise Characterization of Microwave GaAs FET's](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Fukai, I.

- ❑ Three-Dimensional Analysis of a Cylindrical Waveguide Converter for Circular Polarization by the Spatial Network Method
- ❑ Three-Dimensional Analysis of a Through Hole with Radiation Characteristics by the Spatial Network Method

Fukui, K.

- ❑ Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures

Furse, C.M.

- ❑ Improvements to the Finite-Difference Time-Domain Method for Calculating the Radar Cross Section of a Perfectly Conducting Target

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Fuseya, Y.

- ☐ Numerical Simulation of GaAs MESFET's with a p-Buffer Layer on the Semi-Insulating Substrate Compensated by Deep Traps

Gajda, G.B.

- ☐ A FET Amplifier in Finline Technique (Short Papers)

Gallagher, W.J.

- ☐ An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions

Gamand, P.

- ☐ Analysis of the Oscillation Conditions in Distributed Amplifiers (Short Papers)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Gandhi, O.P.

- ☐ Electromagnetic Deposition in an Anatomically Based Model of Man for Leakage Fields of a Parallel-Plate Dielectric Heater
- ☐ Improvements to the Finite-Difference Time-Domain Method for Calculating the Radar Cross Section of a Perfectly Conducting Target
- ☐ Numerical Simulation of Annular Phased Arrays for Anatomically Based Models Using the FDTD Method

Gans, M.J.

- ☐ A Dielectric-Free Superconducting Coaxial Cable
- ☐ Machined Waveguide Twist (Short Papers)

Ganss-Puchstein, R.

- ☐ Analysis and Measurement of Transducer End Radiation in SAW Filters on Strongly Coupling Substrates

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Gao, B.

- ☐ [Deterministic Approach to Full-Wave Analysis of Discontinuities in MIC's Using the Method of Lines](#)

Garcia, P.

- ☐ [Optimization of Planar Devices by the Finite Element Method](#)

Garcia-Molina, R.

- ☐ [Reflection of Electromagnetic Waves from Rough Waveguides \(Short Papers\)](#)

Gardner, P.D.

- ☐ [Wide-Band GaInAs MISFET Amplifiers \(Short Papers\)](#)

Gatti, G.

- ☐ [Measurement and Simulation of Memory Effects in Predistortion Linearizers](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Gauthier, S.

- ❑ Shift of the Complex Resonance Frequency of a Dielectric-Loaded Cavity Produced by Small Sample Insertion Holes (Short Papers)

Gee, C.M.

- ❑ Long Microwave Delay Fiber-Optic Link for Radar Testing (Short Papers)

Geissberger, A.E.

- ❑ C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process
- ❑ Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency
- ❑ GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications

Click on title for a paper summary.



Papers by Author

- ❑ Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits

Gerard, H.

- ❑ A New Approach to the RF Power Operation of MESFET's

German, F.J.

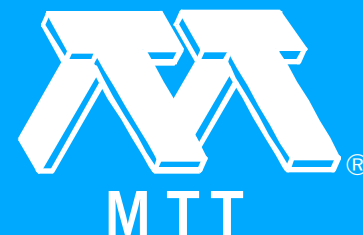
- ❑ Bandwidth Properties of Rectangular T-Septum Waveguides (Short Papers)

Gesche, R.

- ❑ Improving the Characteristics of Rectangular Waveguide Branchings by Cylindrical Obstacles
- ❑ Two Cylindrical Obstacles in a Rectangular Waveguide--Resonances and Filter Applications

Geyi, W.

- ❑ Numerical Solution of Transmission Line Problems by a Network Model Decomposition Method Based on Polygon Discretization



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ghiasi, A.

- ☐ [Novel Wide-Bandwidth Matching Technique for Laser Diodes \(Short Papers\)](#)

Ghione, G.

- ☐ [Modeling of Multiconductor Buses and Analysis of Crosstalk, Propagation Delay, and Pulse Distortion in High-Speed GaAs Logic Circuits](#)
- ☐ [Physical Modeling of GaAs MESFET's in an Integrated CAD Environment: From Device Technology to Microwave Circuit Performance](#)

Giaux, G.

- ☐ [Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Gibbs, A.J.

- ☐ [Optoelectronic Measurements of Picosecond Electrical Pulse Propagation in Coplanar Waveguide Transmission Lines](#)

Gibson, A.A.P.

- ☐ [Cutoff Spaces of Elliptical Gyromagnetic Planar Circuits and Waveguides Using Finite Elements](#)
- ☐ [Finite Element Solution of Longitudinally Magnetized Elliptical Gyromagnetic Waveguides](#)

Gierlowski, P.

- ☐ [Microwave Detectors Based on Granular High-Tc Thin Films \(Feb. 1990 \[T-MTT\]\)](#)

Gilb, J.P.

- ☐ [Pulse Distortion on Multilayer Coupled Microstrip Lines](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Gilb, J.P.K.

- ☐ [Transient Analysis of Distortion and Coupling in Lossy Coupled Microstrips \(Dec. 1990 \[T-MTT\]\)](#)

Glenn, M.

- ☐ [5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier](#)
- ☐ [5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier](#)
- ☐ [High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz](#)

Gluckstern, R.L.

- ☐ [Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen](#)
- ☐ [Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen \(Corrections\)](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Goebel, U.

- ☐ [Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter-Wave Circuits \(Dec. 1989 \[T-MTT\]\)](#)

Goel, J.

- ☐ [Foreword \(Sep. 1989 \[T-MTT\]\)](#)

Goldberg, D.A.

- ☐ [Modes of Elliptical Waveguides: A Correction](#)

Goldberg, L.

- ☐ [Optical Phase Control of an Optically Injection-Locked FET Microwave Oscillator](#)

Goldfarb, M.E.

- ☐ [Losses in GaAs Microstrip \(Dec. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author

Goldhar, J.

- ❑ [Generation and Shaping of Megawatt High-Voltage Pulses by Optoelectronic Technique](#)

Goldsmith, P.F.

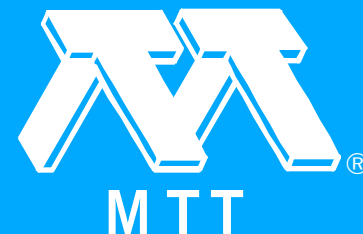
- ❑ [Flexible Circular Waveguides at Millimeter Wavelengths from Metallized Teflon Tubing \(Short Papers\)](#)

Golio, J.M.

- ❑ [A Highly Integrated Two Channel MMIC Down Converter with Gain Control](#)

Goloubkoff, M.

- ❑ [Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers \(Short Papers\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Gombar, A.

- ☐ [Laser-Activated p-i-n Diode Switch for RF Application \(Short Papers\)](#)

Goossen, K.W.

- ☐ [Modeling of Picosecond Pulse Propagation in Microstrip Interconnections on Integrated Circuits](#)

Gopal, M.K.

- ☐ [Gaussian Beam Representation of Aperture Fields in Layered, Lossy Media: Simulation and Experiment](#)

Gopinath, A.

- ☐ [Impedance and Switching of GaAs p-i-n Diodes \(Short Papers\)](#)
- ☐ [Modeling of Ge-Si Heterojunction Bipolar Transistors for Use in Silicon Monolithic Millimeter-Wave Integrated Circuits](#)

Click on title for a paper summary.



Papers by Author

- ❑ [Novel Wide-Bandwidth Matching Technique for Laser Diodes \(Short Papers\)](#)

Gorman, G.M.

- ❑ [GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications](#)

Goth, P.

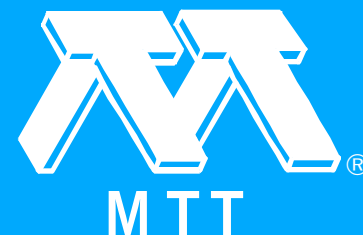
- ❑ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Goutoule, J.-M.

- ❑ [Asymmetrical Finline for Space Applications Using Millimeter Waves](#)

Gouzien, P.

- ❑ [A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

[Contents](#)

[Authors](#)

Goyal, R.

- ☐ [A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter \(Short Papers\)](#)
- ☐ [A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception](#)
- ☐ [Guest Editorial \(Sep. 1990 \[T-MTT\]\)](#)

Graffeuil, J.

- ☐ [Output Conductance Frequency Dispersion and Low-Frequency Noise in HEMT's and MESFET's \(Short Papers\)](#)

Gragnani, G.L.

- ☐ [Equivalent Current Density Reconstruction for Microwave Imaging Purposes](#)
- ☐ [Two-Dimensional Microwave Imaging by a Numerical Inverse Scattering Solution](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Green, H.E.

- ☐ [Conductor Geometry Independence of Phase Velocity in TEM-Mode Transmission Lines \(Letters\)](#)
- ☐ [Determination of the Cutoff of the First Higher Order Mode in a Coaxial Line by the Transverse Resonance Technique \(Short Papers\)](#)

Gregory, P.

- ☐ [Monolithic 9 to 70 GHz Distributed Amplifier](#)

Greiling, P.T.

- ☐ [The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications](#)

Griffin, E.

- ☐ [Multifunction Chip Set for T/R Module Receive Path \(1990 \[MCS\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Griffin, E.J.

- ☐ [A Millimeter-Wave Six-Port Reflectometer Using Dielectric Waveguide](#)

Griffin, E.L.

- ☐ [C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process](#)
- ☐ [Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency](#)
- ☐ [GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications](#)
- ☐ [Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits](#)
- ☐ [Multifunction Small-Signal Chip Set for Transmit/Receive Modules](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Griffith, J.R.

- ☐ [Time-Domain Analysis of Lossy Coupled Transmission Lines](#)

Grischkowsky, D.R.

- ☐ [Characterization of an Optoelectronic Terahertz Beam System](#)

Gronau, G.

- ☐ [A Simple Broad-Band Device De-Embedding Method Using an Automatic Network Analyzer with Time-Domain Option](#)

Grondin, R.O.

- ☐ [Electromagnetic and Transport Considerations in Subpicosecond Photoconductive Switch Modeling](#)

Grutzmacher, D.

- ☐ [MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron \(FECTED\) Oscillators](#)

Click on title for a paper summary.



Papers by Author

Grzyb, J.A.

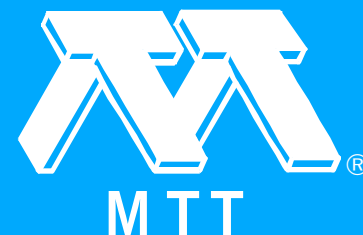
- ❑ [Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits](#)

Guffey, W.

- ❑ [Three Channel I.F. Multiplexers](#)

Guglielmi, M.

- ❑ [Low-Frequency Location of the Leaky-Wave Poles for a Dielectric Layer \(Short Papers\)](#)
- ❑ [Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part I: Rigorous Network Formulations](#)
- ❑ [Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part II: Small-Aperture and Small-Obstacle Solutions](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

- ❑ Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part III: Rigorous Solution
- ❑ Rigorous, Multimode Equivalent Network Representation of Inductive Discontinuities

Guillon, P.

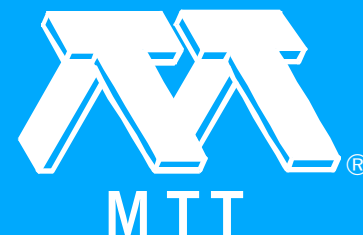
- ❑ Dielectric Resonators Suitable for Use in Planar Integrated Circuits at Short Millimeter Wavelengths (Short Papers)
- ❑ Whispering Gallery Dielectric Resonator Modes for W-Band Devices

Guillory, D.M.

- ❑ Results of Phase and Injection Locking of an Orotron Oscillator (Short Papers)

Gunn, J.M.F.

- ❑ Reflection of Electromagnetic Waves from Rough Waveguides (Short Papers)



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Gustafson, G.

- ☐ [Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect \(Short Papers\)](#)

Gutmann, R.J.

- ☐ [GaAs MESFET Baseband-to-Microwave Passive Switches \(Comments and Reply\)](#)
- ☐ [Modeling and Design of GaAs MESFET Control Devices for Broad-Band Applications](#)

Gutscher, W.D.

- ☐ [A Statistical Method for Calibrating the Six-Port Reflectometer Using Nonideal Standards \(Short Papers\)](#)

Habashy, T.M.

- ☐ [Resonance in Cylindrical-Rectangular and Wraparound Microstrip Structures](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Haddad, G.I.

- ☐ [Power and Stability Limitations of Resonant Tunneling Diodes](#)

Hafizi, M.E.

- ☐ [GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz](#)

Hagen, J.B.

- ☐ [Noise Parameter Transformations for Three-Terminal Amplifiers \(Short Papers\)](#)

Halbout, J.-M.

- ☐ [Broad-Band Microwave Measurements with Transient Radiation from Optoelectronically Pulsed Antennas](#)

Halemane, T.R.

- ☐ [Distortion Characteristics of Optical Directional Coupler Modulators \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Halkias, G.

- ☐ [A New Approach to the RF Power Operation of MESFET's](#)

Hammond, R.B.

- ☐ [Modeling of Picosecond Pulse Propagation in Microstrip Interconnections on Integrated Circuits](#)

Han, K.

- ☐ [Coupled-Wave Small-Signal Transient Analysis of GaAs Distributed Amplifier](#)

Hansen, R.K.

- ☐ [High-Dynamic-Range Airborne Tracking and Fire Control Radar Subsystems](#)

Hara, S.

- ☐ [Broad-Band Monolithic Microwave Active Inductor and its Application to Miniaturized Wide-Band Amplifiers \(Correction\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

- ❑ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part I
- ❑ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part II
- ❑ Lossless Broad-Band Monolithic Microwave Active Inductors (Dec. 1989 [T-MTT])
- ❑ Novel Unilateral Circuits for MMIC Circulators
- ❑ Very Small Ultra-Wide-Band MMIC Magic T and Applications to Combiners and Dividers

Hardy, W.N.

- ❑ Effects of Gain Compression, Bias Conditions, and Temperature on the Flicker Phase Noise of an 8.5 GHz GaAs MESFET Amplifier (Short Papers)

Harokopus, Jr., W.P.

- ❑ Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Harokopus, Jr., WP.

- ❑ [Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses \(Corrections\)](#)

Harrington, R.F.

- ❑ [Full-Wave Analysis of a Strip Crossover](#)
- ❑ [The Equivalent Circuit of a Microstrip Crossover in a Dielectric Substrate](#)

Hartnagel, H.L.

- ❑ [A Basic Concept to Reduce the Frequency Distortion of Distributed Amplifiers \(Letters\)](#)
- ❑ [A New GaAs Power MESFET Structure for Improved Power Capabilities](#)

Hashimoto, K.

- ❑ [A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Hassan, E.E.

- ❑ [Field Solution and Propagation Characteristics of Monofilar-Bifilar Modes of Axially Slotted Coaxial Cable](#)

Hata, S.

- ❑ [A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver \(Dec. 1990 \[T-MTT\]\)](#)

Hattori, J.

- ❑ [Dielectric Receiving Filter with Sharp Stopband Using an Active Feedback Resonator Method for Cellular Base Stations \(Dec. 1989 \[T-MTT\]\)](#)

Hay, R.G.

- ❑ [Results of Phase and Injection Locking of an Orotron Oscillator \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Hayama, N.

- ☐ [A Low-Noise Microwave Oscillator Employing a Self-Aligned AlGaAs/GaAs HBT \(Short Papers\)](#)

Hayata, K.

- ☐ [Finite Element Formulation for Guided-Wave Problems Using Transverse Electric Field Component \(Short Papers\)](#)
- ☐ [Full Vectorial Finite Element Formalism for Lossy Anisotropic Waveguides](#)

Hechtman, C.D.

- ☐ [Transient Analysis of Nonuniform, High-Pass Transmission Lines](#)

Heim, P.J.

- ☐ [Frequency Division Multiplexed Microwave and Baseband Digital Optical Fiber Link for Phased Array Antennas](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Heime, K.

- ☐ RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures

Heinrich, W.

- ☐ Full-Wave Analysis of Conductor Losses on MMIC Transmission Lines (Oct. 1990 [T-MTT])
- ☐ High-Frequency MESFET Noise Modeling Including Distributed Effects
- ☐ High-Frequency MESFET Noise Modeling Including Distributed Effects (Corrections)

Helszajn, J.

- ☐ Cutoff Spaces of Elliptical Gyromagnetic Planar Circuits and Waveguides Using Finite Elements
- ☐ Finite Element Solution of Longitudinally Magnetized Elliptical Gyromagnetic Waveguides

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Herczfeld, P.R.

- ☐ [Guest Editorial \(May 1990 \[T-MTT\]\)](#)

Heron, P.L.

- ☐ [Harmonic Balance and Frequency-Domain Simulation of Nonlinear Microwave Circuits Using the Block Newton Method \(Short Papers\)](#)
- ☐ [Jacobian Calculation Using the Multidimensional Fast Fourier Transform in the Harmonic Balance Analysis of Nonlinear Circuits \(Short Papers\)](#)

Heston, D.D.

- ☐ [A New Low-Noise FET Structure](#)

Higgins, J.A.

- ☐ [Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Hill, D.A.

- ☐ [Reflection Coefficient of a Waveguide with Slightly Uneven Walls](#)

Hill, S.C.

- ☐ [Three-Dimensional SAR Distributions Computed in a Multilayered Cylindrical Model for Electromagnetic Hyperthermia](#)

Hiller, G.

- ☐ [Establishing the Minimum Reverse Bias for a p-i-n Diode in a High-Power Switch](#)
- ☐ [The Frequency-Dependent Impedance of p-i-n Diodes \(Short Papers\)](#)

Hindy, M.A.

- ☐ [Optimized Method for Obtaining Permittivity and Conductivity Profiles of Microwave Materials \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Hiraoka, T.

- ☐ [A Miniaturized Broad-Band MMIC Frequency Doubler](#)
- ☐ [Very Small Wide-Band MMIC Magic T's Using Microstrip Lines on a Thin Dielectric Film](#)

Hirayama, K.

- ☐ [Analysis of Discontinuities in an Open Dielectric Slab Waveguide by Combination of Finite and Boundary Elements](#)
- ☐ [Numerical Analysis of Arbitrarily Shaped Discontinuities Between Planar Dielectric Waveguides with Different Thicknesses](#)

Hirota, T.

- ☐ [Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer](#)
- ☐ [Reduced-Size Branch-Line and Rat-Race Hybrids for Uniplanar MMIC's](#)

Click on title for a paper summary.



Papers by Author

- Uniplanar Monolithic Frequency Doublers

Hiruma, K.

- A New Self-Alignment Technology for Sub-Quarter-Micron-Gate FET's Operating in the Ka-Band

Hjipieris, G.

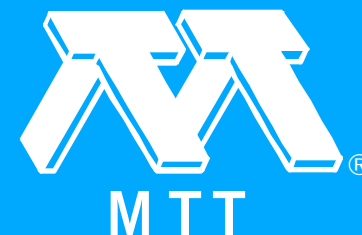
- A Millimeter-Wave Six-Port Reflectometer Using Dielectric Waveguide

Ho, T.Q.

- Scattering Parameters of E-Plane Printed Opposite Fin in Waveguide (Short Papers)
- Spectral-Domain Analysis of E-Plane Waveguide to Microstrip Transitions

Ho, W.J.

- Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



Contents

Authors

Hochstadt, H.

- ❑ [Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part III: Rigorous Solution](#)

Hoefer, W.J.R.

- ❑ [A FET Amplifier in Finline Technique \(Short Papers\)](#)
- ❑ [A Local Mesh Refinement Algorithm for the Time Domain Finite Difference Method Using Maxwell's Curl Equations \(Short Papers\)](#)
- ❑ [A Quasi-Planar FET Amplifier in Integrated Finline and Microstrip Technique \(Short Papers\)](#)
- ❑ [A Two-Dimensional Transmission Line Matrix Microwave Field Simulator Using New Concepts and Procedures](#)
- ❑ [Finlines in Rectangular and Circular Waveguide Housings Including Substrate Mounting and Bending Effects--Finite Element Analysis](#)
- ❑ [Oscillators and Amplifiers in Integrated E-Plane Technique](#)

Click on title for a paper summary.



Papers by Author

- ❑ [p-i-n Diode Control Devices in E-Plane Technique](#)
- ❑ [Transmission Line Matrix Modeling of Dispersive Wide-Band Absorbing Boundaries with Time-Domain Diakoptics for S-Parameter Extraction](#)

Hogan, K.M.

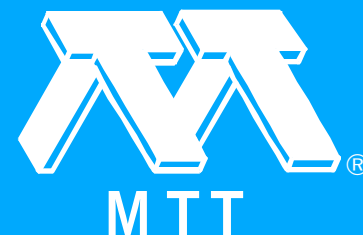
- ❑ [K/sub u/- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts \(1990 \[MCS\]\)](#)

Holloway, C.L.

- ❑ [Comparison of Approximations for Effective Parameters of Artificial Dielectrics \(Short Papers\)](#)

Homentcovschi, D.

- ❑ [A Cylindrical Multiconductor Stripline-Like Microstrip Transmission Line](#)
- ❑ [An Analytical Solution for the Coupled Stripline-Like Microstrip Line Problem \(Corrections\)](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

- ❑ [An Analytical Solution to the Microstrip Line Problem](#)

Honjo, K.

- ❑ [A Low-Noise Microwave Oscillator Employing a Self-Aligned AlGaAs/GaAs HBT \(Short Papers\)](#)

Hopfer, S.

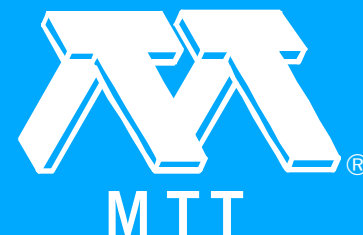
- ❑ [The Design of Millimeter-Wave Control Components](#)

Horio, K.

- ❑ [Numerical Simulation of GaAs MESFET's with a p-Buffer Layer on the Semi-Insulating Substrate Compensated by Deep Traps](#)

Horng, T.-S.

- ❑ [A Generalized Method for Distinguishing Between Radiation and Surface-Wave Losses in Microstrip Discontinuities](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Horno, M.

- ❑ Capacitance Computation of Elliptic Microstrip Disks in Biaxial Anisotropic Multilayered Substrates
- ❑ Capacitance Parameters of Coupled Elliptic Microstrip Disks in Layered Anisotropic Media (Short Papers)
- ❑ Generalized Spectral Analysis of Planar Lines on Layered Media Including Uniaxial and Biaxial Dielectric Substrates
- ❑ Lumped Capacitance and Open End Effects of Striplike Structures in Multilayered and Anisotropic Substrates
- ❑ Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses
- ❑ Spectral and Variational Analysis of Generalized Cylindrical and Elliptical Strip and Microstrip Lines

Horton, J.B.

- ❑ Selected Technology Summaries for Microwave Theory and Techniques--1988

Click on title for a paper summary.



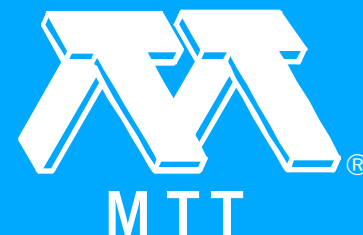
Papers by Author

Houston, D.E.

- ☐ [A Novel Aperture Isolation Circuit for Use in Phased Array Systems](#)
- ☐ [A Novel Aperture-Isolation Circuit for Use in Phased Array Systems](#)

Howes, M.J.

- ☐ [A Large-Signal Physical MESFET Model for Computer-Aided Design and its Applications](#)
- ☐ [A New Model for the Dual-Gate GaAs MESFET](#)
- ☐ [Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits](#)
- ☐ [Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits \(Comments and Reply\)](#)
- ☐ [Nonlinear Circuit Analysis of Harmonic and Intermodulation Distortions in Laser Diodes Under Microwave Direct Modulation](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Hsu, C.G.

- ❑ [Multiple Dielectric Posts in a Rectangular Waveguide \(Corrections\)](#)

Hsue, C.-W.

- ❑ [Elimination of Ringing Signals for a Lossless, Multiple-Section Transmission Line](#)
- ❑ [Transient Analysis of Nonuniform, High-Pass Transmission Lines](#)

Hu, Y.

- ❑ [Nonlinear Analysis of Microwave FET Oscillators Using Volterra Series](#)

Huang, C.

- ❑ [Message from the Technical Program Chairman \(1990 \[MCS\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Huang, D.-H.

- ☐ [DC and Transmission Line Models for a High Electron Mobility Transistor](#)

Huang, H.C.

- ☐ [An MMAC C-Band FET Feedback Power Amplifier](#)
- ☐ [Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique](#)

Huang, J.

- ☐ [Ka-Band MMIC Beam-Steered Transmitter Array \(Short Papers\)](#)

Huang, S.-Y.

- ☐ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Hudgens, R.D.

- ☐ [5 W Monolithic HBT Amplifier for Broadband X-Band Applications](#)

Huff, D.B.

- ☐ [Optoelectronic Isolator for Microwave Applications](#)
- ☐ [Reduced Insertion Loss of X-Band RF Fiber-Optic Links \(Short Papers\)](#)

Hummer, K.A.

- ☐ [Experiments on Injection Locking of Active Antenna Elements for Active Phased Arrays and Spatial Power Combiners](#)

Hung, H.-L.A.

- ☐ [An MMAC C-Band FET Feedback Power Amplifier](#)
- ☐ [Intermixing Optical and Microwave Signals in GaAs Microstrip Circuits for Phase-Locking Applications](#)

Click on title for a paper summary.



Papers by Author

- ❑ Millimeter-Wave Monolithic Integrated Circuit
Characterization by a Picosecond Optoelectronic Technique

Hurwitz, R.

- ❑ Laser-Activated p-i-n Diode Switch for RF Application (Short Papers)

Huting, W.A.

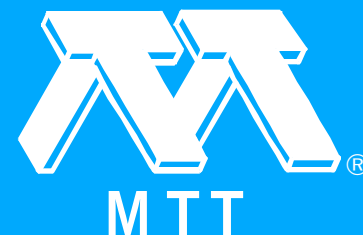
- ❑ Numerical Solution of the Continuous Waveguide Transition Problem

Hwang, V.D.

- ❑ A 2.5 Watt X-Band High Efficiency MMIC Amplifier
- ❑ Nonlinear Modeling and Verification of MMIC Amplifiers
Using the Waveform-Balance Method

Hyde, J.S.

- ❑ p-i-n Diode Attenuator with Small Phase Shift (Additional Comments and Reply)



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Iezekiel, S.

- ☐ [Nonlinear Circuit Analysis of Harmonic and Intermodulation Distortions in Laser Diodes Under Microwave Direct Modulation](#)

Iijima, T.

- ☐ [Frequency-Dependent Characteristics of Current Distributions on Microstrip Lines \(Short Papers\)](#)

Imai, N.

- ☐ [A 30 GHz MMIC Receiver for Satellite Transponders](#)
- ☐ [Novel Linearize Using Balanced Circulators and its Application to Multilevel Digital Radio Systems](#)

In, Y.-A.

- ☐ [Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ino, M.

- ☐ [Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer](#)

Inoue, K.

- ☐ [Three-Dimensional Finite-Element Solution of Dielectric Scattering Obstacles in a Rectangular Waveguide](#)

Ise, K.

- ☐ [Equivalent Circuits for Dielectric Posts in a Rectangular Waveguide \(Short Papers\)](#)
- ☐ [Three-Dimensional Finite-Element Solution of Dielectric Scattering Obstacles in a Rectangular Waveguide](#)

Ishibashi, K.

- ☐ [Three-Dimensional Analysis of Electromagnetic Fields in Rectangular Waveguides by the Boundary Integral Equation Method](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ishii, T.K.

- ☐ [Electromagnetic Field Analysis and Calculation of the Resonance Characteristics of the Loop-Gap Resonator](#)
- ☐ [p-i-n Diode Attenuator with Small Phase Shift \(Additional Comments and Reply\)](#)

Ishikawa, Y.

- ☐ [Dielectric Receiving Filter with Sharp Stopband Using an Active Feedback Resonator Method for Cellular Base Stations \(Dec. 1989 \[T-MTT\]\)](#)

Ishitsuka, F.

- ☐ [A 30 GHz MMIC Receiver for Satellite Transponders](#)
- ☐ [A Compact Full MMIC Module for Ku-Band Phase-Locked Oscillators](#)

Ishizaki, T.

- ☐ [A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Iskander, M.F.

- ☐ Electromagnetic Coupling of Coplanar Waveguides and Microstrip Lines to Highly Lossy Dielectric Media
- ☐ Performance Comparison of Available Interstitial Antennas for Microwave Hyperthermia

Islam, S.

- ☐ A New Analytic Design Technique for Two-and Three-Way Warped Mode Compline Directional Couplers

Israel, M.

- ☐ Hermitian Finite-Element Method for Inhomogeneous Waveguides

Itoh, T.

- ☐ A Periodic Planar Gunn Diode Power Combining Oscillator (Short Papers)
- ☐ Characterization of Uniform Microstrip Line and its Discontinuities Using the Time-Domain Method of Lines

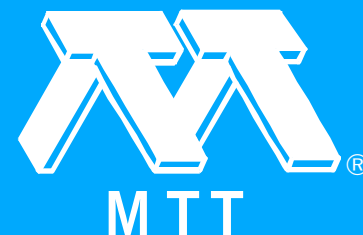
Click on title for a paper summary.



Papers by Author

- ❑ Computer-Aided Design of Evanescent Mode Waveguide Bandpass Filter with Nontouching E-Plane Fins
- ❑ FET-Based Planar Circuits for Quasi-Optical Sources and Transceivers
- ❑ Microwave Active Filters Based on Coupled Negative Resistance Method
- ❑ Microwave and Millimeter-Wave QWITT Diode Oscillators
- ❑ Nonlinear Modeling and Verification of MMIC Amplifiers Using the Waveform-Balance Method
- ❑ Optically Controlled Coplanar Waveguide Phase Shifters
- ❑ Overview of Quasi-Planar Transmission Lines
- ❑ Phenomenological Loss Equivalence Method for Planar Quasi-TEM Transmission Lines with a Thin Normal Conductor or Superconductor
- ❑ Planar FET Oscillators Using Periodic Microstrip Patch Antennas
- ❑ Time-Domain Method of Lines Applied to Planar Guided Wave Structures

Click on title for a paper summary.



Contents

Authors



Papers by Author

- ❑ [Transmission Properties of a Right-Angle Microstrip Bend with and without a Miter \(Short Papers\)](#)
- ❑ [Traveling-Wave Inverted-Gate Field-Effect Transistors: Concept, Analysis, and Potential](#)

Iwashita, K.

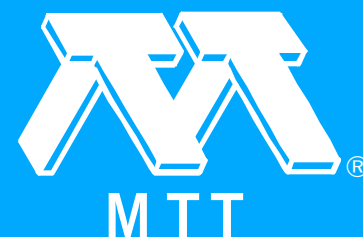
- ❑ [A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver \(Dec. 1990 \[T-MTT\]\)](#)

Izutsu, M.

- ❑ [Integrated Optic Devices for Microwave Applications](#)

Jablonski, D.G.

- ❑ [Attenuation Measurement of Very Low Loss Dielectric Waveguides by the Cavity Resonator Method Applicable in the Millimeter/Submillimeter Wavelength Range \(Comments and Reply\)](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Jablonski, T.F.

- ☐ [Analysis of Dielectric Guiding Structures by the Iterative Eigenfunction Expansion Method](#)

Jachim, S.P.

- ☐ [A Statistical Method for Calibrating the Six-Port Reflectometer Using Nonideal Standards \(Short Papers\)](#)

Jackson, D.R.

- ☐ [Low-Frequency Location of the Leaky-Wave Poles for a Dielectric Layer \(Short Papers\)](#)
- ☐ [Microstrip Open-End and Gap Discontinuities in a Substrate-Superstrate Structure](#)

Jackson, R.W.

- ☐ [Analysis and Design of Microstrip-Slot Line for Phase Shifting Applications](#)
- ☐ [Full-Wave Analysis of an Infinitely Long Magnetic Surface Wave Transducer](#)

Click on title for a paper summary.



Papers by Author

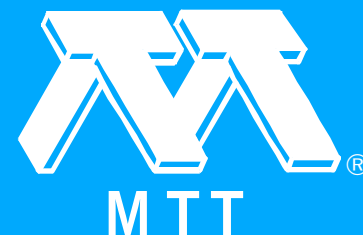
- ❑ Full-Wave, Finite Element Analysis of Irregular Microstrip Discontinuities
- ❑ Mode Conversion at Discontinuities in Finite-Width Conductor-Backed Coplanar Waveguide
- ❑ Surface-to-Surface Transition via Electromagnetic Coupling of Microstrip and Coplanar Waveguide

Jacomb-Hood, A.W.

- ❑ A Novel Aperture Isolation Circuit for Use in Phased Array Systems
- ❑ A Novel Aperture-Isolation Circuit for Use in Phased Array Systems

Jain, F.C.

- ❑ An Analytical Two-Dimensional Perturbation Method to Model Submicron GaAs MESFET's (Short Papers)



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Jain, N.

- ☐ [GaAs MESFET Baseband-to-Microwave Passive Switches \(Comments and Reply\)](#)
- ☐ [Modeling and Design of GaAs MESFET Control Devices for Broad-Band Applications](#)

Janaswamy, R.

- ☐ [Even-Mode Characteristics of the Bilateral Slotline](#)

Jansen, N.

- ☐ [MIMIC Technology Transportability \(1990 \[MCS\]\)](#)

Janton, W.

- ☐ [Laser-Activated p-i-n Diode Switch for RF Application \(Short Papers\)](#)

Jarem, J.M.

- ☐ [The Input Impedance of a Hollow-Probe-Fed, Semi-Infinite Rectangular Waveguide \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author

Jarry, P.

- ❑ [Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers \(Short Papers\)](#)

Jean, P.

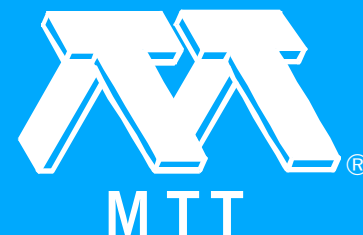
- ❑ [A Multioctave Active GaAs MMIC Quadrature Phase Shifter](#)

Jeng, S.-K.

- ❑ [Frequency-Dependent Characteristics of Open Microstrip Lines with Finite Strip Thickness \(Short Papers\)](#)

Jiao, X.H.

- ❑ [Dielectric Resonators Suitable for Use in Planar Integrated Circuits at Short Millimeter Wavelengths \(Short Papers\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

[Contents](#)

[Authors](#)

Jin, J.-M.

- ☐ [A Moment Method Solution of a Volume-Surface Integral Equation Using Isoparametric Elements and Point Matching \(Short Papers\)](#)

Joachimowicz, N.

- ☐ [Comparison of Three Integral Formulations for the 2-D TE Scattering Problem](#)

Jogiraju, G.V.

- ☐ [Stripline to Microstrip Line Aperture Coupler \(Short Papers\)](#)

Johansson, J.F.

- ☐ [The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications](#)

Johnson, L.M.

- ☐ [An Analytic and Experimental Comparison of Direct and External Modulation in Analog Fiber-Optic Links](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Joines, W.T.

- ☐ [Microwave Hyperthermia Induced by a Phased Interstitial Antenna Array \(Short Papers\)](#)
- ☐ [The Calculated and Measured Temperature Distribution of a Phased Interstitial Antenna Array](#)

Jones, K.M.

- ☐ [Theoretical and Experimental SAR Distributions for Interstitial Dipole Antenna Arrays Used in Hyperthermia](#)

Jorgenson, J.

- ☐ [Multifunction Chip Set for T/R Module Receive Path \(1990 \[MCS\]\)](#)

Jorgenson, J.D.

- ☐ [Multifunction Small-Signal Chip Set for Transmit/Receive Modules](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Joshi, R.P.

- ☐ [Electromagnetic and Transport Considerations in Subpicosecond Photoconductive Switch Modeling](#)

Jovicevic, S.

- ☐ [Boundary Condition Expansion of Basis Functions Method Implemented by Fast Fourier Transform Algorithms](#)

Judah, S.R.

- ☐ [A Dual Six-Port Automatic Network Analyzer Incorporating a Biphas-Bimodulation Element](#)
- ☐ [A Flexible Design Procedure for Microstrip Planar Disk 3 dB Quadrature Hybrids \(Short Papers\)](#)
- ☐ [An Analysis of an N-Port Microstrip Planar Disk Device with an Arbitrarily Located Short Circuit Post of Arbitrary Radius](#)

Jung, G.

- ☐ [Microwave Detectors Based on Granular High-Tc Thin Films \(Feb. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Jung, W.-L.

- ☐ [Stable Broad-Band Microwave Amplifier Design](#)

Jungerman, R.L.

- ☐ [Optical Receiver and Modulator Frequency Response Measurement with a Nd:YAG Ring Laser Heterodyne Technique](#)

Kaertner, F.X.

- ☐ [Determination of the Correlation Spectrum of Oscillators with Low Noise](#)

Kajfez, D.

- ☐ [Analysis of Dielectric Resonator Cavities Using the Finite Integration Technique](#)

Kakogiannos, N.B.

- ☐ [Electromagnetic Scattering from an Infinite Elliptic Metallic Cylinder Coated by a Circular Dielectric One](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kamada, H.

- ☐ [Monolithic Sampling Head IC](#)

Kaneko, T.

- ☐ [Parallel Running System of Three Oscillators Coupled Through a Six-Port Magic Junction](#)

Kanellopoulos, V.N.

- ☐ [A Complete E-Plane Analysis of Waveguide Junctions Using the Finite Element Method](#)

Kapoor, V.J.

- ☐ [Ion-Implanted High Microwave Power Indium Phosphide Transistors](#)

Kashiwa, T.

- ☐ [Three-Dimensional Analysis of a Through Hole with Radiation Characteristics by the Spatial Network Method](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kasten, J.S.

- ❑ [Enhanced Through-Reflect-Line Characterization of Two-Port Measuring Systems Using Free-Space Capacitance Calculation \(Short Papers\)](#)

Katehi, P.B.

- ❑ [A Generalized Method for deriving the Space-Domain Green's Function in a Shielded, Multilayer Substrate Structure with Applications to MIS Slow-Wave Transmission Lines](#)
- ❑ [An Integral Equation Method for the Evaluation of Conductor and Dielectric Losses in High-Frequency Interconnects](#)
- ❑ [Characteristic Impedance and Electromagnetic Field Distribution in Metal-Insulator-Semiconductor Microstrip \(Short Papers\)](#)
- ❑ [Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses](#)

Click on title for a paper summary.



Papers by Author

- ❑ Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses (Corrections)

Kato, H.

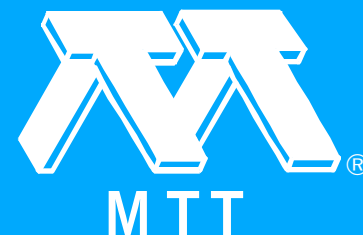
- ❑ A 30 GHz MMIC Receiver for Satellite Transponders
- ❑ A Compact Full MMIC Module for Ku-Band Phase-Locked Oscillators

Katsura, K.

- ❑ A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver (Dec. 1990 [T-MTT])

Katzin, P.J.

- ❑ Monolithic FET Structures for High-Power Control Component Applications



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

[Contents](#)

[Authors](#)

Katzir, A.

- ☐ [An Infrared Fiber-Optic Radiometer for Controlled Microwave Heating \(Short Papers\)](#)

Kaufman, I.

- ☐ [Propagation and Circuit Characteristics of Inductively Coupled Superconducting Microstrip](#)

Kazior, T.E.

- ☐ [A High Power 2-18 GHz T/R Switch \(1990 \[MCS\]\)](#)
- ☐ [A Single Chip 2-20 GHz T/R Module](#)

Kenney, C.S.

- ☐ [Power-Handling Capability of the Rhombic Waveguide](#)

Kerr, A.R.

- ☐ [An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kesan, V.P.

- ☐ [Microwave and Millimeter-Wave QWITT Diode Oscillators](#)

Khanna, A.S.

- ☐ [Large-Signal Computer-Aided Analysis and Design of Silicon Bipolar MMIC Oscillators and Self-Oscillating Mixers](#)

Khatibzadeh, M.A.

- ☐ [5 W Monolithic HBT Amplifier for Broadband X-Band Applications](#)

Khebir, A.

- ☐ [Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities](#)
- ☐ [Higher Order Asymptotic Boundary Condition for the Finite Element Modeling of Two-Dimensional Transmission Line Structures](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kiang, J.-F.

- ☐ [Integral Equation Solution to the Guidance and Leakage Properties of Coupled Dielectric Strip Waveguides](#)
- ☐ [Propagation Properties of Striplines Periodically Loaded with Crossing Strips](#)
- ☐ [Resonance in Cylindrical-Rectangular and Wraparound Microstrip Structures](#)

Kidner, C.

- ☐ [Power and Stability Limitations of Resonant Tunneling Diodes](#)

Kiehl, R.A.

- ☐ [Single-Interface and Quantum-Well Heterostructure MISFET's](#)

Kihata, Y.

- ☐ [A 30 GHz MMIC Receiver for Satellite Transponders](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kikuchi, H.

- ❑ [A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver \(Dec. 1990 \[T-MTT\]\)](#)
- ❑ [Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers](#)

Kim, B.

- ❑ [35 GHz GaAs Power MESFET's and Monolithic Amplifiers](#)

Kim, I.S.

- ❑ [A Local Mesh Refinement Algorithm for the Time Domain Finite Difference Method Using Maxwell's Curl Equations \(Short Papers\)](#)

Kim, M.

- ❑ [Bar-Grid Oscillators](#)

Click on title for a paper summary.



Papers by Author

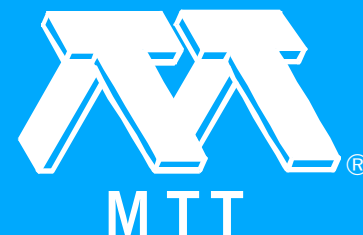
- ❑ Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT (Short Papers)

Kim, M.E.

- ❑ A Monolithic GaAs HBT Upconverter
- ❑ GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz
- ❑ GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications
- ❑ High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz

Kim, Y.-S.

- ❑ The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kim, Y.U.

- ☐ Improved Design of Multihole Directional Couplers Using an Iterative Technique

Kimura, T.

- ☐ Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers

King, R.W.P.

- ☐ Lateral Electromagnetic Waves and Pulses on Open Microstrip
- ☐ Wire and Strip Conductors Over a Dielectric-Coated Conducting or Dielectric Half-Space

Kipnis, I.

- ☐ Large-Signal Computer-Aided Analysis and Design of Silicon Bipolar MMIC Oscillators and Self-Oscillating Mixers

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Kishi, N.

- ☐ [Vectorial Wave Analysis of Uniform-Core Optical Fibers Using a Novel Boundary Integral Method](#)

Kissick, W.A.

- ☐ [Improved Technique for Determining Complex Permittivity with the Transmission/Reflection Method](#)

Kitazawa, T.

- ☐ [Metallization Thickness Effect of Striplines with Anisotropic Media: Quasi-Static and Hybrid-Mode Analysis](#)
- ☐ [Variational Method for Multiconductor Coupled Striplines with Stratified Anisotropic Media](#)
- ☐ [Variational Method for Planar Transmission Lines with Anisotropic Magnetic Media](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kiziloglu, K.

- ☐ [The Nature of the Charges, Currents, and Fields in and About Conductors Having Cross-Sectional Dimensions of the Order of a Skin Depth](#)

Klein, C.A.

- ☐ [Microwave Shielding Effectiveness of EC-Coated Dielectric Slabs \(Short Papers\)](#)

Klein, J.L.

- ☐ [A New Low-Noise FET Structure](#)
- ☐ [Experiments on Injection Locking of Active Antenna Elements for Active Phased Arrays and Spatial Power Combiners](#)

Kleinsasser, A.W.

- ☐ [An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ko, A.

- ☐ [Modal Analysis of Radial-Resonator Waveguide Diode Mounts](#)

Ko, Y.

- ☐ [Three-Dimensional Analysis of a Cylindrical Waveguide Converter for Circular Polarization by the Spatial Network Method](#)

Kobayashi, K.

- ☐ [Equivalent Transformations for the Mixed Lumped Brune-Type Section and Uniform Transmission Line](#)

Kobayashi, K.W.

- ☐ [A Monolithic GaAs HBT Upconverter](#)
- ☐ [GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kobayashi, M.

- ☐ [Frequency-Dependent Characteristics of Current Distributions on Microstrip Lines \(Short Papers\)](#)

Kobayashi, S.

- ☐ [Monolithic Sampling Head IC](#)

Kobrin, P.

- ☐ [Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T_c/ Superconducting Thin Films \(Short Papers\)](#)

Kolk, E.W.

- ☐ [Domain Integral Equation Analysis of Integrated Optical Channel and Ridge Waveguides in Stratified Media](#)

Kollberg, E.L.

- ☐ [Spectral-Domain Analysis of Harmonic Effects in Superconducting Quasiparticle Mixers](#)

Click on title for a paper summary.



Papers by Author

- ❑ [The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications](#)

Komiak, J.J.

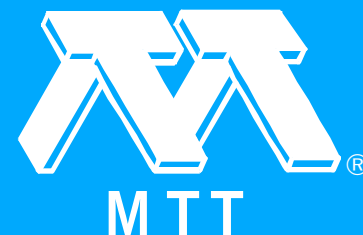
- ❑ [Design and Performance of an Octave Band 11 Watt Power Amplifier MMIC](#)
- ❑ [Octave Band Eleven Watt Power Amplifier MMIC](#)

Kompa, G.

- ❑ [Error-Corrected Large-Signal Waveform Measurement System Combining Network Analyzer and Sampling Oscilloscope Capabilities](#)
- ❑ [Precisely Calibrated Coaxial-to-Microstrip Transitions Yield Improved Performance in GaAs FET Characterization](#)

Kong, J.A.

- ❑ [Application of the Three-Dimensional Finite-Difference Time-Domain Method to the Analysis of Planar Microstrip Circuits](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

- ❑ Integral Equation Solution to the Guidance and Leakage Properties of Coupled Dielectric Strip Waveguides
- ❑ Propagation Properties of Striplines Periodically Loaded with Crossing Strips
- ❑ Resonance in Cylindrical-Rectangular and Wraparound Microstrip Structures

Kong, K.-S.

- ❑ Computer-Aided Design of Evanescent Mode Waveguide Bandpass Filter with Nontouching E-Plane Fins

Konishi, Y.

- ❑ GaAs Devices and the MIC Applications in Satellite Broadcasting

Konopka, A.

- ❑ Microwave Detectors Based on Granular High-Tc Thin Films (Feb. 1990 [T-MTT])

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Konopka, J.

- ☐ [Microwave Detectors Based on Granular High-Tc Thin Films \(Feb. 1990 \[T-MTT\]\)](#)

Kopcsay, G.V.

- ☐ [Broad-Band Microwave Measurements with Transient Radiation from Optoelectronically Pulsed Antennas](#)

Korotky, S.K.

- ☐ [Distortion Characteristics of Optical Directional Coupler Modulators \(Short Papers\)](#)

Korzeniowski, T.L.

- ☐ [The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications](#)

Koscica, T.E.

- ☐ [Wide-Band Ground-Plane dc Block and Bias Feed \(Short Papers\)](#)

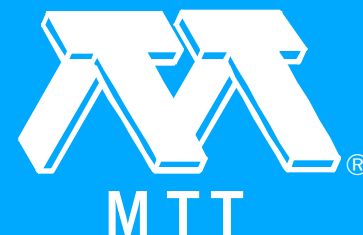
Click on title for a paper summary.



Papers by Author

Koshiba, M.

- ❑ [Analysis of Discontinuities in an Open Dielectric Slab Waveguide by Combination of Finite and Boundary Elements](#)
- ❑ [Equivalent Circuits for Dielectric Posts in a Rectangular Waveguide \(Short Papers\)](#)
- ❑ [Evaluation of Loss Factor of Multilayered Inhomogeneous Waveguides for Magnetostatic Waves Using Efficient Finite Element Formalism](#)
- ❑ [Finite Element Formulation for Guided-Wave Problems Using Transverse Electric Field Component \(Short Papers\)](#)
- ❑ [Finite-Element Analysis of Magnetostatic Wave Propagation in a YIG Film of Finite Dimensions](#)
- ❑ [Full Vectorial Finite Element Formalism for Lossy Anisotropic Waveguides](#)
- ❑ [Numerical Analysis of Arbitrarily Shaped Discontinuities Between Planar Dielectric Waveguides with Different Thicknesses](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

- ❑ Three-Dimensional Finite-Element Solution of Dielectric Scattering Obstacles in a Rectangular Waveguide

Kosman, Z.

- ❑ Percutaneous Transluminal Microwave Balloon Angioplasty (Short Papers)

Koster, U.

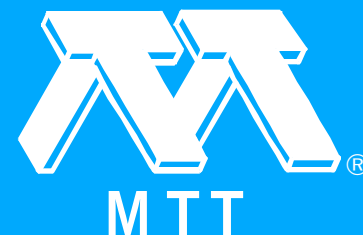
- ❑ Finite-Difference Method without Spurious Solutions for the Hybrid-Mode Analysis of Diffused Channel Waveguides

Kot, J.S.

- ❑ The Complete Spectrum of Image Line

Kother, D.

- ❑ A Generalized Theory for Asymmetrical Coupled Lines (Short Papers)



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kotthaus, U.

- ❑ [Investigation of Planar Antennas for Submillimeter Receivers](#)

Kouki, A.B.

- ❑ [A Mixed Spectral-Domain Approach for Dispersion Analysis of Suspended Planar Transmission Lines with Pedestals](#)
- ❑ [Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities](#)
- ❑ [Higher Order Asymptotic Boundary Condition for the Finite Element Modeling of Two-Dimensional Transmission Line Structures](#)

Krall, A.D.

- ❑ [Attenuation Measurement of Very Low Loss Dielectric Waveguides by the Cavity Resonator Method Applicable in the Millimeter/Submillimeter Wavelength Range \(Comments and Reply\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kraszewski, A.W.

- ☐ [Use of a Microwave Cavity for Sensing Dielectric Properties of Arbitrarily Shaped Biological Objects](#)

Kreindler, L.

- ☐ [An Analytical Solution for the Coupled Stripline-Like Microstrip Line Problem \(Corrections\)](#)

Krempasky, J.J.

- ☐ [Analysis of TEM Mode on a Curved Coaxial Transmission Line](#)

Krowne, C.M.

- ☐ [On the Application of Complex Resistive Boundary Conditions to Model Transmission Lines Consisting of Very Thin Superconductors](#)
- ☐ [Propagation in Layered Biased Semiconductor Structures Based on Transport Analysis](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Krozer, V.

- ☐ [A New GaAs Power MESFET Structure for Improved Power Capabilities](#)

Krumm, C.F.

- ☐ [The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications](#)

Krupka, J.

- ☐ [Magnetic Tuning of Cylindrical H/sub 01delta/-Mode Dielectric Resonators](#)
- ☐ [Resonant Modes in Shielded Cylindrical Ferrite and Single-Crystal Dielectric Resonators](#)

Kuester, E.F.

- ☐ [Comparison of Approximations for Effective Parameters of Artificial Dielectrics \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Kula, W.

- ☐ [Microwave Detectors Based on Granular High-Tc Thin Films \(Feb. 1990 \[T-MTT\]\)](#)

Kumar, M.

- ☐ [Monolithic Integrated Blanking Up-Converter](#)

Kunath, R.

- ☐ [High-Speed Fiber-Optic Links for Distribution of Satellite Traffic](#)

Kuo, J.-T.

- ☐ [Complex Modes in Shielded Suspended Coupled Microstrip Lines](#)

Kusuki, H.

- ☐ [Numerical Simulation of GaAs MESFET's with a p-Buffer Layer on the Semi-Insulating Substrate Compensated by Deep Traps](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

L'Ecuyer, J.

- ☐ [A FET Amplifier in Finline Technique \(Short Papers\)](#)

La Tourrette, P.M.

- ☐ [Special Session in Honor of Dr. Seymour B. Cohn \(Dec. 1989 \[T-MTT\]\)](#)

Lacon, M.

- ☐ [An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application](#)

Lampariello, P.

- ☐ [The Transition Region Between Bound-Wave and Leaky-Wave Ranges for a Partially Dielectric-Loaded Open Guiding Structure \(Dec. 1990 \[T-MTT\]\)](#)

Laslett, L.J.

- ☐ [Modes of Elliptical Waveguides: A Correction](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Latham, P.E.

- ☐ [Determination of the Resonant Frequencies in a Complex Cavity Using the Scattering Matrix Formulation](#)
- ☐ [The Use of a Single Source to Drive a Binary Peak Power Multiplier \(Short Papers\)](#)

Lauer, R.B.

- ☐ [Microwave Packaging of Optoelectronic Components](#)

Lawson, W.G.

- ☐ [Determination of the Resonant Frequencies in a Complex Cavity Using the Scattering Matrix Formulation](#)
- ☐ [Theoretical Evaluation of Nonlinear Tapers for a High-Power Gyrotron](#)

Le Rouzic, M.

- ☐ [Analysis of Rectangular Spiral Transformers for MMIC Applications \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author

Le, H.M.

- ☐ [Nonlinear Modeling and Verification of MMIC Amplifiers Using the Waveform-Balance Method](#)

Leake, B.W.

- ☐ [Accuracy Improvements in Microwave Noise Parameter Measurements](#)

Lebaric, J.E.

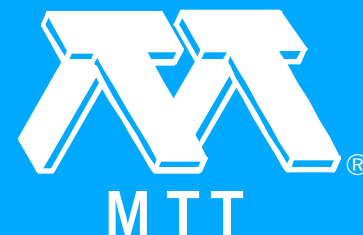
- ☐ [Analysis of Dielectric Resonator Cavities Using the Finite Integration Technique](#)

Lecours, M.

- ☐ [Waveguide Discontinuity Analysis with a Coupled Finite-Boundary Element Method](#)

Lee, A.

- ☐ [Analysis of Transients in Nonuniform and Uniform Multiconductor Transmission Lines](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

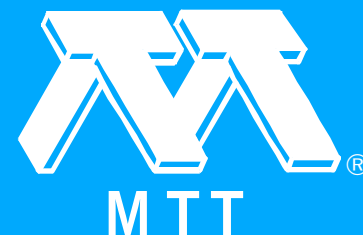
- ❑ Monolithic 9 to 70 GHz Distributed Amplifier

Lee, C.H.

- ❑ Generation and Shaping of Megawatt High-Voltage Pulses by Optoelectronic Technique
- ❑ Generation of High-Power Broad-Band Microwave Pulses by Picosecond Optoelectronic Technique
- ❑ Intermixing Optical and Microwave Signals in GaAs Microstrip Circuits for Phase-Locking Applications
- ❑ Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique
- ❑ Picosecond Optics and Microwave Technology

Lee, H.

- ❑ Spectral-Domain Computation of Characteristic Impedances and Multiport Parameters of Multiple Coupled Microstrip Lines



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Lee, H.-Y.

- ❑ Phenomenological Loss Equivalence Method for Planar Quasi-TEM Transmission Lines with a Thin Normal Conductor or Superconductor

Lee, K.S.H.

- ❑ Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Comments)

Lee, M.J.

- ❑ Analysis of Step Discontinuities on Planar Dielectric Waveguide Containing a Gyrotropic Layer

Lee, R.E.

- ❑ Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's (Dec. 1989 [T-MTT])

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Lee, S.-W.

- ☐ [Gain Optimization of a Near-Field Focusing Array for Hyperthermia Applications](#)

Lee, T.-P.

- ☐ [Applications of Traveling-Wave Laser Amplifiers in Subcarrier Multiplexed Lightwave Systems](#)

Legaud, P.

- ☐ [A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications](#)
- ☐ [Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers \(Short Papers\)](#)

Lemnios, Z.

- ☐ [Three Channel I.F. Multiplexers](#)

Click on title for a paper summary.



Papers by Author

Lenzing, H.F.

- ☐ [Machined Waveguide Twist \(Short Papers\)](#)

Leroy, Y.

- ☐ [Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors \(Short Papers\)](#)

Lesage, S.R.

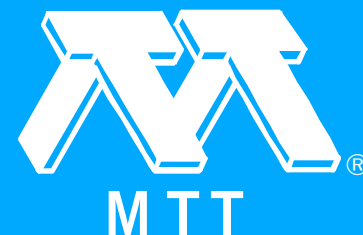
- ☐ [A Low-Noise Microwave Oscillator Employing a Self-Aligned AlGaAs/GaAs HBT \(Short Papers\)](#)

Leviatan, Y.

- ☐ [Numerical Analysis of H-Plane Waveguide Junctions by Combination of Finite and Boundary Elements \(Comments\)](#)

Levy, R.

- ☐ [Editorial \(Jan. 1989 \[T-MTT\]\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Lewandowski, S.J.

- ☐ [Microwave Detectors Based on Granular High-Tc Thin Films \(Feb. 1990 \[T-MTT\]\)](#)

Li, G.

- ☐ [Feedback in Distributed Amplifiers \(Short Papers\)](#)

Li, M.-y.

- ☐ [Low-Cost Microwave/Millimeter-Wave Impedance Measuring Scheme Using a Three-Probe Microstrip Circuit](#)

Li, M.G.

- ☐ [Generation of High-Power Broad-Band Microwave Pulses by Picosecond Optoelectronic Technique](#)
- ☐ [Intermixing Optical and Microwave Signals in GaAs Microstrip Circuits for Phase-Locking Applications](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Li, R.

- ☐ [Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen](#)
- ☐ [Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen \(Corrections\)](#)

Li, X.

- ☐ [An Automated 60 GHz Open Resonator System for Precision Dielectric Measurement](#)

Liang, G.-C.

- ☐ [Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method](#)

Licqurish, C.

- ☐ [A New Model for the Dual-Gate GaAs MESFET](#)

Click on title for a paper summary.



Papers by Author



IEEE

[Contents](#)

[Authors](#)

Liepa, V.V.

- ☐ [A Moment Method Solution of a Volume-Surface Integral Equation Using Isoparametric Elements and Point Matching \(Short Papers\)](#)

Lin, D.-B.

- ☐ [On Microwave Imagery Using Bojarski's Identity \(Short Papers\)](#)

Lin, H.C.

- ☐ [DC and Transmission Line Models for a High Electron Mobility Transistor](#)

Lin, T.S.

- ☐ [An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Lin, W.

- ☐ [A New Way to Optically Control a Millimeter-Wave Oscillator \(Short Papers\)](#)
- ☐ [Measurement and Calibration of a Universal Six-Port Network Analyzer](#)

Lind, T.S.

- ☐ [Electromagnetic Coupling of Coplanar Waveguides and Microstrip Lines to Highly Lossy Dielectric Media](#)

Lindell, I.V.

- ☐ [Transversely Anisotropic Curved Optical Fibers: Variational Analysis of a Nonstandard Eigenproblem](#)

Ling, C.

- ☐ [The Design of an Ultra-Broad-Band 3 dB Coupler in Dielectric Waveguide \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

[Contents](#)

[Authors](#)

Ling, H.

- ☐ [Characterization of a 90° Microstrip Bend with Arbitrary Miter via the Time-Domain Finite Difference Method](#)
- ☐ [Characterization of Uniform Microstrip Line and its Discontinuities Using the Time-Domain Method of Lines](#)
- ☐ [Time-Domain Method of Lines Applied to Planar Guided Wave Structures](#)
- ☐ [Transmission Properties of a Right-Angle Microstrip Bend with and without a Miter \(Short Papers\)](#)

Lipson, J.

- ☐ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)

Liu, Y.-W.

- ☐ [Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Livernois, T.G.

- ❑ [A Generalized Method for deriving the Space-Domain Green's Function in a Shielded, Multilayer Substrate Structure with Applications to MIS Slow-Wave Transmission Lines](#)
- ❑ [Characteristic Impedance and Electromagnetic Field Distribution in Metal-Insulator-Semiconductor Microstrip \(Short Papers\)](#)

Lo, K.W.

- ❑ [p-i-n Diode Attenuator with Small Phase Shift \(Additional Comments and Reply\)](#)

Loane, III, J.T.

- ❑ [Gain Optimization of a Near-Field Focusing Array for Hyperthermia Applications](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Lochel, N.

- ❑ [Two Cylindrical Obstacles in a Rectangular Waveguide--Resonances and Filter Applications](#)

Lomax, R.J.

- ❑ [A Finite-Difference Transmission Line Matrix Method Incorporating a Nonlinear Device Model](#)

Long, S.I.

- ❑ [The Nature of the Charges, Currents, and Fields in and About Conductors Having Cross-Sectional Dimensions of the Order of a Skin Depth](#)

Long, Y.

- ❑ [Evaluation of Loss Factor of Multilayered Inhomogeneous Waveguides for Magnetostatic Waves Using Efficient Finite Element Formalism](#)
- ❑ [Finite-Element Analysis of Magnetostatic Wave Propagation in a YIG Film of Finite Dimensions](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Lord, J.L.M.

- ☐ [FET Up-Converter Design Using Load-Dependent Mixing Transconductance](#)

Lott, U.

- ☐ [Measurement of Magnitude and Phase of Harmonics Generated in Nonlinear Microwave Two-Ports](#)

Lowery, G.

- ☐ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Lu, I.T.

- ☐ [Analysis of Transmission Line Structures Using a New Image-Mode Green's Function \(Short Papers\)](#)

Lubecke, V.

- ☐ [Ka-Band MMIC Beam-Steered Transmitter Array \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Lubke, K.

- ☐ [MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron \(FECTED\) Oscillators](#)

Lumori, M.L.D.

- ☐ [Gaussian Beam Representation of Aperture Fields in Layered, Lossy Media: Simulation and Experiment](#)

Lunsford, II, P.J.

- ☐ [Frequency-Domain Bivariate Generalized Power Series Analysis of Nonlinear Analog Circuits \(Short Papers\)](#)

Lusher, C.P.

- ☐ [Effects of Gain Compression, Bias Conditions, and Temperature on the Flicker Phase Noise of an 8.5 GHz GaAs MESFET Amplifier \(Short Papers\)](#)

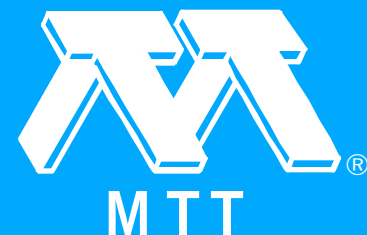
Maas, S.A.

- ☐ [Editor's Note \(Dec. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

- ❑ Minimization of Intermodulation Distortion in GaAs MESFET Small-Signal Amplifiers
- ❑ Modeling MESFET's for Intermodulation Analysis of Mixers and Amplifiers (Dec. 1990 [T-MTT])
- ❑ Modeling the Gate I/V Characteristic of a GaAs MESFET for Volterra-Series Analysis (Short Papers)

MacPhie, R.H.

- ❑ Conservation of Complex Power Technique for Waveguide Junctions with Finite Wall Conductivity
- ❑ Input Impedance of a Coaxial Line Probe Feeding a Circular Waveguide in the TM/sub 01/ Mode (Short Papers)
- ❑ Properties of Dielectric-Loaded T-Septum Waveguides (Short Papers)

Madihian, M.

- ❑ A Low-Noise Microwave Oscillator Employing a Self-Aligned AlGaAs/GaAs HBT (Short Papers)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Madjar, A.

- ☐ [An Improved Analytical AC Large-Signal Model for the GaAs MESFET](#)

Madni, A.M.

- ☐ [High-Dynamic-Range Airborne Tracking and Fire Control Radar Subsystems](#)

Magarshack, J.

- ☐ [European MMIC Activities \(1990 \[MCS\]\)](#)

Mahmoud, S.F.

- ☐ [Modal Analysis of Open Groove Waveguide \(Short Papers\)](#)

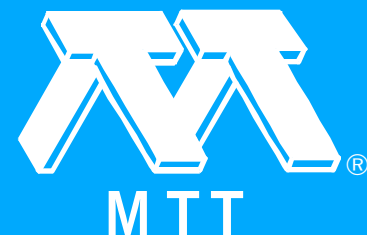
Mahon, J.P.

- ☐ [Tapered Transmission Lines with a Controlled Ripple Response](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Mahoney, L.J.

- ☐ [Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines](#)

Maio, I.

- ☐ [Modeling of Multiconductor Buses and Analysis of Crosstalk, Propagation Delay, and Pulse Distortion in High-Speed GaAs Logic Circuits](#)

Majidi-Ahy, R.

- ☐ [5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier](#)
- ☐ [5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier](#)
- ☐ [Propagation Modes and Dispersion Characteristics of Coplanar Waveguides](#)

Makimoto, M.

- ☐ [Miniaturized Hairpin Resonator Filters and Their Application to Receiver Front-End MIC's \(Dec. 1989 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Mamouni, A.

- ☐ [Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors \(Short Papers\)](#)

Manela, M.

- ☐ [Finite Difference Frequency-Domain Treatment of Open Transmission Structures](#)

Manet, P.

- ☐ [Analog Avalanche Diode Frequency Division \(Short Papers\)](#)

Manheimer, W.M.

- ☐ [Mode Conversion Losses in Highly Overmoded Waveguide Cavities](#)

Manner, O.

- ☐ [Analysis and Measurement of Transducer End Radiation in SAW Filters on Strongly Coupling Substrates](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Manolescu, A.

- ☐ [An Analytical Solution for the Coupled Stripline-Like Microstrip Line Problem \(Corrections\)](#)

Manolescu, A.M.

- ☐ [An Analytical Solution for the Coupled Stripline-Like Microstrip Line Problem \(Corrections\)](#)

Mansour, R.R.

- ☐ [Properties of Dielectric-Loaded T-Septum Waveguides \(Short Papers\)](#)

Maoz, B.

- ☐ [A Novel, Linear Voltage Variable MMIC Attenuator](#)

Marchildon, L.

- ☐ [Shift of the Complex Resonance Frequency of a Dielectric-Loaded Cavity Produced by Small Sample Insertion Holes \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Marchionna, E.

- ☐ [Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies](#)

Maricevic, Z.A.

- ☐ [Inductance of Perfectly Conducting Foils Including Spiral Inductors](#)

Marin, M.

- ☐ [Efficient Analysis of Planar Microstrip Geometries Using a Closed-Form Asymptotic Representation of the Grounded Dielectric Slab Green's Function](#)

Marks, R.

- ☐ [Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits \(Comments and Reply\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Marques, R.

- ❑ [Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses](#)

Martin, E.

- ❑ [Integral Numerical Technique for the Study of Axially Symmetric Resonant Devices \(Short Papers\)](#)

Martinez-Hernandez, A.

- ❑ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Marx, K.D.

- ❑ [A Configuration-Oriented Spice Model for Multiconductor Transmission Lines with Homogeneous Dielectrics](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Mastri, F.

- ☐ [Computer-Aided Noise Analysis of MESFET and HEMT Mixers](#)

Mathews, H.-G.

- ☐ [Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron](#)

Mathur, S.P.

- ☐ [Improvements to the Finite-Difference Time-Domain Method for Calculating the Radar Cross Section of a Perfectly Conducting Target](#)

Matloubian, M.

- ☐ [Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Matsumura, H.

- ☐ [Analysis of a Microwave Power Amplifier Using a Combiner/Divider with Circular Cavities](#)

Matsumura, K.

- ☐ [Reflection and Transmission Characteristics of an Uncoincidental Junction on Rectangular Dielectric Waveguides](#)
- ☐ [Reflection and Transmission Coefficients of Rectangular Dielectric Waveguide Discontinuity with an Air Gap \(Short Papers\)](#)

Matsunaga, T.

- ☐ [New Type of Spectral-Domain Analysis of a Microstrip Line](#)

Matsuno, C.T.

- ☐ [A Large-Signal HSPICE Model for the Heterojunction Bipolar Transistor \(Short Papers\)](#)
- ☐ [A Monolithic GaAs HBT Upconverter](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Matthaei, G.L.

- ☐ [The Nature of the Charges, Currents, and Fields in and About Conductors Having Cross-Sectional Dimensions of the Order of a Skin Depth](#)

Mautz, J.R.

- ☐ [Full-Wave Analysis of a Strip Crossover](#)
- ☐ [The Equivalent Circuit of a Microstrip Crossover in a Dielectric Substrate](#)

Mawhinney, D.

- ☐ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Mazumder, G.G.

- ☐ [Bandwidth Characteristics of Inhomogeneous T-Septum Waveguides](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Mazur, J.

- ☐ [Analysis of Nonreciprocal Coupled Image Lines \(Comments and Reply\) \(Jan. 1989 \[T-MTT\]\)](#)
- ☐ [Coupled Mode Analysis of a Finline](#)
- ☐ [Lower Bound on the Eigenvalues of the Characteristic Equation for an Arbitrary Multilayered Gyromagnetic Structure with Perpendicular Magnetization \(Short Papers\)](#)
- ☐ [Nonreciprocal Operation of Structures Comprising a Section of Coupled Ferrite Lines with Longitudinal Magnetization](#)
- ☐ [On the Mode Coupling in Longitudinally Magnetized Waveguiding Structures](#)

McAdoo, J.H.

- ☐ [Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

McCamant, A.J.

- ☐ [An Improved GaAs MESFET Model for SPICE \(Short Papers\)](#)

McClay, C.P.

- ☐ [Frequency Division Multiplexed Microwave and Baseband Digital Optical Fiber Link for Phased Array Antennas](#)

McCormack, G.D.

- ☐ [An Improved GaAs MESFET Model for SPICE \(Short Papers\)](#)

McDermott, G.

- ☐ [Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

McDermott, M.G.

- ❑ [Integration of High-Q GaAs Varactor Diodes and 0.25 \$\mu\text{m}\$ GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications](#)
- ❑ [Monolithic Ka Band VCO Using Quarter Micron GaAs MESFETs and Integrated High-Q Varactors \(1990 \[MCS\]\)](#)

McDonald, P.T.

- ❑ [High-Dynamic-Range Airborne Tracking and Fire Control Radar Subsystems](#)

McDougall, M.J.

- ❑ [Infinite Elements for the Analysis of Open Dielectric Waveguides](#)

McGeehan, J.P.

- ❑ [A Rigorous and Computationally Efficient Analysis of Microstrip for Use as an Electro-Optic Modulator](#)

Click on title for a paper summary.



Papers by Author

- ❑ [An Analysis of Microstrip with Rectangular and Trapezoidal Conductor Cross Sections](#)

McGrath, C.J.

- ❑ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)

McIntosh, R.E.

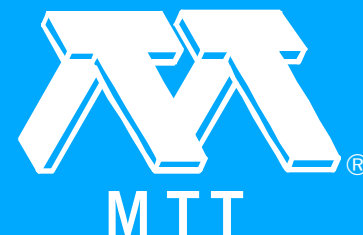
- ❑ [A 225 GHz Polarimetric Radar](#)

McKnight, S.W.

- ❑ [Attenuation and Dispersion for High-T/sub c/ Superconducting Microstrip Lines](#)

McMillan, R.W.

- ❑ [Results of Phase and Injection Locking of an Orotron Oscillator \(Short Papers\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

McNally, P.J.

- ❑ [K/sub u/- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts \(1990 \[MCS\]\)](#)

McQuiddy, Jr., D.N.

- ❑ [Guest Editors' Overview \(Dec. 1990 \[T-MTT\]\)](#)

Mead, J.B.

- ❑ [A 225 GHz Polarimetric Radar](#)

Mechling, J.A.

- ❑ [Theoretical and Experimental SAR Distributions for Interstitial Dipole Antenna Arrays Used in Hyperthermia](#)

Medina, F.

- ❑ [Generalized Spectral Analysis of Planar Lines on Layered Media Including Uniaxial and Biaxial Dielectric Substrates](#)

Click on title for a paper summary.



Papers by Author

- ❑ Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses
- ❑ Spectral and Variational Analysis of Generalized Cylindrical and Elliptical Strip and Microstrip Lines

Mehalic, M.A.

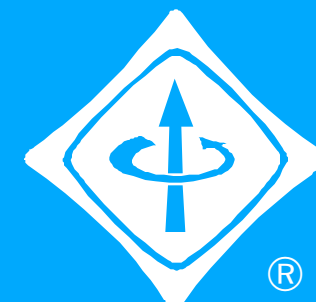
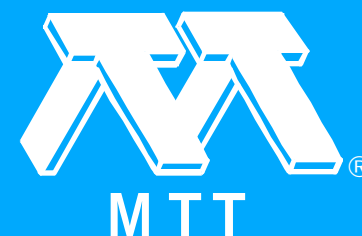
- ❑ Investigation of Tapered Multiple Microstrip Lines for VLSI Circuits (Nov. 1990 [T-MTT])

Mehdi, I.

- ❑ Power and Stability Limitations of Resonant Tunneling Diodes

Mehdizadeh, M.

- ❑ Electromagnetic Field Analysis and Calculation of the Resonance Characteristics of the Loop-Gap Resonator



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Mei, K.K.

- ☐ [Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method](#)

Meinel, H.H.

- ☐ [p-i-n Diode Control Devices in E-Plane Technique](#)

Melai, F.

- ☐ [Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter-Wave Circuits \(Dec. 1989 \[T-MTT\]\)](#)

Melas, A.I.

- ☐ [Analysis of Energy Coupling into Spheroidal Ferritic Implants for Hyperthermia Applications](#)

Menna, R.J.

- ☐ [2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Mesa, F.L.

- ❑ [Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses](#)

Meschede, H.

- ❑ [RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures](#)

Messick, L.J.

- ❑ [Ion-Implanted High Microwave Power Indium Phosphide Transistors](#)

Michalski, K.A.

- ❑ [Rigorous Analysis of Open Microstrip Lines of Arbitrary Cross Section in Bound and Leaky Regimes \(Dec. 1989 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Michels, R.

- ☐ [A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter \(Short Papers\)](#)
- ☐ [A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception](#)

Midford, T.A.

- ☐ [MIMIC Technology Transportability \(1990 \[MCS\]\)](#)

Mikucki, G.F.

- ☐ [A Broad-Band Printed Circuit Hybrid Ring Power Divider](#)

Miller, D.R.

- ☐ [Microwave and Millimeter-Wave QWITT Diode Oscillators](#)

Miller, M.

- ☐ [GaAs MESFET Baseband-to-Microwave Passive Switches \(Comments and Reply\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Milyani, A.M.

- ☐ [A Novel Exponential Power Combiner/Divider](#)

Minakawa, A.

- ☐ [Reduced-Size Branch-Line and Rat-Race Hybrids for Uniplanar MMIC's](#)

Minasian, R.A.

- ☐ [Tuned Optical Receivers for Microwave Subcarrier Multiplexed Lightwave Systems](#)

Miniowitz, R.

- ☐ [Hermitian Finite-Element Method for Inhomogeneous Waveguides](#)

Mirotznik, M.

- ☐ [Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Mirshekar-Syahkal, D.

- ❑ [Accurate Determination of Modes in Dielectric-Loaded Cylindrical Cavities Using a One-Dimensional Finite Element Method](#)

Mirzai, A.R.

- ❑ [Intelligent Alignment of Waveguide Filters Using a Machine Learning Approach](#)

Mishra, U.K.

- ❑ [The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications](#)

Misra, D.

- ❑ [An Experimental Technique for In Vivo Permittivity Measurement of Materials at Microwave Frequencies \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author

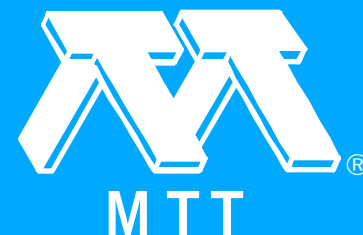
- ❑ Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique

Mitra, R.

- ❑ Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities
- ❑ Higher Order Asymptotic Boundary Condition for the Finite Element Modeling of Two-Dimensional Transmission Line Structures
- ❑ Investigation of Tapered Multiple Microstrip Lines for VLSI Circuits (Nov. 1990 [T-MTT])
- ❑ Study of Modal Solution Procedures for Microstrip Step Discontinuities

Miura, A.

- ❑ Monolithic Sampling Head IC



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Miura, K.

- ❑ [Full Vectorial Finite Element Formalism for Lossy Anisotropic Waveguides](#)

Miwa, T.

- ❑ [Miniature Hybrid Microwave IC's Using a Novel Thin-Film Technology \(Dec. 1990 \[T-MTT\]\)](#)

Miyagawa, Y.

- ❑ [Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers](#)

Moglie, F.

- ❑ [Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies](#)

Mollier, J.-C.

- ❑ [Nonlinear Analysis of Microwave FET Oscillators Using Volterra Series](#)

Click on title for a paper summary.



Papers by Author

- ❑ Semidistributed Model of Millimeter-Wave FET for S-Parameter and Noise Figure Predictions

Mondal, J.P.

- ❑ Distributed Scaling Approach of MESFET's and its Comparison with the Lumped-Element Approach

Mongia, R.K.

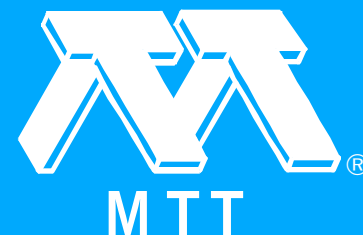
- ❑ Resonant Frequency of Cylindrical Dielectric Resonator Placed in an MIC Environment (Short Papers)

Moore, J.

- ❑ Characterization of a 90° Microstrip Bend with Arbitrary Miter via the Time-Domain Finite Difference Method

Mori, M.

- ❑ A New Self-Alignment Technology for Sub-Quarter-Micron-Gate FET's Operating in the Ka-Band



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Morini, A.

- ☐ [Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies](#)

Mortazawi, A.

- ☐ [A Periodic Planar Gunn Diode Power Combining Oscillator \(Short Papers\)](#)
- ☐ [Microwave and Millimeter-Wave QWITT Diode Oscillators](#)

Moss, S.

- ☐ [Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT \(Short Papers\)](#)

Mott, R.C.

- ☐ [A GaAs Monolithic 6 GHz Low-Noise Amplifier for Satellite Receivers \(Mar. 1989 \[T-MTT\]\)](#)

Click on title for a paper summary.



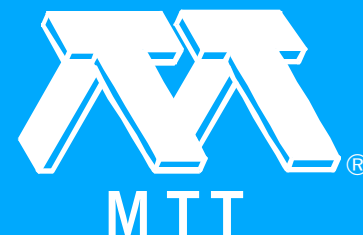
Papers by Author

Moye, C.

- ❑ [A Compact Broadband, Six-Bit MMIC Phasor with Integrated Digital Drivers \(1990 \[MCS\]\)](#)

Mrozowski, M.

- ❑ [Analysis of Nonreciprocal Coupled Image Lines \(Comments and Reply\) \(Jan. 1989 \[T-MTT\]\)](#)
- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation \(Comments and Reply\)](#)
- ❑ [Coupled Mode Analysis of a Finline](#)
- ❑ [Lower Bound on the Eigenvalues of the Characteristic Equation for an Arbitrary Multilayered Gyromagnetic Structure with Perpendicular Magnetization \(Short Papers\)](#)
- ❑ [Nonreciprocal Operation of Structures Comprising a Section of Coupled Ferrite Lines with Longitudinal Magnetization](#)
- ❑ [On the Mode Coupling in Longitudinally Magnetized Waveguiding Structures](#)



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Muggli, P.

- ☐ [Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron](#)

Mukherjee, A.

- ☐ [Dispersion Characteristics of Curved Microstrip Transmission Lines \(Short Papers\)](#)

Muraguchi, M.

- ☐ [Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer](#)
- ☐ [Reduced-Size Branch-Line and Rat-Race Hybrids for Uniplanar MMIC's](#)

Murase, T.

- ☐ [Novel Linearize Using Balanced Circulators and its Application to Multilevel Digital Radio Systems](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Murphy, R.A.

- ☐ [Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines](#)

Myung, J.-S.

- ☐ [A Novel Cavity Resonator Measurement Method for Leaky Waveguides \(Mar. 1989 \[T-MTT\]\)](#)

Naber, J.F.

- ☐ [GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications](#)

Naghed, M.

- ☐ [Equivalent Capacitances of Coplanar Waveguide Discontinuities and Interdigitated Capacitors Using a Three-Dimensional Finite Difference Method](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Nagy, C.

- ☐ [Broad Band Monolithic Cross Point Switch Matrices](#)

Nakajima, M.

- ☐ [A Quasi-TEM Design Method for 3 dB Hybrid Couplers Using a Semi-Reentrant Coupling Section \(Short Papers\)](#)
- ☐ [Microwave Power Combination Using a Bifurcated Waveguide and a Reflecting Plate](#)

Nakao, T.

- ☐ [Two-Path Cutoff Waveguide Dielectric Resonator Filters \(Jul. 1989 \[T-MTT\]\)](#)

Nakhla, M.S.

- ☐ [Time-Domain Analysis of Lossy Coupled Transmission Lines](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Naldi, C.U.

- Physical Modeling of GaAs MESFET's in an Integrated CAD Environment: From Device Technology to Microwave Circuit Performance

Nam, S.

- Characterization of Uniform Microstrip Line and its Discontinuities Using the Time-Domain Method of Lines
- Time-Domain Method of Lines Applied to Planar Guided Wave Structures

Narayan, S.Y.

- 2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si
- Wide-Band GaInAs MISFET Amplifiers (Short Papers)

Narayanan, V.

- Finite Difference Frequency-Domain Treatment of Open Transmission Structures

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Nary, K.R.

- ☐ [An MMIC Amplifier for Automatic Level Control Applications](#)

Nasir, M.A.

- ☐ [A Variational Analysis of Anisotropic, Inhomogeneous Dielectric Waveguides](#)

Navarro, A.

- ☐ [Integral Numerical Technique for the Study of Axially Symmetric Resonant Devices \(Short Papers\)](#)

Naylor, P.

- ☐ [A New Wire Node for Modeling Thin Wires in Electromagnetic Field Problems Solved by Transmission Line Modeling \(Short Papers\)](#)

Ndujiuba, C.N.

- ☐ [Wave Propagation in a Double-Sided Exponentially Tapered Rectangular Waveguide \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Negus, K.J.

- ☐ Implementation of RF/Microwave Receiver Components on a Semi-Custom Silicon Bipolar Array
- ☐ Multifunction Silicon MMIC's for Frequency Conversion Applications

Neidert, R.E.

- ☐ Millimeter-Wave Planar InP Schottky Diodes and Their Small-Signal Equivalent Circuit

Neikirk, D.P.

- ☐ Microwave and Millimeter-Wave QWITT Diode Oscillators
- ☐ Optically Controlled Coplanar Waveguide Phase Shifters

Neilson, D.

- ☐ Modeling MESFET's for Intermodulation Analysis of Mixers and Amplifiers (Dec. 1990 [T-MTT])

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Neilson, J.M.

- ☐ [Determination of the Resonant Frequencies in a Complex Cavity Using the Scattering Matrix Formulation](#)

Nelson, B.L.

- ☐ [High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz](#)

Nelson, S.O.

- ☐ [Use of a Microwave Cavity for Sensing Dielectric Properties of Arbitrarily Shaped Biological Objects](#)

Nelson, W.

- ☐ [Three Channel I.F. Multiplexers](#)

Nemoto, Y.

- ☐ [Equivalent Transformations for the Mixed Lumped Brune-Type Section and Uniform Transmission Line](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Newberg, I.L.

- ☐ Long Microwave Delay Fiber-Optic Link for Radar Testing (Short Papers)
- ☐ Reduced Insertion Loss of X-Band RF Fiber-Optic Links (Short Papers)

Newport, C.

- ☐ Rigorous, Multimode Equivalent Network Representation of Inductive Discontinuities

Ng, K.T.

- ☐ A Mixed Spectral-Domain Approach for Dispersion Analysis of Suspended Planar Transmission Lines with Pedestals
- ☐ Unified Solution of Various Dielectric-Loaded Ridge Waveguides with a Mixed Spectral-Domain Method

Nguyen, R.

- ☐ Ion-Implanted High Microwave Power Indium Phosphide Transistors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ni, D.C.

- ☐ [Millimeter-Wave Generation and Characterization of a GaAs FET by Optical Mixing](#)

Niclas, K.B.

- ☐ [A 2-18 GHz Low-Noise/High-Gain Amplifier Module](#)
- ☐ [Monolithic 2-18 GHz Matrix Amplifiers \(Short Papers\)](#)
- ☐ [On Power Distribution in Additive Amplifiers](#)
- ☐ [On the Design and Performance of a 6-18 GHz Three-Tier Matrix Amplifier](#)

Niehaus, W.C.

- ☐ [MIMIC Technology Transportability \(1990 \[MCS\]\)](#)

Niehenke, E.C.

- ☐ [Guest Editorial \(Sep. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Nikita, K.S.

- ☐ [Analysis of the Power Coupling from a Waveguide Hyperthermia Applicator into a Three-Layered Tissue Model](#)

Nishikawa, T.

- ☐ [Dielectric Receiving Filter with Sharp Stopband Using an Active Feedback Resonator Method for Cellular Base Stations \(Dec. 1989 \[T-MTT\]\)](#)

Nishimoto, C.

- ☐ [5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier](#)
- ☐ [High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz](#)
- ☐ [High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz \(Short Papers\)](#)
- ☐ [Sensitivity of a 40 GHz HEMT Low-Noise Amplifier to Material and Processing Variations \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Nishimoto, C.K.

- ❑ [5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier](#)

Nitzsche, P.M.

- ❑ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)

Noda, T.

- ❑ [New Type of Spectral-Domain Analysis of a Microstrip Line](#)

Nogi, S.

- ❑ [Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures](#)

Nojima, T.

- ❑ [Novel Linearize Using Balanced Circulators and its Application to Multilevel Digital Radio Systems](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Norton, R.H.

- ❑ [Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's \(Dec. 1989 \[T-MTT\]\)](#)

Nunez, M.J.

- ❑ [Integral Numerical Technique for the Study of Axially Symmetric Resonant Devices \(Short Papers\)](#)

Nwoke, C.

- ❑ [An Exact Solution for the Nonuniform Transmission Line Problem \(Short Papers\)](#)

Nyquist, D.P.

- ❑ [A Note on the Mixed Potential Representation of Electric Fields in Layered Media \(Short Papers\)](#)
- ❑ [Full-Wave Perturbation Theory Based Upon Electric Field Integral Equations for Coupled Microstrip Transmission Lines](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Obata, T.

- ☐ Improved Theory for E-Plane Symmetrical Tee Junctions (Short Papers)

Obregon, J.J.

- ☐ Nonlinear Analysis of Microwave FET Oscillators Using Volterra Series

Obrzut, J.

- ☐ Flexible Circular Waveguides at Millimeter Wavelengths from Metallized Teflon Tubing (Short Papers)

Offermanns, S.

- ☐ Resonance Characteristics of a Cavity-Operated Electrodeless High-Pressure Microwave Discharge System

Ogawa, H.

- ☐ Double-Sided MIC's and Their Applications
- ☐ Uniplanar Monolithic Frequency Doublers

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ogawa, K.

- ☐ [A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions](#)

Ogusu, K.

- ☐ [TM Waves Guided by Nonlinear Planar Waveguides](#)

Ohashi, H.

- ☐ [Characterization of Microstrip Lines Near a Substrate Edge and Design Formulas of Edge-Compensated Microstrip Lines](#)

Ohba, Y.I

- ☐ [Equivalent Transformations for the Mixed Lumped Brune-Type Section and Uniform Transmission Line](#)

Ohira, T.

- ☐ [A 30 GHz MMIC Receiver for Satellite Transponders](#)

Click on title for a paper summary.



Papers by Author

- ❑ A Compact Full MMIC Module for Ku-Band Phase-Locked Oscillators
- ❑ Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer

Ohta, I.

- ❑ Parallel Running System of Three Oscillators Coupled Through a Six-Port Magic Junction

Oka, S.

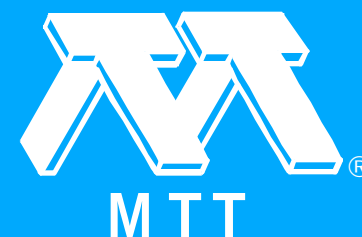
- ❑ Monolithic Sampling Head IC

Oki, A.

- ❑ Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT (Short Papers)

Oki, A.K.

- ❑ A Large-Signal HSPICE Model for the Heterojunction Bipolar Transistor (Short Papers)



Contents

Authors

Click on title for a paper summary.



Papers by Author

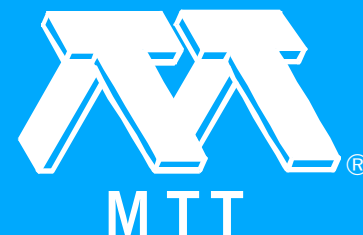
- ❑ [A Monolithic GaAs HBT Upconverter](#)
- ❑ [GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz](#)
- ❑ [GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications](#)
- ❑ [High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz](#)

Okoniewski, M.

- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation \(Comments and Reply\)](#)

Okoshi, T.

- ❑ [Vectorial Wave Analysis of Uniform-Core Optical Fibers Using a Novel Boundary Integral Method](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Oksanen, M.I.

- ☐ Transversely Anisotropic Curved Optical Fibers: Variational Analysis of a Nonstandard Eigenproblem
- ☐ Variational Analysis of Dielectrically Loaded Multidepth Corrugated Waveguides

Olesen, R.L.

- ☐ Analysis of Transmission Line Structures Using a New Image-Mode Green's Function (Short Papers)

Oleson, J.R.

- ☐ Microwave Hyperthermia Induced by a Phased Interstitial Antenna Array (Short Papers)
- ☐ The Calculated and Measured Temperature Distribution of a Phased Interstitial Antenna Array

Oliner, A.A.

- ☐ A Novel Cavity Resonator Measurement Method for Leaky Waveguides (Mar. 1989 [T-MTT])

Click on title for a paper summary.



Papers by Author

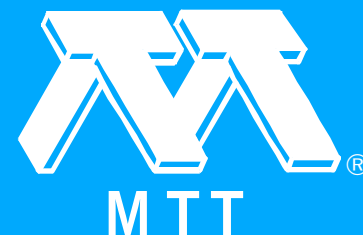
- ❑ Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part I: Rigorous Network Formulations
- ❑ Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part II: Small-Aperture and Small-Obstacle Solutions
- ❑ The Transition Region Between Bound-Wave and Leaky-Wave Ranges for a Partially Dielectric-Loaded Open Guiding Structure (Dec. 1990 [T-MTT])

Olley, C.A.

- ❑ An Approximate Variational Solution to the Step Discontinuity in Finline

Omar, A.S.

- ❑ Analysis of Waveguides with Metal Inserts (Dec. 1989 [T-MTT])



IEEE

Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Onodera, K.

- ❑ [A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver \(Dec. 1990 \[T-MTT\]\)](#)

Onojima, T.

- ❑ [Three-Dimensional Analysis of a Through Hole with Radiation Characteristics by the Spatial Network Method](#)

Opie, M.

- ❑ [Input Impedance of a Coaxial Line Probe Feeding a Circular Waveguide in the TM/sub 01/ Mode \(Short Papers\)](#)

Ortuno, M.

- ❑ [Reflection of Electromagnetic Waves from Rough Waveguides \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Osafune, K.

- ☐ [Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer](#)

Osgood, Jr., R.M.

- ☐ [Losses of Tapered Dielectric Slab Waveguides with Axial Variations in Index of Refraction](#)

Oshita, F.K.

- ☐ [Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T/sub c/ Superconducting Thin Films \(Short Papers\)](#)

Ouslimani, A.

- ☐ [Large-Signal Model of Picosecond FET's and Measurement of the Step Response](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Overfelt, P.L.

- ☐ [Alternate Forms of the Generalized Composite Scattering Matrix \(Letters\)](#)
- ☐ [Power-Handling Capability of the Rhombic Waveguide](#)

Page, M.J.

- ☐ [A Flexible Design Procedure for Microstrip Planar Disk 3 dB Quadrature Hybrids \(Short Papers\)](#)
- ☐ [An Analysis of an N-Port Microstrip Planar Disk Device with an Arbitrarily Located Short Circuit Post of Arbitrary Radius](#)

Pak, S.

- ☐ [On-Wafer Verification of a Large-Signal MESFET Model \(Short Papers\)](#)

Palusinski, O.A.

- ☐ [Analysis of Transients in Nonuniform and Uniform Multiconductor Transmission Lines](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Pan, S.-K.

- ☐ [An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions](#)

Pandharipande, V.M.

- ☐ [Stripline to Microstrip Line Aperture Coupler \(Short Papers\)](#)

Pantoja, R.R.

- ☐ [A Large-Signal Physical MESFET Model for Computer-Aided Design and its Applications](#)
- ☐ [Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits](#)
- ☐ [Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits \(Comments and Reply\)](#)

Pao, Y.-C.

- ☐ [5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Pao, Y.C.

- ☐ 5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier
- ☐ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz (Short Papers)

Papatheodorou, S.

- ☐ Full-Wave Analysis of a Strip Crossover
- ☐ The Equivalent Circuit of a Microstrip Crossover in a Dielectric Substrate

Pastol, Y.

- ☐ Broad-Band Microwave Measurements with Transient Radiation from Optoelectronically Pulsed Antennas

Pastorino, M.

- ☐ Equivalent Current Density Reconstruction for Microwave Imaging Purposes

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

- ❑ Two-Dimensional Microwave Imaging by a Numerical Inverse Scattering Solution

Patel, M.

- ❑ A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter (Short Papers)
- ❑ A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception

Pathak, P.H.

- ❑ Efficient Analysis of Planar Microstrip Geometries Using a Closed-Form Asymptotic Representation of the Grounded Dielectric Slab Green's Function

Pauker, V.

- ❑ A Multioctave Active GaAs MMIC Quadrature Phase Shifter

Click on title for a paper summary.



Papers by Author



Contents
Authors

Paulter, N.G.

- ☐ [Optoelectronic Measurements of Picosecond Electrical Pulse Propagation in Coplanar Waveguide Transmission Lines](#)

Pauplis, B.E.

- ☐ [On the Bandwidth of T-Septum Waveguide \(Short Papers\)](#)

Pawlowicz, L.M.

- ☐ [GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz](#)

Payne, D.

- ☐ [Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications \(Short Papers\)](#)

Pelet, P.

- ☐ [Mode Orthogonality in Chirowaveguides](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Peng, S.-T.

- ☐ [Full-Wave Analysis of Lossy Quasi-Planar Transmission Line Incorporating the Metal Modes](#)

Peng, S.T.

- ☐ [Effect of Transition Waveguides on Dielectric Waveguide Directional Couplers](#)

Pereira, R.R.

- ☐ [A 2-18 GHz Low-Noise/High-Gain Amplifier Module](#)
- ☐ [On Power Distribution in Additive Amplifiers](#)
- ☐ [On the Design and Performance of a 6-18 GHz Three-Tier Matrix Amplifier](#)

Perennec, A.

- ☐ [Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Perkins, W.H.

- ☐ [MIMIC Technology Transportability \(1990 \[MCS\]\)](#)

Perrenoud, A.

- ☐ [Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron](#)

Perry, C.B.

- ☐ [High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz](#)

Petzold, M.C.

- ☐ [A Linear Statistical FET Model Using Principal Component Analysis](#)

Phatak, D.S.

- ☐ [Dispersion Characteristics of Optically Excited Coplanar Striplines: Comprehensive Full-Wave Analysis](#)

Click on title for a paper summary.



Papers by Author

- ❑ Dispersion Characteristics of Optically Excited Coplanar Striplines: Pulse Propagation

Phelleps, F.R.

- ❑ K/sub u/- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts (1990 [MCS])

Philippe, P.

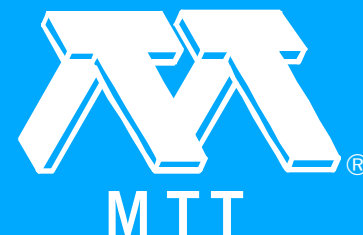
- ❑ A Multioctave Active GaAs MMIC Quadrature Phase Shifter

Pichot, C.

- ❑ Comparison of Three Integral Formulations for the 2-D TE Scattering Problem

Platte, W.

- ❑ Optically CW-Induced Losses in Semiconductor Coplanar Waveguides
- ❑ Periodic-Structure Photoexcitation of a Silicon Coplanar Waveguide for Selective Optoelectronic Microwave Control



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Platzker, A.

- ☐ [Losses in GaAs Microstrip \(Dec. 1990 \[T-MTT\]\)](#)

Poddar, D.R.

- ☐ [Dispersion Characteristics of Curved Microstrip Transmission Lines \(Short Papers\)](#)

Podlesnik, D.V.

- ☐ [Losses of Tapered Dielectric Slab Waveguides with Axial Variations in Index of Refraction](#)

Polak-Dingels, P.

- ☐ [Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique](#)

Pollard, R.D.

- ☐ [Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits \(Comments and Reply\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Politi, M.

- ❑ [Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies](#)

Pollard, R.D.

- ❑ [Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits](#)

Pollman, M.

- ❑ [Multifunction Chip Set for T/R Module Receive Path \(1990 \[MCS\]\)](#)

Pollman, M.D.

- ❑ [GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications](#)
- ❑ [Multifunction Small-Signal Chip Set for Transmit/Receive Modules](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Pomerleau, R.

- ❑ [Enhanced Through-Reflect-Line Characterization of Two-Port Measuring Systems Using Free-Space Capacitance Calculation \(Short Papers\)](#)

Pond, J.M.

- ❑ [On the Application of Complex Resistive Boundary Conditions to Model Transmission Lines Consisting of Very Thin Superconductors](#)
- ❑ [Propagation and Circuit Characteristics of Inductively Coupled Superconducting Microstrip](#)

Popovic, Z.B.

- ❑ [Bar-Grid Oscillators](#)

Pospieszalski, M.W.

- ❑ [Modeling of Noise Parameters of MESFET's and MODFET's and Their Frequency and Temperature Dependence \(Sep. 1989 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Potratz, C.

- ☐ [A Linear Statistical FET Model Using Principal Component Analysis](#)

Potter, K.A.

- ☐ [Bar-Grid Oscillators](#)

Pouysegur, M.

- ☐ [A New Concept to Cancel Insertion Phase Variation in MMIC Amplitude Controller](#)
- ☐ [A Process-Dependent Worst-Case Analysis for MMIC Design Based on a Handy MESFET Simulator](#)

Powell, S.

- ☐ [Broad Band Monolithic Cross Point Switch Matrices](#)

Power, D.C.

- ☐ [On the Bandwidth of T-Septum Waveguide \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Pramanick, P.

- ☐ [A Generalized Theory of Tapered Transmission Line Matching Transformers and Asymmetric Couplers Supporting Non-TEM Modes](#)
- ☐ [Computer-Aided Design Models for Broadside-Coupled Striplines and Millimeter-Wave Suspended Substrate Microstrip Lines \(Corrections\)](#)

Prasad, S.

- ☐ [Computer-Aided Design of Monolithic MESFET Distributed Amplifiers](#)

Pregla, R.

- ☐ [Coupling of Crossed Planar Multiconductor Systems](#)
- ☐ [The Method of Lines for the Analysis of Lossy Planar Waveguides](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Presser, A.

- ☐ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Prince, J.L.

- ☐ [A Parametric Study of the Attenuation Constant of Lossy Microstrip Lines \(Short Papers\)](#)

Prost, W.

- ☐ [RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures](#)

Purchase, K.G.

- ☐ [Optical Generation, Distribution, and Control of Microwaves Using Laser Heterodyne \(Short Papers\)](#)

Purviance, J.E.

- ☐ [A Linear Statistical FET Model Using Principal Component Analysis](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Pyndiah, R.

- ❑ [A 10-14 GHz Linear MMIC Vector Modulator with Less Than 0.1dB and 0.8° Amplitude and Phase Error \(1990 \[MCS\]\)](#)

Qian, Y.

- ❑ [Additional Approximate Formulas and Experimental Data on Micro-Coplanar Striplines \(Short Papers\)](#)

Raffaelli, L.

- ❑ [Integration of High-Q GaAs Varactor Diodes and 0.25 \$\mu\$ m GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications](#)
- ❑ [Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications \(Short Papers\)](#)

Railton, C.J.

- ❑ [A Rigorous and Computationally Efficient Analysis of Microstrip for Use as an Electro-Optic Modulator](#)

Click on title for a paper summary.



Papers by Author

- ❑ [An Analysis of Microstrip with Rectangular and Trapezoidal Conductor Cross Sections](#)

Ramdani, Y.

- ❑ [Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media](#)

Rao, K.V.S.

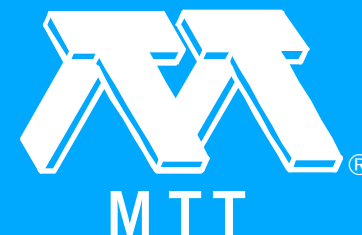
- ❑ [Analysis of Edge-Coupled Elliptical \(Oval\) Rods Between Infinite Ground Planes \(Short Papers\)](#)

Rao, P.V.D.S.

- ❑ [Narrow Wall Axial-Slot-Coupled T Junction Between Rectangular and Circular Waveguides](#)

Rao, S.M.

- ❑ [Electromagnetic Scattering and Radiation from Finite Microstrip Structures](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Rao, T.C.

- ☐ [Characteristic Impedance of a Tubular Dielectric Cylinder Covered with Conducting Arc Strips \(Short Papers\)](#)

Rascoe, D.L.

- ☐ [Ka-Band MMIC Beam-Steered Transmitter Array \(Short Papers\)](#)

Raue, J.E.

- ☐ [Editors' Overview \(Dec. 1989 \[T-MTT\]\)](#)

Rautio, J.C.

- ☐ [An Experimental Investigation of the Microstrip Step Discontinuity \(Short Papers\)](#)

Reddy, V.K.

- ☐ [Microwave and Millimeter-Wave QWITT Diode Oscillators](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Reep, D.H.

- ☐ [MIMIC Technology Transportability \(1990 \[MCS\]\)](#)

Regev, D.

- ☐ [Characterization of Spurious-Response Suppression in Double-Balanced Mixers](#)

Rengarajan, S.R.

- ☐ [Analysis of a Centered-Inclined Waveguide Slot Coupler](#)
- ☐ [Characteristics of a Longitudinal/Transverse Coupling Slot in Crossed Rectangular Waveguides](#)
- ☐ [On Higher Order Mode Cutoff Frequencies in Elliptical Step Index Fibers](#)

Reynoso-Hernandez, J.A.

- ☐ [Output Conductance Frequency Dispersion and Low-Frequency Noise in HEMT's and MESFET's \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Rhyne, G.W.

- ☐ Frequency-Domain Bivariate Generalized Power Series Analysis of Nonlinear Analog Circuits (Short Papers)
- ☐ Frequency-Domain Spectral Balance Using the Arithmetic Operator Method

Riaziat, M.

- ☐ 5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier
- ☐ 5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier
- ☐ Feedback in Distributed Amplifiers (Short Papers)
- ☐ Propagation Modes and Dispersion Characteristics of Coplanar Waveguides

Riblet, G.P.

- ☐ Compact Planar Microstrip-Slotline Symmetrical Ring Eight-Port Comparator Circuits

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Riblet, H.J.

- ☐ Expansions for the Capacitance of a Cross Concentric with a Circle with an Application (Short Papers)
- ☐ Expansions for the Capacitance of a Cross Concentric with a Square with an Identity (Short Papers)

Richard, M.A.

- ☐ Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect (Short Papers)

Richardson, J.R.

- ☐ A Large-Signal Physical MESFET Model for Computer-Aided Design and its Applications
- ☐ Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits
- ☐ Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits (Comments and Reply)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Ries, C.R.

- ☐ [Input Impedance of a Coaxial Line Probe Feeding a Circular Waveguide in the TM/sub 01/ Mode \(Short Papers\)](#)

Riggs, L.S.

- ☐ [Bandwidth Properties of Rectangular T-Septum Waveguides \(Short Papers\)](#)

Riley, A.L.

- ☐ [Ka-Band MMIC Beam-Steered Transmitter Array \(Short Papers\)](#)

Rimmer, R.A.

- ☐ [Modes of Elliptical Waveguides: A Correction](#)

Rizzoli, V.

- ☐ [Computer-Aided Noise Analysis of MESFET and HEMT Mixers](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Robbio, T.

- ☐ [Three Channel I.F. Multiplexers](#)

Robrish, P.

- ☐ [An Analytic Algorithm for Unbalanced Stripline Impedance](#)

Rolland, P.-A.

- ☐ [Read Versus Flat Doping Profile Structures for the Realization of Reliable High-Power, High-Efficiency 94 GHz IMPATT Sources](#)

Rolland, P.A.

- ☐ [Analog Avalanche Diode Frequency Division \(Short Papers\)](#)

Rollins, J.M.

- ☐ [The Input Impedance of a Hollow-Probe-Fed, Semi-Infinite Rectangular Waveguide \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Romanofsky, R.R.

- ❑ [Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect \(Short Papers\)](#)

Roques, D.

- ❑ [A New Concept to Cancel Insertion Phase Variation in MMIC Amplitude Controller](#)
- ❑ [A Process-Dependent Worst-Case Analysis for MMIC Design Based on a Handy MESFET Simulator](#)

Rosario, M.J.

- ❑ [Design Technique for MESFET Mixers for Maximum Conversion Gain](#)

Rose, C.

- ❑ [A Dielectric-Free Superconducting Coaxial Cable](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Rosen, A.

- ☐ [Laser-Activated p-i-n Diode Switch for RF Application \(Short Papers\)](#)
- ☐ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Rosen, H.

- ☐ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Rosenbaum, J.

- ☐ [Design and Fabrication of Two-Pole Monolithic Bulk Acoustic Filters](#)

Rosenberg, U.

- ☐ [Filter Design Using In-Line Triple-Mode Cavities and Novel Iris Couplings](#)
- ☐ [Multiplexing and Double Band Filtering with Common-Multimode Cavities](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Rosloniec, S.

- ☐ [An Improved Algorithm for the Computer-Aided Design of Coupled Slab Lines \(Short Papers\)](#)

Roumeliotis, J.A.

- ☐ [Electromagnetic Scattering from an Infinite Elliptic Metallic Cylinder Coated by a Circular Dielectric One](#)

Roxlo, C.B.

- ☐ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)

Roy, J.S.

- ☐ [Dispersion Characteristics of Curved Microstrip Transmission Lines \(Short Papers\)](#)

Rozzi, T.

- ☐ [An Approximate Variational Solution to the Step Discontinuity in Finline](#)

Click on title for a paper summary.



Papers by Author

- ❑ Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies
- ❑ The Complete Spectrum of Image Line

Ruan, C.

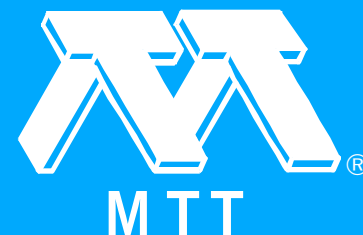
- ❑ Measurement and Calibration of a Universal Six-Port Network Analyzer

Rubin, B.J.

- ❑ Electromagnetic Modeling of Waveguides Involving Finite-Size Dielectric Regions (Short Papers)
- ❑ Modeling of Arbitrarily Shaped Signal Lines and Discontinuities (Short Papers)

Ruiz, J.

- ❑ Integral Numerical Technique for the Study of Axially Symmetric Resonant Devices (Short Papers)
- ❑ Reflection of Electromagnetic Waves from Rough Waveguides (Short Papers)



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Russenschuck, S.

- ☐ [Improving the Characteristics of Rectangular Waveguide Branchings by Cylindrical Obstacles](#)

Rutledge, D.B.

- ☐ [Bar-Grid Oscillators](#)

Ruxton, J.

- ☐ [A Quasi-Planar FET Amplifier in Integrated Finline and Microstrip Technique \(Short Papers\)](#)

Rycroft, C.M.D.

- ☐ [An Approximate Variational Solution to the Step Discontinuity in Finline](#)

Saad, S.M.

- ☐ [A More Accurate Analysis and Design of Coaxial-to-Rectangular Waveguide End Launcher](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Saad, T.S.

- ☐ [The MTT Transactions and Symposia Update \(Jun. 1989, Part II \[T-MTT\]\)](#)

Sachse, K.

- ☐ [The Scattering Parameters and Directional Coupler Analysis of Characteristically Terminated Asymmetric Coupled Transmission Lines in an Inhomogeneous Medium](#)

Sadler, R.A.

- ☐ [GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications](#)

Saedi, R.

- ☐ [High-Speed Fiber-Optic Links for Distribution of Satellite Traffic](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Sagawa, M.

- ☐ Miniaturized Hairpin Resonator Filters and Their Application to Receiver Front-End MIC's (Dec. 1989 [T-MTT])

Saha, P.K.

- ☐ Bandwidth Characteristics of Inhomogeneous T-Septum Waveguides

Saint-Christophe, E.

- ☐ Anisotropic Measurements of Rubber Sheets with an X-Band Three-Wave Interferometer (Short Papers)

Saito, S.

- ☐ State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Comments and Reply)
- ☐ State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Dec. 1989 [T-MTT])

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Sakakura, M.

- ☐ [A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions](#)

Sakamoto, G.

- ☐ [A Compact Broadband, Six-Bit MMIC Phasor with Integrated Digital Drivers \(1990 \[MCS\]\)](#)

Saleeb, A.A.

- ☐ [Refraction at a Curved Dielectric Interface Geometrical Optics Solution \(Comments\) \(Apr. 1990 \[T-MTT\]\)](#)

Salmer, G.

- ☐ [A New Approach to the RF Power Operation of MESFET's](#)

Sandborn, P.A.

- ☐ [MESFET Simulation Oriented Toward Computer-Aided Microwave Circuit Design \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Sandstrom, R.L.

- ☐ [An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions](#)

Sano, E.

- ☐ [Characterization of MIS Structure Coplanar Transmission Lines for Investigation of Signal Propagation in Integrated Circuits](#)

Sardos, R.

- ☐ [Anisotropic Measurements of Rubber Sheets with an X-Band Three-Wave Interferometer \(Short Papers\)](#)
- ☐ [Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media](#)

Sarkar, S.

- ☐ [Effect of a Cochannel Signal on the Electrical Tuning Characteristics of a Gunn Oscillator \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Sarkar, T.K.

- ☐ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation](#)
- ☐ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation \(Comments and Reply\)](#)
- ☐ [Electromagnetic Scattering and Radiation from Finite Microstrip Structures](#)
- ☐ [Finite Difference Frequency-Domain Treatment of Open Transmission Structures](#)
- ☐ [Inductance of Perfectly Conducting Foils Including Spiral Inductors](#)

Sarma, N.V.S.N.

- ☐ [A Rigorous Variational Formulation of an H Plane Slot-Coupled Tee Junction \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author

- ❑ S Matrix of Slot-Coupled H-Plane Tee Junction Using Rectangular Waveguides (Short Papers)

Sato, R.

- ❑ Equivalent Transformations for the Mixed Lumped Brune-Type Section and Uniform Transmission Line

Sauerer, B.

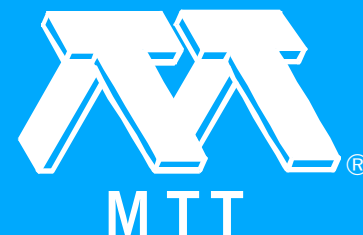
- ❑ Optically CW-Induced Losses in Semiconductor Coplanar Waveguides

Sauter, T.H.

- ❑ Low-Cost Microwave/Millimeter-Wave Impedance Measuring Scheme Using a Three-Probe Microstrip Circuit

Sawado, E.

- ❑ Three-Dimensional Analysis of Electromagnetic Fields in Rectangular Waveguides by the Boundary Integral Equation Method



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Sayadian, H.A.

- ☐ [Generation and Shaping of Megawatt High-Voltage Pulses by Optoelectronic Technique](#)
- ☐ [Generation of High-Power Broad-Band Microwave Pulses by Picosecond Optoelectronic Technique](#)

Scarmozzino, R.

- ☐ [Losses of Tapered Dielectric Slab Waveguides with Axial Variations in Index of Refraction](#)

Schaefer, M.S.

- ☐ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)

Schaller, G.

- ☐ [On the Imaging of Hot Spots Using Correlation Radiometers and a Circular Aperture](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Scheiber, H.

- ☐ [MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron \(FECTED\) Oscillators](#)

Scheinberg, N.

- ☐ [A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter \(Short Papers\)](#)
- ☐ [A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception](#)

Schieblich, C.

- ☐ [Mode Charts for Magnetized Ferrite Cylinders](#)

Schiek, B.

- ☐ [A Self-Calibration Concept for Establishing the Complex Measurement Ability of Homodyne Network Analyzers](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Schindler, M.

- ☐ [GaAs MESFET Baseband-to-Microwave Passive Switches \(Comments and Reply\)](#)

Schindler, M.J.

- ☐ [A High Power 2-18 GHz T/R Switch \(1990 \[MCS\]\)](#)
- ☐ [A Novel MMIC Active Filter with Lumped and Transversal Elements \(Comments and Reply\)](#)
- ☐ [A Novel MMIC Active Filter with Lumped and Transversal Elements \(Dec. 1989 \[T-MTT\]\)](#)
- ☐ [A Single Chip 2-20 GHz T/R Module](#)
- ☐ [Miniature Monolithic Microwave Frequency Diplexers](#)

Schlafer, J.

- ☐ [Microwave Packaging of Optoelectronic Components](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Schlapp, W.

- ☐ RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures

Schlechtweg, M.

- ☐ Precisely Calibrated Coaxial-to-Microstrip Transitions Yield Improved Performance in GaAs FET Characterization

Schmegner, K.-E.

- ☐ A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology

Schmegner, K.E.

- ☐ A Monolithic 94 GHz Balanced Mixer

Schmuckle, F.J.

- ☐ The Method of Lines for the Analysis of Lossy Planar Waveguides

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Schulz, N.

- ❑ [Finite-Difference Method without Spurious Solutions for the Hybrid-Mode Analysis of Diffused Channel Waveguides](#)

Schunemann, K.F.

- ❑ [Analysis of Waveguides with Metal Inserts \(Dec. 1989 \[T-MTT\]\)](#)

Schwab, W.

- ❑ [A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology](#)

Schwering, F.K.

- ❑ [Effect of Transition Waveguides on Dielectric Waveguide Directional Couplers](#)

Seaman, R.L.

- ❑ [Open-Ended Coaxial Exposure Device for Applying RF/Microwave Fields to Very Small Biological Preparations](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Seeds, A.J.

- ☐ [Optical Control of Microwave Semiconductor Devices](#)

Seeley, R.

- ☐ [Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation](#)

Seely, W.

- ☐ [A Highly Integrated Two Channel MMIC Down Converter with Gain Control](#)

Selders, J.

- ☐ [A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology](#)
- ☐ [A Monolithic 94 GHz Balanced Mixer](#)

Sellberg, F.

- ☐ [Formulas Useful for the Synthesis and Optimization of General, Uniform Contradirectional Couplers](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Sethares, J.C.

- ☐ [Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines](#)

Shalkhauser, K.

- ☐ [High-Speed Fiber-Optic Links for Distribution of Satellite Traffic](#)

Sharma, A.K.

- ☐ [A Large-Signal HSPICE Model for the Heterojunction Bipolar Transistor \(Short Papers\)](#)
- ☐ [Considerations in Producibility Engineering of MMIC's](#)
- ☐ [Foreword \(Feb. 1989 \[T-MTT\]\)](#)

Sheaffer, G.S.

- ☐ [Numerical Analysis of H-Plane Waveguide Junctions by Combination of Finite and Boundary Elements \(Comments\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Sheen, D.M.

- ☐ [Application of the Three-Dimensional Finite-Difference Time-Domain Method to the Analysis of Planar Microstrip Circuits](#)

Shen, Y.

- ☐ [The Design of an Ultra-Broad-Band 3 dB Coupler in Dielectric Waveguide \(Short Papers\)](#)

Sheng, C.

- ☐ [Lumped Lossy Circuit Synthesis and its Application in Broad-Band FET Amplifier Design in MMIC's \(Short Papers\)](#)

Sheng, N.H.

- ☐ [Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz](#)

Shi, Y.

- ☐ [Percutaneous Transluminal Microwave Balloon Angioplasty \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Shibata, T.

- ❑ Characterization of MIS Structure Coplanar Transmission Lines for Investigation of Signal Propagation in Integrated Circuits

Shifrin, M.B.

- ❑ Monolithic FET Structures for High-Power Control Component Applications

Shigesawa, H.

- ❑ A New Equivalent Network Method for Analyzing Discontinuity Properties of Open Dielectric Waveguides
- ❑ Two-Path Cutoff Waveguide Dielectric Resonator Filters (Jul. 1989 [T-MTT])

Shih, C.

- ❑ Frequency-Dependent Characteristics of Open Microstrip Lines with Finite Strip Thickness (Short Papers)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Shih, H.-D.

- ☐ [35 GHz GaAs Power MESFET's and Monolithic Amplifiers](#)

Shih, Y.-C.

- ☐ [Nonlinear Modeling and Verification of MMIC Amplifiers Using the Waveform-Balance Method](#)
- ☐ [Spectral-Domain Analysis of E-Plane Waveguide to Microstrip Transitions](#)

Shih, Y.C.

- ☐ [A 2.5 Watt X-Band High Efficiency MMIC Amplifier](#)
- ☐ [Scattering Parameters of E-Plane Printed Opposite Fin in Waveguide \(Short Papers\)](#)

Shimabukuro, F.I.

- ☐ [Attenuation Measurement of Very Low Loss Dielectric Waveguides by the Cavity Resonator Method Applicable in the Millimeter/Submillimeter Wavelength Range \(Comments and Reply\)](#)

Click on title for a paper summary.



Papers by Author

- ❑ Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide

Sieverding, T.

- ❑ Optimum Field Theory Design of Broad-Band E-Plane Branch Guide Phase Shifters and 180° Couplers

Sillars, D.B.

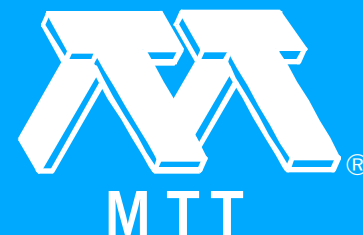
- ❑ Analysis of Nonreciprocal Coupled Image Lines (Comments and Reply) (Jan. 1989 [T-MTT])

Silverman, S.

- ❑ 5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier
- ❑ 5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier

Simon, K.

- ❑ GaAs MESFET Baseband-to-Microwave Passive Switches (Comments and Reply)



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Simon, K.M.

- ☐ [A Single Chip 2-20 GHz T/R Module](#)
- ☐ [Miniature Monolithic Microwave Frequency Diplexers](#)

Simonis, G.J.

- ☐ [Optical Generation, Distribution, and Control of Microwaves Using Laser Heterodyne \(Short Papers\)](#)

Singh, H.P.

- ☐ [GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications](#)

Singh, R.

- ☐ [Application of Transforms to Accelerate the Summation of Periodic Free-Space Green's Functions \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Singh, S.

- ☐ [Application of Transforms to Accelerate the Summation of Periodic Free-Space Green's Functions \(Short Papers\)](#)

Sinha, D.N.

- ☐ [Optoelectronic Measurements of Picosecond Electrical Pulse Propagation in Coplanar Waveguide Transmission Lines](#)

Skaggs, S.G.

- ☐ [Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing](#)

Skrehot, M.K.

- ☐ [A New Resistance Measurement Technique Applicable to High-Temperature Superconducting Materials at Microwave Frequencies \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Smith, B.

- ☐ [K/sub u/- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts \(1990 \[MCS\]\)](#)

Smith, B.M.

- ☐ [Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications \(Short Papers\)](#)

Smith, C.E.

- ☐ [The Resonance Method for Evaluating the Impedances of the Equivalent Network for Dielectric Posts in a Rectangular Waveguide](#)

Smith, C.J.

- ☐ [Low-Parasitic, Planar Schottky Diodes for Millimeter-Wave Integrated Circuits](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Smith, D.

- ☐ Percutaneous Transluminal Microwave Balloon Angioplasty (Short Papers)
- ☐ Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT (Short Papers)

Smith, D.H.

- ☐ An Improved GaAs MESFET Model for SPICE (Short Papers)

Smith, T.

- ☐ K/sub u/- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts (1990 [MCS])
- ☐ Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique

Click on title for a paper summary.



Papers by Author



IEEE

[Contents](#)

[Authors](#)

Snowden, C.M.

- ☐ [A Large-Signal Physical MESFET Model for Computer-Aided Design and its Applications](#)
- ☐ [A New Model for the Dual-Gate GaAs MESFET](#)
- ☐ [Nonlinear Circuit Analysis of Harmonic and Intermodulation Distortions in Laser Diodes Under Microwave Direct Modulation](#)
- ☐ [Optimal Computer-Aided Design of Monolithic Microwave Integrated Oscillators \(Short Papers\)](#)

So, P.P.M.

- ☐ [A Two-Dimensional Transmission Line Matrix Microwave Field Simulator Using New Concepts and Procedures](#)

Soares, R.

- ☐ [Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Soares, R.A

- ☐ [A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications \(Comments and Reply\)](#)

Soares, R.A.

- ☐ [A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications](#)

Sobhy, M.I.

- ☐ [Parallel Processing Application to Nonlinear Microwave Network Design \(Dec. 1989 \[T-MTT\]\)](#)

Sobolewski, R.

- ☐ [Microwave Detectors Based on Granular High-Tc Thin Films \(Feb. 1990 \[T-MTT\]\)](#)

Sokolov, V.

- ☐ [Guest Editors' Overview \(Dec. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Somlo, P.L.

- ❑ [Explicit Microwave Rotary Phase Shifter Calibration Algorithm \(Letters\)](#)

Sommariva, A.M.

- ❑ [Transient Analysis of Multiple-Tuned Injection-Locked Amplifiers with Modulated Input Signal](#)

Song, J.

- ❑ [FAST Gradient Based Yield Optimization of Nonlinear Circuits](#)

Sorrentino, R.

- ❑ [Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter-Wave Circuits \(Dec. 1989 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Sovero, E.

- ❑ [Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T/sub c/ Superconducting Thin Films \(Short Papers\)](#)

Sovero, E.A.

- ❑ [Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz](#)

Sowinski, M.J.

- ❑ [Analysis of Dielectric Guiding Structures by the Iterative Eigenfunction Expansion Method](#)

Stabile, P.

- ❑ [Laser-Activated p-i-n Diode Switch for RF Application \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Staebell, K.F.

- ☐ [An Experimental Technique for In Vivo Permittivity Measurement of Materials at Microwave Frequencies \(Short Papers\)](#)

Staecker, P.

- ☐ [Editor's Preface \(Jun. 1989, Part II \[T-MTT\]\)](#)

Stancil, D.D.

- ☐ [Theory of Magnetostatic Waves in Moving Ferrite Films and Applications to Rotation Rate Sensing](#)

Stankovic, L.

- ☐ [Boundary Condition Expansion of Basis Functions Method Implemented by Fast Fourier Transform Algorithms](#)

Starski, J.P.

- ☐ [p-i-n Diode Attenuator with Small Phase Shift \(Additional Comments and Reply\)](#)

Click on title for a paper summary.



Papers by Author

Stasiak, J.W.

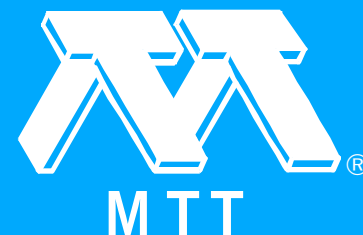
- ☐ [An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions](#)

Staudinger, J.

- ☐ [A Highly Integrated Two Channel MMIC Down Converter with Gain Control](#)

Steer, M.B.

- ☐ [Enhanced Through-Reflect-Line Characterization of Two-Port Measuring Systems Using Free-Space Capacitance Calculation \(Short Papers\)](#)
- ☐ [Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing](#)
- ☐ [Frequency-Domain Bivariate Generalized Power Series Analysis of Nonlinear Analog Circuits \(Short Papers\)](#)
- ☐ [Frequency-Domain Nonlinear Microwave Circuit Simulation Using the Arithmetic Operator Method \(Short Papers\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

- ☐ Frequency-Domain Spectral Balance Using the Arithmetic Operator Method
- ☐ Harmonic Balance and Frequency-Domain Simulation of Nonlinear Microwave Circuits Using the Block Newton Method (Short Papers)
- ☐ Jacobian Calculation Using the Multidimensional Fast Fourier Transform in the Harmonic Balance Analysis of Nonlinear Circuits (Short Papers)

Stern, G.J.

- ☐ Reduced Insertion Loss of X-Band RF Fiber-Optic Links (Short Papers)

Sterzer, F.

- ☐ Percutaneous Transluminal Microwave Balloon Angioplasty (Short Papers)

Stolt, K.S.

- ☐ GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Streit, D.C.

- ☐ [GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz](#)

Strid, E.

- ☐ [Accuracy Improvements in Microwave Noise Parameter Measurements](#)

Strifler, W.A.

- ☐ [Monolithic 2-18 GHz Matrix Amplifiers \(Short Papers\)](#)

Strohbehn, J.W.

- ☐ [Theoretical and Experimental SAR Distributions for Interstitial Dipole Antenna Arrays Used in Hyperthermia](#)

Stumper, U.

- ☐ [Finding Initial Estimates Needed for the Engen Method of Calibrating Single Six-Port Reflectometers \(Short Papers\)](#)
- ☐ [Six-Port and Four-Port Reflectometers for Complex Permittivity Measurements at Submillimeter Wavelengths](#)

Click on title for a paper summary.



Papers by Author

Subbarao, S.N.

- ❑ [2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si](#)

Sueta, T.

- ❑ [Integrated Optic Devices for Microwave Applications](#)

Sullivan, D.

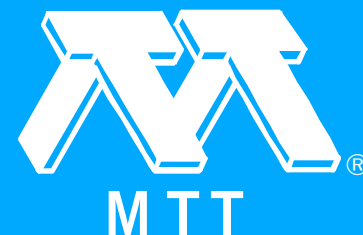
- ❑ [Three-Dimensional Computer Simulation in Deep Regional Hyperthermia Using the Finite-Difference Time-Domain Method](#)

Sullivan, G.J.

- ❑ [Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz](#)

Sussman-Fort, S.E.

- ❑ [A Realization of a GaAs FET Microwave Active Filter \(Short Papers\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

- ❑ [Design Concepts for Microwave GaAs FET Active Filters](#)

Suzuki, H.

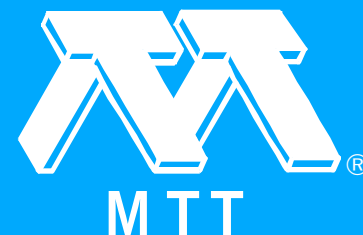
- ❑ [State-Preserving Intermittently Locked Loop \(SPILL\) Frequency Synthesizer for Portable Radio \(Dec. 1989 \[T-MTT\]\)](#)

Svedin, J.A.M.

- ❑ [A Numerically Efficient Finite-Element Formulation for the General Waveguide Problem without Spurious Modes](#)
- ❑ [Propagation Analysis of Chirowaveguides Using the Finite-Element Method](#)

Swaminathan, M.

- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

- ❑ [Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation \(Comments and Reply\)](#)

Sweeney, C.

- ❑ [Monolithic Ka Band VCO Using Quarter Micron GaAs MESFETs and Integrated High-Q Varactors \(1990 \[MCS\]\)](#)

Sweeney, C.N.

- ❑ [Integration of High-Q GaAs Varactor Diodes and 0.25 \$\mu\$ m GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications](#)

Swift, C.W.

- ❑ [1989 MTT-S International Microwave Symposium \(Dec. 1989 \[T-MTT\]\)](#)

Taguchi, Y.

- ❑ [Miniature Hybrid Microwave IC's Using a Novel Thin-Film Technology \(Dec. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Taheri, M.M.

- ❑ [Accurate Determination of Modes in Dielectric-Loaded Cylindrical Cavities Using a One-Dimensional Finite Element Method](#)

Tait, G.B.

- ❑ [Propagation in Layered Biased Semiconductor Structures Based on Transport Analysis](#)

Tajima, Y.

- ❑ [A Novel MMIC Active Filter with Lumped and Transversal Elements \(Comments and Reply\)](#)
- ❑ [A Novel MMIC Active Filter with Lumped and Transversal Elements \(Dec. 1989 \[T-MTT\]\)](#)
- ❑ [Miniature Monolithic Microwave Frequency Diplexers](#)

Click on title for a paper summary.



Papers by Author



IEEE

[Contents](#)

[Authors](#)

Takachio, N.

- ❑ [A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver \(Dec. 1990 \[T-MTT\]\)](#)

Takahashi, K.

- ❑ [Miniaturized Hairpin Resonator Filters and Their Application to Receiver Front-End MIC's \(Dec. 1989 \[T-MTT\]\)](#)

Takahashi, S.

- ❑ [A New Self-Alignment Technology for Sub-Quarter-Micron-Gate FET's Operating in the Ka-Band](#)

Takemoto, J.H.

- ❑ [Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T/sub c/ Superconducting Thin Films \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Takenaka, T.

- ☐ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part I
- ☐ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part II

Takiyama, K.

- ☐ Two-Path Cutoff Waveguide Dielectric Resonator Filters (Jul. 1989 [T-MTT])

Tan, C.-H.

- ☐ Analysis of a Shielded Microstrip Line with Finite Metallization Thickness by the Boundary Element Method (Short Papers)

Tan, T.S.

- ☐ Optical Receiver and Modulator Frequency Response Measurement with a Nd:YAG Ring Laser Heterodyne Technique

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Tan, Z.

- ☐ [5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier](#)

Tan, Z.C.H.

- ☐ [5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier](#)

Tanaka, S.

- ☐ [Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures](#)

Tanaka, T.

- ☐ [Broad-Band Monolithic Microwave Active Inductor and its Application to Miniaturized Wide-Band Amplifiers \(Correction\)](#)

Taniguchi, I.

- ☐ [Microwave Complex Conductivity of a Square Post in Rectangular Waveguide](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Tantod, S.

- ☐ Multifunction Chip Set for T/R Module Receive Path (1990 [MCS])

Tantod, S.S.

- ☐ Multifunction Small-Signal Chip Set for Transmit/Receive Modules

Tarusawa, Y.

- ☐ State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Dec. 1989 [T-MTT])

Tayrani, R.

- ☐ Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications (Short Papers)

Tenedorio, J.

- ☐ MIMIC Technology Transportability (1990 [MCS])

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Theron, B.

- ☐ [Asymmetrical Finline for Space Applications Using Millimeter Waves](#)

Thiel, D.V.

- ☐ [State-Preserving Intermittently Locked Loop \(SPILL\) Frequency Synthesizer for Portable Radio \(Comments and Reply\)](#)

Thim, H.W.

- ☐ [MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron \(FECTED\) Oscillators](#)

Thompson, J.A.

- ☐ [X-Band 0.5, 1, and 2 Watt Power Amplifiers with Marked Improvement in Power-Added Efficiency](#)

Thompson, S.

- ☐ [Three Channel I.F. Multiplexers](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Thorburn, M.

- ❑ [Computation of Frequency-Dependent Propagation Characteristics of Microstriplike Propagation Structures with Discontinuous Layers](#)

Thornber, K.K.

- ❑ [Dominance of Resistive Losses Over Hysteretic Losses in Ferromagnetic Conductors \(Short Papers\)](#)

Thurmond, G.D.

- ❑ [Long Microwave Delay Fiber-Optic Link for Radar Testing \(Short Papers\)](#)

Tokumitsu, T.

- ❑ [A 30 GHz MMIC Receiver for Satellite Transponders](#)
- ❑ [A Miniaturized Broad-Band MMIC Frequency Doubler](#)
- ❑ [Broad-Band Monolithic Microwave Active Inductor and its Application to Miniaturized Wide-Band Amplifiers \(Correction\)](#)

Click on title for a paper summary.

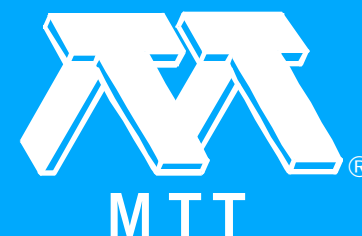


Papers by Author

- ❑ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part I
- ❑ Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part II
- ❑ Lossless Broad-Band Monolithic Microwave Active Inductors (Dec. 1989 [T-MTT])
- ❑ Novel Unilateral Circuits for MMIC Circulators
- ❑ Very Small Ultra-Wide-Band MMIC Magic T and Applications to Combiners and Dividers
- ❑ Very Small Wide-Band MMIC Magic T's Using Microstrip Lines on a Thin Dielectric Film

Tomabechi, Y.

- ❑ Reflection and Transmission Characteristics of an Uncoincidental Junction on Rectangular Dielectric Waveguides



Contents

Authors

Click on title for a paper summary.



Papers by Author

- ❑ Reflection and Transmission Coefficients of Rectangular Dielectric Waveguide Discontinuity with an Air Gap (Short Papers)

Ton, T.N.

- ❑ An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application

Tong, C.-Y.E.

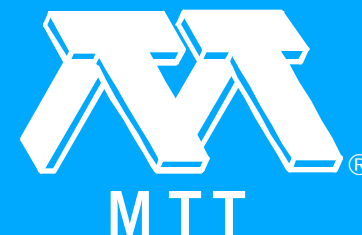
- ❑ Simulation of the Superconducting Quasiparticle Mixer Using a Five-Port Model

Toulios, P.P.

- ❑ Propagation Properties of Ferromagnetic Insular Guide

Tran, L.

- ❑ GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Tran, M.Q.

- ❑ [Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron](#)

Tremblay, B.S.

- ❑ [Theoretical and Experimental SAR Distributions for Interstitial Dipole Antenna Arrays Used in Hyperthermia](#)

Trew, R.J.

- ❑ [Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing](#)

Tripathi, V.K.

- ❑ [Computation of Frequency-Dependent Propagation Characteristics of Microstriplike Propagation Structures with Discontinuous Layers](#)
- ❑ [Modeling of Asymmetric and Offset Gaps in Shielded Microstrips and Slotlines \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author

- ❑ [Perturbation Analysis and Modeling of Curved Microstrip Bends](#)
- ❑ [Spectral-Domain Computation of Characteristic Impedances and Multiport Parameters of Multiple Coupled Microstrip Lines](#)

Truitt, G.A.

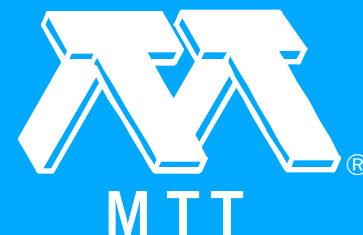
- ❑ [A New Low-Noise FET Structure](#)

Tsai, C.S.

- ❑ [Magnetostatic-Forward-Volume-Wave-Based Guided-Wave Magneto-Optic Bragg Cells and Applications to Communications and Signal Processing](#)

Tsai, I.-S.

- ❑ [Perturbed-TEM Analysis of Transmission Lines with Imperfect Conductors](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Tsalamengas, J.L.

- ❑ [Exact Solutions for Shielded Printed Microstrip Lines by the Carleman-Vekua Method](#)

Tserng, H.Q.

- ❑ [35 GHz GaAs Power MESFET's and Monolithic Amplifiers](#)

Tsuji, M.

- ❑ [A New Equivalent Network Method for Analyzing Discontinuity Properties of Open Dielectric Waveguides](#)
- ❑ [Two-Path Cutoff Waveguide Dielectric Resonator Filters \(Jul. 1989 \[T-MTT\]\)](#)

Tsutsumi, M.

- ❑ [Microstrip Lines Using Yttrium Iron Garnet Film](#)

Tucker, R.S.

- ❑ [Editorial \(Jun. 1990 \[T-MTT\]\)](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Tumeh, A.M.

- ☐ [Performance Comparison of Available Interstitial Antennas for Microwave Hyperthermia](#)

Tzuang, C.-K.C.

- ☐ [Complex Modes in Shielded Suspended Coupled Microstrip Lines](#)
- ☐ [Full-Wave Analysis of Lossy Quasi-Planar Transmission Line Incorporating the Metal Modes](#)
- ☐ [Investigations of Complex Modes in a Generalized Bilateral Finline with Mounting Grooves and Finite Conductor Thickness \(Dec. 1989 \[T-MTT\]\)](#)

Uchida, K.

- ☐ [New Type of Spectral-Domain Analysis of a Microstrip Line](#)

Uchida, S.

- ☐ [Monolithic Sampling Head IC](#)

Click on title for a paper summary.



Papers by Author

Uhde, K.

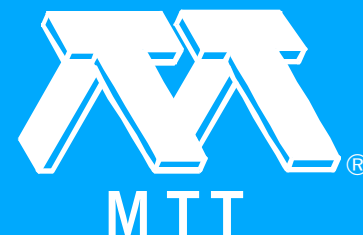
- ❑ [Design and Applications of Optically Controllable Finline Structures \(Short Papers\)](#)

Umeda, A.Y.

- ❑ [A Monolithic GaAs HBT Upconverter](#)

Umemoto, D.K.

- ❑ [A Monolithic GaAs HBT Upconverter](#)
- ❑ [GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz](#)
- ❑ [GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications](#)
- ❑ [High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Upadhyayula, L.C.

- ❑ [High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals](#)
- ❑ [Wide-Band GaInAs MISFET Amplifiers \(Short Papers\)](#)

Uwano, T.

- ❑ [A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions](#)
- ❑ [Accurate Characterization of Microstrip Resonator Open End with New Current Expression in Spectral-Domain Approach \(Short Papers\)](#)
- ❑ [Miniature Hybrid Microwave IC's Using a Novel Thin-Film Technology \(Dec. 1990 \[T-MTT\]\)](#)

Uysal, S.

- ❑ [Synthesis, Design, and Construction of Ultra-Wide-Band Nonuniform Quadrature Directional Couplers in Inhomogeneous Media](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Uzunoglu, N.K.

- ☐ [A Rigorous Analysis of a Coaxial to Shielded Microstrip Line Transition](#)
- ☐ [Analysis of Energy Coupling into Spheroidal Ferritic Implants for Hyperthermia Applications](#)
- ☐ [Analysis of the Power Coupling from a Waveguide Hyperthermia Applicator into a Three-Layered Tissue Model](#)
- ☐ [Electromagnetic Energy Deposition Inside a Three-Layer Cylindrical Human Body Model Caused by Near-Field Radiators](#)

Vahldieck, R.

- ☐ [A New Method of Modeling Three-Dimensional MIC/MMIC Circuits: The Space-Spectral Domain Approach](#)
- ☐ [Characterization of a Class of Waveguide Discontinuities Using a Modified TE/ \$\text{sup } x/\text{sub } mn/\$ Mode Approach](#)
- ☐ [Propagation Characteristics of MIS Transmission Lines with Inhomogeneous Doping Profile](#)

Click on title for a paper summary.



Papers by Author

- ❑ [Quasi-Planar Filters for Millimeter-Wave Applications](#)
- ❑ [The Method of Lines Applied to Planar Transmission Lines in Circular and Elliptical Waveguides](#)

Vai, M.-K.

- ❑ [Computer-Aided Design of Monolithic MESFET Distributed Amplifiers](#)

Vakanas, L.P.

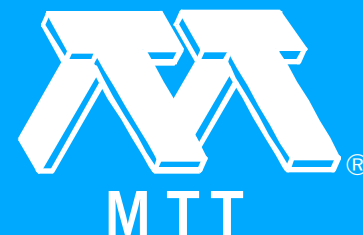
- ❑ [A Parametric Study of the Attenuation Constant of Lossy Microstrip Lines \(Short Papers\)](#)

van de Velde, J.C.

- ❑ [Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors \(Short Papers\)](#)

van den Bogaart, F.L.M.

- ❑ [A 10-14 GHz Linear MMIC Vector Modulator with Less Than 0.1dB and 0.8° Amplitude and Phase Error \(1990 \[MCS\]\)](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

van Deventer, T.E.

- ☐ [An Integral Equation Method for the Evaluation of Conductor and Dielectric Losses in High-Frequency Interconnects](#)

Van Exter, M.

- ☐ [Characterization of an Optoelectronic Terahertz Beam System](#)

van Raay, F.

- ☐ [Error-Corrected Large-Signal Waveform Measurement System Combining Network Analyzer and Sampling Oscilloscope Capabilities](#)
- ☐ [Precisely Calibrated Coaxial-to-Microstrip Transitions Yield Improved Performance in GaAs FET Characterization](#)

Van Tuyl, R.L.

- ☐ [An MMIC Amplifier for Automatic Level Control Applications](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Vanzura, E.J.

- ☐ Improved Technique for Determining Complex Permittivity with the Transmission/Reflection Method

Varian, K.

- ☐ 1990 MTT-S International Microwave Symposium (Dec. 1990 [T-MTT])

Vecchi, G.

- ☐ Modeling of Multiconductor Buses and Analysis of Crosstalk, Propagation Delay, and Pulse Distortion in High-Speed GaAs Logic Circuits

Veit, W.

- ☐ Coupling of Crossed Planar Multiconductor Systems

Vernet, G.

- ☐ Large-Signal Model of Picosecond FET's and Measurement of the Step Response

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Vernon, R.J.

- ❑ [Compact Quasi-Periodic and Aperiodic TE/sub 0n/ Mode Converters in Overmoded Circular Waveguides for Use with Gyrotrons](#)

Vickes, H.-O.

- ❑ [A Novel MMIC Active Filter with Lumped and Transversal Elements \(Comments and Reply\)](#)

Vittoria, C.

- ❑ [Propagation Properties of Ferromagnetic Insular Guide](#)

Voelker, R.H.

- ❑ [A Finite-Difference Transmission Line Matrix Method Incorporating a Nonlinear Device Model](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Volakis, J.L.

- ☐ [A Moment Method Solution of a Volume-Surface Integral Equation Using Isoparametric Elements and Point Matching \(Short Papers\)](#)

Vowinkel, B.

- ☐ [Investigation of Planar Antennas for Submillimeter Receivers](#)

Vu, T.B.

- ☐ [p-i-n Diode Attenuator with Small Phase Shift \(Additional Comments and Reply\)](#)

Wade, J.D.

- ☐ [Conservation of Complex Power Technique for Waveguide Junctions with Finite Wall Conductivity](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Wait, J.R.

- ☐ Electromagnetic Wave Transmission in a Well Logging Cable--Theory (Short Papers)
- ☐ Note on the Impedance of a Wire Grid Parallel to a Homogeneous Interface (Short Papers)

Wakino, K.

- ☐ Dielectric Receiving Filter with Sharp Stopband Using an Active Feedback Resonator Method for Cellular Base Stations (Dec. 1989 [T-MTT])

Walinsky, P.

- ☐ Percutaneous Transluminal Microwave Balloon Angioplasty (Short Papers)

Walker, J.L.B.

- ☐ Analysis and Design of Kemp-Type 3 dB Quadrature Couplers (Short Papers)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Wallace, P.

- ☐ [A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter \(Short Papers\)](#)
- ☐ [A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception](#)

Walters, W.

- ☐ [Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect \(Short Papers\)](#)

Wan, L.A.

- ☐ [High-Dynamic-Range Airborne Tracking and Fire Control Radar Subsystems](#)

Wang, B.-S.

- ☐ [Mutual Impedance Between Probes in a Circular Waveguide](#)

Click on title for a paper summary.



Papers by Author

- ❑ [Mutual Impedance Between Probes in a Waveguide \(Corrections\)](#)

Wang, C.-Q.

- ❑ [Numerical Simulation of Annular Phased Arrays for Anatomically Based Models Using the FDTD Method](#)

Wang, D.C.

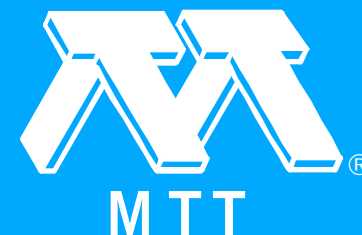
- ❑ [A 2.5 Watt X-Band High Efficiency MMIC Amplifier](#)

Wang, G.-W.

- ❑ [An Analytical Model for I-V and Small-Signal Characteristics of Planar-Doped HEMT's](#)

Wang, J.

- ❑ [A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Wang, J.J.H.

- ☐ Computation of Electromagnetic Fields in Large Biological Bodies by an Iterative Moment Method with a Restart Technique
- ☐ Computation of Fields in an Arbitrarily Shaped Heterogeneous Dielectric or Biological Body by an Iterative Conjugate Gradient Method

Wang, M.

- ☐ Microwave Power Combination Using a Bifurcated Waveguide and a Reflecting Plate

Wang, N.-L.

- ☐ Monolithic IMPATT Oscillator Characterization

Wang, N.L.

- ☐ Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Wang, R.

- ☐ C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process

Wang, T.-H.

- ☐ Investigations of Complex Modes in a Generalized Bilateral Finline with Mounting Grooves and Finite Conductor Thickness (Dec. 1989 [T-MTT])

Wang, W.-K.

- ☐ Investigations of Complex Modes in a Generalized Bilateral Finline with Mounting Grooves and Finite Conductor Thickness (Dec. 1989 [T-MTT])

Wassel, J.

- ☐ 1990 MTT-S International Microwave Symposium (Dec. 1990 [T-MTT])

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Way, W.I.

- ☐ Applications of Traveling-Wave Laser Amplifiers in Subcarrier Multiplexed Lightwave Systems

Weaver, G.R.

- ☐ Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications (Short Papers)

Weaver, P.F.

- ☐ Propagation and Circuit Characteristics of Inductively Coupled Superconducting Microstrip

Webb, C.

- ☐ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Webb, J.P.

- ☐ [A Complete E-Plane Analysis of Waveguide Junctions Using the Finite Element Method](#)
- ☐ [Absorbing Boundary Conditions for the Finite-Element Analysis of Planar Devices](#)
- ☐ [Infinite Elements for the Analysis of Open Dielectric Waveguides](#)
- ☐ [Optimization of Planar Devices by the Finite Element Method](#)

Webb, K.J.

- ☐ [An Equivalent Circuit Model for Terminated Hybrid-Mode Multiconductor Transmission Lines](#)
- ☐ [Isolation Effects in Single- and Dual-Plane VLSI Interconnects](#)
- ☐ [Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique](#)

Click on title for a paper summary.



Papers by Author

- ☐ Numerical Solution of the Continuous Waveguide Transition Problem
- ☐ Study of Modal Solution Procedures for Microstrip Step Discontinuities

Weikle, II, R.M.

- ☐ Bar-Grid Oscillators

Weimann, G.

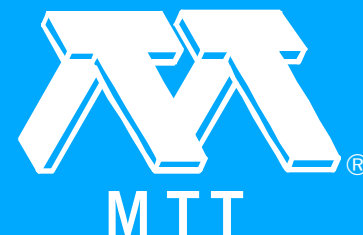
- ☐ RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures

Weisshaar, A.

- ☐ Perturbation Analysis and Modeling of Curved Microstrip Bends

Weller, J.F.

- ☐ Optical Phase Control of an Optically Injection-Locked FET Microwave Oscillator



Contents

Authors

Click on title for a paper summary.



Papers by Author

Weng, S.

- ☐ [5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier](#)

Weng, S.-L.

- ☐ [5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier](#)

West, Jr., M.

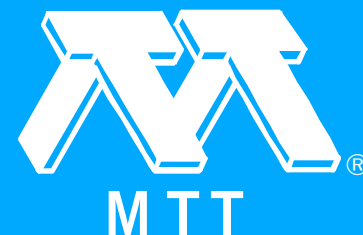
- ☐ [Monolithic Integrated Blanking Up-Converter](#)

West, R.G.

- ☐ [Tunable, Temperature-Compensated Dielectric Resonators and Filters](#)

White, D.J.

- ☐ [Alternate Forms of the Generalized Composite Scattering Matrix \(Letters\)](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Wholey, J.N.

- ☐ Implementation of RF/Microwave Receiver Components on a Semi-Custom Silicon Bipolar Array
- ☐ Multifunction Silicon MMIC's for Frequency Conversion Applications

Wilcox, R.B.

- ☐ Arbitrary Pulse Shape Synthesis via Nonuniform Transmission Lines (Short Papers)

Willems, D.

- ☐ Multifunction Chip Set for T/R Module Receive Path (1990 [MCS])

Willems, D.A.

- ☐ GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications

Click on title for a paper summary.



Papers by Author

- ❑ Multifunction Small-Signal Chip Set for Transmit/Receive Modules

Williams, D.

- ❑ De-Embedding and Underterminating Microwave Fixtures with Nonlinear Least Squares (Short Papers)

Williams, D.F.

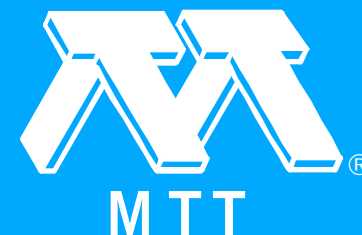
- ❑ Damping of the Resonant Modes of a Rectangular Metal Package (Short Papers)

Wills, J.D.

- ❑ Spectral Estimation for the Transmission Line Matrix Method (Short Papers)

Withers, R.S.

- ❑ Wide-Band Superconductive Chirp Filters



IEEE

Contents

Authors

Click on title for a paper summary.



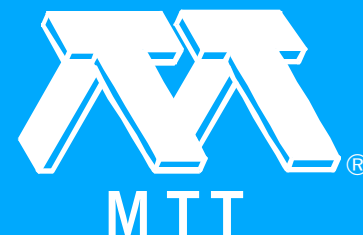
Papers by Author

Withington, S.

- ❑ [Spectral-Domain Analysis of Harmonic Effects in Superconducting Quasiparticle Mixers](#)

Wolff, I.

- ❑ [A Generalized Theory for Asymmetrical Coupled Lines \(Short Papers\)](#)
- ❑ [A Rigorous Dispersive Characterization of Microstrip Cross and T Junctions](#)
- ❑ [A Simple Broad-Band Device De-Embedding Method Using an Automatic Network Analyzer with Time-Domain Option](#)
- ❑ [Equivalent Capacitances of Coplanar Waveguide Discontinuities and Interdigitated Capacitors Using a Three-Dimensional Finite Difference Method](#)
- ❑ [Fast and Accurate Analytic Formulas for Calculating the Parameters of a General Broadside-Coupled Coplanar Waveguide for \(M\)MIC Applications](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author

Wolk, D.

- ☐ [Filter Design Using In-Line Triple-Mode Cavities and Novel Iris Couplings](#)

Wong, H.

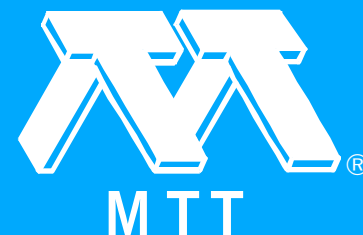
- ☐ [Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications \(Short Papers\)](#)

Wong, T.T.Y.

- ☐ [Coupled-Wave Small-Signal Transient Analysis of GaAs Distributed Amplifier](#)

Wong, Y.-C.

- ☐ [Full-Wave Analysis of Coplanar Waveguides by Variational Conformal Mapping Technique](#)



IEEE

[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Worm, S.B.

- ☐ [Full-Wave Analysis of Discontinuities in Planar Waveguides by the Method of Lines Using a Source Approach \(Short Papers\)](#)

Wortman, D.E.

- ☐ [Results of Phase and Injection Locking of an Orotron Oscillator \(Short Papers\)](#)

Wright, A.S.

- ☐ [A Dual Six-Port Automatic Network Analyzer Incorporating a Biphas-Bimodulation Element](#)

Wu, B.

- ☐ [Lumped Lossy Circuit Synthesis and its Application in Broad-Band FET Amplifier Design in MMIC's \(Short Papers\)](#)

Wu, J.

- ☐ [Stable Broad-Band Microwave Amplifier Design](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Wu, K.

- ☐ A New Method of Modeling Three-Dimensional MIC/MMIC Circuits: The Space-Spectral Domain Approach
- ☐ Propagation Characteristics of MIS Transmission Lines with Inhomogeneous Doping Profile
- ☐ The Method of Lines Applied to Planar Transmission Lines in Circular and Elliptical Waveguides

Wu, K.L.

- ☐ Waveguide Discontinuity Analysis with a Coupled Finite-Boundary Element Method

Wu, R.-B.

- ☐ Frequency-Dependent Characteristics of Open Microstrip Lines with Finite Strip Thickness (Short Papers)

Wu, S.-C.

- ☐ A Generalized Method for Distinguishing Between Radiation and Surface-Wave Losses in Microstrip Discontinuities

Click on title for a paper summary.



Papers by Author

- ❑ [A Rigorous Dispersive Characterization of Microstrip Cross and T Junctions](#)

Wurtele, M.

- ❑ [35 GHz GaAs Power MESFET's and Monolithic Amplifiers](#)

Xia, J.

- ❑ [Propagation Properties of Ferromagnetic Insular Guide](#)

Xu, D.-M.

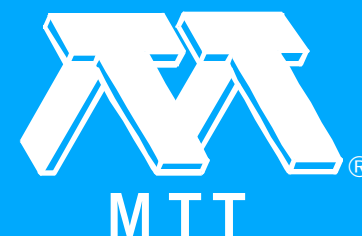
- ❑ [The Design of an Ultra-Broad-Band 3 dB Coupler in Dielectric Waveguide \(Short Papers\)](#)

Xu, Q.

- ❑ [Study of Modal Solution Procedures for Microstrip Step Discontinuities](#)

Xu, S.

- ❑ [Effect of Transition Waveguides on Dielectric Waveguide Directional Couplers](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Xuan, Y.

- ☐ [Optimal Computer-Aided Design of Monolithic Microwave Integrated Oscillators \(Short Papers\)](#)

Xun, P.

- ☐ [Spectral-Domain Immittance Approach for the Propagation Constants of Unilateral Finline with Magnetized Ferrite Substrate \(Short Papers\)](#)

Yakihara, T.

- ☐ [Monolithic Sampling Head IC](#)

Yamashita, E.

- ☐ [A Quasi-TEM Design Method for 3 dB Hybrid Couplers Using a Semi-Reentrant Coupling Section \(Short Papers\)](#)
- ☐ [Additional Approximate Formulas and Experimental Data on Micro-Coplanar Striplines \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author

- ❑ Characterization of Microstrip Lines Near a Substrate Edge and Design Formulas of Edge-Compensated Microstrip Lines

Yanai, H.

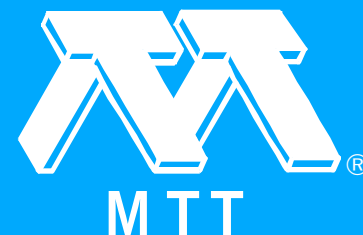
- ❑ Numerical Simulation of GaAs MESFET's with a p-Buffer Layer on the Semi-Insulating Substrate Compensated by Deep Traps

Yang, D.

- ❑ An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application

Yang, H.-Y.

- ❑ A Generalized Method for Distinguishing Between Radiation and Surface-Wave Losses in Microstrip Discontinuities
- ❑ A Rigorous Dispersive Characterization of Microstrip Cross and T Junctions



Contents

Authors

Click on title for a paper summary.



Papers by Author

- ❑ [An Integral Equation Analysis of an Infinite Array of Rectangular Dielectric Waveguides](#)
- ❑ [Microstrip Open-End and Gap Discontinuities in a Substrate-Superstrate Structure](#)

Yanokura, E.

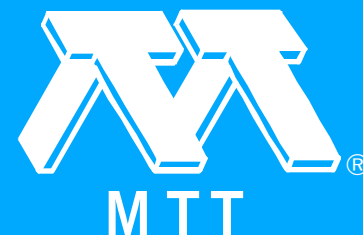
- ❑ [A New Self-Alignment Technology for Sub-Quarter-Micron-Gate FET's Operating in the Ka-Band](#)

Ye, S.

- ❑ [Efficient Large-Signal FET Parameter Extraction Using Harmonics \(Dec. 1989 \[T-MTT\]\)](#)

Yee, H.-Y.

- ❑ [Slotted Waveguide Directional Coupler Characteristics](#)



[Contents](#)

[Authors](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Yeh, C.

- ❑ [Attenuation Measurement of Very Low Loss Dielectric Waveguides by the Cavity Resonator Method Applicable in the Millimeter/Submillimeter Wavelength Range \(Comments and Reply\)](#)
- ❑ [Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide](#)

Yen, H.W.

- ❑ [Long Microwave Delay Fiber-Optic Link for Radar Testing \(Short Papers\)](#)

Yeo, S.-P.

- ❑ [Application of Least-Squares Boundary Residual Method to the Analysis of a Circular Waveguide Loaded with a Nonconcentric Dielectric Rod](#)

Click on title for a paper summary.



Papers by Author



Contents

Authors

Yngvesson, K.S.

- ☐ [The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications](#)

Yonemura, J.Y.

- ☐ [Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications \(Short Papers\)](#)

York, R.A.

- ☐ [Experimental Evaluation of Existing CAD Models for Microstrip Dispersion \(Short Papers\)](#)

Yoshida, N.

- ☐ [Three-Dimensional Analysis of a Cylindrical Waveguide Converter for Circular Polarization by the Spatial Network Method](#)
- ☐ [Three-Dimensional Analysis of a Through Hole with Radiation Characteristics by the Spatial Network Method](#)

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Yoshikado, S.

- ☐ [Microwave Complex Conductivity of a Square Post in Rectangular Waveguide](#)

You, T.-S.

- ☐ [Use of a Microwave Cavity for Sensing Dielectric Properties of Arbitrarily Shaped Biological Objects](#)

Young, D.

- ☐ [Magnetostatic-Forward-Volume-Wave-Based Guided-Wave Magneto-Optic Bragg Cells and Applications to Communications and Signal Processing](#)

Young, J.L.

- ☐ [Note on the Impedance of a Wire Grid Parallel to a Homogeneous Interface \(Short Papers\)](#)

Yu, C.-C.

- ☐ [Analysis of Dielectric-Loaded Waveguide](#)

Click on title for a paper summary.



Papers by Author



[Contents](#)

[Authors](#)

Yu, Z.

- ☐ [A New Way to Optically Control a Millimeter-Wave Oscillator \(Short Papers\)](#)

Yuan, X.

- ☐ [Three-Dimensional Electromagnetic Scattering from Inhomogeneous Objects by the Hybrid Moment and Finite Element Method](#)

Yuan, Y.

- ☐ [Full-Wave Perturbation Theory Based Upon Electric Field Integral Equations for Coupled Microstrip Transmission Lines](#)

Yuen, C.

- ☐ [High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz](#)
- ☐ [High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz \(Short Papers\)](#)

Click on title for a paper summary.



Papers by Author

- ❑ Sensitivity of a 40 GHz HEMT Low-Noise Amplifier to Material and Processing Variations (Short Papers)

Yun, S.W.

- ❑ Analysis of Step Discontinuities on Planar Dielectric Waveguide Containing a Gyrotropic Layer

Zah, C.-E.

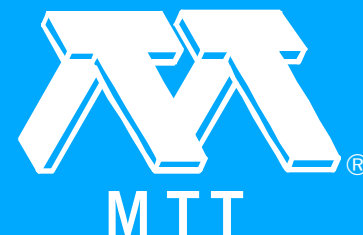
- ❑ Applications of Traveling-Wave Laser Amplifiers in Subcarrier Multiplexed Lightwave Systems

Zaki, K.A.

- ❑ A Novel Coupling Method for Dual-Mode Dielectric Resonators and Waveguide Filters
- ❑ Tunable, Temperature-Compensated Dielectric Resonators and Filters

Zargari, V.

- ❑ Characteristic Impedance of a Tubular Dielectric Cylinder Covered with Conducting Arc Strips (Short Papers)



Contents

Authors

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Zdasiuk, G.

- ☐ 5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier
- ☐ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz
- ☐ High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz (Short Papers)
- ☐ Sensitivity of a 40 GHz HEMT Low-Noise Amplifier to Material and Processing Variations (Short Papers)

Zdasiuk, G.A.

- ☐ 5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier

Zhang, Q.-J.

- ☐ Efficient Large-Signal FET Parameter Extraction Using Harmonics (Dec. 1989 [T-MTT])
- ☐ FAST Gradient Based Yield Optimization of Nonlinear Circuits

Click on title for a paper summary.



Papers by Author



IEEE

Contents

Authors

Zhang, Y.

- ☐ [Microwave Hyperthermia Induced by a Phased Interstitial Antenna Array \(Short Papers\)](#)
- ☐ [The Calculated and Measured Temperature Distribution of a Phased Interstitial Antenna Array](#)

Zheng, D.

- ☐ [Rigorous Analysis of Open Microstrip Lines of Arbitrary Cross Section in Bound and Leaky Regimes \(Dec. 1989 \[T-MTT\]\)](#)

Zheng, W.

- ☐ [Computation of Complex Resonance Frequencies of Isolated Composite Objects](#)
- ☐ [Direct and Inverse Resonance Problems for Shielded Composite Objects Treated by Means of the Null-Field Method](#)

Click on title for a paper summary.



Papers by Author

Zhu, L.

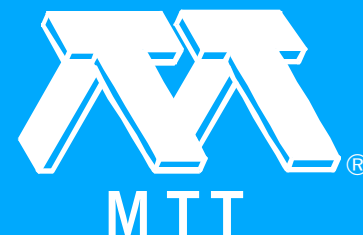
- ☐ [Lumped Lossy Circuit Synthesis and its Application in Broad-Band FET Amplifier Design in MMIC's \(Short Papers\)](#)

Zieniutycz, W.

- ☐ [A New Formulation of the Boundary Condition at Infinity for a Hybrid Radiation Mode and its Application to the Analysis of Radiation Modes of Microstrip Lines](#)

Zur, A.

- ☐ [An Infrared Fiber-Optic Radiometer for Controlled Microwave Heating \(Short Papers\)](#)



IEEE

[Contents](#)

[Authors](#)

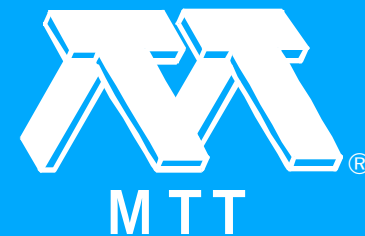
Click on title for a paper summary.



Abstracts

Front Cover (Jan. 1989 [T-MTT])

"Front Cover (Jan. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): f1-f2.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Editorial (Jan. 1989 [T-MTT])

R. Levy. "Editorial (Jan. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 1-2.

I am writing this report at the end of my three-year tenure as Editor with a profound sense of satisfaction and relief; satisfaction that the Transactions continues to serve its purpose as the premier publication in our field, and relief that I am able to hand over the task to such an extraordinarily well qualified individual as Dr. Rodney S. Tucker. Rodney has published over 100 papers encompassing a very broad range of microwave specialities, and will bring enthusiastic dedication to the Editorship with the full Support of AT&T Bell Laboratories. He has been handling day-to-day editorial activities since July 1988 and takes over as Editor of the Transactions with this issue.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

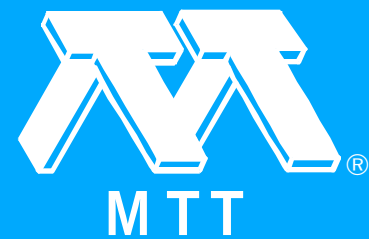
A New Equivalent Network Method for Analyzing Discontinuity Properties of Open Dielectric Waveguides

H. Shigesawa and M. Tsuji. "A New Equivalent Network Method for Analyzing Discontinuity Properties of Open Dielectric Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 3-14.

A novel network approach is proposed for analyzing interacting discontinuities on open planar dielectric waveguides by accurately taking account of both surface modes and waves with continuous spectra. In our approach, a continuum of the radiation wave is recomposed into a set of the newly defined "spectral composite" modes, each of them carrying a finite magnitude of radiation power, and these new modes, in conjunction with surface modes, construct the complete orthonormal set for expressing an arbitrary local field on a dielectric slab waveguide. This idea allows us to provide the modal voltages and currents of the spectral composite modes in the identical definition with those for the surface modes with discrete eigenvalues, thereby developing an equivalent network approach effective for solving discontinuity problems, even on an open waveguide, with the familiar approach for closed waveguide problems. A number of numerical results are shown to prove the usefulness of our approach.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A CAD-Oriented Method for Noise Figure Computation of Two-Ports with Any Internal Topology

J.A. Dobrowolski. "A CAD-Oriented Method for Noise Figure Computation of Two-Ports with Any Internal Topology." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 15-20.

A method for computer-aided noise analysis and an algorithm for the noise parameter computation of two-ports with any internal topology are discussed. The approach is applicable to circuits which are composed of any number of passive linear multiports and active linear two-port devices. The noise analysis is based on the scattering matrix description for circuit elements and wave representation for noise.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Exact Solutions for Shielded Printed Microstrip Lines by the Carleman-Vekua Method

J.G. Fikioris, J.L. Tsalamengas and G.J. Fikioris. "Exact Solutions for Shielded Printed Microstrip Lines by the Carleman-Vekua Method." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 21-33.

Exact analytical solutions for the field of the quasi-TEM mode in various cross-sectional configurations of rectangularly shielded printed microstrip lines are obtained on the basis of Carleman-type singular integral equations (SIE's). There are no limitations on the dimensions or the proximity of the strip conductors to the shield. For the kernel of the SIE, strongly and uniformly convergent series expansions have recently been developed that are suitable for the exact solution of the equation by the Carleman-Vekua regularization method, which proceeds by first solving the so-called dominant equation. The procedure leads to rapidly convergent series solutions for the field of the quasi-TEM mode even when the conductors are large or very near the shield, i.e., in situations for which numerical techniques become inadequate. Characteristic values of the shielded microstrip lines are evaluated by summing a few terms, while field plots, requiring more terms, are shown for various configurations including the case of close proximity.

[Click on title for a complete paper.](#)





[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A New Analytic Design Technique for Two-and Three-Way Warped Mode Comblne Directional Couplers

S. Islam. "A New Analytic Design Technique for Two-and Three-Way Warped Mode Comblne Directional Couplers." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 34-42.

An analytic technique of designing ultra-wide-band warped-mode two-way and three-way microwave directional couplers is presented. With this matrix method it is possible to design couplers for any level of coupling by choosing a warping angle appropriate to the desired output amplitudes. The design technique involves obtaining a "wave propagation" matrix in analytical form as a function of the "taper parameter", which in turn is a function of distance along the coupler length. The line parameters and the forward scattering matrix are then determined from the wave propagation matrix at any distance from the beginning of the coupler. The method is demonstrated here for couplers using microstrip coupled combline. The computed and the measured performance of a two-way and a three-way microstrip combline coupler are presented for equal power splitting. These couplers were found to work between 1.5 and 8.5 GHz.

[Click on title for a complete paper.](#)



Generation of High-Power Broad-Band Microwave Pulses by Picosecond Optoelectronic Technique

H.A. Sayadian, M.G. Li and C.H. Lee. "Generation of High-Power Broad-Band Microwave Pulses by Picosecond Optoelectronic Technique." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 43-50.

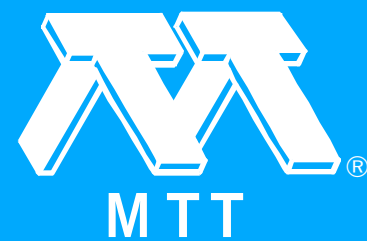
A single-picosecond GaAs photoconductive switch (PS) is used to pulse excite a microwave resonant cavity, thus generating a variety of RF waveforms with picosecond synchronization. The length of the transmission line that connects the photoconductive switch and the cavity, and the strength of input/output cavity coupling elements provide for continuous variation of the frequency distribution of the generated RF power. The generation of over 7 kW, the peak-to-peak voltage over 1.2 kV, of broad-band microwave bursts is demonstrated.



Transversely Anisotropic Curved Optical Fibers: Variational Analysis of a Nonstandard Eigenproblem

M.I. Oksanen and I.V. Lindell. "Transversely Anisotropic Curved Optical Fibers: Variational Analysis of a Nonstandard Eigenproblem." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 51-62.

A new variational functional is introduced for the analysis of curved open and closed waveguides. The theory is based on the variational principle for nonstandard eigenvalue problems, recently applied for straight anisotropic fibers. The present method is valid for arbitrary waveguide cross section and arbitrary radius of curvature for closed waveguides, but for open guides, the radius should be large enough because the method predicts the real part of the propagation constant, not the imaginary part, which gives the attenuation in curved open structures. The dielectric medium can be homogeneous or nonhomogeneous with transverse and/or longitudinal anisotropy. As an example of the method, curved isotropic and anisotropic single-mode fibers with two different kinds of anisotropy models are studied. The analysis includes field distributions, changes in the dispersion curves due to reformed geometry, and birefringence characteristics in curved anisotropic fibers.



IEEE

Contents

Publications

Issues

Papers

Authors





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Analysis of Dielectric Guiding Structures by the Iterative Eigenfunction Expansion Method

T.F. Jablonski and M.J. Sowinski. "Analysis of Dielectric Guiding Structures by the Iterative Eigenfunction Expansion Method." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 63-70.

Numerical results demonstrating capabilities of a recently developed method for determining guided modes of dielectric waveguides are presented. Apart from accuracy tests for the single-core waveguides, examples of the wavelength-selective coupler, the directional coupler with an adhesive layer, and of the side-pit structure are briefly analyzed. The theoretical background of the iterative eigenfunction expansion method (IEEM) and a comprehensive description of the numerical algorithm are also given. As it is efficient, highly accurate, and versatile, the IEEM proved to be useful in the analysis of various dielectric guiding structures.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Cutoff Spaces of Elliptical Gyromagnetic Planar Circuits and Waveguides Using Finite Elements

J. Helszajn and A.A.P. Gibson. "Cutoff Spaces of Elliptical Gyromagnetic Planar Circuits and Waveguides Using Finite Elements." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 71-80.

The finite element method is admirably suited for the analysis of irregular planar circuits on gyromagnetic substrates. It is used in this paper to evaluate the cutoff spaces of elliptical magnetized planar circuits with electric and magnetic walls in all combinations. A knowledge of the four possible solutions and a knowledge of the rules governing the intersections of cutoff branches in the cutoff spaces are sufficient for a complete description of the related elliptical gyromagnetic waveguide with either an electric or a magnetic wall. It is also demonstrated that the demagnetized and split cutoff numbers of the resonator with magnetic sidewall and top and bottom electric walls are sufficient for the approximate description of the split phase constants of the dominant mode in the related weakly magnetized gyromagnetic waveguide problem with either a magnetic or an electric wall.

[Click on title for a complete paper.](#)



Abstracts

Full-Wave, Finite Element Analysis of Irregular Microstrip Discontinuities

R.W. Jackson. "Full-Wave, Finite Element Analysis of Irregular Microstrip Discontinuities." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 81-89.

Finite element expansion currents are used to formulate a full-wave analysis of microstrip discontinuities. A rigorous analysis of fairly irregular structures is possible, including radiation and surface wave effects as well as coupling between closely spaced junctions. The step, stub, and bent-stub discontinuities are analyzed using this technique. Measurements are presented which verify stub calculations.



IEEE

Contents

Publications

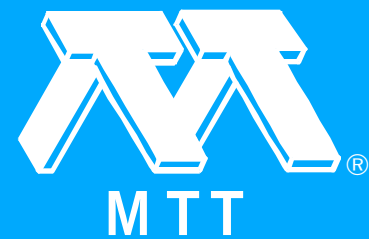
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Determination of the Correlation Spectrum of Oscillators with Low Noise

F.X. Kaertner. "Determination of the Correlation Spectrum of Oscillators with Low Noise." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 90-101.

A general expression for the correlation spectrum of an oscillator, described by a set of nonlinear ordinary differential equations with intrinsic noise sources, is derived by a first-order perturbation theory. The analytical derivations are well suited to the numerical determination of the correlation spectrum by Poincare mapping methods. The theory is applied to a lumped circuit model of a Colpitts oscillator. The noise behavior of complex oscillator circuits used in microwave engineering may be simulated by the derived method.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Open-Ended Coaxial Exposure Device for Applying RF/Microwave Fields to Very Small Biological Preparations

R.L. Seaman, E.C. Burdette and R.L. DeHaan. "Open-Ended Coaxial Exposure Device for Applying RF/Microwave Fields to Very Small Biological Preparations." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 102-111.

An easily fabricated open-ended coaxial exposure device for applying RF/microwave energy to very small biological preparations is described. The device utilizes the fringing fields of a coaxial cable opening into a ground plane. Operation of the device is easily integrated into standard laboratory procedures to observe a biological specimen; monitor temperature; regulate temperature, pH, and pO₂; and record cellular membrane potentials. The electromagnetic field configuration of the device leads to elimination of detectable interaction with microelectrodes. Measured patterns of electric field and specific absorption rate (SAR) are given for a device built with quarter-inch semirigid coaxial cable and operating at 2450 MHz. Comparison is made with previous exposure devices for small biological preparations.



A Broad-Band Printed Circuit Hybrid Ring Power Divider

G.F. Mikucki and A.K. Agrawal. "A Broad-Band Printed Circuit Hybrid Ring Power Divider." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 112-117.

A power divider in the form of a hybrid ring that provides substantially improved amplitude and phase characteristics over a broad frequency range compared to that of a conventional hybrid ring coupler is described. The improvement in bandwidth is obtained by the addition of a fifth port to the conventional four-port design. The new design is applicable to both equal and unequal power divisions and uses the same design equations as the conventional hybrid ring design to obtain the desired degree of coupling. The new design provides substantially improved coupling and phase characteristics over a very broad frequency range; the usable bandwidth is limited primarily by the degradation in the other parameters such as input VSWR and isolation between coupled ports. The bandwidth is approximately twice that of a conventional hybrid ring coupler. A theoretical comparison of the performance characteristics of the improved and the conventional design was accomplished using a CAD program. Experimental verification of the improved design was earned out in a stripline configuration for both equal and unequal power divisions at Ku-band and a bandwidth of approximately 45 percent was achieved.





IEEE

Contents

Publications

Issues

Papers

Authors

Numerical Simulation of Annular Phased Arrays for Anatomically Based Models Using the FDTD Method

C.-Q. Wang and O.P. Gandhi. "Numerical Simulation of Annular Phased Arrays for Anatomically Based Models Using the FDTD Method." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 118-126.

Annular phased arrays (APA's) of aperture and dipole antennas used for hyperthermia are simulated in three dimensions by using the finite difference time-domain (FDTD) method. A 17 363 cell, 1.31 cm resolution, anatomically based model of the human torso surrounded by a bolus of deionized water is used for calculations of specific absorption rates (SAR's). Test runs on the calculation of fields in the water-filled interaction space and with homogeneous circular- and elliptical-cylinder phantoms correlate well with the experimental data in the literature, lending support to the accuracy of the FDTD method for near-field exposure conditions. Results are given for APA's using different sizes of aperture and dipole antennas and for a subannular array to obtain higher SAR's in the liver. Because of its flexibility, the procedure of this paper may be useful for a variety of realistic radio frequency applicators for hyperthermia and other biomedical applications.

Click on title for a complete paper.



Abstracts

Analysis of Transients in Nonuniform and Uniform Multiconductor Transmission Lines

O.A. Palusinski and A. Lee. "Analysis of Transients in Nonuniform and Uniform Multiconductor Transmission Lines." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 127-138.

Delay times of digital logic circuits are now becoming smaller than those of interconnections used in packaging. At high speeds, such interconnections no longer behave as simple short circuits, but take on the appearance of transmission lines. One may choose to solve the problem of delay by increasing the density of the system. This, however, introduces the problem of "cross talk." The analysis of delay and cross talk in a system of transmission lines is rather complex; for this reason, it is usually done with the aid of computer simulation. The present paper introduces a very efficient and flexible time-domain analysis technique to predict the reflections and cross talk. Numerical results show that this technique is indeed efficient and accurate in the transient analysis of general multiple coupled line systems. Furthermore, this algorithm will eventually be coded in a form of subroutine compatible with any standard CAD program, such as SPICE.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

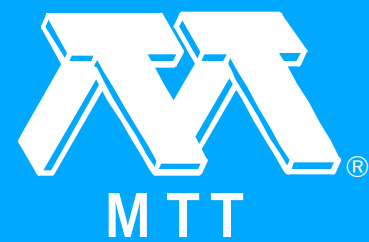
Optically CW-Induced Losses in Semiconductor Coplanar Waveguides

W. Platte and B. Sauerer. "Optically CW-Induced Losses in Semiconductor Coplanar Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 139-149.

This paper presents a quasi-static analysis of photoinduced wave attenuation in a continuously illuminated coplanar waveguide transmission line on semiconductor substrate, using a conformal mapping technique. The relevant effects of charge carrier diffusion and surface recombination on photoconductivity and plasma penetration depth have been incorporated into the theory. This finally allows a quantitative estimate of optically induced losses as a function of the various light source and substrate parameters by means of numerically calculated diagrams. In the particular case of small-plasma-depth excitation, an approximate, analytical expression for the light-controlled attenuation constant is presented. Initial experimental results are in relatively good agreement with the theory.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Analysis and Measurement of Transducer End Radiation in SAW Filters on Strongly Coupling Substrates

A.R. Baghai-Wadji, O. Manner and R. Ganss-Puchstein. "Analysis and Measurement of Transducer End Radiation in SAW Filters on Strongly Coupling Substrates." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 150-158.

We present the analysis and measurement of spurious responses generated at the ends of surface acoustic wave (SAW) interdigital transducers (IDT's). Filters fabricated on LiNbO₃/sub 3/ show an unwanted passband ripple whose period indicates additional generation of acoustic waves at the IDT end. As this effect cannot be explained by methods of analysis based on the infinite array approximation, an exact analysis of the complex-valued, frequency-dependent electric charge distribution on the finite IDT structure is required. Utilizing the method of moments, our analysis is based on a Green's function concept and a spectral-domain representation. Three effects are shown: The first is the charge accumulation of grounded guard fingers located closely to the IDT end, resulting in unwanted end radiation. The second is acoustic end reflections in split-finger IDT's, occurring at the transition from the periodic finger structure to the free substrate. The third is the finger charge induced by the metallic ground plane when the transducer is driven unbalanced to ground. Computer simulations based on our method agree well with measurements.

Click on title for a complete paper.

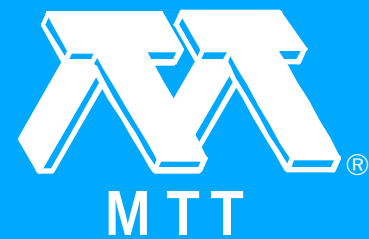


Abstracts

On the Mode Coupling in Longitudinally Magnetized Waveguiding Structures

J. Mazur and M. Mrozowski. "On the Mode Coupling in Longitudinally Magnetized Waveguiding Structures." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 159-165.

The propagation in waveguiding structures containing gyromagnetic material with longitudinal magnetization is analyzed in terms of the coupling between modes having different symmetry properties. It is found that the wave supported by a symmetrical structure of two coupled guides is a combination of the even and odd modes propagating in an isotropic structure. The gyromagnetic medium causes the coupling between the modes, and the energy of the wave is periodically transferred from one mode to another, which in turn results in the exchange of energy between guides. The mathematical model proposed here explains the operation of novel nonreciprocal devices which have been investigated experimentally by other researchers.



IEEE

[Contents](#)

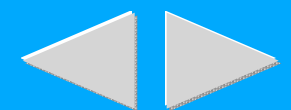
[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)

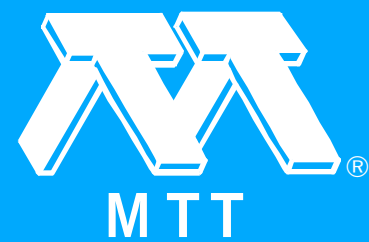


Intelligent Alignment of Waveguide Filters Using a Machine Learning Approach

A.R. Mirzai, C.F.N. Cowan and T.M. Crawford. "Intelligent Alignment of Waveguide Filters Using a Machine Learning Approach." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 166-173.

This paper investigates the use of a machine learning system applied to the tuning of waveguide filters. This system employs techniques from pattern recognition and adaptive signal processing. The manual tuning of the waveguide filters is very time consuming and expensive and a skilled operator is required. Here, the machine learning system is adapted in such a way that it can assist an unskilled operator to perform fast and accurate tuning of these filters.





IEEE

Contents

Publications

Issues

Papers

Authors

Electromagnetic Deposition in an Anatomically Based Model of Man for Leakage Fields of a Parallel-Plate Dielectric Heater

J.-Y. Chen and O.P. Gandhi. "Electromagnetic Deposition in an Anatomically Based Model of Man for Leakage Fields of a Parallel-Plate Dielectric Heater." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 174-180.

The three-dimensional finite-difference time-domain (FDTD) method has been used to calculate the local layer-averaged and whole-body-averaged specific absorption rates (SAR's) and internal RF currents in a 5628-cell anatomically based model of man for spatially variable electromagnetic fields of a parallel-plate applicator representative of RF dielectric heaters used in industry. Included in the calculations are the shape and dimensions of the applicator plates as well as a typical spacing of 21 cm to the human operator. The calculated leakage fields are in agreement with the experimentally measured values. The conditions of exposure of the man model considered are: isolated from ground, feet in contact with ground, and an additional grounded top plate 13.1 cm above the head to simulate screen rooms that are occasionally used for RF heaters. Also considered is the model with a separation layer of rubber ($\epsilon_r = 4.2$) of thickness 2.62 cm between feet and ground to simulate the shoe-wearing condition. For peak E fields as high as 1000-2700 V/m that have been measured at the locations of the operator, significant internal RF currents on the order of 0.5-2.3 A are projected for the operator. Laboratory measurements of the foot currents at 27.12 and 40.68 MHz for a human subject are in agreement with the calculated values.

Click on title for a complete paper.



Abstracts

On the Application of Complex Resistive Boundary Conditions to Model Transmission Lines Consisting of Very Thin Superconductors

J.M. Pond, C.M. Krowne and W.L. Carter. "On the Application of Complex Resistive Boundary Conditions to Model Transmission Lines Consisting of Very Thin Superconductors." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 181-190.

A resistive boundary condition for the case where the resistivity is assumed to be a complex quantity is shown to be an accurate model for a superconducting film which is thin compared to the superconducting penetration depth. The imaginary part of the conductivity is the dominant term and is a measure of the inductive energy stored in the superconductor. Numerical solutions of superconducting microstrip have been obtained and are compared to experimental results and to analytic solutions for superconducting parallel-plate waveguides. Excellent agreement has been found between experimental, analytical, and numerical results.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Variational Analysis of Dielectrically Loaded Multidepth Corrugated Waveguides

M.I. Oksanen. "Variational Analysis of Dielectrically Loaded Multidepth Corrugated Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 191-197.

The propagation behavior in a multidepth corrugated waveguide is analyzed. The analysis is based on the theory of nonstandard eigenvalues and variational methods. This method is tested for an empty dual-depth corrugated guide, the results of which have been previously calculated in the literature by using surface impedance and space harmonic methods. These methods are summarized here. Also, space harmonic formulas are rederived in the form where the fundamental surface admittance component is separated from the higher order terms. It is seen that, with elementary trial functions, very accurate dispersion relations can be obtained by the variational method. Encouraged by this, the method is then extended for a tridepth guide operating in three different frequency bands, and for dielectrically loaded dual- and tridepth guides. The latter components may hold considerable promise because of their simpler fabrication technique.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A 2-18 GHz Low-Noise/High-Gain Amplifier Module

K.B. Niclas, R.R. Pereira and A.P. Chang. "A 2-18 GHz Low-Noise/High-Gain Amplifier Module." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 198-207.

Earlier predictions that the two-tier matrix amplifier possesses excellent low-noise potential have been verified. Experimental modules whose topology is based on a computer-optimized design exhibit an average noise figure of $F = 3.5$ dB with an associated average gain of $G = 17.8$ dB across the 2-18 GHz frequency band. These state-of-the-art results were achieved with GaAs MESFET's whose minimum noise figure is $F = 2.2$ dB at 18 GHz and whose gate dimensions are $0.25 \times 200 \mu\text{m}$. The design considerations and the test results are discussed in detail.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

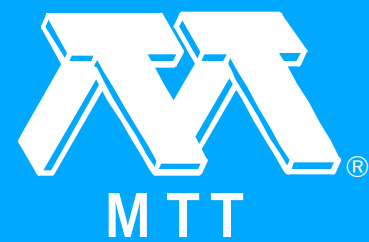
A Partial Variational Approach for Arbitrary Discontinuities in Planar Dielectric Waveguides

S.-J. Chung and C.H. Chen. "A Partial Variational Approach for Arbitrary Discontinuities in Planar Dielectric Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 208-214.

A novel approach for analyzing arbitrary discontinuities in planar dielectric waveguides is proposed that uses the finite-element method along with the frontal solution technique. Based on the partial variational principle (PVP), the fields interior and exterior to the discontinuity finite element region can be treated independently and eventually can be coupled. The interior fields are expanded by the finite element nodal values and the corresponding local bases, while the exterior ones are handled by an approach combining modal expansion and Green's function. In numerical computation, the continuous spectra of the waveguide modes are discretized by the Laguerre expansion method. To check the correctness of the present analysis, two numerical results are compared with those of other methods. The scattering characteristics of several linearly tapered discontinuities, such as transformers and feed structures, are analyzed and compared with those having step junctions.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Spectral-Domain Computation of Characteristic Impedances and Multiport Parameters of Multiple Coupled Microstrip Lines

V.K. Tripathi and H. Lee. "Spectral-Domain Computation of Characteristic Impedances and Multiport Parameters of Multiple Coupled Microstrip Lines." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 215-221.

The numerical procedure based on the spectral-domain techniques is formulated to compute all the frequency-dependent normal-mode parameters of general multiple coupled line structures in an inhomogeneous medium. In addition to the phase and attenuation constants for all the normal modes; these parameters include the line-mode and decoupled line modal impedances and the current and equivalent voltage eigenvector matrices of the coupled system. The multiport admittance (and impedance) matrices and coupled line equivalent circuit model parameters are evaluated in terms of these normal-mode parameters. Numerical results for these normal-mode parameters for typical asymmetric two-, three-, and four-line microstrip structures are included to demonstrate the procedure and the frequency dependence of these parameters.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Six-Port and Four-Port Reflectometers for Complex Permittivity Measurements at Submillimeter Wavelengths

U. Stumper. "Six-Port and Four-Port Reflectometers for Complex Permittivity Measurements at Submillimeter Wavelengths." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 222-230.

The frequency range of six-port reflectometry has been extended into the submillimeter wavelength range. The complex permittivity of low-loss microwave materials has been determined using new six-port and four-port reflectometers developed in the Physikalisch-Technische Bundesanstalt (PTB). These either consist of quasi-optical components or utilize oversized waveguide techniques. Permittivity measurements of materials possessing a wide range of values of ϵ' (2 to 7) and of the loss tangent (0.0003 to 0.03) were carried out at frequencies of about 380 GHz to 390 GHz. Good agreement with published permittivity data is shown.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Spectral-Domain Analysis of Harmonic Effects in Superconducting Quasiparticle Mixers

S. Withington and E.L. Kollberg. "Spectral-Domain Analysis of Harmonic Effects in Superconducting Quasiparticle Mixers." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 231-238.

An algorithm has been developed for calculating the harmonic performance of superconducting quasiparticle millimeter-wave mixers. The scheme uses harmonic balance to determine the steady-state waveform of the large-amplitude voltage which is induced across the tunnel junction by the local oscillator source. A key feature of the new algorithm is that the large-signal tunneling-current calculations are done in the frequency domain rather than in the time domain, and this approach leads to numerically efficient computer simulations. The superiority of the spectral-domain method is particularly pronounced when modeling mixers which incorporate high-quality tunnel junctions with very sharp dc nonlinearities. A simplified mixer simulation has been performed to determine the range of ωCR products for which harmonic effects are likely to be important. An ωCR product of between 3 and 4 appears to be a good compromise between being able to tune out the capacitive reactance at the signal frequency and avoiding the deleterious effects of inadvertent harmonic pumping.

[Click on title for a complete paper.](#)



Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines

C.-L. Chen, A. Chu, L.J. Mahoney, W.E. Courtney, R.A. Murphy and J.C. Sethares.
"Oscillators Using Magnetostatic-Wave Active Tapped Delay Lines." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 239-243.

A novel oscillator that combines a magnetostatic wave (MSW) tapped delay line with GaAs monolithic microwave integrated circuits (MMIC's) has been fabricated. This oscillator incorporates an external feedback loop which is extremely short and provides multiple outputs delayed in time by the MSW delay line. The oscillator is tunable from 2.76 to 2.95 GHz and the 3-dB bandwidth of the oscillation is approximately 10 kHz.



Abstracts

Reflection Coefficient of a Waveguide with Slightly Uneven Walls

D.A. Hill. "Reflection Coefficient of a Waveguide with Slightly Uneven Walls." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 244-252.

First-order results are derived for the reflection coefficient of a waveguide with slightly uneven walls. Specific analytical and numerical results are given for rectangular waveguides and coaxial transmission lines. Simple upper bounds are given for reflection coefficients in terms of the maximum deviation of the waveguide. For typical tolerances the reflection coefficients are very small ($<10^{-3}$), but the results are important in precise six-port measurements.



IEEE

Contents

Publications

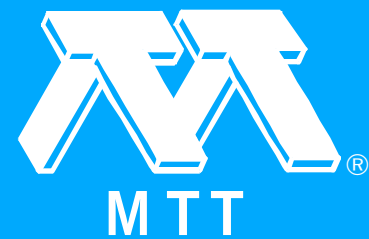
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Damping of the Resonant Modes of a Rectangular Metal Package (Short Papers)

D.F. Williams. "Damping of the Resonant Modes of a Rectangular Metal Package (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 253-256.

When an electrical circuit is enclosed in a metal package huge enough to support resonant modes within the frequencies of operation of the enclosed circuit, coupling between the circuit and these resonant cavity modes may disturb circuit operation. These resonant cavity modes can be effectively damped by placing a dielectric substrate coated with a resistive film in the cavity. In this paper a numerical algorithm is used to find the frequencies and quality factors of the lowest order resonant mode of a cavity damped in this manner.

[Click on title for a complete paper.](#)



Abstracts

Finite Element Formulation for Guided-Wave Problems Using Transverse Electric Field Component (Short Papers)

K. Hayata, M. Eguchi and M. Koshiba. "Finite Element Formulation for Guided-Wave Problems Using Transverse Electric Field Component (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 256-258.

A finite-element formulation for electromagnetic waveguide problems is described using the transverse electric field component. In this approach, the divergence relation $\nabla \cdot \mathbf{D} = 0$ is satisfied and spurious solutions can be eliminated in the entire region of a propagation diagram. The validity of the formulation is examined via applications to a few canonical guided-wave problems.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

An Improved Algorithm for the Computer-Aided Design of Coupled Slab Lines (Short Papers)

S. Rosloniec. "An Improved Algorithm for the Computer-Aided Design of Coupled Slab Lines (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 258-261.

Improved analytical formulas for the computer-aided design of parallel coupled slab lines are presented. These formulas ensure a good agreement of calculations with accurate numerical results for a wide range of geometrical dimensions of the lines.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Analysis of Nonreciprocal Coupled Image Lines (Comments and Reply) (Jan. 1989 [T-MTT])

J. Mazur, M. Mrozowski, D.B. Sillars and L.E. Davis. "Analysis of Nonreciprocal Coupled Image Lines (Comments and Reply) (Jan. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 262-262.

In the above paper an analysis based on the effective dielectric constant approach is used to investigate the coupled dielectric image lines separated by a ferrite slab magnetized in the propagation direction. According to this analysis the structure exhibits nonreciprocal dispersion properties. However, gyromagnetic waveguiding structures magnetized in the propagation direction should be reciprocal in accordance with the generalized reciprocity theorem. The only nonreciprocal effect allowed in this type of guide is the Faraday rotation. The results given by Sillars and Davis violate the reciprocity theorem because the analysis is based on an erroneous interpretation of the solution of the wave equation in the ferrite medium.

[Click on title for a complete paper.](#)



Abstracts

Patent Abstracts (Jan. 1989 [T-MTT])

"Patent Abstracts (Jan. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 263-266.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Copyright Form (Jan. 1989 [T-MTT])

"Copyright Form (Jan. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 269-270.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

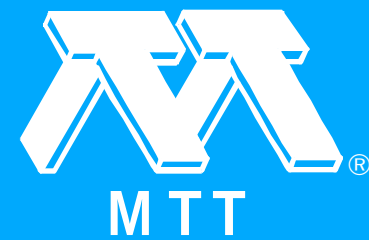
Click on title for a complete paper.



Abstracts

Oliver Heaviside: Sage in Solitude (Advertisement) (Jan. 1989 [T-MTT])

"Oliver Heaviside: Sage in Solitude (Advertisement) (Jan. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 271-271.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

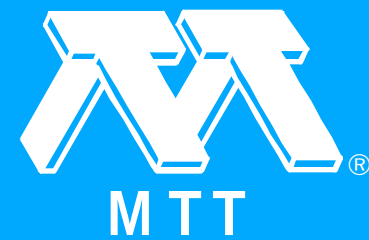
Click on title for a complete paper.



Abstracts

1988 IEEE Membership Directory (Advertisement) (Jan. 1989 [T-MTT])

"1988 IEEE Membership Directory (Advertisement) (Jan. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 272-272.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

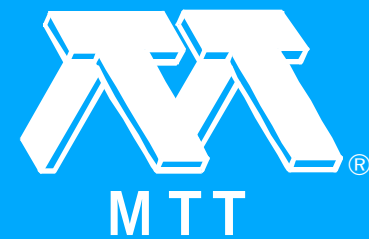
Click on title for a complete paper.



Abstracts

Back Cover (Jan. 1989 [T-MTT])

"Back Cover (Jan. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

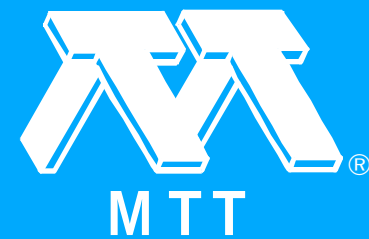
Click on title for a complete paper.



Abstracts

Front Cover (Feb. 1989 [T-MTT])

"Front Cover (Feb. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): f1-f2.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Foreword (Feb. 1989 [T-MTT])

A.K. Sharma. "Foreword (Feb. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 273-274.

Recent progress in quasi-planar millimeter-wave components and subsystems is attributed to significant advances in integrated finline technology. Innovative design techniques utilizing other forms of planar transmission lines with integrated finlines have led to the development of millimeter-wave components and subsystems with a high level of integration.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Overview of Quasi-Planar Transmission Lines

T. Itoh. "Overview of Quasi-Planar Transmission Lines." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 275-280.

A number of quasi-planar transmission lines are reviewed in terms of the general propagation characteristics including useful features, precautions in practice, and some design information. Transmission lines discussed in this paper include coplanar waveguides, finlines, suspended stripline, and microslab waveguides. Attenuation characteristics of some of these lines are compared. In addition, the problems of discontinuity characterizations are included.



[Contents](#)

[Publications](#)

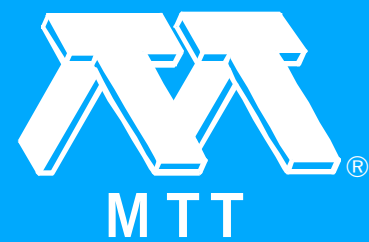
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Coupled Mode Analysis of a Finline

J. Mazur and M. Mrozowski. "Coupled Mode Analysis of a Finline." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 281-288.

A theoretical analysis of a unilateral finline loaded with arbitrary inhomogeneous lossy dielectric material is presented. The rigorous coupled mode approach is used. The electromagnetic field in the line is expressed in terms of the modes of a ridged waveguide and the problem is transformed to a matrix eigenvalue equation. Approximate expressions are derived for investigating the properties of the fundamental mode in finlines loaded with dielectric slabs. Dispersion characteristics, the characteristic impedance, and the attenuation due to dielectric losses and the finite conductivity of metal coating are computed for various line configurations. The numerical results are compared with data obtained by means of the spectral-domain method, proving the validity and usefulness of the proposed approach.

[Click on title for a complete paper.](#)



Asymmetrical Finline for Space Applications Using Millimeter Waves

P. Espes, P.F. Combes, J.-M. Goutoule and B. Theron. "Asymmetrical Finline for Space Applications Using Millimeter Waves." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 289-298.

We have studied a new type of unilateral finline--the asymmetrical structure finline (ASFL). In addition to providing better electromagnetic isolation, this structure solves problems of mechanical and thermal resistance encountered with the traditional line. It provides better electromagnetic performances than the traditional line, while leaving an additional degree of freedom to obtain the characteristic parameters. The calculation software is used to simulate this type of structure, with results close to experimental measurements. The study was completed by producing two circuits a 20 GHz bandpass filter and a balanced mixer.



Abstracts

Finlines in Rectangular and Circular Waveguide Housings Including Substrate Mounting and Bending Effects--Finite Element Analysis

Eswarappa, G.I. Costache and W.J.R. Hoefer. "Finlines in Rectangular and Circular Waveguide Housings Including Substrate Mounting and Bending Effects--Finite Element Analysis." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 299-306.

The finite element method is applied for deriving the dispersion characteristics and field components of dominant and higher order modes in finlines. The method is accurate and covers the metallization thickness, substrate mounting grooves, bending of the substrate, and arbitrary cross sections. Results for structures already obtained with other methods have been found to agree well with available data. As a new contribution, the effect of substrate bending on the propagation constant is studied. Also, the dispersion characteristics for the dominant and higher order modes for bilateral finlines in circular waveguide housing are calculated for the first time. The field plots for all the modes are also given.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

p-i-n Diode Control Devices in E-Plane Technique

H. Callsen, H.H. Meinel and W.J.R. Hoefer. "p-i-n Diode Control Devices in E-Plane Technique." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 307-316.

The status of p-i-n diode control devices in E-plane technique, especially in integrated finline configurations, is reviewed. The circuit topologies, operating principles, and design considerations for state-of-the-art switches, attenuators, and digital modulators are discussed, and typical performance characteristics are presented. The superior performance of these components confirms that finline is the appropriate transmission medium for the realization of millimeter-wave p-i-n diode switches and attenuators in the low-power regime (up to some 10 W of CW power), where beam-lead p-i-n diodes can be used. By properly matching these devices to their finline embedding network, excellent broad-band characteristics can be achieved.

Click on title for a complete paper.



Abstracts

The Design of Millimeter-Wave Control Components

J. Adelman, R. Ben-Michael, S. Caspi and S. Hopfer. "The Design of Millimeter-Wave Control Components." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 317-323.

The design of broad-band high-performance control components covering the 18-40 GHz frequency range utilizing microstrip technology is described. Design considerations and experimental results are presented for high-speed single-pole, single-throw and single-pole, double-throw switches with 80 and 60 dB isolation, respectively. Design equations and experimental results are presented for a 3 dB quadrature microstrip reentrant coupler and for a nonreflective voltage-controlled attenuator with a dynamic range of 50 dB.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Quasi-Planar Filters for Millimeter-Wave Applications

R. Vahldieck. "Quasi-Planar Filters for Millimeter-Wave Applications." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 324-334.

This paper reviews a variety of quasi-planar low-pass, bandpass, and bandstop filters suitable for millimeter-wave applications. The emphasis is on ladder-shaped E-plane bandpass filters to highlight their advantages as well as limitations in terms of design, performance, and manufacturing. To extend their range of application it is suggested that E-plane filters be cascaded for better passband separation. A modified finline filter is presented to improve the performance and manufacturing of filters in waveguides below cutoff. Finally, it is shown that plated through holes can simplify filter housing fabrication and that surface-metallized composite housings are a lightweight and low-cost alternative to metal housings.

[Click on title for a complete paper.](#)



Abstracts

Computer-Aided Design of E-Plane Waveguide Passive Components

P. Fan and D. Fan. "Computer-Aided Design of E-Plane Waveguide Passive Components." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 335-339.

The newly developed numerical analysis method for the inductive discontinuities in rectangular waveguide is presented. It can be used to analyze the scattering properties of E-plane uniform conductor-dielectric inserts in rectangular waveguide. These inserts are of arbitrary cross section and number. The calculation accuracy and speed are remarkably improved by a combined analytical-numerical approach. Some practical applications are given demonstrating its engineering usefulness.



[Contents](#)

[Publications](#)

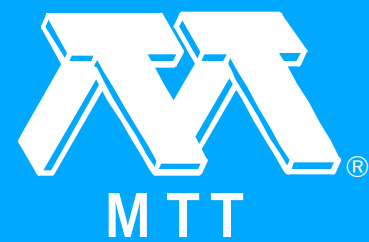
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Rigorous Field Theory Design of Millimeter-Wave E-Plane Integrated Circuit Multiplexer

J. Dittloff and F. Arndt. "Rigorous Field Theory Design of Millimeter-Wave E-Plane Integrated Circuit Multiplexer." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 340-350.

The overall field theory designs of two types of quasi-planar millimeter-wave multiplexer utilizing low-cost, low-insertion-loss printed metallic E-plane filters are described. Very compact components are achieved by using E-plane filters printed on a common metal sheet which is directly integrated in the septate sections of an E-plane n-furcated split-block waveguide housing. The second configuration proposed extends the useful principle of waveguide H-plane slit-coupled manifold multiplexer to the case of millimeter-wave printed metallic E-plane filters. Based on the modal scattering matrix description of suitable key building blocks, the rigorous simulation technique used comprises the complete multiplexer structure including the E-plane transformer or iris elements, the waveguide E- or H-plane junctions, and the filter sections. The optimization process takes all relevant influences into account, such as finite metallization thicknesses and the higher order mode interactions of all discontinuities. Computer-optimized data are presented for seven-resonator metal insert filter diplexer and triplexer examples in the E-band (60-90 GHz) designed for common-port passband return losses of more than 25 dB and 20 dB, respectively. The theory is verified by measured results of typical individual components and of a septate E-plane diplexer realized in the Ku-band.

Click on title for a complete paper.

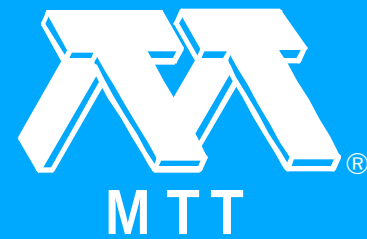


Abstracts

Oscillators and Amplifiers in Integrated E-Plane Technique

W.J.R. Hoefer. "Oscillators and Amplifiers in Integrated E-Plane Technique." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 351-364.

This paper presents an overview of solid-state oscillators and amplifiers realized in E-plane technology. The circuit topology, basic design procedures, and performance characteristics are described and compared. The paper surveys Gunn oscillators, IMPATT oscillators, transistor oscillators, injection-locked Gunn oscillators, and transistor amplifiers. Gunn and transistor oscillators have been realized successfully for frequencies from 10 to 110 GHz, thus covering almost the entire frequency range suitable for E-plane technology. IMPATT oscillators are difficult to design and to reproduce in quasi-planar form because of the high impedance ratio that must be overcome by the circuit. E-plane FET amplifiers have been built for frequencies up to 60 GHz.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications

K.S. Yngvesson, T.L. Korzeniowski, Y.-S. Kim, E.L. Kollberg and J.F. Johansson. "The Tapered Slot Antenna--A New Integrated Element for Millimeter-Wave Applications." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 365-374.

Tapered slot antennas (TSA's) have a number of potential applications as single elements and focal plane arrays. TSA's can be fabricated with photolithographic techniques and integrated in either hybrid or MMIC circuits with receiver or transmitter components. They offer considerably narrower beams than other integrated antenna elements and have high aperture efficiency and packing density as array elements. Typical applications which have been demonstrated or are under development are reviewed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Investigation of Planar Antennas for Submillimeter Receivers

U. Kotthaus and B. Vowinkel. "Investigation of Planar Antennas for Submillimeter Receivers." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 375-380.

A frequency-scaled model of a tapered slot antenna has been investigated. The antenna consists of a dielectric substrate which serves as a carrier for a tapered slotline. The width and the shape of the slotline and the dimensions of the substrate (including the value of the permittivity) have been varied to investigate the radiation patterns. The result is a planar antenna with a symmetrical beam in the E and H planes and a beam efficiency of almost 50 percent. The substrate thickness is the most important limiting factor for scaling the model to submillimeter frequencies. Taking away parts of the dielectric substrate in the front area of the antenna allows a relatively large substrate thickness. The variations of the half-power beam width versus slot parameters, versus the dielectric thickness of the substrate, and versus the length and the width of the substrate are presented. In addition the beam efficiency has been measured for various frequencies, and the radiation pattern has been calculated for comparison.

[Click on title for a complete paper.](#)



Abstracts

Study of Modal Solution Procedures for Microstrip Step Discontinuities

Q. Xu, K.J. Webb and R. Mittra. "Study of Modal Solution Procedures for Microstrip Step Discontinuities." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 381-387.

Single and cascaded microstrip step discontinuity problems are studied. Modal formulations and numerical solution procedures are investigated in an effort to determine computationally efficient techniques for the solution of such problems. The enforcement of a modal orthogonality criterion, the boundary enlargement/reduction concept, and convergence as a function of the number of modes and their accuracy are considered. Theoretical and experimental results are presented for the scattering parameters of several example geometries.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Spectral-Domain Analysis of E-Plane Waveguide to Microstrip Transitions

T.Q. Ho and Y.-C. Shih. "Spectral-Domain Analysis of E-Plane Waveguide to Microstrip Transitions." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 388-392.

The spectral-domain technique and a residue calculus theorem are used to compute the input impedance of a microstrip transition to a rectangular waveguide. The transition consists of a printed circuit board inserted into a waveguide housing along the E plane. The effects of the dielectric layer are considered in the present analysis. The behavior of the input impedance of the transition is studied with respect to the critical dimensions of the probe length and backshort location. Calculated results by the new formulation agree well with those computed using an integral equation and those measured at Ku-band frequencies.

[Click on title for a complete paper.](#)



Abstracts

Monolithic IMPATT Oscillator Characterization

N.-L. Wang and M. Cobb. "Monolithic IMPATT Oscillator Characterization." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 393-399.

Recent interest in monolithic millimeter-wave IMPATT's has generated much activity. However, there have been few measurements to confirm circuit design predictions. Both the high-frequency and the low IMPATT impedance levels make such measurements difficult and inaccurate. In this paper, two useful methods for characterizing the resonator will be described. Theory and experiment will be presented.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

A Novel Exponential Power Combiner/Divider

A.M. Affandi and A.M. Milyani. "A Novel Exponential Power Combiner/Divider." 1989 *Transactions on Microwave Theory and Techniques* 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 400-405.

A simple and novel theoretical analysis for an exponential two-way power combiner/divider is developed. The proposed power combiner/divider's parameters, such as input impedance and reflection and transmission coefficients, are determined. The capacitance effect due to the finite thickness of the coupled-line conductor for both uniform and nonuniform transmission lines is found. The properties of the combiner/divider have been tested experimentally.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Double-Sided MIC's and Their Applications

M. Aikawa and H. Ogawa. "Double-Sided MIC's and Their Applications." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 406-413.

This paper presents the basic concept and features of double-sided microwave integrated circuits (double-sided MIC's), which effectively utilize various kinds of transmission lines on both sides of a substrate. The fundamental circuits such as 180° hybrids (magic T's) and many application circuits described in this paper are very useful in developing microwave and millimeter-wave band equipment. The concept of doublesided MIC technique can be also applied to MMIC's.



IEEE

Contents

Publications

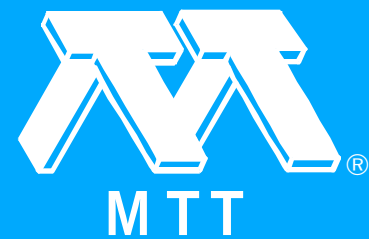
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Reflection and Transmission Characteristics of an Uncoincidental Junction on Rectangular Dielectric Waveguides

K. Matsumura and Y. Tomabechi. "Reflection and Transmission Characteristics of an Uncoincidental Junction on Rectangular Dielectric Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 414-420.

A novel approach to the analysis of an uncoincidental junction in rectangular dielectric waveguide (RDWG) is presented. The boundary condition equations on the junction plane are presented through the tangential components of guided modes and radiation modes which are excited at the discontinuity. To obtain the reflection and transmission coefficients at the discontinuity, the equations are transformed into the spectral domain by the two-dimensional Fourier transformation. In the spectral domain, the orthogonal relationship between the guided and radiation modes is used to determine the reflection and transmission coefficients approximately. The parameters corresponding to the phase constant of the radiation fields in the spectral domain are defined by using an iterative calculation. The reflection and transmission coefficients are determined exactly. These coefficients are compared with 10 GHz band experiments. Our analysis is found to be in good agreement with experimental results.

Click on title for a complete paper.



Abstracts

Circuit Parameters for Single and Coupled Microstrip Lines by a Rigorous Full-Wave Space-Domain Analysis (Short Papers)

N. Fache and D. De Zutter. "Circuit Parameters for Single and Coupled Microstrip Lines by a Rigorous Full-Wave Space-Domain Analysis (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 421-425.

A rigorous full-wave analysis is applied to determine the dispersion characteristics and the impedance matrix of coplanar microstrip lines. It is shown that the impedance definition based on the propagating power and the longitudinal current is the most appropriate one. Examples are given for the single strip, for two coupled strips, either symmetric or asymmetric, and for a three-strip configuration. Some attention is also devoted to the current profiles associated with each eigenmode.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A FET Amplifier in Finline Technique (Short Papers)

J. L'Ecuyer, G.B. Gajda and W.J.R. Hoefer. "A FET Amplifier in Finline Technique (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 425-428.

The successful design and realization of a stable FET amplifier in finline technique are presented. The circuit has been realized in integrated E-plane technology and features an input and an output port in unilateral finline and a combined microstrip/coplanar bias circuit. The amplifier has been designed for 17 GHz operation and has a gain of 6 dB over a bandwidth of 1 GHz using a NE67300 FET.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A Quasi-Planar FET Amplifier in Integrated Finline and Microstrip Technique (Short Papers)

J. Ruxton and W.J.R. Hoefer. "A Quasi-Planar FET Amplifier in Integrated Finline and Microstrip Technique (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 429-432.

The design and performance of a single-stage 20 GHz GaAs FET amplifier in quasi-planar technology are described. The component includes a compact, wide-band transition between the finline input and output ports and the microstrip impedance-matching networks for the transistor. By virtue of a novel bias network which includes a microstrip bandstop filter and a 50 Ohm resistor, this transition provides unconditional stability even at frequencies below cutoff of the finline ports. The overall amplifier has a gain of 6 dB at 20 GHz, and a 3 dB bandwidth of 17 percent.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Dielectric Resonators Suitable for Use in Planar Integrated Circuits at Short Millimeter Wavelengths (Short Papers)

X.H. Jiao, P. Guillon, P. Auxemery and D. Cros. "Dielectric Resonators Suitable for Use in Planar Integrated Circuits at Short Millimeter Wavelengths (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 432-437.

This paper presents new experimental results of planar whispering gallery mode dielectric resonators. The three-dimensional field patterns obtained by using finite element techniques as well as measured resonant frequencies and quality factors carried out in the Ka (26.5-40 GHz) and 90-100 GHz bands are presented. The application to millimeter-wave components is also dealt with.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

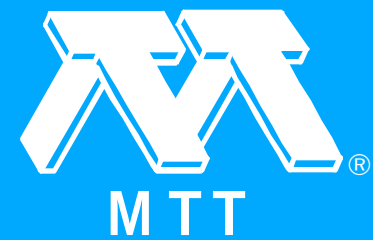
Click on title for a complete paper.



Abstracts

Patent Abstracts (Feb. 1989 [T-MTT])

"Patent Abstracts (Feb. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 438-442.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

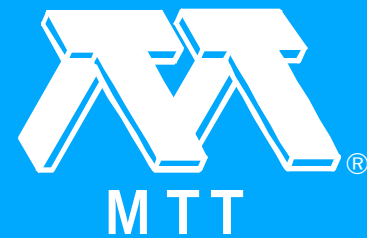
Click on title for a complete paper.



Abstracts

Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Feb. 1989 [T-MTT])

"Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Feb. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 443-443.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Principles of Computerized Tomographic Imaging (Advertisement) (Feb. 1989 [T-MTT])

"Principles of Computerized Tomographic Imaging (Advertisement) (Feb. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): 444-444.



MTT



IEEE

Contents

Publications

Issues

Papers

Authors

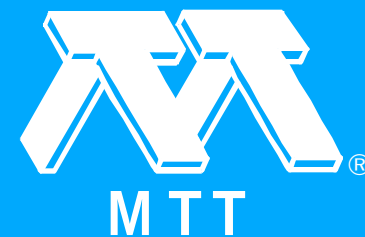
Click on title for a complete paper.



Abstracts

Back Cover (Feb. 1989 [T-MTT])

"Back Cover (Feb. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.2 (Feb. 1989 [T-MTT] (Special Issue on Quasi-Planar Millimeter-Wave Components and Subsystems)): b1-b2.



IEEE

Contents

Publications

Issues

Papers

Authors

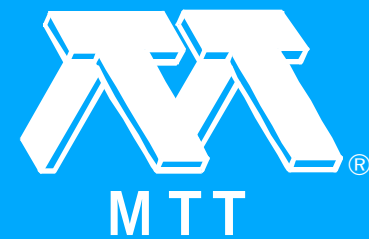
Click on title for a complete paper.



Abstracts

Front Cover (Mar. 1989 [T-MTT])

"Front Cover (Mar. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): f1-f2.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Modeling of Multiconductor Buses and Analysis of Crosstalk, Propagation Delay, and Pulse Distortion in High-Speed GaAs Logic Circuits

G. Ghione, I. Maio and G. Vecchi. "Modeling of Multiconductor Buses and Analysis of Crosstalk, Propagation Delay, and Pulse Distortion in High-Speed GaAs Logic Circuits." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 445-456.

The paper presents an analysis of crosstalk, propagation delay, and pulse distortion in multiconductor buses for high-speed GaAs logic circuits. A simple but accurate quasi-TEM model of the bus is developed, and a critical analysis is carried out both on the accuracy of different approximate lumped and distributed models and on the impact of such approximations on the time-domain response. Results are presented on the behavior of multiconductor buses in the presence of realistic input waveforms, and design criteria are obtained.



[Contents](#)

[Publications](#)

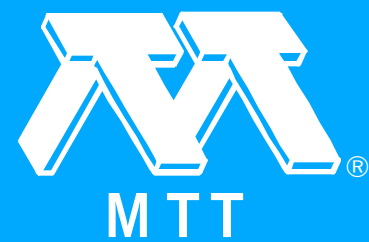
[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

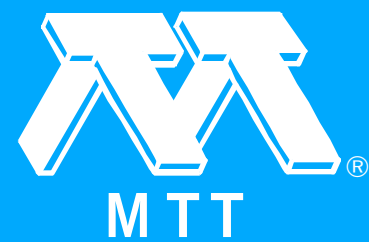
Physical Modeling of GaAs MESFET's in an Integrated CAD Environment: From Device Technology to Microwave Circuit Performance

G. Ghione, C.U. Naldi and F. Filicori. "Physical Modeling of GaAs MESFET's in an Integrated CAD Environment: From Device Technology to Microwave Circuit Performance." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 457-468.

A CAD environment leading from technology to performance evaluation by integrating process, device, and circuit simulation would be a valuable tool for the development of monolithic microwave circuits. The paper focuses on the linkage between a physical device simulator for small- and large-signal characterization, and CAD tools for both linear and nonlinear circuit analysis and design. Efficient techniques are presented for the physical dc and small-signal analysis of MESFET's; then, the problem of physical simulation in a circuit environment is discussed, and it is shown how such a simulation makes it possible to obtain small-signal models accounting for propagation and external parasitic. Finally, efficient solutions are proposed for physical large-signal simulation, based on deriving large-signal equivalent circuits from small-signal analyses under different bias conditions. The small- and large-signal characterizations thereby obtained allow physical simulation to be performed, efficiently in a circuit environment. Examples and results are presented throughout the paper.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Modeling of Picosecond Pulse Propagation in Microstrip Interconnections on Integrated Circuits

K.W. Goossen and R.B. Hammond. "Modeling of Picosecond Pulse Propagation in Microstrip Interconnections on Integrated Circuits." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 469-478.

We have made theoretical time-domain analyses of the dispersion and loss of square-wave and exponential pulses on microstrip transmission line interconnections on silicon integrated-circuit substrates, using the quasi-TEM approximation. Geometric dispersion and conductor line width, as well as losses from conductor resistance, conductor skin effect, and substrate conductance, are considered over the frequency range from 100 MHz to 100 GHz. Results show the enormous significance of the substrate losses and demonstrate the need for substrate resistivities $>10 \text{ } \Omega \cdot \text{cm}$ for high-performance circuits. The results also show the effects of geometric dispersion for frequencies above 10 GHz (which increase with decreasing line width), the unimportance of conductor skin-effect losses for frequencies up to 100 GHz, and the transition from a high-frequency regime where losses do not affect phase velocity to a low-frequency regime where the ratio of the conductor and substrate loss coefficients determines phase velocity. Qualitatively similar phenomena are seen for Al, W, and WSi/sub 2/ lines, but low-frequency velocity is increased for either increasing conductor resistivity, decreasing conductor line width, or both. Poly-Si, with its significantly greater loss, shows qualitatively different frequency-dependent behavior. High phase velocity and high loss can coexist in poly-Si lines.



Abstracts

A Simple Broad-Band Device De-Embedding Method Using an Automatic Network Analyzer with Time-Domain Option

G. Gronau and I. Wolff. "A Simple Broad-Band Device De-Embedding Method Using an Automatic Network Analyzer with Time-Domain Option." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 479-483.

A simple method for de-embedding S parameters of devices in microstrip is presented. The use of only one transmission line and two nonideal shorts or opens different in length as calibration standards allows the determination of the unknown S parameters of the connectors and the complex propagation coefficient of the lines.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

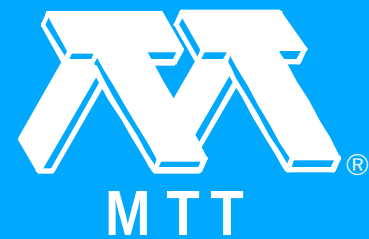
Variational Method for Multiconductor Coupled Striplines with Stratified Anisotropic Media

T. Kitazawa. "Variational Method for Multiconductor Coupled Striplines with Stratified Anisotropic Media." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 484-491.

The applicability of the variational method is extended to the general structure of multiconductor coupled striplines with stratified uniaxially anisotropic substrates. Numerical examples are presented for the propagation constants as well as the characteristic impedances of various types of multicoupled striplines. Numerical computations are performed very accurately to provide sufficient precision even for tight coupling between strips of the multiconductor system; the basis functions used in the calculation are increased up to ten. Accurate numerical results reveal the mode coupling in the multimode propagation.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Analysis of Step Discontinuities on Planar Dielectric Waveguide Containing a Gyrotropic Layer

S.W. Yun, M.J. Lee and I.S. Chang. "Analysis of Step Discontinuities on Planar Dielectric Waveguide Containing a Gyrotropic Layer." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 492-496.

Nonreciprocal wave propagation characteristics through step discontinuities on planar dielectric waveguides with a gyrotropic layer such as ferrite are presented. In the proposed nonreciprocal structures, the wave propagates from a dielectric waveguide to a ferrite and dielectric waveguide or vice versa, where two structures are connected to create abrupt discontinuities. Nonreciprocal scattering coefficients for TE excitation are calculated at 35 GHz using the well-known mode-matching method.

[Click on title for a complete paper.](#)





[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

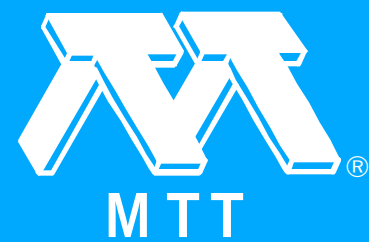
A Cylindrical Multiconductor Stripline-Like Microstrip Transmission Line

D. Homentcovschi. "A Cylindrical Multiconductor Stripline-Like Microstrip Transmission Line." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 497-502.

An analytical expression for the Maxwell capacitance matrix of a class of cylindrical inhomogeneous, multiconductor transmission lines is provided. This class includes cylindrical structures symmetrical with respect to the circuit circle and having a symmetry axis. The effective dielectric constant of the line is found to be the arithmetical mean of the dielectric constants of the two media. Hence, this structure enjoys the main advantages of the planar stripline-like microstrip systems. It is also pointed out how to obtain elliptical stripline-like microstrip transmission lines.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Generalized Spectral Analysis of Planar Lines on Layered Media Including Uniaxial and Biaxial Dielectric Substrates

F. Medina, M. Horno and H. Baudrand. "Generalized Spectral Analysis of Planar Lines on Layered Media Including Uniaxial and Biaxial Dielectric Substrates." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 504-511.

In this paper the spectral-domain analysis (SDA) is generalized in order to compute the dispersive properties of a wide variety of planar and quasi-planar transmission lines (microstrips and finlines) printed on a stratified dielectric medium. Uniaxial and biaxial dielectric anisotropy can be easily manipulated due to the definition of a "transverse propagation matrix" characterizing each dielectric layer. The whole boundary value problem is reduced to two simpler problems involving only one or two dielectrics. Then, the spectral dyadic Green's function is derived via a recurrence algorithm. The dispersion equation is derived by using the Ritz-Galerkin method. The numerical convergence is substantially improved taking into account the asymptotic behavior of the series. A number of illustrative examples have been included to emphasize the power of the method.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

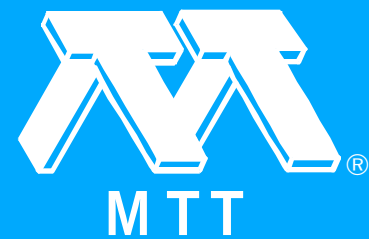
Full-Wave Analysis of a Perfectly Conducting Wire Transmission Line in a Double-Layered Conductor-Backed Medium

N. Fache and D. De Zutter. "Full-Wave Analysis of a Perfectly Conducting Wire Transmission Line in a Double-Layered Conductor-Backed Medium." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 512-518.

This paper presents a full-wave eigenmode analysis of a waveguide structure which consists of a double-layered conductor-backed medium with a perfectly conducting cylindrical wire in either the top layer or the bottom layer. The analysis starts with a Fourier series representation of the total longitudinal and transverse current components on the wire surface, which are seen as the sources of the eigenmode of the waveguide. The fields generated by these sources can be expressed in terms of suitable incoming and scattered fields. Finally, Galerkin's method is used to impose the boundary conditions on the wire surface. Numerical results are presented for a typical microwire interconnection structure.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Surface-to-Surface Transition via Electromagnetic Coupling of Microstrip and Coplanar Waveguide

J.J. Burke and R.W. Jackson. "Surface-to-Surface Transition via Electromagnetic Coupling of Microstrip and Coplanar Waveguide." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 519-525.

A structure is described which forms a transition from coplanar waveguide on one substrate to microstrip on another. Energy is transferred via electromagnetic coupling rather than with wire bonds. A full-wave formulation along with the theory of asymmetrically coupled lines is used to analyze the transition. Two model transitions were built and tested. Theory and measurement show good agreement when the coupler length to width ratio is larger than 0.6.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Vectorial Wave Analysis of Uniform-Core Optical Fibers Using a Novel Boundary Integral Method

N. Kishi and T. Okoshi. "Vectorial Wave Analysis of Uniform-Core Optical Fibers Using a Novel Boundary Integral Method." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 526-533.

Vectorial wave analyses of uniform-core optical fibers using a novel boundary integral method that does not use Green's function, are presented. The expansion of the electromagnetic field on the boundary, the selection of the weight function, and the method for giving boundary conditions are discussed first. By using the formulation obtained, the propagation characteristics of elliptical-core optical fibers are analyzed. The effect of the boundary shape on the numerical results is also investigated through analyses of rectangular-core fibers. It is found that the new boundary integral method can easily be applied to solve vectorial wave boundary value problems.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

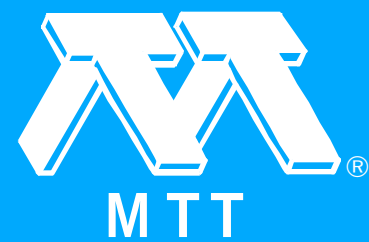
Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part I: Rigorous Network Formulations

M. Guglielmi and A.A. Oliner. "Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part I: Rigorous Network Formulations." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 534-541.

In Part I of this set of two papers, the problem of a plane wave incident at an arbitrary angle on a metal-strip grating of arbitrary period located at an air-dielectric interface is formulated rigorously in terms of a pair of "static" integral equations, from which new equivalent multimode network descriptions are derived. Both aperture and obstacle approaches are treated, and both TE and TM polarizations are considered explicitly. In Part II we present two approximate, but very simple and accurate, analytical solutions of the relevant integral equations, which in turn lead to simple and useful multimode network descriptions of the discontinuity. Several numerical comparisons are also presented between the results obtained using these new simple networks and those from an independent numerical reference solution. Excellent agreement is found over a fairly large range of parameter values.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

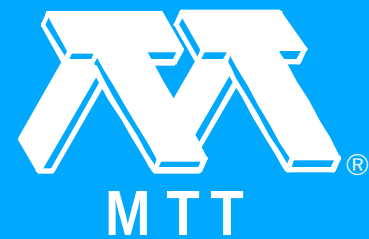
Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part II: Small-Aperture and Small-Obstacle Solutions

M. Guglielmi and A.A. Oliner. "Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part II: Small-Aperture and Small-Obstacle Solutions." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 542-552.

In Part I of this pair of papers, we developed new multimode equivalent network representations for the scattering of a plane wave incident on a metal-strip grating at an air-dielectric interface. The analytical phrasing led to two Fredholm integral equations of the first kind with singular kernels. In this paper (Part II) we present two analytical small-argument solution procedures for those integral equations, and we derive explicit expressions for the elements of the coupling matrices in the small-aperture and small-obstacle ranges for both TE and TM polarizations. Simple and useful equivalent network descriptions are derived in which all of the network elements are in very simple analytical form. When the discontinuity is "electrically small," the resulting network becomes dramatically simple. The various networks are discussed together with estimates for their ranges of applicability. Finally, numerical comparisons are presented with an independent numerical reference solution, showing that the new simple networks are indeed very accurate within their ranges of applicability.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Field Solution and Propagation Characteristics of Monofilar-Bifilar Modes of Axially Slotted Coaxial Cable

E.E. Hassan. "Field Solution and Propagation Characteristics of Monofilar-Bifilar Modes of Axially Slotted Coaxial Cable." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 553-557.

The electromagnetic problem of an infinite, axially slotted coaxial cable is solved. The monofilar and the bifilar eigenmodes are obtained with good accuracy and previous conflicting results are discussed. Further, a field solution satisfying the proper boundary conditions is obtained and shown to be essentially azimuthal.

[Click on title for a complete paper.](#)



Abstracts

Large-Signal Computer-Aided Analysis and Design of Silicon Bipolar MMIC Oscillators and Self-Oscillating Mixers

I. Kipnis and A.S. Khanna. "Large-Signal Computer-Aided Analysis and Design of Silicon Bipolar MMIC Oscillators and Self-Oscillating Mixers." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 558-564.

This paper presents a large-signal analysis and design of silicon bipolar monolithic microwave integrated circuit (MMIC) feedback oscillators and self-oscillating mixers, emphasizing the modeling of the active and passive devices and the large-signal analysis and design of nonlinear circuits using SPICE. Measured and simulated data of a C-band self-oscillating mixer are presented.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts

A GaAs Monolithic 6 GHz Low-Noise Amplifier for Satellite Receivers (Mar. 1989 [T-MTT])

R.C. Mott. "A GaAs Monolithic 6 GHz Low-Noise Amplifier for Satellite Receivers (Mar. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 565-570.

A design approach and accurate modeling techniques have been developed to realize a GaAs monolithic, 6 GHz, two-stage, low-noise amplifier (LNA) with a measured 1.7 dB noise figure and associated 21 dB gain. This self-biased LNA design, with chip dimensions of 80x135 mil, utilizes an ion-implantation FET model which predicts measured in-band amplifier gain to within 0.5 dB and peak frequency response to within 4 percent. The derived noise parameter estimation process, which uses a Gaussian elimination technique to predict the measured noise figure to within 0.2 dB, reduces a set of complex binomial equations to simple relationships which are easily programmable. A deep-recessed gate realization of this LNA design demonstrates that LNA low-noise performance is achievable under FET saturated drain current conditions.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A Multi-IMPATT Injection-Locked Oscillator at 35 GHz

M.G. Adlerstein and J. Fines. "A Multi-IMPATT Injection-Locked Oscillator at 35 GHz." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 571-579.

A 35 GHz solid-state injection-locked oscillator giving 38 W peak power with 30 percent duty cycle is described. The power source utilizes a total of ten GaAs IMPATT diodes grouped in two stages. In this paper, we discuss the performance of the source as well as the systematic design and measurement procedures used to develop the multidiode cavities employed.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions

S.-K. Pan, A.R. Kerr, M.J. Feldman, A.W. Kleinsasser, J.W. Stasiak, R.L. Sandstrom and W.J. Gallagher. "An 85-116 GHz SIS Receiver Using Inductively Shunted Edge Junctions." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 580-592.

For the most part, SIS receivers have failed by a wide margin to achieve the sensitivity promised by theory. One of the main reasons for this is the difficulty of providing appropriate embedding impedances at the signal and image frequencies and at the higher harmonic sidebands. We describe an SIS mixer with a broad-band integrated tuning structure. The mixer is tunable from 85 to 116 GHz and at 114 GHz has a noise temperature ≤ 5.6 K DSB and unity DSB conversion gain. The mixer noise temperature is less than or comparable to the photon noise temperature $hf/k = 5.5$ K. Referred to the mixer input flange, the receiver noise temperature is ≤ 9.5 K DSB when operated with an L-band HEMT IF amplifier. Saturation measurements have been made using CW and broadband noise sources.

[Click on title for a complete paper.](#)



Abstracts

Printed Circuit Antennas with Integrated FET Detectors for Millimeter-Wave Quasi Optics

W. Chew and H.R. Fetterman. "Printed Circuit Antennas with Integrated FET Detectors for Millimeter-Wave Quasi Optics." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 593-597.

Planar twin dipole microstrip antennas with integrated FET detectors have been constructed and found to provide antenna patterns suitable for millimeter-wave quasi-optical applications. The circuits are suitable as individual elements of an imaging array. A 63 GHz heterodyne mixer using such a circuit produced a system noise temperature of 7900 K.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

An Accurate Measurement Technique for Line Properties, Junction Effects, and Dielectric and Magnetic Material Parameters

A. Enders. "An Accurate Measurement Technique for Line Properties, Junction Effects, and Dielectric and Magnetic Material Parameters." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 598-605.

Transmission/reflection coefficients of unknown transmission lines are analyzed. The characteristic impedance, the propagation constant, and the parameters of the junctions at the connections with the measurement setup can be calculated if the coefficients of three different lengths of the line being investigated are measured. Therefore it is called the L^3 method (line/line/line). Transmission data suffice for the determination of only the propagation constant. They are used in the case of material parameter measurements with loaded lines. Dielectric and magnetic properties of the filling material are calculated via the set of transverse resonance equations. Even nonreciprocal lines and off-diagonal tensor elements are amenable as are the properties of fluids or powders. Due to the availability of an analytically exact formulation, the overall accuracy achievable can be precisely specified, e.g. 0.1 percent in the X-band for the absolute values of material parameters. The accuracy is dependent mainly on geometrical tolerances if precise vector network analyzers are used.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Deterministic Approach to Full-Wave Analysis of Discontinuities in MIC's Using the Method of Lines

Z. Chen and B. Gao. "Deterministic Approach to Full-Wave Analysis of Discontinuities in MIC's Using the Method of Lines." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 606-611.

A deterministic approach to the full-wave analysis of discontinuities in MIC's using the method of lines is described. Arbitrarily shaped one-port and in-line two-port discontinuities in any quasi-planar configurations can be analyzed by this "one step" method. Using the hybrid homogeneous boundary conditions, this approach simplifies the calculation, with $\psi/\sup e/$ and $\psi/\sup h/$ being discretized only in and near the discontinuity regions. Illustrative examples of S-parameter calculation are given. Computed results are compared with measured data and with the published results of other authors.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.

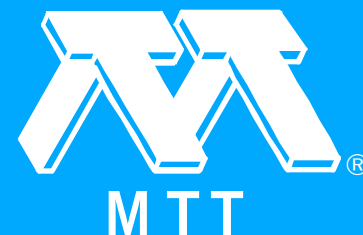


Abstracts

Microwave Power Combination Using a Bifurcated Waveguide and a Reflecting Plate

M. Wang and M. Nakajima. "Microwave Power Combination Using a Bifurcated Waveguide and a Reflecting Plate." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 612-617.

A simple microwave power combining circuit is proposed. The coupling circuit is constructed of a bifurcated rectangular waveguide which is especially suitable for high power combination. In this circuit, there is a thin conductor plate perpendicular to the E plane which acts as a reflector for only higher modes, so that the reflected wave is injected back into oscillators for mutual synchronization. Both analytical and experimental results show that a maximum power-combining efficiency near 100 percent is achievable.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

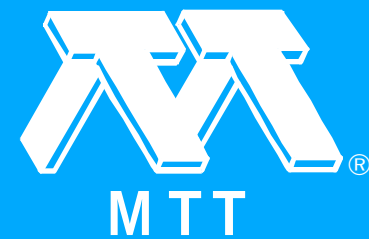


Abstracts

A Novel Cavity Resonator Measurement Method for Leaky Waveguides (Mar. 1989 [T-MTT])

A.A. Oliner and J.-S. Myung. "A Novel Cavity Resonator Measurement Method for Leaky Waveguides (Mar. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 618-621.

In this novel cavity resonator method for measuring the phase and leakage constants of leaky waveguides, power is sent in transversely, in a reversal of the leakage process itself. The cavity therefore requires no coupling holes, and the method is accurate and convenient to use, as shown in an illustrative example.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

A Generalized Theory for Asymmetrical Coupled Lines (Short Papers)

D. Kother, I. Wolff and A. Beyer. "A Generalized Theory for Asymmetrical Coupled Lines (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 622-624.

A method will be presented that calculates the properties of geometrically or electromagnetically asymmetrical coupled lines. Analogous to the normally used theory of even and odd modes, the electromagnetic fields on the coupler will be described in terms of two modes as the basic variables to calculate the coupling behavior. As a criterion for determining the amplitudes of the two modes, the power transported on the two guides will be used. An image guide coupler with a ferrite slab will theoretically demonstrate the feasibility of this method.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Improved Theory for E-Plane Symmetrical Tee Junctions (Short Papers)

T. Obata and J. Chiba. "Improved Theory for E-Plane Symmetrical Tee Junctions (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 624-627.

We examine Lewin's theory, which describes an E-plane symmetrical tee junction by a peculiar equivalent circuit with only three parameters. It is shown that although his theory is formally correct, its circuit parameters depend on the amplitudes of reflected waves. An improved theory corrects this fault.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Effect of a Cochannel Signal on the Electrical Tuning Characteristics of a Gunn Oscillator (Short Papers)

B.N. Biswas, S. Sarkar and S. Chatterjee. "Effect of a Cochannel Signal on the Electrical Tuning Characteristics of a Gunn Oscillator (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 627-630.

New experimental observations on the pull-in as well as hold-in characteristics of an injection-locked microwave (Gunn) oscillator in the presence of a cochannel signal have been reported. The analytical treatment presented herein confirms the observations.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Accurate Characterization of Microstrip Resonator Open End with New Current Expression in Spectral-Domain Approach (Short Papers)

T. Uwano. "Accurate Characterization of Microstrip Resonator Open End with New Current Expression in Spectral-Domain Approach (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 630-633.

This paper describes a resonant frequency characterization of microstrip resonators which is suitable for very accurate computer-aided design. First, the convergence behavior of the numerical computation based on the spectral-domain approach is discussed to secure the convergence accuracy. To reduce computation time considerably, which at present may amount to several hours, a new current expression in the spectral-domain approach is proposed. In the process described, the computational results under a good convergence have excellent agreement with those measured after estimation of a suitable dielectric constant.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Analysis of the Oscillation Conditions in Distributed Amplifiers (Short Papers)

P. Gamand. "Analysis of the Oscillation Conditions in Distributed Amplifiers (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 637-640.

It has been shown that under certain conditions oscillation phenomena in distributed amplifiers can occur. It has also been demonstrated, using a simplified transistor model and a symmetrical amplifier with lumped circuit elements, that the oscillation depends directly on the transconductance $g_{\text{sub m/}}$ of the active devices. The origin of this oscillation was found to be the "loop" formed in the distributed amplifier structure. The analysis has been experimentally verified in a practical 1-20 GHz monolithic MESFET amplifier. Finally, design guidelines have been established in order to avoid stability problems and to improve the capabilities of high-gain distributed amplifiers.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts

Lower Bound on the Eigenvalues of the Characteristic Equation for an Arbitrary Multilayered Gyromagnetic Structure with Perpendicular Magnetization (Short Papers)

M. Mrozowski and J. Mazur. "Lower Bound on the Eigenvalues of the Characteristic Equation for an Arbitrary Multilayered Gyromagnetic Structure with Perpendicular Magnetization (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 640-643.

A layered gyromagnetic waveguiding structure magnetized perpendicularly to interfaces between layers is analyzed. The lower bound on the eigenvalues of the wave equation for this structure is derived using the spectral theory of linear operators. The elements of the transfer matrix for a layer of a gyromagnetic medium are given. A numerical example confirming the validity of the theoretical results is included.



IEEE

Contents

Publications

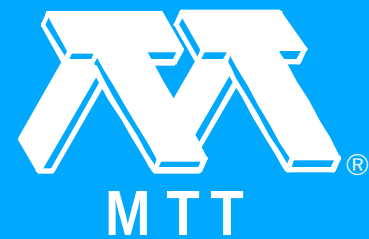
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Effects of Gain Compression, Bias Conditions, and Temperature on the Flicker Phase Noise of an 8.5 GHz GaAs MESFET Amplifier (Short Papers)

C.P. Lusher and W.N. Hardy. "Effects of Gain Compression, Bias Conditions, and Temperature on the Flicker Phase Noise of an 8.5 GHz GaAs MESFET Amplifier (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 643-646.

We have measured the phase noise of an 8.5 GHz GaAs MESFET amplifier at temperatures from 1.7 K to 300 K for input powers from -30 dBm to well past the 1 dB gain compression point, for sideband frequencies from 0.1 Hz to 25 kHz. The observed flicker phase noise was independent of input power, even at levels producing 4 dB of gain compression, also changed very little with bias conditions. The intrinsic phase noise at low temperatures (observed below 2.17 K, where an extrinsic effect due to the bubbling of the liquid helium coolant disappears) was slightly higher than that observed at room temperature. However, we saw no sign of the dramatic increase in flicker phase noise at low temperatures recently reported at 9.7 GHz. Based on our data, we predict that a cryogenic loop oscillator built from such an amplifier should have exceptionally good short-term frequency stability.

Click on title for a complete paper.



Abstracts

Determination of the Scattering Matrix of Ring-Loaded Corrugated Waveguide Mode Converters (Short Papers)

L.C. da Silva. "Determination of the Scattering Matrix of Ring-Loaded Corrugated Waveguide Mode Converters (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 646-649.

A previously developed method for the determination of the scattering matrix of cylindrical waveguide mode converters, which is based on the representation of the fields inside the corrugations by a small number of radial modes, is extended to mode converters with ring-loaded corrugations. The method, besides being accurate, reduces the computer time necessary for the computations.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts

Attenuation Measurement of Very Low Loss Dielectric Waveguides by the Cavity Resonator Method Applicable in the Millimeter/Submillimeter Wavelength Range (Comments and Reply)

D.G. Jablonski, A.D. Krall, F.I. Shimabukuro and C. Yeh. "Attenuation Measurement of Very Low Loss Dielectric Waveguides by the Cavity Resonator Method Applicable in the Millimeter/Submillimeter Wavelength Range (Comments and Reply)." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 650-651.

Shimabukuro and Yeh describe the use of a cavity to measure the attenuation factors for circular dielectric waveguides propagating the HE/sub 11/ mode. We would like to comment on three issues.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Patent Abstracts (Mar. 1989 [T-MTT])

"Patent Abstracts (Mar. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 652-657.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

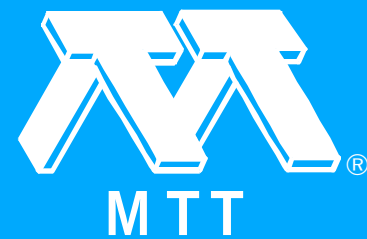
Click on title for a complete paper.



Abstracts

Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Mar. 1989 [T-MTT])

"Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Mar. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 658-658.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

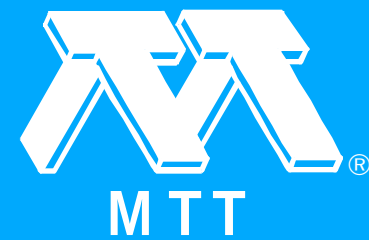
Click on title for a complete paper.



Abstracts

Kalman Filtering Ordering Form (Advertisement) (Mar. 1989 [T-MTT])

"Kalman Filtering Ordering Form (Advertisement) (Mar. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 659-659.



IEEE

Contents

Publications

Issues

Papers

Authors

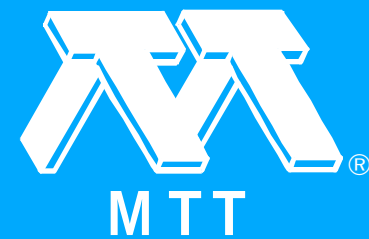
Click on title for a complete paper.



Abstracts

Principles of Computerized Tomographic Imaging (Advertisement) (Mar. 1989 [T-MTT])

"Principles of Computerized Tomographic Imaging (Advertisement) (Mar. 1989 [T-MTT])."
1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): 660-660.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Back Cover (Mar. 1989 [T-MTT])

"Back Cover (Mar. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.3 (Mar. 1989 [T-MTT]): b1-b2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Front Cover (Apr. 1989 [T-MTT])

"Front Cover (Apr. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): f1-f2.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

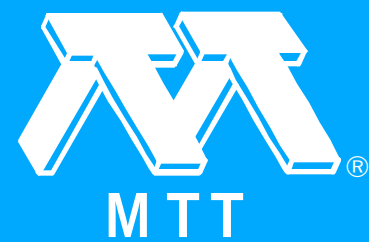
A Variational Analysis of Anisotropic, Inhomogeneous Dielectric Waveguides

W.C. Chew and M.A. Nasir. "A Variational Analysis of Anisotropic, Inhomogeneous Dielectric Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 661-668.

We derive a variational formulation for anisotropic, dielectric waveguides using only the (E_x , E_y) or only the (H_z , H_y) components of the electromagnetic field. We show that the (E_x , E_y) formulation is completely equivalent to the (H_z , H_y) formulation. In fact, they are the transpose problems of each other. Given the variational formulation, one can derive the finite element solution quite easily. We also show how to derive a variational expression where the natural boundary conditions are incorporated as an optimal solution of the variational expression. We illustrate our theory with a simple implementation of a finite element solution. Our solutions agree with previous results, and there is no occurrence of spurious modes. Furthermore, our formulation allows the easy inclusion of loss and frequency dispersion in the μ and ϵ .

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

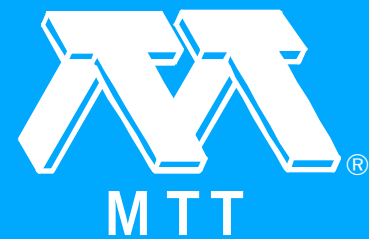
Efficient Analysis of Planar Microstrip Geometries Using a Closed-Form Asymptotic Representation of the Grounded Dielectric Slab Green's Function

M. Marin, S. Barkeshli and P.H. Pathak. "Efficient Analysis of Planar Microstrip Geometries Using a Closed-Form Asymptotic Representation of the Grounded Dielectric Slab Green's Function." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 669-679.

A newly developed closed-form asymptotic representation of the grounded dielectric slab Green's function can be very efficiently applied to analyze planar microstrip configurations. In this study, such a representation is used in a moment method formulation to calculate the propagation constant of an infinite microstrip transmission line and the input impedance of a finite length, center-fed printed dipole. In these problems, source and field points are laterally rather than vertically separated with respect to the substrate. The conventional Sommerfeld integral and the plane wave spectral integral (PWS) representations of the microstrip Green's function converge very slowly in this case. However, the asymptotic closed-form representation of the Green's function does not have this limitation, and it remains accurate even for very small integral separation between source and observation points. Only for observation points in the immediate vicinity of the source is a modified form of the Sommerfeld integral representation used, while the asymptotic form is employed elsewhere. Some numerical results based on this approach are presented and are shown to compare very well with previous results based on the corresponding exact-integral or PWS forms of the Green's function.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Evaluation of Loss Factor of Multilayered Inhomogeneous Waveguides for Magnetostatic Waves Using Efficient Finite Element Formalism

Y. Long and M. Koshiba. "Evaluation of Loss Factor of Multilayered Inhomogeneous Waveguides for Magnetostatic Waves Using Efficient Finite Element Formalism." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 680-685.

An efficient finite element solution procedure is developed for calculating propagation losses of magnetostatic waves in multilayered inhomogeneous waveguides. The final matrix equation is reduced to a standard complex eigenvalue problem whose eigenvalue corresponds to the complex phase constant itself. Thus, iteration procedures are not necessary and the phase and attenuation constants can be directly obtained by solving a standard eigenvalue equation. The validity of the method is confirmed by calculating propagation losses of magnetostatic surface waves in a single YIG-film structure. Numerical results for a triple-layered YIG-film structure are also presented. It is found that in the triple-layered structure, propagation losses are highly dependent on the line width of the film in which the magnetostatic potential is well confined.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Effect of Transition Waveguides on Dielectric Waveguide Directional Couplers

S. Xu, S.T. Peng and F.K. Schwering. "Effect of Transition Waveguides on Dielectric Waveguide Directional Couplers." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 686-690.

The coupling of energy between two curved dielectric waveguides is investigated by the staircase approximation method, which combines the building block approach of multimode network theory with a rigorous mode-matching procedure. Particular attention is directed toward two major effects of transition waveguides on the performance of directional couplers composed of dielectric waveguides one is the change in the coupling length, the other is the radiation loss. The coupling problem is analyzed in terms of the scattering of an incident guided mode by the coupler structure as a whole. Numerical results are given to illustrate the coupling characteristics of various structures and to establish useful guidelines for the design of directional couplers.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Resonant Modes in Shielded Cylindrical Ferrite and Single-Crystal Dielectric Resonators

J. Krupka. "Resonant Modes in Shielded Cylindrical Ferrite and Single-Crystal Dielectric Resonators." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 691-697.

The Galerkin-Rayleigh-Ritz method is applied for computing the first few lowest resonant frequencies of cylindrical anisotropic resonators in a cylindrical cavity. The resonators are allowed to have gyromagnetic and uniaxial dielectric anisotropy with respect to the z axis of the cylinder. Results of computations of the resonant frequencies are compared with exact solutions for many simple resonant structures and with results of experiments for more complicated structures. A new method of measuring permeability tensor components is presented. The method utilizes two parallel-plate cylindrical resonators operating in the $HE_{\pm 111}$ and H_{011} modes. A method of measuring permittivity tensor components of single crystals is proposed using one parallel-plate cylindrical resonator operating in two different modes.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Centimeter-Wave Microstrip Phase Shifter on a Ferrite-Dielectric Substrate

S. Bolioli, H. Benzina, H. Baudrand and B. Chan. "Centimeter-Wave Microstrip Phase Shifter on a Ferrite-Dielectric Substrate." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 698-705.

The propagation characteristics and fields of a microstrip transmission line on a composite ferrite-dielectric substrate are studied with a focus on its phase-shifting behavior. Two different methods are used for theoretical analysis, namely the least-squares boundary residual (LSBR), which offers high precision, and a variational method in the spectral domain, which requires a low computing time. Quasi-TEM propagation is assumed in both cases. The results obtained are compared with the experimental data, and good agreement is observed. Besides its easy design, this phase shifter presents the advantage of having a good peak power handling capacity as well as a low production cost because of the ease with which it can be integrated in planar systems.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Wide-Band Superconductive Chirp Filters

M.S. Dilorio, R.S. Withers and A.C. Anderson. "Wide-Band Superconductive Chirp Filters." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 706-710.

Chirp filters are described that consist of miniature tapped superconductive stripline. The stripline consists of 40- μm -wide niobium thin films in a spiral pattern on 125- μm -thick silicon wafers, and tapping is effected by backward-wave couplers between neighboring lines. Sophisticated fabrication and packaging techniques have led to a now mature technology. Devices with 2.6 GHz bandwidth and time-bandwidth products of 98 are routinely fabricated that exhibit amplitude errors within a few tenths of a decibel and phase errors within a fraction of a degree of theoretical. In pulse-compression tests, matched amplitude-weighted devices yield peak relative side-lobe levels of -32 dB.

[Click on title for a complete paper.](#)



Abstracts

Propagation in Layered Biased Semiconductor Structures Based on Transport Analysis

C.M. Krowne and G.B. Tait. "Propagation in Layered Biased Semiconductor Structures Based on Transport Analysis." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 711-722.

A transport-field parallel-plate formulation and solution method to determine the small-signal propagation constant is given for wide microstrip lines over an inhomogeneously doped semiconductor substrate of small transverse dimensions. Included in the detailed transport model are two carrier species, recombination-generation mechanisms, dc and ac field-dependent mobilities and diffusion constants, and boundary condition contact effects. A transverse dc bias condition is applied. Structures numerically simulated are a voltage-variable GaAs distributed Schottky barrier phase shifter and a transmission line over a Si bipolar junction. Numerical data based on a finite difference technique are generated on carrier densities, electric potentials and fields, and current densities. Propagation constant calculations were favorably compared with those calculated by both full-wave field analysis and moments-of-the-Boltzmann-equation analysis for some less general cases. gamma results for the GaAs structure we compared with available experimental data.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

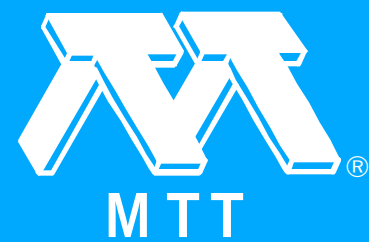
A Compact Full MMIC Module for Ku-Band Phase-Locked Oscillators

T. Ohira, H. Kato, K. Araki and F. Ishitsuka. "A Compact Full MMIC Module for Ku-Band Phase-Locked Oscillators." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 723-728.

A compact Ku-band phase-locked oscillator module has been developed in a full MMIC configuration. The module includes an MMIC voltage-controlled oscillator, an analog frequency divider, and interstage amplifiers. The constituent monolithic chips are integrated in a very small single-package module and operate at the target frequencies without any external trimming or matching network. The oscillator is tuned more than 1 GHz with a constant output amplitude. The frequency-divided output is also obtained over the whole tuning range. Spurious output is not found at any frequency up to 22 GHz. In spite of the very low Q factor of GaAs monolithic circuitry, the oscillator phase noise exhibited is less than -80 dBc/Hz, due to the high-gain, high-speed phase lock.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

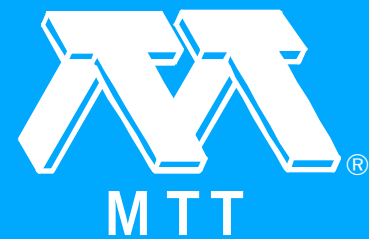
Phase and Amplitude Characteristics of InP: Fe Modified Interdigitated Gap Photoconductive Microwave Switches

I.L. Andersson and S.T. Eng. "Phase and Amplitude Characteristics of InP: Fe Modified Interdigitated Gap Photoconductive Microwave Switches." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 729-733.

The transmission amplitude and phase characteristics of InP:Fe modified interdigitated gap (MIG) photoconductive microwave switches are reported. Measurements in the 0.1-1 GHz frequency range show that the phase is shifted $\sim 90^\circ$ and that the corresponding change in amplitude ranges from 43 dB at 0.1 GHz to 23 dB at 1 GHz when the illumination-induced conductance is switched from a low OFF-state value ($\sim 4.10 \times 10^{-8} \text{ S}$) to a high ON-state value (5 mS). The observed characteristics can be described by a phase-shifting region and an amplitude modulation region. In the phase-shifting region the phase strongly depends on the conductance, and the amplitude is almost constant. In the amplitude modulation region both the amplitude and the phase depend on the conductance but the effect on the amplitude is much more pronounced. A lumped-element model describing the device performance is presented. It is concluded that these optoelectronic microwave switching devices are suitable for high-speed amplitude modulation but are not too promising as high-speed phase shifters.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Measurement and Calibration of a Universal Six-Port Network Analyzer

W. Lin and C. Ruan. "Measurement and Calibration of a Universal Six-Port Network Analyzer." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 734-742.

A general theory of measuring multiport networks is presented in this paper. In order to measure microwave multiport networks conveniently a method involving the stepwise reduction of the order of the network under test is suggested. All formulas for calibrating and measuring the triple six-port network analyzer (TSPNA), which is a universal six-port network analyzer, are given without any ambiguity. The procedures for calibration and measurement are very simple. No standard three-port network is needed to calibrate the six-port system. Finally, the error caused by nonideal isolation is discussed.

[Click on title for a complete paper.](#)



Magnetic Tuning of Cylindrical $H_{01\Delta}$ -Mode Dielectric Resonators

J. Krupka. "Magnetic Tuning of Cylindrical $H_{01\Delta}$ -Mode Dielectric Resonators." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 743-747.

The theory of magnetic tuning of cylindrical $H_{01\Delta}$ dielectric resonators is developed. It is based on rigorous solutions to the dielectric resonator systems containing microwave ferrites. It is shown that the most effective magnetic tuning of $H_{01\Delta}$ dielectric resonators can be accomplished by inserting a thin ferrite rod through an axial hole in the resonator. This kind of tuning utilizes the dependence of the parallel permeability tensor component μ_z , on the magnetic field applied. Experiments have been performed which show that a 4 percent tuning range can be attained with a Q factor of the resonant system of the order of 2000 at X-band. Using an appropriate dc magnetic field circuit a 120 MHz tuning bandwidth has been obtained with a consumption of tuning power of about 75 mW.



Abstracts

A Quasi-TEM Analysis for Curved and Straight Planar Multiconductor Systems

H. Diestel. "A Quasi-TEM Analysis for Curved and Straight Planar Multiconductor Systems." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 748-753.

In this paper an extended quasi-TEM analysis is presented. The transverse field of the weakly curved planar multiconductor system is described by the static electric and magnetic solutions of the corresponding axially symmetrical structure. The capacitance and inductance matrices of this system of concentric microstrip rings are calculated using the "method of lines." A two-port network consisting of circularly curved transmission lines is calculated and the results are compared with measured values.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Wire and Strip Conductors Over a Dielectric-Coated Conducting or Dielectric Half-Space

R.W.P. King. "Wire and Strip Conductors Over a Dielectric-Coated Conducting or Dielectric Half-Space." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 754-760.

The complex wavenumber and characteristic impedance are determined for a wire or flat strip over a dielectric-coated half-space that may be a conductor or a dielectric with large permittivity. Elevated microstrip is an example of the configuration. The properties of the wire as an antenna or transmission line are determined from those of the insulated antenna with a two-layer eccentric insulation. The theory is extended to the strip conductor with the help of a comparison of the tubular and strip conductors over a perfectly conducting half-space.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Analysis of Discontinuities in an Open Dielectric Slab Waveguide by Combination of Finite and Boundary Elements

K. Hirayama and M. Koshiba. "Analysis of Discontinuities in an Open Dielectric Slab Waveguide by Combination of Finite and Boundary Elements." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 761-768.

A combination of the finite element and boundary element methods is proposed for the solution of arbitrarily shaped discontinuities in an open dielectric slab waveguide. The discontinuity region is divided into two regions. One is a finite region with arbitrary inhomogeneities, and the other is a semi-infinite and homogeneous region. The finite element and boundary element methods are applied to the former and the latter region, respectively. For uniform waveguide regions connected to discontinuities, analytical solutions in which both the guided and the radiated modes are taken into account are used. To show the validity and usefulness of this approach, computed results are given for several kinds of discontinuities, and the accuracy of the solutions is investigated in detail.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Metallization Thickness Effect of Striplines with Anisotropic Media: Quasi-Static and Hybrid-Mode Analysis

T. Kitazawa. "Metallization Thickness Effect of Striplines with Anisotropic Media: Quasi-Static and Hybrid-Mode Analysis." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 769-775.

The effect of metallization thickness in striplines is investigated on the basis of the quasi-static and frequency-dependent hybrid-mode formulations. The formalism utilizes the aperture fields as source quantities and employs the extended version of the network analytical methods of electromagnetic fields. It is therefore applicable for the general structure, i.e., coupled thick strips with uniaxially anisotropic media. Numerical computations include comparisons with available data for the simpler cases to show the accuracy of the present method and the quasi-static and frequency-dependent hybrid-mode solutions for single and coupled thick strips with anisotropic media.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Propagation Properties of Striplines Periodically Loaded with Crossing Strips

J.-F. Kiang, S.M. Ali and J.A. Kong. "Propagation Properties of Striplines Periodically Loaded with Crossing Strips." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 776-786.

A rigorous dyadic Green's function formulation in the spectral domain is used to study the dispersion characteristics of signal striplines in the presence of metallic crossing strips. A set of coupled vector integral equations for the current distribution on the conductors is derived. Galerkin's method is then applied to derive the matrix eigenvalue equation for the propagation constant. The dispersion properties of the signal lines are studied for the two cases of finite and infinite length crossing strips. The effects of the structure dimensions on the passband and stopband characteristics are investigated. For crossing strips of finite length, the stopband is mainly affected by the period, the crossing strip length, and the separation between the signal and the crossing strips. For crossing strips of infinite length carrying traveling waves, attenuation along the signal line exists over the whole frequency range of operation.

[Click on title for a complete paper.](#)



Abstracts

The Frequency-Dependent Impedance of p-i-n Diodes (Short Papers)

R.H. Caverly and G. Hiller. "The Frequency-Dependent Impedance of p-i-n Diodes (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 787-791.

The purpose of this paper is to demonstrate that the impedance of the p-i-n diode is definable as a function of frequency and depends on the diode's geometry and electronic properties. A procedure for calculating the equivalent series p-i-n diode impedance is presented and compared with experimental resistance versus frequency data for silicon p-i-n diodes. A procedure is also outlined for determining diode parameters for a desired resistance-frequency response.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications (Short Papers)

J. Archer, B.M. Smith, G.R. Weaver, H. Wong and J.Y. Yonemura. "Development and Evaluation of a GaAs MMIC Phase-Locked Loop Chip Set for Space Applications (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 790-792.

GaAs monolithic microwave integrated circuit (MMIC) chips designed for a phase-locked loop frequency source to be used in space applications have been developed. The chip set includes a three-stage resistive feedback amplifier (RFA) with 13 dB gain in a 275 MHz to 5.85 GHz bandwidth, a 2.0 GHz voltage-controlled oscillator (VCO), a 2.8 GHz digital prescaler, and a VHF/UHF digital phase/frequency discriminator. Both analog and buffered-FET logic (BFL) digital circuits were fabricated on the same wafer. The MMIC process which was developed for this application comprises molecular beam epitaxial (MBE) deposition of the active layer, proton isolation, submicron gates, thin-film TaN resistor deposition, and silicon nitride passivation. The chip set was used successfully to implement a 2.0 GHz all-GaAs phase-locked loop (PLL).





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Frequency-Dependent Characteristics of Open Microstrip Lines with Finite Strip Thickness (Short Papers)

C. Shih, R.-B. Wu, S.-K. Jeng and C.H. Chen. "Frequency-Dependent Characteristics of Open Microstrip Lines with Finite Strip Thickness (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 793-795.

A rigorous approach based on the variational conformal mapping technique is proposed for analyzing the characteristics of open microstrip lines with finite strip thickness. By Chang's mapping, the solution domain becomes a finite and nearly rectangular region in which the finite element method is applied. The wedge conditions at the strip corners, which are very difficult to discuss by the conventional methods, are now correctly handled. Numerical results included here are the current distributions around the strip and variations of the effective dielectric constant caused by the finite-thickness effect.

[Click on title for a complete paper.](#)



Abstracts

An Improved Design of Systems Based on Three Coupled Microstrip Lines (Short Papers)

N.A. El-Deeb. "An Improved Design of Systems Based on Three Coupled Microstrip Lines (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 795-798.

An improved design of systems based on three coupled microstrip lines is introduced. The improvement lies mainly in the use of equal-mode-impedance lines, which greatly facilitates the design of the system. The design parameters of such a system are introduced in a manner that allows a simple systematic design procedure. An experimental coupler is realized and its practical performance is in good agreement with the theory.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Frequency-Dependent Characteristics of Current Distributions on Microstrip Lines (Short Papers)

M. Kobayashi and T. Iijima. "Frequency-Dependent Characteristics of Current Distributions on Microstrip Lines (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 799-801.

The spectral-domain analysis using Chebyshev's polynomials as basis functions is used to obtain the frequency-dependent characteristics of current distributions and the effective relative permittivities of an open microstrip line. The results obtained are compared with other available results. To accurately obtain the current distributions requires a larger number of basis functions. Both longitudinal and transverse current distributions on the strip are shown for wide ranges of frequency ($0 \leq h/\gamma_{0l} \leq 1$).

[Click on title for a complete paper.](#)



Abstracts

Shift of the Complex Resonance Frequency of a Dielectric-Loaded Cavity Produced by Small Sample Insertion Holes (Short Papers)

S. Gauthier, L. Marchildon and C. Akyel. "Shift of the Complex Resonance Frequency of a Dielectric-Loaded Cavity Produced by Small Sample Insertion Holes (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 801-804.

The presence of small sample insertion holes in a cylindrical cavity produces a shift in the complex resonance frequency of the cavity. A mathematical model is proposed to compute the shift when the cavity oscillates in an axially symmetric TM/sub 0mp/ mode. The treatment applies to samples with arbitrary complex permittivity. The model is compared with other treatments and checked against measured results.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

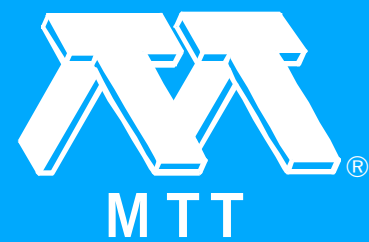
Conductor Geometry Independence of Phase Velocity in TEM-Mode Transmission Lines (Letters)

H.E. Green. "Conductor Geometry Independence of Phase Velocity in TEM-Mode Transmission Lines (Letters)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 805-806.

It is well known that the phase velocity of a wave in any two-conductor, TEM-mode transmission line having a homogeneous dielectric filling depends only on the properties of the dielectric and not at all on the conductor geometry. Normally this is demonstrated starting from Maxwell's equations. However it is interesting to recall that transmission line theory can be studied from circuit principles alone without recourse to electrodynamics.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Numerical Analysis of H-Plane Waveguide Junctions by Combination of Finite and Boundary Elements (Comments)

Y. Leviatan and G.S. Sheaffer. "Numerical Analysis of H-Plane Waveguide Junctions by Combination of Finite and Boundary Elements (Comments)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 805-805.

In the above paper, Ise and Koshiba consider a lossy dielectric post in a rectangular waveguide. In figures 6 through 10, they compare their results with results published by us in [1] and infer that their results are more reasonable than ours. We rechecked our results and noted that the results of Ise and Koshiba are indeed the more accurate ones. We found out that the library subroutine that we used in 1985 for calculating Hankel functions with complex arguments was, unfortunately, deficient. This subroutine affected only those results in [1] pertaining to the lossy post case. Since that time the library subroutine had been corrected, and consequently the plots we now obtain using the method of [1] are consistent with those given by Ise and Koshiba in all regions. Computed results for a sample of the cases considered in table I of their paper are tabulated in Table I below. The excellent agreement between the results in the two tables can be easily verified. It was also revealed that luckily the error in the library subroutine had been corrected before the results we presented in our second paper were derived and thus our results in [2] are impeccable.



Abstracts

Multiple Dielectric Posts in a Rectangular Waveguide (Corrections)

C.G. Hsu and H.A. Auda. "Multiple Dielectric Posts in a Rectangular Waveguide (Corrections)." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 806-806.

The above paper contains two typographical errors. The minus sign leading the series in equation should be changed to a plus sign, and the " $\tan/\sup -1$ " term in equation should be multiplied by $f/0$ over $i/$. The results and conclusions of the paper, as well as those of [1], however, are not affected by these errors.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Patent Abstracts (Apr. 1989 [T-MTT])

"Patent Abstracts (Apr. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 807-812.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

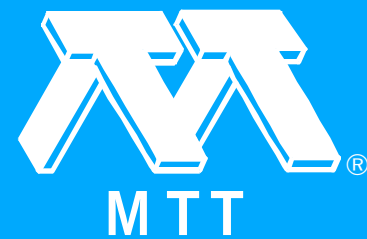
Click on title for a complete paper.



Abstracts

Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Apr. 1989 [T-MTT])

"Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Apr. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 813-813.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - 1989 IEEE Gallium Arsenide Integrated Circuit Symposium (Apr. 1989 [T-MTT])

"Call for Papers - 1989 IEEE Gallium Arsenide Integrated Circuit Symposium (Apr. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 814-814.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

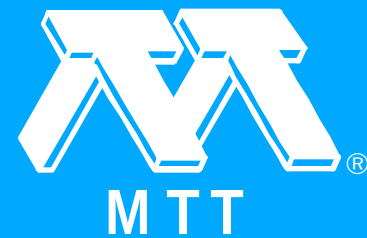
Click on title for a complete paper.



Abstracts

MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (Apr. 1989 [T-MTT])

"MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (Apr. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 815-815.



IEEE

Contents

Publications

Issues

Papers

Authors

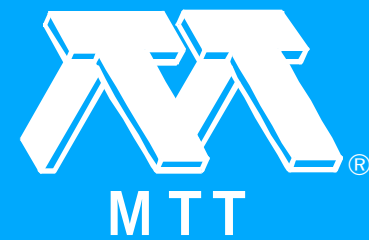
Click on title for a complete paper.



Abstracts

1989 IEEE Membership Directory (Advertisement) (Apr. 1989 [T-MTT])

"1989 IEEE Membership Directory (Advertisement) (Apr. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): 816-816.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Back Cover (1989 [T-MTT])

"Back Cover (1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.4 (Apr. 1989 [T-MTT]): b1-b2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Front Cover (May 1989 [T-MTT])

"Front Cover (May 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A New Approach to the RF Power Operation of MESFET's

G. Halkias, H. Gerard, Y. Crosnier and G. Salmer. "A New Approach to the RF Power Operation of MESFET's." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 817-825.

A new numerical large-signal model for a MESFET is described which allows investigations of the behavior of these devices at X-band frequencies under large-signal conditions. The results of the numerical simulations are compared with those of the measurements and provide an improved understanding of the behavior of GaAs MESFET's that operate at microwave frequencies and with high power requirements. Furthermore, our analysis yields some indications about the optimum design of these devices.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Transient Analysis of Multiple-Tuned Injection-Locked Amplifiers with Modulated Input Signal

E.F. Calandra and A.M. Sommariva. "Transient Analysis of Multiple-Tuned Injection-Locked Amplifiers with Modulated Input Signal." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 826-835.

A method for the dynamical investigation of reflection-type injection-locked amplifiers (ILA's) driven by modulated input signals is presented. Its distinctive feature is to cover the large-signal analysis of high-order ILA's, which allows the exploitation of broad-banding multiresonant structures. Small-parameter, stroboscopic, and congruence algebra techniques are combined in order to permit the calculation of output voltage transients directly in terms of amplitude and phase of the complex envelope, thus limiting the computational time required in CAD applications. Further, owing to the employed black-box (scattering matrix) description of the tank and coupling two-port, both linear and nonlinear subsystem identification can be performed in terms of measured data. As an example of the application of the method, a fourth-order ILA is analyzed, and results pertaining to BPSK modulated input signals are presented.

[Click on title for a complete paper.](#)



Abstracts

High-Frequency MESFET Noise Modeling Including Distributed Effects

W. Heinrich. "High-Frequency MESFET Noise Modeling Including Distributed Effects." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 836-842.

A microwave FET noise analysis is presented including distributed effects caused by the wave propagation along the gate width direction. Using this model the noise characteristics of submicrometer-gate MESFET's at frequencies beyond 20 GHz are evaluated. We found that, in the case of well-designed quarter-micron LN-MESFET's, distributed effects may be neglected. Common lumped approximations, on the other hand, are shown to produce noticeable deviations. An improved lumped model is proposed.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Fast and Accurate Analytic Formulas for Calculating the Parameters of a General Broadside-Coupled Coplanar Waveguide for (M)MIC Applications

S.S. Bedair and I. Wolff. "Fast and Accurate Analytic Formulas for Calculating the Parameters of a General Broadside-Coupled Coplanar Waveguide for (M)MIC Applications." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 843-850.

Fast and accurate analytic formulas for calculating the quasi-static TEM parameters of a general broadside-coupled coplanar waveguide (GBSC CPW) are presented. Simplicity, high speed of computation, and accuracy recommend the use of these formulas for (M)MIC CAD programs. Numerical calculations are presented in order to investigate various electrical properties of the structure. An asymmetrical BSC CPW, as well as the single CPW resulting from connecting the two coupled strips of the GBSC CPW at the input and the output ports, is also analyzed. Criteria are obtained to ensure the coplanar behavior of the structure.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Theory of Magnetostatic Waves in Moving Ferrite Films and Applications to Rotation Rate Sensing

D.D. Stancil. "Theory of Magnetostatic Waves in Moving Ferrite Films and Applications to Rotation Rate Sensing." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 851-859.

A first-order field theory for electromagnetic waves in moving ferrites and ferrite thin films is presented. The dominant effect of the motion is found to be the Doppler-shifted frequency observed in the moving frame. This gives rise to an anomalously large shift in wavenumber owing to the dispersive nature of the ferrite medium. Because of the large effect, it is suggested that a moving medium experiment using magnetostatic waves could be used to distinguish between various competing forms for the dispersion term in the Fresnel-Fizeau coefficient. The large Fresnel-Fizeau coefficient suggests that magnetostatic waves could be used to measure relative rotation rates if confined to propagate around the perimeter of a rotating disk. Since the phase drift would be established in the time required to propagate around the disk, the response time could be significantly shorter than conventional tachometers. An experiment with counterpropagating magnetostatic waves would clarify the effect of a magnetic medium on the magnitude of the Sagnac effect. Although it should be possible, in principle, to construct an absolute rotation rate sensor using magnetostatic waves (or more precisely, magnetic polaritons), the magnitude of the Sagnac effect is predicted to be the same as for ordinary electromagnetic waves with the same frequency. Since the magnitude of the Sagnac phase shift is proportional to frequency, optical interferometers are still preferable.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Modeling Ferrimagnetic Resonators

M. Buswell. "Modeling Ferrimagnetic Resonators." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 860-867.

The impedance matrix for an arbitrary n-port ferrimagnetic resonator is derived by applying Poynting's theorem to a region of space surrounding the resonator. Simplifications to the impedance matrix for low-loss ($Q > \approx 100$) ferrite material make it possible to obtain an equivalent circuit model for the resonator, which can be used with most computer-based circuit simulation programs. The circuit model for the general-case polymodal ferromagnetic resonator consists of a network of single-pole resonators, each of which has a possible non-frequency-dependent, nonreciprocal phase shift. The components of the circuit model are described in terms of the properties of the ferrite material, and the coupling strength of the microwave circuit to the magnetostatic modes of the ferrimagnet. The method is demonstrated in three simple examples, including a one- and two-port loop coupled filter, and a ferrimagnet in a waveguide.

[Click on title for a complete paper.](#)



Abstracts

The Complete Spectrum of Image Line

T. Rozzi and J.S. Kot. "The Complete Spectrum of Image Line." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 868-874.

As image line is an open waveguide, its finite, discrete spectrum of bound modes is complemented by a continuum. The latter plays an important role in discontinuity and radiation problems arising in circuit components and antenna applications. However, the continuous spectrum has failed to receive attention so far, possibly because of the essential two-dimensional, nonseparable nature of the problem. In this paper, we derive from basic principles the complete orthonormalized spectrum, under LSE/LSM assumptions, by means of a method of "partial wave phase shifts." The results are applicable to radiation and discontinuity problems in image line.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Full Vectorial Finite Element Formalism for Lossy Anisotropic Waveguides

K. Hayata, K. Miura and M. Koshiba. "Full Vectorial Finite Element Formalism for Lossy Anisotropic Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 875-883.

An efficient computer-aided solution procedure based on the finite-element method is developed for solving general waveguiding structures containing lossy anisotropic materials. In this procedure, a formulation in terms of the transverse magnetic field component is adopted and the eigenvalue of the final matrix equation corresponds to the propagation constant itself. Thus one can avoid the unnecessary iterations which arise when using complex frequencies. To demonstrate the strength of the present method, numerical results are shown for a rectangular waveguide filled with lossy anisotropic dielectric with off-diagonal elements in a permittivity tensor.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Analysis of a Centered-Inclined Waveguide Slot Coupler

S.R. Rengarajan. "Analysis of a Centered-Inclined Waveguide Slot Coupler." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 884-889.

A rigorous analysis of a centered-inclined broad wall slot coupler between two crossed rectangular waveguides is presented. Pertinent integral equations are developed, taking into account finite wall thickness. The integral equations are then solved for the slot aperture E field using the method of moments. Coupling slot characteristics are deduced, including resonant length and dominant mode scattering in both waveguides. Numerical results for resonant length and scattering parameters are presented over a range of tilt angles, frequencies, and waveguide dimensions. These results have significant application in the design of waveguide-fed slot arrays.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Characterization of Microstrip Lines Near a Substrate Edge and Design Formulas of Edge-Compensated Microstrip Lines

E. Yamashita, H. Ohashi and K. Atsuki. "Characterization of Microstrip Lines Near a Substrate Edge and Design Formulas of Edge-Compensated Microstrip Lines." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 890-896.

The proximity effects of microstrip lines near a substrate edge have been pointed out by Pucel as a problem for effectively designing high-packing-density MMIC's. Proximity effects of this type are analyzed by using the rectangular boundary division method. The concept of edge-compensated microstrip lines (ECM lines) is introduced, whereby we can circumvent the proximity effects on the characteristic impedance. The design parameters of the ECM lines are given in the form of simple polynomials together with numerical data. Some experimental results on the line capacitance agree with the theory, with errors of about 1 percent.

[Click on title for a complete paper.](#)



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Time-Domain Method of Lines Applied to Planar Guided Wave Structures

S. Nam, H. Ling and T. Itoh. "Time-Domain Method of Lines Applied to Planar Guided Wave Structures." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 897-901.

A new time-domain method for the analysis of wave propagation and scattering in a planar transmission structure is developed in which the concept of the method of lines is used. The analytical process incorporated along one of the three dimensions has been executed for each line independently (one-dimensional process) or for one set of lines (two-dimensional process) depending on whether or not the structure contains metallic strips at the dielectric interface boundary. A simple numerical example is presented as a demonstration of the above two processes of the method, and its validity is shown by comparison with other data.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

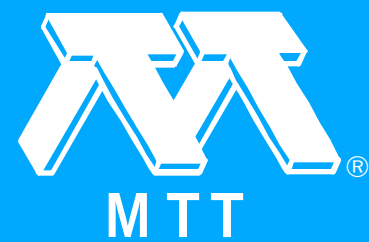
Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part III: Rigorous Solution

M. Guglielmi and H. Hochstadt. "Multimode Network Description of a Planar Periodic Metal-Strip Grating at a Dielectric Interface--Part III: Rigorous Solution." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 902-909.

In a recent pair of papers we studied the scattering problem posed by a plane wave incident at an angle on a plane, periodic, metal-strip grating at a dielectric interface. In the first paper (Part I) we formulated the solution to the scattering problem in terms of novel multimode equivalent network representations. The analytical phrasing followed in Part I led to two Fredholm integral equations of the first kind with singular kernels. In the second paper (Part II) we presented two approximate solution procedures for those integral equations that led to four simple and accurate equivalent network representations for the scattering problem under investigation. In this paper (Part III) we further this investigation by deriving a novel rigorous analytical solution for one of the two integral equations derived in Part I. We obtain closed-form, rigorous, analytical expressions for the elements involved in the equivalent network representations derived. Finally, we present the results of a number of numerical computations carried out by using the rigorous equivalent networks developed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Equivalent Current Density Reconstruction for Microwave Imaging Purposes

S. Caorsi, G.L. Gragnani and M. Pastorino. "Equivalent Current Density Reconstruction for Microwave Imaging Purposes." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 910-916.

The possibilities of reconstructing the distribution of the equivalent current density vector in a domain with a known volume, V , inside which dielectric scatterers stand at arbitrary locations, are studied by means of numerical computer simulations. An integrodifferential formulation of the three-dimensional electromagnetic inverse scattering is transformed into matrix form through the application of the moment method. A pseudoinversion algorithm overcoming ill-conditioned problems is used to obtain the distribution of the equivalent current density also in the case where the input data (i.e., the simulated values of the scattered field vector to be obtained in an observation domain) are affected either by Gaussian noise or by uniformly distributed errors. The results furnish information that could be used to devise a possible imaging method for detecting the locations and surface shapes of scattering objects.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Bandwidth Properties of Rectangular T-Septum Waveguides (Short Papers)

F.J. German and L.S. Riggs. "Bandwidth Properties of Rectangular T-Septum Waveguides (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 917-919.

The transmission line modeling (TLM) method is applied to rectangular T-septum waveguides for the determination of the separation between the hybrid TE/sub 10/ and hybrid TE/sub 20/ modes. While previous analyses have predicted a wider bandwidth for this class of waveguiding structure than is available with conventional ridged waveguide, they have not been in agreement on the exact bandwidth properties. This discrepancy is resolved, and the apparent cause of error in previously published results is pointed out.

[Click on title for a complete paper.](#)



Abstracts

On the Bandwidth of T-Septum Waveguide (Short Papers)

B.E. Pauplis and D.C. Power. "On the Bandwidth of T-Septum Waveguide (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 919-922.

There is some degree of confusion in the recent literature concerning the bandwidth properties of T-septum waveguide. Two analyses, using the same Rayleigh-Ritz-Galerkin technique, disagree significantly. We present another analysis of the T-septum guide, using an alternative formulation of the method, which supports the original analysis of Mazumder and Saha. A possible source of the disagreement is found and illustrated. The history of the T-septum waveguide is discussed and several additional references are provided.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Optimized Method for Obtaining Permittivity and Conductivity Profiles of Microwave Materials (Short Papers)

M.A. Hindy. "Optimized Method for Obtaining Permittivity and Conductivity Profiles of Microwave Materials (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 922-925.

A new iterative method for obtaining the distribution of the relative permittivity $\epsilon_r(z)$ or electrical conductivity $\sigma(z)$ of microwave semiconducting materials is presented. The semiconducting material is fitted in a rectangular waveguide which is terminated by a variable short circuit. The reflection coefficients of the system are measured at a single frequency and at different positions of the moving short. The measured coefficients are used in the iterative process of solving the inverse problem by obtaining the functional gradient. The method takes into account continuous and discontinuous profiles.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Transmission Properties of a Right-Angle Microstrip Bend with and without a Miter (Short Papers)

A.D. Broumas, H. Ling and T. Itoh. "Transmission Properties of a Right-Angle Microstrip Bend with and without a Miter (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 925-929.

Based on the waveguide model, the transmission properties of a microstrip bend with and without a miter are investigated using the Green's theorem approach. Unlike the conventional mode-matching technique, this approach does not require a modal description of fields inside the discontinuity region. Scattering parameters for the bend are presented. They agree well with the quasi-static results at low frequencies. Significant improvement in the transmission properties is observed for the bend with a miter.

[Click on title for a complete paper.](#)



Abstracts

The Use of a Single Source to Drive a Binary Peak Power Multiplier (Short Papers)

P.E. Latham. "The Use of a Single Source to Drive a Binary Peak Power Multiplier (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 929-931.

The binary power multiplier (BPM) recently proposed by Farkas requires a pair of RF inputs whose phases are set independently. In this note, a method is presented in which a single source may be used to drive a BPM. Phase coding occurs at the source input, where the power is low and phase switching is straightforward. There is a loss in energy of around 25 percent but only a small reduction in peak power.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Mutual Impedance Between Probes in a Waveguide (Corrections)

B.-S. Wang. "Mutual Impedance Between Probes in a Waveguide (Corrections)." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 932-932.

In the above paper, the following corrections should be made.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Patent Abstracts (May 1989 [T-MTT])

"Patent Abstracts (May 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 933-937.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

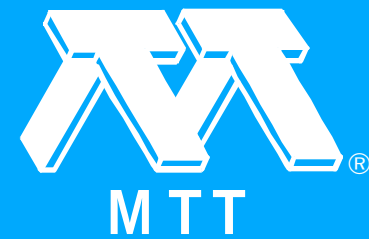
Click on title for a complete paper.



Abstracts

Microwave Week (Advertisement) (May 1989 [T-MTT])

"Microwave Week (Advertisement) (May 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 938-938.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (May 1989 [T-MTT])

"Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (May 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 939-939.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (May 1989 [T-MTT])

"MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (May 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): 940-940.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

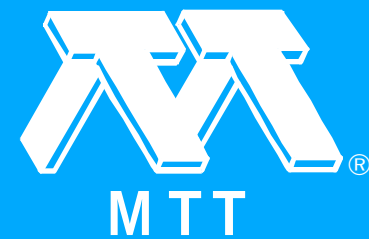
Click on title for a complete paper.



Abstracts

Back Cover (May 1989 [T-MTT])

"Back Cover (May 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.5 (May 1989 [T-MTT]): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Front Cover (Jun. 1989, Part I [T-MTT])

"Front Cover (Jun. 1989, Part I [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

TM Waves Guided by Nonlinear Planar Waveguides

K. Ogusu. "TM Waves Guided by Nonlinear Planar Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 941-946.

This paper presents a numerical method for calculating the dispersion relations and field distributions of stationary nonlinear TM waves guided by optical planar waveguides with intensity-dependent permittivities. The method can basically treat arbitrary linear permittivity profiles and arbitrary types of the nonlinearity, since it is based on a numerical integration of the nonlinear wave equation. In this paper, the numerical results for TM waves guided by a symmetric nonlinear film with linear claddings and a three-layer waveguide with a nonlinear cover have been presented for different mechanisms of the nonlinearity and compared with those for TE waves. The treated waveguide is weakly guiding and the nonlinearity is of the Kerr type. It is shown that under these assumptions, the dispersion relations for TM waves are similar to those for TE waves except for the power levels required for operation. The behavior of TM waves is also little affected by the nonlinear mechanism. These features can be derived from the fact that the longitudinal electric field component E_z is fairly small compared with the transverse component E_x .

[Click on title for a complete paper.](#)



Abstracts

New Type of Spectral-Domain Analysis of a Microstrip Line

K. Uchida, T. Noda and T. Matsunaga. "New Type of Spectral-Domain Analysis of a Microstrip Line." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 947-952.

The problem of an open microstrip line is analyzed by the spectral-domain method combined with the sampling theorem. In the spectral domain, the boundary conditions of zero tangential electric fields are expressed in terms of the convolution integral forms with a sampling function, and these relations are discretized by the method of moments with the spherical Bessel function as a weighting function. A well-chosen incorporation of the Weber-Schafheitlin integration formula yields good accuracy and saves a significant amount of time in numerical calculations. Numerical examples are shown for the effective dielectric constants and for the current distributions, both longitudinal and transverse, in comparison with the results obtained by various other methods.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)

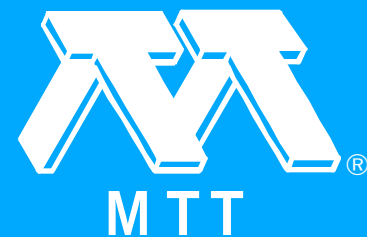


Abstracts

Computation of Complex Resonance Frequencies of Isolated Composite Objects

W. Zheng. "Computation of Complex Resonance Frequencies of Isolated Composite Objects." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 953-961.

A technique based on the null-field method is developed to investigate the resonance frequencies and the quality factors of isolated composite dielectric/ferrite resonators. A method of identifying the resonant modes is suggested for nonspherical resonators by analyzing the peaks of their scattering cross sections in the resonance frequency range. Computed resonance frequencies and Q factors for composite resonators, such as double disks and tubular resonators with ferrite core, are compared with published calculations and experiments whenever possible. These comparisons show that the present technique is an effective and flexible one for investigating composite resonators with relatively complicated geometries.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

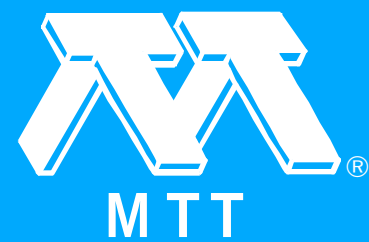
Two Cylindrical Obstacles in a Rectangular Waveguide--Resonances and Filter Applications

R. Gesche and N. Lochel. "Two Cylindrical Obstacles in a Rectangular Waveguide--Resonances and Filter Applications." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 962-968.

Two metallic or lossy dielectric cylinders placed in one cross section of a rectangular waveguide are investigated by means of the orthogonal expansion method. Resonances are shown by frequency responses of the transmission coefficient. They are discussed by patterns of the magnetic field and diagrams of the Poynting vector. Physical explanations of the resonances are given. The structure may be used as a filter element. With two small dielectric posts, a frequency characteristic with two stopbands can be obtained. Center frequencies are tunable by moving the posts. Using one large metallic and one small dielectric post, a tunable passband characteristic can be realized.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Synthesis, Design, and Construction of Ultra-Wide-Band Nonuniform Quadrature Directional Couplers in Inhomogeneous Media

S. Uysal and H. Aghvami. "Synthesis, Design, and Construction of Ultra-Wide-Band Nonuniform Quadrature Directional Couplers in Inhomogeneous Media." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 969-976.

A computer-aided synthesis design procedure is given for nonuniform quadrature directional couplers in inhomogeneous media. A wiggly geometry is employed which effectively slows the odd-mode phase velocity to match the even-mode phase velocity. The wiggly geometry results in improved isolation and increased effective dielectric constant. This technique provides a shorter coupler length due to increased effective dielectric constant. Cubic splines of strip width, strip spacing, and wiggle depth as functions of coupling coefficient are computed using static capacitances of uniform coupled lines. These functions are then used as synthesis functions to evaluate the continuous physical parameters of nonuniform coupled lines by using the continuously varying coupling coefficient. A nonuniform interdigitated coupler is introduced to realize the tight coupling values. Manufacturing tolerances on wiggle depth are derived. Geometrical details are given for the construction of nonuniform wiggly lines. Computational and experimental data are also given for a 2-18 GHz, -3 dB tandem nonuniform directional coupler built on alumina substrate.

Click on title for a complete paper.



Abstracts

An Approximate Variational Solution to the Step Discontinuity in Finline

C.A. Olley, T. Rozzi and C.M.D. Rycroft. "An Approximate Variational Solution to the Step Discontinuity in Finline." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 977-983.

The step in finline is the basic building block of filters, transformers, and matching elements. We present a simplified, yet fairly accurate, treatment based on solving by variational methods the step in symmetric finned waveguide for the E and H formulations. Experiment is in good agreement with theoretical predictions for not too large steps and fairly good even for large steps. An "optimized" equivalent circuit with constant (lumped) components for commonly encountered steps is presented in a form directly usable by the designer.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Microwave Complex Conductivity of a Square Post in Rectangular Waveguide

S. Yoshikado and I. Taniguchi. "Microwave Complex Conductivity of a Square Post in Rectangular Waveguide." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 984-992.

A simple measurement technique for the complex conductivity of a square lossy dielectric post loaded in a rectangular waveguide is described. The measurement technique is based on a solution of the reflection coefficient for the incident electric field of the TE/sub 10/ mode. The reflection coefficient can be expressed by a simple formula for the electric fields scattered from the post. Values of complex conductivities of standard materials were calculated by applying an iteration method to this formula with respect to measured values of reflection coefficients. These agreed with the values measured by other techniques and reported by several authors. The present method is also applicable to measurements related to filling the cross section of the waveguide with a dielectric material.

[Click on title for a complete paper.](#)



Abstracts

Waveguide Discontinuity Analysis with a Coupled Finite-Boundary Element Method

K.L. Wu, G.Y. Delisle, D.G. Fang and M. Lecours. "Waveguide Discontinuity Analysis with a Coupled Finite-Boundary Element Method." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 993-998.

A new numerical method for the analysis of waveguide discontinuities is proposed. The proposed approach is based upon the coupling of the finite element and boundary element methods. The respective merits of these methods are extracted to yield much faster solution and to enhance computation efficiency. A general procedure is described using a quadratic elements approximation, and the validity and efficiency of the method are demonstrated in the cases of a 3-port H-plane ferrite waveguide Y junction and of a right-angle corner bend with and without dielectric loading. Comparisons of the present results with those obtained using the finite element approach are made and shown to be in good agreement. An experimental result is also presented and the validity of the technique can be easily verified.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Finite Element Solution of Longitudinally Magnetized Elliptical Gyromagnetic Waveguides

A.A.P. Gibson and J. Helszajn. "Finite Element Solution of Longitudinally Magnetized Elliptical Gyromagnetic Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 999-1005.

One of the most common methods employed in the study of waveguides with irregular electric or magnetic walls is the finite element approach. This method is based on the minimization of a functional, the solution of which satisfies the boundary value problem. It is utilized in this paper to study the elliptical gyromagnetic waveguide with either an electric or a magnetic wall. The functionals for the four possible planar solutions are separately summarized.



[Contents](#)

[Publications](#)

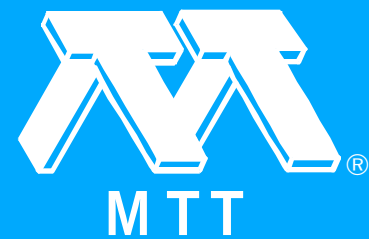
[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Mutual Impedance Between Probes in a Circular Waveguide

B.-S. Wang. "Mutual Impedance Between Probes in a Circular Waveguide." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1006-1011.

The general formulas of mutual impedance between two probes arbitrarily located in a circular waveguide are given by means of a dyadic Green's function (DGF) and reaction concept. The waveguide is semi-infinite. The reflection coefficient at the terminal plane is Γ . The lengths, feeding points, and orientations of the two probes in the waveguide are all arbitrary. As examples, expressions of mutual impedance for three specific cases are given and discussed.

[Click on title for a complete paper.](#)



Abstracts

Nonreciprocal Operation of Structures Comprising a Section of Coupled Ferrite Lines with Longitudinal Magnetization

J. Mazur and M. Mrozowski. "Nonreciprocal Operation of Structures Comprising a Section of Coupled Ferrite Lines with Longitudinal Magnetization." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1012-1020.

Nonreciprocal devices based on a section of two coupled lines containing ferrite magnetized in the propagation direction are investigated. The necessary conditions for nonreciprocal operation are derived. Several new configurations are proposed and their scattering matrices are given. An explanation of the action of experimental devices constructed by other researchers is proposed and substantiated by a numerical investigation of their simplified models under nonideal operating conditions.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Bandwidth Characteristics of Inhomogeneous T-Septum Waveguides

P.K. Saha and G.G. Mazumder. "Bandwidth Characteristics of Inhomogeneous T-Septum Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1021-1026.

Rectangular waveguides with T-shaped septa were recently shown to have superior characteristics compared to conventional ridged guides. Here the dispersion equations of the hybrid modes of an inhomogeneously filled septum guide have been determined by the Ritz-Galerkin technique. Results of numerical computations indicate that with dielectric filling of the septum gap, further enhancement of the cutoff wavelength of the lowest mode and the bandwidth with respect to the next higher mode is possible.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Traveling-Wave Inverted-Gate Field-Effect Transistors: Concept, Analysis, and Potential

S.M. El-Ghazaly and T. Itoh. "Traveling-Wave Inverted-Gate Field-Effect Transistors: Concept, Analysis, and Potential." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1027-1032.

The inverted-gate FET (INGFET) is very promising as a traveling-wave transistor. A unified approach to the analysis of the traveling-wave INGFET is presented. The equivalent circuit parameters of the GaAs inverted-gate FET, with submicron gate length, are obtained using a two-dimensional computer model which takes into account the nonstationary electron dynamics. The parameters of the passive transmission line, corresponding to the INGFET structure, are obtained using a quasi-TEM wave approach. The conductor losses of this structure are estimated using the incremental inductance rule. The coupled mode theory is used to derive the wave equation describing this traveling-wave transistor. The results show the existence of a rapidly growing mode along the device electrodes. It is also shown that this mode can be excited alone by appropriate matching and feeding arrangements. Improper matching and feeding lead to a narrower bandwidth due to the resonance phenomenon of the resulting standing wave.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

FET Up-Converter Design Using Load-Dependent Mixing Transconductance

J.L. Fikart and J.L.M. Lord. "FET Up-Converter Design Using Load-Dependent Mixing Transconductance." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1033-1039.

A new method for a more accurate prediction of FET up-converter gain has been developed. The method uses an equivalent circuit containing a conversion current source at the upper and lower sideband output frequency. The magnitude of the current is related to the IF input voltage by the mixing transconductance factor, which is not a constant but a function of internal LO voltages in the FET. These in turn depend on the output load impedance at the LO frequency. With this approach, we can optimize the output network for acceptable match at the selected sideband and for desired LO signal rejection, while avoiding those impedance values in the LO frequency range that have been observed to cause severe degradation in conversion gain.

[Click on title for a complete paper.](#)



Abstracts

Selected Technology Summaries for Microwave Theory and Techniques--1988

J.B. Horton. "Selected Technology Summaries for Microwave Theory and Techniques--1988." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1040-1053.

This paper includes a summary of the technical advances during the years 1984 - 1988 in nine technical areas of interest to the microwave community. These areas are computer-aided design; acoustics; lightwaves; integrated circuits; network theory; packaging; ferrites; systems; and superconductivity.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

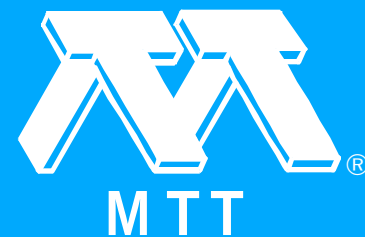


Abstracts

A Proposed Microwave and Millimeter-Wave Spectrum Analyzer (Short Papers)

J.D. Cohen. "A Proposed Microwave and Millimeter-Wave Spectrum Analyzer (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1054-1057.

A system is proposed which performs real-time spectrum analysis of large-bandwidth radio frequency signals. The apparatus allows the simultaneous monitoring of all frequencies within the band of interest, and operates in the presence of multiple frequencies. The approach also overcomes the slowness and ambiguity of scanning methods.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Modeling of Arbitrarily Shaped Signal Lines and Discontinuities (Short Papers)

B.J. Rubin. "Modeling of Arbitrarily Shaped Signal Lines and Discontinuities (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1057-1060.

The propagation characteristics for signal lines and discontinuities embedded in a homogeneous medium and having any shape composed of steps along the Cartesian coordinates are obtained through an extension of the author's work on scattering from periodic apertures. The approach is specifically applied to high-performance computer packages, where previously employed capacitance and inductance techniques may not be appropriate. Numerical results are given for representative structures that involve signal lines, mesh planes, vias, and crossing and coupled lines.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

An Analytical Solution for the Coupled Stripline-Like Microstrip Line Problem (Corrections)

D. Homentcovschi, A. Manolescu, A.M. Manolescu and L. Kreindler. "An Analytical Solution for the Coupled Stripline-Like Microstrip Line Problem (Corrections)." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1061-1061.

In the above paper the following corrections should be made.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

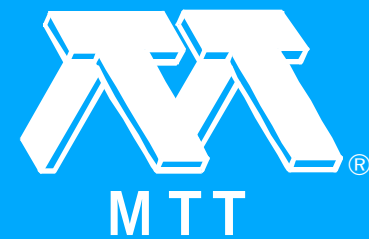
Click on title for a complete paper.



Abstracts

Patent Abstracts (Jun. 1989, Part I [T-MTT])

"Patent Abstracts (Jun. 1989, Part I [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1062-1065.



- Contents
- Publications
- Issues
- Papers
- Authors

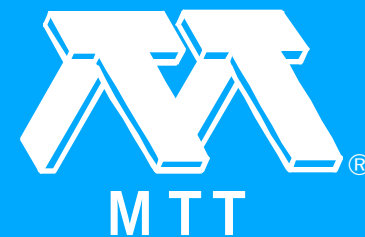
Click on title for a complete paper.



Abstracts

Microwave Week (Advertisement) (Jun. 1989, Part I [T-MTT])

"Microwave Week (Advertisement) (Jun. 1989, Part I [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1066-1066.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - Application of Lightwave Technology to Microwave Device, Circuits, and Systems (Jun. 1989, Part I [T-MTT])

"Call for Papers - Application of Lightwave Technology to Microwave Device, Circuits, and Systems (Jun. 1989, Part I [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1067-1067.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

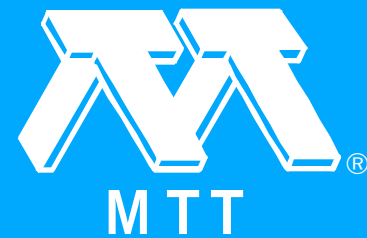
Click on title for a complete paper.



Abstracts

Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broad-Band Networks (Jun. 1989, Part I [T-MTT])

"Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broad-Band Networks (Jun. 1989, Part I [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): 1068-1068.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Back Cover (Jun. 1989, Part I [T-MTT])

"Back Cover (Jun. 1989, Part I [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part I [T-MTT]): b1-b2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Front Cover (Jun. 1989, Part II [T-MTT])

"Front Cover (Jun. 1989, Part II [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Editor's Preface (Jun. 1989, Part II [T-MTT])

P. Staecker. "Editor's Preface (Jun. 1989, Part II [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)): 1-1.

The first MTT index issue (June 1981, Part II) collected all references to Transactions articles from the first issue, in March 1953, through 1980. The second index issue (September 1983, Part II) collected all references to papers published in proceedings of the IEEE MTT-S International Microwave Symposium. Papers from the first technical meeting of the then PGM-TT in November 1952 through the June 1983 meeting in Boston were included in this second issue.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

The MTT Transactions and Symposia Update (Jun. 1989, Part II [T-MTT])

T.S. Saad. "The MTT Transactions and Symposia Update (Jun. 1989, Part II [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)): 2-9.

In the two earlier index issues, as your historian, I wrote on the history of the Transactions and the history of the Symposia. Without going into the extensive detail of those two earlier introductions, I would like to mention a few of the more important changes that have taken place since then.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

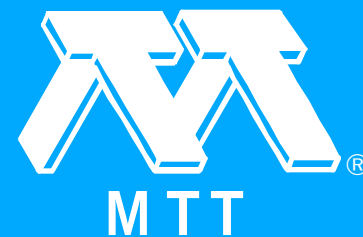
Click on title for a complete paper.



Abstracts

1981-1988 Cumulative Index - Guide to the Index (Jun. 1989, Part II [T-MTT])

"1981-1988 Cumulative Index - Guide to the Index (Jun. 1989, Part II [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)): 10-10.



IEEE

Contents

Publications

Issues

Papers

Authors

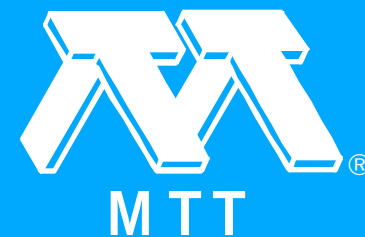
Click on title for a complete paper.



Abstracts

Index of Authors, Cumulative, 1981-1988 (Jun. 1989, Part II [T-MTT])

"Index of Authors, Cumulative, 1981-1988 (Jun. 1989, Part II [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)): i11-i73.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

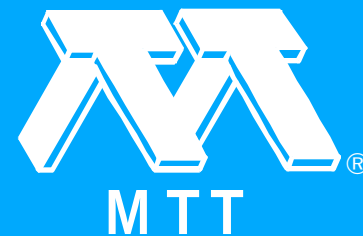
Click on title for a complete paper.



Abstracts

Index of Subjects, Cumulative, 1981-1988 (Jun. 1989, Part II [T-MTT])

"Index of Subjects, Cumulative, 1981-1988 (Jun. 1989, Part II [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)): i74-i187.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

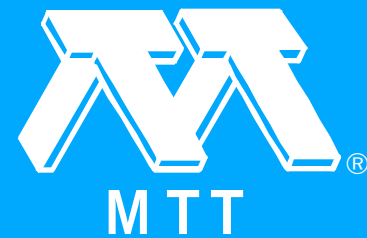
Click on title for a complete paper.



Abstracts

MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (Jun. 1989, Part II [T-MTT])

"MTT Society Series of Home Video Tutorials - Emerging Technologies (Advertisement) (Jun. 1989, Part II [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)): 188-188.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Back Cover (Jun. 1989, Part II [T-MTT])

"Back Cover (Jun. 1989, Part II [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.6 (Jun. 1989, Part II [T-MTT] (8 Year Cumulative Index)): b1-b2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

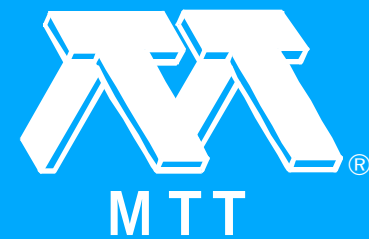
Click on title for a complete paper.



Abstracts

Front Cover (Jul. 1989 [T-MTT])

"Front Cover (Jul. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): f1-f2.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

On the Design and Performance of a 6-18 GHz Three-Tier Matrix Amplifier

K.B. Niclas and R.R. Pereira. "On the Design and Performance of a 6-18 GHz Three-Tier Matrix Amplifier." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1069-1077.

A 3x3 matrix amplifier for the 6-18 GHz frequency band has been developed. Employing MESFET's fabricated on VPE material, gains of $G = 23.5 \pm 0.5$ dB with a maximum reflection loss of $RL = -10$ dB were obtained from 5.2 to 18.7 GHz. Gain improved to $G = 29.1 \pm 1.1$ dB at a worst-case reflection loss of $RL = -7.5$ dB between 4.6 and 18.3 GHz when MBE material was used for the MESFET's. In addition to the experimental results, important design considerations, especially in regard to the termination impedances of the idle ports, are discussed.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Experiments on Injection Locking of Active Antenna Elements for Active Phased Arrays and Spatial Power Combiners

K. Chang, K.A. Hummer and J.L. Klein. "Experiments on Injection Locking of Active Antenna Elements for Active Phased Arrays and Spatial Power Combiners." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1078-1084.

Two types of active antenna elements have been studied experimentally. One type uses a microstrip antenna with an active device mounted directly on the antenna. The other uses an active device coupled to a microstrip patch antenna through an aperture. Microstrip active antenna elements and two-element arrays have been demonstrated for both types of circuits. Injection locking of the antenna elements has been achieved through space and mutual coupling. The circuit Q factor was calculated based on the locking gain and the locking bandwidth. The power output from two elements has been successfully combined in free space with a combining efficiency of over 90 percent. For a single active antenna with a Gunn diode mounted directly on the patch, an electronic tuning range exceeding 9 percent has been achieved by varying the dc bias. The results should have many applications in low-cost active arrays, active transmitters, and spatial power combiners.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Distributed Scaling Approach of MESFET's and its Comparison with the Lumped-Element Approach

J.P. Mondal. "Distributed Scaling Approach of MESFET's and its Comparison with the Lumped-Element Approach." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1085-1090.

An appropriate scaling procedure is described for large MESFET cells with experimental verification. A comparison is presented between lumped and distributed modeling approaches. The scalability of elements in the equivalent circuit model of a MESFET is discussed.



IEEE

Contents

Publications

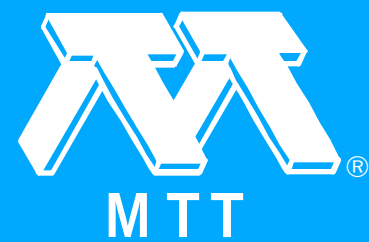
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Rigorous Analysis of a Coaxial to Shielded Microstrip Line Transition

C.N. Capsalis, C.P. Chronopoulos and N.K. Uzunoglu. "A Rigorous Analysis of a Coaxial to Shielded Microstrip Line Transition." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1091-1098.

The transition from a coaxial to a shielded microstrip line is analyzed by applying a rigorous mode-matching technique. The symmetry axes of the two transmission lines are assumed to be parallel while the relative position of the coaxial line center conductor with respect to the microstrip line is taken to be arbitrary. The fields inside the shielded microstrip line are expanded in terms of the normal hybrid modes, while in describing the fields inside the coaxial line the transverse electric and magnetic modes are utilized. Both propagating and evanescent modes are taken into account in each transmission line. A modified mode-matching procedure is employed on the junction plane of the two transmission lines to formulate the corresponding discontinuity problem. The mode-matching equations are solved by applying projection techniques. Numerical stability and computational efficiency are achieved in determining the scattering parameters of the coaxial to microstrip line transitions. Numerical results are computed and presented for several coaxial to microstrip line transition geometries.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Rigorous and Computationally Efficient Analysis of Microstrip for Use as an Electro-Optic Modulator

C.J. Railton and J.P. McGeehan. "A Rigorous and Computationally Efficient Analysis of Microstrip for Use as an Electro-Optic Modulator." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1099-1104.

Much interest has been shown in the literature concerning the direct modulation of an optical signal by a microwave signal making use of a microstrip-like structure with a diffused optical waveguide. Due to the particular geometry of the modulator, the usual rigorous methods of analysis, such as the spectral-domain method (SDM), encounter problems and less efficient methods have had to be used. In this paper it is shown that by using an asymptotic form of the Green's function in the standard SDM, an accurate, efficient, and rigorous full-wave analysis can readily be undertaken. A closed-form first-order solution to the field patterns is also derived.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Two-Path Cutoff Waveguide Dielectric Resonator Filters (Jul. 1989 [T-MTT])

H. Shigesawa, M. Tsuji, T. Nakao and K. Takiyama. "Two-Path Cutoff Waveguide Dielectric Resonator Filters (Jul. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1105-1112.

This paper proposes a new type of evanescent-mode waveguide filter consisting of two parallel cutoff waveguide paths with dielectric resonators. We initiate here an accurate design method incorporating both the full-wave analytical method and the impedance inverter method. The specified overall characteristic is then synthesized with the help of a computer-aided design method. Measurements on several kinds of filters modeled at X-band show excellent agreement with the designed characteristics.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Electromagnetic Field Analysis and Calculation of the Resonance Characteristics of the Loop-Gap Resonator

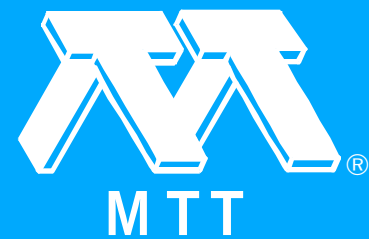
M. Mehdizadeh and T.K. Ishii. "Electromagnetic Field Analysis and Calculation of the Resonance Characteristics of the Loop-Gap Resonator." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1113-1118.

The electromagnetic field configuration of the loop-gap resonator is analyzed and expressions for field distributions are derived. The method involves solving Maxwell's equations for the boundary conditions and matching the internal magnetic fields of the resonator to the evanescent fringing fields by a numerical fitting method. The expressions derived from this analysis are used in the derivation of equations for the resonant frequency and the quality factor of the resonator. The computed results are in good agreement with the measured values for resonant frequency and quality factors.

[Click on title for a complete paper.](#)



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Computation of Fields in an Arbitrarily Shaped Heterogeneous Dielectric or Biological Body by an Iterative Conjugate Gradient Method

J.J.H. Wang and J.R. Dubberley. "Computation of Fields in an Arbitrarily Shaped Heterogeneous Dielectric or Biological Body by an Iterative Conjugate Gradient Method." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1119-1125.

Electromagnetic (EM) fields in a three-dimensional, arbitrarily shaped heterogeneous dielectric or biological body illuminated by a plane wave are computed by an iterative conjugate gradient method. The method is a generalized method of moments applied to the volume integral equation. Because no matrix is explicitly involved or stored, the present iterative method is capable of computing EM fields in objects an order of magnitude larger than those that can be handled by the conventional method of moments. Excellent numerical convergence is achieved. Perfect convergence to the result of the conventional moment method using the same basis and weighted with delta functions is consistently achieved in all the cases computed, indicating that these two algorithms (direct and iterative) are equivalent.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Performance Comparison of Available Interstitial Antennas for Microwave Hyperthermia

A.M. Tumeh and M.F. Iskander. "Performance Comparison of Available Interstitial Antennas for Microwave Hyperthermia." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1126-1133.

The use of interstitial antennas for microwave hyperthermia has gained popularity because of the increased utilization of invasive treatment techniques using radioactive seeds. This method of directly applying therapeutic heating has the advantage of causing minimal damage to the surrounding healthy tissue and it helps achieve heating of deep-seated tumors. Several designs of interstitial antennas are commercially available and there is a need to evaluate and compare their performance. In a recent paper, an experimental comparison was made between three different antennas: the Dartmouth, the BSD Medical, and the Cheung. Many of the commercially available antenna designs are multisections, while available analytical techniques are only valid for uniformly insulated antennas. We have developed a numerical model which calculates the current distribution and radiation characteristics of multisection antennas having varying diameters of the center conductor and/or the types and thicknesses of the insulation. In this paper we briefly describe the model and compare the numerical results with the experimented data published by Ryan and Strohbehn. Excellent correlation between the experimental and calculated patterns was obtained. The numerical model was then used to examine some interesting changes in the commercial designs, such as the effect of the tip termination of the antenna and the diameters of the conducting sections (collars) on the heating patterns of the BSD Medical antenna. Important observations regarding the role of each section, in multisection antenna designs, in guiding along the antenna versus coupling to the ambient were also investigated and verified.

Click on title for a complete paper.



Abstracts

Modeling the Gate I/V Characteristic of a GaAs MESFET for Volterra-Series Analysis (Short Papers)

S.A. Maas and A. Crosmun. "Modeling the Gate I/V Characteristic of a GaAs MESFET for Volterra-Series Analysis (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1134-1136.

This paper shows that the Taylor-series coefficients of a FET's gate/drain I/V characteristic, which is used to model this nonlinearity for Volterra-series analysis, can be derived from low-frequency RF measurements of harmonic output levels. The method circumvents many of the problems of using dc measurements to characterize this nonlinearity.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Note on the Impedance of a Wire Grid Parallel to a Homogeneous Interface (Short Papers)

J.L. Young and J.R. Wait. "Note on the Impedance of a Wire Grid Parallel to a Homogeneous Interface (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1136-1138.

We provide new numerical data for the correction factor which is used to calculate the impedance of a planar wire grid parallel to the interface between two dielectric half-spaces. Comparisons are made with earlier investigations which clarify, extend, and supersede previous computations. Here we show more clearly the significant influence of the interface on the equivalent grid impedance.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Analysis of Wide Transverse Inductive Metal Strips in a Rectangular Waveguide (Short Papers)

B.H. Chu and K. Chang. "Analysis of Wide Transverse Inductive Metal Strips in a Rectangular Waveguide (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1138-1141.

An analysis based on the variational method and the moment method has been developed to calculate the discontinuity susceptance due to one or more inductive strips in a rectangular waveguide. The strips can have wide widths and be located unsymmetrically on the transverse plane of the waveguide. The current distribution on the strips has been determined by solving a set of linear equations. The theoretical results agree closely with experiments.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

On Microwave Imagery Using Bojarski's Identity (Short Papers)

T.-H. Chu and D.-B. Lin. "On Microwave Imagery Using Bojarski's Identity (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1141-1144.

In this paper, theoretical and experimental studies of microwave imagery of a perfectly conducting convex object of a size larger than the incident wavelength are presented. Experimental data were measured in the frequency range 4-10 GHz. Calculations were done with Bojarski's identity, one-dimensional Fourier inversion of the range-normalized scattered far field, and a back-projection algorithm. The images show the distribution of specular reflection regions on the surface of the object.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

The Input Impedance of a Hollow-Probe-Fed, Semi-Infinite Rectangular Waveguide (Short Papers)

J.M. Rollins and J.M. Jarem. "The Input Impedance of a Hollow-Probe-Fed, Semi-Infinite Rectangular Waveguide (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1144-1146.

Image theory is used to determine the input impedance of a coaxial feed in a short-circuited, semi-infinite rectangular waveguide. The analysis presented here is applicable to hollow antenna probes of variable height and lends itself well to accurate numerical evaluation. The numerical results are compared to results obtained from other methods and show the efficacy of rising image theory to determine the waveguide input impedance.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

dc to 40 GHz Coaxial-to-Microstrip Transition for 100- μ m-Thick GaAs Substrates (Short Papers)

J. Chenkin. "dc to 40 GHz Coaxial-to-Microstrip Transition for 100- μ m-Thick GaAs Substrates (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1147-1150.

The design, design approach, and test results are presented for a simple coaxial-to-microstrip transition. The approach provides improved performance over the basic coaxial-to-microstrip transition by causing a TEM-to-quasi-TEM transformation through a tapering of the coaxial line for $432 \pm 51 \mu\text{m}$ (≤ 6 percent of λ_0 at 40 GHz) prior to impinging a portion of the resultant quasi-TEM field directly across the microstrip's dielectric at the coaxial-microstrip interface. Tests show that the return loss for the transition into a 50 Ω microstrip line on a 100- μ m-thick GaAs substrate is better than 16.9 dB per transition from 200 MHz to 40 GHz. A cover having a height of 1.9 mm and a width of 2.6 mm had little or no influence on test results.

[Click on title for a complete paper.](#)



Abstracts

A Note on the Mixed Potential Representation of Electric Fields in Layered Media (Short Papers)

M.J. Cloud and D.P. Nyquist. "A Note on the Mixed Potential Representation of Electric Fields in Layered Media (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1150-1152.

A mixed potential formulation is given for electric fields in layered environments. Contributions to the field from charges are identified explicitly through a scalar Green's function for layered media. The outcome is a computationally expedient Sommerfeld integral representation.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Dominance of Resistive Losses Over Hysteretic Losses in Ferromagnetic Conductors (Short Papers)

K.K. Thornber. "Dominance of Resistive Losses Over Hysteretic Losses in Ferromagnetic Conductors (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1152-1153.

In the presence of ferromagnetic conductors, electromagnetic signal propagation might be seriously degraded through hysteretic losses. It is shown, however, that, independent of frequency, such losses are always smaller than the ordinary resistive losses one would calculate for a similarly resistive, equivalent paramagnetic material. This indicates that measurements of conductivity and permeability suffice to bound hysteretic losses, obviating the necessity for measurements of hysteresis at operating frequencies.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

GaAs MESFET Baseband-to-Microwave Passive Switches (Comments and Reply)

R.J. Gutmann, N. Jain, M. Schindler, M. Miller and K. Simon. "GaAs MESFET Baseband-to-Microwave Passive Switches (Comments and Reply)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1154-1155.

In two recent publications on broad-band passive GaAs MESFET switches, Schindler and colleagues presented the low-power, low-frequency characteristics of these useful components. While complete characteristics were presented over the microwave spectrum, power-handling capability was not presented below 3 GHz. This letter emphasizes that the power-handling capability, as well as related nonlinearities such as total harmonic distortion, degrades significantly at lower frequencies in previously reported GaAs MESFET switches, and we expect similar characteristics in these recently reported switches as well. While this power-handling reduction is not significant for most RF and microwave users, there are negative implications for broad-band, baseband applications such as instrumentation and signal processing.



Abstracts

Broad-Band Monolithic Microwave Active Inductor and its Application to Miniaturized Wide-Band Amplifiers (Correction)

S. Hara, T. Tokumitsu, T. Tanaka and M. Aikawa. "Broad-Band Monolithic Microwave Active Inductor and its Application to Miniaturized Wide-Band Amplifiers (Correction)." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1155-1155.
In the above paper, a small change in equation (1) is required for an accurate description of the active inductor.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

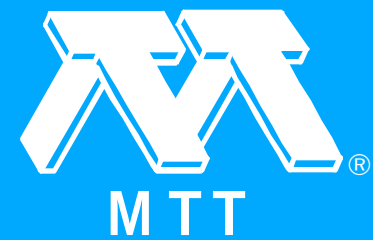
Click on title for a complete paper.



Abstracts

Patent Abstracts (Jul. 1989 [T-MTT])

"Patent Abstracts (Jul. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1156-1162.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Jul. 1989 [T-MTT])

"Call for Papers - Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems (Jul. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1163-1164.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

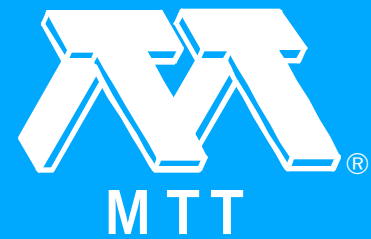
Click on title for a complete paper.



Abstracts

Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks (Jul. 1989 [T-MTT])

"Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks (Jul. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): 1164-1164.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Back Cover (Jul. 1989 [T-MTT])

"Back Cover (Jul. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.7 (Jul. 1989 [T-MTT]): b1-b2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

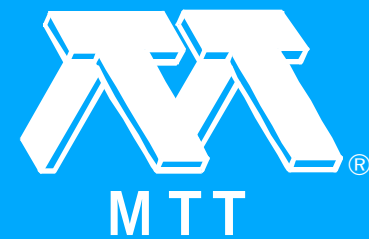
Click on title for a complete paper.



Abstracts

Front Cover (Aug. 1989 [T-MTT])

"Front Cover (Aug. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): f1-f2.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Determination of the Resonant Frequencies in a Complex Cavity Using the Scattering Matrix Formulation

J.M. Neilson, P.E. Latham, M. Caplan and W.G. Lawson. "Determination of the Resonant Frequencies in a Complex Cavity Using the Scattering Matrix Formulation." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1165-1170.

A method for computing the resonant frequency in a complex cavity consisting of a series of waveguide sections is derived. The analysis uses the scattering matrix formulation to produce an eigenvalue equation which must be solved numerically. The technique is easily implemented numerically and shows good agreement with experiment.



[Contents](#)

[Publications](#)

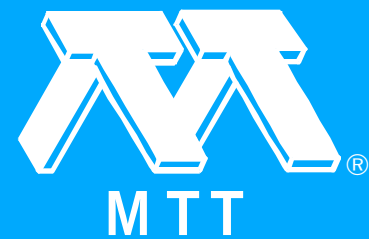
[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Characteristics of a Longitudinal/Transverse Coupling Slot in Crossed Rectangular Waveguides

S.R. Rengarajan. "Characteristics of a Longitudinal/Transverse Coupling Slot in Crossed Rectangular Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1171-1177.

A rigorous analysis of a broad wall slot coupler between two crossed rectangular waveguides is presented. The slot is longitudinal and offset from the center line in the main guide and is centered transverse in the branch guide. Pertinent integral equations are developed, taking into account finite wall thickness. The integral equations are then solved for the aperture electric field. Coupling slot characteristics are obtained, including the resonant length and dominant mode scattering. Numerical results for resonant length and scattering parameters are presented over a range of offsets, waveguide dimensions, and frequencies.

[Click on title for a complete paper.](#)



Abstracts

Elimination of Ringing Signals for a Lossless, Multiple-Section Transmission Line

C.-W. Hsue. "Elimination of Ringing Signals for a Lossless, Multiple-Section Transmission Line." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1178-1182.

Transient processes are examined for a lossless, multiple-section transmission line terminated with resistive load. The signal components of the transmitted wave at the load end are examined in detail. The ringing effect is primarily due to two factors (1) the voltage difference between the first arriving wave and the quasi-steady voltage and (2) the voltage signals generated by internal reflection-transmission processes. By properly choosing the values of the characteristic impedances of the signal line, we find that a multiple-section line in which the sections are of equal length can provide high-quality signals to the load. Several examples are given to illustrate this new methodology.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

A Generalized Theory of Tapered Transmission Line Matching Transformers and Asymmetric Couplers Supporting Non-TEM Modes

P. Pramanick and P. Bhartia. "A Generalized Theory of Tapered Transmission Line Matching Transformers and Asymmetric Couplers Supporting Non-TEM Modes." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1184-1191.

This paper presents a generalized Fourier transform pair for the analysis, synthesis of tapered transmission lines supporting a non-TEM mode. The Fourier transform pair first pointed out by Bolinder and subsequently used by Klopfenstein and others, for TEM lines, can be shown to be a special case of the present transform pair. A step-by-step synthesis method has been described for exact designs of matching transformers, asymmetric couplers. The theory is verified with the design of two Ka-band finline tapers, a C-band microstrip coupler.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

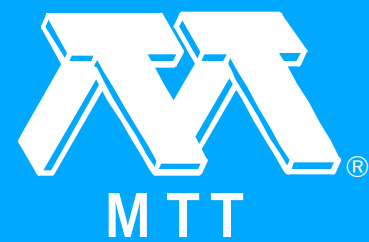
Three-Dimensional SAR Distributions Computed in a Multilayered Cylindrical Model for Electromagnetic Hyperthermia

S.C. Hill and D.Q. Chowdhury. "Three-Dimensional SAR Distributions Computed in a Multilayered Cylindrical Model for Electromagnetic Hyperthermia." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1192-1199.

A model consisting of multilayered, concentric, circular cylinders is used to numerically investigate specific absorption rate (SAR) distributions for electromagnetic hyperthermia. The fields in the cylinders are expanded in eigenfunctions, and axial confinement is achieved via Fourier transformation. Only axisymmetric SAR distributions are considered. TM/sub 0/ modes have, SAR distributions appearing most useful for hyperthermia of deep-seated tumors. As the SAR is more confined axially: 1) the radial components of the TM/sub 0/ mode fields increase, and 2) the attenuation in the radial direction increases. Differences in SAR distributions are more apparent near the surface of a model than they are near the core. The effects of axial confinement on the optimal frequency of operation are discussed.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Theoretical and Experimental SAR Distributions for Interstitial Dipole Antenna Arrays Used in Hyperthermia

K.M. Jones, J.A. Mechling, J.W. Strohbehn and B.S. Trembly. "Theoretical and Experimental SAR Distributions for Interstitial Dipole Antenna Arrays Used in Hyperthermia." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1200-1209.

Theoretical predictions and experimental measurements of power deposition in muscle tissue phantoms from arrays of microwave dipole antennas used for hyperthermia cancer therapy are compared. The antennas are linear coaxial dipoles, constructed from coaxial cable approximately 1 mm in diameter, which are inserted into small nylon catheters implanted in the tumor volume. The antennas have a tip section consisting of an expanded extension of the inner conductor, and a second section consisting of the outer conductor and extending from the tip section back to the insertion point into the tissue or phantom. In this work these two sections have equal length; i.e. the antennas are symmetrical dipoles. The specific absorption rate (SAR, W/kg) patterns for a 2 cm square array of four 915 MHz antennas are presented for both resonant and nonresonant dipoles. Arrays of dipoles with lengths much shorter than the resonant half-wavelength have a far more reactive input impedance and a much smaller absolute SAR magnitude in the array center than is seen for arrays of resonant dipoles, and the maximum SAR shifts from the array center to the antenna surfaces. The absolute length of the volume heated by the small-diameter antennas with the longer half -wavelength was longer than that for the larger diameter antennas. SAR distributions for 4 cm square arrays of eight and nine antennas fed with equal amplitude and phase are also compared. It is found that much of the array volume has a power deposition less than 25 percent of the maximum SAR and that the distribution is nonuniform for both the eight- and nine-antenna configurations.

Click on title for a complete paper.



Abstracts

On the Imaging of Hot Spots Using Correlation Radiometers and a Circular Aperture

G. Schaller. "On the Imaging of Hot Spots Using Correlation Radiometers and a Circular Aperture." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1210-1216.

A microwave correlation radiometer system with a circular synthetic aperture for the imaging of hot spots in homogeneous lossy tissue is investigated. Together with a proper reconstruction algorithm, the system has the ability to reconstruct correctly the position and the power density ratios of point-shaped noise sources. Results from computer simulations for various system parameters are presented in a graphical manner. Furthermore, it is shown that inexactly known attenuation and phase constants of the tissue vary the reconstructions only slightly.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.

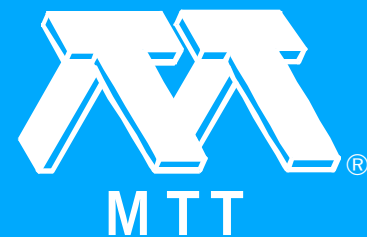


Abstracts

Optical Receiver and Modulator Frequency Response Measurement with a Nd:YAG Ring Laser Heterodyne Technique

T.S. Tan, R.L. Jungerman and S.S. Elliott. "Optical Receiver and Modulator Frequency Response Measurement with a Nd:YAG Ring Laser Heterodyne Technique." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1217-1222.

The frequency response of optical receivers is accurately calibrated by measuring a heterodyne signal generated by mixing two NdYAG ring lasers. The heterodyne system offers more than 50 dB of dynamic range. Calibration of optical phase and amplitude modulators is achieved by down-converting a sideband of the modulated optical carrier to a fixed IF frequency with another laser. This technique eliminates the need for a high-speed receiver.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique

H.-L.A. Hung, P. Polak-Dingels, K.J. Webb, T. Smith, H.C. Huang and C.H. Lee. "Millimeter-Wave Monolithic Integrated Circuit Characterization by a Picosecond Optoelectronic Technique." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1223-1231.

The characterization of microwave and millimeter-wave monolithic integrated circuits (MIMIC's) using picosecond pulse sampling techniques is developed, with emphasis on improving broad-band coverage and measurement accuracy. GaAs photoconductive switches are used for signal generation and sampling operations. The measured time-domain response allows the spectral transfer function of the MIMIC to be obtained. This measurement technique was verified by characterization of the frequency response (magnitude and phase) of a reference 50 Ohm microstrip line and a two-stage K/sub a/-band MIMIC amplifier. The measured broad-band results agree well with those obtained from conventional frequency-domain measurements using a network analyser. The application of this optical technique to on-wafer MIMIC characterization is also described.

[Click on title for a complete paper.](#)



Planar FET Oscillators Using Periodic Microstrip Patch Antennas

J. Birkeland and T. Itoh. "Planar FET Oscillators Using Periodic Microstrip Patch Antennas." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1232-1236.

Planar oscillators in which periodic microstrip antennas are integrated with FET negative resistance elements to form an integrated quasi-optical source are described. The antennas considered here are periodic microstrip patch arrays operated in the leaky-wave stopband. Because of the high VSWR in this case, this type of antenna may be used as both a resonant and a radiating element. Such circuits are suitable for use in millimeter-wave systems as well as at microwave frequencies. A design procedure is given and the performance of X-band prototype circuits is reported. Prototype circuits showed 9 dB isotropic conversion gain and 40 MHz tuning range at 9.5 GHz.



Abstracts

Novel Linearize Using Balanced Circulators and its Application to Multilevel Digital Radio Systems

N. Imai, T. Nojima and T. Murase. "Novel Linearize Using Balanced Circulators and its Application to Multilevel Digital Radio Systems." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1237-1243.

A new miniaturized RF predistortion linearizer for a GaAs FET power amplifier applicable to 256 QAM digital microwave systems is presented. This linearizer, which is based upon the cubic linearizer technique, utilizes circulators and a pair of diodes as fundamental components. It allows not only miniaturization and easy adjustment of the circuit, but also compensation for temperature variation in the circulators. The fundamental characteristics of the linearizer and its effect on the 256 QAM signal are shown. The results show an improvement of more than 6 dB in the output back-off of the amplifier.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

On Higher Order Mode Cutoff Frequencies in Elliptical Step Index Fibers

S.R. Rengarajan. "On Higher Order Mode Cutoff Frequencies in Elliptical Step Index Fibers." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1244-1248.

Cutoff frequencies of several higher order modes in two-layer step index elliptical fiber are computed from a rigorous analysis of the boundary value problem. Cutoff characteristics of modes in rectangular and elliptical fibers in the literature are reviewed. Mode correspondence, field symmetries, and physical considerations are invoked to establish confidence in previously published results on the first higher order mode cut off in elliptical fibers. Very large birefringence fibers are shown to have low values for the first higher order mode cut off; hence, their usefulness in single-mode applications is limited.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Uniplanar Monolithic Frequency Doublers

T. Hirota and H. Ogawa. "Uniplanar Monolithic Frequency Doublers." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1249-1254.

GaAs monolithic frequency doublers in the 13 GHz band and 26 GHz band have been designed and fabricated. These doublers employ a newly developed uniplanar monolithic microwave IC (MMIC) structure. They are composed of coplanar waveguides, slotlines, and air bridges only on the upper side of the GaAs substrate. These uniplanar MMIC frequency doublers offer the advantages of smaller circuit size and simpler fabrication processes than microstrip-based MMIC's. The fabricated doublers have achieved a conversion gain of 2.9 dB at 12.4 GHz and a minimum conversion loss of 0.7 dB at 24.4 GHz. Furthermore, a 6.5 GHz to 26 GHz frequency quadruple has been made using a cascade connection of the doubler chips. It demonstrated stable operation without any adjustment and achieved a conversion loss of 10 dB.



[Click on title for a complete paper.](#)



Abstracts



IEEE

Contents

Publications

Issues

Papers

Authors

Laser-Activated p-i-n Diode Switch for RF Application (Short Papers)

A. Rosen, P. Stabile, W. Janton, A. Gombar, P. Basile, J. Delmaster and R. Hurwitz. "Laser-Activated p-i-n Diode Switch for RF Application (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1255-1257.

There is a growing interest in optically controlled high-power switches from HF to millimeter wave. This paper deals specifically with the results obtained utilizing an optically activated RF switch in the 2-30 MHz range. Preliminary testing of a 0.25-mm-thick p-i-n device activated with 116 W peak optical power from a two-dimensional laser array in a 50 Omega system has yielded isolation between 20.8 and 49 dB, and an average insertion loss of. 0.38 dB when measured between 2.5 and 30 MHz.

Click on title for a complete paper.



Abstracts

Analysis of Rectangular Spiral Transformers for MMIC Applications (Short Papers)

A. Boulouard and M. Le Rouzic. "Analysis of Rectangular Spiral Transformers for MMIC Applications (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1257-1260.

To evaluate rectangular spiral transformers for use in microwave monolithic integrated circuits (MMIC's) on GaAs substrate, we have calculated the chain matrices of multiconductor coupled line sections and bends from multimode characteristic impedances and effective dielectric constants. A new kind of MMIC transformer, called a triformer, has been analyzed by this method and may be used as an integrated circuit balun. Theoretical results are presented for components over the range 1-10 GHz and compared to measurements.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Analysis of Edge-Coupled Elliptical (Oval) Rods Between Infinite Ground Planes (Short Papers)

K.V.S. Rao and P. Bhartia. "Analysis of Edge-Coupled Elliptical (Oval) Rods Between Infinite Ground Planes (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1260-1263.

The paper presents an analysis of the even- and odd-mode impedances for a generalized edge-coupled structure consisting of two elliptical (oval) conducting rods. Data on the even- and odd-mode impedances for different special cases of the generalized elliptical (oval) structure are presented. Some special cases of the present formulation are compared with results available in the literature.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Numerical Conformal Transformation of Three-Magnetic-Wall Structures (Short Papers)

E. Costamagna. "Numerical Conformal Transformation of Three-Magnetic-Wall Structures (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1263-1266.

The traditional conformal transformation approach for capacitance and impedance evaluation in TEM transmission lines leads to the mapping of the line structure into a rectangular geometry. This approach is not suitable to cope with general two-conductor, three-magnetic-wall line structures, and this paper describes how conformal transformations may transform these structures into less complicated geometries, which either can be solved or have been solved previously by numerical techniques.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Alternate Forms of the Generalized Composite Scattering Matrix (Letters)

P.L. Overfelt and D.J. White. "Alternate Forms of the Generalized Composite Scattering Matrix (Letters)." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1267-1268.

The cascading of two scattering matrices to form a composite scattering matrix is a well-known operation. Its advantage over the more straightforward cascading of transmission matrices lies in the fact that scattering matrices avoid the often occurring large transmission matrix elements that lead to computational difficulties. A fairly recent paper by Chu and Itoh used direct substitution between inputs and outputs to derive a form for the generalized composite scattering matrix. We would like to point out that this is by no means the only method of derivation. "Star" matrix multiplication conversion of a generalized composite transmission matrix to its scattering equivalent, and signal flow graph analysis are other methods of derivation. The forms of the resultant composite scattering matrices derived by these methods are often different. It is the purpose of this note to reconcile these different forms.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Patent Abstracts (Aug. 1989 [T-MTT])

"Patent Abstracts (Aug. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1269-1274.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

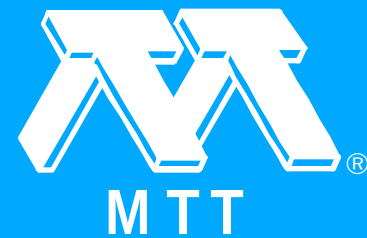
Click on title for a complete paper.



Abstracts

Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks (Aug. 1989 [T-MTT])

"Call for Papers - Applications for RF and Microwave Subcarriers to Optical Fiber Transmission in Present and Future Broadband Networks (Aug. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1275-1275.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Call for Papers - 1990 IEEE MTT-S International Microwave Symposium (Aug. 1989 [T-MTT])

"Call for Papers - 1990 IEEE MTT-S International Microwave Symposium (Aug. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): 1276-1276.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

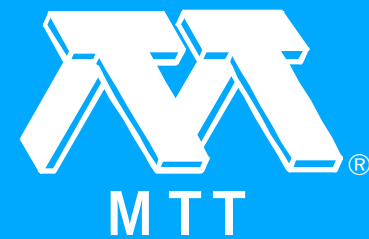
Click on title for a complete paper.



Abstracts

Back Cover (Aug. 1989 [T-MTT])

"Back Cover (Aug. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.8 (Aug. 1989 [T-MTT]): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

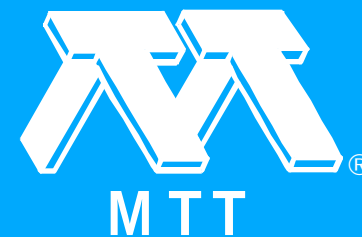
Click on title for a complete paper.



Abstracts

Front Cover (Sep. 1989 [T-MTT])

"Front Cover (Sep. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): f1-f2.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Foreword (Sep. 1989 [T-MTT])

J. Goel. "Foreword (Sep. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1277-1278.

Recent advances in GaAs semiconductor material growth, the development of e-beam for submicron lithography, and improved processing techniques have not only improved the performance of conventional field-effect transistors but also resulted in several novel heterostructure devices. At the present time, the focus of the activity in materials is on producing highly uniform and consistent epitaxial layers and improving processing techniques to produce submicron geometries.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications

U.K. Mishra, A.S. Brown, M.J. Delaney, P.T. Greiling and C.F. Krumm. "The AlInAs-GaInAs HEMT for Microwave and Millimeter-Wave Applications." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1279-1285.

This paper reviews the status of lattice-matched and pseudomorphic AlInAs-GaInAs HEMT's grown on InP substrates. The best lattice-matched devices with 0.1 μm gate length had a transconductance $g_m = 1080 \text{ mS/mm}$ and unity current gain cutoff frequency $f_T = 178 \text{ GHz}$, whereas similar pseudomorphic HEMT's had $g_m = 1160 \text{ mS/mm}$ and $f_T = 210 \text{ GHz}$. Single-stage V-band amplifiers demonstrated 1.3 and 1.5 dB noise figures and 9.5 and 8.0 dB associated gains for the lattice-matched and pseudomorphic HEMT's, respectively. The best performance achieved was $F_{\text{min}} = 0.8 \text{ dB}$ with $G_a = 8.7 \text{ dB}$.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications

M.E. Kim, A.K. Oki, G.M. Gorman, D.K. Umemoto and J.B. Camou. "GaAs Heterojunction Bipolar Transistor Device and IC Technology for High-Performance Analog and Microwave Applications." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1286-1303.

This paper discusses the GaAs/AlGaAs N-p-n heterojunction bipolar transistor (GaAs HBT) technology and its application to analog and microwave functions for high-performance military and commercial systems. In focused applications the GaAs HBT offers key advantages over alternative advanced silicon bipolar and III-V compound field-effect transistor (FET) approaches. The TRW GaAs HBT device and IC fabrication process, basic HBT dc and RF performance, examples of applications, and qualification work are presented and serve as a basis for addressing general technology issues. A relaxed $3\mu\text{m}$ emitter-up, self-aligned HBT IC process permits a combination of excellent transistor dc and RF performance including simultaneous $f_{\text{sub T}}$, $f_{\text{sub max}}$ /spl ap/ 20-40 GHz and dc current gain beta /spl ap/ 50-100 at useful collector current densities $J_{\text{sub C}}$ /spl ap/ 3-10 kA/cm^2 , Early voltage $V_{\text{sub A}}$ /spl ap/ 500-1000 V, and MSI-LSI integration levels. These capabilities facilitate versatile dc-20 GHz analog/microwave as well as 3-6 Gbit/s digital, 2-3 Gs/s A/D conversion, and monolithically combined functions -- with producibility. In analog and microwave applications, key improvements are realized over Si bipolar and GaAs-related FET (such as MESFET and HEMT) approaches in combinations of operational frequency, power consumption, gain-bandwidth product, harmonic distortion, and phase (1/f) noise.

Click on title for a complete paper.

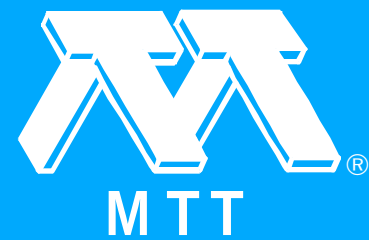


Abstracts

Single-Interface and Quantum-Well Heterostructure MISFET's

R.A. Kiehl. "Single-Interface and Quantum-Well Heterostructure MISFET's." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1304-1314.

The physical operation of heterostructure metal-insulator-semiconductor field-effect transistors (H-MISFET's) is described and compared with that of more familiar heterostructure FET's. Undoped, doped-channel, and quantum-well MISFET's based on AlGaAs/GaAs heterostructures are examined. Focus is placed on quantum-well MISFET's, which differ most from more conventional devices. Results of experiments and simulations are presented to examine the physical mechanisms related to charge-control, gate leakage, device geometry, short-channel effects, buffer leakage, and electron trapping in the devices, and the advantages of other III-V materials systems are discussed. Finally, the potential advantages of H-MISFET's for circuit applications are discussed.



IEEE

[Contents](#)

[Publications](#)

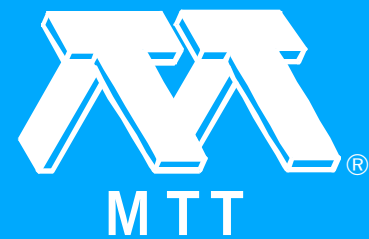
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

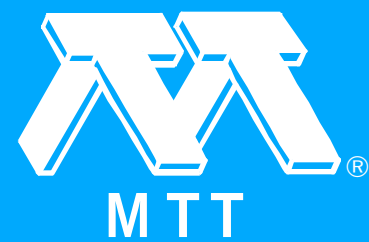
Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency

I.J. Bahl, E.L. Griffin, A.E. Geissberger, C. Andricos and T.F. Brukiwa. "Class-B Power MMIC Amplifiers with 70 Percent Power-Added Efficiency." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1315-1320.

C-band monolithic amplifiers using high-efficiency, class-B MSAG processing have been designed, fabricated, and tested. The class-B single-ended amplifier design employed reactive termination for higher order harmonics and achieved state-of-the art efficiency of 70 percent with associated gain of 8 dB and output power of 1.7 W over the 5-6 GHz band.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Ion-Implanted High Microwave Power Indium Phosphide Transistors

M.D. Biedenbender, V.J. Kapoor, L.J. Messick and R. Nguyen. "Ion-Implanted High Microwave Power Indium Phosphide Transistors." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1321-1326.

Indium phosphide (InP) metal-insulator-semiconductor field-effect transistors (MISFET's) have demonstrated substantially higher output power density at microwave frequencies compared to gallium arsenide metal-semiconductor field-effect transistors (MESFET's). Presented here are the microwave characteristics from an investigation of encapsulated rapid thermal annealing (RTA) for the fabrication of InP power MISFET's with ion-implanted source, drain, and active channel regions. The MISFET's had a gate length of 1.4 μm . They were made with individual gate finger widths of 100 or 125 μm , and six to ten gate fingers per device were used to make MISFET's with total gate widths of 0.75, 0.8, or 1 mm. The source and drain contact regions and the channel region of the MISFET's were fabricated using silicon implants in semi-insulating InP at energies from 60 to 360 keV with doses from 1×10^{12} to 5.6×10^{14} cm². The implants were activated using RTA at 700° C for 30 s in N₂ or H₂ ambients using a silicon nitride encapsulant. The channel region was chemically recessed prior to depositing approximately 1000 Å of SiO₂ for the gate insulator. The high power and high efficiency InP MISFET's were characterized at 9.7 GHz, and the output microwave power density for the RTA conditions used was as high as 2.4 W/mm. For a 1 W input at 9.7 GHz gains up to 3.7 dB were observed, with an associated power-added efficiency of 29 percent. The output power density achieved was 70 percent greater than has been achieved with GaAs MESFET's.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

35 GHz GaAs Power MESFET's and Monolithic Amplifiers

B. Kim, N. Camilleri, H.-D. Shih, H.Q. Tserng and M. Wurtele. "35 GHz GaAs Power MESFET's and Monolithic Amplifiers." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1327-1333.

GaAs MESFET's have been optimized for power operation at 35 GHz. Various doping levels and potential barrier layers at the interface between the buffer and the active layer have been studied. The best power performance has been obtained from the FET on a very heavily doped active layer. The device on AlGaAs heterobuffer had further improved output power. The best devices delivered output power densities of 0.8 W/mm with 23 percent efficiency, 0.71 W/mm with 34 percent efficiency, and 0.61 W/mm with 41 percent efficiency. Monolithic power amplifiers with a 400 μ m FET have generated 200 mW of output power. These amplifiers were monolithically power combined, resulting in 600 mW of output power at 34 GHz.

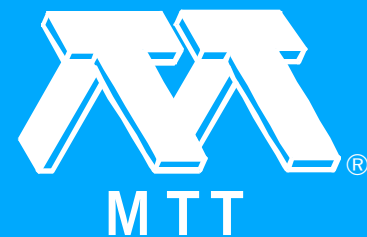


Abstracts

A New GaAs Power MESFET Structure for Improved Power Capabilities

K. Fricke, V. Krozer and H.L. Hartnagel. "A New GaAs Power MESFET Structure for Improved Power Capabilities." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1334-1339.

A new GaAs power MESFET structure incorporating an additional transmission line parallel to the gate allows an increase of the single gate width by a factor of approximately 4. It is experimentally shown that the power capabilities of the new device increase correspondingly if the transmission line is properly terminated. The larger unit gate width results in a significantly higher input resistance.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Modeling of Noise Parameters of MESFET's and MODFET's and Their Frequency and Temperature Dependence (Sep. 1989 [T-MTT])

M.W. Pospieszalski. "Modeling of Noise Parameters of MESFET's and MODFET's and Their Frequency and Temperature Dependence (Sep. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1340-1350.

A simple noise model of a microwave MESFET (MODFET, HEMT, etc.) is described and verified at room and cryogenic temperatures. Closed-form expressions for T_{min} , the minimum noise temperature, Z_{opt} , the optimum generator impedance, g_n , the noise conductance, and $Z_{\text{M}}/g_{\text{opt}}$, the generator impedance minimizing noise measure, are given in terms of the frequency, the elements of a FET equivalent circuit, and the equivalent temperatures of intrinsic gate resistance and drain conductance to be determined from noise measurement. These equivalent temperatures are demonstrated in the example of a Fujitsu FHR01FH MODFET to be independent of frequency in the frequency range in which $1/f$ noise is negligible. Thus, the model allows prediction of noise parameters for a broad frequency range from a single-frequency noise parameters measurement. The relations between this approach and other relevant studies are established.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Distributed Numerical Modeling of Dual-Gate GaAs MESFET's

R.B. Darling. "Distributed Numerical Modeling of Dual-Gate GaAs MESFET's." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1351-1360.

A one-dimensional, numerical gradual channel model is used to examine the behavior of dual-gate GaAs metal-semiconductor field-effect transistors (MESFET's). Lumped circuit models for the dual-gate FET are based upon two single-gate devices with their channels in series and are considerably more complex than those for a single-gate device. By contrast, distributed numerical models for dual-gate devices do not incur any significant changes over equivalent single-gate device models. Such distributed numerical models are very useful for examining the regions of operation of each channel, the internal field distributions, and are also applicable to the case where the close proximity of the two gates couples the parameters of the individual channels and invalidates the modeling of the device as two channels in series.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

DC and Transmission Line Models for a High Electron Mobility Transistor

D.-H. Huang and H.C. Lin. "DC and Transmission Line Models for a High Electron Mobility Transistor." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1361-1370.

Two improved dc models are developed for the output current voltage characteristics and small-signal parameters of a GaAs high electron mobility transistor (HEMT). A simple analytical nonlinear charge control model for two-dimensional electron gas is introduced and included in one of the dc models. The HEMT is modeled as a transmission line for the microwave frequency ac analysis, and the microwave performance of the HEMT is predicted by the parameters obtained from fitting dc characteristics. Both dc and ac model predictions show a good agreement with experimental results of a 0.3 μm GaAs HEMT.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Numerical Simulation of GaAs MESFET's with a p-Buffer Layer on the Semi-Insulating Substrate Compensated by Deep Traps

K. Horio, Y. Fuseya, H. Kusuki and H. Yanai. "Numerical Simulation of GaAs MESFET's with a p-Buffer Layer on the Semi-Insulating Substrate Compensated by Deep Traps." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1371-1379.

Numerical simulation of GaAs MESFET's with a p-buffer layer on the semi-insulating substrate is performed in which impurity compensation by traps in the substrate is considered. It is shown that the use of a thicker p-buffer layer results in lower device current due to the formation of a steeper barrier at the channel-substrate interface. It is also shown that in a case with higher acceptor and trap densities in the substrate, the drain current becomes lower due to the decrease in the substrate current. This decrease in the substrate current occurs due to the formation of a negative space-charge layer in the substrate. It is concluded that using a thick p-buffer layer has the same effect as using a substrate with a high density of traps inasmuch as both of them lead to minimizing the short-channel effects in GaAs MESFET's.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures

W. Brockerhoff, H. Meschede, W. Prost, K. Heime, G. Weimann and W. Schlapp. "RF Measurements and Characterization of Heterostructure Field-Effect Transistors at Low Temperatures." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1380-1388.

The RF performance of both conventional AlGaAs/GaAs and superlattice AlAs/GaAs heterostructure field-effect transistors has been investigated at 120 K and the results are compared with room-temperature values. Both the system used for low-temperature RF measurements up to 12 GHz and the procedure to extract the equivalent circuit from measured S parameters of the packaged FET are described. The high-frequency performance of the HFET's is strongly improved at low temperatures but is sensitive to light due to the device structure. Both the problems of low-temperature measurements and the results of the RF investigation are discussed.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

A Linear Statistical FET Model Using Principal Component Analysis

J.E. Purviance, M.C. Petzold and C. Potratz. "A Linear Statistical FET Model Using Principal Component Analysis." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1389-1394.

An important issue in statistical circuit design, other than the algorithms themselves, is the development of efficient, statistically valid element models. This paper first presents what is needed for a good statistical model. The standard FET model is shown to be difficult to use in a statistical simulation, due to the nonlinear relation between FET S parameters and model parameters. A linear statistical FET model is then proposed based upon principal component analysis. This linear model gives uncorrelated model parameters. In an example using measured S-parameter data from 90 0.5 μm GaAs FET's, 13 uncorrelated model parameters were needed to model the data from 1 to 11 GHz and at one bias. Simulation using this linear model and issues relating to bias are discussed.

Click on title for a complete paper.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

An Analytical Model for I-V and Small-Signal Characteristics of Planar-Doped HEMT's

G.-W. Wang and L.F. Eastman. "An Analytical Model for I-V and Small-Signal Characteristics of Planar-Doped HEMT's." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1395-1400.

An analytical current-voltage model for planar-doped HEMT's has been developed. This compact model is able to cover the complete HEMT I-V characteristics, including the current saturation region and the parasitic conduction in the electron-supplying layer. Analytical expressions of small-signal parameters and current gain cutoff frequency ($f_{sub\ t/}$) are derived from the I-V model. Modeling results of a 0.1- μ m-gate planar-doped AlInAs/GaInAs HEMT show excellent agreement with measured characteristics. Threshold voltages and parasitic conduction in planar-doped and uniformly doped HEMT's are also compared and discussed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Computer-Aided Noise Analysis of MESFET and HEMT Mixers

V. Rizzoli, F. Mastri and C. Cecchetti. "Computer-Aided Noise Analysis of MESFET and HEMT Mixers." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1401-1410.

The paper discusses a novel numerical approach to the noise analysis of MESFET and HEMT mixers of arbitrary topology. A qualitative picture of the complex physical mechanisms responsible for the generation of the IF noise is first outlined, and the corresponding computational algorithms are presented. The derivation of a noisy nonlinear model for the microwave FET is then addressed, and it is shown that a satisfactory solution to this apparently formidable problem can be obtained by combining a conventional time-domain model with standard noise information. The method has been implemented in a computer program designed to work in conjunction with an existing general-purpose harmonic-balance simulator. An example of application is described in detail to demonstrate the excellent performance of this new software tool.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Minimization of Intermodulation Distortion in GaAs MESFET Small-Signal Amplifiers

A.M. Crosmun and S.A. Maas. "Minimization of Intermodulation Distortion in GaAs MESFET Small-Signal Amplifiers." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1411-1417.

This paper examines the dependence of third-order intermodulation distortion on the source-reflection coefficient, Γ_s , as a function of frequency in an amplifier designed according to available-gain criteria. By means of a numerical formulation of the Volterra series, a complete equivalent circuit of the FET can be used, and intermodulation calculations include all feedback effects. We show that the sensitivity of IP_3 to Γ_s decreases with increasing frequency and can be related to the MESFET's stability.

[Click on title for a complete paper.](#)



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Design Concepts for Microwave GaAs FET Active Filters

S.E. Sussman-Fort. "Design Concepts for Microwave GaAs FET Active Filters." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1418-1424.

GaAs MMIC technology has already been employed to great advantage in the design of various active circuits, for example, matching networks, multipliers, and circulators. The development of active filters in this technology seems to us to represent a logical step forward in the evolution of GaAs MMIC circuit applications. This paper gives a comprehensive history of microwave active filter development to date, and then presents a design methodology for the realization of precision broad-band filters in spite of problems such as the nonideal behavior of microwave GaAs FET's and the low Q and related parasitic effects of MMIC inductors and capacitors. Finally, the feasibility of our approach is illustrated by the computer-simulated design of a cascadable, second-degree microwave bandpass filter.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Attenuation Compensation in Distributed Amplifier Design

S. Deibele and J.B. Beyer. "Attenuation Compensation in Distributed Amplifier Design." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1425-1433.

A high-gain common-gate FET can present at its drain a broad-band impedance characterized by a (frequency-dependent) negative resistance and a capacitance. This is examined both theoretically and experimentally. Loading the input and/or the output lines of a distributed amplifier with this circuit reduces the signal losses, leading to an increase in the allowed number of active devices with a consequent increase in the gain-bandwidth and gain-maximum frequency products. The cascode circuit, a related loss reduction network, is also evaluated because of its use in distributed amplifiers. Several designs employing the common-gate FET loss-compensating circuit and/or the cascode amplifying circuit are compared to a conventional distributed amplifier optimized for gain-bandwidth product. Simulated gain-maximum operating frequency product increases of 27 to 245 percent over that of the optimized conventional distributed amplifier are shown. The increase in single-stage amplifier gain provided by this technique often results in (proportionally) higher maximum output power.





IEEE

Contents

Publications

Issues

Papers

Authors

A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions

K. Ogawa, T. Ishizaki, K. Hashimoto, M. Sakakura and T. Uwano. "A 50 GHz GaAs FET MIC Transmitter/Receiver Using Hermetic Miniature Probe Transitions." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1434-1441.

A very compact 50 GHz band transmitter/receiver for a video link has been developed. The RF assemblies in the system consist of 25/50 GHz frequency doublers, a 25 GHz DRO, and a 25 GHz FM modulator. The circuits make extensive use of MIC technology where the active elements used are all GaAs FET's. GaAs FET frequency doublers exhibited a minimum conversion loss of 2.6 dB, a maximum output power of 11 dBm. A 25 GHz FM modulator which was highly frequency stabilized by a dielectric resonator was obtained. Newly developed miniature probe microstrip-to-waveguide transitions permit the MIC assemblies to be installed compactly in hermetically sealed packages. Design considerations and experimental results of the transition are presented. With these technologies, a transmitting power of 10 dBm and a receiver noise figure of 13 dB were obtained.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

A Process-Dependent Worst-Case Analysis for MMIC Design Based on a Handy MESFET Simulator

J.-L. Cazaux, M. Pouysegur, D. Roques and S. Bertrand. "A Process-Dependent Worst-Case Analysis for MMIC Design Based on a Handy MESFET Simulator." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1442-1451.

The design of inexpensive MMIC modules implies a practical use of worst-case analysis. A reliable method based on the unavoidable dispersion of uncorrelated technological parameters is proposed. The method relies on a convenient MESFET simulator which provides the dc, RF, and noise parameters for any bias conditions. The input data comprise geometrical or electrical information readily available to the designer. All the equations are given in detail. The results are compared with experimental data from several GaAs MMIC manufacturers. Finally the method is successfully applied to the design of a monolithic C-band amplifier. The forecasts of the worst-case analysis are compared with the experimental results. Measurements from different chips and from different wafers are presented and show a high RF yield.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

FET-Based Planar Circuits for Quasi-Optical Sources and Transceivers

J. Birkeland and T. Itoh. "FET-Based Planar Circuits for Quasi-Optical Sources and Transceivers." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1452-1459.

We describe the design and construction of planar FET-based quasi-optical sources and transceivers. The circuits are quite simple in construction and exhibit isotropic conversion gain. Both single-device and balanced transmitter and transceiver circuits are described. Balanced sources are reported which may be operated in push-pull mode for power combining or in push-push mode for frequency doubling. A single-FET quasi-optical oscillator circuit using a microstrip patch linear array is reported with an effective radiated power of 31.6 dBm at 10 GHz. A dual-FET frequency-doubling oscillator circuit using a coupled rampart line antenna is reported with an effective radiated power of 21.6 dBm at 19.7 GHz. Quasi-optical transceiver elements are reported which use the FET's as both signal sources and self-oscillating mixers for down-conversion of the received signal. The application of these transceiver elements to Doppler motion detection is reported.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Large-Signal Model of Picosecond FET's and Measurement of the Step Response

A. Ouslimani, G. Vernet, P. Crozat and R. Adde. "Large-Signal Model of Picosecond FET's and Measurement of the Step Response." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1460-1465.

A FET large-signal model is developed for the time-domain CAD of ultrafast circuits. Numerical 2-D look-up tables describe the nonlinear parameters versus the device internal voltages. A dc and microwave FET characterization versus bias voltage followed by parameter extraction completely determines the tables of parameters. The model may be implemented in simulators handling 2-D tables and applied to commercial transistors without a detailed knowledge of the internal technology. The step response of a NEC710 MESFET is measured and compared with the model, demonstrating its accuracy in representing switching waveforms and transient phenomena in the range covering tens of picosecond. The 20 ps switching time of the NEC710 shows that the presented methodology of modeling, measurement, and simulation is adequate for studying picosecond transient phenomena in single transistors.

Click on title for a complete paper.



Abstracts

A New Self-Alignment Technology for Sub-Quarter-Micron-Gate FET's Operating in the Ka-Band

E. Yanokura, M. Mori, K. Hiruma and S. Takahashi. "A New Self-Alignment Technology for Sub-Quarter-Micron-Gate FET's Operating in the Ka-Band." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1466-1471.

A new self-alignment technology is proposed and applied to GaAs MESFET's. With this technology, sub-quarter-micron gates are fabricated using conventional optical lithography and selective etching of different insulators. Furthermore, an offset gate structure is realized using the self-alignment method. Gate lengths between 340 nm and 90 nm are attained with excellent controllability. This technology is successfully applied to high-power GaAs MESFET's operating in the Ka-band. A linear gain of 4.0 dB and a saturation power of 0.8 W are obtained at 28 GHz from an FET with a gate width of 3.6 mm, thus demonstrating the effectiveness of the self-aligned offset gate structure.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A Large-Signal HSPICE Model for the Heterojunction Bipolar Transistor (Short Papers)

C.T. Matsuno, A.K. Sharma and A.K. Oki. "A Large-Signal HSPICE Model for the Heterojunction Bipolar Transistor (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1472-1475.

The emergence of the heterojunction bipolar transistor (HBT) from digital integrated circuit designs to analog/microwave MMIC applications has led to the need for accurate nonlinear models at microwave frequencies. The ability to predict performances of RF circuits such as mixers, voltage-controlled oscillators, and amplifiers is very important to the first-pass success of MMIC chip designs. The development of an accurate HSPICE model for the $3 \times 10 \mu\text{m}^2$ HBT allows the simulation of nonlinear measurements such as gain at the 1 dB compression point ($P_{\text{sub 1 dB}}$) and third-order intercept point (IP3) for circuit designs utilizing this emerging technology.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers (Short Papers)

A. Perennec, R. Soares, P. Jarry, P. Legaud and M. Goloubkoff. "Computer-Aided Design of Hybrid and Monolithic Broad-Band Amplifiers for Optoelectronic Receivers (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1475-1478.

In very high data rate fiber-optic systems, it is necessary to have an ultra-wide-band, high-gain, low-noise amplifier after the front end. This paper shows how powerful analytical techniques, such as the real frequency technique, may be applied to the design of a 4 MHz-7 GHz amplifier. A two-stage monolithic amplifier designed according to the theory gives 17 dB gain; a three-stage hybrid amplifier exhibits 16 dB gain across the same frequency band.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Output Conductance Frequency Dispersion and Low-Frequency Noise in HEMT's and MESFET's (Short Papers)

J.A. Reynoso-Hernandez and J. Graffeuil. "Output Conductance Frequency Dispersion and Low-Frequency Noise in HEMT's and MESFET's (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1478-1481.

In this paper it is reported that the large low-frequency noise observed in MESFET's and HEMT's in the saturation regime usually scales with the device output conductance frequency dispersion (in MESFET's) or with the parallel conduction through the GaAlAs (in HEMT's).



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Optimal Computer-Aided Design of Monolithic Microwave Integrated Oscillators (Short Papers)

Y. Xuan and C.M. Snowden. "Optimal Computer-Aided Design of Monolithic Microwave Integrated Oscillators (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1481-1484.

A technique for the optimal computer-aided design of MMIC oscillators is described. A novel dual-source technique is used in conjunction with the device computer simulation in order to obtain the terminating impedances required by the FET, which ensures the optimal circuit conditions to obtain the required frequency and power output from the oscillator. A number of GaAs MESFET MMIC oscillators have been designed and fabricated. Experimental results agree very closely with the predicted data for the complete set of working circuits.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

An Analytical Two-Dimensional Perturbation Method to Model Submicron GaAs MESFET's (Short Papers)

E. Donkor and F.C. Jain. "An Analytical Two-Dimensional Perturbation Method to Model Submicron GaAs MESFET's (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1484-1488.

A two-dimensional analytical model has been developed for the potential distribution in submicron GaAs MESFET's. The potential distribution is obtained by solving Poisson's equation with nonrectangular boundary conditions using a perturbation method. The expression for the potential is used to derive the current-voltage relation for GaAs MESFET's having channel lengths ranging from 0.2 to 0.9 μm . The model is applicable in the linear, the saturation, and the subthreshold regimes of the current-voltage characteristics. Numerically simulated results are compared with experimental data and are found to be in good agreement.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Lumped Lossy Circuit Synthesis and its Application in Broad-Band FET Amplifier Design in MMIC's (Short Papers)

L. Zhu, C. Sheng and B. Wu. "Lumped Lossy Circuit Synthesis and its Application in Broad-Band FET Amplifier Design in MMIC's (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1488-1491.

In this paper, a lumped lossy circuit is synthesized by means of the transformation introduced in [1]. The circuit contains two different kinds of lossy branches, in which arbitrary nonuniform reactive resistors, as well as lossy inductors and capacitors, are included. This new approach can synthesize a lumped lossy matching network more flexibly than ever before. An example is presented to show the application of the synthesis of the lumped lossy matching networks in the design of a broad-band microwave integrated FET amplifier, and the advantages of the new technique can be clearly seen by comparison with the amplifier designed by the method in [1].

[Click on title for a complete paper.](#)



Abstracts

Patent Abstracts (Sep. 1989 [T-MTT])

"Patent Abstracts (Sep. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1492-1494.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

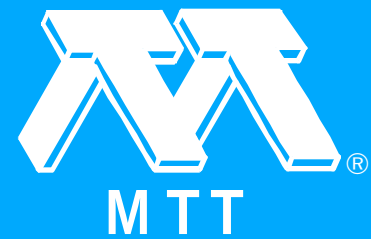
Click on title for a complete paper.



Abstracts

Call for Papers - 1990 IEEE MTT-S International Microwave Symposium (Sep. 1989 [T-MTT])

"Call for Papers - 1990 IEEE MTT-S International Microwave Symposium (Sep. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1495-1495.



IEEE

Contents

Publications

Issues

Papers

Authors

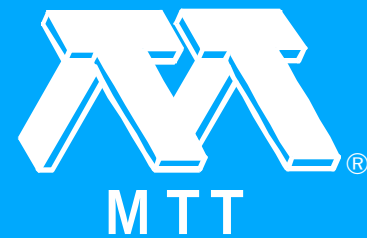
Click on title for a complete paper.



Abstracts

Call for Papers - Multifunction MMICs and Their System Applications (Sep. 1989 [T-MTT])

"Call for Papers - Multifunction MMICs and Their System Applications (Sep. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): 1496-1496.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

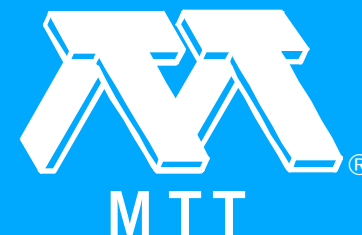
Click on title for a complete paper.



Abstracts

Back Cover (Sep. 1989 [T-MTT])

"Back Cover (Sep. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.9 (Sep. 1989 [T-MTT] (Special Issue on FET Structures Modeling and Circuit Applications)): b1-b2.



IEEE

Contents

Publications

Issues

Papers

Authors

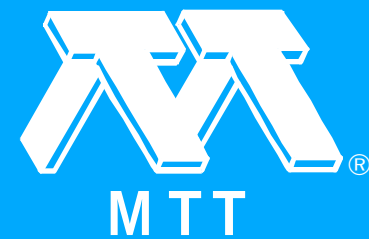
Click on title for a complete paper.



Abstracts

Front Cover (Oct. 1989 [T-MTT])

"Front Cover (Oct. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): f1-f2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

A New Model for the Dual-Gate GaAs MESFET

C. Licqurish, M.J. Howes and C.M. Snowden. "A New Model for the Dual-Gate GaAs MESFET." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1497-1505.

The development of a novel GaAs dual-gate MESFET model suitable for the design and analysis of microwave circuits is described. The model, a quasi-two-dimensional physical model, is numerically efficient due to a unique formulation of the carrier transport equations. The model includes a comprehensive description of the geometric and material parameters accounting for recess structures, nonuniform doping profiles, current injection into the buffer layer, forward-biased gate conduction, and surface depletion. The accuracy of the model under dc, small-signal, and large-signal operating conditions is assessed by comparing simulated and measured performance.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Measurement of Magnitude and Phase of Harmonics Generated in Nonlinear Microwave Two-Ports

U. Lott. "Measurement of Magnitude and Phase of Harmonics Generated in Nonlinear Microwave Two-Ports." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1506-1511.

A new method for simultaneously measuring the magnitude and phase of the harmonics generated by a microwave two-port is reported. The two-port under test is driven with a sinusoidal microwave signal strong enough to force it into nonlinear operation. Its output harmonics are measured in the frequency domain with a setup which includes a vector network analyzer. For phase calibration at the harmonic frequencies, a millimeter-wave Schottky diode is used as a reference device. Measurement results for the first four harmonics generated in a commercial GaAs MESFET under large-signal operation are presented. To show the validity of the phase measurement, the time-domain waveform constructed from the frequency-domain measurement data is compared to a direct time-domain measurement of the same device with a sampling oscilloscope.

[Click on title for a complete paper.](#)



Optical Phase Control of an Optically Injection-Locked FET Microwave Oscillator

R.D. Esman, L. Goldberg and J.F. Weller. "Optical Phase Control of an Optically Injection-Locked FET Microwave Oscillator." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1512-1518.

A simple technique is proposed and demonstrated for controlling the phase of an optically injection-locked 7.2 GHz FET oscillator. The relative phase ϕ between the oscillator and the optically injected locking signal is adjusted by optically tuning the oscillator frequency. Locking characteristics described include locking bandwidth (2.6 MHz), phase tuning range (187°), phase modulation ($\text{Beta}=0.69$ at 500 kHz), and optical tuning (125 MHz).



Abstracts

An Improved Analytical AC Large-Signal Model for the GaAs MESFET

A. Madjar. "An Improved Analytical AC Large-Signal Model for the GaAs MESFET." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1519-1522.

Currently, the analysis of nonlinear microwave networks is a topic of much research effort and has produced many efficient and useful algorithms. To apply these algorithms, it is necessary to use an efficient model for each nonlinear device used. The modeling of MESFET's has been dealt with quite extensively in recent years, including a continuous effort by the author. In a recent publication, an efficient analytical model was presented. In the present paper, an improved model is described. The new model is basically the same as the previous one, except that a better expression is used for the conduction current calculation. The accuracy and applicability of the model are demonstrated by a set of simulation results and by comparison to measurement.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Lumped Capacitance and Open End Effects of Striplike Structures in Multilayered and Anisotropic Substrates

R.R. Boix and M. Horno. "Lumped Capacitance and Open End Effects of Striplike Structures in Multilayered and Anisotropic Substrates." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1523-1528.

Variational techniques in the spectral domain are used to calculate the lumped capacitance of a rectangular patch embedded in an arbitrary multilayered anisotropic substrate in a very accurate way. The results obtained are applied to the determination of the quasi-static edge capacitance of semi-infinite striplines and microstrip lines.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

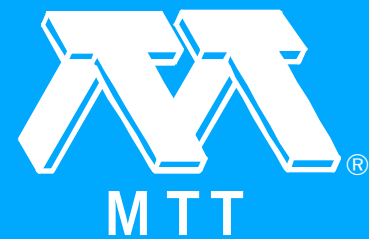


Insertion Loss of Electronically Variable Magnetostatic Wave Delay Lines

S.N. Bajpai. "Insertion Loss of Electronically Variable Magnetostatic Wave Delay Lines." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1529-1535.

This paper presents an investigation of insertion loss and constant variable delays in electronically variable magnetostatic volume wave delay lines. The delay line has a conductor-dielectric-YIG-dielectric-conductor structure. Variable delays up to 300 MHz have been obtained in single volume wave delay line by adjusting the direction and magnitude of the biasing dc magnetic field in a plane containing the normal to the YIG film and the direction of wave propagation. Insertion loss as a function of frequency has been obtained for different biasing field angles and also for the angles corresponding to variable constant delays. Comparison of theoretically obtained insertion loss has been made with experimental results, and good agreement is found. Electronically variable magnetostatic wave delay lines have promising applications in broad-band phased array antennas at 1-20 GHz frequencies.





IEEE

Contents

Publications

Issues

Papers

Authors

Accurate Determination of Modes in Dielectric-Loaded Cylindrical Cavities Using a One-Dimensional Finite Element Method

M.M. Taheri and D. Mirshekar-Syahkal. "Accurate Determination of Modes in Dielectric-Loaded Cylindrical Cavities Using a One-Dimensional Finite Element Method." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1536-1541.

A unified approach is presented here to calculate the resonant frequencies of all the modes in cylindrical cavities axisymmetrically loaded with dielectrics. In this method, the radial variations of the field components in the resonator are expressed in terms of first-degree finite element polynomials while the axial variations of the field components are approximated by trigonometric functions. To calculate the resonant frequencies, an H-vector variational formulation is employed and minimized with respect to the coefficients of the expanded field components. Spurious solutions which are inherent in the finite element technique are effectively eliminated by means of a penalty term included in the variational expression, imposing a divergence-free magnetic field constraint. To show the capability of the method, resonant frequencies of several cylindrical cavities including those loaded with dielectric rods and dielectric rings were calculated. A mode chart is also presented which can be used for designing certain multimode dielectric-loaded cavity filters. In contrast to other rigorous techniques reported in the literature, the present method is highly efficient when dielectrics are fully extended along the cavity length.

Click on title for a complete paper.



Abstracts

Microstrip Open-End and Gap Discontinuities in a Substrate-Superstrate Structure

H.-Y. Yang, N.G. Alexopoulos and D.R. Jackson. "Microstrip Open-End and Gap Discontinuities in a Substrate-Superstrate Structure." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1542-1546.

Overlays (superstrates) are of practical use in a variety of microstrip circuit applications. This article presents the analysis, modeling of microstrip open-end, gap discontinuities in a substrate-superstrate structure using the numerical solution of integral equations. Good accuracy is achieved by adopting semi-infinite, subdomain mode expansion functions, with a transverse coordinate dependence obtained from a two-dimensional infinite fine analysis. A parametric study of the material layer effects on radiation, surface wave losses, of the fringing fields at the discontinuities is also performed.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Propagation Properties of Ferromagnetic Insular Guide

J. Xia, P.P. Toullos and C. Vittoria. "Propagation Properties of Ferromagnetic Insular Guide." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1547-1554.

In order to realize new ferrite planar devices for applications at millimeter-wavelength frequencies, we have considered in our development of nonreciprocal ferrite devices schemes of incorporating ferromagnetic layers in dielectric insular guide geometries. Our research program involves both the calculation and the measurement of device characteristics. For the calculational part a method of effective permeability is introduced to characterize the ferrite material in which the permeability is a tensor. The propagation properties of the insular guide were calculated by using a single-mode approach. Our calculational results of dispersion, dielectric, and conductivity losses show resonant behavior with the application of a magnetic bias field for a guide configuration in which the ferrite replaces the insular dielectric. Ferrite phase shifters, filters, isolators, and circulators are potential applications of this guide configuration. For the experimental part wave dispersion and attenuation were measured in a purely dielectric insular guide from 26.5 to 40 GHz. In addition to these experiments wave attenuation was measured as a function of magnetic bias fields for the case where a hexagonal ferrite platelet was mounted on the ground plane near the insular guide. General agreement is found between calculations and measured attenuation.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Mode Charts for Magnetized Ferrite Cylinders

C. Schieblich. "Mode Charts for Magnetized Ferrite Cylinders." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1555-1561.

Waveguide junction circulators in E-and H-plane technique usually employ height-dependent ferrite modes. The most crucial parameter is the frequency splitting between two angle-dependent modes. It rises with the magnetic bias field until there is a maximum at about saturation. In this contribution, mode charts are given which help the designer to look up the resonance frequencies of the most important modes as a function of the external, measurable field. Also, the unsaturated state of the ferrite material is covered. These diagrams are in good accordance with experimental experience and have been helpful in interpreting circulator performance, especially for the identification of spurious resonances.

[Click on title for a complete paper.](#)



Abstracts

Space-Domain Green's Function Approach to the Capacitance Calculation of Multiconductor Lines in Multilayered Dielectrics with Improved Surface Charge Modeling

W. Delbare and D. De Zutter. "Space-Domain Green's Function Approach to the Capacitance Calculation of Multiconductor Lines in Multilayered Dielectrics with Improved Surface Charge Modeling." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1562-1568.

An integral equation method for the calculation of capacitance and inductance matrices is presented. The method is suitable for multiconductor transmission lines embedded in a multilayered dielectric medium on top of a ground plane. Conductors of arbitrary polygonal cross section can be handled, as well as infinitely thin conductors. The method is new in two respects. The kernel of the integral equation is the space-domain Green's function of the layered medium. The accuracy of the solution is enhanced by using basis functions which exactly model the singular behavior of the charge density in the neighborhood of a conductor edge. Numerical examples show the accuracy of the calculations and the complexity of the configurations that can be treated.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Very Small Wide-Band MMIC Magic T's Using Microstrip Lines on a Thin Dielectric Film

T. Hiraoka, T. Tokumitsu and M. Aikawa. "Very Small Wide-Band MMIC Magic T's Using Microstrip Lines on a Thin Dielectric Film." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1569-1575.

A newly developed MMIC magic T (180° hybrid circuit) using microstrip lines on a thin silicon oxynitride (SiON) dielectric film has been proposed. The microstrip fine area reduction is achieved by rising very narrow line width thin-film microstrip (TFMS) lines, derived from the thin substrate structure. The area is effectively minimized using meander-like configurations. The SiON thin film is successfully deposited by low-temperature plasma CVD. The MMIC magic T has been designed for a center frequency of 12 GHz, and small size with wide-band performance from 6 GHz to 18 GHz has been achieved. Thus, magic T's using thin-film microstrip lines are promising for miniaturized high-performance MMIC's, such as balanced mixers and modulators.

[Click on title for a complete paper.](#)



Abstracts

A Mathematical Formulation of the Equivalence Principle

K.-M. Chen. "A Mathematical Formulation of the Equivalence Principle." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1576-1581.

A mathematical formulation of the equivalence principle is presented. This may lead to a better understanding and easier applications of the principle.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts

Mode Conversion at Discontinuities in Finite-Width Conductor-Backed Coplanar Waveguide

R.W. Jackson. "Mode Conversion at Discontinuities in Finite-Width Conductor-Backed Coplanar Waveguide." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1582-1589.

The effect of overmoding in a conductor-backed coplanar waveguide is discussed, with special emphasis on mode conversion at discontinuities. The coplanar waveguide gap end and shorted end are studied via a fully electromagnetic application of the moment method technique. Significant conversion occurs at the gap end. The results of a simple experiment are described.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Narrow Wall Axial-Slot-Coupled T Junction Between Rectangular and Circular Waveguides

B.N. Das, P.V.D.S. Rao and A. Chakraborty. "Narrow Wall Axial-Slot-Coupled T Junction Between Rectangular and Circular Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1590-1596.

This paper presents an analysis of a T junction between rectangular and circular waveguides coupled through a long axial slot in the narrow wall of the rectangular waveguide. A moment method with entire orthogonal basis functions is used for deriving the expressions of the elements of the scattering matrix. The effect of the wall thickness is taken into account by treating the coupling slot as a short section of a rectangular waveguide and matching the boundary conditions at the interfaces. The conditions satisfied by the scattering matrix of the junction are verified. A comparison between the theoretical and experimental results on variation of coupling with frequency is presented.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Improving the Characteristics of Rectangular Waveguide Branchings by Cylindrical Obstacles

R. Gesche and S. Russenschuck. "Improving the Characteristics of Rectangular Waveguide Branchings by Cylindrical Obstacles." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1597-1602.

The scattering matrix of a transition between parallel rectangular waveguides and a larger rectangular waveguide contains two metallic or dielectric cylinders is investigated by orthogonal expansion method. Mathematical programming order to improve the characteristics. Reflection of a rectangular discontinuity can be reduced by 30 dB using metallic or dielectric obstacles. Using Teflon cylinders, coupling of a transition can be dB without debasing reflection. Physical interpretations are help of field patterns.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

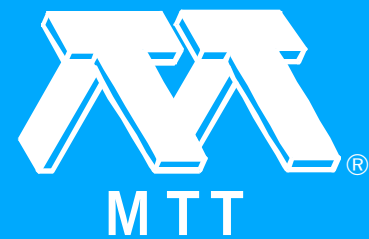
Electromagnetic Model of a Radial-Resonator Waveguide Diode Mount

M.E. Bialkowski. "Electromagnetic Model of a Radial-Resonator Waveguide Diode Mount." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1603-1611.

An electromagnetic model of a class of waveguide diode mounts that incorporate a radial resonator with the diode arbitrarily positioned is derived. The model is tested through comparison of numerical and experimental results for the input impedance of the mount. The tests show good agreement between theory and experimental and indicate that the model may be especially useful in investigating the effects of an off-centered positioning of the diode.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Optoelectronic Measurements of Picosecond Electrical Pulse Propagation in Coplanar Waveguide Transmission Lines

N.G. Paulter, D.N. Sinha, A.J. Gibbs and W.R. Eisenstadt. "Optoelectronic Measurements of Picosecond Electrical Pulse Propagation in Coplanar Waveguide Transmission Lines." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1612-1619.

We present our observations of the effects of coplanar wave-guide transmission lines on the propagation of picosecond electrical pulses using an optoelectronic time-domain measurement technique. Effects of various test structure design factors in optoelectronic transmission lines such as substrate thickness, thickness of transmission line metallization, discontinuity spacing, ground plane width, pulser/sampler line length, and pulser/sampler geometry on picosecond electrical pulse propagation in microwave/millimeter wave coplanar waveguide transmission lines are discussed and schemes for minimizing the adverse effects of each of the above factors are provided.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Pulse Distortion on Multilayer Coupled Microstrip Lines

J.P. Gilb and C.A. Balanis. "Pulse Distortion on Multilayer Coupled Microstrip Lines." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1620-1628.

The distortion of pulses due to dispersion and coupling on generalized planar microstrip is investigated. A simple, general form for the Green's function is obtained by solving the boundary value problem separately for the TE/sup y/ and TM/sup y/ modes. The mechanism of even/odd-mode distortion is discussed and numerical results are presented illustrating its effect. The design of structures with low even/odd-mode distortion is considered. Results for pulse distortion on this type of microstrip are also included.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Gain Optimization of a Near-Field Focusing Array for Hyperthermia Applications

J.T. Loane, III and S.-W. Lee. "Gain Optimization of a Near-Field Focusing Array for Hyperthermia Applications." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1629-1635.

A new variation of the array gain optimization problem has arisen in the study of microwave arrays used for hyperthermia, the heating of biological tissue. For a given array configuration and arbitrary medium it is desired to maximize the power deposition at a prescribed focus in the near field of the array. This paper shows how the optimum excitation may be found by solving an eigenvalue problem. Our optimum solution is compared with two other solutions, namely a closed-form solution which optimizes the power in one linear polarization of the radiated field, and a solution based on the popular conjugate-field scheme.

[Click on title for a complete paper.](#)



Wide-Band GaInAs MISFET Amplifiers (Short Papers)

D. Bechtle, L.C. Upadhyayula, P.D. Gardner and S.Y. Narayan. "Wide-Band GaInAs MISFET Amplifiers (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1636-1638.

We present the first reported results on wide-band GaInAs MISFET amplifiers. Using 1- μ m-gate-length 0.56-mm-gate-width GaInAs MISFET's, we obtained (a) a power output of 230 ± 30 mW (0.41 W/mm) with 33 ± 3 percent power-added efficiency, (b) a power output of 265 ± 5 mW (0.47 W/mm) with 30 ± 3 percent power-added efficiency (both over the 7-11 GHz band), and (c) a power output of 220 ± 45 mW (0.39 W/mm) with 29 ± 4 percent power-added efficiency over the 6-12 GHz band. With a 0.7- μ m-gate-length GaInAs MESFET, a small-signal gain of 5 ± 0.5 dB over the 11.4--22.6 GHz band was obtained. These data include all connector, bias network, and circuit losses. We also present an equivalent circuit model of 1- μ m-gate-length GaInAs MISFET's based on S-parameter measurements. The model is essentially that of a MESFET with capacitors representing gate-to-source and gate-to drain overlap capacitances added at input and output.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Reactance of Slotline Short and Open Circuits on Alumina Substrate (Short Papers)

J. Chramiec. "Reactance of Slotline Short and Open Circuits on Alumina Substrate (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1638-1641.

Resonant techniques have been employed in order to determine the equivalent normalized reactance of slotline planar short circuits and open circuits realized on alumina substrates. Data for slotline short circuits are presented in a graph covering a wide range of normalized slot widths. Characteristics of several slotline open circuits are given demonstrating their resonant behavior and the resulting bandwidth limitation. As an example of an application, the design of broad-band microstrip-slotline transitions employing experimentally characterized slotline open circuits is outlined.

[Click on title for a complete paper.](#)



Abstracts

A Moment Method Solution of a Volume-Surface Integral Equation Using Isoparametric Elements and Point Matching (Short Papers)

J.-M. Jin, J.L. Volakis and V.V. Liepa. "A Moment Method Solution of a Volume-Surface Integral Equation Using Isoparametric Elements and Point Matching (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1641-1645.

It is shown that traditional subdomain elements such as rectangles and triangles with a pulse expansion basis could lead to inaccuracies when simulating biological scatterers having high permittivities. In this paper, isoparametric elements are used in a moment method implementation to remove modeling inaccuracies of fields and boundaries associated with traditional elements. Numerical results are also given that show the improvement achieved in the scattering solution for high-contrast circular cylinders.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Characteristic Impedance of a Tubular Dielectric Cylinder Covered with Conducting Arc Strips (Short Papers)

V. Zargari and T.C. Rao. "Characteristic Impedance of a Tubular Dielectric Cylinder Covered with Conducting Arc Strips (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1645-1647.

The characteristic impedance of a circular cylindrical dielectric tubular transmission line that is partially covered by thin conducting arc strips on the outer periphery is determined by conformal transformation. The variation of the characteristic impedance with the physical parameters is studied and some numerical results are presented.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Spectral-Domain Immittance Approach for the Propagation Constants of Unilateral Finlines with Magnetized Ferrite Substrate (Short Papers)

P. Xun. "Spectral-Domain Immittance Approach for the Propagation Constants of Unilateral Finlines with Magnetized Ferrite Substrate (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1647-1650.

In the paper, the admittances of TM and TE modes in ferrite substrate are given, and the propagation constants for the forward and backward directions of the dominant mode in unilateral finlines with magnetized ferrite substrate are obtained. The solution is obtained by applying the transverse equivalent transmission line in the spectral domain and Galerkin's method. Numerical results are presented which can be used in designing a finline displacement isolator.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T/sub c/ Superconducting Thin Films (Short Papers)

J.H. Takemoto, F.K. Oshita, H.R. Fetterman, P. Kobrin and E. Sovero. "Microstrip Ring Resonator Technique for Measuring Microwave Attenuation in High-T/sub c/ Superconducting Thin Films (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1650-1652.

Microwave attenuation of high-T/sub c/ superconducting (HTS) films sputtered on MgO and ZrO/sub 2/ were measured using a microstrip ring resonator circuit. The results of Y-Ba-Cu-O and Bi-Sr-Ca-Cu-O resonators were compared to gold-plated resonators of identical design. The losses of superconducting and gold-plated films were determined from unloaded Q-factor measurements. The attenuation of Y-Ba- Cu- O film on a MgO substrate is approximately 31 percent lower than gold films at 6.6 GHz and 33 percent lower at 19.2 GHz for temperatures below 50 K. The approach of using microstrips to characterize microwave losses shows the usefulness of HTS films in integrated circuit technology.

Click on title for a complete paper.



Abstracts

Determination of the Cutoff of the First Higher Order Mode in a Coaxial Line by the Transverse Resonance Technique (Short Papers)

H.E. Green. "Determination of the Cutoff of the First Higher Order Mode in a Coaxial Line by the Transverse Resonance Technique (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1652-1653.

This paper uses the transverse resonance technique and static field considerations to determine cutoff for the first higher order mode in a coaxial line. The result, while approximate, agrees very well with the rigorous field-theory solution for all practical coaxial lines. The solution also has an immediate connection with the physics of the problem which makes the result obtained almost obvious.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Properties of Dielectric-Loaded T-Septum Waveguides (Short Papers)

R.R. Mansour and R.H. MacPhie. "Properties of Dielectric-Loaded T-Septum Waveguides (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1654-1657.

The conservation of complex power technique is employed to analyze T-septum waveguides. The effect of dielectric loading on the cutoff frequency and the bandwidth is investigated. Numerical results are presented which show that loading the gap with dielectric not only improves the power handling capability of the structure but also increases its bandwidth.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Computer-Aided Design Models for Broadside-Coupled Striplines and Millimeter-Wave Suspended Substrate Microstrip Lines (Corrections)

P. Pramanick and P. Bhartia. "Computer-Aided Design Models for Broadside-Coupled Striplines and Millimeter-Wave Suspended Substrate Microstrip Lines (Corrections)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1658-1658.

The above paper contains three typographical errors.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

p-i-n Diode Attenuator with Small Phase Shift (Additional Comments and Reply)

J.P. Starski, B.M. Albinsson, T.B. Vu, K.W. Lo, R.J. Baeten, T.K. Ishii and J.S. Hyde. "p-i-n Diode Attenuator with Small Phase Shift (Additional Comments and Reply)." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1658-1659.

The above paper, by Baeten et al., and the subsequent comments by Lo and Vu were both published considerably later than our work. The work described by Lo and Vu is very similar to our project for an absorptive attenuator with optimized phase response, which was done in 1983 and published in 1984.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Patent Abstracts (Oct. 1989 [T-MTT])

"Patent Abstracts (Oct. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1660-1665.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

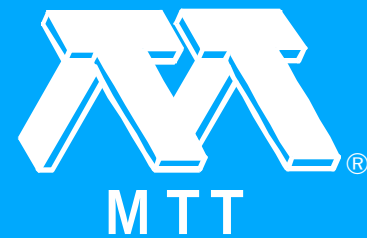
Click on title for a complete paper.



Abstracts

Call for Papers - 1990 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium (Oct. 1989 [T-MTT])

"Call for Papers - 1990 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium (Oct. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1666-1666.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Call for Papers - 1990 IEEE MTT-S International Microwave Symposium (Oct. 1989 [T-MTT])

"Call for Papers - 1990 IEEE MTT-S International Microwave Symposium (Oct. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1667-1667.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

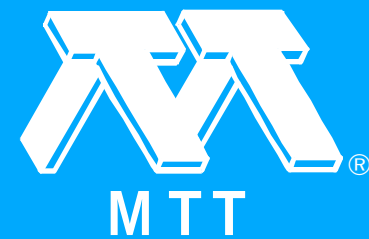
Click on title for a complete paper.



Abstracts

Call for Papers - Multifunction MMICs and Their System Applications (Oct. 1989 [T-MTT])

"Call for Papers - Multifunction MMICs and Their System Applications (Oct. 1989 [T-MTT])."
1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): 1668-1668.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Back Cover (Oct. 1989 [T-MTT])

"Back Cover (Oct. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.10 (Oct. 1989 [T-MTT]): b1-b1.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

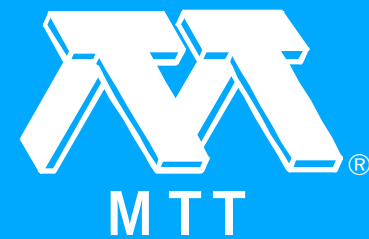
Click on title for a complete paper.



Abstracts

Front Cover (Nov. 1989 [T-MTT])

"Front Cover (Nov. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): f1-f2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications

R.A. Soares, P. Gouzien, P. Legaud and G. Follot. "A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1669-1674.

A rigorous mathematical treatment of microwave network analyzer calibration and de-embedding procedures for the two-port error network representation is employed in order to explain current calibration techniques in a succinct and homogeneous manner. It is demonstrated that the essence of through-delay de-embedding techniques consists in the use of two known two-port calibration standards to obtain pairs of similar matrices for the input and output error adapters. Once the characteristic vectors for these matrices are obtained, a number of different approaches may be employed in order to solve for the scaling constants.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits

R.R. Pantoja, M.J. Howes, J.R. Richardson and R.D. Pollard. "Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1675-1680.

A novel procedure for the calibration of microwave integrated circuit test fixtures, based on a generalization of the "through-reflect-line" algorithm, is presented. Its advantages compared with previous methods, namely bandwidth of validity and standards availability, are discussed. The approach is verified through the characterization of a particular microstrip verification standard using both the "generalized TRL" and precision 7 mm calibration techniques. Comparison of the results obtained from these schemes indicates that both the effective directivity and the source/load match are better than 30 dB.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Frequency-Domain Spectral Balance Using the Arithmetic Operator Method

C.-R. Chang, M.B. Steer and G.W. Rhyne. "Frequency-Domain Spectral Balance Using the Arithmetic Operator Method." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1681-1688.

A frequency-domain spectral balance method for the simulation of nonlinear analog circuits with multidimensional nonlinearities is presented. The method is coupled with a combination of Shamanskii and block Newton iteration schemes to produce an efficient general-purpose simulator. The technique is verified with measurements of a MESFET amplifier with single-tone and two-tone excitations.

[Click on title for a complete paper.](#)

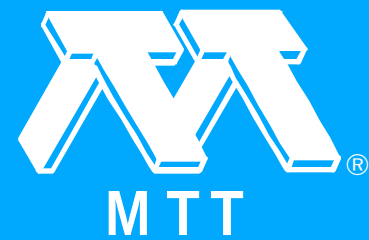


Abstracts

Nonlinear Analysis of Microwave FET Oscillators Using Volterra Series

Y. Hu, J.J. Obregon and J.-C. Mollier. "Nonlinear Analysis of Microwave FET Oscillators Using Volterra Series." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1689-1693.

In this paper, a novel approach to determine the amplitude and frequency of nonlinear FET oscillators is presented. The nonlinear elements of the active device are modeled by Volterra series. The frequency and amplitude of oscillation are then calculated by solving two algebraic equations. Experimental results obtained from a constructed oscillator confirm the validity of the theory, the discrepancy between measured and calculated frequency and amplitude values being less than 10 percent.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Millimeter-Wave Planar InP Schottky Diodes and Their Small-Signal Equivalent Circuit

R.E. Neidert and S.C. Binari. "Millimeter-Wave Planar InP Schottky Diodes and Their Small-Signal Equivalent Circuit." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1694-1698.

Two planar indium phosphide Schottky diode designs have been fabricated and analyzed for millimeter-wave detector applications up to 150 GHz. Device structure and fabrication are discussed and small-signal equivalent circuit models are presented. The following topics are included: the planar InP diode structure fabricated by MeV ion implantation, dc and RF measurements, circuit model values, and 94 GHz small-signal detector performance. The zero-bias detector sensitivity at 94 GHz was measured to be as high as 400 mV/mW, and the calculated tangential signal sensitivity was -56 dBm.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

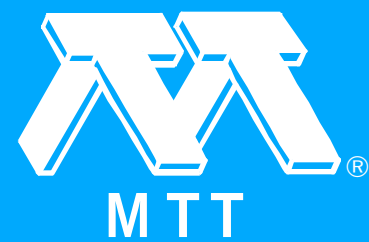
Parallel Running System of Three Oscillators Coupled Through a Six-Port Magic Junction

I. Ohta and T. Kaneko. "Parallel Running System of Three Oscillators Coupled Through a Six-Port Magic Junction." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1699-1707.

This paper treats parallel running systems of three oscillators symmetrically coupled to one another through a six-port magic junction and closely examines two systems for power combining. One system delivers a combined power to the coaxial arm, the other to a circular waveguide in the form of a circular polarization. The former is marked by its easy adjustability and simple structure and the latter by its output form and the electrical switch of the direction of rotation of circular polarization. Experimental verification for the two power-combining systems is presented.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

A Numerically Efficient Finite-Element Formulation for the General Waveguide Problem without Spurious Modes

J.A.M. Svedin. "A Numerically Efficient Finite-Element Formulation for the General Waveguide Problem without Spurious Modes." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1708-1715.

A numerically efficient finite-element procedure showing no spurious modes is presented for the analysis of propagation characteristics in arbitrarily shaped metal waveguides loaded with linear materials of arbitrary complex tensor permittivity and permeability. The method is straightforwardly derived from the first-order Maxwell curl equations and comprises both the transversal and longitudinal components of the electric and magnetic fields. Hence, all necessary boundary conditions on the tangential field components are a priori satisfied by the trial functions. With this formulation an absence of spurious modes has been found.

Furthermore, by also imposing the additional boundary conditions on the normal components of the magnetic induction and electric displacement fields, the dimension of the resulting matrix equation may be significantly reduced. In this formulation both the propagation constant and the frequency may be treated as an eigenvalue of the resulting sparse generalized eigenvalue problem. For the fundamental modes, both the convergence order and the accuracy of the presented method are found to be significantly higher than those of comparable methods when applied to some numerical examples.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Mixed Spectral-Domain Approach for Dispersion Analysis of Suspended Planar Transmission Lines with Pedestals

C.H. Chan, K.T. Ng and A.B. Kouki. "A Mixed Spectral-Domain Approach for Dispersion Analysis of Suspended Planar Transmission Lines with Pedestals." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1716-1723.

A mixed spectral-domain analysis is used to derive dispersion characteristics of dominant modes in a class of planar transmission lines with a pedestal. Equivalent structures are constructed in which magnetic surface currents are identified as the unknowns at the aperture separating two different regions. Spectral dyadic Green's functions are derived for these structures using the spectral-domain immittance approach. The characteristic equations resulting from the application of the spectral Galerkin method involve mixing two different spectral domains, which exist on the two sides of the pedestal support. The present method allows one to retain the simplicity and numerical efficiency of the conventional spectral-domain immittance approach, which cannot be applied directly to the present structures. Numerical data are provided for the dispersion characteristics of dominant modes in a pedestal-supported stripline and finline.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Infinite Elements for the Analysis of Open Dielectric Waveguides

M.J. McDougall and J.P. Webb. "Infinite Elements for the Analysis of Open Dielectric Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1724-1731.

The finite element method is applied to the modal analysis of unbounded, arbitrarily shaped, and arbitrarily inhomogeneous dielectric waveguides with the use of new infinite elements incorporating several radially decaying exponential trial functions. The outer optimization loop required by previous methods employing a single decaying trial function is eliminated and all modes corresponding to a given phase constant are calculated in one pass of the solver. The method is tested with examples of slab, circular, and square dielectric waveguides.

[Click on title for a complete paper.](#)



Abstracts

Direct and Inverse Resonance Problems for Shielded Composite Objects Treated by Means of the Null-Field Method

W. Zheng. "Direct and Inverse Resonance Problems for Shielded Composite Objects Treated by Means of the Null-Field Method." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1732-1739.

Resonances of a composite object shielded by a perfect conductor are investigated using the null-field method. Computed resonance frequencies and quality factors of shielded homogeneous and composite resonators are reported and compared with previously published results whenever possible. Conversely, in the inverse sense, the permittivities and geometric parameters of shielded composite objects are computed from calculated or measured complex frequencies.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

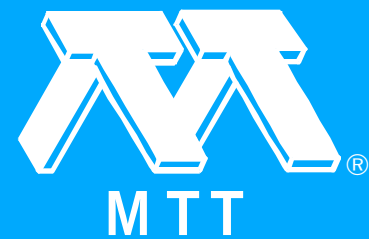
Analysis of Dielectric Resonator Cavities Using the Finite Integration Technique

J.E. Lebaric and D. Kajfez. "Analysis of Dielectric Resonator Cavities Using the Finite Integration Technique." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1740-1748.

Resonant modes in shielded dielectric resonators are studied by a numerical technique which yields the resonant frequencies, modal field distribution, and Q factors of various resonant modes, including the hybrid modes. The technique employs field discretization by virtue of dual electric and magnetic grids and allows for a direct numerical solution of the integral form of Maxwell's equations for specified boundary conditions. The details of the matrix formulation are explained on an example of the cavity subdivided into a grid consisting of 3 x 3 electric cells. A modal field plot exhibiting a spiraling behavior has been observed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Variational Method for Planar Transmission Lines with Anisotropic Magnetic Media

T. Kitazawa. "Variational Method for Planar Transmission Lines with Anisotropic Magnetic Media." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1749-1754.

Upper and lower bound expressions of line inductances are presented for the first time for planar transmission lines with anisotropic magnetic media. Green's functions are derived for the general structure by using recurrent relations. Numerical examples of striplines and coplanar waveguide are presented, and the calculated values of the quasi-static characteristics of stripline on an anisotropic magnetic substrate with the tensor permeability are in good agreement with measured values.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures

S. Tanaka, S. Nogi, K. Fukui and Y.-A. In. "Crucial Factors in Power Combining by Oversized Cylindrical Cavity Multiple-Device Structures." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1755-1760.

Power combining in oversized cylindrical cavities has hitherto not given successful results. The purpose of this paper is to show both analytically and experimentally that the combining efficiency in such cavities can be remarkably improved by finding the optimum position and number of devices. An "equivalent loss resistance," which indicates the cavity loss per device when every device generates its available power, is introduced, and the number and position of devices which minimize the quantity is obtained for a TM/sub 0n0/-mode cavity by carrying out FEM field analysis. Power-combining experiments using TM/sub 020/- and TM/sub 030/-mode cavities confirmed the theory and achieved excellent power-combining efficiencies of, respectively, 117 percent and 107 percent in the TM/sub 020/-mode cavity with ten devices and in the TM/sub 030/-mode one with 12 devices.

[Click on title for a complete paper.](#)



Abstracts

A Generalized Method for deriving the Space-Domain Green's Function in a Shielded, Multilayer Substrate Structure with Applications to MIS Slow-Wave Transmission Lines

T.G. Livernois and P.B. Katehi. "A Generalized Method for deriving the Space-Domain Green's Function in a Shielded, Multilayer Substrate Structure with Applications to MIS Slow-Wave Transmission Lines." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1761-1767.

An efficient technique for deriving the space-domain Green's function due to an arbitrarily oriented current in shielded, multilayer substrate structures is presented. The derived Green's function is then used to find the dispersion characteristics of single and symmetric coupled line MIS slow-wave structures. These results are compared to published theoretical and experimental data to verify the theory presented.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Finite-Element Analysis of Magnetostatic Wave Propagation in a YIG Film of Finite Dimensions

M. Koshiba and Y. Long. "Finite-Element Analysis of Magnetostatic Wave Propagation in a YIG Film of Finite Dimensions." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1768-1772.

A unified numerical approach based on the finite-element method is described for the magnetostatic wave propagation in a YIG film of finite dimensions. Both magnetostatic volume wave and magnetostatic surface wave modes are treated. The validity of the method is confirmed by calculating the magnetostatic wave modes in a YIG-loaded rectangular waveguide and in a YIG film of finite width. The numerical results of a YIG film with nonuniform bias field along the film width are also presented, and the effects of bias field distributions on the delay characteristics and potential profiles are examined.

[Click on title for a complete paper.](#)



Abstracts

Resonance in Cylindrical-Rectangular and Wraparound Microstrip Structures

S.M. Ali, T.M. Habashy, J.-F. Kiang and J.A. Kong. "Resonance in Cylindrical-Rectangular and Wraparound Microstrip Structures." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1773-1783.

A rigorous analysis of the resonance frequency problem of both the cylindrical-rectangular and the wraparound microstrip structure is presented. The problem is formulated in terms of a set of vector integral equations. Using Galerkin's method to solve the integral equations, the complex resonance frequencies are studied with sinusoidal basis functions which incorporate the edge singularity. Furthermore, the complex resonance frequencies are computed using a perturbation approach. Modes suitable for resonator or antenna applications are investigated.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

An Equivalent Circuit Model for Terminated Hybrid-Mode Multiconductor Transmission Lines

L. Carin and K.J. Webb. "An Equivalent Circuit Model for Terminated Hybrid-Mode Multiconductor Transmission Lines." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1784-1793.

An equivalent circuit for terminated hybrid-mode multiconductor transmission lines is presented. Existing CAD packages, such as SPICE, can be used for its implementation. Model parameters can be found from either a TEM or a full-wave analysis of the transmission lines. The equivalent circuit is used to simulate multiconductor microstrip for applications in high-speed integrated circuits. An examination of the validity of the TEM approximation for example cases is carried out in the time and frequency domains.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Analysis of the Power Coupling from a Waveguide Hyperthermia Applicator into a Three-Layered Tissue Model

K.S. Nikita and N.K. Uzunoglu. "Analysis of the Power Coupling from a Waveguide Hyperthermia Applicator into a Three-Layered Tissue Model." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1794-1801.

The power deposition from a rectangular-aperture flanged waveguide into a three-layered stratified tissue medium is analyzed theoretically. The fields inside the tissue layers are expressed in terms of Fourier integrals satisfying the corresponding wave equations while the fields inside the waveguide are expanded in terms of the guided and evanescent normal modes. An integral equation is derived on the aperture plane of the flanged waveguide by applying the continuity of the tangential electric and magnetic fields. This integral equation is solved by expressing the unknown electric field in terms of the waveguide mode fields and by applying a Galerkin procedure. The electromagnetic fields inside the tissue medium are then determined and patterns of the deposited power at frequencies of 432 MHz and 144 MHz for apertures of $5.6 \times 2.8 \text{ cm}^2$ and $16.5 \times 8.3 \text{ cm}^2$ respectively are computed and presented.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Numerical Solution of the Continuous Waveguide Transition Problem

W.A. Huting and K.J. Webb. "Numerical Solution of the Continuous Waveguide Transition Problem." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1802-1808.

Waveguide transitions are an essential part of many microwave systems. A simple transition between two sizes of rectangular waveguide is analyzed by using the generalized telegraphist's equation. Solutions are obtained using a new moment method technique, a Runge-Kutta algorithm, and an iterative numerical integration technique. The results are compared to previously published experimental and numerical data.

[Click on title for a complete paper.](#)



Abstracts

On-Wafer Verification of a Large-Signal MESFET Model (Short Papers)

W.R. Curtice and S. Pak. "On-Wafer Verification of a Large-Signal MESFET Model (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1809-1811.

A relatively simple and new RF measurement procedure is described that is useful for on-wafer, large-signal tests. Predictions using the GaAs FET model agree well with measurements of typical RF gain, gain compression at the fundamental frequency, and the power output at the second and third harmonics.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

A Low-Noise Microwave Oscillator Employing a Self-Aligned AlGaAs/GaAs HBT (Short Papers)

M. Madihian, N. Hayama, S.R. Lesage and K. Honjo. "A Low-Noise Microwave Oscillator Employing a Self-Aligned AlGaAs/GaAs HBT (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1811-1814.

This paper studies the application of heterojunction bipolar transistors (HBT's) to low-noise microwave circuits. Design considerations and the low-noise performance of a Ku-band free-running oscillator using a self-aligned AlGaAs/GaAs HBT are described. The device has a novel structure in which by utilizing SiO/sub 2/ sidewalls the base surface area, which is the main cause of low-frequency noise, is drastically reduced. For a collector current of 1 mA, the fabricated device has base current noise power densities of 4×10^{-20} A²/Hz, 6×10^{-21} A²/Hz, and 2.5×10^{-21} A²/Hz at baseband frequencies of 1 kHz, 10 kHz, and 100 kHz, respectively. The prototype oscillator operating at 15.5 GHz has a measured output power of 6 dBm and SSB FM noise power densities of -34 dBc/Hz at 1 kHz, -65 dBc/Hz at 10 kHz, and -96 dBc/Hz at 100 kHz off-carrier, respectively, without employing any high-Q elements such as a dielectric resonator. The results of this study demonstrate the suitability of HBT's for low-phase-noise microwave and millimeter-wave oscillator applications.

Click on title for a complete paper.



Abstracts

Integral Numerical Technique for the Study of Axially Symmetric Resonant Devices (Short Papers)

J. Ruiz, M.J. Nunez, A. Navarro and E. Martin. "Integral Numerical Technique for the Study of Axially Symmetric Resonant Devices (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1814-1816.

A numerical technique is proposed which is based on the coupling of Kirchhoff's integral formulation and the moment method and is suitable for application to the study of a wide class of axially symmetric resonant devices. Numerical results are presented and compared with corresponding theoretical data for two systems which allow an analytical treatment. In this way the validity of method has been confirmed.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

An Experimental Investigation of the Microstrip Step Discontinuity (Short Papers)

J.C. Rautio. "An Experimental Investigation of the Microstrip Step Discontinuity (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1816-1818.

Measurements of a cascade of microstrip step discontinuities are compared with results of an electromagnetic analysis and with models available in commercial software. The experimental validation technique, which can be applied to other discontinuities, is described.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

The Lossy Waveguide as a Problem in Perturbation Theory (Short Papers)

J.L. Anderson. "The Lossy Waveguide as a Problem in Perturbation Theory (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1819-1821.

A systematic perturbation theory for lossy waveguides is presented. Two possible small dimensionless parameters are identified and introduced into Maxwell's equations by rescaling pursuant to effecting an expansion of the fields in these parameters.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Expansions for the Capacitance of a Cross Concentric with a Circle with an Application (Short Papers)

H.J. Riblet. "Expansions for the Capacitance of a Cross Concentric with a Circle with an Application (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1821-1823.

Expansions are given for the capacitance per unit length for the geometry having a cross section in which an equiarmed cross is concentric with an external circle.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Equivalent Circuits for Dielectric Posts in a Rectangular Waveguide (Short Papers)

K. Ise and M. Koshiba. "Equivalent Circuits for Dielectric Posts in a Rectangular Waveguide (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1823-1825.

Scattering by dielectric posts in a rectangular waveguide is investigated by a combination of the finite and boundary element methods (CFBEM), and the equivalent circuits are derived. Some of the lossless dielectric post resonances in a rectangular waveguide can be physically realized by a lattice circuit, and the interaction between two posts can be evaluated by this circuit.



Abstracts

A Statistical Method for Calibrating the Six-Port Reflectometer Using Nonideal Standards (Short Papers)

S.P. Jachim and W.D. Gutscher. "A Statistical Method for Calibrating the Six-Port Reflectometer Using Nonideal Standards (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1825-1827.

This paper presents an alternative method for calibrating the six-port reflectometer. Through the use of a redundant set of calibration standards, an estimate of the 11 real calibration constants is determined in the minimum-mean-squared-error sense. This technique enables the user to weight the contribution of each standard to the calibration process as a function of confidence in the quality of that standard. The resulting computer algorithm is quite straightforward and provides a direct measure of the tightness of fit between the estimated six-port model and the observed data.



IEEE

[Contents](#)

[Publications](#)

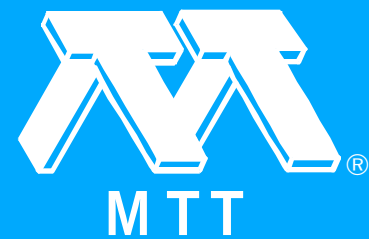
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Results of Phase and Injection Locking of an Orottron Oscillator (Short Papers)

*R.W. McMillan, D.M. Guillory, R.G. Hay, D.E. Wortman, H. Dropkin and J.M. Cotton, Jr..
"Results of Phase and Injection Locking of an Orottron Oscillator (Short Papers)." 1989
Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1828-1830.*

We describe experiments resulting in phase and injection locking of a 60 GHz orottron oscillator in pulsed and CW modes. The measured phase-locked phase noise results obtained in CW mode were -85, -95, and -105 dBc/Hz at 1, 10, and 100 kHz separation from the carrier, respectively. The null depths and asymmetry of the first maxima of the pulsed spectrum for this source were 35 dB and 2 dB (difference between power levels of first maxima), respectively, operating with a pulse width of 15 μ s. At 3 μ s, these quantities become 25 dB and 1 dB, respectively. The orottron was observed to injection lock in pulsed mode with an input signal 22 dB below the output power level.

[Click on title for a complete paper.](#)



Abstracts

Patent Abstracts (Nov. 1989 [T-MTT])

"Patent Abstracts (Nov. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1831-1835.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - Multifunction MMICs and Their System Applications (Nov. 1989 [T-MTT])

"Call for Papers - Multifunction MMICs and Their System Applications (Nov. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): 1836-1836.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

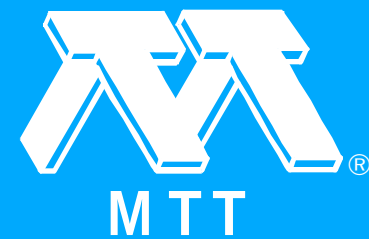
Click on title for a complete paper.



Abstracts

Back Cover (Nov. 1989 [T-MTT])

"Back Cover (Nov. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.11 (Nov. 1989 [T-MTT]): b1-b2.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Front Cover (Dec. 1989 [T-MTT])

"Front Cover (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

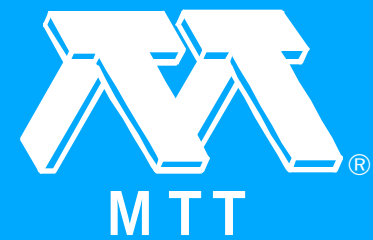
Click on title for a complete paper.



Abstracts

Table of Contents (Dec. 1989 [T-MTT])

"Table of Contents (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1837-1838.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Editors' Overview (Dec. 1989 [T-MTT])

F.J. Bayuk and J.E. Raue. "Editors' Overview (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1839-1840.

The record number of papers presented at the Symposium (297) resulted in a record 97 expanded manuscripts submitted for possible publication in this Special Issue. The review coordination required for such a large number of papers represented an extraordinary effort, which was accomplished with the enthusiastic support of the IEEE members who served as reviewers. While a significant number of papers qualified for publication, a severe page limitation imposed on this issue, which saw the page budget reduced to 240 pages (down from 300 last year), restricted the number of papers that could be accepted. This fact, coupled with the record number of papers received, made the selection process difficult and as a result only about one third of the submitted papers were accepted. Consequently, many technically sound papers had to be excluded because they were only marginally expanded in substance from the Symposium Digest version. All prospective authors were advised of these "ground rules" (i.e., the need to expand substantially beyond the Digest transcript) at the time the invitation for the Transactions version of their paper was extended to them. The degree of compliance with the ground rules varied significantly, with a substantial number of papers being identical or nearly identical to the Digest version. These papers were denied publication for the reasons stated above. Following review, several papers were recommended for further expansion, clarification, or reduction in scope and subsequent resubmittal to the regular Editor for consideration for later publication, as neither time nor page allowance would permit publication in this issue.

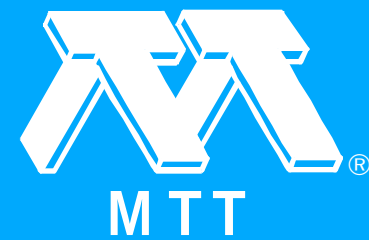
Click on title for a complete paper.



Abstracts

Reviewers for this Special Issue (Dec. 1989 [T-MTT])

"Reviewers for this Special Issue (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1841-1841.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

1989 MTT-S International Microwave Symposium (Dec. 1989 [T-MTT])

C.W. Swift. "1989 MTT-S International Microwave Symposium (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1842-1842.

Did you ever plan a party, and then no one came? The 1989 MTT-S Steering Committee had some of the same misgivings in the planning stages for the 1989 Symposium in Long Beach. What if discount fares disappeared, and company travel budgets were reduced? The defense budget is being cut, and won't that result in lower attendance? No modern-day computer or old fashioned crystal ball could provide us the answer, so we just waited...and prayed.



IEEE

Contents

Publications

Issues

Papers

Authors

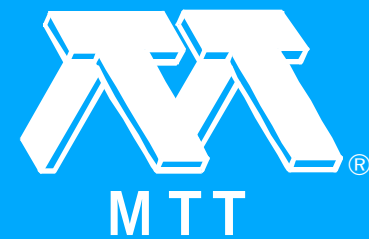
Click on title for a complete paper.



Abstracts

Awards (Dec. 1989 [T-MTT])

"Awards (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1850-1856.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Special Session in Honor of Dr. Seymour B. Cohn (Dec. 1989 [T-MTT])

P.M. La Tourrette. "Special Session in Honor of Dr. Seymour B. Cohn (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1857-1861.

A Special Session in honor of Dr. Seymour B. Cohn was held at the 1989 IEEE MTT-S International Microwave Symposium in Long Beach, CA, on the afternoon of Wednesday, June 14.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Microwave Radiometry: Its Importance to the Detection of Cancer

K.L. Carr. "Microwave Radiometry: Its Importance to the Detection of Cancer." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1862-1869.

Developments in the application of microwave technology to the solution of medical problems, particularly the detection and treatment of cancer, have been very encouraging. In the treatment of cancer, for example, microwave hyperthermia has been accepted as an adjunctive procedure to radiation therapy in the treatment of superficial lesions. While not as widely reported, the use of microwave radiometry as a noninvasive, passive technique for the early detection of cancer appears very promising. Wider acceptance of these methods, however, awaits fundamental improvements in the ability to focus energy at depth in human tissue, an important and nontrivial antenna problem. Further development in the areas of antennas and antenna arrays is required if microwave technology is to provide a practical solution to the detection and treatment of cancer. This paper discusses developments in the medical uses of microwave radiometry, particularly in relation to the early detection of cancer, as well as the significance of and progress in related antenna technology.

[Click on title for a complete paper.](#)



Broad-Band Distributed Amplifier Impedance-Matching Techniques

K.R. Cioffi. "Broad-Band Distributed Amplifier Impedance-Matching Techniques." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1870-1876.

A circuit concept is developed which allows impedance transformations to be performed over extremely broad bandwidths. The transformation is obtained by coupling one or more input or output lines of a distributed amplifier into several output or input lines respectively. The circuit technique is demonstrated for a 1:2 impedance transformation over a 2-20 GHz bandwidth by results presented for a fabricated amplifier. The amplifier yields a VSWR of better than 1.7:1 at the input into 25 Ω and better than 1.5:1 into 50 Ω at the output while maintaining a gain of 9 ± 1 dB. An application of the technique to the important broad-band impedance-matching problem of a laser diode is discussed.



A Two-Dimensional Transmission Line Matrix Microwave Field Simulator Using New Concepts and Procedures

P.P.M. So, Eswarappa and W.J.R. Hoefer. "A Two-Dimensional Transmission Line Matrix Microwave Field Simulator Using New Concepts and Procedures." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1877-1884.

A two-dimensional field simulator for microwave circuit modeling is described. It incorporates a number of novel concepts and advanced transmission line matrix (TLM) procedures recently developed at the University of Ottawa. In particular, a discrete Green's function concept based on Johns' time-domain diakoptics has been realized, providing unprecedented processing power through modularization of large structures at the field level, simulation of wide-band matched loads or absorbing walls, modeling of frequency-dispersive boundaries in the time domain, and large-scale numerical preprocessing of passive structures. Nonlinear field modeling concepts have also been implemented in the TLM field simulator. It can analyze two-dimensional circuits of arbitrary geometry containing both linear and nonlinear media. The circuit topology is input graphically. Both time-domain and frequency-domain responses can be computed and displayed. The capabilities and limitations of the simulator are discussed and several microstrip and waveguide components are modeled to demonstrate its important features.



IEEE

Contents

Publications

Issues

Papers

Authors





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

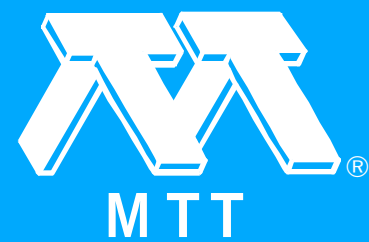
Measurement and Simulation of Memory Effects in Predistortion Linearizers

W. Bosch and G. Gatti. "Measurement and Simulation of Memory Effects in Predistortion Linearizers." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1885-1890.

A typical method for designing a predistortion linearizer is to realize a circuit that creates an AM/AM and AM/PM characteristic inverse to that of the power amplifier to be linearized. This strategy is correct only if the predistortion circuit maintains this characteristic also at signal envelope frequencies. This is often not true due to the time constants present in the linearizer circuits that limit its effectiveness (hereafter these effects are referred as memory effects). This problem is not limited to linearization techniques but affects the operation of nonlinear systems in general. The purpose of this paper is to review the major consequences of memory effects, to present efficient techniques to measure them, and to illustrate a simulation approach that can be used to predict their influence in practical systems.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Investigations of Complex Modes in a Generalized Bilateral Finline with Mounting Grooves and Finite Conductor Thickness (Dec. 1989 [T-MTT])

W.-K. Wang, C.-K.C. Tzuang, J.-S. Chang and T.-H. Wang. "Investigations of Complex Modes in a Generalized Bilateral Finline with Mounting Grooves and Finite Conductor Thickness (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1891-1897.

A generalized bilateral finline with mounting grooves and finite conductor thickness is analyzed by a full-wave mode-matching method. The final nonstandard eigenvalue equation is derived from the unknown coefficients in the slot regions to reduce the size of the matrix equation. The convergence studies of the mode-matching method are first performed for the fundamental mode of a symmetric bilateral finline. Both the propagation constant and the characteristic impedance based on the power-voltage definition are analyzed and compared to the existing data. Excellent agreement between various data is obtained and the effects of metallization thickness and mounting grooves are discussed. The accurate results for the fundamental mode obtained by the mode-matching method with considerations of both relative and absolute convergence apply equally well to the analyses of the complex modes of the finline. The field matching plots at the slot-dielectric (air) interface of the finline also confirm that the converged solutions for the complex modes have superior field matchings over the nonconverged ones. The dispersion characteristics of the fundamental, higher order, evanescent, and complex modes are presented for an asymmetric bilateral finline. The effects of mounting grooves and metallization thickness on the complex mode propagation constants are investigated and discussed.

Click on title for a complete paper.



State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Dec. 1989 [T-MTT])

S. Saito, Y. Tarusawa and H. Suzuki. "State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1898-1903.

A novel PLL concept, SPILL, suitable for the intermittent operation of frequency synthesizers used in UHF portable radio sets is proposed. SPILL employs a new digital circuit technique which preserves frequency and phase during power-off periods, in order to perform fast acquisition at the beginning of power-on periods. Both a theoretical analysis and experiments confirm acceptable acquisition performance. A 1.6 GHz SPILL frequency synthesizer achieves an improvement in acquisition time by two orders of magnitude. Applications of SPILL to high-frequency synthesizers in portable radio communication sets are especially effective for reducing power consumption.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Phenomenological Loss Equivalence Method for Planar Quasi-TEM Transmission Lines with a Thin Normal Conductor or Superconductor

H.-Y. Lee and T. Itoh. "Phenomenological Loss Equivalence Method for Planar Quasi-TEM Transmission Lines with a Thin Normal Conductor or Superconductor." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1904-1909.

The incremental inductance rule for conductor loss calculations is not valid if conductor thickness decreases and becomes comparable to the penetration depth, such as in monolithic microwave integrated circuits. In this paper, a simple approach, referred to as the phenomenological loss equivalence method, is proposed for characterizing a planar quasi-TEM transmission line with a thin normal conductor or superconductor over a wide range of field penetrations. For microstrip lines with a thin copper or high-T/sub c/ superconductor, the conductor losses calculated by this method agree very well with the published data calculated by the finite element method and the Monte Carlo method, respectively. Because of the simplicity of the calculation, this method should be very useful for the computer-aided design of monolithic microwave circuits.

[Click on title for a complete paper.](#)



Electromagnetic Coupling of Coplanar Waveguides and Microstrip Lines to Highly Lossy Dielectric Media

M.F. Iskander and T.S. Lind. "Electromagnetic Coupling of Coplanar Waveguides and Microstrip Lines to Highly Lossy Dielectric Media." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1910-1917.

In medical diagnosis and geophysical well-logging applications of electromagnetic (EM) techniques, it is of critical importance to couple the EM energy to the object under interrogation efficiently and with minimum external leakage. Experimentally, a family of coplanar waveguides and microstrip lines has proven to be ideal EM energy couplers for such applications. To date, no analytical work has been done to investigate the coupling characteristics of these structures to highly lossy dielectric media. In this paper, the spectral-domain technique is utilized to analyze the coupling characteristics of coplanar waveguides and microstrip lines to multilayer lossy dielectric media. Numerical results illustrating the dispersion characteristics of coplanar and microstrip lines, as well as the various electric field components coupled to highly lossy dielectric media, are presented. It is shown that the presence of a superstrate of lossless dielectric between the coplanar waveguide and the lossy medium plays a key role in setting up an axial electric field component that facilitates leaky-wave-type coupling to the lossy medium. The thickness of the superstrate relative to the gap width in the coplanar waveguide is important in controlling the magnitude of this axial electric field component. It is also shown that even a very thin superstrate layer would generate the leaky-wave type axial electric field component in the lossy medium. The coupling characteristics of the microstrip and coplanar lines are compared, and results generally show improved coupling if coplanar waveguides were utilized. Specifically, values of the attenuation constant α are higher for coplanar waveguide than for microstrip line, and for both structures, α decreases with the frequency decrease. These, as well as other observations, are illustrated graphically.



Abstracts

Computation of Electromagnetic Fields in Large Biological Bodies by an Iterative Moment Method with a Restart Technique

J.J.H. Wang and J.R. Dubberley. "Computation of Electromagnetic Fields in Large Biological Bodies by an Iterative Moment Method with a Restart Technique." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1918-1923.

The computation of EM fields in a large, three-dimensional arbitrarily shaped dielectric or biological body is made practical by a conjugate gradient algorithm with a restart technique. This algorithm allows the operator to run the program for large bodies in a measured and controlled manner. It is clarified that in achieving convergence, a good initial guess plays only a very minor role while the $g/\sup (n)/$ and $A/\sup (n)/$ functions are crucial to the convergence in the conjugate gradient algorithm and must be included in the restart.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Analysis of Waveguides with Metal Inserts (Dec. 1989 [T-MTT])

A.S. Omar and K.F. Schunemann. "Analysis of Waveguides with Metal Inserts (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1924-1932.

A systematic analysis of waveguides with metal inserts is presented. The method is based on a field expansion in terms of the normal modes of the corresponding hollow waveguide without metal inserts. The analysis leads to two main formulations the matrix formulation and the moment method formulation. The matrix formulation is suitable for structures with smooth metal inserts, which are free from sharp edges, while the moment method is more suitable for metal sheets (e.g. strips and fins) or metal inserts with sharp edges (e.g. ridges). The validity of the method is tested by investigating some special cases, in which the surface of the metal insert coincides with one of the coordinate surfaces, e.g. a bifurcation in circular or rectangular waveguides. The method is then applied to the analysis of striplines and ridge waveguides. It leads to a generalization of the widely used spectral-domain technique in that ridges, fins, and strips with finite thickness can now be analyzed likewise. Any existing routine for the analysis of planar structures which is based on the spectral-domain technique can then be slightly modified in order to take the metallization thickness into account.



IEEE

[Contents](#)

[Publications](#)

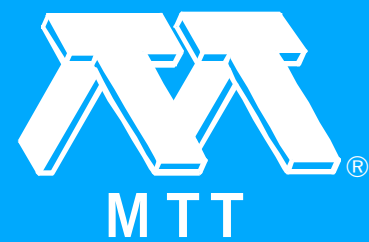
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Microwave and Millimeter-Wave QWITT Diode Oscillators

V.P. Kesan, A. Mortazawi, D.R. Miller, V.K. Reddy, D.P. Neikirk and T. Itoh. "Microwave and Millimeter-Wave QWITT Diode Oscillators." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1933-1941.

We present dc, microwave, and millimeter-wave characteristics of different quantum well injection transit time (QWITT) devices. Small-signal and large-signal device models are used to provide physical device design parameters to maximize the output power density at any desired frequency of operation. A peak output power density of 3.5-5 kW/cm² in the frequency range of 5-8 GHz has been obtained from a planar QWITT oscillator. This is the highest output power density obtained from any quantum well oscillator at any frequency. This result also represents the first planar circuit implementation of a quantum well oscillator. Good qualitative agreement between dc and RF characteristics of QWITT devices and theoretical predictions based on small-signal and large-signal analyses has been achieved. We also present results on improving device efficiency by optimizing the design of the drift region in the device through the use of a doping spike. By optimizing the doping concentration of the spike, an increase in efficiency from 3 to 5 percent has been obtained, without compromising the output power at X-band. Self-oscillating QWITT diode mixers have also been demonstrated at X-band in both waveguide and planar circuits. The self-oscillating mixer exhibits a conversion gain of about 10 dB in a narrow bandwidth and a conversion loss of about 5 dB if broad-band operation is desired. This is to our knowledge the first report of conversion gain obtained from a self-oscillating mixer using a quantum well device.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

High-Dynamic-Range Airborne Tracking and Fire Control Radar Subsystems

A.M. Madni, P.T. McDonald, R.K. Hansen and L.A. Wan. "High-Dynamic-Range Airborne Tracking and Fire Control Radar Subsystems." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1942-1948.

Two high-dynamic-range receiver subsystems for use in airborne radar fire control and tracking applications are described. The X-band dual-channel monopulse tracking receiver operates at 9.36 ± 0.290 GHz with a 6 dB NF and a linear instantaneous dynamic range of 42 dB. A total of 80 dB of RF and IF gain control is programmable with less than $\pm 15^\circ$ phase and ± 1 dB amplitude tracking errors. The Doppler radar receiver operating at 9.3 ± 0.15 GHz has a 4.6 dB NF with ≥ 80 dB of instantaneous dynamic range. An 18 dB sensitivity time control (STC) circuit and a 60 dB dump attenuator allow close-in target reception.

[Click on title for a complete paper.](#)



Abstracts

Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method

G.-C. Liang, Y.-W. Liu and K.K. Mei. "Full-Wave Analysis of Coplanar Waveguide and Slotline Using the Time-Domain Finite-Difference Method." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1949-1957.

We have presented a detailed full-wave analysis of a coplanar waveguide (CPW) and a slotline by the time-domain finite-difference method (TD-FD). The transient propagating waveforms along the coplanar waveguide and slotline, which are excited by retarded Gaussian pulses, are found in the time domain. After the time-domain field distributions are obtained, frequency-domain parameters such as the effective dielectric constant and the complex characteristic impedance are calculated using Fourier transformations. The results agree well with available theoretical and experimental data over a wide frequency range. We have also checked the validity of the quasi-TEM assumptions for CPW and slotline analyses. This is done by evaluating the ratios of the longitudinal and transverse field components directly.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

The Method of Lines Applied to Planar Transmission Lines in Circular and Elliptical Waveguides

K. Wu and R. Vahldieck. "The Method of Lines Applied to Planar Transmission Lines in Circular and Elliptical Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1958-1963.

The method of lines (MOL) is utilized to analyze a class of planar transmission lines with circular or semicircular/elliptical metallic shielding. The paper shows how the general MOL principles can be modified such that curved boundary structures can be included. Dispersion diagrams are presented for microstrip and slotline structures with curved metallic shielding as well as for their suspended counterparts in circular and elliptical waveguides.



IEEE

[Contents](#)

[Publications](#)

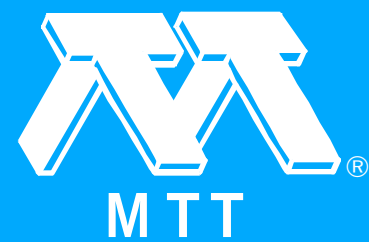
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

An Integral Equation Method for the Evaluation of Conductor and Dielectric Losses in High-Frequency Interconnects

T.E. van Deventer, P.B. Katehi and A.C. Cangellaris. "An Integral Equation Method for the Evaluation of Conductor and Dielectric Losses in High-Frequency Interconnects." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1964-1972.

An integral equation method is developed to solve for the complex propagation constant in multilayer planar structures with an arbitrary number of strip conductors on different levels. Both dielectric losses in the substrate layers and conductor losses in the strips and ground plane are considered. The Green's function included in the integral equation is derived by using a generalized impedance boundary formulation. The microstrip ohmic losses are evaluated by using an equivalent frequency-dependent impedance surface which is derived by solving for the fields inside the conductors. This impedance surface replaces the conducting strips and takes into account the thickness and skin effect of the strips at high frequencies. The effects of various parameters such as frequency, thickness of the lines, and substrate surface roughness on the complex propagation constant are investigated. Results are presented for single strips, coupled lines, and two-level interconnects. Good agreement with available literature data is shown.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Accuracy Improvements in Microwave Noise Parameter Measurements

A.C. Davidson, B.W. Leake and E. Strid. "Accuracy Improvements in Microwave Noise Parameter Measurements." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1973-1978.

Factors contributing to microwave noise parameter measurement accuracy have been examined theoretically and experimentally. It is shown that for good accuracy the test source impedances need not be grouped around the impedance that produces minimum noise figure. System calibration and DUT S-parameter accuracy are important to the derived noise parameter accuracy, and the use of a vector network analyzer is advantageous. A new algorithm has been implemented which avoids errors caused by different noise source "on" and "off" impedances.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Lossless Broad-Band Monolithic Microwave Active Inductors (Dec. 1989 [T-MTT])

S. Hara, T. Tokumitsu and M. Aikawa. "Lossless Broad-Band Monolithic Microwave Active Inductors (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1979-1984.

Lossless broad-band microwave active inductors for general-purpose use in microwave circuits are proposed and their characteristics are discussed. These active inductors are composed of a common-source cascode FET and a feedback FET, and operate in a wide frequency range with very low series resistance. A maximum Q factor of 65 is obtained. Theoretically, it can reach infinity. Furthermore, the inductance value can be controlled by an external voltage control.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

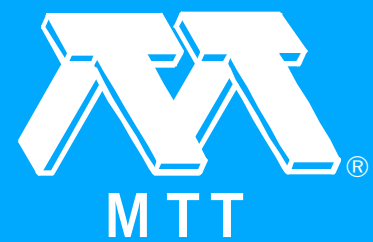
Very Small Ultra-Wide-Band MMIC Magic T and Applications to Combiners and Dividers

T. Tokumitsu, S. Hara and M. Aikawa. "Very Small Ultra-Wide-Band MMIC Magic T and Applications to Combiners and Dividers." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1985-1990.

An FET-sized 1-18 GHz monolithic active magic T (180° hybrid) is proposed. It unifies two different dividers, electrically isolated from each other, in a novel GaAs FET electrode configuration, viz. the LUFET concept. Its characteristics and experiment results are presented. Applications of the magic T to miniature wide-band RF signal processing modules such as dividers, combiners, and switches are described.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Miniaturized Hairpin Resonator Filters and Their Application to Receiver Front-End MIC's (Dec. 1989 [T-MTT])

M. Sagawa, K. Takahashi and M. Makimoto. "Miniaturized Hairpin Resonator Filters and Their Application to Receiver Front-End MIC's (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1991-1997.

This paper describes the fundamental characteristics of newly developed miniaturized hairpin resonators having parallel coupled lines and shows their applications to bandpass filters and receiver front-end MIC's. A method for calculating filter coupling parameters using a general-purpose microwave circuit simulator is also presented. The bandpass filters using newly developed hairpin resonators have a suitable structure for microwave integrated circuits (MIC's), and the size of the experimental bandpass filters has been reduced to one half that of conventional hairpin resonators without increasing insertion losses. Trial receiver front-end MIC's using these filters have also been developed and have shown good characteristics, for example, low noise and a high image suppression ratio. They are considered to be applicable to a higher frequency range above the L-band.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Computer-Aided Design of Evanescent Mode Waveguide Bandpass Filter with Nontouching E-Plane Fins

K.-S. Kong and T. Itoh. "Computer-Aided Design of Evanescent Mode Waveguide Bandpass Filter with Nontouching E-Plane Fins." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 1998-2004.

This paper presents an efficient computer-aided design procedure for an evanescent mode waveguide bandpass filter with nontouching E-plane fins. The design procedure systematically utilizes a look-up table containing the scattering parameters from differently dimensioned E-plane fins. The main idea is to achieve an optimal combination of the filter parameters with proper selections of the E-plane fins from the look-up table and appropriate determinations of the other filter structure elements in order to satisfy the given filter specifications. The technique of selecting the proper fin from the look-up table is explained. The relationship between the desired center frequency of the filter and the approximate resonant frequency of the single fin in the table is shown. Also, the relationship between each design parameter and the filter characteristic is presented. Mean square error multiplied by the selected weight function in the range of 1.0 dB bandwidth is calculated to obtain better optimized design parameters.



Abstracts

Rigorous Analysis of Open Microstrip Lines of Arbitrary Cross Section in Bound and Leaky Regimes (Dec. 1989 [T-MTT])

K.A. Michalski and D. Zheng. "Rigorous Analysis of Open Microstrip Lines of Arbitrary Cross Section in Bound and Leaky Regimes (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2005-2010.

The problem of an open microstrip line of arbitrary cross section is solved by an integral equation technique in conjunction with the method of moments. The approach is general and can handle as special cases multiple strips and strips of finite or infinitesimal thickness. It applies to both the fundamental and higher order modes, whether in the bound or the leaky regime. Computed dispersion curves and modal current distributions are presented for several cases of interest and, where possible, are compared with published data.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

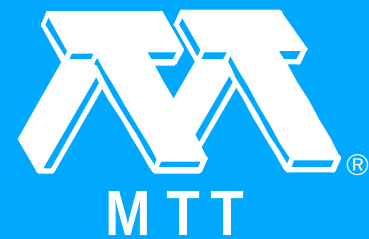


Abstracts

Filter Design Using In-Line Triple-Mode Cavities and Novel Iris Couplings

U. Rosenberg and D. Wolk. "Filter Design Using In-Line Triple-Mode Cavities and Novel Iris Couplings." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2011-2019.

The introduction of an in-line triple-mode cavity and two new iris coupling methods provide a significant extension in filter designs. It is shown that these principles allow optimal filter realizations with a minimum of triple- and dual-mode cavities. A conspicuous example is the possible elliptic function in-line filter design up to seventh order. Verification of these principles has been obtained through several realized new filter types. Experimental results are provided for elliptic function filters of fifth, sixth (both in in-line configuration) and seventh order using a minimum number of TE/sub 113//TM/sub 012/ degeneracies.



[Contents](#)

[Publications](#)

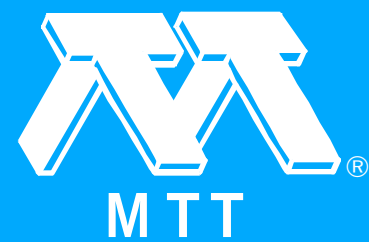
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter-Wave Circuits (Dec. 1989 [T-MTT])

F. Alessandri, U. Goebel, F. Melai and R. Sorrentino. "Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter-Wave Circuits (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2020-2027.

A new quasi-planar structure, the nonsymmetrically shielded coplanar waveguide (NSCPW), is proposed as a quasi-TEM transmission line with advantageous characteristics for millimeter-wave circuit applications. Advantages in terms of broad-band behavior and ease of machining, as well as device mounting and substrate mounting, are pointed out. An experimental method has been developed which allows the evaluation of the transmission line spectrum in a very wide frequency band (15:1) with a single transmission measurement. The propagation characteristics of the dominant and higher order modes evaluated experimentally are shown to be in excellent agreement with the theoretical predictions based on the generalized transverse resonance technique. This method has also been used for an extensive characterization of the structure in terms of characteristic impedance and useful frequency band.



Abstracts

The Generalized Method of Characteristics for Waveform Relaxation Analysis of Lossy Coupled Transmission Lines (Dec. 1989 [T-MTT])

F.-Y. Chang. "The Generalized Method of Characteristics for Waveform Relaxation Analysis of Lossy Coupled Transmission Lines (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2028-2038.

The transient response of lossy coupled transmission lines is simulated by iterative waveform relaxation analyses of equivalent disjoint networks constructed with congruence transformers, FFT waveform generators, and characteristic impedances synthesized by the Pade approximation. A phenomenal two order reduction of CPU time and one order savings in computer memory have been achieved. A lossy directional coupler is simulated for illustration.



[Contents](#)

[Publications](#)

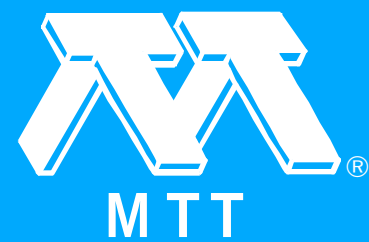
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

A Large-Signal Physical MESFET Model for Computer-Aided Design and its Applications

R.R. Pantoja, M.J. Howes, J.R. Richardson and C.M. Snowden. "A Large-Signal Physical MESFET Model for Computer-Aided Design and its Applications." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2039-2045.

A quasi-static, large-signal MESFET circuit model has been developed. It is based on a comprehensive quasi-two-dimensional semiclassical device physical simulation where its unique formulation and efficiency make it suitable for the computer-aided design of nonlinear MESFET subsystems. Using this approach the semiconductor equations are reduced to a consistent one-dimensional approximation requiring substantially less computing resources than a full two-dimensional simulation. CPU time is typically reduced by a factor of 1000. A single/two-tone harmonic balance analysis procedure which employs the describing frequency concept has also been developed and combined with the MESFET model. Numerical load-pull contours, as well as intermodulation distortion contours, have been simulated and comparison of these with measured results validates the approach taken.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Modeling of Ge-Si Heterojunction Bipolar Transistors for Use in Silicon Monolithic Millimeter-Wave Integrated Circuits

S.A. Campbell and A. Gopinath. "Modeling of Ge-Si Heterojunction Bipolar Transistors for Use in Silicon Monolithic Millimeter-Wave Integrated Circuits." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2046-2050.

Previous work on high-resistivity silicon suggests that microstrip line dielectric losses cease to be significant above 30 GHz. Silicon-Germanium heterojunction bipolar transistors now provide a well-behaved three-terminal device capable of operating at microwave frequencies, making the fabrication of silicon monolithic millimeter-wave integrated circuits a genuine possibility. The trade-offs available to operate this device at millimeter-wave frequencies are discussed, and one-dimensional calculations along with two-dimensional simulations of transistor performance are presented.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

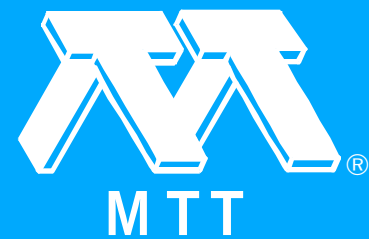
Characterization of Uniform Microstrip Line and its Discontinuities Using the Time-Domain Method of Lines

S. Nam, H. Ling and T. Itoh. "Characterization of Uniform Microstrip Line and its Discontinuities Using the Time-Domain Method of Lines." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2051-2057.

The general formulation and the procedure of the time-domain method of lines for the analysis of wave scattering and propagation properties in a planar circuit are described. The results of the time-domain data and the derived frequency-domain characteristics for the uniform microstrip line and its several discontinuities (step, open-end, and gap) are presented.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses

W.P. Harokopus, Jr. and P.B. Katehi. "Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2058-2066.

A two-dimensional space-domain method of moments treatment of open microstrip discontinuities on multi-dielectric-layer substrates is presented. The full-wave analysis accounts for electromagnetic coupling, radiation, and all substrate effects. The technique has been utilized to characterize commonly used discontinuities on one and two dielectric layers, and numerical results for step, corner, and T-junction discontinuities are included.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

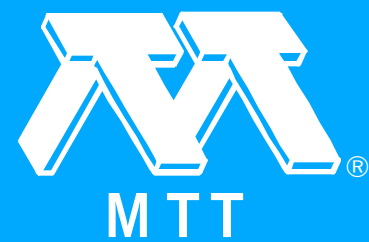
Parallel Processing Application to Nonlinear Microwave Network Design (Dec. 1989 [T-MTT])

M.I. Sobhy and Y.A.R. El-Sawy. "Parallel Processing Application to Nonlinear Microwave Network Design (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2067-2073.

One of the objectives of this paper is to introduce microwave network designers to an important new development in computer-aided design techniques. The paper describes how parallel processing is applied to the CAD of nonlinear microwave circuits. The advantage of parallel processing is the significant reduction in computational time it offers, such that optimization becomes feasible even on a desktop computer. The developed programs run on an AT desktop with one Transputer board capable of concurrent processing speeds of over 80 MIPS at a processor speed of 20 MHz. A new representation of microwave and nonlinear circuits has been developed to suit the required parallelism. Applications to the analysis of nonlinear amplifiers and frequency multipliers are described.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Dielectric Receiving Filter with Sharp Stopband Using an Active Feedback Resonator Method for Cellular Base Stations (Dec. 1989 [T-MTT])

T. Nishikawa, Y. Ishikawa, J. Hattori and K. Wakino. "Dielectric Receiving Filter with Sharp Stopband Using an Active Feedback Resonator Method for Cellular Base Stations (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2074-2079.

An 800 MHz band dielectric receiving filter with a sharp stopband has been developed. This filter is composed of a conventional dielectric antenna filter and three active band-stop filters, each sharply eliminating one band in the passband. In the active band-stop filters, small dielectric resonators in which the unloaded Q is raised to about 50000 by means of an active feedback resonator method are used. The active band-stop filter is designed to obtain optimum stability and an optimum noise figure. One of these active band-stop filters has a center frequency of 845.75 MHz, a stopband width of 1.0 MHz, and an attenuation of 30 dB. Deviation of the resonant frequency is held within ± 30 kHz and the noise figure at passband is adequately small. The size of the dielectric receiving filter is $480 \times 250 \times 44$ mm³, and the volume is less than 1/20 that of a conventional filter rising cavity resonators.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Unified Solution of Various Dielectric-Loaded Ridge Waveguides with a Mixed Spectral-Domain Method

K.T. Ng and C.H. Chan. "Unified Solution of Various Dielectric-Loaded Ridge Waveguides with a Mixed Spectral-Domain Method." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2080-2085.

A mixed spectral-domain method is developed and applied to analyze various dielectric-loaded ridge waveguides. Magnetic surface currents at apertures are identified as unknowns in auxiliary structures. Spectral Green's functions are formulated with the spectral immittance approach for these structures. Mixing different spectral domains existing on the two sides of an aperture in a spectral Galerkin approach then leads to the characteristic equations required for the dispersion analysis. The simplicity and numerical efficiency of the conventional spectral-domain immittance approach, which cannot be applied directly to the present structures, are maintained. Representative results are obtained to illustrate the application of the method.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's (Dec. 1989 [T-MTT])

R.E. Lee, R.S. Beaubien, R.H. Norton and J.W. Bacon. "Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMT's (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2086-2092.

Pseudomorphic HEMT's (termed PHEMT's) with gate lengths of one tenth micrometer based on the AlGaAs/InGaAs/GaAs material system have achieved very low noise millimeter-wave performance. The room-temperature device noise figure at 43 GHz is measured to be 1.32 dB (noise temperature = 103 K) with 6.7 dB of associated gain; when cooled to 17 K physical temperature, the noise figure falls to 0.36 dB (noise temperature = 25 K) with 6.9 dB of associated gain. These pseudomorphic devices also show improved sensitivity to input noise match ($N = 0.13$ at 43 GHz) compared with conventional HEMT's and MESFET's. These pseudomorphic HEMT devices have the lowest noise temperature (N.F.) and noise sensitivity (normalized to frequency) of any GaAs device yet reported.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron (FECTED) Oscillators

H. Scheiber, K. Lubke, D. Grutzmacher, C.G. Diskus and H.W. Thim. "MIMIC-Compatible GaAs and InP Field Effect Controlled Transferred Electron (FECTED) Oscillators." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2093-2098.

An MIMIC-compatible transferred electron oscillator is investigated which utilizes the frequency-independent negative resistance of the stationary charge dipole domain that forms in the channel of a MESFET. Devices fabricated from GaAs and InP exhibit 56 mW at 29 GHz and 55 mW at 34 GHz, respectively. CW power levels are somewhat lower (30 mW). These power levels are the highest ever obtained with lateral transferred electron oscillators and FET oscillators.

[Click on title for a complete paper.](#)



Abstracts

Efficient Large-Signal FET Parameter Extraction Using Harmonics (Dec. 1989 [T-MTT])

J.W. Bandler, Q.-J. Zhang, S. Ye and S.H. Chen. "Efficient Large-Signal FET Parameter Extraction Using Harmonics (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2099-2108.

We present a novel approach to nonlinear large-signal FET model parameter extraction for GaAs MESFET devices measured under large-signal conditions. Powerful nonlinear adjoint-based optimization which employs the harmonic balance method as the nonlinear circuit simulation technique, simultaneously processes multibias, multipower inputs, multi-fundamental-frequency excitations, and multiharmonic measurements to uniquely reveal the parameters of the intrinsic FET. In contrast to other methods by which the model parameters are extracted using dc and small-signal measurements, our new approach can provide more accurate and reliable large-signal model parameters extracted under actual operating conditions. The modified Materka and Kacprzak FET model serves as an example. Numerical results verify that our approach can effectively determine the parameters of this model. Including harmonics in parameter extraction results in a reliable large-signal model. Real data provided by Texas Instruments have also been employed. The technique has been implemented in a new program called HarPE.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Recent European Developments in Active Microwave Imaging for Industrial, Scientific, and Medical Applications

J.-C. Bolomey. "Recent European Developments in Active Microwave Imaging for Industrial, Scientific, and Medical Applications." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2109-2117.

At the beginning of the 1980's, research programs devoted to short-range active microwave imaging were initiated in Europe. Since that time, a permanent research effort has been organized and oriented toward the development of microwave imaging equipment for industrial and medical applications. This effort has been conducted within the framework of national or European cooperative programs. This paper presents some representative results which have been obtained during the last decade and discusses the general trends concerning their continuation and extension in the next few years. Without underestimating theoretical aspects and their importance for the further evolution of microwave imaging techniques, special emphasis has been given to equipment which provides the real measure of the impact of the recently developed microwave imaging technologies in a growing field of applications.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Foreword (Dec. 1989 [T-MTT])

A. Chu. "Foreword (Dec. 1989 [T-MTT])." *1989 Transactions on Microwave Theory and Techniques* 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2118-2118.

The 1989 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium took place on June 12 and 13, 1989, in Long Beach, CA. As in previous years, this meeting was held in conjunction with the IEEE MTT-S International Microwave Symposium. This year our program comprised one invited paper, entitled "Progress of MMICs in Japan," 32 contributed papers, and three panel discussions. The contributed papers were organized into eight sessions, which were devoted to low-noise amplifiers; power amplifiers; nonlinear circuits; advanced circuits and applications; control circuits; receivers and mixers; millimeter-wave amplifiers; and broad-band integrated circuits.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

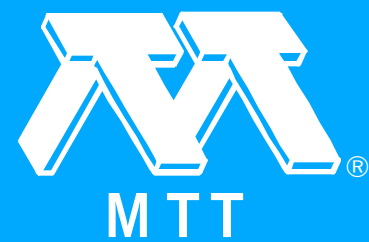
A Multioctave Active GaAs MMIC Quadrature Phase Shifter

P. Philippe, P. Coget, V. Pauker, P. Dautriche and P. Jean. "A Multioctave Active GaAs MMIC Quadrature Phase Shifter." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2119-2124.

A GaAs monolithic quadrature phase shifter based upon a phase locked loop system covers a 0.1 to 4.5 GHz frequency range. It provides about 8 dB of gain and its phase error and amplitude mismatch are respectively less than 2.5° and 0.4 dB over the band. When integrated into a single-sideband receiver, a sideband rejection of at least 30 dB has been achieved.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Nonlinear Modeling and Verification of MMIC Amplifiers Using the Waveform-Balance Method

V.D. Hwang, Y.-C. Shih, H.M. Le and T. Itoh. "Nonlinear Modeling and Verification of MMIC Amplifiers Using the Waveform-Balance Method." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2125-2133.

An accurate nonlinear MESFET model, a new amplifier large-signal simulation algorithm, and a reliable model verification approach are presented. The MESFET model is derived from S-parameter characterization of the MESFET using a wide range of bias voltages. This model is shown to be accurate at various frequencies, bias voltages, and input power levels. The nonlinear simulation utilizes a circuit analysis algorithm which we call the waveform-balance method. The algorithm is a hybrid method which uses both time-and frequency-domain analysis. Unlike the popular harmonic balance method, the solution is optimized in the time domain, where the closed-form error gradient matrix (Jacobian matrix) is calculated. This new algorithm is shown to have good convergence speed. To verify the MESFET model, two MMIC single-stage power amplifiers and test patterns of their matching circuits are designed. The load and source impedances presented to the MESFETs in the amplifier circuits are accurately determined by on-wafer S-parameter measurements of the amplifiers' matching circuits. These S-parameter data are directly used in the simulation of the MMIC amplifiers. The simulation results agree well with the measurement data.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Monolithic FET Structures for High-Power Control Component Applications

M.B. Shifrin, P.J. Katzin and Y. Ayasli. "Monolithic FET Structures for High-Power Control Component Applications." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2134-2141.

A new monolithic switch FET control circuit has been developed that can be integrated with other monolithic functions or used as a discrete component in an MIC structure. This device increases the power-handling capability of the conventional single FET switch by an order of magnitude. It does this by overcoming the breakdown voltage limitation of the FET device. The design, fabrication, and performance of two high-power control components using these circuits are described as examples of the implementation of this technology (an L-band terminated single-pole single throw (SPST) switch and an L-band limiter).

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology

B. Adelseck, A. Colquhoun, J.-M. Dieudonne, G. Ebert, K.-E. Schmegner, W. Schwab and J. Selders. "A Monolithic 60 GHz Diode Mixer and IF Amplifier in Compatible Technology." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2142-2147.

To integrate key components of a millimeter-wave system monolithically in the future a novel technology has been developed which allows the integration of Schottky diodes and MESFET's on one chip. The fabricated Schottky diodes have a cutoff frequency $f_{sub T}$ of 2300 GHz. A monolithic 60 GHz mixer chip with these diodes shows a conversion loss of 6 dB and a noise figure (DSB) of 3.3 dB. The MESFET's, have an $f_{sub max}$ up to 70 GHz. A realized two-stage IF amplifier shows a gain of 20.6 dB and a noise figure of 1.7 dB at 4 GHz.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Novel MMIC Active Filter with Lumped and Transversal Elements (Dec. 1989 [T-MTT])

M.J. Schindler and Y. Tajima. "A Novel MMIC Active Filter with Lumped and Transversal Elements (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2148-2153.

A novel active filter structure has been developed and demonstrated as an MMIC. This filter structure makes use of both lumped elements and active transversal elements. The combination of lumped and transversal elements provides performance superior to that of a filter made of lumped elements alone and is much smaller than a filter made of transversal elements alone. This miniature MMIC filter has a passband of 9.8-11.1 GHz with 2 dB loss, and better than 30 dB rejection 1.1 GHz from either passband edge. This level of performance could not have been achieved on a conventional 4-mil-thick GaAs MMIC with only passive lumped elements.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process

I.J. Bahl, R. Wang, A.E. Geissberger, E.L. Griffin and C. Andricos. "C-Band 10 W MMIC Class-A Amplifier Manufactured Using the Refractory SAG Process." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2154-2158.

This paper describes the design, fabrication, and test results of a C-Band single-chip GaAs MMIC class-A amplifier manufactured using the ITT multifunctional self-aligned gate (MSAG) process. The amplifier demonstrates a 10 W power output (0.625 W/mm power density) at 5.5 GHz with an associated gain of 5 dB and a power-added efficiency of 36 percent. The average functional yield of the IC was above 70 percent. To our knowledge, these results exceed the best published results for C-band power MMIC amplifiers.

[Click on title for a complete paper.](#)



Monolithic 2-18 GHz Matrix Amplifiers (Short Papers)

A.P. Chang, K.B. Niclas, B.D. Cantos and W.A. Strifler. "Monolithic 2-18 GHz Matrix Amplifiers (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2159-2162.

The designs and performances of two different monolithic 2-18 GHz matrix amplifiers are discussed. The first module, optimized for gain and return loss, yields gains of $G = 15.5 \pm 0.9$ dB and a maximum return loss of $RL = -12.0$ dB. When cascading these modules to form a two- or three-stage amplifier, gains of $G = 31.4 \pm 1.4$ dB and $G = 43.2 \pm 1.8$ dB are measured. With the second unit, designed for low noise and gain, noise figures of $NF = 4.15 \pm 0.85$ dB and gains of $G = 17.1 \pm 1.25$ dB were achieved.



Abstracts

Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications (Short Papers)

J.V. Bellantoni, D.C. Bartle, D. Payne, G. McDermott, S. Bandla, R. Tayrani and L. Raffaelli. "Monolithic GaAs p-i-n Diode Switch Circuits for High-Power Millimeter-Wave Applications (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2162-2165.

Two different Ku-band SPDT switch circuits using monolithic GaAs epitaxial p-i-n diode technology are presented. The lowest insertion loss is 0.7 dB at 35 GHz, and isolation is better than 32 dB from 30 to 40 GHz. The power handling capability is at least +38 dBm pulsed and +35 dBm CW. Switching speed rise and fall times are 2 ns.



MTT



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts



IEEE

Contents

Publications

Issues

Papers

Authors

Ka-Band MMIC Beam-Steered Transmitter Array (Short Papers)

D.L. Rascoe, A.L. Riley, J. Huang, V. Lubecke and L. Duffy. "Ka-Band MMIC Beam-Steered Transmitter Array (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2165-2168.

A 32 GHz six-element linear transmitter array utilizing MMIC phase shifters and power amplifiers has been designed and tested as part of the development of a spacecraft array feed for NASA deep-space communications applications. Measurements of the performance of individual phase shifters, power amplifiers, and microstrip radiators were carried out and electronic beam steering of the linear array was demonstrated.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Sensitivity of a 40 GHz HEMT Low-Noise Amplifier to Material and Processing Variations (Short Papers)

C. Yuen, C. Nishimoto, S. Bandy and G. Zdasiuk. "Sensitivity of a 40 GHz HEMT Low-Noise Amplifier to Material and Processing Variations (Short Papers)." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): 2169-2170.

A monolithic, single-stage HEMT low-noise amplifier has been developed at 40 GHz for the application to satellite communication. This amplifier includes a single 0.25- μm -gate-length HEMT active device with on-chip matching and biasing circuits. A gain of 8 dB and a noise figure of 4 dB were measured from 36 to 42 GHz for an amplifier with a mushroom gate profile. Using a triangular gate profile device with a lower gate-to-drain feedback capacitance, the amplifier achieved a 10 dB peak gain at 43 GHz. The chip size is 1.1 x 1.1 mm².

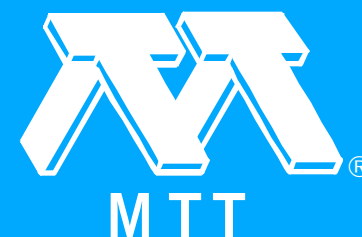
Click on title for a complete paper.



Abstracts

Index, IEEE [T-MTT] 1989, Volume 37, and MTT-S Sponsored Conferences

"Index, IEEE [T-MTT] 1989, Volume 37, and MTT-S Sponsored Conferences." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): i1-i50.



IEEE

Contents

Publications

Issues

Papers

Authors

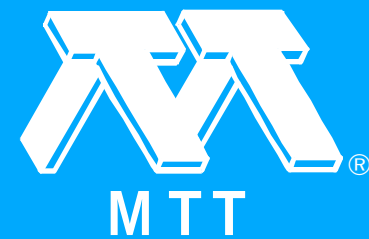
Click on title for a complete paper.



Abstracts

Back Cover (Dec. 1989 [T-MTT])

"Back Cover (Dec. 1989 [T-MTT])." 1989 Transactions on Microwave Theory and Techniques 37.12 (Dec. 1989 [T-MTT] (1989 Symposium Issue)): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

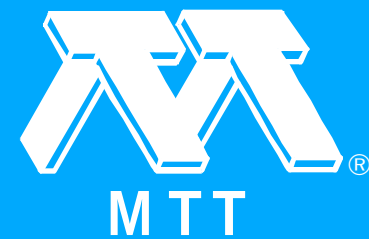
Click on title for a complete paper.



Abstracts

Front Cover (Jan. 1990 [T-MTT])

"Front Cover (Jan. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): f1-f2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Broad-Band Simultaneous Measurement of Complex Permittivity and Permeability Using a Coaxial Discontinuity

N.-E. Belhadj-Tahar, A. Fourier-Lamer and H. de Chanterac. "Broad-Band Simultaneous Measurement of Complex Permittivity and Permeability Using a Coaxial Discontinuity." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 1-7.

A technique is presented for simultaneously measuring the real and imaginary parts of both permittivity and permeability of a given material. A gap in a coaxial line is filled with the material under test. Complex permittivity and permeability are computed from the S-parameter (S_{11} and S_{21}) measurement made on the gap taking into account higher order modes excited at the discontinuity. Measured ϵ_r and μ_r data for several materials are presented from 45 MHz up to 18 GHz. This technique shows good agreement between calculated and generally accepted values.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique

D. Misra, M. Chhabra, B.R. Epstein, M. Mirotznik and K.R. Foster. "Noninvasive Electrical Characterization of Materials at Microwave Frequencies Using an Open-Ended Coaxial Line: Test of an Improved Calibration Technique." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 8-14.

We consider dielectric measurements using a probe consisting of coaxial transmission line with an open-circuit end placed against the sample. For the 2.99 or 3.6 mm (OD) probes considered in this study, a simple lumped parameter model shows errors above 1 GHz that increase greatly with frequency. We evaluate an approximate model due originally to Marcuvitz, on the basis of measured probe impedances from 1 to 18 GHz with samples consisting of water, methanol, and dioxane-water mixtures. This model is more accurate than the lumped-parameter model, and is better suited for calibration of the automated network analyzer. Finally, we consider the errors introduced in dielectric measurements by the use of approximate models for the probe. The technique succeeds because of partial cancellation of errors in modeling the probe in ANA-based measurements.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Low-Parasitic, Planar Schottky Diodes for Millimeter-Wave Integrated Circuits

J.W. Archer, R.A. Batchelor and C.J. Smith. "Low-Parasitic, Planar Schottky Diodes for Millimeter-Wave Integrated Circuits." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 15-22.

The design and fabrication of air-bridged, ultra-low-capacitance Schottky barrier diodes are described. Mott diodes, for mixer applications, and varactor diodes, for use in frequency multipliers, have been produced simultaneously on epitaxial wafers grown by molecular beam epitaxy. Typical mixer diodes have a nominal anode contact area of $4\mu\text{m}^2$ exhibit a total zero-bias capacitance of 4.0-4.5 fF (including a parasitic capacitance of approximately 1.0 fF) and a series resistance of 6-8 Ω . Diode chips have been incorporated in hybrid integrated circuit (MIC) mixers for 33-50 GHz and 75-110 GHz and an MIC frequency tripler for 90-140 GHz. Fully monolithic (MMIC) subharmonically pumped mixers for 75-110 GHz have also been fabricated and tested.

[Click on title for a complete paper.](#)



Abstracts

Coupled-Wave Small-Signal Transient Analysis of GaAs Distributed Amplifier

K. Han and T.T.Y. Wong. "Coupled-Wave Small-Signal Transient Analysis of GaAs Distributed Amplifier." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 23-29.

A coupled-wave small-signal transient analysis for the GaAs distributed amplifier is presented. The analysis takes into consideration the effect of $c/\text{sub dg/}$ in the active device, leading to a coupled-mode formulation. Dispersions within the transmission lines and the presence of two normal modes make it impractical to obtain broad-band matching. Numerical results for specific terminations and various degrees of passive and active coupling clearly indicate the influence of $C/\text{sub dg/}$ and the necessity for coupled-mode analysis. The presented numerical scheme based on Bromwich integration can be incorporated into CAD routines for time-domain response optimization.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Capacitance Computation of Elliptic Microstrip Disks in Biaxial Anisotropic Multilayered Substrates

R.R. Boix and M. Horno. "Capacitance Computation of Elliptic Microstrip Disks in Biaxial Anisotropic Multilayered Substrates." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 30-37.

Variational technique in the spectral domain are used to develop an algorithm which calculates a lower bound of the capacitance of a conductor elliptic disk embedded in a lossless multilayered substrate with arbitrary dielectric anisotropy. This algorithm is intended to be a useful tool for lumped element design in MMIC applications. The calculation method is shown to be general, quick, and accurate when implemented in a computer program. Numerical results are given to demonstrate the efficiency of the algorithm.



Abstracts

Lateral Electromagnetic Waves and Pulses on Open Microstrip

R.W.P. King. "Lateral Electromagnetic Waves and Pulses on Open Microstrip." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 38-47.

The propagation of lateral electromagnetic waves and pulses on microstrip is investigated further. Interference patterns generated by the superposition of the lateral and direct waves along the air-substrate surface are shown. The field generated by the pulse excitation of a horizontal dipole on the air-substrate boundary is shown to consist of a lateral-wave pulse and a slower direct-wave pulse. Their differences in shape and decay rate are clarified. It is shown that the shape of a Gaussian pulse propagating along an open microstrip transmission line is closely related to the shape of the lateral electric-field pulse generated by a Gaussian current pulse in a dipole the air-substrate boundary.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Optimization of Planar Devices by the Finite Element Method

P. Garcia and J.P. Webb. "Optimization of Planar Devices by the Finite Element Method." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 48-53.

The finite element method has been shown to be an efficient and flexible way of computing the scattering parameters of N-port planar devices (microstrip, stripline, rectangular waveguide, etc.). In addition, it can provide at little extra cost the sensitivity of scattering parameters to changes in the shape of the device. Such information may be useful in itself; it also leads to a faster automatic optimization of the shape. This approach has been implemented with high-order, triangular finite elements and the Broyden-Fletcher-Goldfarb-Shanno optimization scheme. Sensitivities were computed for an empty parallel-plate waveguide and for a rectangular waveguide containing a dielectric slab the agreement with analytical solutions was excellent. The method was used to determine the optimum shape of a microstrip 3 dB hybrid and was found to require far fewer analyses than a previous technique.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Millimeter-Wave Six-Port Reflectometer Using Dielectric Waveguide

G. Hji pieris, R.J. Collier and E.J. Griffin. "A Millimeter-Wave Six-Port Reflectometer Using Dielectric Waveguide." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 54-61.

A novel six-port reflectometer circuit is described which is particularly suited to dielectric-type waveguides. Its scattering matrix is derived allowing for flexibility in design. A phase shifting network is incorporated in the circuit and it is shown that a quadrature hybrid can be configured for this purpose. The reflectometer is implemented in dielectric waveguide for W-band (75 GHz- 110 GHz) operation and measurements are presented.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Precisely Calibrated Coaxial-to-Microstrip Transitions Yield Improved Performance in GaAs FET Characterization

G. Kompa, M. Schlechtweg and F. van Raay. "Precisely Calibrated Coaxial-to-Microstrip Transitions Yield Improved Performance in GaAs FET Characterization." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 62-68.

A new approach for calibrating coaxial-to-microstrip transitions up to 26.5 GHz with high precision is presented. An ideal through, noncritical open, noncritical short, and a surface absorber are used as microstrip standards for the calibration. The calibration measurement and a novel approach in extracting the scattering parameters of the transitions are described. Error-corrected results on broad-band measurements of the scattering coefficients of packaged FET's in a hybrid circuit configuration are given.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

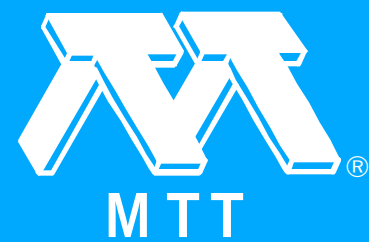
The Calculated and Measured Temperature Distribution of a Phased Interstitial Antenna Array

Y. Zhang, W.T. Joines and J.R. Oleson. "The Calculated and Measured Temperature Distribution of a Phased Interstitial Antenna Array." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 69-77.

The power deposition pattern of four antennas, positioned on the corners of a 2 cm square array with different driving phase is computed under the assumption of negligible coupling between the antennas. The spatial SAR (specific absorption rate) distribution is calculated by modeling each interstitial applicator as an insulated, asymmetric dipole. For comparison with the heating patterns measured by a thermal video system, the calculated SAR distributions are converted into temperature patterns through an electric network simulation of the heating in artificial muscle tissue. At each nodal point of a grid in the thermal system, the absorbed microwave power (or SAR times density), thermal resistivity, heat capacitance, and temperature are simulated, respectively, as current source, electrical resistance, electrical capacitance, and potential. Therefore, solving the equivalent electric network on a computerized simulation routine (SPICE) yields the temperature distribution. In both the axial and transverse planes, the resulting temperature distributions from the antenna array, with various driving phases, agree very well with the measured temperature patterns.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Domain Integral Equation Analysis of Integrated Optical Channel and Ridge Waveguides in Stratified Media

E.W. Kolk, N.H.G. Baken and H. Blok. "Domain Integral Equation Analysis of Integrated Optical Channel and Ridge Waveguides in Stratified Media." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 78-85.

A domain integral equation approach has been developed to compute both propagation constants and corresponding electromagnetic field distributions of guided waves in an integrated optical waveguide. The waveguide is embedded in a stratified medium. The refractive index of the waveguide may be graded, but the refractive indices of the layers of the stratified medium are assumed to be piecewise homogeneous. The waveguide is regarded as a perturbation of its embedding, so the electric field strength can be expressed in terms of a domain integral representation. The kernel of this integral consists of a dyadic Green's function which is constructed using an operator approach. By investigating the electric field strength within the waveguide, an integral equation can be derived which represents an eigenvalue problem which is solved numerically by applying the method of moments. The application of the domain integral equation approach in combination with a numerically stable evaluation of the Green's kernel functions provides a new and valuable tool for the characterization of integrated optical waveguides embedded in stratified media. Numerical results are presented for various channel and ridge waveguides and are compared with those of other methods where possible.

Click on title for a complete paper.



Abstracts

A Periodic Planar Gunn Diode Power Combining Oscillator (Short Papers)

A. Mortazawi and T. Itoh. "A Periodic Planar Gunn Diode Power Combining Oscillator (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 86-87.

Several planar periodic power combining oscillators containing two to six Gunn diodes operating in the X-band are designed and fabricated. The maximum power combining efficiency, 126.7 percent, is obtained from the three-diode oscillator. Injection locking is maintained over a large variation of the bias voltage.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Analysis and Design of Kemp-Type 3 dB Quadrature Couplers (Short Papers)

J.L.B. Walker. "Analysis and Design of Kemp-Type 3 dB Quadrature Couplers (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 88-90.

An analysis is presented of the Kemp et al. type of 3 dB quadrature coupler. A table of element values is given for three-, five-, and seven-section couplers for various ripple levels. It is shown that the Kemp approach overcomes the tight coupling problem associated with the Cristal and Young method, but that it introduces a bandwidth contraction penalty.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

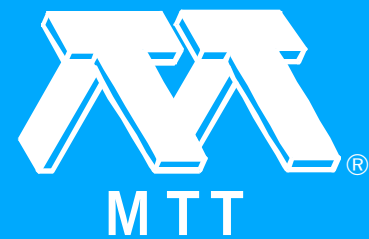
Percutaneous Transluminal Microwave Balloon Angioplasty (Short Papers)

A. Rosen, P. Walinsky, D. Smith, Y. Shi, Z. Kosman, A. Martinez-Hernandez, H. Rosen, F. Sterzer, D. Mawhinney, A. Presser, J.-S. Chou, P. Goth and G. Lowery. "Percutaneous Transluminal Microwave Balloon Angioplasty (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 90-93.

Microwave balloon angioplasty (MBA) combines conventional balloon angioplasty techniques with microwave heating to help enlarge the lumen of narrowed arteries and reduce the occurrence of restenosis. An apparatus for the delivery of MBA using 2450 MHz heating power is described. Using this apparatus, local arterial wall temperatures as high as 90°C were obtained during MBA on anesthetized rabbits. Tissue modification of the arterial walls due to simultaneous ballooning and heating was observed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

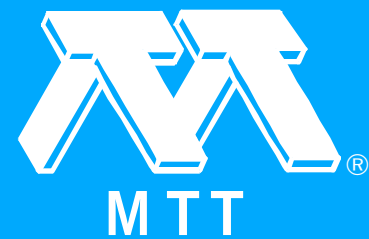
A Rigorous Variational Formulation of an H Plane Slot-Coupled Tee Junction (Short Papers)

B.N. Das, N.V.S.N. Sarma and A. Chakraborty. "A Rigorous Variational Formulation of an H Plane Slot-Coupled Tee Junction (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 93-95.

The paper presents a rigorous analysis for the determination of an exact equivalent network for the slot-coupled H plane Tee junction, taking the effect of wall thickness into account. A variational formulation is used for the determination of the parameters of the network. The parameters of the S matrix as well as coupling are evaluated from the exact equivalent network. Comparisons between theoretical and experimental results wherever available are presented.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Explicit Microwave Rotary Phase Shifter Calibration Algorithm (Letters)

P.L. Somlo. "Explicit Microwave Rotary Phase Shifter Calibration Algorithm (Letters)." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 96-96.

A microwave rotary phase shifter calibration method described previously requires the device under test (DUT) to be connected in tandem with a 2-state phase stepper (flap) of initially unknown phase shift F to form an arm of a phase bridge circuit. The measurement is carried out by setting the DUT sequentially to a series of cardinal points, α_{0i} , $i = 1, \dots, M$, equally spaced around the dial. At each, the phase bridge is balanced, and after introducing the flap, the new setting α_{fi} , of the DUT needed to return the phase bridge to balance is found.

[Click on title for a complete paper.](#)



Abstracts

High-Frequency MESFET Noise Modeling Including Distributed Effects (Corrections)

W. Heinrich. "High-Frequency MESFET Noise Modeling Including Distributed Effects (Corrections)." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 96-97.

In the above paper Figs. 5, 6, and 8 were partially illegible owing to poor reproduction. These figures are reprinted here.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

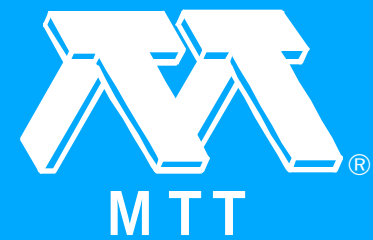
Click on title for a complete paper.



Abstracts

Patent Abstracts (Jan. 1990 [T-MTT])

"Patent Abstracts (Jan. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 98-105.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - Directions in Design and Applications of Microwave Systems (Jan. 1990 [T-MTT])

"Call for Papers - Directions in Design and Applications of Microwave Systems (Jan. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 106-106.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

IEEE Copyright Form (Jan. 1990 [T-MTT])

"IEEE Copyright Form (Jan. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): 107-108.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

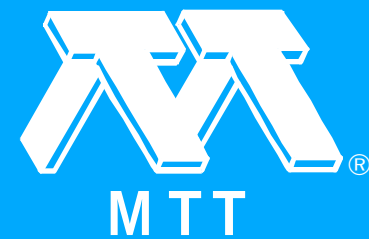
Click on title for a complete paper.



Abstracts

Back Cover (Jan. 1990 [T-MTT])

"Back Cover (Jan. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.1 (Jan. 1990 [T-MTT]): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Front Cover (Feb. 1990 [T-MTT])

"Front Cover (Feb. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Modeling and Design of GaAs MESFET Control Devices for Broad-Band Applications

N. Jain and R.J. Gutmann. "Modeling and Design of GaAs MESFET Control Devices for Broad-Band Applications." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 109-117.

In this paper, closed-form expressions are developed for the small-signal parameters of broad-band GaAs control MESFET's. The theoretical conducting-state resistance and nonconducting-state capacitance are compared with experimental data and demonstrate the usefulness of the models. Additionally, we considered the power handling capability of these devices and describe the various limitations in both conducting and nonconducting states. Our models show that self-aligned gate devices (SAGFET's) have a broad-band cutoff-frequency figure of merit as much as twice that of conventional MESFET's, although the voltage handling capability of the SAGFET is considerably inferior.

[Click on title for a complete paper.](#)



A Graphic Design Method for Matched Low-Noise Amplifiers

B.M. Albinsson. "A Graphic Design Method for Matched Low-Noise Amplifiers." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 118-122.

This paper presents a graphic design method for matched low-noise amplifiers where all necessary design information is presented in the load plane. It is possible to work exclusively in the load plane, as the input matching requirement makes the source admittance dependent on the load admittance. As a consequence of the bilinear transformation involved, all parameters may be presented by circles. Analytic equations giving the centers and the radii of the circles in the load plane are presented. The method is particularly useful for feedback amplifiers. For a given feedback situation, a trade-off between different design parameters can be evaluated by inspection of the graph. The analytic equations make the calculations very fast, and the result of changes in the feedback element values can be viewed directly. Two kinds of amplifier configurations are considered. First, a single-stage amplifier with an input match requirement is described. Secondly, a two-stage cascade amplifier is considered. The latter is required to have an output match and noise-optimized second stage, in addition to an input match. For the single stage case the noise figure, the power gain, the stability, and the input network are treated. In the cascade design, the total noise figure, the interstate network, and the available gain are treated as well. A design example for lossless feedback is presented.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Characterization of Spurious-Response Suppression in Double-Balanced Mixers

D. Regev. "Characterization of Spurious-Response Suppression in Double-Balanced Mixers." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 123-128.

A new analysis of spurious-response suppression in double-balanced (DB) mixers, using the diode current-voltage characteristic, is presented. A theoretical relationship between different spurious responses and the input power level is shown. This relationship leads to the following new conclusions: 1) a direct relationship exists between the spurious-response suppression and the spurious-response order of the RF component, and 2) a linear relationship exists between the spurious-response suppression and RF power. Experimental results are presented, showing close agreement with the above conclusions.

[Click on title for a complete paper.](#)



Abstracts

A More Accurate Analysis and Design of Coaxial-to-Rectangular Waveguide End Launcher

S.M. Saad. "A More Accurate Analysis and Design of Coaxial-to-Rectangular Waveguide End Launcher." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 129-134.

A new, more accurate electromagnetic model is developed for the analysis of the coaxial-to-rectangular waveguide transition of the end-launcher type. As an alternative to the well-known modeling via a coupling loop, the new model describes the coupling mechanism in terms of an excitation probe which is fed by a transmission line intermediate section. The two models have a few analytical steps in common, but expressions of the probe model are easier to derive, compute. The two models are presented together with numerical examples, experimental verification. The superiority of the probe model is illustrated, and a design method yielding a maximum VSWR of 1.035 over 13 percent bandwidth is outlined.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

The Equivalent Circuit of a Microstrip Crossover in a Dielectric Substrate

S. Papatheodorou, R.F. Harrington and J.R. Mautz. "The Equivalent Circuit of a Microstrip Crossover in a Dielectric Substrate." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 135-140.

A quasi-static analysis is carried out to examine the capacitive coupling between two nonintersecting orthogonal microstrip lines above a ground plane and in a dielectric substrate. The charge density along the width of each strip is described using a prescribed charge distribution. A pair of coupled integral equations is derived and solved via the method of moments to obtain the excess charge densities. The lumped excess capacitances are computed and compared to the ones obtained using wire lines with radii equal to the equivalent radii of the strips.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

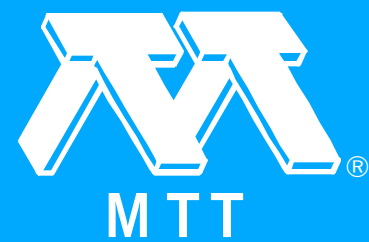
Losses of Tapered Dielectric Slab Waveguides with Axial Variations in Index of Refraction

R. Scarmozzino, D.V. Podlesnik and R.M. Osgood, Jr.. "Losses of Tapered Dielectric Slab Waveguides with Axial Variations in Index of Refraction." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 141-147.

The effects of varying the index of refraction in the cladding along the length of a tapered dielectric waveguide are calculated using a bent normal mode analysis. It is found that in some cases the losses can be reduced by an order of magnitude, even for short tapers whose length is of the order of the guide dimensions.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

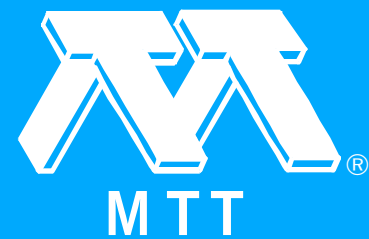
[Authors](#)

Computation of Frequency-Dependent Propagation Characteristics of Microstriplike Propagation Structures with Discontinuous Layers

M. Thorburn, A. Agoston and V.K. Tripathi. "Computation of Frequency-Dependent Propagation Characteristics of Microstriplike Propagation Structures with Discontinuous Layers." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 148-153.

A general procedure based on the method of lines is presented for the full-wave analysis of propagation structures having layered substrates with step inhomogeneities in each layer. Examples of such structures include microslab lines and microstrip near a substrate edge. It is shown that with this extended method of lines technique the frequency-dependent characteristics, including the modal impedance, current distribution, and other properties of these structures, can be calculated. To illustrate the technique typical structures such as microstrips on a finite-width dielectric slab and microstrips near a substrate edge are considered, and the effect of the proximity of the edge on the propagation characteristics of the microstrip is computed. For the case of a microstrip near a substrate edge, the numerical results obtained are compared with measured values of propagation constants.





IEEE

Contents

Publications

Issues

Papers

Authors

Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation

M. Swaminathan, E. Arvas, T.K. Sarkar and A.R. Djordjevic. "Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 154-159.

This paper describes a procedure for obtaining the cutoff wavenumbers of TE and TM modes in waveguides of arbitrary cross section. A surface integral equation approach is used where the E-field equation has been transformed into a matrix equation using the method of moments. An iterative technique has been used to pick the eigenvalues of the solution matrix which corresponds to the waveguide cutoff wavenumbers. The salient features of this technique are its speed, its simplicity, and the absence of any spurious modes while treating waveguides of arbitrary cross section. The first four modes have been tabulated for various waveguides and results are in very good agreement with published data.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

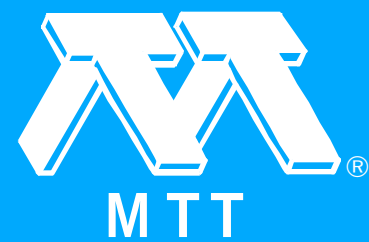
[Authors](#)

Microwave Detectors Based on Granular High-Tc Thin Films (Feb. 1990 [T-MTT])

J. Konopka, R. Sobolewski, G. Jung, W. Kula, P. Gierlowski, A. Konopka and S.J. Lewandowski. "Microwave Detectors Based on Granular High-Tc Thin Films (Feb. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 160-165.

Detecting and mixing properties of microstrip superconducting Y-Ba-Cu-O and Bi-Ca-Sr-Cu-O thin-film structures deposited on various substrates have been investigated. The device performance was tested in 25, 55, and 110 GHz frequency bands at temperatures ranging from 100 K to about 50 K. Sensitivity obtained at 110 GHz was comparable to that of crystalline detectors. The mixing experiments were performed in a 25 GHz frequency band and indicated that the detector response time was less than 40 ps. The intermediate frequency was varied from 50 MHz to 5 GHz without any decrease in the mixer output up to 3 GHz. Auxiliary emission measurements performed at 12 GHz and down to 4.2 K revealed that the detector low-temperature performance limit was associated with microwave radiation from clusters of intergrain weak links arranged in multiloop quantum interferometers.





IEEE

Contents

Publications

Issues

Papers

Authors

A Dielectric-Free Superconducting Coaxial Cable

C. Rose and M.J. Gans. "A Dielectric-Free Superconducting Coaxial Cable." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 166-177.

We have investigated the theoretical properties of a dielectric free superconducting coaxial cable with a magnetically levitated inner conductor. We found that at 100 GHz the intrinsic attenuation along such a cable is on the order of a 0.1 dB per kilometer. Furthermore, for a given cable, the loss is proportional to the square of the frequency. Thus, at 10 GHz, one could expect losses on the order of $10/\text{sup } -3/$ dB/km. This low loss, coupled with a generous signal to noise ratio (/spl ap/80 dB at 100 GHz bandwidth), helps provide bit rates of 100 Gbit/s over 600 km. At 10 Gbit/s the distance increases to over 60000 kilometers: about 1.5 times the earth's circumference. Such a high-bandwidth, extremely low loss electronic transmission medium might be of interest for very long distance repeaterless communications. In addition, since efficient means of tapping coaxial media already exist, local area network applications with in excess of $10/\text{sup } 4/$ users could be supported. The two properties of superconductors central to this application are (1) very low intrinsic loss and (2) expulsion of magnetic flux. Low loss allows high-bandwidth dispersionless transmission. Magnetic flux expulsion permits magnetic support of the inner conductor, thereby avoiding the large dielectric losses associated with any support material.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Comparison of Three Integral Formulations for the 2-D TE Scattering Problem

N. Joachimowicz and C. Pichot. "Comparison of Three Integral Formulations for the 2-D TE Scattering Problem." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 178-185.

Electromagnetic modeling for biomedical applications requires effective numerical methods. At present, one of the most efficient methods used to solve diffraction problems with dissipative dielectric objects is the FFT-CGM (fast-Fourier-transform conjugate gradient method). However, in contrast to TM polarization, substantial errors are found when we use it for computing the internal field distribution in the TE polarization case for 2-D objects. We here analyze the source of these errors and show that the modified method, empirically introduced in [4], is not required if correct terms in the integral equation are accounted for. With this aim in mind, we propose another integral formulation using generalized functions and compare it to several formulations available in the literature. Numerical comparisons are carried out for inhomogeneous dissipative cylinders whose electromagnetic parameters are close to those of biological tissues. The solution associated with this integral formulation appears to behave better than the others, in comparison with the exact analytical solutions.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen

R.L. Gluckstern, R. Li and R.K. Cooper. "Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 186-192.

Frequently in the generation and transmission of RF waves, different regions of excitation are coupled by a small aperture in a common plane wall. When the dimensions of the aperture are small compared to the wavelength, the effect of the aperture can be described by an electric polarizability, χ , and magnetic susceptibilities ψ_{xx} and ψ_{yy} , which are defined in static terms. Specific results for χ , ψ_{xx} , and ψ_{yy} have been derived by Bethe and Collin for circular and elliptical holes. We have derived integral equations for the field components in the plane of the hole and variational forms for χ , ψ_{xx} , and ψ_{yy} , in terms of these field components. We have also shown that the polarizability and (diagonalized) susceptibility are connected by $1/\chi = 1/\psi_{xx} + 1/\psi_{yy}$, a relation which does not appear in any of the related literature which we have examined for an aperture of general shape.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Integral Equation Solution to the Guidance and Leakage Properties of Coupled Dielectric Strip Waveguides

J.-F. Kiang, S.M. Ali and J.A. Kong. "Integral Equation Solution to the Guidance and Leakage Properties of Coupled Dielectric Strip Waveguides." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 193-203.

The guidance and leakage properties of single and coupled dielectric strip waveguides are analyzed using the dyadic Green's function and integral equation formulation. Galerkin's method is used to solve the integral equation for the dispersion relation. The effects of the geometrical and the electrical parameters on the dispersion relation are investigated. A method to predict the occurrence of leakage is proposed. The properties of the even and the odd leaky modes are also investigated. Results are compared with previous analysis and shown to be in good agreement.

[Click on title for a complete paper.](#)



Abstracts

Three-Dimensional Computer Simulation in Deep Regional Hyperthermia Using the Finite-Difference Time-Domain Method

D. Sullivan. "Three-Dimensional Computer Simulation in Deep Regional Hyperthermia Using the Finite-Difference Time-Domain Method." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 204-211.

The finite-difference time-domain method is used for detailed three-dimensional simulation for applications in deep regional hyperthermia. The ability to simulate SAR patterns from the near field of prototype applicators is demonstrated by comparison with measured data. The method is also used to simulate treatments on commercially available equipment by using a detailed model of a cancer patient constricted from computerized axial tomography scans. The model has 1 cm resolution and consists of 34751 cells. The method is further used to anticipate results of treatments with prototype applicators.



IEEE

Contents

Publications

Issues

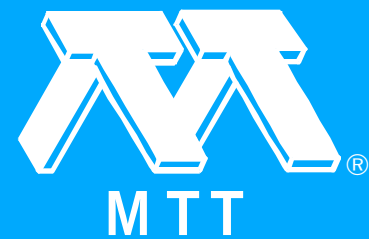
Papers

Authors

Click on title for a complete paper.



Abstracts



IEEE

Contents

Publications

Issues

Papers

Authors

Feedback in Distributed Amplifiers (Short Papers)

M. Riazat, S. Bandy, L.Y. Ching and G. Li. "Feedback in Distributed Amplifiers (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 212-215.

Parallel and series feedback effects are described for application in distributed amplifiers, and their frequency dependence characteristics are discussed. A six-element distributed amplifier utilizing series feedback is described. This amplifier demonstrates a 2 dB improvement in small-signal gain over the 2 to 18 GHz frequency range compared to a regular distributed amplifier rising the same active device.

Click on title for a complete paper.



Abstracts

Enhanced Through-Reflect-Line Characterization of Two-Port Measuring Systems Using Free-Space Capacitance Calculation (Short Papers)

J.S. Kasten, M.B. Steer and R. Pomerleau. "Enhanced Through-Reflect-Line Characterization of Two-Port Measuring Systems Using Free-Space Capacitance Calculation (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 215-217.

A through-reflect-line calibration procedure is presented wherein the free-space capacitance and propagation factor of the line standard are used to determine the line characteristic impedance. The method is applied to measurement of a microstrip via.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Microwave Hyperthermia Induced by a Phased Interstitial Antenna Array (Short Papers)

Y. Zhang, W.T. Joines and J.R. Oleson. "Microwave Hyperthermia Induced by a Phased Interstitial Antenna Array (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 217-221.

An interstitial microwave antenna array for hyperthermia cancer treatment is investigated. The purpose is to generate both uniform and controlled nonuniform temperature distributions in biological tissue by modulating the phases of the signals applied to each antenna. The array has four antennas positioned on the corners of a 2 cm square. The distributions of absorbed power within the arrays are computed and then converted into temperature distributions through a heat conduction simulation. The temperature patterns over phantom muscle are presented in both the lateral plane (perpendicular to the antennas) and the axial plane (parallel to the antennas). It has been found that, by proper phase modulation of RF signals applied to each antenna, a uniform heating can be produced in the entire array volume. Also, a peripheral heating pattern may be generated around the array, again by using the proper phase modulation.



Abstracts

Patent Abstracts (Feb. 1990 [T-MTT])

"Patent Abstracts (Feb. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 222-223.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

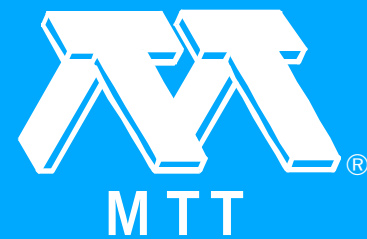
Click on title for a complete paper.



Abstracts

Call for Papers - Directions in Design and Applications of Microwave Systems (Feb. 1990 [T-MTT])

"Call for Papers - Directions in Design and Applications of Microwave Systems (Feb. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): 224-224.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

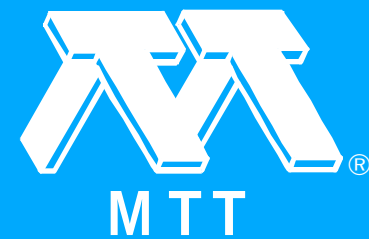
Click on title for a complete paper.



Abstracts

Back Cover (Feb. 1990 [T-MTT])

"Back Cover (Feb. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.2 (Feb. 1990 [T-MTT]): b1-b2.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

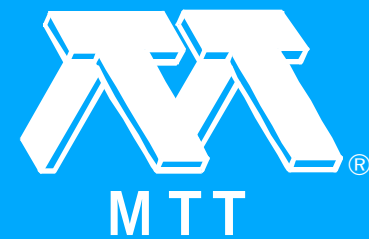
Click on title for a complete paper.



Abstracts

Front Cover (Mar. 1990 [T-MTT])

"Front Cover (Mar. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): f1-f2.



IEEE

[Contents](#)

[Publications](#)

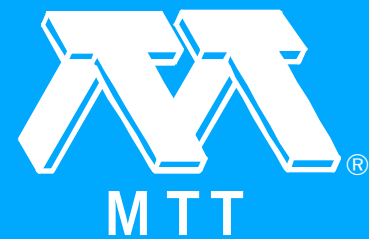
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Bar-Grid Oscillators

Z.B. Popovic, R.M. Weikle, II, M. Kim, K.A. Potter and D.B. Rutledge. "Bar-Grid Oscillators." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 225-230.

Grid oscillators are an attractive way of obtaining high power levels from solid-state devices, since potentially the output powers of thousands of individual devices can be combined. The active devices do not require an external locking signal and the power combining is done in free space. In this work 36 transistors are mounted on parallel brass bars, which provide a stable bias and have a low thermal resistance. The output power degrades gradually when devices fail. The grid gives an effective radiated power (ERP) of 3 W at 3 GHz. The directivity is 11.3 dB and the dc to RF efficiency is 22 percent. Modulation capabilities of the grid are demonstrated. An equivalent circuit model for the grid is derived, and comparison with experimental results is shown.

[Click on title for a complete paper.](#)



Abstracts

Measuring Adapter Efficiency Using a Sliding Short Circuit

W.C. Daywitt and G. Counas. "Measuring Adapter Efficiency Using a Sliding Short Circuit." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 231-237.

This paper describes a simple technique for measuring the efficiency of adapters with losses less than 2dB. The technique is useful in microwave applications where a moderate error in the measured loss is acceptable. This error is less than 10 percent of the loss for losses between 0.5 and 2dB, and is less than 0.05dB below 0.5dB. An expression for the error is given.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

[Click on title for a complete paper.](#)

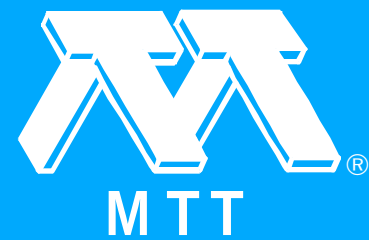


Abstracts

A Dual Six-Port Automatic Network Analyzer Incorporating a Biphas-Bimodulation Element

S.R. Judah and A.S. Wright. "A Dual Six-Port Automatic Network Analyzer Incorporating a Biphas-Bimodulation Element." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 238-244.

Current state-of-the-art dual six-port automatic network analyzers (ANA's) are dependent upon mechanical phase shifters and attenuators. Slow measurement and calibration are among the factors that have prevented six-port ANA's from more general use outside standards and research laboratories. This paper introduces biphas bimodulation, a new technique which removes the requirement for mechanical phase shifters or attenuators. A significant increase in measurement speed is achieved, allowing quasi-real-time evacuation of scattering parameters.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Propagation Modes and Dispersion Characteristics of Coplanar Waveguides

M. Riazat, R. Majidi-Ahy and I.-J. Feng. "Propagation Modes and Dispersion Characteristics of Coplanar Waveguides." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 245-251.

The coplanar waveguide structure is subdivided into five classes based on substrate thickness, backside metallization, and ground plane width. Radiation and guided modes are studied in each class, and their effects on loss and dispersion are described.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

New High-Frequency Circuit Model for Coupled Lossless and Lossy Waveguide Structures

N. Fache and D. De Zutter. "New High-Frequency Circuit Model for Coupled Lossless and Lossy Waveguide Structures." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 252-259.

A coupled transmission line model is proposed describing the two fundamental modes of any two-conductor (above a ground plane or shielded) dispersive or nondispersive lossless waveguide system. The model is based on a power-current formulation of the impedances but does not need an a priori supposition about the power distribution over each transmission line. In the second part of the paper the analysis is extended to lossy structures and to the multiconductor situation. Impedance calculations for a typical coupled microstrip configuration are used to illustrate the approach.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Numerical Analysis of Arbitrarily Shaped Discontinuities Between Planar Dielectric Waveguides with Different Thicknesses

K. Hirayama and M. Koshiba. "Numerical Analysis of Arbitrarily Shaped Discontinuities Between Planar Dielectric Waveguides with Different Thicknesses." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 260-264.

An approach that combines the finite-element and boundary-element methods is applied to the analysis of arbitrarily shaped discontinuities between planar dielectric waveguides with different thicknesses. The fields interior and exterior to the region enclosing the discontinuities are treated by the finite-element and the boundary-element method, respectively. The waveguide regions connected to the discontinuities are handled by analytical solutions. In this approach, scattering characteristics of the discontinuities can be accurately evaluated, and far-field radiation patterns can be easily calculated. To show the validity and usefulness of this approach, the scattering characteristics of a step, a staircase transformer, and a tapered transformer are analyzed. Also, a simple equivalent network approach is introduced for estimating the reflection and transmission characteristics of planar dielectric waveguide discontinuities, and the effectiveness of this simple approach is confirmed by comparing the numerical results with those of the approach that combines the finite-element and boundary-element methods.

Click on title for a complete paper.



Abstracts

Coupling of Crossed Planar Multiconductor Systems

W. Veit, H. Diestel and R. Pregla. "Coupling of Crossed Planar Multiconductor Systems." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 265-269.

Capacitive couplings between orthogonally crossed, galvanically separated transmission lines are analyzed using the "method of lines." The static capacitances of typical stripline configurations are calculated. Charge density distributions occurring when two parallel striplines are crossed by a third are described.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

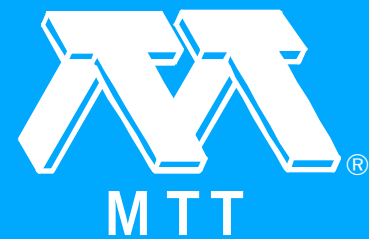
Reduced-Size Branch-Line and Rat-Race Hybrids for Uniplanar MMIC's

T. Hirota, A. Minakawa and M. Muraguchi. "Reduced-Size Branch-Line and Rat-Race Hybrids for Uniplanar MMIC's." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 270-275.

A new method of miniaturizing branch-line 90° hybrids and 180° rat-race hybrids is proposed. The method utilizes combinations of short high-impedance transmission lines and shunt lumped capacitors. The new hybrids are fabricated on GaAs substrates and the validity and effectiveness of the method are confirmed through experiments at 25 GHz and 11 GHz. The fabricated hybrids demonstrate excellent design accuracy even at high frequencies, with a circuit size that is more than 80 percent smaller than conventional hybrids. These hybrids are particularly suitable for uniplanar MMIC's where necessary shunt connections are easily made.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Analysis and Design of Microstrip-Slot Line for Phase Shifting Applications

E.-B. El-Sharawy and R.W. Jackson. "Analysis and Design of Microstrip-Slot Line for Phase Shifting Applications." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 276-283.

This paper describes the analysis and design of printed phase shifters based on the microstrip-slot line and, as a special case, the microstrip line. A spectral-domain analysis is presented where the necessary Green's functions are formulated using the transmission matrix technique. The nonreciprocal characteristics for single and multilayer structures are studied. Microstrip-slot in a multilayer structure of ferrite and high-dielectric material is found to have considerably more nonreciprocity than microstrip-slot or microstrip in a single layer structure. Over $65^\circ/\text{cm}$ is predicted for certain optimized designs. This, in addition to the 50 Ω design capability of the line, make the microstrip-slot line a suitable choice for phase shifting applications. A multilayer microstrip-slot line was constructed on a rectangular ferrite toroid. Differential phase shifts of roughly $45^\circ/\text{cm}$ were measured over a 6.0-8.5 GHz frequency range. These results are in good agreement with the analysis.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Self-Calibration Concept for Establishing the Complex Measurement Ability of Homodyne Network Analyzers

H.-J. Eul and B. Schiek. "A Self-Calibration Concept for Establishing the Complex Measurement Ability of Homodyne Network Analyzers." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 284-289.

A homodyne phase shifter controlled double reflectometer is presented. Its ability to make complex measurements of a network depends on a knowledge of the phase shifter characteristics. This knowledge is established using fully unknown standards merely by exploiting reciprocity. If a system error correction is performed, the data needed for error correction contain enough information to determine the behavior of the phase shifter and no additional standards are needed. It is shown by simulation that the measurement of the parameters of the device under test is only weakly influenced by errors in the phase shifter behavior.

[Click on title for a complete paper.](#)



Abstracts

A Complete E-Plane Analysis of Waveguide Junctions Using the Finite Element Method

V.N. Kanellopoulos and J.P. Webb. "A Complete E-Plane Analysis of Waveguide Junctions Using the Finite Element Method." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 290-295.

A complete finite element analysis of inhomogeneous E-plane waveguide junctions is presented. It is shown that at least two field components are needed for the analysis. This method solves for the three components of the magnetic field in two dimensions, and calculates the scattering parameters of the junction. Precalculated matrices are used for fast matrix assembly. Results for a metallic post agree very well with earlier published values. A dielectric post was also analyzed.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Boundary Condition Expansion of Basis Functions Method Implemented by Fast Fourier Transform Algorithms

L. Stankovic and S. Jovicevic. "Boundary Condition Expansion of Basis Functions Method Implemented by Fast Fourier Transform Algorithms." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 296-301.

This paper presents a new approach to boundary value problems. It is based on boundary condition expansion on basis functions. The expansion coefficients are determined using the fast Fourier transform of basis functions on the boundary. This approach is compared with the least-squares boundary residual method (LSBRM). It is shown that this approach results in a considerable reduction in computation time in comparison with the original LSBRM. The procedure is successfully demonstrated on diffraction and eigenvalue problems.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Finite-Difference Transmission Line Matrix Method Incorporating a Nonlinear Device Model

R.H. Voelker and R.J. Lomax. "A Finite-Difference Transmission Line Matrix Method Incorporating a Nonlinear Device Model." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 302-312.

This paper describes a variable-mesh combination of the expanded-node transmission line matrix (TLM) and finite-difference time-domain (FD-TD) methods for solving time-domain electromagnetic problems. It retains the physical process of wave propagation and the numerical stability of the former, and has the computational efficiency of the latter. This full-wave finite-difference transmission line matrix (FD-TLM) method utilizes transmission lines of differing impedances to implement a three-dimensional variable mesh which makes practical the simulation of structures having fine details, such as digital integrated circuits (IC's). Circuit models for lumped resistors, capacitors, diodes, and MESFET's have been developed and included for use in simulating digital and microwave IC's. The validity of the variable mesh implementation is verified by comparing an FD-TLM simulation of a picosecond pulse generator structure with electro-optical measurements, and the validity of the device model implementation is verified by comparing an FD-TLM simulation of a MESFET logic inverter with a SPICE simulation.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media

R. Sardos, J.-F. Escarmant, Y. Ramdani, A. Balana and W.J. Ellison. "Using a 16 GHz Interferential Reflecto-Ellipso-Polarimeter to Study Magnetic Composite Media." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 313-318.

A 16 GHz interferential reflecto-ellipso-polarimeter is described. This apparatus is a combination of a lossy turnstile junction and a three-wave interferometer. One can use it to measure very small variations in the rotation and ellipticity of reflected waves. The device has been used to study waves reflected from a magnetic composite material, formed by compression of PVC and ferrite particles, and under the influence of a magnetic field perpendicular to the direction of wave propagation. For ferrite concentrations exceeding 30 percent, several resonances were observed they seem to be related to the average distance between the magnetic particles. This "contact" between the magnetic particles could be called magnetic percolation by analogy with electric percolation.

Click on title for a complete paper.



Abstracts

Noise Parameter Transformations for Three-Terminal Amplifiers (Short Papers)

J.B. Hagen. "Noise Parameter Transformations for Three-Terminal Amplifiers (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 319-321.

The common-emitter noise parameters and z parameters for a transistor (or any three-terminal amplifier) are used to obtain the corresponding sets of noise parameters for the common-base and common-collector configurations. It is shown that the three configurations must have the same minimum noise measure. A practical example is presented to confirm this invariance.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Microwave Shielding Effectiveness of EC-Coated Dielectric Slabs (Short Papers)

C.A. Klein. "Microwave Shielding Effectiveness of EC-Coated Dielectric Slabs (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 321-324.

The purpose of this paper is to derive correct formulas for the microwave shielding effectiveness (SE) of a thin metallic layer deposited on top of a dielectric slab. For coatings much thinner than the skin depth, the following holds (a) In a half-wave geometry, SE is a function of the sheet resistance only, $SE \text{ (in dB)} = 20 \times \log (1 + 188.5/R_{\text{sub } s})$ if $R_{\text{sub } s}$ is in ohms per square; (b) in a quarter-wave geometry, $SE \text{ (in dB)} = 20 \times \log [(1 + \epsilon_{\text{sub } r}) / (2\sqrt{\epsilon_{\text{sub } r}} + 188.5/(\sqrt{\epsilon_{\text{sub } r}} R_{\text{sub } s}))]$, where $\epsilon_{\text{sub } r}$ refers to the dielectric constant of the substrate. These formulas provide upper and lower limits for the effective shielding performance of an electroconductively coated dielectric slab.

[Click on title for a complete paper.](#)



Abstracts

Flexible Circular Waveguides at Millimeter Wavelengths from Metallized Teflon Tubing (Short Papers)

J. Obrzut and P.F. Goldsmith. "Flexible Circular Waveguides at Millimeter Wavelengths from Metallized Teflon Tubing (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 324-327.

Flexible waveguides for use at millimeter wavelengths have been fabricated by deposition of a metallic film onto the composite-modified inside surface of Teflon tubing. The attenuation characteristics in the range 80 to 115 GHz show losses of the order of 0.1 dB/cm. Bending, twisting, and rotating to the limit of plastic mechanical stability (curvature radius typically >8 cm) have negligible effect on the attenuation, and bend angles $\leq 45^\circ$ produce relatively small changes in the insertion phase.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Experimental Evaluation of Existing CAD Models for Microstrip Dispersion (Short Papers)

R.A. York and R.C. Compton. "Experimental Evaluation of Existing CAD Models for Microstrip Dispersion (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 327-328.

Microstrip dispersion measurements covering a variety of different substrate materials and line impedances were carried out using the gap-coupled resonator pair method. The results were compared against nine microstrip dispersion models. The results indicate two models that are consistently accurate and are therefore recommended for CAD applications.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A New Wire Node for Modeling Thin Wires in Electromagnetic Field Problems Solved by Transmission Line Modeling (Short Papers)

P. Naylor and C. Christopoulos. "A New Wire Node for Modeling Thin Wires in Electromagnetic Field Problems Solved by Transmission Line Modeling (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 328-330.

A new three-dimensional wire node for the numerical solution of electromagnetic field problems by transmission line modeling has been developed. The wire node can represent thin wires in a coarse mesh, thus substantially increasing computational efficiency. The scattering matrix for the node is given, together with a simulation result and comparisons with another method.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Anisotropic Measurements of Rubber Sheets with an X-Band Three-Wave Interferometer (Short Papers)

R. Sardos, J.-F. Escarmant and E. Saint-Christophe. "Anisotropic Measurements of Rubber Sheets with an X-Band Three-Wave Interferometer (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 330-333.

A three-wave recording interferometer has been modified in order to adapt it for the anisotropic measurements of rubber sheets containing carbon particles. Due to the modifications made, it is no longer necessary to use an anechoic chamber, and the disadvantages of antennas are eliminated, together with diffraction along the edges of samples. After a description of the experimental instrument, some of the measurement results are presented.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Input Impedance of a Coaxial Line Probe Feeding a Circular Waveguide in the TM/sub 01/ Mode (Short Papers)

R.H. MacPhie, M. Opie and C.R. Ries. "Input Impedance of a Coaxial Line Probe Feeding a Circular Waveguide in the TM/sub 01/ Mode (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 334-337.

By means of the conservation of complex power technique (CCPT), a formally exact full-wave solution is given for the case of a coaxial line probe feeding a circular waveguide for TM/sub 01/ modal excitation. The overall scattering matrix of the coaxial line probe-circular waveguide system is deduced and numerical results for the impedance as "seen" by the coaxial line are presented and compared with experimental results obtained in the 9.0-11.5 GHz frequency range.

[Click on title for a complete paper.](#)



Abstracts

An Experimental Technique for In Vivo Permittivity Measurement of Materials at Microwave Frequencies (Short Papers)

K.F. Staebell and D. Misra. "An Experimental Technique for In Vivo Permittivity Measurement of Materials at Microwave Frequencies (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 337-339.

This paper involves the formulation of a new procedure to be used in making in vivo dielectric measurements with an open-ended coaxial line probe. The theory behind the technique is discussed along with a correction method to account for the system imperfections. Experimental results are compared with the corresponding data available in the literature. The limitations of this technique are considered.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts

Patent Abstracts (Mar. 1990 [T-MTT])

"Patent Abstracts (Mar. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 340-343.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - Directions in Design and Applications of Microwave Systems (Mar. 1990 [T-MTT])

"Call for Papers - Directions in Design and Applications of Microwave Systems (Mar. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 344-344.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Back Cover (Mar. 1990 [T-MTT])

"Back Cover (Mar. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): b1-b2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

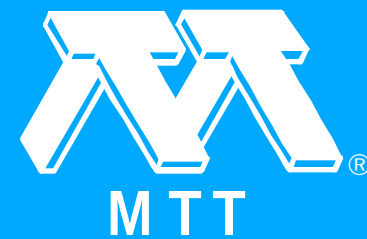
Click on title for a complete paper.



Abstracts

Front Cover (Apr. 1990 [T-MTT])

"Front Cover (Apr. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): f1-f2.



IEEE

[Contents](#)

[Publications](#)

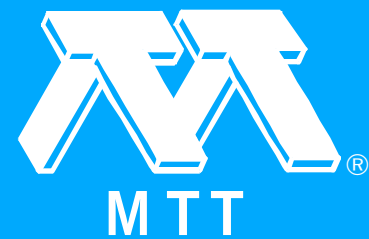
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Computer-Aided Design of Monolithic MESFET Distributed Amplifiers

M.-K. Vai and S. Prasad. "Computer-Aided Design of Monolithic MESFET Distributed Amplifiers." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 345-349.

A computerized optimization method called simulated annealing is applied to the design of monolithic distributed amplifiers. The element values in the small-signal equivalent circuit model of the MESFET's, the characteristics of the gate and drain transmission lines, and the number of stages are generated to match a specified frequency response by this computer-aided design (CAD) process. The success of this process lies in the fact that it is fully automatic and the only input needed is the desired flat band gain and the 3 dB point. The method itself is sufficiently general that it can be applied to a variety of design problems. Excellent agreement is shown when the distributed amplifier designed is simulated using Touchstone, a popular microwave simulation program.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

An MMAC C-Band FET Feedback Power Amplifier

A.K. Ezzeddine, H.-L.A. Hung and H.C. Huang. "An MMAC C-Band FET Feedback Power Amplifier." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 350-357.

A new feedback power amplifier using miniaturized microwave active circuit (MMAC) technology has been developed for satellite C-band applications. This design demonstrates for the first time that a strong negative feedback can be implemented in the microwave frequencies to improve amplifier linearity and output power over a 750 MHz bandwidth. The amplifier provides a third-order intermodulation distortion improvement of 7 to 9 dB across the band at backoff, compared to results obtained using the conventional approach without feedback. The theory, proof-of-concept experiment, design, and MMAC implementation of the feedback amplifier are presented.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Error-Corrected Large-Signal Waveform Measurement System Combining Network Analyzer and Sampling Oscilloscope Capabilities

G. Kompa and F. van Raay. "Error-Corrected Large-Signal Waveform Measurement System Combining Network Analyzer and Sampling Oscilloscope Capabilities." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 358-365.

A large-signal automatic stepped CW waveform measurement system for nonlinear device characterization is presented which combines the high accuracy of a vector network analyzer with the waveform measurement capabilities of a sampling oscilloscope. A large-signal error model and a corresponding coaxial calibration procedure are proposed to describe the systematic errors of the measurement setup. The error parameters and the correction algorithm are independent of the properties of the RF generator. System accuracy is investigated by Schottky diode verification measurements with different offsets toward the reference plane. GaAs MESFET reflection and transmission response measurements with error correction extended to the planar DUT reference planes are given.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Read Versus Flat Doping Profile Structures for the Realization of Reliable High-Power, High-Efficiency 94 GHz IMPATT Sources

C. Dalle and P.-A. Rolland. "Read Versus Flat Doping Profile Structures for the Realization of Reliable High-Power, High-Efficiency 94 GHz IMPATT Sources." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 366-372.

The potential RF performance of various types of silicon IMPATT homojunction structures has been systematically investigated in order to define the one that is most efficient for reliable high-power, high-efficiency CW generation in the 94 GHz window. The comparison has been carried out by means of an IMPATT oscillator model accounting, in a self-consistent manner, for both the thermal limitation and the diode impedance matching. The main result is that in contrast to lower operating frequencies, the realization of a Read doping profile does not improve the RF performance level compared to flat doping profile structures. High RF emitted performance has been predicted under optimum operating conditions. In addition, the fundamental influences on RF performance of both the diode thermal resistance and RF losses have been quantified.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Conservation of Complex Power Technique for Waveguide Junctions with Finite Wall Conductivity

J.D. Wade and R.H. MacPhie. "Conservation of Complex Power Technique for Waveguide Junctions with Finite Wall Conductivity." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 373-378.

Scattering at the junction of two waveguides with finite wall conductivity is rigorously treated using E-field mode matching and the conservation of complex power technique. At the transverse junction discontinuity between the two waveguides the complex power absorbed by the junction wall is taken into account along with the usual transfer of complex power from one guide to the other. This leads to a generalized form of the scattering matrix [S] of the lossy junction which incorporates the surface impedance Z_{m} , of the transverse metallic wall, assumed to be a good conductor. The specific case of a copper transverse diaphragm with centered circular iris in X-band guide is considered and the equivalent TE_{10} shunt admittance is computed. Numerical results are also given for lossy X-band cavity resonators with circular coupling holes.

[Click on title for a complete paper.](#)



Abstracts

Transmission Line Matrix Modeling of Dispersive Wide-Band Absorbing Boundaries with Time-Domain Diakoptics for S-Parameter Extraction

Eswarappa, G.I. Costache and W.J.R. Hoefer. "Transmission Line Matrix Modeling of Dispersive Wide-Band Absorbing Boundaries with Time-Domain Diakoptics for S-Parameter Extraction." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 379-386.

A numerical modeling procedure based on Johns' time-domain diakoptics approach has been developed for efficient transmission line matrix (TLM) analysis of two-dimensional microwave circuits by introducing space interpolation techniques. Frequency dispersive boundaries are represented in the time domain by their characteristic impulse response or numerical Green's function (Johns matrix). Almost perfect wide-band absorbing boundary conditions have been obtained with this technique, permitting accurate characterization of waveguide discontinuities and components. The application of these techniques saves considerable computer run time and memory when compared with conventional TLM analysis.



[Contents](#)

[Publications](#)

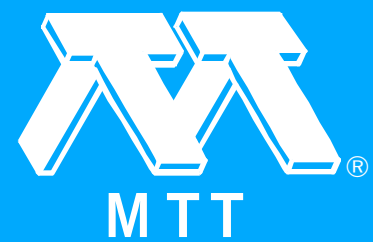
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Attenuation and Dispersion for High-T/_c/ Superconducting Microstrip Lines

E.B. Ekholm and S.W. McKnight. "Attenuation and Dispersion for High-T/_c/ Superconducting Microstrip Lines." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 387-395.

We have calculated the attenuation and dispersion of microstrip lines of the high-T/_c/ superconductor YBa/₂/Cu/₃/O/₇/ (YBCO) on yttria-stabilized zirconia (YSZ) substrates as a function of frequency and temperature. YBCO is modeled as a BCS superconductor with a critical temperature T/_c/ = 90 K and a superconducting energy gap 2Δ = 4.5kT/_c/. The effect on pulse propagation of superconducting and modal dispersion in addition to the attenuation is demonstrated. At 60 K, microstrip lines of YBCO are significantly less attenuating at frequencies below 500 GHz than microstrip lines of copper at the same temperature. This advantage is particularly significant at the higher attenuations that result as the substrate thickness is made smaller for miniaturization or to improve the microstrip line bandwidth. The application of YBCO for microstrip lines appears to be most useful at frequencies above 100 GHz and dielectric thicknesses less than 100 μm, where the attenuation of cooled copper is prohibitively large. Cooled to temperatures below 20K, YBCO may make possible a new generation of extremely high bandwidth (~5 THz), small feature size (~5 μm) circuits and devices.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Isolation Effects in Single- and Dual-Plane VLSI Interconnects

L. Carin and K.J. Webb. "Isolation Effects in Single- and Dual-Plane VLSI Interconnects." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 396-404.

The issue of interline coupling in high-speed VLSI interconnects is addressed. A full-wave-based technique is used to numerically solve for the modes and hence the line voltages and currents for multiconductor microstrip. The accuracy of these results is compared with time-domain experimental data. Isolation lines placed between signal lines and grounded at both ends are considered as a means of significantly reducing crosstalk. It is shown that the performance of such lines depends on several factors such as relative mode velocities, signal rise and fall times, and line length. These points are illuminated by considering the effects of isolation lines in two geometries of interest in high-speed integrated circuits. On the basis of these results one can determine the usefulness of isolation lines for a given geometry.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Characterization of a 90° Microstrip Bend with Arbitrary Miter via the Time-Domain Finite Difference Method

J. Moore and H. Ling. "Characterization of a 90° Microstrip Bend with Arbitrary Miter via the Time-Domain Finite Difference Method." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 405-410.

A 90° microstrip bend with an arbitrary miter is characterized using the finite difference time-domain (FDTD) method. To simplify computations, the microstrip structure is enclosed by four electric walls; thus radiation effects are neglected. Time histories generated by FDTD are Fourier-transformed to yield broad-band S parameters of the microstrip bend. A miter is introduced to improve the transmission characteristics of the bend, and an optimal miter length is found such that the reflection from the microstrip bend over a broad frequency range is minimized.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

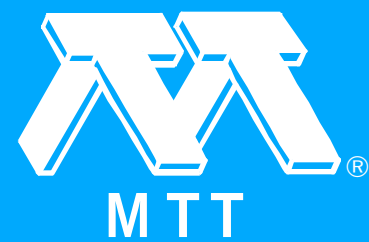
Improved Design of Multihole Directional Couplers Using an Iterative Technique

R.S. Elliott and Y.U. Kim. "Improved Design of Multihole Directional Couplers Using an Iterative Technique." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 411-416.

The widely used first-order polynomial representation of the frequency response of a multihole directional coupler is assumed. The roots of this polynomial are displaced iteratively until a desired response is achieved. One possible outcome is a Chebyshev response, but the method is capable of improving on that result if all portions of the passband are not equally important. Further improvement can be achieved if the directivity is made to ripple around a somewhat higher level. This causes a minor sacrifice in bandwidth. Examples are given.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

The Scattering Parameters and Directional Coupler Analysis of Characteristically Terminated Asymmetric Coupled Transmission Lines in an Inhomogeneous Medium

K. Sachse. "The Scattering Parameters and Directional Coupler Analysis of Characteristically Terminated Asymmetric Coupled Transmission Lines in an Inhomogeneous Medium." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 417-425.

The scattering matrix of asymmetric coupled two-line structures in an inhomogeneous medium terminated in a set of impedances which are equal to the characteristic impedances of the individual, uncoupled lines has been derived in terms of the coupled-mode parameters. It has been proved that the structure can compose an ideal, backward-coupling directional coupler, perfectly matched and isolated at all frequencies, if the inductive $k_{\text{sub } L}$ and capacitive $k_{\text{sub } C}$ coupling coefficients of the coupled lines are equal. The effect of the nonideal equalization of the coupling coefficients on the coupler critical parameters is then investigated. The normal-mode parameters (mode numbers and mode impedances) in the proximity of the point when $k_{\text{sub } L} = k_{\text{sub } C}$ and at that point are also examined. Numerical results confirm the validity of the developed analysis and prove the possibility of a very high directivity asymmetrical coupler design.



Abstracts

MESFET Simulation Oriented Toward Computer-Aided Microwave Circuit Design (Short Papers)

P.A. Sandborn and P.A. Blakey. "MESFET Simulation Oriented Toward Computer-Aided Microwave Circuit Design (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 426-429.

This paper describes a MESFET simulator designed to link physically based transistor simulation to microwave circuit simulation within an integrated CAD environment. The key features of the simulator are efficient implementation of a large-signal time-domain device simulation kernel; incorporation of extensive postprocessing of raw time-domain data; and an interactive, graphics-oriented user interface. An example is presented that demonstrates the utility of the approach for assessing circuit models.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Jacobian Calculation Using the Multidimensional Fast Fourier Transform in the Harmonic Balance Analysis of Nonlinear Circuits (Short Papers)

P.L. Heron and M.B. Steer. "Jacobian Calculation Using the Multidimensional Fast Fourier Transform in the Harmonic Balance Analysis of Nonlinear Circuits (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 429-431.

A technique is developed whereby the gradient of frequency-domain simulation variables may be analytically determined using time-domain derivative information and the multidimensional fast Fourier transform. It is shown that this technique can be efficiently implemented when a circuit is driven by any number of incommensurate input frequencies. A harmonic balance simulator is constructed which uses this technique to determine the entries of the Jacobian matrix which are needed in a quasi-Newton iteration scheme. A significant reduction of simulation time is observed when compared with a harmonic balance simulator that uses matrix-multiplication-based transforms.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Harmonic Balance and Frequency-Domain Simulation of Nonlinear Microwave Circuits Using the Block Newton Method (Short Papers)

C.-R. Chang, P.L. Heron and M.B. Steer. "Harmonic Balance and Frequency-Domain Simulation of Nonlinear Microwave Circuits Using the Block Newton Method (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 431-434.

An efficient algorithm using block Newton and chord methods is presented for the iterative minimization of the spectral balance error in the analysis of nonlinear microwave circuits. This algorithm is used in the harmonic balance and frequency-domain, spectral balance simulation of a MESFET amplifier with single-tone and two-tone excitation.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

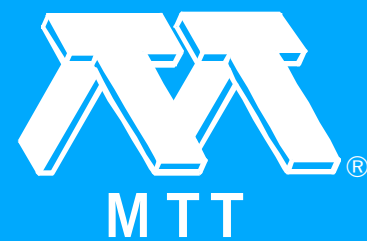


Abstracts

A New Resistance Measurement Technique Applicable to High-Temperature Superconducting Materials at Microwave Frequencies (Short Papers)

M.K. Skrehot and K. Chang. "A New Resistance Measurement Technique Applicable to High-Temperature Superconducting Materials at Microwave Frequencies (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 434-437.

A two-gap electrically floating resonant strip is used for surface resistance measurements of the high-temperature superconductor $\text{YBa}/\text{sub } 2/\text{Cu}/\text{sub } 3/\text{O}/\text{sub } 7\text{-}\delta/$. The method used is simple, has no electrical contact, operates at various resonant frequencies, and requires only a small sample. An analysis was used that allows for the accurate design of the strip dimensions to produce a desired resonant frequency. Experimental measurements on resonant frequencies in X- and Ku-bands (8-18 GHz) agree well with the calculations. The method allows one to extract the normalized surface resistance of the sample from transmission coefficient measurements at the resonant frequency. These normalized values were found to compare favorably to the Mattis-Bardeen theory taken in the local limit. The resonant strip in waveguide should have applications in high-temperature superconductive material characterization and in the development of waveguide superconductive filters.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Modal Analysis of Open Groove Waveguide (Short Papers)

S.F. Mahmoud. "Modal Analysis of Open Groove Waveguide (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 437-439.

A self-contained analysis for lower order modes in the open groove waveguide is presented. By adopting an approximate form for the fields in the outer region of the guide and then performing the remainder of the analysis rigorously, closed-form results for the fields and modal equation are obtained. The analysis allows a simple transverse network representation which can be compared with that obtained by Oliner and Lampariello. Universal dispersion curves, obtained numerically for the dominant mode, are presented.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Stripline to Microstrip Line Aperture Coupler (Short Papers)

G.V. Jogiraju and V.M. Pandharipande. "Stripline to Microstrip Line Aperture Coupler (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 440-443.

The paper presents the analysis of aperture coupling between stripline and microstrip line as a function of the electric and magnetic polarizabilities of the aperture using Bethe's small-aperture coupling theory. A coupling expression for the general case of an aperture in the common ground plane is derived. Coupling variations with aperture dimensions for the case of a thin slot, a hole, a diamond, a rounded end slot, and an ellipse are determined using McDonald's polynomial approximations for the electric and magnetic polarizability for small apertures. Experimental results for the case of a thin slot and a circular aperture are also presented.

[Click on title for a complete paper.](#)



Abstracts

Additional Approximate Formulas and Experimental Data on Micro-Coplanar Striplines (Short Papers)

Y. Qian and E. Yamashita. "Additional Approximate Formulas and Experimental Data on Micro-Coplanar Striplines (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 443-445.

Additional approximate design formulas and experimental data of micro-coplanar striplines, which have recently been proposed for high-packing-density MMIC's, are given in this paper to be applied to four types of substrate materials GaAs, plastics, and alumina with different dielectric constants.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Reflection of Electromagnetic Waves from Rough Waveguides (Short Papers)

R. Garcia-Molina, J. Ruiz, R. Chicon, M. Ortuno and J.M.F. Gunn. "Reflection of Electromagnetic Waves from Rough Waveguides (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 445-448.

The reflection coefficient of a section of randomly rough waveguide is calculated by using a coordinate transformation developed by Mallick and Sanyal. We perform a perturbation analysis, assuming that the amplitude of the roughness is small compared to the average width of the waveguide. A drastic difference at long wavelengths between TEM on the one hand and TE and TM on the other has been found.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Spectral Estimation for the Transmission Line Matrix Method (Short Papers)

J.D. Wills. "Spectral Estimation for the Transmission Line Matrix Method (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 448-451.

Spectral estimation for the transmission line matrix (TLM) method by use of the discrete Fourier transform and fast Fourier transform is reviewed. Error bounds are given and checked by means of a numerical example. A new spectral estimation method based on Prony's method is presented for use with TLM. A numerical example shows that the new method allows an order of magnitude reduction in the number of iterations in the TLM method for equal accuracy.

[Click on title for a complete paper.](#)



Abstracts

Refraction at a Curved Dielectric Interface Geometrical Optics Solution (Comments) (Apr. 1990 [T-MTT])

A.A. Saleeb. "Refraction at a Curved Dielectric Interface Geometrical Optics Solution (Comments) (Apr. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 452-453.

In the above paper the authors solved the problem of transmission of a spherical or plane wave through an arbitrary curved dielectric interface.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits (Comments and Reply)

R. Marks, R.R. Pantoja, M.J. Howes, J.R. Richardson and R.D. Pollard. "Improved Calibration and Measurement of the Scattering Parameters of Microwave Integrated Circuits (Comments and Reply)." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 453-454.

The above paper proposes "generalized TRL" as an alternative to the TRL and LRL calibration methods. The contributions of the work, according to the authors, are "the reformulation in terms of S parameters and the removal of the requirement to specify a line length." In fact, it appears that only the formulation, not the method itself, is novel.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts

Patent Abstracts (Apr. 1990 [T-MTT])

"Patent Abstracts (Apr. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 455-461.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

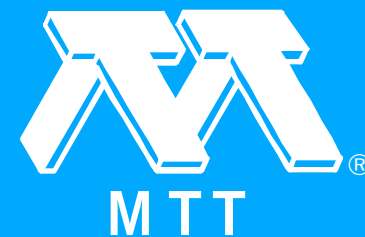
Click on title for a complete paper.



Abstracts

Call for Papers - 1990 IEEE GaAs IC Symposium (Apr. 1990 [T-MTT])

"Call for Papers - 1990 IEEE GaAs IC Symposium (Apr. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 462-462.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

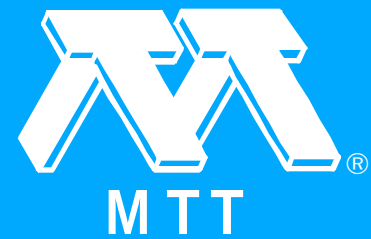
Click on title for a complete paper.



Abstracts

Call for Papers - Directions in Design and Applications of Microwave Systems (Apr. 1990 [T-MTT])

"Call for Papers - Directions in Design and Applications of Microwave Systems (Apr. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 463-463.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

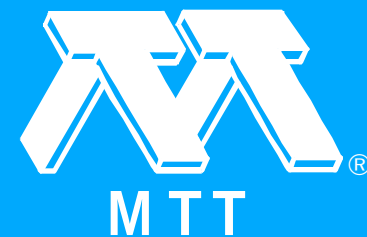
Click on title for a complete paper.



Abstracts

Call for Papers - Microwave Applications of Superconductors (Apr. 1990 [T-MTT])

"Call for Papers - Microwave Applications of Superconductors (Apr. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): 464-464.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

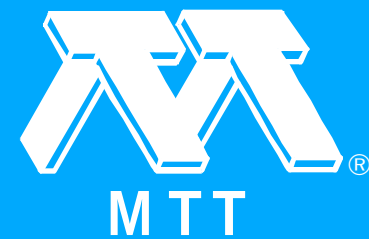
Click on title for a complete paper.



Abstracts

Back Cover (Apr. 1990 [T-MTT])

"Back Cover (Apr. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.4 (Apr. 1990 [T-MTT]): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

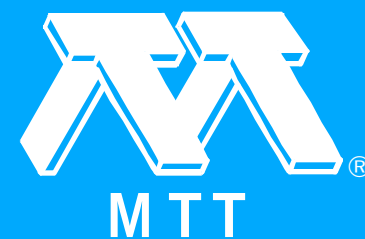
Click on title for a complete paper.



Abstracts

Front Cover (May 1990 [T-MTT])

"Front Cover (May 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): f1-f2.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

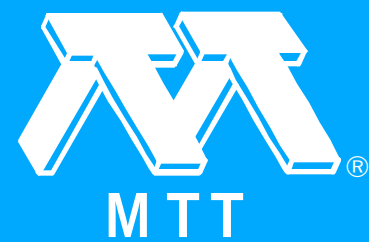
Guest Editorial (May 1990 [T-MTT])

P.R. Herczfeld. "Guest Editorial (May 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 465-466.

The most dramatic advances today in electronics are in very high speed (picosecond) circuits and in photonics. The extensive effort in monolithic microwave integrated circuits (MMIC's) will have a profound effect on high-speed, high-frequency analog and digital components and systems. Rapid progress in photonics and associated lightwave technologies, such as fiber optics, image processing, and high-speed parallel computing, are already making a significant impact in communications, surveillance, computer networking, office and factory automation, and medicine. The interface between these two major areas, lightwave and microwave technologies, is therefore a growing area of interest. Consequently, this special joint issue of the IEEE Transactions on Microwave Theory and Techniques and the Journal of Lightwave Technology is devoted to Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Optical Synchronization of Millimeter-Wave Oscillators for Distributed Architectures

A.S. Daryoush. "Optical Synchronization of Millimeter-Wave Oscillators for Distributed Architectures." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 467-476.

Future generations of communication and surveillance platforms will be based on large-aperture phased array antennas composed of many active-MMIC-based transmit/receive modules. This paper concerns the phase and frequency coherency of these modules. A review of various methods of phase and frequency synchronization of active modules is presented, and particular emphasis is placed on the synchronization of oscillators through the use of an indirect subharmonic optical injection locking technique. In this approach, the nonlinear behavior of both large-signal modulated laser diodes and solid-state oscillators is exploited to extend the bandwidth of the synchronizing link to the millimeter-wave frequency range. Experimental results of the phase and frequency coherency of two 21.5 GHz FET oscillators are also reported here. Optimum performance has been achieved at a subharmonic factor of 1/4, with a locking range of 84 MHz and a phase noise degradation of only 14 dB. The phase coherency measurement of two injection-locked oscillators points to a phase shift, which is introduced as a result of the frequency detuning between the slave and master oscillator signals. A scheme to correct for this phase error is also presented.



Abstracts

Integrated Optic Devices for Microwave Applications

T. Sueta and M. Izutsu. "Integrated Optic Devices for Microwave Applications." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 477-482.

Integrated optic devices designed for use in microwave applications are reviewed and the prospects for these new technologies are discussed. The interaction of lightwave and microwave signals, especially the modulation of light at microwave frequencies, is briefly summarized, and features of integrated optic devices are pointed out.



IEEE

Contents

Publications

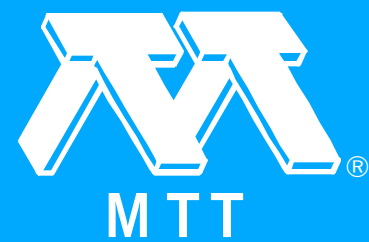
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

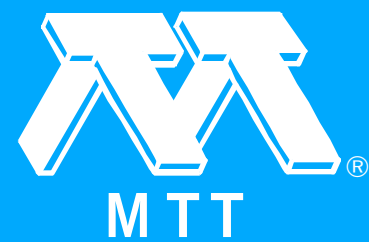
Authors

High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals

J. Lipson, L.C. Upadhyayula, S.-Y. Huang, C.B. Roxlo, E.J. Flynn, P.M. Nitzsche, C.J. McGrath, G.L. Fenderson and M.S. Schaefer. "High-Fidelity Lightwave Transmission of Multiple AM-VSB NTSC Signals." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 483-493.

In this paper we report on progress towards developing AM lightwave links for the transmission of multiple TV signals. While the signal quality objectives and transmission distances are appropriate for the CATV trunking application, the technology is ultimately expected to have applicability to the distribution of video signals in the subscriber loop. Highly linear 1.3 μm DFB lasers, designed expressly for analog requirements, were used to transmit 42 continuous wave carriers according to the standard U.S. CATV frequency plan. For our best lasers, when evaluated over 12 km of fiber, carrier to noise, composite second-order distortion, and composite triple beat were >52 dB, >70 dBc, and >70 dBc, respectively. The relationship between measurements with CW carriers and actual video signals is discussed. System design rules are offered. Properties that lead to superior analog performance are discussed. Data from >700 links indicate that composite third-order distortion generally scales with product count but that composite second-order distortion has a significant frequency-dependent component.





IEEE

Contents

Publications

Issues

Papers

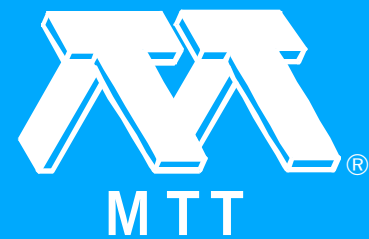
Authors

Frequency Division Multiplexed Microwave and Baseband Digital Optical Fiber Link for Phased Array Antennas

P.J. Heim and C.P. McClay. "Frequency Division Multiplexed Microwave and Baseband Digital Optical Fiber Link for Phased Array Antennas." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 494-500.

A frequency division multiplexed optical fiber link is described in which microwave (1 to 8 GHz) and baseband digital (1 to 10 Mb/s) signals are combined electrically and transmitted through a direct modulation microwave optical link. The microwave signal does not affect bit error rate (BER) performance of the Manchester-coded baseband digital data link. The baseband digital signal affects microwave signal quality by generating second-order intermodulation noise. The intermodulation noise power density is found to be proportional to both the microwave input power and the digital input power, enabling the system to be modeled as a mixer (AM modulator). The conversion loss for the digital signal is approximately 68 dB for a 1 GHz microwave signal and is highly dependent on the microwave frequency, reaching a minimum value of 41dB at 4.5 GHz, corresponding to the laser diode relaxation oscillation frequency. We show that Manchester coding on the digital link places the intermodulation noise peak away from the microwave signal, preventing degradation of close carrier phase noise (<1 kHz offset). A direct trade-off between intermodulation noise and digital link margin is developed to project system performance.





IEEE

Contents

Publications

Issues

Papers

Authors

An Analytic and Experimental Comparison of Direct and External Modulation in Analog Fiber-Optic Links

C.H. Cox, III, G.E. Betts and L.M. Johnson. "An Analytic and Experimental Comparison of Direct and External Modulation in Analog Fiber-Optic Links." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 501-509.

Analytic lumped-element small-signal models of directly and externally modulated analog fiber-optic links have been derived. Incremental modulation efficiency is defined and used to compare the performance of these modulation techniques. In experiments to optimize link RF-to-RF gain and noise figure, the measurements obtained agreed with calculations to within ± 1 dB. The externally modulated link was operated with two different impedance matching circuits. With a low-pass match the bandwidth was 150 MHz, and the link transducer gain was 1 dB with a band-pass match the bandwidth was 22 MHz, the link transducer gain was 11 dB, and the noise figure was 6 dB. The directly modulated link was operated with a low-pass match. In this case, the bandwidth was 1 GHz, the link transducer gain was -14 dB, and the noise figure was 33 dB. These experimental results were achieved with no amplification and represent a significant improvement in performance over previously reported analog fiber-optic links.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

High-Speed Fiber-Optic Links for Distribution of Satellite Traffic

A.S. Daryoush, E. Ackerman, R. Saedi, R. Kunath and K. Shalkhauser. "High-Speed Fiber-Optic Links for Distribution of Satellite Traffic." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 510-517.

Large-aperture phased array antennas operating at millimeterwave frequencies are designed for space-based communications and imaging platforms. Array elements are comprised of active T/R modules which are linked to the central processing unit through high-speed fiber-optic networks. The system architecture that best satisfies system requirements at millimeter-wave frequencies is T/R level data mixing, in which data frequency and reference signals are distributed independently before mixing at the T/R modules. This paper demonstrates the design procedures for a low-loss, high-speed fiber-optic link used for transmission of data signals over a 500-1000 MHz bandwidth as part of a data link in the T/R level mixing architecture. The FO link is characterized for transmission of analog and digital data. A dynamic range of 88 dB/MHz was measured for analog data over this bandwidth. On the other hand, for bursted SMSK satellite traffic at 200 Mb/s rates, a BER of 10^{-9} was measured for E_b/N_0 of 15.5 dB.



Abstracts

Microwave Packaging of Optoelectronic Components

J. Schlafer and R.B. Lauer. "Microwave Packaging of Optoelectronic Components." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 518-523.

The design and performance characteristics of single-mode fiber-coupled laser and photodiode packages suitable for use in microwave RF or broad-band transmission systems are discussed. The necessary packaging considerations to achieve laser and photodiode performance to 20 GHz are described. Mechanical, thermal, optical, and microwave details of two laser packages and one photodiode package are given and the optoelectronic characteristics of the packaged units are presented and discussed. It is seen that the intrinsic optoelectronic performance of the components is preserved to at least 20 GHz and that this performance is not affected by package design.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Lightwave Subcarrier CATV Transmission Systems

T.E. Darcie and G.E. Bodeep. "Lightwave Subcarrier CATV Transmission Systems." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 524-533.

We describe the design and performance of multichannel AM-VSB lightwave CATV systems. Requirements on linearity and noise are derived, and factors limiting the performance of the laser transmitters and receivers are discussed. For high-performance lasers the carrier to-noise ratio and composite second- and third-order distortions are acceptable for video trunk systems. Impairments because of fiber reflections and dispersion and mode partition fluctuations in the laser are discussed. Feedforward, feedback, and predistortion are discussed, but difficulties with each prevent immediate application. Finally, the use of LiNbO₃/sub 3/ external modulators and high-power solid-state lasers is considered. The third-order distortion and insertion loss of the modulator more than counteract the high available laser power (100 mW), making this alternative unattractive unless a third-order linearizer can be implemented.



Abstracts

Applications of Traveling-Wave Laser Amplifiers in Subcarrier Multiplexed Lightwave Systems

W.I. Way, C.-E. Zah and T.-P. Lee. "Applications of Traveling-Wave Laser Amplifiers in Subcarrier Multiplexed Lightwave Systems." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 534-545.

Applications of traveling-wave laser amplifiers in subcarrier multiplexed lightwave systems, for the distribution of multiple channels of FM and AM-VSB video signals, are described. Both experimental results and a general analysis on the video carrier-to-noise ratio are presented. Other important system design considerations associated with using TWLA's are also discussed.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Tuned Optical Receivers for Microwave Subcarrier Multiplexed Lightwave Systems

K.E. Alameh and R.A. Minasian. "Tuned Optical Receivers for Microwave Subcarrier Multiplexed Lightwave Systems." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 546-551.

An analysis of tuned optical receiver noise performance for microwave subcarrier multiplexed lightwave systems is presented. The effect of correlation between the gate and the drain HEMT noise sources is included, and the design of tuning networks to obtain partial noise cancellation is investigated. An optimization algorithm is used to determine the tuning element values for minimizing noise. Improvements in noise of 16 dB for a 60 video channel SCM system, and 12 dB for a 120 channel system are demonstrated, allowing a significant increase in passive optical network distribution capacity, and design results for tuned front-end receivers encompassing the effects of p-i-n, HEMT and SCM band parameters are presented.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Optical Test Set for Microwave Fiber-Optic Network Analysis

D.D. Curtis and E.E. Ames. "Optical Test Set for Microwave Fiber-Optic Network Analysis." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 552-559.

An optical test set is presented which can be used with any vector network analyzer for measuring microwave transmission and reflection scattering parameters of fiber-optic components. Measurement configurations and operating characteristics are discussed. Calibration of the network analyzer, which is performed using fiber-optic offset shorts, matched load, and thru calibration standards, is discussed, reflection error terms are computed, and de-embedding relations are given for transmission and reflection measurements. A frequency response normalization is also presented as an alternative means of de-embedding reflection magnitude and phase. Accuracy limitations are addressed in terms of connector repeatability, calibration repeatability, accuracy of the calibration standards, test set dynamic range, and resolution. S matrices measured at 2.0 GHz are also presented to illustrate the utility of characterizing fiber-optic components in terms of microwave performance when designing a microwave fiber-optic network.





IEEE

Contents

Publications

Issues

Papers

Authors

Magnetostatic-Forward-Volume-Wave-Based Guided-Wave Magneto-Optic Bragg Cells and Applications to Communications and Signal Processing

C.S. Tsai and D. Young. "Magnetostatic-Forward-Volume-Wave-Based Guided-Wave Magneto-Optic Bragg Cells and Applications to Communications and Signal Processing." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 560-570.

In this paper realization of magnetostatic forward volume wave (MSFVW) based guided-wave magneto-optic (MO) Bragg cells and their applications to communications and signal processings are reported. First, Bragg diffraction of guided optical waves from the MSFVW in a noncollinear coplanar geometry is analyzed. The design of microstrip line transducers that facilitate wide-band MO Bragg diffraction with electronically tunable microwave carrier frequencies (2.0 to 12.0 GHz) is then briefly discussed. Subsequently, the experimental results obtained with the resulting Bragg cells in both pure and bismuth-doped YIG waveguides and a comparison to the theoretical predictions are presented. Finally, applications of the MO Bragg cells to light beam modulation, scanning/switching, and RF spectral analysis are presented in detail.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Optoelectronic Isolator for Microwave Applications

D.B. Huff and J.P. Anthes. "Optoelectronic Isolator for Microwave Applications." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 571-576.

A new family of devices is described. The microwave characteristics of high-speed semiconductor laser diodes and photodiodes allow the design of low-loss isolators at high frequencies. A prototype optoelectronic isolator has achieved, for the first time, forward transmission gain without the need for auxiliary amplification. The unilateral transformation between electrical and optical regimes has produced a device with high isolation (>80 dB) and 0.13 dB gain. Prototype characteristics are compared to analytic models.

[Click on title for a complete paper.](#)

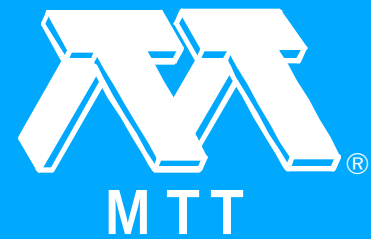


Abstracts

Optical Control of Microwave Semiconductor Devices

A.J. Seeds and A.A.A. de Salles. "Optical Control of Microwave Semiconductor Devices." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 577-585.

The use of optical signals to control the operation of microwave amplifiers, oscillators, switches, and mixers is reviewed. Among the active devices treated are Gunn and IMPATT oscillators, MESFET and HEMT amplifiers, oscillators, and mixers, and diode mixers. Future directions for research in this area are discussed.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Optically Controlled Coplanar Waveguide Phase Shifters

P. Cheung, D.P. Neikirk and T. Itoh. "Optically Controlled Coplanar Waveguide Phase Shifters." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 586-595.

This paper reviews the progress and ongoing development of optically controlled phase shifters, primarily those based on the use of coplanar waveguide (CPW) printed on semiconductor substrates. We first qualitatively describe slow-wave phenomena in such guides, their possible use to produce variable phase shifts, and several different approaches using these phenomena to implement phase shifters. Two main techniques, one based on the use of Schottky-contacted CPW electrodes and the other on optically generated carriers, are discussed, together with the experimental performance of prototype devices using these control mechanisms. Finally, we discuss a newer technique, based on the combined use of Schottky contacts and optical illumination. Preliminary results on such a device indicate that this technique is a promising alternative to a purely Schottky contact or purely optical control while preserving advantages of both techniques.

[Click on title for a complete paper.](#)



Abstracts

Picosecond Optics and Microwave Technology

C.H. Lee. "Picosecond Optics and Microwave Technology." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 596-607.

Progress in the application of ultrafast optics to microwave and millimeter-wave technology using picosecond photoconductors is reviewed. The generation, control, and characterization of both pulsed and CW high-frequency waves using a frozen wave generator, an impulse excited resonator, and a spectral filter are presented. A time-domain network analyzer which uses optoelectronic techniques for on-wafer monolithic microwave and millimeter-wave integrated circuit measurements is described.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Millimeter-Wave Generation and Characterization of a GaAs FET by Optical Mixing

D.C. Ni, H.R. Fetterman and W. Chew. "Millimeter-Wave Generation and Characterization of a GaAs FET by Optical Mixing." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 608-614.

Coherent mixing of optical radiation from a tunable CW dye laser and a stabilized He-Ne laser was used to generate millimeter-wave signals in GaAs FET's attached to printed circuit millimeter-wave antennas. The generated signal was further down-converted to a 2 GHz IF by an antenna-coupled millimeter-wave LO at 62 GHz. Detailed characterizations of power and S/N under different bias conditions have been performed. This technique is expected to allow signal generation and frequency-response evaluation of millimeter-wave devices at frequencies as high as 100 GHz.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Broad-Band Microwave Measurements with Transient Radiation from Optoelectronically Pulsed Antennas

G. Arjavalingam, Y. Pastol, J.-M. Halbout and G.V. Kopcsay. "Broad-Band Microwave Measurements with Transient Radiation from Optoelectronically Pulsed Antennas." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 615-621.

A broad-band microwave measurement technique, based on picosecond transient radiation from optoelectronically pulsed antennas is described. It is performed with exponentially tapered coplanar stripline antennas which are integrated with the photoconductive devices used for ultrafast pulse generation and sampling. The signal analysis required for deriving the desired physical properties from the measured time-domain waveforms is discussed. This is a coherent technique that independently determines both the real and the imaginary parts of the dielectric constants of materials, from 10 to 130 GHz, in a single experiment. Some representative results are presented.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Generation and Shaping of Megawatt High-Voltage Pulses by Optoelectronic Technique

H.A. Sayadian, S. Feng, J. Goldhar and C.H. Lee. "Generation and Shaping of Megawatt High-Voltage Pulses by Optoelectronic Technique." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 622-628.

A composite miniature structure is used to generate megawatt electrical pulses. Two photoconductive switches (one GaAs and the other Si) are used, along with voltage multiplication and pulse forming lines, to generate over 14 kV pulses from a dc bias of only 9 kV. These megawatt pulses have picosecond synchronization and can vary in width from nanoseconds to picoseconds.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Electromagnetic and Transport Considerations in Subpicosecond Photoconductive Switch Modeling

S.M. El-Ghazaly, R.P. Joshi and R.O. Grondin. "Electromagnetic and Transport Considerations in Subpicosecond Photoconductive Switch Modeling." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 629-637.

It is now possible to use optoelectronic techniques to both generate and measure electrical waveforms with subpicosecond rise times. These rise times invalidate assumptions commonly made in developing equivalent circuit models for transmission lines and other simplifications commonly made in modeling conductivity. In this paper we discuss how a combination of direct finite-difference time-domain solutions of Maxwell's equations and Monte Carlo models of photocarrier transport can be used to avoid making these assumptions.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Periodic-Structure Photoexcitation of a Silicon Coplanar Waveguide for Selective Optoelectronic Microwave Control

W. Platte. "Periodic-Structure Photoexcitation of a Silicon Coplanar Waveguide for Selective Optoelectronic Microwave Control." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 638-646.

A detailed analysis of the microwave Bragg reflection characteristics of a periodically CW-photoexcited coplanar waveguide on silicon substrate, with special regard to the inherent carrier diffusion mechanisms, is presented. In particular, the carrier diffusion in the direction of wave propagation can strongly affect the stopband reflection spectra of the configuration with respect to magnitude and bandwidth, or efficiency and selectivity, respectively. The dominant effects are studied quantitatively and are outlined in the form of practical performance diagrams. From this, future application of periodically photoexcited transmission line sections for light-induced tunable filters or Bragg reflectors may be inferred. Initial experimental results from a three-section periodic structure of 17 GHz center frequency under 840 nm LED CW excitation are reported.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Optical Fiber Fabry-Perot Cavities and Recirculating Delay Lines as Tunable Microwave Filters

C.-L. Chen. "Optical Fiber Fabry-Perot Cavities and Recirculating Delay Lines as Tunable Microwave Filters." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 647-653.

When an optical interferometer is excited by amplitude-modulated light with a sufficiently long coherence length, there may be the interference of the optical carrier and that of the modulation signals. Two interference effects can be combined to give complicated characteristics at the modulation frequency, which may be in the radio frequency or the microwave range. In this work, the radio frequency or microwave responses of single-mode fiber Fabry-Perot cavities and recirculating delay lines are studied. It is shown that fiber Fabry-Perot cavities may be used as band-pass filters and the recirculating delay lines as band-stop filters at radio or microwave frequencies. These electric filters are tunable by electro-optic effects since the band-pass or band-stop characteristic changes when the cavity or the delay line length is varied by a few tenths of an optical wavelength. The ultimate limit on speed of tuning is set by the coherence time of the light source. The dependence of the filter responses on the spectral purity of light is also studied.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Dispersion Characteristics of Optically Excited Coplanar Striplines: Pulse Propagation

D.S. Phatak and A.P. Defonzo. "Dispersion Characteristics of Optically Excited Coplanar Striplines: Pulse Propagation." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 654-661.

This paper analyzes the propagation of optically excited picosecond electrical pulses on coplanar striplines. A full-wave analysis method that includes dispersion and losses over terahertz bandwidths is outlined. Results of the full-wave analysis are interpreted in terms of the underlying physical phenomena. The full-wave analysis reveals the existence of peaks in the dispersion curve of the coplanar stripline. These are interpreted in terms of the onset and coupling of the substrate modes to the transmission line mode. Results of the full-wave analysis are in good agreement with those obtained by established theory. Pulse propagation is simulated using the dispersion and loss data obtained from the analysis and accounts for all the relevant mechanisms. Results of simulations are compared with experimental data available in the literature for normal as well as superconducting lines. It is demonstrated that the superconducting phenomena are not dominant, whereas modal dispersion and substrate losses dominate the evolution of the output pulse and must be included for accurate modeling of pulse propagation on coplanar striplines.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Reduced Insertion Loss of X-Band RF Fiber-Optic Links (Short Papers)

H. Blauvelt, D.B. Huff, G.J. Stern and I.L. Newberg. "Reduced Insertion Loss of X-Band RF Fiber-Optic Links (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 662-664.

Fiber-optic links offer the promise of providing the microwave system designer with new flexibility and capabilities for use in radar and avionics systems. Results presented in this paper show a significant reduction in link RF insertion loss from the typical 40 dB at X-band (9 GHz) to 7 dB with a 3 dB bandwidth of 800 MHz while maintaining a signal-to-noise ratio (SNR) greater than 125 dBc/Hz. This 33 dB improvement can lead the way to many uses of fiber optics in microwave designs, especially for short-distance applications, where currently used waveguide or coax cables have low insertion loss.

[Click on title for a complete paper.](#)



Abstracts

Long Microwave Delay Fiber-Optic Link for Radar Testing (Short Papers)

I.L. Newberg, C.M. Gee, G.D. Thurmond and H.W. Yen. "Long Microwave Delay Fiber-Optic Link for Radar Testing (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 664-666.

A long fiber-optic delay line is used as a radar repeater to improve radar testing capabilities. The first known generation of 152 μ s delayed ideal target at X-band (10 GHz) frequencies having the phase stability and signal-to-noise ratio (SNR) needed for testing modern high-resolution Doppler radars is demonstrated with a 31.6 km experimental externally modulated fiber-optic link with a distributed-feedback (DFB) laser.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Optical Generation, Distribution, and Control of Microwaves Using Laser Heterodyne (Short Papers)

G.J. Simonis and K.G. Purchase. "Optical Generation, Distribution, and Control of Microwaves Using Laser Heterodyne (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 667-669.

Results are presented which demonstrate the optical generation and transmission of a microwave signal by mixing two high-quality optical signals from diode-laser-pumped Nd:YAG ring lasers, resulting in a narrow microwave line width (less than 5 kHz line width at 3 dB and less than -115 dBc/Hz at 300 kHz from line center) and broad microwave tunability (dc to 52 GHz). A III-V semiconductor waveguide with a doping superlattice active region is used to optoelectronically provide 20 dB of amplitude control and up to 5pi of phase shift. This approach can be straightforwardly implemented using integrated optics and fiber-optic links for control of phased array antenna elements.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Distortion Characteristics of Optical Directional Coupler Modulators (Short Papers)

T.R. Halemane and S.K. Korotky. "Distortion Characteristics of Optical Directional Coupler Modulators (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 669-673.

Waveguide electrooptic modulators are of much interest for analog optical transmission. Here, a theoretical analysis of the nonlinearities of the intensity modulation response of the optical directional coupler as a function of bias point for the case of phase-mismatch modulation is made and the results are compared with those of interferometric modulators. The interferometric, standard 2×2 directional coupler and the 1×2 y-fed directional coupler modulators are shown to exhibit very similar intermodulation distortion effects. At 4% optical modulation depth, the third-order intermodulation products are -74 dB, -72 dB, and -73.6 dB, respectively, below the carrier level.

Click on title for a complete paper.



Abstracts

Novel Wide-Bandwidth Matching Technique for Laser Diodes (Short Papers)

A. Ghiasi and A. Gopinath. "Novel Wide-Bandwidth Matching Technique for Laser Diodes (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 673-675.

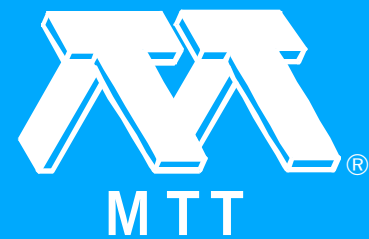
This paper describes a low-loss microstrip matching circuit with large bandwidth for connecting a laser diode of nominal impedance of 2 Ω to a 50 Ω system. The technique utilizes a microstrip Chebyshev transformer without very wide line widths to obtain the match at a center frequency of 10.5 GHz with a bandwidth of 9 GHz, an insertion loss of less than 1.5 dB, and a reflection coefficient of better than -10 dB.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

An Infrared Fiber-Optic Radiometer for Controlled Microwave Heating (Short Papers)

S. Drizlikh, A. Zur and A. Katzir. "An Infrared Fiber-Optic Radiometer for Controlled Microwave Heating (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 675-677.

An infrared fiber-optic radiometer was used as a linear feedback element for noncontact temperature control of a microwave heating system. The temperature of water was monitored and maintained at about 42° C with a standard deviation of $\pm 0.15^\circ$ C and a maximum deviation of $\pm 0.45^\circ$ C. This controlled system would be very useful for medical, industrial, and domestic applications.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

InGaAsP DC-PBH Semiconductor Laser Diode Frequency Response Model (Short Papers)

A.A.A. de Salles. "InGaAsP DC-PBH Semiconductor Laser Diode Frequency Response Model (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 677-679.

A simple and accurate model for the frequency response of InGaAsP double-channel planar buried heterostructure semiconductor laser diodes intensity modulated in the microwave range is presented. It is shown that the parasitic capacitance associated with the reverse-biased blocking junction can significantly reduce the 3 dB modulation bandwidth. The results obtained and alternatives to improve the high-frequency performance are discussed and compared to experiments.

[Click on title for a complete paper.](#)



Abstracts

Design and Applications of Optically Controllable Finline Structures (Short Papers)

K. Uhde and R. Eimertenbrink. "Design and Applications of Optically Controllable Finline Structures (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 679-683.

This paper describes the design of finline structures on a semiconducting substrate. Using high-resistivity silicon and gallium arsenide substrates, insertion losses between 1dB and 2 dB have been achieved. By illuminating the slot region with a laser diode, attenuators and/or switches with on-off ratios up to -40 dB have been realized in the 26.5-40 GHz region. The attenuation, phase shift, and switching times are given. Further application are also discussed.



IEEE

Contents

Publications

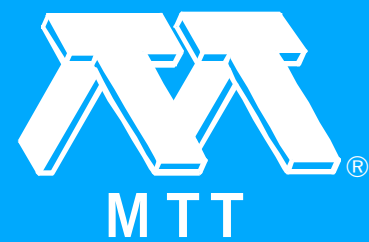
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT (Short Papers)

M. Matloubian, H. Fetterman, M. Kim, A. Oki, J. Camou, S. Moss and D. Smith. "Picosecond Optoelectronic Measurement of S Parameters and Optical Response of an AlGaAs/GaAs HBT (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 683-686.

The S parameters of an AlGaAs/GaAs heterojunction bipolar transistor (HBT) were measured using a picosecond optoelectronic system. The measured S parameters show qualitatively good agreement with those obtained using a conventional vector network analyzer. The optical response of the HBT was also measured using this system by directly illuminating the base-collector region. Used as a phototransistor, the HBT showed pulse widths with FWHM as short as 15 ps.

Click on title for a complete paper.



Abstracts

Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect (Short Papers)

K.B. Bhasin, P.C. Claspy, M.A. Richard, R.R. Romanofsky, M. Bendett, G. Gustafson and W. Walters. "Control of a GaAs Monolithic Ka-Band Phase Shifter Using a High-Speed Optical Interconnect (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): 686-688.

The use of a high-speed optical interconnect in the control of a Ka-band GaAs monolithic phase shifter is described. A 16 b serial control signal was used to modulate the output of a laser transmitter, and the transmitted optical signal was detected and demultiplexed into 16 parallel electrical outputs using a high-speed hybrid GaAs optoelectronic integrated circuit (OEIC). Four of the parallel output lines were interfaced to the 4 b phase shifter, and high-speed, optically controlled switching of the phase shifter was observed at clock frequencies to 30 MHz using an interferometric technique.



IEEE

Contents

Publications

Issues

Papers

Authors

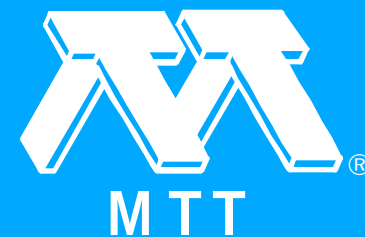
Click on title for a complete paper.



Abstracts

Back Cover (May 1990 [T-MTT])

"Back Cover (May 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.5 (May 1990 [T-MTT] (Special Issue on Applications of Lightwave Technology to Microwave Devices, Circuits, and Systems)): b1-b2.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Front Cover (Jun. 1990 [T-MTT])

"Front Cover (Jun. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Editorial (Jun. 1990 [T-MTT])

R.S. Tucker. "Editorial (Jun. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 689-690.

This editorial marks the end of my term as Editor of the Transactions on Microwave Theory and Techniques. The Editor's term is normally three years, but after 18 months as Editor, I moved from AT&T Bell Laboratories and took up the position of Professor of Electrical Engineering at the University of Melbourne, in Australia. It was clear that editing the Transactions would be difficult from such a distance and I have therefore stepped down from the position.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide

C. Yeh, F.I. Shimabukuro and J. Chu. "Dielectric Ribbon Waveguide: An Optimum Configuration for Ultra-Low-Loss Millimeter/Submillimeter Dielectric Waveguide." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 691-702.

Dielectric ribbon waveguide supporting the HE_{11} dominant mode can be made to yield an attenuation constant for this mode of less than 20 dB/km in the millimeter/submillimeter-wavelength range. The waveguide is made with a high-dielectric-constant, low-loss material such as alumina or sapphire. It takes the form of thin dielectric ribbon surrounded by lossless dry air. A detailed theoretical analysis of the attenuation and field extent characteristics for the low-loss dominant HE_{11} mode along a ribbon dielectric waveguide was carried out using the exact finite-element technique as well as two approximate techniques. Analytical predictions were then verified by measurements on ribbon guides made with Rexolite using the highly sensitive cavity resonator method. Excellent agreement was found.

[Click on title for a complete paper.](#)



Abstracts

An Improved Model for Noise Characterization of Microwave GaAs FET's

R.K. Froelich. "An Improved Model for Noise Characterization of Microwave GaAs FET's." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 703-706.

A simple, lumped-element noise model for microwave FET's is proposed where determination of the elements requires a minimal quantity of measured data. At the same time, the model is complete enough to yield good predictions of measured results. These predictions are in better agreement with measurements than those of a similar, recently published model.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

X-Band 0.5, 1, and 2 Watt Power Amplifiers with Marked Improvement in Power-Added Efficiency

R.D. Boesch and J.A. Thompson. "X-Band 0.5, 1, and 2 Watt Power Amplifiers with Marked Improvement in Power-Added Efficiency." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 707-711.

Very efficient X-band MESFET power amplifiers showing greater power-added efficiency over a wider bandwidth than any X-band amplifiers of comparable output reported to date have been designed, fabricated, and measured. The amplifiers were designed with attention to optimum bias, proper harmonic termination, and efficient power combining. This paper discusses these device and design issues, and describes a straightforward design method which achieved the increased levels of efficiency.



MTT



IEEE

[Contents](#)

[Publications](#)

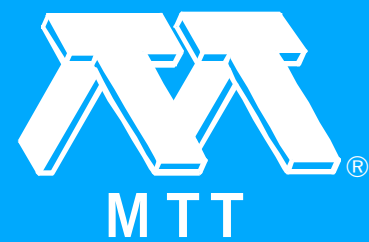
[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

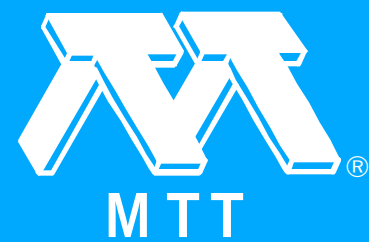
Compact Quasi-Periodic and Aperiodic TE/sub 0n/ Mode Converters in Overmoded Circular Waveguides for Use with Gyrotrons

M.J. Buckley and R.J. Vernon. "Compact Quasi-Periodic and Aperiodic TE/sub 0n/ Mode Converters in Overmoded Circular Waveguides for Use with Gyrotrons." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 712-721.

Designs of compact quasi-periodic and aperiodic TE/sub 0n/-TE/sub 0n-1/ circular waveguide converters for use with gyrotrons in an electron cyclotron heating (ECH) system are developed by analytically and numerically solving the coupled-mode differential equations. Quasi-periodic mode transducer designs are developed which convert the TE/sub 02/ mode to the TE/sub 01/ mode and in some cases include a taper (waveguide radius reduction). A 60 GHz aperiodic mode converter-taper combines a 6.35 cm-2.779 cm waveguide diameter taper and a TE/sub 02/ -TE/sub 01/ mode converter. A 140 GHz aperiodic mode converter-taper combines a 6.35 cm-2.779 cm waveguide diameter taper and a TE/sub 03/ -TE/sub 02/ -TE/sub 01/ mode converter. The resulting designs are highly efficient (conversion efficiencies $\geq 99.4\%$), are shorter, have a broader bandwidth than previous designs, and have a waveguide radius greater than or equal to 1.389 cm over the entire length of the transducer to allow for high-power transmission. Experimental results which are consistent with theoretical calculations are presented.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

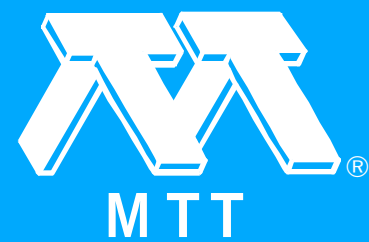
Finite-Difference Method without Spurious Solutions for the Hybrid-Mode Analysis of Diffused Channel Waveguides

N. Schulz, K. Bierwirth, F. Arndt and U. Koster. "Finite-Difference Method without Spurious Solutions for the Hybrid-Mode Analysis of Diffused Channel Waveguides." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 722-729.

Diffused dielectric channel waveguides with an arbitrarily varying refractive index profile in the cross-sectional plane are analyzed with a rigorous finite-difference method formulated in terms of the wave equation for the transverse components of the magnetic field. This leads to an eigenvalue problem where the nonphysical, spurious modes do not appear. The analysis includes the complete set of hybrid modes, takes mode-conversion effects and complex waves into account, and allows the immediate inclusion of large index difference levels as well as the two-dimensional continuously varying index profile function without the usual staircase approximation. By way of example, dispersion characteristics are calculated for structures suitable for millimeter-wave and optical integrated circuits, such as channel waveguides with refractive index variations having stepped, linear, Gaussian, and exponential function profiles. The theory is verified by comparison with results available from other rigorous methods.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Full-Wave Analysis of an Infinitely Long Magnetic Surface Wave Transducer

E.-B. El-Sharawy and R.W. Jackson. "Full-Wave Analysis of an Infinitely Long Magnetic Surface Wave Transducer." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 730-738.

This paper presents a rigorous analysis of an infinitely long microstrip line embedded in a multilayer structure which includes a ferrite layer. In certain frequency ranges, such a line launches magnetic surface waves in the ferrite and thus becomes a surface wave transducer. The analysis described herein is a self-consistent full-wave solution which rigorously includes the effect of radiating magnetic waves. By expanding the transducer currents in terms of both even and odd functions, it is shown that the principal current is not symmetrically distributed across the transducer width. The propagation constant of the transducer mode is complex and shows a large imagination part (attenuation) tied to the excitation of magnetostatic surface waves. In addition, the propagation constant remains complex even for frequencies above the magnetostatic surface wave bandwidth. This has been found to be due to the excitation of magnetic surface waves having complex propagation constants. Measurements of the insertion loss of a multilayer microstrip transducer are presented and are in reasonable agreement with the calculated attenuation.

Click on title for a complete paper.





[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Analysis of TEM Mode on a Curved Coaxial Transmission Line

J.J. Krempasky. "Analysis of TEM Mode on a Curved Coaxial Transmission Line." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 739-747.

Through the use of a perturbation approach, explicit expressions are derived for the changes in the electromagnetic field structure that occur when a TEM mode on a coaxial transmission line enters a bend in the line. All of these changes are evaluated to at least first order in the inverse of the radius of curvature of the coaxial line. An explicit expression is also constructed for the first nonvanishing correction term to the propagation constant, which turns out to be of second order. Graphical results are presented for the variation of the propagation constant as a function of curvature and other parameters characteristic of the coaxial line.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Semidistributed Model of Millimeter-Wave FET for S-Parameter and Noise Figure Predictions

L. Escotte and J.-C. Mollier. "Semidistributed Model of Millimeter-Wave FET for S-Parameter and Noise Figure Predictions." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 748-753.

Besides sophisticated fully distributed FET models for predicting small-signal performance up to millimeter-wave frequencies, it may be convenient to make use of a simpler electrical model which avoids the need of solving coupled differential equations while taking account of propagation effects along device electrodes. We present a new electrical FET model derived from a partition of the actual transistor along its gate width into N identical sections. This so-called sliced model has two main advantages in comparison with distributed models: first, the derivation of its element values is obtained by a direct application of Kirchhoff's laws and, second, insertion of the noise sources is easy and makes it possible to predict the FET noise parameters. An example is given that shows good agreement between minimum noise figures derived from the "sliced" model and from the Fukui formula in the range 18--40 GHz.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Perturbed-TEM Analysis of Transmission Lines with Imperfect Conductors

I.-S. Tsai and C.H. Chen. "Perturbed-TEM Analysis of Transmission Lines with Imperfect Conductors." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 754-759.

A novel perturbed-TEM approach is proposed to study the detailed current distribution and the propagation constant of a multi-conductor transmission line system with imperfect conductors. In this study, the perturbed fields are derived under the assumption that the fields outside the conductors are TEM waves of the corresponding lossless system and those inside the conductors satisfy the TM modal equations. These fields are then substituted into a perturbational formula to obtain the propagation constant of the lossy system. Presented as an example are the current distribution and the propagation constant of a lossy two-wire transmission line, which clearly illustrates the loss mechanism due to the skin effect and the proximity effect.

[Click on title for a complete paper.](#)



Even-Mode Characteristics of the Bilateral Slotline

R. Janaswamy. "Even-Mode Characteristics of the Bilateral Slotline." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 760-765.

Transmission line data are presented for the even-mode characteristics of a bilateral slotline. The bilateral slotline (double-sided slotline) is analyzed by the spectral Galerkin method and results are presented for the slot wavelength and characteristic impedance for substrates having $\epsilon_r = 2.22, 3.5, 6.0, 9.8,$ and 12.8 . The results are presented for $0.01 \leq \text{radic } \epsilon_r / \lambda_0 \leq 0.25$, where $2d$ is the substrate thickness and ϵ_r its dielectric constant.



Abstracts

An Analytical Solution to the Microstrip Line Problem

D. Homentcovschi. "An Analytical Solution to the Microstrip Line Problem." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 766-769.

An analytical method to determine the capacitance of microstrip lines in an inhomogeneous medium is presented. The capacitance is expressed in terms of the solution of an infinite system of linear equations. The numerical examples included provide a very good approximation for cases of practical interest.



IEEE

Contents

Publications

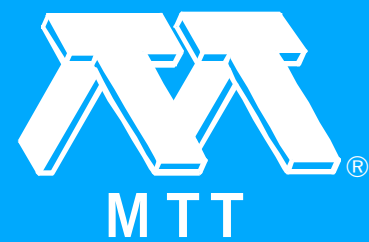
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Three-Dimensional Analysis of a Through Hole with Radiation Characteristics by the Spatial Network Method

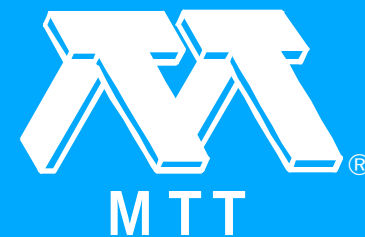
T. Onojima, T. Kashiwa, N. Yoshida and I. Fukai. "Three-Dimensional Analysis of a Through Hole with Radiation Characteristics by the Spatial Network Method." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 770-778.

In recent electronic devices, a through hole has been used for mutual connections between layers of printed circuit boards, multi-layer wirings on the silicon surface of LSI, and external connections of IC packages. With recent uses of through holes in superminiaturized systems for super-high-frequency waves and ultra-high-speed pulse waves, the influences of the holes not only on the propagation characteristics of the lines but also on the properties of other elements are becoming more pronounced. Therefore to understand the characteristics of the total system, analyses of the electromagnetic field as affected by through holes become indispensable. It is especially necessary to consider the radiation characteristics from a through hole since the radiation affects other lines and devices. However through holes generate complicated distributions of electromagnetic fields owing to their three-dimensional structures. It is necessary to perform rigorous vectorial analyses for three-dimensional fields by using all field components, boundary conditions, and properties of the medium. Hence we applied the spatial network method to this analysis. The method has many features for analysis of three-dimensional electromagnetic fields in the time domain. We have already simulated the basic field behavior of the through hole by this method. Such a time-dependent analysis of electromagnetic fields has shown its utility not only in clarifying the variation of the fields in time but also in providing information on the mechanisms by which the distributions of a field at the stationary state are brought about. In this paper, the radiation characteristics of the through hole are discussed. For the near field, the Poynting vector is important in knowing the field characteristics by the energy flow property. Therefore the variation of Poynting vector distributions near the through hole is simulated in the time domain. Finally, from the distribution of the electric field on the top plane of the through hole that contains the connected stripline and the land, the far-field patterns are computed by the Fourier transform. It is shown that the fundamental characteristics of the radiation from the through hole are thereby obtained.

Click on title for a complete paper.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



S Matrix of Slot-Coupled H-Plane Tee Junction Using Rectangular Waveguides (Short Papers)

B.N. Das, A. Chakraborty and N.V.S.N. Sarma. "S Matrix of Slot-Coupled H-Plane Tee Junction Using Rectangular Waveguides (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 779-781.

Complex scattering matrix parameters of a slot-coupled waveguide tee junction are determined using a moment method of analysis with entire orthogonal basis functions and including a rigorous analysis of the effect of wall thickness. The variations of the equivalent network parameter, coupling, and return loss with frequency are evaluated and the results are compared with experimental data. The unitary property of the S matrix is verified. The dependence of coupling on slot length, slot width, and thickness is presented.



Abstracts

Analysis of Transmission Line Structures Using a New Image-Mode Green's Function (Short Papers)

I.T. Lu and R.L. Olesen. "Analysis of Transmission Line Structures Using a New Image-Mode Green's Function (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 782-785.

A hybrid image-mode-moment method is developed for the quasi-TEM analysis of transmission lines of arbitrary cross section and number suspended between infinite parallel ground planes. This new method combines the conventional moment method and a new image-mode Green's function systematically in a single formulation. The moment method is employed to model the interaction between transmission lines, and the new image-mode method is used to furnish the Green's function of the parallel plates. Several configurations are studied and are compared with work given in the references where possible.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

The Design of an Ultra-Broad-Band 3 dB Coupler in Dielectric Waveguide (Short Papers)

Y. Shen, D.-M. Xu and C. Ling. "The Design of an Ultra-Broad-Band 3 dB Coupler in Dielectric Waveguide (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 785-787.

A new structure of embedding dielectric waveguide coupler is described which offers advantages such as very flat frequency response over 50% bandwidth, simple construction, and good repeatability. A theoretical analysis by a superposition of normal modes is presented. Experimental results at the 3 mm wave band are given which show agreement with theoretical calculations.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

De-Embedding and Unterminating Microwave Fixtures with Nonlinear Least Squares (Short Papers)

D. Williams. "De-Embedding and Unterminating Microwave Fixtures with Nonlinear Least Squares (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 787-791.

This paper investigates a general method of characterizing microwave test fixtures for the purpose of determining the S parameters of devices embedded in the fixture. The accuracy of the technique was studied and compared with that of the common open-short-load and thru-reflect-line methods. Increased accuracy was obtained using redundant measurements.



IEEE

[Contents](#)

[Publications](#)

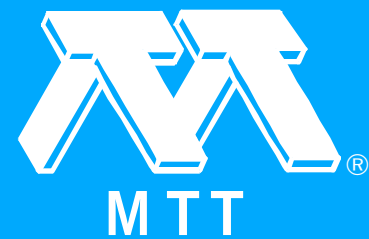
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors (Short Papers)

B. Bocquet, J.C. van de Velde, A. Mamouni, Y. Leroy, G. Giaux, J. Delannoy and D. Delvaee. "Microwave Radiometric Imaging at 3 GHz for the Exploration of Breast Tumors (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 791-793.

A process of microwave radiometric imaging working at 3 GHz permits the mapping of radiometric intensities on a square area about half a decimeter on a side. These data, translated in terms of colored image, point out the existence of lateral temperature gradients in the tissues. This system was initially used in order to examine large breast tumors; at present, it is also used for the detection of smaller, impalpable tumors. We try to define the roles for the characterization of benignity or malignancy of small tumors which appear in a mammographic examination (X rays). The definition of an appropriate parameter, deduced from this image processing, seems to make it possible to indicate if the tumor is benign or malignant.

[Click on title for a complete paper.](#)



Abstracts

Capacitance Parameters of Coupled Elliptic Microstrip Disks in Layered Anisotropic Media (Short Papers)

R.R. Boix and M. Horno. "Capacitance Parameters of Coupled Elliptic Microstrip Disks in Layered Anisotropic Media (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 794-796.

An algorithm is provided to calculate the modal capacitances and the gap capacitance of coupled microstrip elliptic disks embedded in layered media with dielectric anisotropy. The capacitance parameters determined are useful in accounting for coupling effects in the design of interacting lumped microstrip components of elliptic shape.



IEEE

[Contents](#)

[Publications](#)

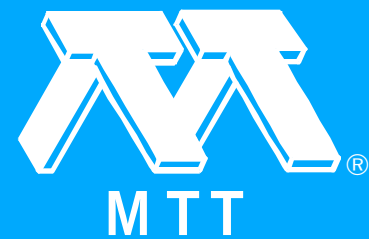
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Reflection and Transmission Coefficients of Rectangular Dielectric Waveguide Discontinuity with an Air Gap (Short Papers)

Y. Tomabechi and K. Matsumura. "Reflection and Transmission Coefficients of Rectangular Dielectric Waveguide Discontinuity with an Air Gap (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 797-799.

Reflection, transmission, and radiation characteristics of rectangular dielectric waveguide discontinuities with an air gap are analyzed. A case where the guide axes are displaced in transverse directions is also treated. The characteristic of this discontinuity has never been analyzed by a conventional slab model. In this analysis, a two-dimensional Fourier transformation and orthogonal relations between guided and radiation modes are utilized. Numerical calculations and experimental results in X-band are compared, and good agreement is found. To discuss our numerical results, the principle of energy conservation is introduced. It becomes evident that the discrepancy between our results and this principle is less than 0.0003.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Analysis of the Junction Between Smooth and Corrugated Cylindrical Waveguides in Mode Converters (Short Papers)

L.C. da Silva and M.G.C. Branco. "Analysis of the Junction Between Smooth and Corrugated Cylindrical Waveguides in Mode Converters (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 800-802.

A method for the determination of the scattering matrix of the junction between smooth and corrugated cylindrical waveguides is developed based on the expansion of the modal fields for the corrugated waveguide into eigenfunctions of the transmission matrix of a waveguide unit cell. This method, used in conjunction with usual techniques for evaluation of the scattering matrix of mode converters, is here shown to improve the precision of results obtained by rendering uniform the accuracy of the models applied in the calculations. Also, the analysis is now valid for any size of corrugation depth, and the frequency band of applicability is enlarged accordingly.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Resonant Frequency of Cylindrical Dielectric Resonator Placed in an MIC Environment (Short Papers)

R.K. Mongia. "Resonant Frequency of Cylindrical Dielectric Resonator Placed in an MIC Environment (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 802-804.

In this paper, an effective dielectric constant technique has been used to determine the resonant frequency of the TE/sub 01delta/ mode of a cylindrical dielectric resonator placed in an MIC environment. A suitable expression for epsilon/sub eff/ has been reported which makes it possible to obtain results that compare favorably with rigorous methods. A large number of experimental results are also reported to demonstrate the validity of the method. Finally, for a given resonant frequency, closed-form expressions are given for computing the height of the resonator.

[Click on title for a complete paper.](#)



Abstracts

Wide-Band Ground-Plane dc Block and Bias Feed (Short Papers)

T.E. Koscica. "Wide-Band Ground-Plane dc Block and Bias Feed (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 805-806.

The realization of a new wide-band ground-plane dc block and bias feed is described for microstrip transmission lines operating in Ka-band, 26.5-40.0 GHz. The waveguide-to-microstrip fixture and transition used for testing are described. Analysis of the ground-plane bias gap structure is provided. A few possible applications are discussed.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Electromagnetic Modeling of Waveguides Involving Finite-Size Dielectric Regions (Short Papers)

B.J. Rubin. "Electromagnetic Modeling of Waveguides Involving Finite-Size Dielectric Regions (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 807-812.

A moment method is presented for handling arbitrarily shaped 2-D and 3-D waveguides that involve conductors, finite-size dielectric regions, or both. A novel procedure for modeling the dielectric allows 2-D rooftop functions to represent both the 3-D polarization current in the dielectric and the surface current on the conductors, and precludes the presence of fictitious charge within the dielectric. Examples include coaxial, microstrip, and dielectric waveguides. Numerical convergence, consistency with physical principles, and agreement with the literature are demonstrated.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A Local Mesh Refinement Algorithm for the Time Domain Finite Difference Method Using Maxwell's Curl Equations (Short Papers)

I.S. Kim and W.J.R. Hoefer. "A Local Mesh Refinement Algorithm for the Time Domain Finite Difference Method Using Maxwell's Curl Equations (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 812-815.

In this paper we consider an efficient local mesh refinement algorithm subdividing a computational domain to resolve fine dimensions in a TD-FD space-time grid structure. At a discontinuous coarse-fine mesh interface, the boundary conditions for the tangential and normal field components are enforced for a smooth transition of highly nonuniform field quantities.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

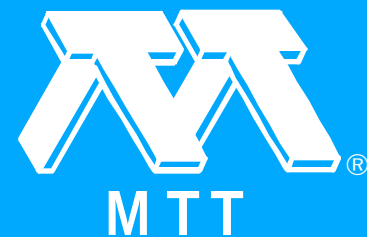


Abstracts

Frequency-Domain Bivariate Generalized Power Series Analysis of Nonlinear Analog Circuits (Short Papers)

P.J. Lunsford, II, G.W. Rhyne and M.B. Steer. "Frequency-Domain Bivariate Generalized Power Series Analysis of Nonlinear Analog Circuits (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 815-818.

Bivariate generalized power series analysis is introduced for the analysis and behavioral modeling of nonlinear analog circuits and systems. It can be used to model analog subsystems and is compatible with circuit simulation. Thus full circuits and behaviorally modeled analog subcircuits can be simulated together in an analog circuit/system simulator. The entire analysis is performed in the frequency domain, and arbitrary nonlinear circuits and any number of noncommensurable input frequencies can be handled. A diode ring demodulator is analyzed as an example.



[Contents](#)

[Publications](#)

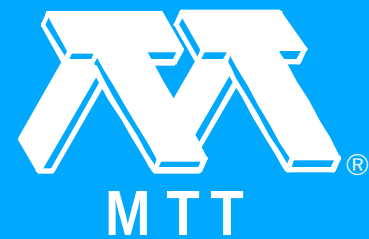
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Modeling of Asymmetric and Offset Gaps in Shielded Microstrips and Slotlines (Short Papers)

A. Biswas and V.K. Tripathi. "Modeling of Asymmetric and Offset Gaps in Shielded Microstrips and Slotlines (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 818-819.

A generalized model for characterizing the frequency-dependent properties of general symmetric, asymmetric, and offset gaps in microstrips and slotlines on a single-layer or multilayer dielectric medium is presented. The transverse resonance technique is applied in the spectral domain to extract the equivalent circuit model parameters of the discontinuities. This technique incorporates the end effect of the discontinuity by a compatible choice of basis functions.

[Click on title for a complete paper.](#)



Abstracts



IEEE

Contents

Publications

Issues

Papers

Authors

An Improved GaAs MESFET Model for SPICE (Short Papers)

A.J. McCamant, G.D. McCormack and D.H. Smith. "An Improved GaAs MESFET Model for SPICE (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 822-824.

A SPICE model has been developed to more accurately model GaAs MESFET devices. In particular, small-signal parameters such as the S parameters are accurately modeled over a wide range of bias conditions. These results were achieved by modifying the Statz model equations to better represent the variation of I_{ds} as a function of the applied voltage. The model applies over a large range of pinch-off voltages, allows size scaling of devices, and is suited for modeling R_{ds} changes with frequency. The Statz equations are used to represent diode characteristics and capacitive components of the model.

Click on title for a complete paper.



Abstracts

Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses (Corrections)

WP. Harokopus, Jr. and P.B. Katehi. "Characterization of Microstrip Discontinuities on Multilayer Dielectric Substrates Including Radiation Losses (Corrections)." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 825-825.

The above paper contains three transcription errors.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Patent Abstracts (Jun. 1990 [T-MTT])

"Patent Abstracts (Jun. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 826-845.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

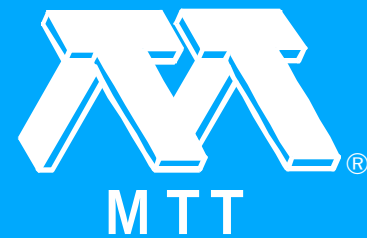
Click on title for a complete paper.



Abstracts

Call for Papers - Directions in Design and Applications of Microwave Systems (Jun. 1990 [T-MTT])

"Call for Papers - Directions in Design and Applications of Microwave Systems (Jun. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 846-846.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

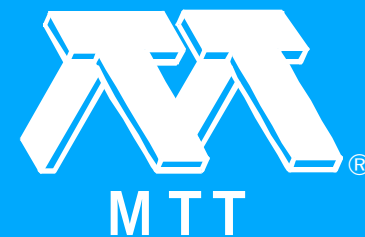
Click on title for a complete paper.



Abstracts

Call for Papers - Microwave Applications of Superconductors (Jun. 1990 [T-MTT])

"Call for Papers - Microwave Applications of Superconductors (Jun. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 847-847.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

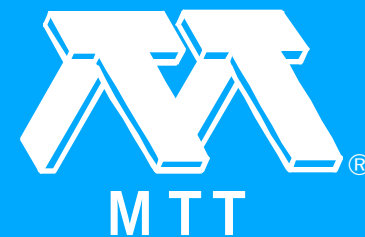
Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Jun. 1990 [T-MTT])

"Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Jun. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): 848-848.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

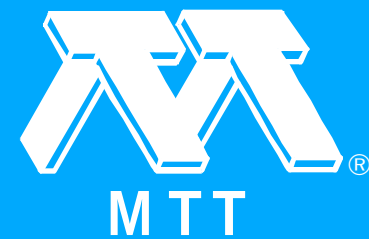
Click on title for a complete paper.



Abstracts

Back Cover (Jun. 1990 [T-MTT])

"Back Cover (Jun. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.6 (Jun. 1990 [T-MTT]): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Front Cover (Jul. 1990 [T-MTT])

"Front Cover (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Application of the Three-Dimensional Finite-Difference Time-Domain Method to the Analysis of Planar Microstrip Circuits

D.M. Sheen, S.M. Ali, M.D. Abouzahra and J.A. Kong. "Application of the Three-Dimensional Finite-Difference Time-Domain Method to the Analysis of Planar Microstrip Circuits." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 849-857.

A direct three dimensional finite-difference time-domain (FDTD) method is applied to the full-wave analysis of various microstrip structures. The method is shown to be an efficient tool for modeling complicated microstrip circuit components as well as microstrip antennas. From the time-domain results, the input impedance of a line-fed rectangular patch antenna and the frequency-dependent scattering parameters of a low-pass filter and a branch line coupler are calculated. These circuits are fabricated and the measurements are compared with the FDTD results and shown to be in good agreement.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

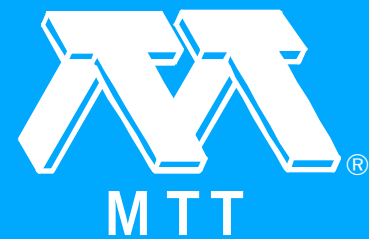
Use of a Microwave Cavity for Sensing Dielectric Properties of Arbitrarily Shaped Biological Objects

A.W. Kraszewski, S.O. Nelson and T.-S. You. "Use of a Microwave Cavity for Sensing Dielectric Properties of Arbitrarily Shaped Biological Objects." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 858-863.

A rectangular waveguide resonator operating in the H_{105} mode at 3.2 GHz was used in determining the change in resonant frequency, ΔF , and the Q factor of the cavity, ΔT , when measured with and without single corn kernels of various shapes and dimensions. By measuring those variables for a kernel oriented in two positions, differing by a 90° rotation with respect to the maximum E-field vector, the average values of ΔF and ΔT were found to be quite independent of shape. The ratio $\Delta F/\Delta T$ is independent of size and is a function of the material properties ($\epsilon' - 1/\epsilon''$). This function is shown to be related to the material density, the moisture content, or other characteristics when all other properties except the one selected remain unchanged.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Power and Stability Limitations of Resonant Tunneling Diodes

C. Kidner, I. Mehdi, J.R. East and G.I. Haddad. "Power and Stability Limitations of Resonant Tunneling Diodes." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 864-872.

The existence of negative resistance in double barrier resonant tunneling structures has led to the proposal of various applications for these devices. For many of these applications, stability is an important consideration. Stability criteria for resonant tunneling diodes are investigated in this paper. Details of how extrinsic elements such as series inductance and parallel capacitance affect the stability are presented. A GaAs/AlAs/InGaAs/AlAs/GaAs double barrier diode is then investigated showing the effect of different modes of low-frequency oscillation and the extrinsic circuit required for stabilization. The effect of device stabilization on high-frequency power generation is described. The main results of the paper are (1) stable resonant tunneling diode operation is difficult to obtain and (2) the circuit and device conditions required for stable operation greatly reduce the amount of power that can be produced by these devices.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

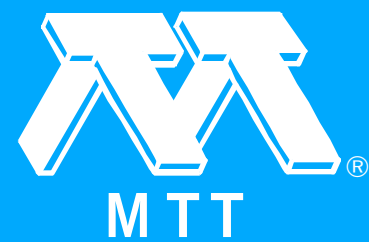
An Integral Equation Analysis of an Infinite Array of Rectangular Dielectric Waveguides

H.-Y. Yang, J.A. Castaneda and N.G. Alexopoulos. "An Integral Equation Analysis of an Infinite Array of Rectangular Dielectric Waveguides." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 873-880.

An integral equation analysis is applied to the study of the propagation characteristics of an infinite array of dielectric waveguides. The geometry under study is assumed rectangular in shape. To find the Green's function of the structure, the Floquet theorem has been applied such that the mutual coupling between dielectric waveguide elements is effectively included in the analysis. The effect of the coupling on the propagation characteristics of a dielectric waveguide is studied by varying the size of the Floquet cell. The validity of this analysis to simulate the case of an open dielectric waveguide is confirmed by a comparison with previous results, in spite of the fact that the radiation and the leaky wave modes are not accounted for here. The complex modes due to the periodicity of the structure are found and their properties are described. The analysis presented in this paper with minor modification can deal with the problems of dielectric image lines or dielectric-loaded metallic waveguides.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Characterization of MIS Structure Coplanar Transmission Lines for Investigation of Signal Propagation in Integrated Circuits

T. Shibata and E. Sano. "Characterization of MIS Structure Coplanar Transmission Lines for Investigation of Signal Propagation in Integrated Circuits." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 881-890.

A full-wave analysis of MIS structure micron coplanar transmission lines on doped semiconductor substrates is carried out by means of a finite difference time-domain approach. Metal conductor loss is taken into account in the analysis, which has been ignored in previous full-wave treatments. Line parameters as well as electromagnetic field distributions are calculated over a wide frequency range involving slow-wave and dielectric quasi-TEM mode limits. Measurements of these line parameters, varying substrate resistivity from 1 to 1000 $\Omega \cdot \text{cm}$, in the frequency range up to 40 GHz are also presented, and these agree with analysis quite well. On the basis of these results, an equivalent circuit line model will be induced and some considerations on the relationship between line structure and properties will be made.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Broad-Band Determination of the FET Small-Signal Equivalent Circuit

M. Berroth and R. Bosch. "Broad-Band Determination of the FET Small-Signal Equivalent Circuit." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 891-895.

An improved method to determine the broad-band small-signal equivalent circuit of field effect transistors (FET's) is proposed. This method is based on an analytic solution of the equations for the Y parameters of the intrinsic device and allows direct determination of the circuit elements at any specific frequency or averaged over a frequency range. The validity of the equivalent circuit can be verified by showing the frequency independence of each element. The method can be used for the whole range of measurement frequencies and can even be applied to devices exhibiting severe low-frequency effects.

[Click on title for a complete paper.](#)



A 30 GHz MMIC Receiver for Satellite Transponders

H. Kato, T. Ohira, F. Ishitsuka, T. Tokumitsu, Y. Kihata and N. Imai. "A 30 GHz MMIC Receiver for Satellite Transponders." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 896-903.

The development of 30-GHz-band MMIC's and multichip MMIC modules (low-noise amplifier and frequency converters) is reported. A 30-GHz-band full-MMIC receiver for satellite transponders has been successfully constructed using the MMIC modules. The performance of the full-MMIC receiver is evaluated. Test results indicate its successful performance as a satellite receiver system. In this paper, the design and performance of the MMIC's (a two-stage amplifier, an image rejection mixer, and a frequency multiplier), of multichip-type MMIC modules (a 30-GHz-band low-noise amplifier module with a gain of 30 dB and a noise figure of 8.2 dB, and an image rejection frequency converter with a 10 dB conversion loss and an 18 dB image rejection ratio), and of the full-MMIC receiver, which weighs 1/6 as much as a conventional hybrid IC, are presented.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

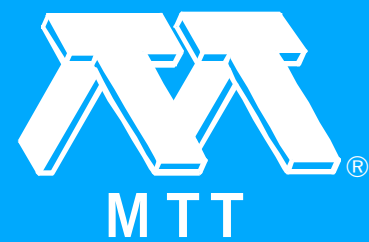
Resonance Characteristics of a Cavity-Operated Electrodeless High-Pressure Microwave Discharge System

S. Offermanns. "Resonance Characteristics of a Cavity-Operated Electrodeless High-Pressure Microwave Discharge System." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 904-911.

To characterize the resonance behavior of cavity-operated electrodeless high-pressure microwave discharge systems, a microwave circuit has been developed that allows high-power network analysis during the operation of the discharge. The frequency-dependent complex impedance of the cavity including the plasma is obtained from reflection measurement in the range 1.5-4.5 GHz. This method allows an observation of the actual resonance frequency and the actual vectorial mismatch so that a coupling efficiency $> 99\%$ can always be achieved with proper adjustment of operation frequency and coupling probe. The experimental results with a cylindrical TM/sub 010/ cavity and coaxially situated discharge show a decrease of the resonance frequency with increasing power (increasing plasma temperature, electron density, electrical conductivity), depending on the discharge geometry and the plasma composition. In accordance with a simple one-dimensional model, the Q factor passes through a minimum at medium power levels, where the cavity discharge system absorbs the microwave energy most effectively.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

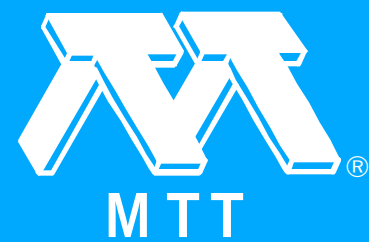
Three-Dimensional Analysis of a Cylindrical Waveguide Converter for Circular Polarization by the Spatial Network Method

Y. Ko, N. Yoshida and I. Fukai. "Three-Dimensional Analysis of a Cylindrical Waveguide Converter for Circular Polarization by the Spatial Network Method." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 912-918.

Recently, the circularly polarized wave has gained prominence due to its use as the principal propagation mode in satellite communications. To realize the multiplexing of the transmitting system in satellite communications, it is necessary to supply the waves instantly to the devices. Therefore, to know the transient characteristics of devices, time-domain analysis is important. In this paper, using spatial network method (SNM), we analyze the transient characteristics of two types of converters to generate a circularly polarized wave from linearly polarized one: those loaded with metal plates in a cylindrical waveguide and those loaded with a fin. The cutoff wavelengths computed from the frequency response by applying the fast Fourier transform. The phase shift constants and guide wavelengths are computed by the spatial and time variations of the electric field distribution. The whole distribution of fields obtained by the SNM can be seen provide detailed information on the field properties, such as the field concentration. In particular, the process of generating either circularly or an elliptically polarized wave from a linearly polarized wave is shown by three-dimensional and time-domain analysis. Finally, we confirm that the fundamental characteristics of the converters well with previous analysis and results.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Improvements to the Finite-Difference Time-Domain Method for Calculating the Radar Cross Section of a Perfectly Conducting Target

C.M. Furse, S.P. Mathur and O.P. Gandhi. "Improvements to the Finite-Difference Time-Domain Method for Calculating the Radar Cross Section of a Perfectly Conducting Target." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 919-927.

The finite-difference time-domain (FDTD) method has been used extensively to calculate scattering and absorption from both dielectric objects and perfectly conducting objects. Several improvements to the FDTD method for calculating the radar cross section (RCS) of a perfectly conducting target are presented in this paper. Sinusoidal pulsed FDTD excitations are compared to determine an efficient method of finding the frequency response of targets. The maximum cell size, minimum number of external cells, and a new method to eliminate storage in the shielded internal volume of perfect conductors to reduce the computer storage requirements of FDTD are discussed. The magnetic field dc offset induced by surface currents on perfectly conductive objects is observed and its effects removed by postprocessing to achieve convergence of RCS calculations. RCS calculations using the method in two dimensions are presented for both square and circular infinite cylinders illuminated by both TE and TM polarized plane waves. The RCS of a metal cube in three dimensions is also presented. Agreement between FDTD calculations and theoretical values is achieved for all cases, and parameters necessary to achieve this agreement are examined.



Abstracts

Analysis of a Microwave Power Amplifier Using a Combiner/Divider with Circular Cavities

H. Matsumura. "Analysis of a Microwave Power Amplifier Using a Combiner/Divider with Circular Cavities." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 928-933.

Based on the discrete Fourier transformation, equations have been developed for the analysis of a microwave power amplifier consisting of unit amplifiers and a power combiner/divider with circular cavities. The equations are obtained by taking account of the spurious-mode excitations to the cavity from unit amplifiers. By examining the gain of the power amplifier with a failed unit amplifier, the equations can be used to evaluate the effect of the slits in the combiner/divider on graceful degradation.



IEEE

Contents

Publications

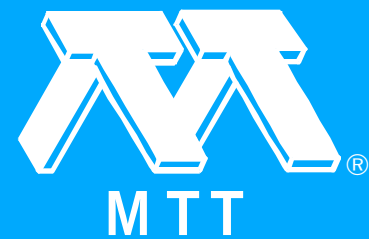
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Power-Handling Capability of the Rhombic Waveguide

P.L. Overfelt and C.S. Kenney. "Power-Handling Capability of the Rhombic Waveguide." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 934-941.

This paper uses a dimensionless efficiency factor to compute a figure of merit quantifying the power-handling capability of the uniform, perfectly conducting rhombic waveguide. A new method involving an infinite sum of nonseparable solutions of the Helmholtz equation provides accurate eigenfunctions and eigenvalues for use in the efficiency factor calculation. The power-handling capability of the rhombic waveguide is compared with that of the standard rectangular waveguide and is found to be only slightly lower.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

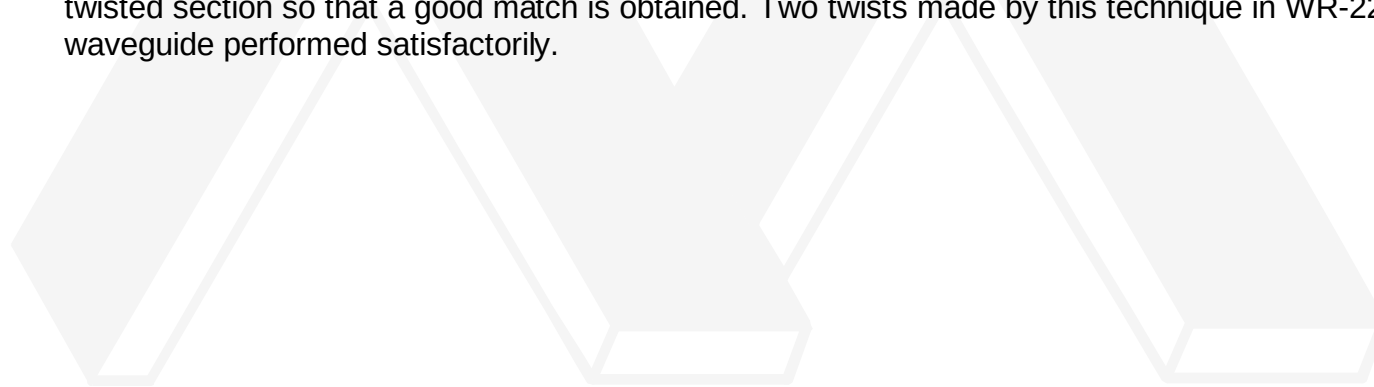
Papers

Authors

Machined Waveguide Twist (Short Papers)

H.F. Lenzing and M.J. Gans. "Machined Waveguide Twist (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 942-944.

In the fabrication of microwave and millimeter-wave circuits in waveguide, the designer often requires a 90° change of the E plane. This presents no problem if the circuit is assembled from discrete waveguide components, since 90° twists are commercially available. However, if the circuit is machined from aluminum blocks, a 90° twist is difficult to realize. This note presents a simple solution to that problem. At the waveguide input, half the waveguide wide dimension is machined into one aluminum block the mirror image being machined into a second block. The technique involves gradually reducing the width of the "input" waveguide (machined as described above) in one block and simultaneously increasing the depth of the waveguide in the opposite block until the "output" waveguide depth is equal to the "input" waveguide width. Care must be taken to maintain a constant waveguide cutoff frequency through the length of the twisted section so that a good match is obtained. Two twists made by this technique in WR-22 waveguide performed satisfactorily.



Click on title for a complete paper.



Abstracts

An Exact Solution for the Nonuniform Transmission Line Problem (Short Papers)

C. Nwoke. "An Exact Solution for the Nonuniform Transmission Line Problem (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 944-946.

The theory of functions of a matrix is used to obtain an exact solution for the nonuniform transmission line problem. The method has certain advantages over existing ones, which include independent variation of the line parameters.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Finding Initial Estimates Needed for the Engen Method of Calibrating Single Six-Port Reflectometers (Short Papers)

U. Stumper. "Finding Initial Estimates Needed for the Engen Method of Calibrating Single Six-Port Reflectometers (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 946-949.

In this paper it is shown how the initial estimates of the six-port to four-port reduction parameters needed for the Engen six-port calibration method can be found with a minimum of reflective terminations, by using six-port parameters obtained either by a calibration method developed at the Physikalisch-Technische Bundesanstalt (Braunschweig, West Germany) or by a new method developed by Neumeyer. With these methods, only five reflection values are needed, which can easily be realized by waveguide offset short-circuit reflection standards of different lengths, in the range of millimeter waves, where good low-reflectivity terminations or sliding loads may become difficult to manufacture.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

A Basic Concept to Reduce the Frequency Distortion of Distributed Amplifiers (Letters)

H.L. Hartnagel. "A Basic Concept to Reduce the Frequency Distortion of Distributed Amplifiers (Letters)." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 950-950.

The broad-band features of distributed amplifiers are nowadays incorporated into numerous components of microwave analog integrated circuits, such as phase shifter, attenuators, combiners, and mixers. Efforts are being made to enhance the bandwidth of operation even farther than generally reported today. Therefore, it is useful to consider the bandwidth-limiting effects very carefully and to consider new approaches which may yield a further bandwidth improvement.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

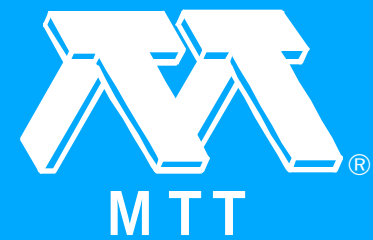
[Click on title for a complete paper.](#)



Abstracts

Asian Abstracts (Jul. 1990 [T-MTT])

"Asian Abstracts (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 951-968.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

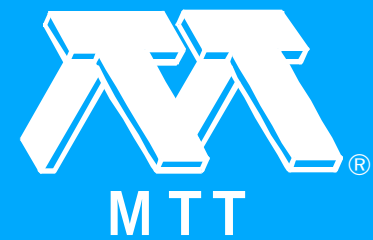
Click on title for a complete paper.



Abstracts

Patent Abstracts (Jul. 1990 [T-MTT])

"Patent Abstracts (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 969-973.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

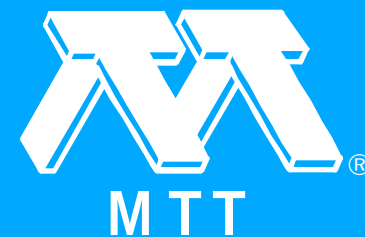
Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Jul. 1990 [T-MTT])

"Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 974-974.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

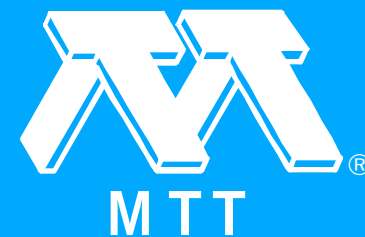
Click on title for a complete paper.



Abstracts

Call for Papers - IEEE Microwave and Guided Wave Letters (Jul. 1990 [T-MTT])

"Call for Papers - IEEE Microwave and Guided Wave Letters (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 975-975.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

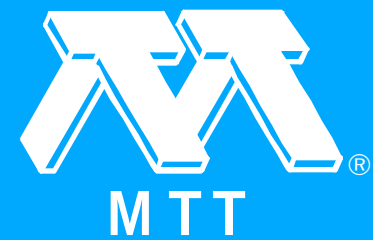
Click on title for a complete paper.



Abstracts

Information for Authors (Jul. 1990 [T-MTT])

"Information for Authors (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 976-977.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

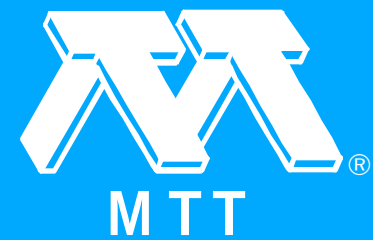
Click on title for a complete paper.



Abstracts

Author Check List (Jul. 1990 [T-MTT])

"Author Check List (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 978-978.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

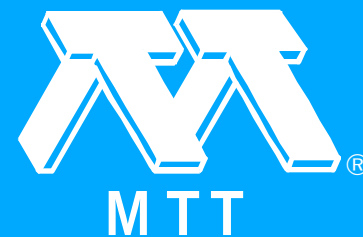
Click on title for a complete paper.



Abstracts

Call for Papers - Directions in Design and Applications of Microwave Systems (Jul. 1990 [T-MTT])

"Call for Papers - Directions in Design and Applications of Microwave Systems (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 979-979.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

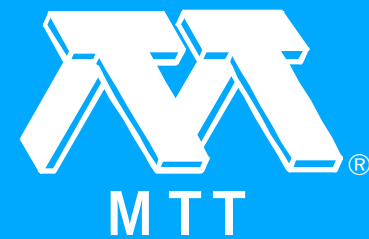
Click on title for a complete paper.



Abstracts

Call for Papers - Microwave Applications of Superconductors (Jul. 1990 [T-MTT])

"Call for Papers - Microwave Applications of Superconductors (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): 980-980.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Back Cover (Jul. 1990 [T-MTT])

"Back Cover (Jul. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.7 (Jul. 1990 [T-MTT]): b1-b2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

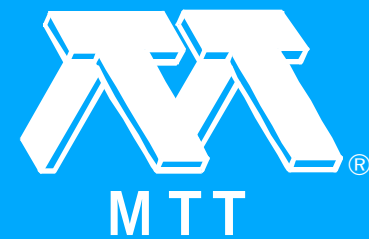
Click on title for a complete paper.



Abstracts

Front Cover (Aug. 1990 [T-MTT])

"Front Cover (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): f1-f2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Two-Dimensional Microwave Imaging by a Numerical Inverse Scattering Solution

S. Caorsi, G.L. Gagnani and M. Pastorino. "Two-Dimensional Microwave Imaging by a Numerical Inverse Scattering Solution." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 981-989.

A numerical approach is proposed that aims to detect, by means of interrogating microwaves, the locations and the dielectric permittivities of unknown inhomogeneous dielectric cylindrical objects of arbitrary cross sections that might be present inside a fixed area of interest. We assume an illumination with the electric field vector polarized along the cylindrical axis. The two-dimensional Lippman-Schwinger integral equation of electromagnetic scattering is transformed into matrix form by the moment method. The system obtained is solved by using a pseudoinversion algorithm to overcome ill-conditioning problems. The first-order Born approximation is also applied when the dielectric inhomogeneities are weakly scattering. Computer simulations have been performed by means of a numerical program; results show the capabilities and limitations of the proposed approach.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Electromagnetic Energy Deposition Inside a Three-Layer Cylindrical Human Body Model Caused by Near-Field Radiators

P.G. Cottis, G.E. Chatzarakis and N.K. Uzunoglu. "Electromagnetic Energy Deposition Inside a Three-Layer Cylindrical Human Body Model Caused by Near-Field Radiators." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 990-999.

The electromagnetic energy deposition inside a three-layer cylindrical human body model caused by loop or aperture applicators is considered analytically. The complex electromagnetic problem is formulated with the aid of the Green's function theory. The Green's function for the three-layer cylindrical structure is determined as the response to a unit excitation located outside the cylinder. Then the response to the radiators under examination is found. Numerical results are presented for several radiator dimensions and locations. A new applicator with enhanced penetration depth is proposed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Formulas Useful for the Synthesis and Optimization of General, Uniform Contradirectional Couplers

F. Sellberg. "Formulas Useful for the Synthesis and Optimization of General, Uniform Contradirectional Couplers." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1000-1010.

Explicit formulas that allow the synthesis and optimization of general, uniform contradirectional couplers are derived. The well-known method of compensating for different phase velocities of the coupler modes with shunting capacitors is also mathematically formulated in a stringent form, so that a lossless coupler of the general class mentioned above can be made ideal at any chosen frequency. Only specialized cases have been treated in closed mathematical form previously. Finally, compensated and uncompensated microstrip coupler designs are compared under the influence of realistic losses. It is shown that a considerably better directivity is attainable with capacitive compensation, even over a frequency range as large as one octave. The value of the formulas is confirmed by application to previously published experimental results.

[Click on title for a complete paper.](#)



Abstracts

An Analytic Algorithm for Unbalanced Stripline Impedance

P. Robrish. "An Analytic Algorithm for Unbalanced Stripline Impedance." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1011-1016.

This paper describes an approximation for the impedance of an unbalanced stripline with inner conductor thickness >0 and compares it with solutions generated using the boundary element method.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

An Analysis of Microstrip with Rectangular and Trapezoidal Conductor Cross Sections

C.J. Railton and J.P. McGeehan. "An Analysis of Microstrip with Rectangular and Trapezoidal Conductor Cross Sections." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1017-1022.

In this paper, microstrips with both rectangular and trapezoidal cross sections are analyzed by means of the finite-difference time-domain method and results are presented for microstrip both with and without a passivation layer. Where results from other authors are available, good agreement has been found to exist.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Transient Analysis of Nonuniform, High-Pass Transmission Lines

C.-W. Hsue and C.D. Hechtman. "Transient Analysis of Nonuniform, High-Pass Transmission Lines." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1023-1030.

The transient behavior of nonuniform transmission lines is studied by investigating the step response of a cascaded multiple-section line. Both the first arriving wave and the transition ripple at the load end are examined in detail. We find that the characteristic impedances necessary for obtaining the maximum first arriving wave are the same as those of the conventional multiple-section quarter-wave transformer. The discrete characteristic impedances of the multiple-section line are then extended to a continuously varied impedance function of a tapered line. The high-pass characteristic of the tapered nonuniform line is verified with techniques in the frequency domain.

[Click on title for a complete paper.](#)

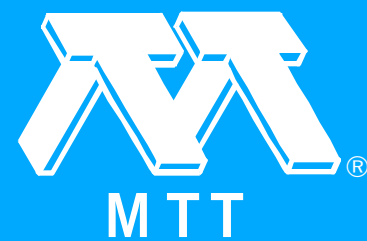


Abstracts

The Nature of the Charges, Currents, and Fields in and About Conductors Having Cross-Sectional Dimensions of the Order of a Skin Depth

G.L. Matthaei, K. Kiziloglu, N. Dagli and S.I. Long. "The Nature of the Charges, Currents, and Fields in and About Conductors Having Cross-Sectional Dimensions of the Order of a Skin Depth." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1031-1036.

The nature of the charge, current, and field patterns is investigated in and about transmission line conductors operating in a frequency range where one or more of the cross-sectional dimensions of the conductors is of the order of a skin depth. Questions are addressed concerning whether quasi-TEM approximations can be used. Examples are considered which simulate the relatively lossy, longer on-chip interconnects in high-speed digital circuits. For comparison, approximations to MMIC line examples, which usually have larger cross-sectional dimension and hence are less lossy, are also examined.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Modal Analysis of Radial-Resonator Waveguide Diode Mounts

B.D. Bates and A. Ko. "Modal Analysis of Radial-Resonator Waveguide Diode Mounts." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1037-1045.

A method of calculating the driving-point and transfer admittances of waveguide diode mounts with radial resonators is presented. The method is applicable to a variety of mount configurations, including the widely used resonant-cap mount. The analysis uses multimodal admittance matrices to represent the radial regions and their coupling and includes the influence of the waveguide boundary conditions. The coupling is determined by matching tangential fields at the boundary of the radial regions. The accuracy of the analysis is confirmed by comparison with experimental results.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Tunable, Temperature-Compensated Dielectric Resonators and Filters

S.-W. Chen, K.A. Zaki and R.G. West. "Tunable, Temperature-Compensated Dielectric Resonators and Filters." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1046-1052.

A thermal and an electromagnetic model of a tunable hybrid-mode dielectric double resonator is introduced and then analyzed by the mode-matching technique. Results of the analysis show the temperature sensitivity of the structure as a function of the center frequency as well as the other resonator parameters. A simple optimization procedure is described which allows the design of the resonator to simultaneously have a wide tunability range and good thermal stability of the resonant frequency. A circuit model is presented for a tunable four-pole dual-mode filter. The model exhibits interesting dual pass-bands, separated by a very high attenuation stopband. Measured results obtained from an experimental four-pole dual-mode dielectric resonator filter designed using the tunable hybrid-mode resonators showed excellent tunability range (200 MHz at C-band) and good agreement with the circuit model.

[Click on title for a complete paper.](#)



Abstracts

Three-Dimensional Electromagnetic Scattering from Inhomogeneous Objects by the Hybrid Moment and Finite Element Method

X. Yuan. "Three-Dimensional Electromagnetic Scattering from Inhomogeneous Objects by the Hybrid Moment and Finite Element Method." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1053-1058.

The hybrid moment and finite element method is used to obtain 3-D scattering and/or absorption from inhomogeneous, arbitrarily shaped objects. The surface of the object is approximated by triangles and the volume of the object is approximated by tetrahedrons. The electrical parameters are assumed constant in each tetrahedron. The Galerkin testing procedure is used. To avoid contaminations of spurious mode, a divergenceless vector basis function is used in finite elements. The calculated internal field and scattered field for a homogeneous sphere, a layered sphere, and a lossy prolate spheroid are compared with Mie series solutions and other numerical techniques. The accuracy and rate of convergence of the solution are discussed.



[Contents](#)

[Publications](#)

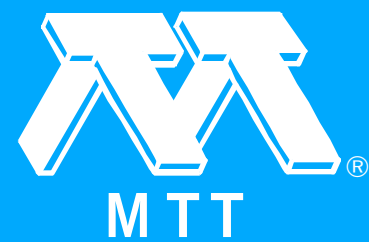
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses

M. Horno, F.L. Mesa, F. Medina and R. Marques. "Quasi-TEM Analysis of Multilayered, Multiconductor Coplanar Structures with Dielectric and Magnetic Anisotropy Including Substrate Losses." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1059-1068.

In this paper, a quasi-TEM analysis of multiconductor planar lines embedded in a layered structure involving lossy iso/anisotropic electric and/or magnetic materials is achieved. Conditions under which a quasi-TEM assumption is valid are theoretically determined. An efficient spectral-domain analysis is used to determine the complex capacitance, [C] and inductance, [L] matrices characterizing the transmission system. The computation of [L] when media characterized for a fully general permeability tensor are present, is reduced to the computation of an equivalent capacitance matrix. It is also shown that most actual MMIC microstrip-type structures (where semiconductor substrates are present and possible future applications including lossy magnetic materials can be analyzed by using the simple quasi-TEM model. The validity of the results has been verified by comparison with "full-wave" theoretical and experimental data on microstrip lines on magnetic substrates and slow-wave structures.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies

T. Rozzi, F. Moglie, A. Morini, E. Marchionna and M. Politi. "Hybrid Modes, Substrate Leakage, and Losses of Slotline at Millimeter-Wave Frequencies." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1069-1078.

This contribution deals with guided, hybrid propagation in slotline at microwave and millimeter-wave frequencies. The analysis is carried out rigorously in the space domain involving the variational solution of a singular integral equation for an E field tangential to the slot. Data are obtained for field distributions, dispersion, and characteristic impedance and are compared with data available in the literature. For the first time, we report results on power lost by the propagation mode in the conductors and in the dielectric substrate. Moreover, the analysis highlights the onset of leakage into a sufficiently thick substrate due the excitation of a TM surface wave. This sets a high-frequency limit for lossless operation.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

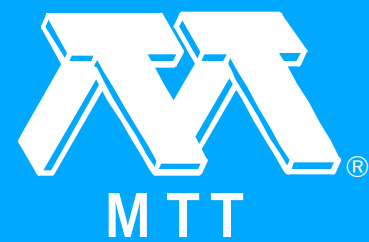
Stable Broad-Band Microwave Amplifier Design

W.-L. Jung and J. Wu. "Stable Broad-Band Microwave Amplifier Design." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1079-1085.

A modified real-frequency technique for designing a broad-band microwave amplifier with guaranteed stability is presented. This method generates the two sets of resistive excursions necessary for synthesizing the source and load admittances of the amplifier concurrently, rather than sequentially, while both the stability and realizability requirements are satisfied simultaneously. Regardless of its constrained nature, the method has been formulated as an unconstrained optimization problem. An 8-12 GHz band amplifier design example is presented to demonstrate its application. The transducer power gain obtained in the example by this method is 11.3 ± 0.4 dB, which is 2.6 dB higher than that obtained by using the real-frequency technique.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Numerical Solution of Transmission Line Problems by a Network Model Decomposition Method Based on Polygon Discretization

W. Geyi. "Numerical Solution of Transmission Line Problems by a Network Model Decomposition Method Based on Polygon Discretization." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1086-1091.

In formulating the network models for field equations, it is usually assumed that the region to be analyzed is covered by two orthogonal systems of equally spaced lines, forming a mesh system over the whole region. Apparently such a formulation lacks the advantages of the finite-element method, where the elements can be concentrated or dispersed where needed. In this paper, a polygon discretization technique is introduced to establish a network model which is suitable for both TEM transmission lines and hollow waveguides, and then a diakoptic algorithm for the analysis of the network model is developed. The algorithm is referred to as network model decomposition, and it can be used to calculate the characteristic impedance of an arbitrarily shaped TEM transmission line and the cutoff wavenumbers of a hollow waveguide of arbitrary section. Numerical results are also presented as a demonstration of the validity of the method.

[Click on title for a complete paper.](#)



Abstracts

Application of Least-Squares Boundary Residual Method to the Analysis of a Circular Waveguide Loaded with a Nonconcentric Dielectric Rod

S.-P. Yeo. "Application of Least-Squares Boundary Residual Method to the Analysis of a Circular Waveguide Loaded with a Nonconcentric Dielectric Rod." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1092-1095.

Although the point matching method had been used by other researchers to analyze dielectric-loaded waveguides, it lacks the mathematical rigor of the least squares boundary residual method (LSBRM). The present paper seeks, therefore, to utilize the LSBRM as an alternative modeling tool to analyze a circular waveguide loaded with a nonconcentric dielectric rod. Tests indicate that the numerical accuracies obtainable from the LSBRM model can be better than $\pm 0.5\%$.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

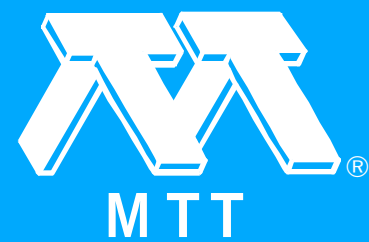
Improved Technique for Determining Complex Permittivity with the Transmission/Reflection Method

J. Baker-Jarvis, E.J. Vanzura and W.A. Kissick. "Improved Technique for Determining Complex Permittivity with the Transmission/Reflection Method." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1096-1103.

The transmission/reflection method for complex permittivity and permeability determination is studied. The special case of permittivity measurement is examined in detail. New robust algorithms for permittivity determination that eliminate the ill-behaved nature of the commonly used procedures at frequencies corresponding to integer multiples of one-half wavelength in the sample are presented. An error analysis is presented which yields estimates of the errors incurred due to the uncertainty in scattering parameters, length measurement, and reference plane position. In addition, new equations are derived for determining complex permittivity independent of reference plane position and sample length.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Transverse Resonance, Standing Wave, and Resonator Formulations of the Ridge Waveguide Eigenvalue Problem and its Application to the Design of E-Plane Finned Waveguide Filters

J. Bornemann and F. Arndt. "Transverse Resonance, Standing Wave, and Resonator Formulations of the Ridge Waveguide Eigenvalue Problem and its Application to the Design of E-Plane Finned Waveguide Filters." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1104-1113.

Utilizing the rigorous field distribution of the ridge waveguide eigenmodes, this paper presents an accurate computer-aided design of compact, low-cost, low-insertion-loss evanescent-mode waveguide band-pass filters with bilateral metallic E-plane fins. The design theory takes into account the influences of both the finite fin thickness and the higher order mode interaction at all discontinuities. The numerical advantage of the transverse resonance method for solving the related cross-sectional eigenvalue problem is demonstrated for the design of quasi-high-pass and band-pass filters of different ridge gap widths and is compared with the classical standing wave and resonator mode-matching techniques. Computer-optimized design data are given for filters with passbands in X-band (8-12 GHz) and E-band (60-90 GHz), which achieve high skirt selectivity and wide stopband. The theory is verified by measurements.



Equivalent Transformations for the Mixed Lumped Brune-Type Section and Uniform Transmission Line

R. Sato, Y.I Ohba, Y. Nemoto and K. Kobayashi. "Equivalent Transformations for the Mixed Lumped Brune-Type Section and Uniform Transmission Line." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1114-1122.

As a new analytical method for nonuniform transmission lines, equivalent transformations which were recently derived for mixed lumped and distributed circuits are extended to circuits consisting of a cascade connection of a lumped Brune type section (Brune section and C section) and a uniform transmission line. By considering the limiting case of these equivalent transformations, we can derive equivalent transformations for circuits consisting of a cascade connection of a lumped resonance circuit and a uniform transmission line.



Abstracts

A Configuration-Oriented Spice Model for Multiconductor Transmission Lines with Homogeneous Dielectrics

K.D. Marx and R.I. Eastin. "A Configuration-Oriented Spice Model for Multiconductor Transmission Lines with Homogeneous Dielectrics." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1123-1129.

The use of the SPICE circuit analysis computer program to simulate a lossless multiconductor transmission line is investigated. It is demonstrated that for the case of a homogeneous dielectric, the multiconductor line can be represented by a system of standard two-wire lines which is not based on modal decomposition. This system is readily modeled with SPICE. While restricted to situations where the dielectric constant can be assumed uniform, the present method has the advantage of an intuitive relationship to the conductor configuration, simpler SPICE input data requirements and an improvement in computer run time over other methods.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Analysis of a Shielded Microstrip Line with Finite Metallization Thickness by the Boundary Element Method (Short Papers)

T.-N. Chang and C.-H. Tan. "Analysis of a Shielded Microstrip Line with Finite Metallization Thickness by the Boundary Element Method (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1130-1132.

A boundary element method is presented for the quasistatic analysis of a shielded microstrip line with finite metallization thickness. The analysis is based on the solution of a system of boundary integral equations, which are derived from Green's second identity. Numerical results for the charge distribution along the strip and the effects of metallization thickness on line characteristics are presented. The results show good agreement with data available in the literature.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Analog Avalanche Diode Frequency Division (Short Papers)

C. Dalle, G. Ellena, P. Manet and P.A. Rolland. "Analog Avalanche Diode Frequency Division (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1132-1136.

In this paper the potential interest of analog avalanche diode frequency dividers is demonstrated. Their fundamental operating principle relies on the use of an idler signal. Experiments performed on avalanche diode frequency dividers with division ratios of 2, 3, and 4 in the centimeter-wave range have pointed out the possibility of wide instantaneous bandwidth and interesting RF conversion efficiencies.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Parametric Study of the Attenuation Constant of Lossy Microstrip Lines (Short Papers)

L.P. Vakanas, A.C. Cangellaris and J.L. Prince. "A Parametric Study of the Attenuation Constant of Lossy Microstrip Lines (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1136-1139.

In high-density, high-speed electronic circuits, the conductor and dielectric losses in microstrip-type interconnections are of particular concern. The attenuation constant of a microstrip line with finite strip conductivity and strip thickness comparable to the skin depth is investigated at a frequency of 1 GHz, and its dependence on the width of the strip and the thickness of the dielectric substrate ($\epsilon_r = 11$) is examined. It is found that the minimum in the attenuation constant predicted by earlier studies, when the conductor thickness is about two skin depths, occurs only for microstrips with impractical strip width to substrate thickness ratios.

[Click on title for a complete paper.](#)



Abstracts

Frequency-Domain Nonlinear Microwave Circuit Simulation Using the Arithmetic Operator Method (Short Papers)

C.-R. Chang and M.B. Steer. "Frequency-Domain Nonlinear Microwave Circuit Simulation Using the Arithmetic Operator Method (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1139-1143.

A frequency domain spectral balance technique for the analysis of microwave circuits with analytically modeled nonlinear devices is developed. The technique uses linear matrix transformation of spectra to perform basic arithmetic operations--multiplication and division--in the frequency domain, and is termed the arithmetic operator method. A single MESFET amplifier described by the Curtice model is simulated with one- and two-tone excitations using this novel technique. Excellent agreement is obtained when compared to the results simulated using the conventional harmonic balance method.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications (Comments and Reply)

H.-J. Eul and R.A Soares. "A Unified Mathematical Approach to Two-Port Calibration Techniques and Some Applications (Comments and Reply)." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1144-1145.

In the above paper certain assumptions are made which are not valid in general. The authors assume that the error boxes are reciprocal networks. In general this assumption is not valid because the error matrices are not related to an existing network. They only describe a mathematical relationship between the complex waves at the measurement ports and the output of the measurement channels.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts

Patent Abstracts (Aug. 1990 [T-MTT])

"Patent Abstracts (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1146-1153.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Aug. 1990 [T-MTT])

"Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1154-1154.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

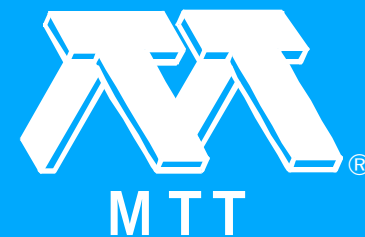
Click on title for a complete paper.



Abstracts

Call for Papers - IEEE Microwave and Guided Wave Letters (Aug. 1990 [T-MTT])

"Call for Papers - IEEE Microwave and Guided Wave Letters (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1155-1155.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

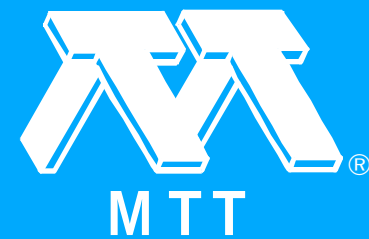
Click on title for a complete paper.



Abstracts

Information for Authors (Aug. 1990 [T-MTT])

"Information for Authors (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1156-1157.



- Contents
- Publications
- Issues
- Papers
- Authors

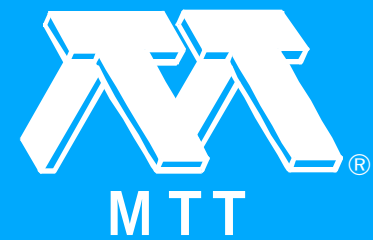
Click on title for a complete paper.



Abstracts

Author Check List (Aug. 1990 [T-MTT])

"Author Check List (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1158-1158.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

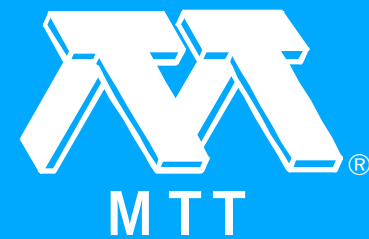
Click on title for a complete paper.



Abstracts

Call for Papers - Microwave Applications of Superconductors (Aug. 1990 [T-MTT])

"Call for Papers - Microwave Applications of Superconductors (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1159-1159.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

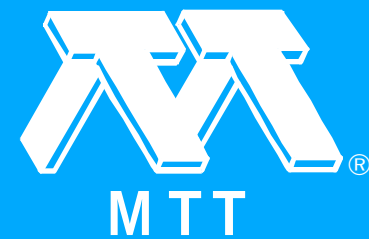
Click on title for a complete paper.



Abstracts

Call for Papers - Special Issue on Microwaves in Space (Aug. 1990 [T-MTT])

"Call for Papers - Special Issue on Microwaves in Space (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): 1160-1160.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

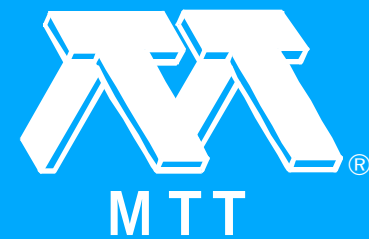
Click on title for a complete paper.



Abstracts

Back Cover (Aug. 1990 [T-MTT])

"Back Cover (Aug. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.8 (Aug. 1990 [T-MTT]): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

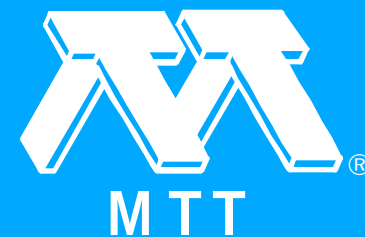
Click on title for a complete paper.



Abstracts

Front Cover (Sep. 1990 [T-MTT])

"Front Cover (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): f1-f2.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Guest Editorial (Sep. 1990 [T-MTT])

R. Goyal and E.C. Niehenke. "Guest Editorial (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1161-1163.

Commercial and military electronic systems require the use of a variety of sophisticated microwave and millimeter-wave circuit functions. These small, low-cost system components must exhibit highly reliable performance as they are adapted to both present and future needs. Circuit applications include transmit/receive modules for phased array radars, solid-state transmitters, down-converters for satellite receivers, optical receivers, microwave synthesizers, frequency converters and modulators, and additional integrated microwave functions. To meet present demands and develop new potential markets, there has been an extensive focus on the development of new processing technologies and circuits for multifunction MMIC's.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Multifunction MMIC History from a Process Technology Perspective

G.E. Brehm. "Multifunction MMIC History from a Process Technology Perspective." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1164-1170.

During the 1980's MMIC's proliferated, and a substantial number now include more than one system function on the same chip. These multifunction MMIC's are reviewed in this paper in the light of the processes that were used to fabricate them. Remarkable chips performing all the microwave functions of radar transmit/receive modules, receivers, and frequency synthesizers have been developed. The core technologies used for these chips were ion-implanted GaAs MESFET's on semi-insulating GaAs substrates. Process complexity is a dominant factor determining their practicality and cost, and the most successful circuits have been designed with process limitations in mind. In the future, proliferation of multifunction MMIC's with even greater functional complexity is expected, but additional process complexities will be added sparingly.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

MIMIC from the Department of Defense Perspective

E.D. Cohen. "MIMIC from the Department of Defense Perspective." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1171-1174.

The Microwave and Millimeter Wave Monolithic Integrated Circuits (MIMIC) Program is a Defense Advanced Research Projects Agency initiative to provide affordable, reliable, and reproducible microwave and millimeter-wave circuits in monolithic format for use in Department of Defense systems. This paper describes the objectives of the program, progress being made toward meeting those objectives, and some planned future work.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits

I.J. Bahl, M.J. Drinkwine, A.E. Geissberger, E.L. Griffin and J.A. Grzyb. "Multifunction SAG Process for High-Yield, Low-Cost GaAs Microwave Integrated Circuits." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1175-1182.

A new fully planar, multifunction refractory self-aligned gate (MSAG) technology suitable for the fabrication of GaAs small-signal and power MMIC's is demonstrated in a manufacturing environment. We present data on the distribution of dc and RF performance and yield for pilot production of discrete FET's and MMIC's. Lots having good wafer yields have demonstrated average chip yields on PCM good wafers of 45%, 49%, and 36% for 2.5-8 GHz feedback amplifiers, 1 W C-band power amplifiers, and 4 W C-band power amplifiers, respectively.



IEEE

[Contents](#)

[Publications](#)

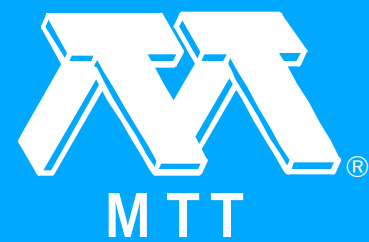
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Integration of High-Q GaAs Varactor Diodes and 0.25 μm GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications

M.G. McDermott, C.N. Sweeney, M. Benedek, J.J. Borelli, G. Dawe and L. Raffaelli.
"Integration of High-Q GaAs Varactor Diodes and 0.25 μm GaAs MESFET's for Multifunction Millimeter-Wave Monolithic Circuit Applications." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1183-1190.

Two technologies have been demonstrated whereby high-Q, vertical-structure, abrupt-junction varactor diodes have been monolithically integrated with 0.25 μm GaAs MESFET's on semi-insulating GaAs substrates for multifunction millimeter-wave monolithic circuit applications. A range of diodes with various anode sizes have been realized with measured capacitance swings of $>2.1:1$ from 0 V to -4 V and series resistances of approximately 1 Ω . Diodes having a zero bias capacitance of 0.35 pF have Q's of $>19\,000$ (50 MHz) with -4 V applied to the anode. Under power bias conditions, the MESFET's have a measured gain of >6 dB at 35 GHz with extrapolated values for $f_{\text{sub } t/}$ and $f_{\text{sub } \text{max}/}$ of 32 GHz and 78 GHz, respectively. Using these technologies, a monolithic Ku-band VCO containing a varactor diode, a 0.25 μm GaAs MESFET, and the usual MMIC passive components has been built and tested. At around 31 GHz, the circuit has demonstrated 60 mW power output with 300 MHz of tuning bandwidth. The technologies can be extended to integrate other types of diodes and 0.25 μm FET devices on the same GaAs wafer, such as p-i-n's and MESFET's/HEMT's or Schottky mixer diodes and MESFET's/HEMT's.



Abstracts



IEEE

Contents

Publications

Issues

Papers

Authors

Multifunction Silicon MMIC's for Frequency Conversion Applications

K.J. Negus and J.N. Wholey. "Multifunction Silicon MMIC's for Frequency Conversion Applications." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1191-1198.

Recent advances in silicon bipolar IC technology have produced devices with 10-20 GHz $f_{\text{sub T}}$ and $f_{\text{sub max}}$ and excellent yields at MSI levels (~ 100 devices). Thus cost-effective multifunction silicon MMIC's can now be developed for many commercial RF/microwave systems. In this work, the modeling, design, and testing of two silicon MMIC's for frequency conversion applications are illustrated in detail. The first product is a wide-band frequency doubler with conversion gain, 20 dBc rejection of harmonics, and a 2 GHz bandwidth. The second product is a wide-band vector demodulator (or image reject mixer) that utilizes an on-chip digital frequency divider to generate 0° and 90° LO phases from 0.05-1.5 GHz. Both products operate from a single 5 V supply, are load-insensitive, require no external baluns, and are packaged in tiny 180 mil hermetic packages. These frequency conversion MMIC's and others currently under development have been prototype on the analog silicon transistor array starCHIPTM-1, which is also described.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si

S.N. Subbarao, D.W. Bechtle, R.J. Menna, J.C. Connolly, R.L. Camisa and S.Y. Narayan. "2-4 GHz Monolithic Lateral p-i-n Photodetector and MESFET Amplifier on GaAs-on-Si." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1199-1203.

The design, fabrication, and evaluation of a monolithic lateral p-i-n photodetector and a MESFET amplifier on GaAs-on-Si are described. The GaAs-on-Si was grown by MOCVD. The low-capacitance p-i-n detector is fabricated directly on the high-resistivity GaAs buffer layer in an MMIC-compatible process. A quantum efficiency exceeding 60% has been measured for the p-i-n detectors. The 2 to 4 GHz frequency responses of one and two-stage p-i-n/FET preamplifiers are presented. The response varies ± 3 dB over the frequency band. These results are comparable to those of a similar circuit fabricated on a GaAs substrate.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer

T. Ohira, M. Muraguchi, T. Hirota, K. Osafune and M. Ino. "Dual-Chip GaAs Monolithic Integration Ku-Band Phase-Locked-Loop Microwave Synthesizer." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1204-1209.

Two novel multifunction monolithic chips, GaAs MMIC and LSI, have been developed to realize an extremely small and lightweight microwave synthesizer. The MMIC includes a voltage-controlled oscillator, a dual-output buffer amplifier, a balun, and dynamic/static prescalers. To integrate these functions on a single chip, each circuit has been drastically reduced in size by utilizing a uniplanar MMIC configuration. The LSI includes a dual-modulus prescaler, programmable counters, and a phase/frequency comparator. By incorporating these two monolithic chips into the structure, a Ku-band microwave synthesizer has successfully been fabricated in an 11 X 23 mm² flat package.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part I

T. Tokumitsu, S. Hara, T. Takenaka and M. Aikawa. "Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part I." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1210-1217.

FET-sized combiners and dividers, in phase and out of phase, based on a novel line-unified-FET (LUFET) concept are described and demonstrated. Some effective extensions, such as extended combiner LUFET's, magic T LUFET's, and phase inverter LUFET's, are also described. The "extension" of the basic combiner and divider LUFET's allows the realization of various circuit functions in a very small area. The area of fabricated LUFET's is between 0.1 and 0.3 mm² and the operating frequency bandwidth approaches 20 GHz. LUFET applications as miniaturized RF signal processing MMIC's are described in Part II (in this issue).

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

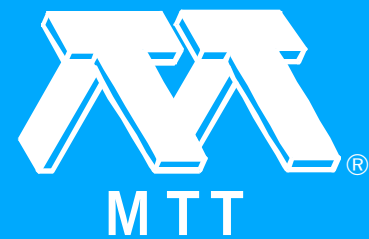
Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part II

T. Tokumitsu, S. Hara, T. Takenaka and M. Aikawa. "Divider and Combiner Line-Unified FET's as Basic Circuit Function Modules--Part II." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1218-1226.

Applications of line-unified FET's (LUFET's) to RF signal processing elements such as multiport combiner/dividers, mixers, balanced modulators, signal path switches, and circulators are proposed and demonstrated. These MMIC's are realized by modifying and combining LUFET's. The area of the fabricated LUFET's and LUFET MMIC's is between 0.1 and 1.5 mm², the average being about 0.5 mm². Multioctave-band operation suitable for generic use is also easily achieved.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Monolithic Integrated Blanking Up-Converter

M. West, Jr. and M. Kumar. "Monolithic Integrated Blanking Up-Converter." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1227-1231.

A wide-band monolithic integrated blanking up-converter is described which up-converts a 0.1 to 0.5 GHz IF signal to a 0.6 to 1.75 GHz RF signal. The up-converter consists of a wide-band FET double balanced mixer, LO and IF input amplifiers, a novel actively matched 180° phase splitter, and an RF amplifier. The up-converter provides a conversion gain of 8 dB, maximum input and output VSWR's less than 1.6, a 40 dB on/off blanking capability, and a power dissipation of 0.8 W. The high level of integration of various functions on a single chip utilizing all active matching is realized in a small size of 1.22 mm X 1.22 mm.

Click on title for a complete paper.



Abstracts

GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications

I.J. Bahl, D.A. Willems, J.F. Naber, H.P. Singh, E.L. Griffin, M.D. Pollman, A.E. Geissberger and R.A. Sadler. "GaAs IC's Fabricated with the High-Performance, High-Yield Multifunction Self-Aligned Gate Process for Radar and EW Applications." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1232-1241.

This paper presents design and test results for several multiuse GaAs IC's for radar and EW applications. The chips described are a redundant switch, a broad-band distributed amplifier, a broad-band variable-gain amplifier, a 2.5 GHz sample and hold, a 1 GHz analog-to-digital converter, and an L-band buffered prescaler. These IC's, fabricated with the ITT 0.4- μ m-gate MESFET multifunction self-aligned gate (MSAG) process, demonstrated excellent performance.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Considerations in Producibility Engineering of MMIC's

A.K. Sharma. "Considerations in Producibility Engineering of MMIC's." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1242-1248.

Advances in GaAs devices and processing technology have made monolithic microwave and millimeter-wave integrated circuit (MMIC) technology feasible for various military and space communication systems. The producibility engineering of monolithic microwave integrated circuits and modules required for various system insertions requires careful consideration in the areas of processing, device characterization and modeling, circuit simulation, module assembly, packaging, and testing. Appropriate design tools are necessary in achieving their desired performance. This paper highlights some considerations in the producibility engineering aspects of the chips and modules, in terms of both design methodologies and design tool.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter (Short Papers)

R. Michels, P. Wallace, R. Goyal, N. Scheinberg and M. Patel. "A High-Performance, Miniaturized X-Band Active Mixer for DBS Receiver Application with On-Chip IF Noise Filter (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1249-1251.

This paper describes a GaAs monolithic microwave integrated circuit (MMIC) dual-gate FET active mixer at X-band that is designed for direct broadcast satellite (DBS) applications. All the components of the mixer, including biasing circuitry, RF, LO, and IF matching networks, as well as the IF noise filter, were implemented monolithically into a 25 mil x 30 mil area. The design was process tolerant, and layout was compact for manufacturability and low cost. The mixer was integrated monolithically into a complete single-chip DBS low-noise block (LNB) converter. The active mixer discussed here has a conversion gain of 5.5 dB and a single-sideband noise figure of 8.5 dB. The circuit was manufactured using a 0.5 μm gate length, buried p- depletion mode MESFET process without substrate-through via holes.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A 225 GHz Polarimetric Radar

J.B. Mead and R.E. McIntosh. "A 225 GHz Polarimetric Radar." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1252-1258.

This paper describes an incoherent 225 GHz polarimetric radar capable of measuring the Mueller matrix of point and distributed targets. The transmitter employs an extended interaction oscillator that transmits 60 W pulses of 50 to 600 ns duration. Incoherent measurements of the Mueller matrix are achieved by transmitting four polarization states and measuring the scattered wave using a dual polarized receiver. A novel calibration technique is presented that requires a single in-scene reflector. We also present polarimetric measurements of a dihedral corner reflector and foliage which are the first polarimetric measurements reported at this wavelength. The foliage measurements indicate a pronounced sensitivity of the polarimetric data to fine-scale surface structure.

[Click on title for a complete paper.](#)



Analysis of Energy Coupling into Spheroidal Ferritic Implants for Hyperthermia Applications

P.G. Cottis, A.I. Melas and N.K. Uzunoglu. "Analysis of Energy Coupling into Spheroidal Ferritic Implants for Hyperthermia Applications." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1259-1267.

The coupling of energy of RF power into lossy tissues using a needle-shaped ferromagnetic implant excited by an externally applied current loop is analyzed theoretically. The ferritic implant is assumed to be of prolate spheroidal shape, while the tissue medium is modeled as a lossy sphere. The electromagnetic fields inside the ferritic implant, the surrounding lossy tissue, and the free space are appropriately expressed in terms of spherical or spheroidal wave functions. Application of the boundary conditions results in an infinite system of equations for the unknown field expansion coefficients. This system is truncated and solved and the electromagnetic field is computed numerically. Absorbed power density inside the implant and the surrounding medium is computed, and the efficiency of the present method in producing in-depth energy deposition is examined.



Abstracts

The Current Distribution and AC Resistance of a Microstrip Structure

R. Faraji-Dana and Y.L. Chow. "The Current Distribution and AC Resistance of a Microstrip Structure." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1268-1277.

This paper presents an analysis of the ac resistance in a microstrip structure for any metallization thickness by deriving the current distribution over the strip cross section. The analysis uses the separation of variables technique and the Green's function method. It shows that the skin current of the strip is concentrated toward the ground plane in a microstrip structure. In the extreme case, the ac resistance of the strip can be twice as high as the ac resistance of the same strip isolated. The imperfect ground plane also adds to the total conductor loss of a microstrip line. For a wide strip over a lossy ground plane at high frequency, the ground plane surface current distribution is concentrated directly under the strip, and the ground plane ac resistance can be as large as the strip ac resistance. Therefore, the total ac resistance of the microstrip line can be four times as high as that of an isolated strip conductor.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Complex Modes in Shielded Suspended Coupled Microstrip Lines

J.-T. Kuo and C.-K.C. Tzuang. "Complex Modes in Shielded Suspended Coupled Microstrip Lines." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1278-1286.

The existence of complex modes in electrically shielded suspended coupled microstrip lines has been studied extensively, and the results are presented. A rigorous full-wave spectral-domain approach (SDA) with a newly proposed and tested set of basis functions can efficiently and accurately determine the propagation characteristics of the dominant, higher order, and complex modes for planar or quasi-planar transmission lines. These basis functions are validated by comparing the convergence study of field solutions with those obtained by various sets of preconditioned bases and by the unconditioned subdomain ones. Excellent agreement is obtained for the propagation constants and the normalized complex longitudinal and transverse current distributions on conducting strips for the strongly coupled microstrip lines. This suggests that the proposed set of basis functions can be a viable candidate for the SDA in analyses of planar or quasi-planar transmission lines. Under all the particular case studies of this paper, it is shown that the complex modes may exist in all the shielded suspended coupled microstrip lines, even when the substrate dielectric constant is low. Theoretical results for the fundamental, higher order, evanescent, and complex modes are presented for suspended coupled microstrip lines.



Abstracts

Spectral and Variational Analysis of Generalized Cylindrical and Elliptical Strip and Microstrip Lines

F. Medina and M. Horno. "Spectral and Variational Analysis of Generalized Cylindrical and Elliptical Strip and Microstrip Lines." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1287-1293.

In this paper, the variational technique in the spectral domain (VTSD) is shown to be an efficient method for computing the quasi-TEM parameters of arbitrary multiconductor and multielectric cylindrical or elliptical strip configurations. Simple conformal mappings reduce the cylindrical or elliptical geometries to an equivalent rectangular one with periodic boundary conditions. Minor modifications of previous work on planar structures allow us to analyze any cylindrical or elliptical geometry, computing the capacitance [C] and inductance [L] matrices, from which the effective dielectric constants and mode impedances are obtained.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A New Formulation of the Boundary Condition at Infinity for a Hybrid Radiation Mode and its Application to the Analysis of Radiation Modes of Microstrip Lines

W. Zieniutycz. "A New Formulation of the Boundary Condition at Infinity for a Hybrid Radiation Mode and its Application to the Analysis of Radiation Modes of Microstrip Lines." 1990 *Transactions on Microwave Theory and Techniques* 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1294-1299.

In the paper a new boundary condition for hybrid radiation modes is introduced. The validity of the condition is proved by its application to the analysis of a laterally shielded dielectric slab. Next, using this condition, an iterative method in the spectral domain is proposed in order to analyze striplike stratified transmission lines. As a result, two solutions, classified as perturbed LSE and LSM modes, have been obtained. Numerical results concerning the convergence of the method as well as the field distribution are also presented for the case of a microstrip line.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Three-Dimensional Analysis of Electromagnetic Fields in Rectangular Waveguides by the Boundary Integral Equation Method

K. Ishibashi and E. Sawado. "Three-Dimensional Analysis of Electromagnetic Fields in Rectangular Waveguides by the Boundary Integral Equation Method." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1300-1308.

A rapidly convergent expression of electromagnetic fields in rectangular waveguides is proposed for three dimensional electromagnetic field analysis by using the integral equation method. The new method is an improved image expansion method utilizing the rapid convergence of the orthogonal expansion method, and gives an accurate numerical value with a short computing time. Using the new method, when the electromagnetic fields in a waveguide with a circular post of arbitrary length were analyzed, goods results were obtained.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

A New Method of Modeling Three-Dimensional MIC/MMIC Circuits: The Space-Spectral Domain Approach

K. Wu and R. Vahldieck. "A New Method of Modeling Three-Dimensional MIC/MMIC Circuits: The Space-Spectral Domain Approach." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1309-1318.

A new space-spectral domain analysis has been developed to characterize arbitrarily shaped, spatial three-dimensional (3-D) discontinuities in MIC/MMIC circuits. The method is very general and combines the advantages of the spectral-domain analysis (SDA) with that of the one-dimensional method of lines (MOL). The new approach is numerically very efficient and can be applied to planar transmission lines on insulating as well as semiconducting substrates with and without open boundaries. Several resonator structures are analyzed to demonstrate the usefulness of this new method.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Hermitian Finite-Element Method for Inhomogeneous Waveguides

M. Israel and R. Miniowitz. "Hermitian Finite-Element Method for Inhomogeneous Waveguides." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1319-1327.

A finite-element method (FEM) based on Hermitian fifth-degree polynomials has been established in order to determine within a closed waveguide filled with inhomogeneous material to the method based on the Lagrangian approximation, spurious solutions are eliminated when the divergence-free constraint is satisfied the boundary conditions are explicitly enforced. However, the (C/sup 1/) Hermitian approximation allows the direct elimination of the field component in each triangle element. This procedure results reduction of the computer memory needed and in programming efficiency. As the Hermitian FEM uses smooth basis functions, the also increases the quality of the field solution. The method has been applied to mode characterization in waveguides. Several comparisons with Lagrangian FEM demonstrate the advantages of the Hermitian FEM. Some difficulties arising in cases of waveguides with sharp edges are discussed. A solution based on mesh refinement near the sharp edges is proposed.

[Click on title for a complete paper.](#)



Abstracts

Absorbing Boundary Conditions for the Finite-Element Analysis of Planar Devices

J.P. Webb. "Absorbing Boundary Conditions for the Finite-Element Analysis of Planar Devices." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1328-1332.

Microwave and optical devices in which the fields are not confined to a finite region can nevertheless be analyzed with the finite-element method if special boundary conditions are used, to absorb outgoing radiation. The absorbing boundary conditions may be imposed by the addition of two terms to the usual functional for the scalar Helmholtz equation. New universal matrices are introduced to allow the additional terms to be easily assembled, for polynomial orders one through four. Results are given for the impedance of a parallel-plate waveguide radiating into free space and for the scattering parameters of three dielectric slab waveguide devices: a rectangular discontinuity, a feed structure, and a Y junction.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Analysis of Dielectric-Loaded Waveguide

C.-C. Yu and T.-H. Chu. "Analysis of Dielectric-Loaded Waveguide." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1333-1338.

In this paper, the calculation of eigenvalues including propagation constants and cutoff wavelengths of LSE/sub nm/ and LSM/sub nm/ modes in homogeneous and inhomogeneous lossless dielectric-slab-loaded rectangular waveguides using a modified variation-iteration method is presented. The initial eigenvalues used in the iteration are selected on the basis of a physical consideration. Numerical examples shown are capable of efficiently calculating propagation constants and cutoff wavelengths of LSE/sub nm/ and LSM/sub nm/ modes given values of the free-space propagation constant and the lower bound of the cutoff wavelength, respectively.

[Click on title for a complete paper.](#)



Abstracts

Full-Wave Analysis of Coplanar Waveguides by Variational Conformal Mapping Technique

C.-N. Chang, Y.-C. Wong and C.H. Chen. "Full-Wave Analysis of Coplanar Waveguides by Variational Conformal Mapping Technique." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1339-1344.

A new full-wave analysis of coplanar waveguides presented. A modification of Wen's mapping is combined with the variational formulation to facilitate a finite-element solution. This mapping function transforms the infinite original domain into a finite domain and also overcomes the difficulty of field singularities near conductor edges. In this study, numerical results for the frequency-dependent effective dielectric constants and characteristic impedances of coplanar waveguides are presented. Particular attention is given the electric field distributions over the air-dielectric interface and the current distributions on the signal strip. Comparisons are made between the computed results and available ones.



IEEE

Contents

Publications

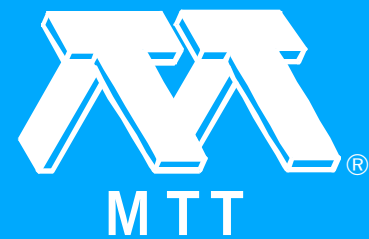
Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

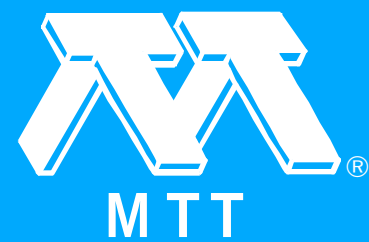
Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron

P. Muggli, M.Q. Tran, H.-G. Mathews, G. Agosti, S. Alberti and A. Perrenoud. "Effect of Power Reflection on the Operation of a Low-Q 8 GHz Gyrotron." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1345-1351.

The operating characteristics of a low-Q ($Q_{\text{cav}} = 225$), 8 GHz gyrotron oscillator operating in the TE_{011} mode and submitted to various mismatched loads are reported. Under matched conditions, output power up to 310 kW ($\eta = 35\%$) and maximum efficiency up to 43% have been measured. In general, power reflection from loads with different phases and amplitudes leads to an output power decrease. Excessive reflections cause mode switching (TE_{011} to TE_{012}) or even arcing inside the tube. The effect of power reflection is seen to increase rapidly with current and output power. Nevertheless, we have observed that, as predicted by calculations, the maximum output power is not reached under matched conditions but with a specific nonzero value of the complex reflection coefficient.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Three-Dimensional Finite-Element Solution of Dielectric Scattering Obstacles in a Rectangular Waveguide

K. Ise, K. Inoue and M. Koshiba. "Three-Dimensional Finite-Element Solution of Dielectric Scattering Obstacles in a Rectangular Waveguide." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1352-1359.

A numerical approach is described for the analysis of scattering from dielectric obstacles in a rectangular waveguide. The approach is a combination of the finite-element method and the analytical solution. For saving computer memory, the substructure method is introduced in the finite-element method. Moreover, to combine the uniform waveguide region with the finite-element-method region, evanescent modes as well as propagating modes are considered in the analytical solution. Spurious fields like the spurious solutions generated in the finite-element analysis of three-dimensional eigenvalue problems can appear in the three-dimensional discontinuity problems when the variational expression in terms of three components of the magnetic field is used. To suppress and eliminate the spurious fields, the penalty function method is also introduced. To confirm the validity and usefulness of the present approach, numerical examples are shown for a rectangular dielectric scattering obstacle in a waveguide.

Click on title for a complete paper.

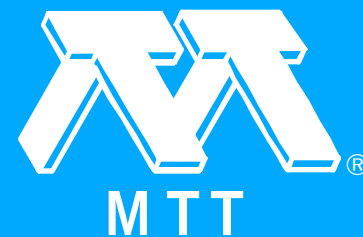


Abstracts

A New Way to Optically Control a Millimeter-Wave Oscillator (Short Papers)

Z. Yu and W. Lin. "A New Way to Optically Control a Millimeter-Wave Oscillator (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1360-1362.

This paper proposes a new way to optically control a millimeter-wave oscillator. In contrast to previously reported optically controlled oscillators, which usually give a negative frequency variance response to the controlling light signals, the method proposed here can produce a positive frequency variance. In our experiments, an increasing optically controlled frequency variance of about 150 MHz has been observed in a Ka-band Gunn oscillator.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Wave Propagation in a Double-Sided Exponentially Tapered Rectangular Waveguide (Short Papers)

S.O. Ajose and C.N. Ndujiuba. "Wave Propagation in a Double-Sided Exponentially Tapered Rectangular Waveguide (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1362-1365.

Electromagnetic wave propagation in a rectangular waveguide for which both sides are exponentially tapered is discussed. The wave equation in the guide is a second-order nonlinear partial differential equation which is solved numerically using the finite element approach. The results obtained for large taper coefficients are useful in the design of miniaturized waveguide/microstrip transitions constituting the input and output sections of test jigs employed in solid-state circuits mounted in waveguide environments.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Dispersion Characteristics of Curved Microstrip Transmission Lines (Short Papers)

J.S. Roy, D.R. Poddar, A. Mukherjee and S.K. Chowdhury. "Dispersion Characteristics of Curved Microstrip Transmission Lines (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1366-1370.

In this paper, an empirical expression for the effective dielectric permittivity of curved microstrip transmission lines is derived. Considering a rectangular line as a curved line of infinite radius, the closed-form expression for the frequency dependence of the effective dielectric permittivity of rectangular microstrip line is compared with other available results. This expression for the frequency dependence of the effective dielectric permittivity of curved microstrip transmission lines is very general, simple, and accurate and is suitable for CAD implementation.

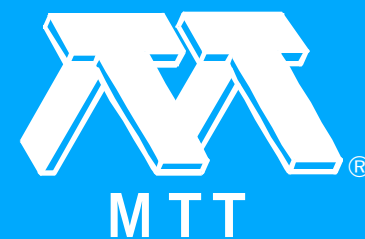
[Click on title for a complete paper.](#)



Abstracts

Patent Abstracts (Sep. 1990 [T-MTT])

"Patent Abstracts (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1371-1373.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

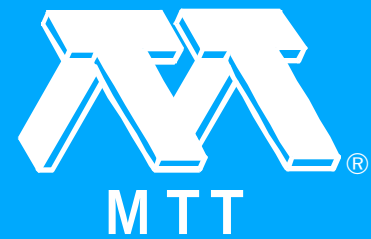
Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Sep. 1990 [T-MTT])

"Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1374-1374.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

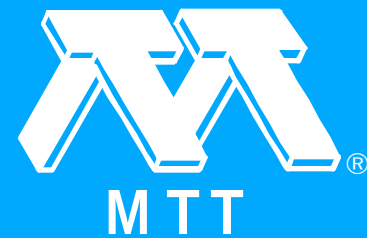
Click on title for a complete paper.



Abstracts

Call for Papers - IEEE Microwave and Guided Wave Letters (Sep. 1990 [T-MTT])

"Call for Papers - IEEE Microwave and Guided Wave Letters (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1375-1375.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Information for Authors (Sep. 1990 [T-MTT])

"Information for Authors (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1376-1377.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

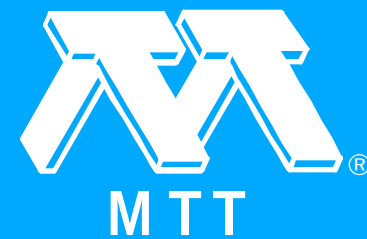
Click on title for a complete paper.



Abstracts

Author Check List (Sep. 1990 [T-MTT])

"Author Check List (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1378-1378.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

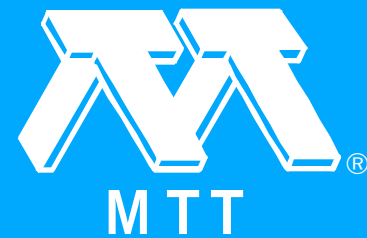
Click on title for a complete paper.



Abstracts

Call for Papers - Microwave Applications of Superconductors (Sep. 1990 [T-MTT])

"Call for Papers - Microwave Applications of Superconductors (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1379-1379.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

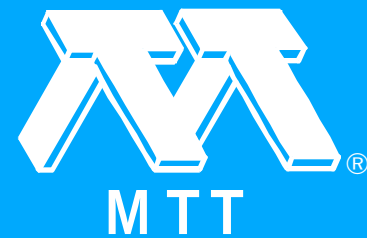
Click on title for a complete paper.



Abstracts

Call for Papers - Special Issue on Microwaves in Space (Sep. 1990 [T-MTT])

"Call for Papers - Special Issue on Microwaves in Space (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): 1380-1380.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

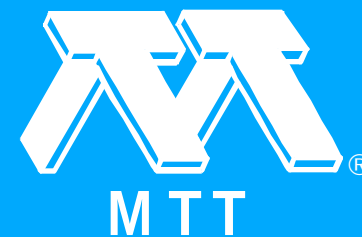
Click on title for a complete paper.



Abstracts

Back Cover (Sep. 1990 [T-MTT])

"Back Cover (Sep. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.9 (Sep. 1990 [T-MTT] (Special Issue on Multifunction MMIC's and their System Applications)): b1-b2.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Front Cover (Oct. 1990 [T-MTT])

"Front Cover (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz

N.L. Wang, N.H. Sheng, M.F. Chang, W.J. Ho, G.J. Sullivan, E.A. Sovero, J.A. Higgins and P.M. Asbeck. "Ultrahigh Power Efficiency Operation of Common-Emitter and Common-Base HBT's at 10 GHz." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1381-1390.

In this paper, ultrahigh power-added efficiency is reported for AlGaAs/GaAs HBT's operating at 10 GHz in common-emitter (CE) and common-base (CB) modes. A record high 67.8% power-added efficiency with 11.6 dB associated gain was achieved with a CE HBT at a CW output power of 0.226 W, corresponding to a power density of 5.6 W/mm. With a CB HBT, 62.3% power-added efficiency with 11.85 dB gain and 0.385 W total CW power was demonstrated. Details of the operation of both CE and CB HBT's are described and compared. Current gain, stability, near class B operation, and power saturation characteristics are discussed. Differences from FET behavior are highlighted.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Simulation of the Superconducting Quasiparticle Mixer Using a Five-Port Model

C.-Y.E. Tong and R. Blundell. "Simulation of the Superconducting Quasiparticle Mixer Using a Five-Port Model." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1391-1398.

A harmonic Newton technique has successfully been used in the simulation of superconducting quasiparticle mixers in a five-port model. The steady-state large-signal waveform impressed across the tunnel junction by the incident local oscillator (LO) power is computed in the frequency domain. The three-frequency approximation provides the initial trial solution, which, together with the superlinear convergence property of Newton's method, ensures rapid convergence. A wide range of simulations based on the response function of a real superconductor insulator-superconductor (SIS) junction is presented. The case of an SIS harmonic mixer ($n = 2$) has also been studied. The first results indicate that harmonic quasiparticle mixing may be very attractive in the submillimeter-wave band.

[Click on title for a complete paper.](#)



Novel Unilateral Circuits for MMIC Circulators

S. Hara, T. Tokumitsu and M. Aikawa. "Novel Unilateral Circuits for MMIC Circulators." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1399-1406.

Novel three-port unilateral circuit modules, which have elemental functions required in a circulator, are proposed. The proposed modules are composed of an active out-of-phase divider and an active in-phase combiner or of an active in-phase divider and an active out-of-phase combiner. The modules have many variations and all are very small and operate over a very wide frequency range. These modules can be used in MMIC's as circulators and are key components for very high frequency signal processing.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Inductance of Perfectly Conducting Foils Including Spiral Inductors

A.R. Djordjevic, C.K. Allen, T.K. Sarkar and Z.A. Maricevic. "Inductance of Perfectly Conducting Foils Including Spiral Inductors." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1407-1414.

A numerical method for calculating the lumped inductance parameters of perfectly conducting foils (i.e., current sheets) is presented. A quasi-static analysis is described for computing the inductance for foils arbitrarily shaped in three dimensions. The vector current distribution on the structure is solved for in terms of a scalar current potential function. The method of moments is utilized to solve the integral equation. Numerical results are also presented. The strength of this technique is that a bound on the numerical accuracy can be provided. The relative error not only provides a self-consistency check but also provides the accuracy with which the numerical values have been computed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Tapered Transmission Lines with a Controlled Ripple Response

J.P. Mahon and R.S. Elliott. "Tapered Transmission Lines with a Controlled Ripple Response." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1415-1420.

A synthesis procedure is presented which generalizes Klopfenstein's Dolph-Chebyshev design of a tapered transmission line to give a response with all lobe heights in the passband individually specified. A further generalization replaces the lobelike characteristic with a rippled response of controlled height. Physically realizable tapers result for both generalizations.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Compact Planar Microstrip-Slotline Symmetrical Ring Eight-Port Comparator Circuits

G.P. Riblet. "Compact Planar Microstrip-Slotline Symmetrical Ring Eight-Port Comparator Circuits." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1421-1426.

In this paper it is shown that the common eight-port comparator circuit may be constructed starting from a fully symmetrical eight-port device. Several examples of symmetrical planar ring comparator circuits, which make use of microstrip and slotline transmission lines, are described. The ring circumference may be a wavelength or less at midband.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities

A. Khebir, A.B. Kouki and R. Mittra. "Asymptotic Boundary Conditions for Finite Element Analysis of Three-Dimensional Transmission Line Discontinuities." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1427-1432.

In this paper, the finite element method is used to analyze open region three-dimensional transmission line structures in the quasi-TEM regime. Starting with the general form of the solution to the three-dimensional Laplace's equation in spherical coordinates, a set of asymptotic boundary condition (ABC) operators is derived. Later, the second-order ABC is applied on a conformable outer boundary for the purpose of truncating the mesh in an efficient manner. To illustrate its application, the method is used to compute the capacitance of a rectangular microstrip path, and the results are found to be in good agreement with data published elsewhere.

[Click on title for a complete paper.](#)



Abstracts

Higher Order Asymptotic Boundary Condition for the Finite Element Modeling of Two-Dimensional Transmission Line Structures

A. Khebir, A.B. Kouki and R. Mittra. "Higher Order Asymptotic Boundary Condition for the Finite Element Modeling of Two-Dimensional Transmission Line Structures." 1990 *Transactions on Microwave Theory and Techniques* 38.10 (Oct. 1990 [T-MTT]): 1433-1438.

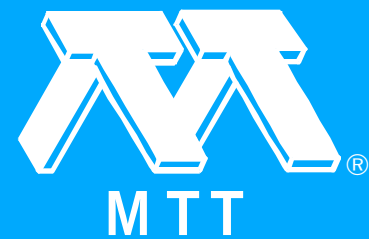
In this work the general form of the solution to Laplace's equation is used to derive a higher order asymptotic boundary condition. The boundary condition is then implemented in the finite element scheme to model two-dimensional transmission line structures operating in the quasi-TEM mode. The numerical results of two- and six-conductor configurations show that the higher order asymptotic boundary condition not only yields more accurate results than those obtainable with a perfectly conducting shield but also compares more favorably with the published work than the simple asymptotic condition.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Full-Wave Analysis of a Strip Crossover

S. Papatheodorou, J.R. Mautz and R.F. Harrington. "Full-Wave Analysis of a Strip Crossover." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1439-1448.

A full-wave analysis of a strip crossover above a conducting plane is carried out. Higher order modes are excited in the form of evanescent waves in the vicinity of the discontinuity, while further away only the dominant (TEM) modes exist. The higher order mode currents are modeled by triangle functions and the dominant modes by outgoing traveling waves. The method of moments is employed to reduce the integral equations on the surface of each strip to matrix equations whose solution determines the currents on each strip. Then the impedance and scattering matrices of the four-port follow along with the equivalent circuit. The results obtained using this full-wave solution are in agreement with results obtained using a quasi-static analysis, which at low frequencies is a very good approximation.

[Click on title for a complete paper.](#)



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Perturbation Analysis and Modeling of Curved Microstrip Bends

A. Weisshaar and V.K. Tripathi. "Perturbation Analysis and Modeling of Curved Microstrip Bends." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1449-1454.

The frequency-dependent transmission properties of the curved microstrip bend are derived by utilizing a second-order perturbation analysis of the equivalent modified curved waveguide model and a mode-matching method which includes the higher order modes. The scattering parameters of typical curved microstrip bends in (M)MIC's are computed and compared with those of the right-angle and chamfered right-angle microstrip bends. The calculations for the scattering parameters of the curved microstrip bends exhibit good convergence behavior with increasing number of higher order modes considered. The results are consistent for large curvatures and bends with small angle.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Low-Cost Microwave/Millimeter-Wave Impedance Measuring Scheme Using a Three-Probe Microstrip Circuit

K. Chang, M.-y. Li and T.H. Sauter. "Low-Cost Microwave/Millimeter-Wave Impedance Measuring Scheme Using a Three-Probe Microstrip Circuit." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1455-1460.

A simple, compact, and low-cost three-probe microstrip impedance measuring scheme has been developed. The impedance of an unknown load can be easily determined by measuring the coupling power levels at the three probes. The coupling coefficients for the three probes can be unequal and arbitrary, and only one power meter is required by using a single-pole three-throw switch. A prototype device has been built at X-band. The measured results agree very well with those obtained from an HP 8510 automatic network analyzer.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Microstrip Lines Using Yttrium Iron Garnet Film

M. Tsutsumi and T. Asahara. "Microstrip Lines Using Yttrium Iron Garnet Film." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1461-1467.

The spectral-domain technique is employed for computing the dispersion characteristics and the transverse field distributions of microstrip lines using a yttrium iron garnet (YIG) film substrate. Numerical results are presented to show a sharp cutoff characteristic for large thickness of gadolinium gallium garnet (GGG), which is caused by the reduction in the negative permeability range, and to show the effect of YIG thickness of the nonreciprocal behavior. Experiments are carried out using a YIG film a few tenths of a micrometer thick and 400- μm -thick GGG substrate. A narrow stopband characteristic of 200 MHz is observed at 6 GHz, which agrees well with the theory. The application to a band-rejection filter is also discussed briefly.

[Click on title for a complete paper.](#)



Abstracts

Full-Wave Analysis of Conductor Losses on MMIC Transmission Lines (Oct. 1990 [T-MTT])

W. Heinrich. "Full-Wave Analysis of Conductor Losses on MMIC Transmission Lines (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1468-1472.

A mode-matching analysis of lossy planar transmission lines is presented. In contrast to the usual perturbation methods, it includes metallic loss by a self-consistent description without any skin-effect approximation. The analysis holds for arbitrarily high losses and also for metallization dimensions smaller than the skin depth. The approach is validated by comparison with previous experimental and theoretical work. MMIC microstrip and coplanar lines are investigated, studying the variation in propagation characteristics for typical metallization thicknesses and discussing the consequences with regard to MMIC design. For the CPW, significant deviations compared to the conventional assumption of lossless zero-thickness strips are found.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

The Method of Lines for the Analysis of Lossy Planar Waveguides

F.J. Schmuckle and R. Pregla. "The Method of Lines for the Analysis of Lossy Planar Waveguides." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1473-1479.

An extension of the efficient method of lines for the full-wave analysis of the electrical characteristics of lossy waveguides is presented. Ohmic losses in metallizations (with frequency-dependent, extremely high dielectric constants) and dielectric losses are simultaneously considered. Despite the high ratios of the dielectric constants of the metallizations and the dielectrics, the analysis and numerical treatment are done accurately, whereas in most other investigations only dielectric losses are exactly investigated and ohmic losses are calculated with approximate solutions. The results for a single microstrip line are shown and compared with those of other authors.

[Click on title for a complete paper.](#)



Abstracts

Time-Domain Analysis of Lossy Coupled Transmission Lines

J.R. Griffith and M.S. Nakhla. "Time-Domain Analysis of Lossy Coupled Transmission Lines." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1480-1487.

A new method, based on numerical inversion of the Laplace transform, is presented for the analysis of lossy coupled transmission lines with arbitrary linear terminal and interconnecting networks. The method is more reliable and efficient than previously published techniques based on the fast Fourier transform.



[Contents](#)

[Publications](#)

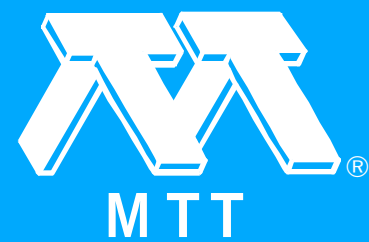
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Propagation Analysis of Chirowaveguides Using the Finite-Element Method

J.A.M. Svedin. "Propagation Analysis of Chirowaveguides Using the Finite-Element Method." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1488-1496.

Propagation characteristics of chirowaveguides, i.e., waveguides including chiral media, have been calculated using a generalization of the full vector finite-element formulation in terms of the electric and magnetic fields. The described formulation permits numerous inhomogeneous waveguide structures of arbitrary linear composition including chiral media to be analyzed without any nonphysical, spurious modes. In the proposed formulation both the necessary conditions on the tangential field components and the additional conditions on the normal field components are automatically satisfied by the trial functions. In this way the dimension of the resulting sparse generalized eigenvalue problem is significantly reduced. The straightforward extension to the novel class of chirowaveguides, which exhibit a number of interesting new features, demonstrates the versatility of the utilized formulation. The previously noted advantageous numerical properties have thus been preserved. Numerical examples on both metal and dielectric chirowaveguides are given. The finite-element results are compared with exact solutions, which are also reported, and the correspondence is found to be excellent.

Click on title for a complete paper.



Abstracts

Slotted Waveguide Directional Coupler Characteristics

H.-Y. Yee. "Slotted Waveguide Directional Coupler Characteristics." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1497-1502.

This paper demonstrates a moment method solution for slotted waveguide directional couplers which is sufficiently accurate for predicting the couplers' characteristics. The formulation uses Galerkin's method with the entire domain basis of sinusoidal functions. Under the assumption of a narrow slot, the field distribution considered is uniform across the slot aperture. A detailed discussion of the characteristics of narrow-wall and broad-wall slotted waveguide directional couplers is presented.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Mode Conversion Losses in Highly Overmoded Waveguide Cavities

J.M. Burke and W.M. Manheimer. "Mode Conversion Losses in Highly Overmoded Waveguide Cavities." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1503-1509.

A technique to quantify the effects of mode conversion losses in highly overmoded waveguide cavity resonators using the WKB method is presented. The theory is accurate for weakly irregular waveguide cavities with small amounts of mode conversion. The results of the theory are presented in the context of the trade-offs associated with the design of an 85 GHz T/sub 1.3/ phase-locked gyrokystron oscillator experiment.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Full-Wave Analysis of Discontinuities in Planar Waveguides by the Method of Lines Using a Source Approach (Short Papers)

S.B. Worm. "Full-Wave Analysis of Discontinuities in Planar Waveguides by the Method of Lines Using a Source Approach (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1510-1514.

For use in microwave integrated circuit design, an accurate full-wave analysis of discontinuities in shielded microwave structures by the method of lines is presented. Interacting discontinuities can be treated without segmentation. Inhomogeneous boundary conditions are introduced to account for the excitation. Source terms must be added to the difference expressions, which are given for nonequidistant discretization. A deterministic equation for the current distribution is derived. The microstrip step discontinuity and a coupled line filter are analyzed. Measurements are given which verify the filter calculations.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Arbitrary Pulse Shape Synthesis via Nonuniform Transmission Lines (Short Papers)

S.C. Burkhart and R.B. Wilcox. "Arbitrary Pulse Shape Synthesis via Nonuniform Transmission Lines (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1514-1518.

A discrete inverse scattering technique is used to define the impedance profile for a nonuniform transmission line which reflects an arbitrary waveform. Initially charged nonuniform lines, switched out into a general load, can also be synthesized by this method and are discussed. The direct or "layer peeling" algorithm is applied to generate profiles which were subsequently analyzed using the one-dimensional finite difference method and fabricated in stripline. Excitation for the nonuniform line was done using a charged line connected to a photoconductive silicon switch triggered by a mode locked YLF laser. Several lines were fabricated relevant to amplitude modulation of the master oscillator laser pulse for fusion experiments.

[Click on title for a complete paper.](#)

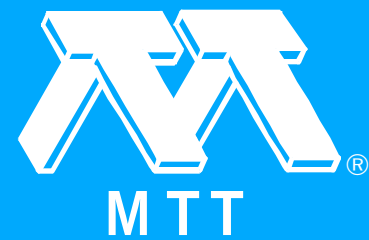


Abstracts

Electromagnetic Wave Transmission in a Well Logging Cable--Theory (Short Papers)

J.R. Wait. "Electromagnetic Wave Transmission in a Well Logging Cable--Theory (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1518-1521.

A well logging cable is idealized as a uniform cylindrical structure consisting of N axial dielectric-coated thin wires in a lossy medium, all encased by a metallic sheath. A general modal equation is developed which is specialized to low frequencies where quasi-static conditions prevail. It is pointed out that the line parameters are spatially dispersive in addition to being frequency dependent. The formulation differs from most multiconductor transmission theories because of the presence of the lossy filler material, which actually allows for a simplification of the working mode equation, which is an N -order polynomial.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Expansions for the Capacitance of a Cross Concentric with a Square with an Identity (Short Papers)

H.J. Riblet. "Expansions for the Capacitance of a Cross Concentric with a Square with an Identity (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1522-1523.

Expansions are given for the capacitance per unit length for the geometry having a cross section in which an equiarmed cross is concentric with an external square, so oriented that its arms bisect the diagonals of the square.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Realization of a GaAs FET Microwave Active Filter (Short Papers)

S.E. Sussman-Fort. "A Realization of a GaAs FET Microwave Active Filter (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1524-1526.

The traditional audio and video frequency domains for active filters are rapidly expanding to include the microwave regime as well. A methodology for microwave active filter design has been presented in [1], and we illustrate here a practical implementation of a network discussed in that work. The prototype accurately realizes a second-degree band-pass response with a center frequency of 6 GHz and a pole q of 2.5. The circuit represents a building block suitable for use in the cascade realization of higher order filters. The filter section was constructed in hybrid form with lumped components and employs two NEC 900100 GaAs FET's.

[Click on title for a complete paper.](#)



Abstracts

Impedance and Switching of GaAs p-i-n Diodes (Short Papers)

Z. Abid and A. Gopinath. "Impedance and Switching of GaAs p-i-n Diodes (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1526-1528.

The impedance of GaAs p-i-n diodes under forward bias is modeled using the two-dimensional simulation program PISCES. The capacitance and resistance, representing the parallel equivalent circuit of the diode, are constant over a wide frequency range. The switching transient of the p-i-n diode is also modeled and it is found that switching time is determined by the sweep out time of the carriers and not by the carrier lifetime.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Comments)

K.S.H. Lee. "Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Comments)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1529-1529.

The authors of the above paper state that they have proved $1/X = 1/\Psi_{xx} + 1/\Psi_{yy}$ for a plane aperture of arbitrary shape, where X is the electric polarizability and Ψ_{xx} and Ψ_{yy} are the magnetic polarizabilities along the principal x and y axes.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Corrections)

R.L. Gluckstern, R. Li and R.K. Cooper. "Electric Polarizability and Magnetic Susceptibility of Small Holes in a Thin Screen (Corrections)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1529-1530.

Shortly after our paper appeared, R. Barrington pointed out the counterexample of a thin cross to our proposed relationship between the electric polarizability and magnetic susceptibilities for an aperture of arbitrary shape in a plane metallic screen.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

A Novel MMIC Active Filter with Lumped and Transversal Elements (Comments and Reply)

H.-O. Vickes, M.J. Schindler and Y. Tajima. "A Novel MMIC Active Filter with Lumped and Transversal Elements (Comments and Reply)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1530-1532.

In the above paper the authors have discussed fundamental properties of microwave transversal filter structures.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Comments and Reply)

D.V. Thiel and S. Saito. "State-Preserving Intermittently Locked Loop (SPILL) Frequency Synthesizer for Portable Radio (Comments and Reply)." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1532-1532.

This paper describes an interesting technique for reducing the power required to sustain a phase locked loop based frequency synthesizer. The technique adopted is to dramatically reduce the lock in time of the phase locked loop by resetting the programmable counter and prescaler in the feedback path of the loop.

Click on title for a complete paper.



Abstracts

Patent Abstracts (Oct. 1990 [T-MTT])

"Patent Abstracts (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1533-1537.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Oct. 1990 [T-MTT])

"Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1538-1538.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - IEEE Microwave and Guided Wave Letters (Oct. 1990 [T-MTT])

"Call for Papers - IEEE Microwave and Guided Wave Letters (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1539-1539.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

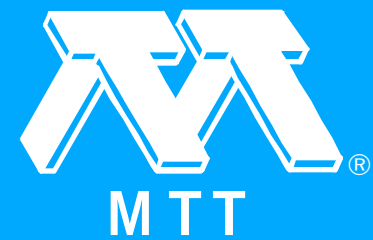
Click on title for a complete paper.



Abstracts

Information for Authors (Oct. 1990 [T-MTT])

"Information for Authors (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1540-1541.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

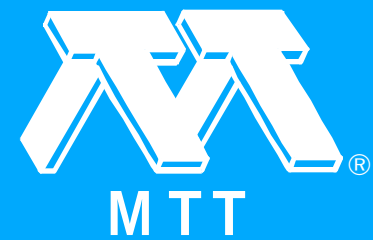
Click on title for a complete paper.



Abstracts

Author Check List (Oct. 1990 [T-MTT])

"Author Check List (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1542-1542.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

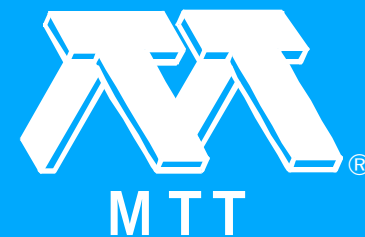
Click on title for a complete paper.



Abstracts

Call for Papers - Microwave Applications of Superconductors (Oct. 1990 [T-MTT])

"Call for Papers - Microwave Applications of Superconductors (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1543-1543.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - Special Issue on Microwaves in Space (Oct. 1990 [T-MTT])

"Call for Papers - Special Issue on Microwaves in Space (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): 1544-1544.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

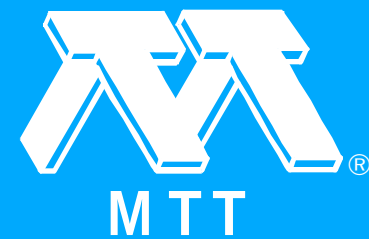
Click on title for a complete paper.



Abstracts

Back Cover (Oct. 1990 [T-MTT])

"Back Cover (Oct. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.10 (Oct. 1990 [T-MTT]): b1-b2.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

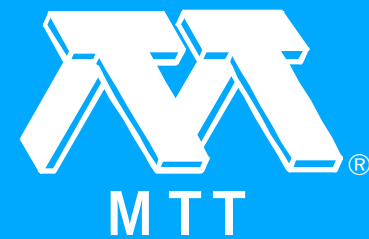
Click on title for a complete paper.



Abstracts

Front Cover (Nov. 1990 [T-MTT])

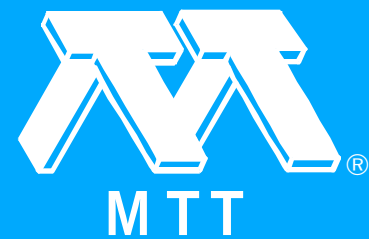
"Front Cover (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): f1-f2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Microwave Technology and Careers in Transition: The Interests and Activities of Visitors to the Sperry Gyroscope Company's Klystron Plant in 1939-1940

J.H. Bryant. "Microwave Technology and Careers in Transition: The Interests and Activities of Visitors to the Sperry Gyroscope Company's Klystron Plant in 1939-1940." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1545-1558.

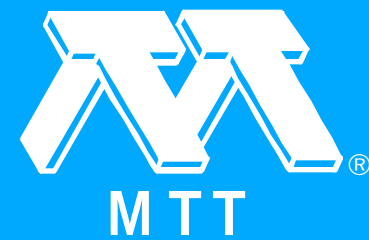
An 18-month "window in time," June 1939 to November 1940, is provided by the Visitor Register of the Sperry Gyroscope Company plant in San Carlos, California, where the klystron electron tube was first manufactured. This register was recently donated to the Stanford University Archives by William T. Cooke, who became manager of the Sperry Gyroscope Company klystron project in 1938. The klystron electron tube is significant in being the first microwave source that was both electrically and mechanically suitable for use in systems. A few of the visitors to the Sperry plant were experts in electron tubes, and were interested in the structure and design details of klystrons. Most of them, however, were interested in potential applications of the emerging microwave technology, represented by the klystron electron tube, waveguide, and compact antennas, which held promise for filling needs in aircraft navigation and instrument landing systems. In 1940 the interest shifted to include urgent needs for microwave radar systems to meet the growing threat of global conflict. The small Sperry facility in San Carlos never had more than 12 employees, but it was a fascinating crossroads for visitors with widely different levels of interest and responsibility. In fact, the list of visitors reads like a who's who among scientists, engineers, and others in academic, government, military, and industrial positions--from top executive to the working level. The Visitor Register is reproduced in Fig. 1, with the entries sequentially numbered. Register entries are transcribed in Fig. 2. All but a few of the names have been deciphered and most of the individuals identified. In the text, the numbers in parentheses after names refer to the sequential numbers. The 121 entries date from June 27, 1939, to November 5, 1940. There are 115 individuals, six of them having made two visits. It is known that not all visitors--especially local ones--signed the register. A sizable number of the 115 visitors to the Sperry

Click on title for a complete paper.



Abstracts

plant are living today, and much valuable information was obtained from them in correspondence, visits, and telephone conversations. This information has been combined with information from other knowledgeable individuals and from publications. The result, presented in Section II, forms a historical mosaic, created around the individuals who signed the Visitor Register and who played important roles in bringing new systems and equipment into being between 1940 and 1945. The background to this activity is given in Section I.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Investigation of Tapered Multiple Microstrip Lines for VLSI Circuits (Nov. 1990 [T-MTT])

M.A. Mehalic and R. Mittra. "Investigation of Tapered Multiple Microstrip Lines for VLSI Circuits (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1559-1567.

The analysis of tapered, coupled microstrip transmission lines is presented. These lines, used as interconnects between integrated circuit devices, are modeled using an iteration-perturbation approach applied in the spatial domain. From this model, a frequency-dependent scattering parameter characterization is determined. A time-domain simulation of pulse propagation through the tapered, coupled microstrip lines is performed. The frequency-domain scattering parameters are inverse Fourier transformed to obtain the time-domain Green's function. The input pulse is convolved with the Green's function, and a Newton-Raphson algorithm is applied to account for nonlinear loads. Finally, some experimental results are shown and a simulation approximation is proposed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Electromagnetic Scattering and Radiation from Finite Microstrip Structures

T.K. Sarkar, S.M. Rao and A.R. Djordjevic. "Electromagnetic Scattering and Radiation from Finite Microstrip Structures." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1568-1575.

In this paper, two techniques are presented for the analysis of electromagnetic radiation and scattering from finite microstrip structures. The two techniques are based on two different formulations, viz. the volume/surface and surface/surface formulations. In the volume/surface formulation the finite-sized dielectric is replaced by an equivalent volume polarization current whereas the conducting plates are replaced by equivalent surface currents. For the surface/surface formulation the surface covering the dielectric volume is replaced by equivalent electric and magnetic currents and the conducting plates by surface electric currents. Both techniques can be utilized for the analysis of arbitrarily shaped finite microstrip structures. The techniques are quite accurate and they are utilized to validate each other. Finally, typical numerical results are presented representing the agreement between these two solution techniques.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Full-Wave Perturbation Theory Based Upon Electric Field Integral Equations for Coupled Microstrip Transmission Lines

Y. Yuan and D.P. Nyquist. "Full-Wave Perturbation Theory Based Upon Electric Field Integral Equations for Coupled Microstrip Transmission Lines." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1576-1584.

A full-wave perturbation theory for the system of N coupled microstrip transmission lines is developed based on an integral equation description of the microstrip circuit structure. The perturbation theory is suitable for application to nearly degenerate multistrip coupling. The physical justification of the perturbation approximation is based upon the current distributions on the strips. The associated computational procedure is relatively simple. For the case of two coupled lines, it is found that the propagation eigenvalues split and shift symmetrically away from the average of their isolated limits as the microstrips become closely spaced. Numerical results obtained by the perturbation theory are compared with those obtained by a more accurate method of moments solution of coupled electric field integral equations. An experimental PC-board implementation is set up, electric field distributions are measured, and the results are found to be in good agreement with the theoretical prediction.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

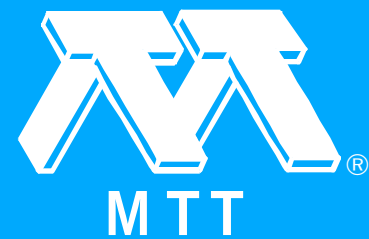
Shunt Posts in Microstrip Transmission Lines

K.L. Finch and N.G. Alexopoulos. "Shunt Posts in Microstrip Transmission Lines." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1585-1594.

Shunt posts in open microstrip lines are analyzed by employing the planar waveguide model. A multipole expansion method with greatly enhanced efficiency and accuracy has been achieved with the development of very fast algorithms for the computation of Schloemilch-type series. The method applies to perfectly conducting, imperfectly conducting, and composite shunt posts. This approach is compared with the standard point matching technique for perfectly conducting posts. The two methods are found to be in excellent agreement in regions of overlapping applicability. Applications to microstrip short circuits, cavity filters, and single dielectric post filters are discussed and illustrated.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

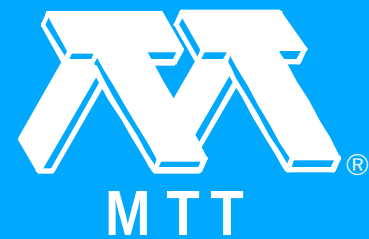
The Resonance Method for Evaluating the Impedances of the Equivalent Network for Dielectric Posts in a Rectangular Waveguide

H.A. Auda and C.E. Smith. "The Resonance Method for Evaluating the Impedances of the Equivalent Network for Dielectric Posts in a Rectangular Waveguide." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1595-1602.

In this paper, the resonance method is applied to evaluate the impedances of the equivalent network for dielectric posts symmetrically located about a reference plane in a rectangular waveguide. Explicit relationships for the impedances of the equivalent lattice network of the posts in a rectangular waveguide are given in terms of the resonant frequencies of the rectangular cavity constricted by short-circuiting the waveguide at equal distances from the reference plane. A perturbational analysis is subsequently carried out to determine the resonant frequencies for a rectangular cavity loaded with slightly lossy circular posts whose largest cross-sectional dimensions are small compared with the wavelength. Sample numerical results for a single loss-free dielectric post illustrating the application of the derived expressions are given.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Modes of Elliptical Waveguides: A Correction

D.A. Goldberg, L.J. Laslett and R.A. Rimmer. "Modes of Elliptical Waveguides: A Correction." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1603-1608.

We show that the fields associated with the TM/sub 01/, mode of an elliptical waveguide are qualitatively different from those which have appeared in the standard literature for the past 50 years, and that the original fields as plotted were also in qualitative disagreement with the analytic expressions which accompanied them. Nonetheless, the cutoff frequencies given for that mode, as well as for the five other modes described in those references, are exceedingly accurate (within roughly 1%) for elliptical eccentricities as large as 0.75; for eccentricities in excess of 0.9, the inaccuracy increases from 5% to nearly 50%, depending on the mode in question.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Finite Difference Frequency-Domain Treatment of Open Transmission Structures

T.K. Sarkar, M. Manela, V. Narayanan and A.R. Djordjevic. "Finite Difference Frequency-Domain Treatment of Open Transmission Structures." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1609-1616.

In this paper, a full-wave solution utilizing the finite difference frequency-domain approach is applied to the computation of propagation characteristics of open transmission structures. For this, one must find a way for terminating the finite difference grid at some finite distance, although the field actually extends to infinity. A method is presented based on boundary operators that terminates the grid. The boundary operators require a knowledge of the radial propagation constant which is to be solved for. This difficulty is overcome by an innovative iterative technique. Typical numerical results are presented to illustrate the accuracy of this method.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Theoretical Evaluation of Nonlinear Tapers for a High-Power Gyrotron

W.G. Lawson. "Theoretical Evaluation of Nonlinear Tapers for a High-Power Gyrotron." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1617-1622.

In this paper the theoretical performance of two nonlinear circular waveguide tapers constructed for a 10 GHz, 30 MW amplifier utilizing the lowest circular electric mode is evaluated. Mode coupling is estimated with a code that solves the generalized telegraphist's equations numerically and is compared with the results of a cascaded scattering matrix code. It is found that assuming a sufficiently lossy conducting boundary allows evaluation of modes that pass through cutoff and that consideration of backward modes usually results in small changes in the forward modes that reconcile the two numerical procedures. A comparison of the raised cosine profile with other taper shapes is made.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Gaussian Beam Representation of Aperture Fields in Layered, Lossy Media: Simulation and Experiment

M.L.D. Lumori, J.B. Andersen, M.K. Gopal and T.C. Cetas. "Gaussian Beam Representation of Aperture Fields in Layered, Lossy Media: Simulation and Experiment." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1623-1630.

This paper demonstrates that a three-dimensional electromagnetic field of a given linear polarization, emanating from an aperture source and propagating in a lossy medium, can be represented by an astigmatic Gaussian beam with complex source coefficients. The values of the coefficients can be determined experimentally by scans of the phase and amplitude of the field in the electric and magnetic principal planes near the aperture by means of a monopole probe and a liquid phantom (a phantom being a device that simulates the conditions encountered when radiation (e.g. microwaves) is deposited in biological tissues (e.g. human muscles) and permits a quantitative estimation of its effects). Once the source parameters are obtained, computations of the field everywhere else can be achieved rapidly. The theory is verified experimentally for bounded, homogeneous, and layered lossy media. Agreement is within 3% (relative to the maximum field at the aperture) over the entire scanned area.



Abstracts

Mode Orthogonality in Chirowaveguides

N. Engheta and P. Pelet. "Mode Orthogonality in Chirowaveguides." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1631-1634.

In this paper, we derive the orthogonality relations for modes supported by a general cylindrical chirowaveguide. As introduced in our earlier work a chirowaveguide is a cylindrical waveguide filled with chiral or optically active materials. As in conventional waveguides, the orthogonality relations reported here can be used to expand an arbitrary E or H field within a chirowaveguide in terms of a complete set of mutually orthogonal modes in the waveguide.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Propagation and Circuit Characteristics of Inductively Coupled Superconducting Microstrip

J.M. Pond, P.F. Weaver and I. Kaufman. "Propagation and Circuit Characteristics of Inductively Coupled Superconducting Microstrip." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1635-1643.

The propagation characteristics and circuit properties of two inductively coupled superconducting transmission lines are studied. An expression for the attenuation of the coupled-line modes is derived for the case of low loss. It is found that for transmission line geometries of practical interest the low-loss expression agrees well with the more general numerical solution. The numerical solution is used to determine the dispersion characteristics of inductively coupled lines as a function of the superconductor thickness and the operating temperature. An equivalent circuit, with the same dispersion equation, is presented along with the relationship between the circuit element values and the physical parameters of the line. The characteristic impedances of the two dominant coupled-line modes are derived from the equivalent circuit expressions.

[Click on title for a complete paper.](#)



Abstracts

First-Order Symmetric Modes for a Slightly Lossy Coaxial Transmission Line

W.C. Daywitt. "First-Order Symmetric Modes for a Slightly Lossy Coaxial Transmission Line." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1644-1650.

A complete set of solutions for Maxwell's equations to first order in the normalized surface impedance z of the coaxial conductors is found. The resulting characteristic admittance and distributed line parameters are calculated; the distributed line resistance is significantly different from other calculations found in the literature.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Rigorous, Multimode Equivalent Network Representation of Inductive Discontinuities

M. Guglielmi and C. Newport. "Rigorous, Multimode Equivalent Network Representation of Inductive Discontinuities." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1651-1659.

Discontinuities such as inductive windows and obstacles are very frequently used in rectangular waveguide components, and a number of equivalent network representations can be found for them in the technical literature. Most of the equivalent networks available, however, are valid only under single-mode conditions or are obtained using approximate procedures. In this paper we derive rigorous, multimode equivalent network representations for zero-thickness inductive windows and inductive obstacles in rectangular waveguide. The network representations developed are valid for arbitrary aperture/obstacle dimensions and offset, and can accommodate a different medium on each side of the discontinuity. Numerical results are also presented indicating that the network representations developed are rapidly convergent so that they can be easily used to carry out computations involving an arbitrary number of propagating higher order modes.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Electromagnetic Scattering from an Infinite Elliptic Metallic Cylinder Coated by a Circular Dielectric One

N.B. Kakogiannos and J.A. Roumeliotis. "Electromagnetic Scattering from an Infinite Elliptic Metallic Cylinder Coated by a Circular Dielectric One." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1660-1666.

In this paper the scattering from an infinite elliptic metallic cylinder coated by a circular dielectric one is considered. The electromagnetic field is expressed in terms of both circular and elliptical cylindrical wave functions, which are connected with one another by well-known expansion formulas. In the special case of small $h = ka/2$ (a being the interfocal distance of the elliptic conductor and k the wavenumber of the dielectric coating), exact, closed-form expressions of the form $S(h) = S(0)[1 + g''h^2 + O(h/\sup 4)]$ are obtained for the scattered field and the various scattering cross sections of the problem. Both polarizations are considered for normal incidence. Graphical results for various values of the parameters are given.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Whispering Gallery Dielectric Resonator Modes for W-Band Devices

D. Cros and P. Guillon. "Whispering Gallery Dielectric Resonator Modes for W-Band Devices." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1667-1674.

This paper discusses the utilization of planar millimeter-wavelength whispering gallery dielectric resonator modes for the design of W-band directional filters and power combiners. Various advantages of these resonator modes allow their utilization in the millimeter-wavelength range. The analysis based on the ring resonator model makes it possible to predict the theoretical responses of any devices. Finally, experimental results obtained for directional filters and for power combiners in W-band are given.

[Click on title for a complete paper.](#)



A Novel, Linear Voltage Variable MMIC Attenuator

B. Maoz. "A Novel, Linear Voltage Variable MMIC Attenuator." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1675-1683.

Voltage variable attenuators (VVA's) for microwave applications that are fabricated using present technology and design methods feature a nonlinear relationship between the attenuation measured in dB and the control signal. To linearize this relationship it is necessary to employ external active linearization circuitry, which complicates the component, adding to its size and cost while reducing reliability. In this work we describe a novel VVA that features a linear attenuation-control voltage relationship without the need for external linearization. We accomplished this by connecting a number of FET segments in a unique fashion to form a composite FET. The channel resistance of the composite FET constitutes a prescribed function of its gate-source voltage. By careful design we synthesized the resistance functions that are necessary for realization of linear attenuators. The attenuator was fabricated using GaAs MMIC technology employing MESFET's as voltage variable resistors. It is completely passive and does not require a dc supply. The attenuation ranges from 2 to 15 dB over dc to 8 GHz while port impedance is kept close to 50 Ω . The deviation of the attenuation from a straight line is less than 0.2 dB. The chip can be used in applications such as amplitude modulators and temperature compensation circuits. The technique used can also be applied in the design of, for example, mixers, frequency multipliers, and vector modulators.



Characterization of an Optoelectronic Terahertz Beam System

M. Van Exter and D.R. Grischowsky. "Characterization of an Optoelectronic Terahertz Beam System." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1684-1691.

We describe the performance of an optoelectronic THz beam system. The transmitter operation is based on the repetitive, subpicosecond laser excitation of a Hertzian dipole antenna embedded in a charged coplanar line. With this transmitter electromagnetic beams of 1/2 cycle THz pulses at a repetition rate of 100MHz are produced. The associated optoelectronic receiver is gated in synchronism with the excitation of the transmitter by subpicosecond pulses from the same laser source. With this receiver, the 10 nW beams of THz pulses were observed with a signal-to-noise ratio greater than 10 000:1. Several sources contributing to the noise of the receiver are discussed, together with ways to reduce them. With an integration time of 125 ms, a signal-to-noise ratio of 1 is obtained for a THz beam with an average power of 10^{-16} W. The receiver operates in the sampling mode and has a time resolution of 0.5 ps.

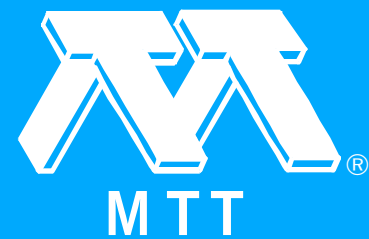


On Power Distribution in Additive Amplifiers

K.B. Niclas, R.R. Pereira and A.P. Chang. "On Power Distribution in Additive Amplifiers." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1692-1700.

An analysis of the linear power distribution in amplifiers employing the additive amplification principle has been made. It reveals the wide spread of the active devices contributions to the output power at any one frequency and exposes the band-sharing nature of the additive amplification process in multioctave amplifiers. Reversals in the direction of the energy flow over parts of the frequency band converting active into passive devices have been observed. The flat gain response of these amplifiers was found to be the result of a sophisticated process in balancing the active devices' output powers. Finally, the computed and measured performance parameters of a 6-18 GHz 2 x 2 matrix amplifier with emphasis on its experimental nonlinear behavior are briefly discussed.





IEEE

Contents

Publications

Issues

Papers

Authors

FAST Gradient Based Yield Optimization of Nonlinear Circuits

J.W. Bandler, Q.-J. Zhang, J. Song and R.M. Biernacki. "FAST Gradient Based Yield Optimization of Nonlinear Circuits." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1701-1710.

This paper meets the challenge of yield optimization of nonlinear microwave circuits operating in the steady state under large-signal periodic excitations. Yield-driven design is formulated as a one-sided $1/\text{sub } 1/$ optimization problem. We introduce two novel, high-speed methods of gradient calculation, the integrated gradient approximation technique (IGAT) and the feasible adjoint sensitivity technique (FAST). IGAT utilizes the Broyden formula with special iterations of Powell to update the approximate gradients. FAST combines the efficiency and accuracy of the adjoint sensitivity technique with the simplicity of the perturbation technique. IGAT and FAST are compared with the simple perturbation approximate sensitivity technique (PAST) on the one extreme and the theoretical exact adjoint sensitivity technique (EAST) on the other. FAST, linking state-of-the-art optimization and efficient harmonic balance simulation, is the key to making our approach to nonlinear microwave circuit design the most powerful available. A FET frequency doubler example treats statistics of both linear elements and nonlinear device parameters. This design has six optimizable variables including input power and bias conditions, and 34 statistical parameters. Using either IGAT or FAST, yield is driven from 40% to 70%. FAST exhibits superior efficiency.





IEEE

Contents

Publications

Issues

Papers

Authors

Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing

G.L. Bilbro, M.B. Steer, R.J. Trew, C.-R. Chang and S.G. Skaggs. "Extraction of the Parameters of Equivalent Circuits of Microwave Transistors Using Tree Annealing." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1711-1718.

The problem of extracting a physically based equivalent circuit model for a HBT transistor from S-parameter measurements is solved with a new formulation of simulated annealing. The physical model necessary for an accurate representation of the HBT leads to an extraction problem with many local minima. A satisfactory minimum can be found by conventional gradient-based techniques only with considerable expert guidance. The proposed algorithm finds equivalent circuits as good as those from conventional techniques but without human intervention. It is more efficient than the conventional stochastic simulated annealing because it accumulates a probability density of good equivalent circuits which it subsequently uses to refine its statistical search for the best equivalent circuit.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Dispersion Characteristics of Optically Excited Coplanar Striplines: Comprehensive Full-Wave Analysis

D.S. Phatak, N.K. Das and A.P. Defonzo. "Dispersion Characteristics of Optically Excited Coplanar Striplines: Comprehensive Full-Wave Analysis." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1719-1730.

A spectral-domain full-wave analysis is developed to obtain dispersion and loss characteristics of optically excited coplanar striplines. This can account for the propagation of electrical pulses with bandwidths exceeding one terahertz. Peaks are observed in the dispersion curve of the coplanar stripline. These are physically related to the onset and coupling of the substrate modes to the transmission line mode. Analytically, the excitation of substrate modes is shown to correspond to the occurrence of the poles of the Green's function in the reaction integrals. Results of the full-wave analysis are in good agreement with those obtained by established theory.

[Click on title for a complete paper.](#)



Abstracts

A Quasi-TEM Design Method for 3 dB Hybrid Couplers Using a Semi-Reentrant Coupling Section (Short Papers)

M. Nakajima and E. Yamashita. "A Quasi-TEM Design Method for 3 dB Hybrid Couplers Using a Semi-Reentrant Coupling Section (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1731-1733.

An effective quasi-TEM design method for 3 dB hybrid couplers using a semi-reentrant coupling section is presented. The design method includes an analysis technique with the rectangular boundary division method and a sequential optimization procedure. A 3 dB hybrid coupler with Teflon substrate is designed with this method, and measured characteristics are compared with theoretical ones.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

A Flexible Design Procedure for Microstrip Planar Disk 3 dB Quadrature Hybrids (Short Papers)

M.J. Page and S.R. Judah. "A Flexible Design Procedure for Microstrip Planar Disk 3 dB Quadrature Hybrids (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1733-1736.

A flexible design procedure is presented for the recently synthesized microstrip planar disk 3 dB quadrature hybrid. For a device with a given disk radius this approach facilitates the design of devices having various center, frequencies. Experimental results verifying the design methodology are given.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Scattering Parameters of E-Plane Printed Opposite Fin in Waveguide (Short Papers)

T.Q. Ho and Y.C. Shih. "Scattering Parameters of E-Plane Printed Opposite Fin in Waveguide (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1736-1740.

An analysis of the E-plane printed opposite fin in waveguide is presented. The current distribution existing on the metal fin is obtained through a variational technique that utilizes the extremization process. The eigenvalue functions derived from the transverse resonance condition are used to include the effects of the dielectric layer. Numerical results agree well with those computed using the spectral-domain technique for a special case and with those measured by a band-reject filter at Ka-band.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Characteristic Impedance and Electromagnetic Field Distribution in Metal-Insulator-Semiconductor Microstrip (Short Papers)

T.G. Livernois and P.B. Katehi. "Characteristic Impedance and Electromagnetic Field Distribution in Metal-Insulator-Semiconductor Microstrip (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1740-1743.

The characteristic impedance for MIS microstrip is calculated using a space-domain representation of electromagnetic fields. The numerical results obtained are compared with published experimental data. Transverse field distributions for various structural parameters are presented and used to illustrate the three distinct modes of operation for MIS transmission lines.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

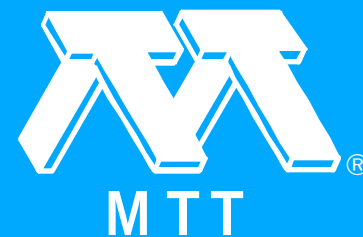


Abstracts

Low-Frequency Location of the Leaky-Wave Poles for a Dielectric Layer (Short Papers)

M. Guglielmi and D.R. Jackson. "Low-Frequency Location of the Leaky-Wave Poles for a Dielectric Layer (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1743-1746.

Explicit asymptotic solutions of the characteristic equations are derived for the propagation constants of TM and TE modes in the leaky-wave range for a dielectric layer with or without a metal ground-plane backing. The expressions derived for the phase and attenuation constants of the leaky waves become increasingly accurate as the frequency is lowered.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

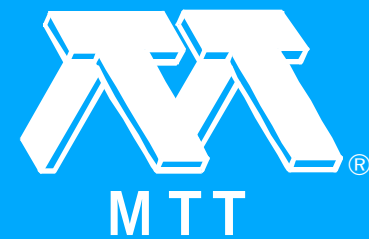


Abstracts

Application of Transforms to Accelerate the Summation of Periodic Free-Space Green's Functions (Short Papers)

S. Singh and R. Singh. "Application of Transforms to Accelerate the Summation of Periodic Free-Space Green's Functions (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1746-1748.

The results of applying two acceleration techniques to accelerate the convergence of free-space Green's functions of the Helmholtz equation are presented. The techniques make use of Kummer's, Poisson's, and Shanks's transforms. It is shown that considerable savings in computation time is achieved by application of the transforms. Numerical results include relative error versus number of terms taken in the series, and computation time versus a predefined convergence factor.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Determining Adapter Efficiency by Envelope Averaging Swept Frequency Reflection Data (Short Papers)

W.C. Daywitt. "Determining Adapter Efficiency by Envelope Averaging Swept Frequency Reflection Data (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1748-1752.

A simple automated network analyzer swept frequency technique for measuring adapter efficiency across its entire frequency band is described. Envelope averaging is used to avoid the model assumptions usually found in regression averaging techniques. Calculations show that errors arising from the theoretical assumptions leading to the technique are around 0.004 dB for a common WR 42 waveguide-to-coaxial adapter.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Comparison of Approximations for Effective Parameters of Artificial Dielectrics (Short Papers)

E.F. Kuester and C.L. Holloway. "Comparison of Approximations for Effective Parameters of Artificial Dielectrics (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1752-1755.

Formulas available in the literature for approximating the effective permittivity and permeability of a periodic array of (possibly lossy) dielectric rods of arbitrary cross section are assessed for their accuracy by comparing them with precise numerical values for special forms of the arrays. It is found that while no single formula is capable of very high precision in every case, we can construct good approximate formulas in individual cases as a result of this comparison.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

Combining Modal Analysis and the Finite-Difference Time-Domain Method in the Study of Dielectric Waveguide Problems (Short Papers)

S.T. Chu and S.K. Chaudhuri. "Combining Modal Analysis and the Finite-Difference Time-Domain Method in the Study of Dielectric Waveguide Problems (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1755-1760.

A technique is presented to extract the modal parameters from the FDTD results in the analysis of dielectric waveguide problems. In this approach, the dielectric waveguide problem is first solved by the FDTD method, and then the guided mode amplitudes in the waveguides are extracted in a least squares sense. The method exploits the flexibility of the FDTD method, which can analyze arbitrarily shaped or profiled geometries, while expressing the results in the simple modal solution form.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

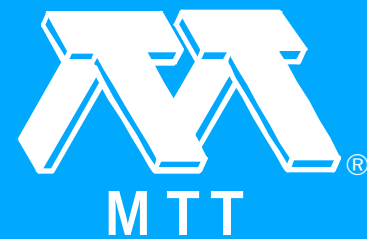
Click on title for a complete paper.



Abstracts

Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation (Comments and Reply)

M. Mrozowski, M. Okoniewski, M. Swaminathan, E. Arvas, T.K. Sarkar and A.R. Djordjevic.
"Computation of Cutoff Wavenumbers of TE and TM Modes in Waveguides of Arbitrary Cross Sections Using a Surface Integral Formulation (Comments and Reply)." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1761-1762.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Patent Abstracts (Nov. 1990 [T-MTT])

"Patent Abstracts (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1763-1765.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

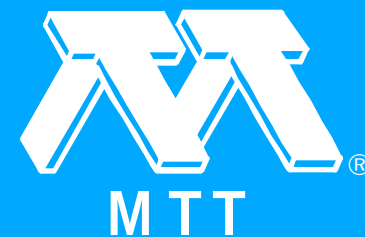
Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Nov. 1990 [T-MTT])

"Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1766-1766.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

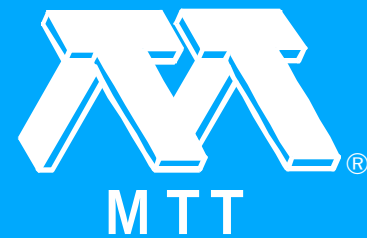
Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE Microwave and Millimeter Wave Monolithic Circuits Symposium (Nov. 1990 [T-MTT])

"Call for Papers - 1991 IEEE Microwave and Millimeter Wave Monolithic Circuits Symposium (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1767-1767.



IEEE

Contents

Publications

Issues

Papers

Authors

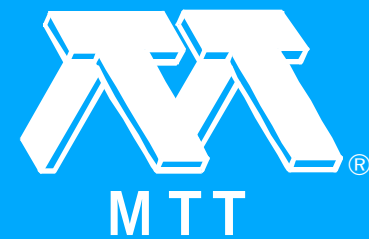
Click on title for a complete paper.



Abstracts

Call for Papers - Special Issue on Microwaves in Space (Nov. 1990 [T-MTT])

"Call for Papers - Special Issue on Microwaves in Space (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1768-1768.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Call for Papers - IEEE Microwave and Guided Wave Letters (Nov. 1990 [T-MTT])

"Call for Papers - IEEE Microwave and Guided Wave Letters (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1769-1769.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

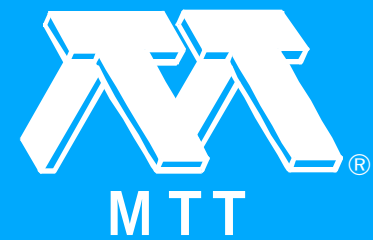
Click on title for a complete paper.



Abstracts

Information for Authors (Nov. 1990 [T-MTT])

"Information for Authors (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1770-1771.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

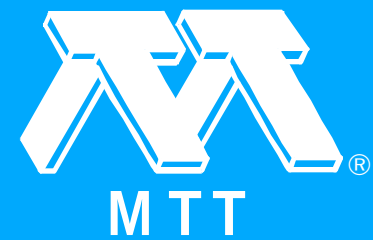
Click on title for a complete paper.



Abstracts

Author Check List (Nov. 1990 [T-MTT])

"Author Check List (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1772-1772.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Back Cover (Nov. 1990 [T-MTT])

"Back Cover (Nov. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): b1-b1.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Front Cover (Dec. 1990 [T-MTT])

"Front Cover (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): f1-f2.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Table of Contents (Dec. 1990 [T-MTT])

"Table of Contents (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1773-1774.



MTT



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Editor's Note (Dec. 1990 [T-MTT])

S.A. Maas. "Editor's Note (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1775-1775.

It has come to our attention that the paper by M. West and M. Kumar, "Monolithic Integrated Blanking UpConverter," in the September 1990 issue of the Transactions had been published previously in the Proceedings of the 19th European Microwave Conference. Furthermore, in the submission to the MTT Transactions the names of two of the four original authors, S. Vincelette and M. L. Gosse, were removed.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Guest Editors' Overview (Dec. 1990 [T-MTT])

D.N. McQuiddy, Jr. and V. Sokolov. "Guest Editors' Overview (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1776-1777.

The 1990 International Microwave Symposium and the Microwave and Millimeter-Wave Monolithic Circuits Symposium technical programs continued the growth trend that was experienced by our Society throughout the 1980's. Of the 614 papers that were submitted for consideration, the two Technical Program Committees accepted 331 for presentation at the symposia and for publication in the Symposium digests. The authors of the accepted papers were invited to submit an expanded version as a candidate for publication in this December issue of the Transactions. Eighty-six manuscripts were submitted for this special consideration.

Click on title for a complete paper.



Abstracts

1990 MTT-S International Microwave Symposium (Dec. 1990 [T-MTT])

J. Wassel and K. Varian. "1990 MTT-S International Microwave Symposium (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1778-1784.

The 27th MTT-S International Microwave Symposium (IMS) and Exhibition was held in the West Hall of the Dallas Convention Center, Dallas, Texas, from May 8 to May 10, 1990. This year, the IMS was held jointly with the IEEE Antennas and Propagation Society (AP-S) and the International Union of Radio Science (URSI). Additionally, the 9th Microwave and Millimeter-Wave Monolithic IC Symposium (MMMC) was held on May 7 in the West Hall of the Dallas Convention Center and the 35th Automatic RF Techniques Group (ARFTG) Conference was held on May 10 and May 11 at the Fairmont Hotel in Dallas. We note that the 1st MMMC Symposium was held in June 1982, when Dallas hosted the 19th IMS.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

1990 MTT-S Awards (Dec. 1990 [T-MTT])

"1990 MTT-S Awards (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1785-1791.



IEEE

[Contents](#)

[Publications](#)

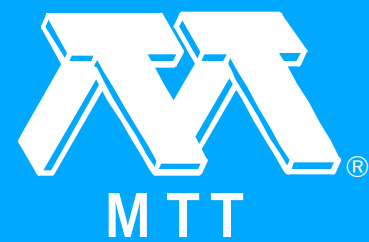
[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Full-Wave Analysis of Lossy Quasi-Planar Transmission Line Incorporating the Metal Modes

C.-K.C. Tzuang, C.-D. Chen and S.-T. Peng. "Full-Wave Analysis of Lossy Quasi-Planar Transmission Line Incorporating the Metal Modes." *1990 Transactions on Microwave Theory and Techniques* 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1792-1807.

We present a novel and accurate full-wave mode-matching approach to analyze the dispersion characteristics of millimeter-wave and microwave transmission lines with finite conductivity, metallization thickness, and holding grooves. The approach is quite general but only the results for a unilateral finline are presented. The accuracy of the solution depends primarily on the correct and complete description of eigenfunction expansions in each of the uniform (stratified) or nonuniform layer regions. The latter consists of metallized strips of finite conductivity, which in turn produce the so-called metal modes (eigenmodes). The metal mode exists in the metallized region with high conductivity for the most part and decays sharply in the air region. Without incorporating the metal modes, the convergence studies will fail and the accuracy of the field theory solution deteriorates. Since the accuracy of the present approach is established, the composite effects of the finite conductivity and metallization thickness can be studied rigorously. A numerical limiting case analysis shows that the mode conversion between the dominant finline mode and the dielectric-slab-loaded waveguide mode may happen through the reduction of the metallization thickness. The theoretical results for the dispersion parameters of the dominant mode propagation constant and the characteristic impedance are reported. The effects of the conductor losses using various metallizing materials are also presented.

Click on title for a complete paper.



Abstracts

A Generalized Method for Distinguishing Between Radiation and Surface-Wave Losses in Microstrip Discontinuities

T.-S. Horng, S.-C. Wu, H.-Y. Yang and N.G. Alexopoulos. "A Generalized Method for Distinguishing Between Radiation and Surface-Wave Losses in Microstrip Discontinuities." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1800-1807.

A generalized method for calculating both radiation and surface-wave losses is developed for microstrip discontinuities. The losses are determined by a rigorous Poynting vector analysis where the current distribution over all the microstrip discontinuities is a result of a full-wave moment method solution. A self-consistency check of the results based on power conservation is performed to confirm the numerical results. It is found that above a certain frequency, the surface-wave loss becomes more important than the radiation loss.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

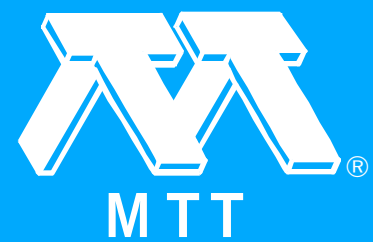
Equivalent Capacitances of Coplanar Waveguide Discontinuities and Interdigitated Capacitors Using a Three-Dimensional Finite Difference Method

M. Naghed and I. Wolff. "Equivalent Capacitances of Coplanar Waveguide Discontinuities and Interdigitated Capacitors Using a Three-Dimensional Finite Difference Method." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1808-1815.

Equivalent capacitances of coplanar waveguide discontinuities on multilayered substrates are calculated using a three-dimensional finite difference method. The application of the method is demonstrated for open ends and gaps in microstrip and coplanar waveguides as well as for more complicated structures such as interdigitated capacitors. The effect of conductor metallization thickness is also investigated. The calculated data are in good agreement with experimental results.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Characterization of a Class of Waveguide Discontinuities Using a Modified TE/ x /sub mn / Mode Approach

J. Bornemann and R. Vahldieck. "Characterization of a Class of Waveguide Discontinuities Using a Modified TE/ x /sub mn / Mode Approach." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1816-1822.

This paper presents a modified TE/ x /sub mn / wave approach which is used in conjunction with the mode matching method for the field. theory modeling of a class of waveguide discontinuities. In particular, for characterizing waveguide discontinuities in which resonant effects occur, this method resolves conflicting results which have been observed rising the conventional TE/ x /sub mn / mode matching technique, commonly known from the literature, and the generalized analysis based on a linear superposition of TE/ z /sub mn / and TM/ z /sub mn / modes. It is found that results from the modified TE/ x /sub mn / mode approach are consistent with the generalized analysis and agree well with measurements on iris filters and corrugated waveguide polarizers. In comparison with the generalized TE-TM mode analysis, the modified TE/ x /sub mn / mode procedure consumes less memory and CPU time and provides improved convergence behavior without sacrificing design accuracy.

Click on title for a complete paper.



Abstracts

An Analysis of an N-Port Microstrip Planar Disk Device with an Arbitrarily Located Short Circuit Post of Arbitrary Radius

S.R. Judah and M.J. Page. "An Analysis of an N-Port Microstrip Planar Disk Device with an Arbitrarily Located Short Circuit Post of Arbitrary Radius." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1823-1830.

An analysis technique is presented which allows the performance of a multiport microstrip planar disk device with an arbitrarily located internal short circuit (S/C) post of arbitrary radius to be predicted. The analysis approach does not rely on the determination of eigenvalues and yields analytical expressions which are ideal for CAD implementation. The experimental results are in good agreement with the theoretical predictions.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

The Transition Region Between Bound-Wave and Leaky-Wave Ranges for a Partially Dielectric-Loaded Open Guiding Structure (Dec. 1990 [T-MTT])

P. Lampariello, F. Frezza and A.A. Oliner. "The Transition Region Between Bound-Wave and Leaky-Wave Ranges for a Partially Dielectric-Loaded Open Guiding Structure (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1831-1836.

Most modes on partially dielectric-loaded open guiding structures are purely bound in some frequency range and leaky in another. The transition region between them is complicated and interesting, including a section where the dispersion curve doubles back because it connects a complex nonspectral (leaky-wave) solution with a real spectral (bound-wave or surface-wave) solution. The physical nature of this type of transition region is first discussed qualitatively, where some anomalous features are considered; then numerical values are presented for a specific example, a recently proposed novel leaky-wave antenna structure.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Rigorous Dispersive Characterization of Microstrip Cross and T Junctions

S.-C. Wu, H.-Y. Yang, N.G. Alexopoulos and I. Wolff. "A Rigorous Dispersive Characterization of Microstrip Cross and T Junctions." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1837-1844.

A full-wave spectral-domain analysis is applied to the characterization of multiport microstrip discontinuities. This method employs the moment method to find the currents in the microstrip circuits and subsequently the scattering parameters of the junctions. In this approach, all the physical effects are considered including radiation and surface waves. The numerical results for a T and a cross junction are presented and agree well with the quasi-static values at low frequencies. The S parameters of a T junction are further compared with the measured results, with excellent agreement. The utilization of a shaped T junction as a broad-band equal-power divider is also discussed.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

An Automated 60 GHz Open Resonator System for Precision Dielectric Measurement

M.N. Afsar, X. Li and H. Chi. "An Automated 60 GHz Open Resonator System for Precision Dielectric Measurement." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1845-1853.

An automated open resonator system is designed and constructed for precision measurement of the loss tangent and dielectric permittivity of low absorbing materials at 60 GHz. The use of a high-Q hemispherical Fabry-Perot cavity together with highly stabilized synthesized phase locked Gunn oscillator sources and a superheterodyne receiver enabled us to measure loss tangent value as low as 10 μ rad. Both cavity length variation and frequency variation techniques were utilized to provide precise data.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Optimum Field Theory Design of Broad-Band E-Plane Branch Guide Phase Shifters and 180° Couplers

F. Arndt, T. Sieverding and P. Anders. "Optimum Field Theory Design of Broad-Band E-Plane Branch Guide Phase Shifters and 180° Couplers." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1854-1861.

Optimum rectangular waveguide E-plane branch guide phase shifters and 180° branch guide couplers are designed with the rigorous method of field expansion into normalized eigenmodes. The design includes both the higher order mode interaction between the step discontinuities and the finite step and branch heights. The phase shifter design applies the Schiffman principle to branch guide couplers where two ports are short-circuited. The 180° coupler design combines the advantage of the broad-band potential of multiple-branch couplers with the low-insertion-loss qualities of E-plane stub-loaded phase shifters. A computer-optimized phase shifter prototype for the waveguide Ku-band (12-18 GHz) shows a $90^\circ \pm 1^\circ$ differential phase shift with reference to an empty waveguide within about 23% bandwidth. Five-branch three-stub coupler prototypes, designed for 3 ± 0.2 dB coupling, for the waveguide Ku- and Ka-bands (26-40 GHz) achieve a $180^\circ \pm 1^\circ$ differential phase shift at the output ports within about 19% bandwidth, as well as more than 30 dB isolation and return loss. The theory is verified by measured results.

Click on title for a complete paper.



Abstracts

Multiplexing and Double Band Filtering with Common-Multimode Cavities

U. Rosenberg. "Multiplexing and Double Band Filtering with Common-Multimode Cavities." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1862-1871.

A new multiplexing and "double band filtering" (DBF) method is established. DBF refers to two-port equipment which serves two transmit frequency channels simultaneously. The new methods build on frequency-independent resonance modes, excited within a common multimode cavity (CMC), which are assigned to different channel filters. The design principles are presented for cylindrical CMC's by way of example. It is shown that combining CMC's with advanced coupling methods produces a multitude of new design variants. Initial experimental results are presented for a diplexer and DBF equipment that are both realized with only two "double-dual" TE/sub 112/ /TM/sub 110/ CMC's and a novel iris-providing four intercavity couplings--to perform two four-pole elliptic function filter responses.



[Contents](#)

[Publications](#)

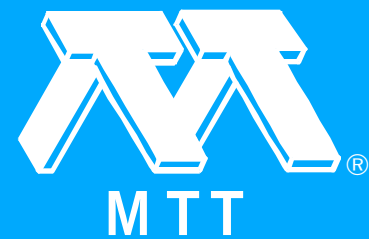
[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Propagation Characteristics of MIS Transmission Lines with Inhomogeneous Doping Profile

K. Wu and R. Vahldieck. "Propagation Characteristics of MIS Transmission Lines with Inhomogeneous Doping Profile." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1872-1878.

This paper presents a hybrid-mode analysis of slow-wave MIS transmission lines with a gradually inhomogeneous doping profile. In general it was found that, in comparison with homogeneously doped semiconductor layers, a Gaussian-type doping distribution results in lower losses for the slow-wave mode in both thin- and thick-film MIS CPW's. While the effect of the doping profile is more pronounced in thin-film structures which support a slow-wave mode only up to 3 GHz, it is less significant in thick-film structures. On the other hand, numerical analysis indicates that thick-film structures can support a slow-wave mode at moderate loss up to 40 GHz. The behavior of MIS microstrip lines is similar to that of MIS CPW's, except that for thick-film transmission lines an increase in losses can be observed when the doping profile becomes inhomogeneous. The numerical investigation was carried out by using the method of lines. Several transmission lines have been investigated and results are presented for microstrip, coupled microstrips, and coplanar lines.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

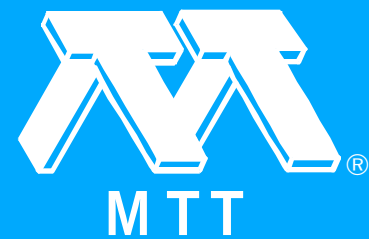
Microwave Active Filters Based on Coupled Negative Resistance Method

C.-Y. Chang and T. Itoh. "Microwave Active Filters Based on Coupled Negative Resistance Method." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1879-1884.

A new coupled negative resistance method to build a microwave active band-pass filter is introduced. Based on this method, four microstrip line end-coupled filters are built. Two are fixed-frequency one-pole and two-pole filters, and two are tunable one-pole and two-pole filters. In order to broaden the bandwidth of the end-coupled filter a modified end-coupled structure is proposed. Using the modified structure, an active filter with a bandwidth up to 7.5% is built. All of the filters show significant passband performance improvement.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Novel Coupling Method for Dual-Mode Dielectric Resonators and Waveguide Filters

S.-W. Chen and K.A. Zaki. "A Novel Coupling Method for Dual-Mode Dielectric Resonators and Waveguide Filters." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1885-1893.

A new method for coupling dual-mode waveguide or dielectric resonator cavities is described and analyzed. The method has the advantages of providing a practical, flexible, economic means of replacing irises, of offering easy tunability of the coupling over a wide range of coupling values, and of reducing the length of the coupling structure. Calculation of the resonator's coupling parameters using the mode-matching method yields accurate results and is verified by measurements. Experimental four-pole dual-mode elliptic function filters using the new coupling method for empty cavities and dielectric-resonator-loaded cavities were constructed and tested. The test results showed excellent agreement with theoretical analysis.

[Click on title for a complete paper.](#)



Abstracts

Transient Analysis of Distortion and Coupling in Lossy Coupled Microstrips (Dec. 1990 [T-MTT])

J.P.K. Gilb and C.A. Balanis. "Transient Analysis of Distortion and Coupling in Lossy Coupled Microstrips (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1894-1899.

The transient response of lossy coupled microstrips is studied using the spectral-domain approach (SDA) to rigorously compute the dielectric losses. The dielectric loss coefficient is computed using the SDA with a complex dielectric constant and results are compared with those obtained by the formula advanced by Schneider using a finite-difference approximation for the partial derivative. Transient coupling is formulated in the frequency domain by an even/odd mode approach, showing how differences in either the modal loss coefficients or modal propagation constants can be responsible for coupling between lines. Results for pulse distortion on a semiconducting substrate are presented showing how losses reduce the signal amplitude without significantly distorting the shape.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

[Click on title for a complete paper.](#)



Abstracts

A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver (Dec. 1990 [T-MTT])

N. Takachio, K. Iwashita, S. Hata, K. Onodera, K. Katsura and H. Kikuchi. "A 10 Gb/s Optical Heterodyne Detection Experiment Using a 23 GHz Bandwidth Balanced Receiver (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1900-1905.

A balanced receiver for multigigabit per second coherent optical transmission systems is described. A balanced optical receiver with a frequency bandwidth of 23 GHz is achieved by connecting an InGaAs twin-p-i-n photodiode to a fabricated 0.5-30 GHz GaAs monolithic distributed amplifier with a solder bump flip-chip interconnection technique. An experiment is conducted which proves that this receiver has the potential for use in 10 Gb/s optical CPFSK heterodyne detection systems.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Nonlinear Circuit Analysis of Harmonic and Intermodulation Distortions in Laser Diodes Under Microwave Direct Modulation

S. Iezekiel, C.M. Snowden and M.J. Howes. "Nonlinear Circuit Analysis of Harmonic and Intermodulation Distortions in Laser Diodes Under Microwave Direct Modulation." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1906-1915.

A microwave nonlinear circuit analysis technique which can account for all known steady-state responses has been developed and applied to the large-signal characterization of directly modulated laser diodes. An equivalent circuit derived from the rate equations is used to model the laser diode. The proposed technique is based on a harmonic balance algorithm which represents two-tone inputs by describing frequencies. Second-harmonic and third-order intermodulation distortion results for a single-mode GaAlAs diode have been compared with corresponding measured data to validate the method. Aperiodic responses are detected by means of bifurcation theory prior to the harmonic balance analysis and are simulated in the time domain.

Click on title for a complete paper.



Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers

H. Kikuchi, Y. Miyagawa and T. Kimura. "Broad-Band GaAs Monolithic Equalizing Amplifiers for Multigigabit-per-Second Optical Receivers." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1916-1923.

This paper discusses the development of IC's for a preamplifier, a gain-controllable amplifier, and main amplifiers with and without a three-way divider for multigigabit-per-second optical receivers using a single-ended parallel feedback circuit, two (inductor and capacitor) peaking techniques, and advanced GaAs process technology. An optical front-end circuit consisting of a GaAs preamplifier and an InGaAs p-i-n photodiode achieves a 3 dB bandwidth of 7 GHz and -12 dBm sensitivity at 10 Gb/s. Moreover, a gain-controllable amplifier obtains a maximum gain of 15 dB, a gain dynamic range of 25 dB, and a 3 dB bandwidth of 6.1 GHz by controlling the source bias of the common-source circuit. Gain, 3 dB bandwidth, and output power of the main amplifier with the three-way divider are 17.4 dB, 5.2 GHz, and 5 dBm, respectively. These IC's can be applied to optical receivers transmitting NHZ signals in excess of 7 Gb/s.



Abstracts

Intermixing Optical and Microwave Signals in GaAs Microstrip Circuits for Phase-Locking Applications

M.G. Li, E.A. Chauchard, C.H. Lee and H.-L.A. Hung. "Intermixing Optical and Microwave Signals in GaAs Microstrip Circuits for Phase-Locking Applications." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1924-1931.

The microwave modulation of the interference generated by optical beams that are reflected from the top and bottom surfaces of GaAs substrate adjacent to a microstrip line is studied. The detected modulation is used to directly characterize the electro-optic effect. This optical-microwave intermixing technique is applied to phase-lock a free-running microwave oscillator with picosecond laser pulses. One potential application of this technique is for the optical on-wafer characterization of MMIC's.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Miniaturized Broad-Band MMIC Frequency Doubler

T. Hiraoka, T. Tokumitsu and M. Akaike. "A Miniaturized Broad-Band MMIC Frequency Doubler." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1932-1937.

A miniaturized broad-band balanced MMIC frequency doubler, which consists of a common-gate FET and a common-source FET directly connected on each drain electrode, is proposed. A size of 0.5 mm X 0.5 mm, excluding the output matching circuit, is achieved with conversion loss from 8 to 10 dB and fundamental signal suppression better than 17 dB from 6 to 16 GHz. The broad-band doubler as a miniaturized MMIC function module is valuable for MMIC oscillators, front ends, and transmitters.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Establishing the Minimum Reverse Bias for a p-i-n Diode in a High-Power Switch

R.H. Caverly and G. Hiller. "Establishing the Minimum Reverse Bias for a p-i-n Diode in a High-Power Switch." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1938-1943.

An important circuit design parameter in a high-power p-i-n diode application is the selection of an appropriate applied dc reverse bias voltage. Until now, this important circuit parameter has been chosen either conservatively, using the magnitude of the peak RF voltage, or by empirical trials to determine a possible lower value. This paper explores the reverse bias requirement for a p-i-n diode operating in a high-power RF and microwave environment. It demonstrates that the minimum reverse bias voltage is equivalent to the p-i-n diode's self-generated dc voltage under similar RF conditions. A concise expression for this self-generated voltage is developed and experimentally verified and will assist the design engineer in more accurately selecting an appropriate minimum value for the applied reverse bias voltage setting.

[Click on title for a complete paper.](#)

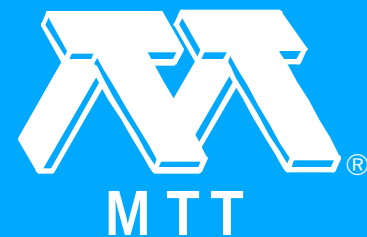


Abstracts

A New Low-Noise FET Structure

G.A. Truitt, D.D. Heston and J.L. Klein. "A New Low-Noise FET Structure." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1944-1948.

A new monolithic FET topology has demonstrated improved minimum noise figure when compared with a conventional pi-gate FET. The new structure, referred to as the spider FET, has allowed noise figures to be achieved in monolithic LNA applications that are 0.3 dB lower using the standard 0.5 μm GaAs MESFET ion-implantation process.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Miniature Hybrid Microwave IC's Using a Novel Thin-Film Technology (Dec. 1990 [T-MTT])

K. Eda, T. Miwa, Y. Taguchi and T. Uwano. "Miniature Hybrid Microwave IC's Using a Novel Thin-Film Technology (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1949-1956.

A novel thin-film technology for miniature hybrid microwave IC's is presented. All passive components, such as resistors and capacitors, are fully integrated on ordinary alumina ceramic substrates rising the thin-film technology with very high yield. The numbers of parts and wiring processes were significantly reduced. This technology was applied to the fabrication of Ku-band solid-state power amplifiers.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

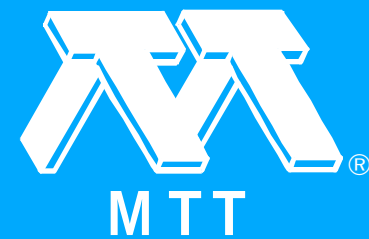


Abstracts

Losses in GaAs Microstrip (Dec. 1990 [T-MTT])

M.E. Goldfarb and A. Platzker. "Losses in GaAs Microstrip (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1957-1963.

This paper presents newly measured data for the loss of microstrip on 4 mil GaAs from dc to 40 GHz. These data were taken from transmission measurements of lightly coupled, multiple half wavelength resonators. A comparison of the loss data with the predicted losses from three popular CAE tools is provided.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Modeling MESFET's for Intermodulation Analysis of Mixers and Amplifiers (Dec. 1990 [T-MTT])

S.A. Maas and D. Neilson. "Modeling MESFET's for Intermodulation Analysis of Mixers and Amplifiers (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1964-1971.

This paper examines the problem of modeling GaAs MESFET's for calculations of intermodulation and spurious responses. We show that an adequate model must express not only the absolute I/V characteristics of the device, but also the derivatives of those characteristics. Finally we propose a large-signal FET model that models those derivatives more realistically than do existing models.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Design Technique for MESFET Mixers for Maximum Conversion Gain

M.J. Rosario and J.C. Freire. "Design Technique for MESFET Mixers for Maximum Conversion Gain." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1972-1979.

A design technique for MESFET mixers is described. This technique is based on a mixer analysis program (MIXAN) designed to obtain the value of conversion gain and evaluate the influence of the embedding impedances for any local oscillator power and dc bias, in order to optimize the mixer performance. The MIXAN program, which uses SPICE as a "subroutine" to determine large-signal current and voltage waveforms, is able to obtain the operating conditions for maximum conversion gain. The good agreement between experimental and simulation results for X-band drain and gate mixers proves the validity of the design technique.

[Click on title for a complete paper.](#)



Monolithic Sampling Head IC

A. Miura, T. Yakhara, S. Uchida, S. Oka, S. Kobayashi, H. Kamada and M. Dobashi.
"Monolithic Sampling Head IC." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1980-1985.

A monolithic sampling head IC composed of a resonant tunneling diode (RTD) for the sampling pulse generator and Schottky barrier diodes for the sampling bridge has been developed. The RTD was made using an In/sub 0.53/Ga/sub 0.47/As/AlAs structure (pseudomorphic strained superlattice) and used as a sampling pulse generator. For this type of high switching voltage RTD, a peak to valley ratio (P/V ratio) of 9 at 202°C and peak to peak switching voltages of 1.5 V or more- at room temperature were achieved. The Schottky barrier diodes were made from an (In/sub 0.53/Ga/sub 0.47/As)/sub 0.5/(In/sub 0.52/Al/sub 0.48/As)/sub 0.5/ compound. A frequency bandwidth of at least 26 GHz was obtained. When attempting to use a quantum effect device such as an RTD in a practical application, the most important factor to consider is its reliability. We achieved good results in an endurance test of this device, in which it was made to continuously oscillate between 600 MHz and 1 GHz at 90°C for more than 1000 h.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier

R. Majidi-Ahy, C.K. Nishimoto, M. Riazat, M. Glenn, S. Silverman, S.-L. Weng, Y.-C. Pao, G.A. Zdasiuk, S.G. Bandy and Z.C.H. Tan. "5-100 GHz InP Coplanar Waveguide MMIC Distributed Amplifier." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1986-1993.

A single-stage 5-100 GHz InP MMIC amplifier with an average gain of more than 5.5 dB has been developed. This MMIC distributed amplifier has the highest frequency and bandwidth of operation (5-100 GHz) reported to date for wide-band amplifiers. The average associated (not optimized) noise figure of the MMIC amplifier was approximately 5.8 dB measured over 4-40 GHz. The active devices in this seven-section distributed amplifier were 0.1 μm mushroom gate, InGaAs-InAlAs lattice-matched HEMT's on a semi-insulating InP substrate. Coplanar waveguide was the transmission medium for this 100 GHz MMIC with an overall chip dimension of 500 μm by 860 μm .

[Click on title for a complete paper.](#)



Abstracts

A Novel Aperture Isolation Circuit for Use in Phased Array Systems

A.W. Jacomb-Hood, M.S. Booth, D.E. Houston and T. Alcorn. "A Novel Aperture Isolation Circuit for Use in Phased Array Systems." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1994-2000.

A novel electronically controlled matching network has been demonstrated as an aperture isolation circuit. This approach offers smaller size, lower weight, and potentially lower cost than circulators. An X-band MMIC realization of this circuit has comparable loss to a circulator. An S-band hybrid realization demonstrated reductions in insertion loss of up to 2.3 dB for antenna VSWR's of up to 5:1 lying within a 100° sector on the Smith chart.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Design and Performance of an Octave Band 11 Watt Power Amplifier MMIC

J.J. Komiak. "Design and Performance of an Octave Band 11 Watt Power Amplifier MMIC." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 2001-2006.

The design and performance of a two-stage 3.0 to 6.0 GHz MMIC power amplifier that has established a new standard for power output and bandwidth in MMIC form are reported. The amplifier produces $11 \text{ W} \pm 1 \text{ dB}$ from 3.0 to 6.0 GHz, with maximum power outputs of 13.5 W and 10.5 W at the respective S and C radar bands, and a minimum power of 9 W. This benchmark eclipses the best power levels reported for both two-stage (8 W at S-band) and single-stage (10 W at C-band) narrow-band MMIC power amplifiers with a continuous bandwidth coverage of 67%. The yield of this two-stage 40 mm gate periphery MMIC, based upon $0.5 \mu\text{m}$ gate length selective-implant MESFET technology, averaged 43%, with a 57% yield from the best wafer.

[Click on title for a complete paper.](#)



Abstracts

Multifunction Small-Signal Chip Set for Transmit/Receive Modules

D.A. Willems, M.E. Coluzzi, S.S. Tantod, I.J. Bahl, M.D. Pollman, J.D. Jorgenson, E.L. Griffin, C. Andricos and T.F. Brukiewa. "Multifunction Small-Signal Chip Set for Transmit/Receive Modules." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 2007-2015.

This paper presents design and test results for small-signal multifunction MMIC's for C-band transmit/receive (T/R) modules. This chip set includes the entire receive path and a portion of the transmit path (seven stages of amplification and 11 passive circuits) in just four chips. These IC's, fabricated with the multifunction self-aligned gate (MSAG) process, demonstrate a high level of integration, excellent performance, and a good yield. The variable-gain low noise amplifier has 30 ± 1 dB gain and 2.5 dB noise figure, the phase shifter/SPDT switch has 8 ± 1 dB loss, the transmit/receive buffer amplifier has 6.5 ± 0.2 gain and 3.5 dB noise figure, and the variable gain buffer amplifier has 8.5 ± 0.5 dB gain and 2.5 dB noise figure.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz (Short Papers)

C. Yuen, C. Nishimoto, Y.C. Pao, M. Day, S. Bandy and G. Zdasiuk. "High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers up to 60 GHz (Short Papers)." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 2016-2017.

Ultra-broad-bandwidth distributed amplifiers with cutoff frequencies of 45 and 60 GHz have been developed utilizing 0.25 μm AlGaAs and InP cascode HEMT's with a mushroom gate profile. A measured gain as high as 10 ± 1 dB from 5 to 50 GHz and a gain of 8 ± 1 dB from 5 to 60 GHz, respectively, have been achieved from amplifiers using AlGaAs HEMT's. Amplifiers fabricated on InP HEMT material have demonstrated a gain of 15 ± 1 dB from 5 to 50 GHz and 12 ± 1 dB from 5 to 60 GHz, respectively. The measured noise figure for these amplifiers is approximately 2.5-4 dB in the Ka-band. The measured $P_{\text{sub } 1 \text{ dB}}$ is around 12.5 dBm at 40 GHz. The chip size is 2.3 X 0.9 mm².

Click on title for a complete paper.



Abstracts

Patent Abstracts (Dec. 1990 [T-MTT])

"Patent Abstracts (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 2018-2028.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

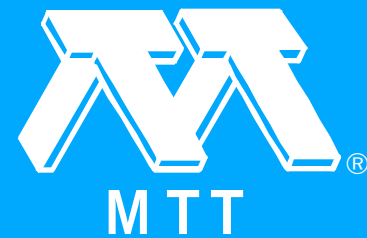
Click on title for a complete paper.



Abstracts

Call for Papers - Special Issue on Microwaves in Space (Dec. 1990 [T-MTT])

"Call for Papers - Special Issue on Microwaves in Space (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1380-1380.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Dec. 1990 [T-MTT])

"Call for Papers - 1991 IEEE MTT-S International Microwave Symposium (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 2030-2030.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

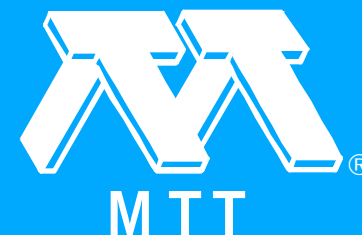
Click on title for a complete paper.



Abstracts

Call for Papers - 37th ARFTG Conference (Dec. 1990 [T-MTT])

"Call for Papers - 37th ARFTG Conference (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 2031-2031.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

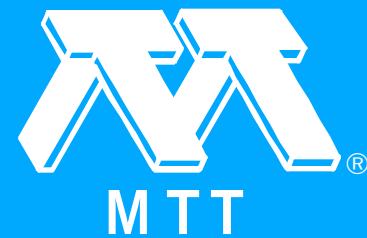
Click on title for a complete paper.



Abstracts

Call for Papers - 1991 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium (Dec. 1990 [T-MTT])

"Call for Papers - 1991 IEEE Microwave and Millimeter-Wave Monolithic Circuits Symposium (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 2032-2032.



IEEE

Contents

Publications

Issues

Papers

Authors

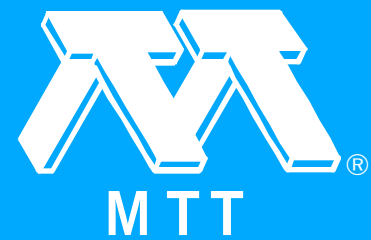
Click on title for a complete paper.



Abstracts

Index, IEEE [T-MTT] 1990, Volume 38, and MTT-S Sponsored Conferences

"Index, IEEE [T-MTT] 1990, Volume 38, and MTT-S Sponsored Conferences." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): i1-i28.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Back Cover (Dec. 1990 [T-MTT])

"Back Cover (Dec. 1990 [T-MTT])." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): b1-b2.



- Contents
- Publications
- Issues
- Papers
- Authors

Click on title for a complete paper.



Abstracts

Front Cover (1990 [MCS])

"Front Cover (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): f1-f1.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

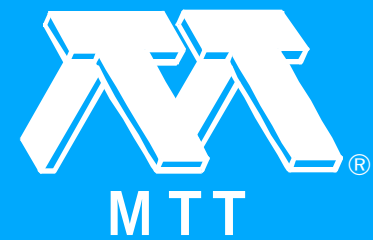
Click on title for a complete paper.



Abstracts

Copyright (1990 [MCS])

"Copyright (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): i-ii.



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Message from the General Chairman (1990 [MCS])

A. Chu. "Message from the General Chairman (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): iii-iii.

On behalf of the Steering Committee, I invite you to attend the 9th annual Microwave and Millimeter-Wave Monolithic Circuits Symposium to be held on May 7 and 8, 1990 at the Dallas Convention Center, Dallas, Texas. For the first time the technical sessions will be open to all conference participants enabling attendance on a space available basis. This open-door invitation was implemented to encourage greater interaction amongst technical disciplines, which is the trend in our industry. As in past years, on Tuesday May 8th, the sessions will be held jointly with the IEEE MTT-S International Microwave Symposium. All sessions will be held at the Dallas Convention Center.

Click on title for a complete paper.



Abstracts

Committees (1990 [MCS])

"Committees (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): iv-iv.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

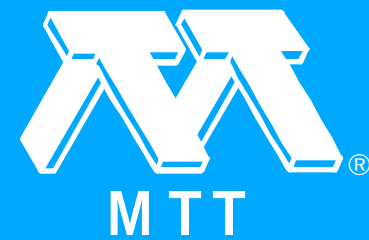
Click on title for a complete paper.



Abstracts

Message from the Technical Program Chairman (1990 [MCS])

C. Huang. "Message from the Technical Program Chairman (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): v-v.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Committee Photographs (1990 [MCS])

"Committee Photographs (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): vi-vi.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Table of Contents (1990 [MCS])

"Table of Contents (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): vii-x.



MTT



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts



[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

GaAs Devices and the MIC Applications in Satellite Broadcasting

Y. Konishi. "GaAs Devices and the MIC Applications in Satellite Broadcasting." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 1-6.

GaAs devices such as low noise HEMT, low noise FET and wide band UHF amplifiers are used extensively for satellite broadcasting receivers, especially in LNBs (Low Noise Block Down Converters). The Ku-band prescaler for non-adjusting local oscillators, the active band pass filter for miniaturized filters, and the monolithic IC for high volume production have also been developed recently. This paper presents a summary of information on GaAs devices and the MMIC, including the personal opinion of the author on the merits and future availability of MMIC and discrete circuits. The status and popularization of satellite broadcasting reception in Japan is also shown for forecasting purposes.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception

P. Wallace, R. Michels, J. Bayruns, S.B. Christianson, N. Scheinberg, J. Wang, R. Goyal and M. Patel. "A Low Cost High Performance MMIC Low Noise Downconverter for Direct Broadcast Satellite Reception." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 7-10.

This paper describes a low cost single chip receiver designed for use in direct broadcast satellite (DBS) receivers operating over 11.7 to 12.2 GHz. The chip is comprised of a low noise amplifier, image filter, active mixer, IF filter, IF amplifier and local oscillator replacing about 50 discrete components in typical outdoor DBS receiver. The unit is housed in a low cost hermetic package and requires only dielectric resonator for proper operation. With power supplies of +6 V and -5 V, the typical noise figure is about 5 dB, with a conversion gain of about 36 dB. The device is manufactured in a 0.5 micron, buried P layer GaAs MESFET IC process without through substrate vias.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

A Highly Integrated Two Channel MMIC Down Converter with Gain Control

J. Staudinger, W. Seely, J.M. Golio and B. Beckwith. "A Highly Integrated Two Channel MMIC Down Converter with Gain Control." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 11-14.

A complete MMIC down converter with variable gain control has been fabricated. A 6-8 GHz RF input signal is converted using a fixed 10 GHz LO to a two channel 2-4 GHz IF. The die is highly integrated, including an RF preamplifier, double balanced mixer, LO amplifier, power divider, IF amplification, and two voltage controlled IF amplifiers which provide variable gain adjustment. Back vias are utilized to establish grounding for both dc and rf. Probe pads are also included for measuring chip level performance.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz

B.L. Nelson, D.K. Umemoto, C.B. Perry, R. Dixit, B.R. Allen, M.E. Kim and A.K. Oki. "High-Linearity, Low DC Power Monolithic GaAs HBT Broadband Amplifiers to 11 GHz." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 15-18.

Two broadband monolithic amplifiers based on GaAs heterojunction bipolar transistors (HBT) have been developed covering the 0.05-11 GHz frequency band. The hybrid designs reported earlier have been successfully implemented with MMIC technology. These amplifiers represent the first reported balanced and distributed MMIC HBT amplifiers and offer significant improvement over MESFET and HEMT approaches in high linearity, low dc power performance for communication and EW applications. A 5-11 GHz MMIC balanced amplifier designed for high linearity produces +33 dBm third-order output intercept point (IP3) with 7.5 dB associated gain and less than 160 mW dc power consumption. A 0.05-9 GHz distributed amplifier designed for low dc power and high gain consumes less than 50 mW and provides 6-10 dB gain at nominal bias.

[Click on title for a complete paper.](#)



GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz

K.W. Kobayashi, D.K. Umemoto, R. Esfandiari, A.K. Oki, L.M. Pawlowicz, M.E. Hafizi, L. Tran, J.B. Camou, K.S. Stolt, D.C. Streit and M.E. Kim. "GaAs HBT MMIC Broadband Amplifiers from DC to 20 GHz." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 19-22.

Three monolithic wideband and high gain amplifiers implemented with 2-3 μm GaAs heterojunction bipolar transistor (HBT) MMIC technology are presented. A single-stage direct-coupled amplifier achieves a 3-dB bandwidth from dc to 20 GHz, believed to be the widest bandwidth reported for direct-coupled amplifiers. The amplifier has a 6 dB nominal gain with a peak gain of 7.3 dB at 10 GHz. The 1-dB compression is 10 dBm at midband and the noise figure is between 7 and 10 dB over the bandwidth. A two-stage version of this amplifier achieves 14.5 dB gain up to 12 GHz. Its output power and noise performance is comparable to the single-stage version. The third wide band amplifier design is based on passive component and microstrip matching circuitry. The matched amplifier has 14.5dB nominal gain with a 3-dB bandwidth from 5 to 12 GHz.



IEEE

Contents

Publications

Issues

Papers

Authors

High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz

C. Yuen, C. Nishimoto, M. Glenn, C. Webb, S. Bandy and G. Zdasiuk. "High-Gain, Low-Noise Monolithic HEMT Distributed Amplifiers Up to 60 GHz." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 23-26.

Ultrabroad bandwidth distributed amplifiers with cutoff frequencies of 45 to 60 GHz were developed using 0.25- μ m HEMTs with a mushroom gate profile. Both single and cascode HEMTs were used as the active devices in the amplifiers. A measured gain as high as 10 ± 1 dB from 5 to 50 GHz and a gain of 8 ± 1 dB from 5 to 60 GHz, respectively were achieved from amplifiers using cascode HEMTs. The measured noise figure for these amplifiers is approximately 3-4 dB in the Ka-band. The chip size is 2.3 x 0.9 mm.

Click on title for a complete paper.



Abstracts

Monolithic 9 to 70 GHz Distributed Amplifier

N. Camilleri, P. Chye, A. Lee and P. Gregory. "Monolithic 9 to 70 GHz Distributed Amplifier." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 27-30.

Multi-octave monolithic GaAs Pseudomorphic HEMT (PHEMT) amplifiers have been developed to operate from 9 to 70 GHz. These amplifiers make use of state of the art sub .2 μm PHEMT devices. Typical performance for a distributed amplifier using a 75 μm device is 4 dB of gain with 0.5dB peak-to-peak ripple and a maximum noise figure of 7 dB across the 9 to 70 GHz band.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier

R. Majidi-Ahy, M. Riaziat, C. Nishimoto, M. Glenn, S. Silverman, S. Weng, Y.C. Pao, G. Zdasiuk, S. Bandy and Z. Tan. "5-100 GHz InP CPW MMIC 7-Section Distributed Amplifier." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 31-34.

A single stage 5-100 GHz InP MMIC amplifier with an average gain of more than 5.0 dB has been developed. This MMIC distributed amplifier has the highest frequency and bandwidth of operation (5-100 GHz), reported for wideband amplifiers. The active devices in this 7-section distributed amplifier were 0.1 μm mushroom gate, InGaAs-InAlAs lattice-matched HEMTs on a semi-insulating InP Substrate. Coplanar waveguide was the transmission medium for this 100 GHz MMIC with an overall chip dimension of 500 by 860 μm 's.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Octave Band Eleven Watt Power Amplifier MMIC

J.J. Komiak. "Octave Band Eleven Watt Power Amplifier MMIC." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 35-38.

The design and performance of a two-stage 3.0 to 6.0 GHz MMIC power amplifier that has established a new standard for power output and bandwidth in MMIC form is reported. The amplifier produces 11 Watts $\pm$ 1 dB from 3.0 to 6.0 GHz, with maximum power outputs of 13.5 Watts and 10.5 Watts at the respective S and C radar bands, and a minimum power of 9 Watts. This benchmark eclipses the best power levels reported for both two-stage (8 Watts at S-band) and single-stage (10 Watts at C-band) narrowband MMIC power amplifiers with a continuous bandwidth coverage of 67%. The yield of this MMIC, based upon 0.5 μ m gate-length selective-implant MESFET technology, averaged 43%, with a 57% yield from the best wafer.

[Click on title for a complete paper.](#)

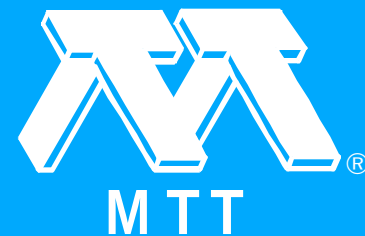


Abstracts

A 2.5 Watt X-Band High Efficiency MMIC Amplifier

V.D. Hwang, Y.C. Shih, T.Y. Chi and D.C. Wang. "A 2.5 Watt X-Band High Efficiency MMIC Amplifier." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 39-41.

A broadband two-stage X-band high efficiency power amplifier using ion-implanted MMIC technology is presented. The amplifier has 2.3 to 2.9 watt CW output power, 31 to 35 percent PA efficiency and 11 dB power gain across the frequency band. These data represent a state-of-the-art performance for MMIC amplifier. The amplifier is a true monolithic circuit since it does not use any off-chip combining or tuning.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

5 W Monolithic HBT Amplifier for Broadband X-Band Applications

B. Bayraktaroglu, M.A. Khatibzadeh and R.D. Hudgens. "5 W Monolithic HBT Amplifier for Broadband X-Band Applications." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 43-46.

We report the first monolithic HBT amplifier producing greater than 5 W output power at X-band frequencies. A single-stage, totally monolithic amplifier was fabricated using 2.4 mm emitter length AlGaAs/GaAs HBT for operation in the 7 - 10 GHz frequency range. A maximum of 5.3 W cw output power was obtained in this frequency range with 4.6 dB gain and 22% power-added efficiency.

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation

J.H. McAdoo, W.M. Bollen, R. Seeley, W. Catoe and J. Frey. "Rectification Failure in GaAs MESFETs Subjected to Single Pulses of Intense Microwave Radiation." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 47-49.

An important mechanism for damage to GaAs microwave integrated circuits from single pulses of intense microwave radiation has been observed by the use of high speed photography, and optical spectroscopy and rf spectroscopy. We call this mechanism rectification failure because it transforms the Schottky junctions of the transistors to ohmic resistors.

[Click on title for a complete paper.](#)



A Novel Aperture-Isolation Circuit for Use in Phased Array Systems

A.W. Jacomb-Hood, M. Booth, D.E. Houston and T.S. Alcorn. "A Novel Aperture-Isolation Circuit for Use in Phased Array Systems." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 51-54.

A novel electronically controlled matching network has been demonstrated as an aperture-isolation circuit. This approach offers smaller size, lower weight, and potentially lower cost than circulators. The demonstrated circuit has comparable loss to a circulator, however in certain applications (e.g., lower frequency of operation) and with improved devices, cited below, it is anticipated that this approach will offer lower insertion loss than circulators. MMIC-compatible GaAs PIN diodes have demonstrated a cutoff frequency of 2.4 THz and a breakdown voltage of 95 V.



Miniature Monolithic Microwave Frequency Duplexers

K.M. Simon, M.J. Schindler, Y. Tajima and A.M. Bertrand. "Miniature Monolithic Microwave Frequency Duplexers." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 55-58.

Two novel duplexers composed of active, lumped and transversal element filters have been developed as MMICs. One duplexer produces a low pass cut-off band edge at 7.5 GHz and a high pass turn-on band edge at 9 GHz while the second duplexer produces two passbands, one from 12.5-13.5 GHz and the second from 15.5-16.5 GHz. These are the first reported active MMIC duplexers. Both duplexers have 30 dB of signal rejection 1.5 GHz from their band edges. The use of active, transversal filters produces the high rejection characteristic and also yields compact duplexers that can be used as building blocks in miniature microwave frequency multiplexing applications.



A New Concept to Cancel Insertion Phase Variation in MMIC Amplitude Controller

D. Roques, J.L. Cazaux and M. Pouysegur. "A New Concept to Cancel Insertion Phase Variation in MMIC Amplitude Controller." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 59-62.

This paper presents a new concept able to maintain a very low insertion phase variation in analog MMIC amplitude controller. This new approach, applicable to Dual-Gate FET variable gain amplifiers consists to connect an active variable load to the second-gate of the DGFET. This load makes use of a cold FET (with $V_{ds} = 0$ v) whose impedance varies dependingly on the amplitude command of the circuit. Then, the cold FET compensates the insertion phase change introduced by the DGFET attenuation control over a wide dynamic range. Based on this principle, a C-band GaAs MMIC attenuator for active antenna application has been designed at ALCATEL ESPACE. The phase variation versus gain is always lower than $\pm 2^\circ$ over 20 dB gain/attenuation range.



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Design and Fabrication of Two-Pole Monolithic Bulk Acoustic Filters

J. Rosenbaum and D. Dawson. "Design and Fabrication of Two-Pole Monolithic Bulk Acoustic Filters." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 63-66.

A new class of miniature monolithic filters has been fabricated in the 1 to 1.5 GHz range. The devices are 2-pole ladder filters which incorporate two inductors, a coupling capacitor and two bulk acoustic resonators. They are characterized by small size and weight, low insertion loss (typically between 1 and 1.5 dB), narrow passbands (between 2 and 5%) and potentially very low cost. Filters have been fabricated on both high resistivity silicon and semi-insulating gallium arsenide substrates. Fabrication is completely compatible with all MMIC components and thus it is straightforward to integrate these devices with active components on the same wafer.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Implementation of RF/Microwave Receiver Components on a Semi-Custom Silicon Bipolar Array

K.J. Negus and J.N. Wholey. "Implementation of RF/Microwave Receiver Components on a Semi-Custom Silicon Bipolar Array." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 67-72.

The analog transistor array starCHIP/sup tm/-1 has been developed for rapid, cost-effective design and delivery of many RF/microwave components for applications to 5 GHz. The array is based on silicon bipolar devices with 10 GHz $f_{sub T}$ and 20 GHz $f_{sub max}$ and thin-film polysilicon resistors with low parasitic capacitance and excellent matching. This paper presents an overview of the array topology and technology. The implementation of receiver functions and their measured results is also illustrated with a frequency doubler, a vector demodulator, a limiting amplifier and a phase detector with on-chip VCO. All these components are wideband, require no external baluns, have 50 Ω input and output impedance matching, and operate from a single 5 V power supply.

Click on title for a complete paper.



An MMIC Amplifier for Automatic Level Control Applications

K.R. Nary and R.L. Van Tuyl. "An MMIC Amplifier for Automatic Level Control Applications." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 73-76.

An automatic gain control amplifier for automatically-leveled output power, broadband, swept frequency applications to 3GHz has been developed. Consisting of a variable pi attenuator, four additive-gain amplifier stages, a temperature compensated peak detector and an output buffer, the amplifier features a maximum leveled gain of 22dB, a gain control range of 25dB, good input and output matches to 50 Omega and suppressed 2nd harmonic distortion. It operates with $\pm 6V$ power supplies and dissipates approximately 800mW.



Abstracts

A Monolithic GaAs HBT Upconverter

A.Y. Umeda, C.T. Matsuno, A.K. Oki, G.S. Dow, K.W. Kobayashi, D.K. Umemoto and M.E. Kim. "A Monolithic GaAs HBT Upconverter." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 77-80.

A 2.6 to 5.5 GHz upconverter/mixer has been implemented with a GaAs heterojunction bipolar transistor (HBT) IC technology. The upconverter consists of a transconductance multiplier based on a Gilbert cell topology, followed by a two-stage Darlington-coupled amplifier. Measured conversion gain is greater than 20 dB up to an RF output frequency of 5.5 GHz. This upconverter is believed to be the first reported using the GaAs HBT technology.



[Contents](#)
[Publications](#)
[Issues](#)
[Papers](#)
[Authors](#)

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Three Channel I.F. Multiplexers

S. Thompson, Z. Lemnios, W. Guffey, A. Chamberlain, T. Robbio and W. Nelson. "Three Channel I.F. Multiplexers." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 81-84.

This paper describes the first integration of multiple I.F. functions into highly integrated GaAs MMICs for electronic warfare applications. The I.F. functions include amplifiers, switches, and attenuators combined into three channel I.F. multiplexers. The multiplexer provide three channel selectivity and variable gain in each channel for application in wide bandwidth, high dynamic range electronic warfare receivers.

Click on title for a complete paper.



Abstracts

European MMIC Activities (1990 [MCS])

J. Magarshack. "European MMIC Activities (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 85-90.

A brief review of the development programmed involving MMIC's in Europe supported by the EEC and military administrations will be given. Then a glance at a European outlook on civil applications leads to examples from four leading European Manufacturers of MMIC's namely, PLESSEY, TELEFUNKEN, PHILIPS and THOMSON-CSF. These show how systems people are now exploiting MMIC's in new types of applications.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

MIMIC Technology Transportability (1990 [MCS])

W.H. Perkins, N. Jansen, T.A. Midford, W.C. Niehaus, D.H. Reep and J. Tenedorio. "MIMIC Technology Transportability (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 91-94.

Technology transportability is a primary goal of the MIMIC program. Successful transfer of GE's design and process for a C-band 3-watt, 2-stage amplifier from GE's pilot line to four Hughes/GE MIMIC team foundries is an important milestone in that effort. This paper details the cooperative exchange of technology which has enabled transport of this C-band MIMIC, and describes fabrication status, examines process variations, and compares data achieved by the foundries.

[Click on title for a complete paper.](#)





IEEE

Contents

Publications

Issues

Papers

Authors

Multifunction Chip Set for T/R Module Receive Path (1990 [MCS])

D. Willems, I. Bahl, M. Pollman, J. Jorgenson, E. Griffin, M. Coluzzi, S. Tantod and C. Andricos. "Multifunction Chip Set for T/R Module Receive Path (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 95-98.

This paper presents design and test results for multifunction MMICs for C-Band Transmit/Receive (T/R) modules. This small signal chip set contains the entire receive path (5 stages of amplification and 10 passive devices) in just three chips. These IC's fabricated with the Multi-functional Self-Aligned Gate (MSAG) process, demonstrate a high level of integration, excellent performance and a good yield. The variable gain low noise amplifier has 30 ± 1 dB gain, 2.5 dB noise figure, the phase shifter/SPDT switch has 8 ± 1 dB loss and the buffer amplifier has 6.5 ± 0.2 gain and 3.5 dB noise figure. Average yield for these circuits was 40% or better.

Click on title for a complete paper.



Abstracts



IEEE

Contents

Publications

Issues

Papers

Authors

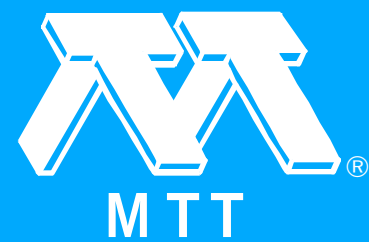
A Single Chip 2-20 GHz T/R Module

M.J. Schindler, S.L. Chu, T.E. Kazior, A.M. Bertrand and K.M. Simon. "A Single Chip 2-20 GHz T/R Module." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 99-102.

A single chip 2-20 GHz Transmit/Receive (T/R) module has been demonstrated. This MMIC includes a 4-stage power amplifier chain, a 4-stage low noise amplifier chain, and two T/R switches. A selective ion implantation process was used. One implant profile was optimized for low-noise operation, a second was optimized for power performance. All circuits were designed to be relatively insensitive to process variations to ensure adequate yield, despite the complexity of the chip. Distributed amplifiers are used throughout, and the T/R switches use a standard series-shunt FET configuration. All circuits have been miniaturized to keep the total chip size small. The entire T/R circuit measures only .143" x .193" (3.6 mm x 4.9 mm).

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

Monolithic Ka Band VCO Using Quarter Micron GaAs MESFETs and Integrated High-Q Varactors (1990 [MCS])

M.G. McDermott, C. Sweeney, M. Benedek and G. Dawe. "Monolithic Ka Band VCO Using Quarter Micron GaAs MESFETs and Integrated High-Q Varactors (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 103-106.

High Q GaAs abrupt varactor diodes and 0.25 μ m GaAs MESFETs have been combined on a semi-insulating GaAs substrate for millimeter wave MMIC applications. Based on the measured series resistance and capacitance, the diodes have a calculated Q at -4V, 50MHz of approximately 19,000. The MESFETs have a measured gain of >6dB at 35GHz with extrapolated values for $f_{sub\ t/}$ and $f_{sub\ max/}$ of 32GHz and 78GHz respectively. A monolithic Ka band VCO using these devices has been built and tested. Output powers of 60mW with 70MHz of tuning bandwidth and 40mW with 120MHz of tuning bandwidth have been measured at 32GHz.





IEEE

Contents

Publications

Issues

Papers

Authors

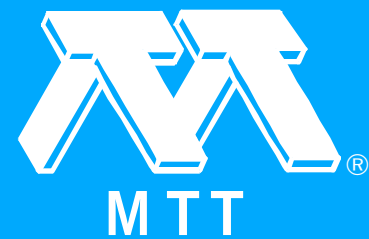
K/_u- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts (1990 [MCS])

P.J. McNally, T. Smith, F.R. Phelleps, K.M. Hogan, B. Smith and H. Deitrich. "K/_u- and K-Band GaAs MMIC Varactor-Tuned FET Oscillators Using MEV Ion-Implanted Buried-Layer Back Contacts (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 107-110.

An all ion-implant, planar process has been used to fabricate high-Q, hyper-abrupt carrier profile, varactor diodes as components of GaAs MMIC VCOs with state-of-the-art performance. These GaAs varactor-tuned FET oscillators operate up to 24 GHz with a tuning bandwidth of 5 GHz in K-band. The high-Q varactors feature a buried N⁺ layer created by ion-implantation at up to 6 MEV. Separately masked implanted N⁺ areas connect the buried layer to ohmic contacts at the surface. Varactor f_c of 1600 GHz was obtained at 0.09 pF.

Click on title for a complete paper.





IEEE

Contents

Publications

Issues

Papers

Authors

A Monolithic 94 GHz Balanced Mixer

B. Adelseck, J.M. Dieudonne, K.E. Schmegner, A. Colquhoun, G. Ebert and J. Selders. "A Monolithic 94 GHz Balanced Mixer." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 111-114.

On the basis of a recently developed GaAs technology, which allows the realisation of millimeter wave Schottky mixer diodes and MESFETs on the same monolithic chip, different 94 GHz monolithic mixers have been fabricated. The Schottky diodes show cutoff frequencies of up to 2.3 THz, whereas MESFETs with typical F_{max} ($MAG=1$) of about 90 GHz have been measured. The mixer chips show conversion losses of less than 8 dB combined with noise figures below 6 dB (DSB).

Click on title for a complete paper.





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application

T.N. Ton, G.S. Dow, T.H. Chen, M. Lacon, T.S. Lin, S. Bui and D. Yang. "An X-Band Monolithic Double Double-Balanced Mixer for High Dynamic Receiver Application." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 115-118.

An X-Band monolithic double double-balanced mixer utilizing MESFET process is described. This monolithic mixer demonstrates RF performance comparable to that of a hybridized mixer. The mixer achieves a high input IP/sub 3/of 20 dBm and 1-dB compression output power of 3.6 dBm at 20 dBm LO drive. The measured conversion loss is less than 10 dB from 7 to 10 GHz with a IF output frequency of 5 GHz. We believed this represents highest IP/sub 3/ performance among the reported monolithic mixers.

[Click on title for a complete paper.](#)



Abstracts



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A High Power 2-18 GHz T/R Switch (1990 [MCS])

M.J. Schindler and T.E. Kazior. "A High Power 2-18 GHz T/R Switch (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 119-122.

A high power 2-18 GHz T/R switch MMIC has been developed for use in broadband T/R modules. This switch has power handling better than 35 dBm (3.2 watts), 8 dB higher than any previously reported broadband switch. A combination of techniques was used to yield higher power handling while preserving low loss and high isolation. These circuit techniques include: asymmetrical design of the Transmit and Receive arms; the use of dual-gate FETs for handling large voltages, and the use of large FET peripheries for handling large currents.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

A Compact Broadband, Six-Bit MMIC Phasor with Integrated Digital Drivers (1990 [MCS])

C. Moyer, G. Sakamoto and M. Brand. "A Compact Broadband, Six-Bit MMIC Phasor with Integrated Digital Drivers (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 123-126.

Digital and microwave technologies have been successfully combined on a single chip to realize a broadband, 6-bit MMIC phase shifter. It exhibits low insertion loss, good VSWR, and exceptional phase performance with less than 3 degrees RMS phase error for all sixty-four phase states over the entire 7.2-10.2 GHz band. Compared to previous designs, the number of required control lines has been reduced by a factor of two due to the integration of the digital driver circuitry.

[Click on title for a complete paper.](#)





IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Broad Band Monolithic Cross Point Switch Matrices

S. Powell, P. Becker, M. Dupuis and C. Nagy. "Broad Band Monolithic Cross Point Switch Matrices." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 127-130.

A series of broadband monolithic switch matrices has been fabricated. Circuits covering DC to 18 GHz are described, including a 4 to 10 GHz fully monolithic 2 by 2 matrix on a single chip with 4 dB insertion loss and greater than 40 dB isolation. The circuits utilize a high isolation microstrip crossover.

[Click on title for a complete paper.](#)



Abstracts

A 10-14 GHz Linear MMIC Vector Modulator with Less Than 0.1dB and 0.8° Amplitude and Phase Error (1990 [MCS])

F.L.M. van den Bogaart and R. Pyndiah. "A 10-14 GHz Linear MMIC Vector Modulator with Less Than 0.1dB and 0.8° Amplitude and Phase Error (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 131-134.

The design, fabrication and performance of a GaAs monolithic linear vector modulator in the 10-14 GHz band is described. The circuit exhibits side band and carrier rejections of more than 45 dB with third order intermodulation signals at -40 dBc. Such performance has never been obtained previously in neither hybrid nor monolithic technology.



IEEE

Contents

Publications

Issues

Papers

Authors

Click on title for a complete paper.



Abstracts

Index of Authors (1990 [MCS])

"Index of Authors (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): 135-135.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.



Abstracts

Back Cover (1990 [MCS])

"Back Cover (1990 [MCS])." 1990 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 90.1 (1990 [MCS]): b1-b1.



MTT



IEEE

[Contents](#)

[Publications](#)

[Issues](#)

[Papers](#)

[Authors](#)

Click on title for a complete paper.

