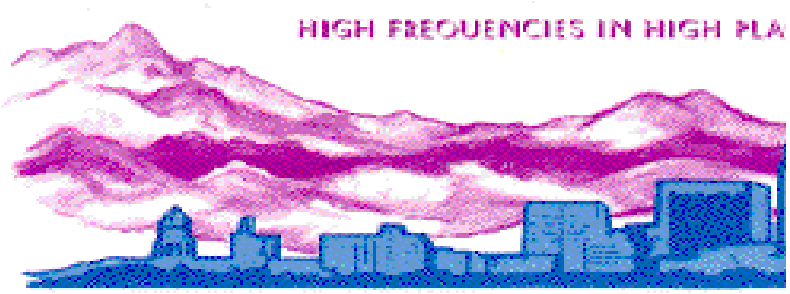
1997 IEEE MTT-S INTERNATIONAL MICROWAVE SYMPOSIUM DIGEST

Technical Program Contents
Thursday, June 12



Session TH1A

Innovations in Microwave Systems

Chair

D. Meharry

Sanders a Lockheed-Martin Co.

Co-Chair

R. Ranson

Filtronic Contek

System innovations are rapidly occurring in microwave and millimeter-wave consumer, commercial, and military applications. This session represents all of these areas, including a ground penetration radar exciter, a silicon monolithic receiver, and a compact 60 GHz transmitter.

Session TH1B
(Focused Session)

Microwave Metrology and Standards: A Historic View

Chair

R.A. Kamper

National Institute of Standards and Technology (Retired)

Much of the development of microwave measurement techniques and the physical standards that support them took place after the surge of military technology development in World War II. This development was the original reason for the establishment of the laboratories of the National Bureau of Standards (now renamed National Institute of Standards and Technology) in Boulder, Colorado, where a significant part of this work took place. After an introduction by Wilbert Snyder to tell how it all started, this session will tell the technical side of the story of the development of some of the major techniques and standards, as recounted by people who were involved in the process, either early or late.

Session TH1C

Millimeter and Microwave Power Amplifiers

Chair

H.J. Kuno

Quin Star Technology

Co-Chair

K.K. Ikossi-Anastasiou

Lousiana State University

This session covers the recent progress achieved in the field of millimeter-wave and microwave power amplifiers. The first two papers describe the development of 94 and 60 GHz MMIC amplifiers. The third paper presents power combined MMIC amplifier modules with 6 W power output at Ka-band. The last two papers deal with linearization techniques for extending the dynamic range of power amplifiers.

Session TH1D

Signal Generation

Chair

S. Wetenkamp

SCEAN

The pressure of increasing demand for wireless data bandwidth is driving microwave sources toward higher operating frequencies, improved phase noise and spurious performance. The area is receiving a great deal of attention and significant progress has been made.

Session TH1E

Application Oriented Concepts in Field Theory

Chair

F. Arndt

University of Bremen, Germany

Co-Chair

J. Mink

North Carolina State University

This session presents new aspects of application oriented field theory including TLM, hybrid mode-matching/ FEM, FEM time domain, variational, and mode-matching effects. Progress is reported on the application on periodic coplanar line structures, ridged waveguide and waffle-iron filters, mixed distributed lumped elements, iris coupling elements, dual mode coupling mechanisms as well as polarizers.

Session TH2A

Transportation System Technology

Chair

R. Henning

University of South Florida

This session provides an update on the status of systems and components for automotive radar applications. Included are several novel concepts and significant achievements.

Session TH2B

Low Noise Millimeter-Wave Components

Chair

J. Whelehan, Jr.

AIL Systems, Inc.

This session presents excellent low-noise amplifiers at frequencies as high as 155 GHz. In addition papers are presented concerning noise modeling and design of a K-band noise generator with noise temperature much lower than its ambient temperature.

Session TH2C

Devices and Circuits for Wireless Power Applications

Chair

A. Platzker

Raytheon

This session features a number of power amplifier device techniques that advance the state-of-the-art in low voltage operation, linearity and efficiency for wireless applications. Enhance mode FET and PHEMT, and HBT devices are described that permit single supply operation at 2 and 3 volts. Advances in Silicon/Germanium device technology support wireless cost and performance requirements. Silicon devices compare favorably with GaAs for 900 MHz applications.

Session TH2D

Probing Techniques and Dielectric Measurement

Chair

R.D. Pollard

The University of Leeds, United Kingdom

Co-Chair

Z. Skvor

Chech Technical University, Prague

Microwave probing is now well established and popular. The papers in this session show how the technology is consolidating and providing higher frequency of operation and improvement in resolution. Electro-optical, scanning microscopes and contact probing are all represented. Improvement in accuracy and applicability are demanded of dielectric measurements which have important industrial applications. There are a range of measurement methods that are applied to the problem including transmission line techniques for dielectric constant or thickness using coplanar waveguide, a resonator applied to very low loss dielectrics and free space methods applied to plastic and composite materials.

Session TH2E

Recent Developments in Field Theory

Chair

A. Beyer

Duisburg University, Germany

This session is dedicated to recent problems and new developments in field theory. The contributions will address a time domain finite-difference approach based on the expression of the field quantities by means of the vector potentials, investigation of various H-shaped antennas with an ATLM field-solver, and a unified analysis of modes in planar transmission lines. Further presentations will focus upon global edge-conditioned basis functions from local solutions of Maxwell's equations, circuit-based model for coupling between MMICs in multi-chip assemblies, and nonlinear perfectly matched layer (PML) for absorption of electromagnetic waves in nonlinear medium.

Session TH3A

Wireless Components and Systems

Chair

J.F. Sevic

Qualcomm

Co-Chair

J. Bellantoni

Watkins-Johnson

The focus of this session is recent developments in device, circuit and system technologies for the personal communication market. Topics include advances in FET amplifiers, WLAN oscillators and CDMA systems. Engineers involved in the design of wireless products will find these presentations timely and practical.

Session TH3C

High Power Transistor Amplifiers

Chair

T. Cisco

Hughes Aircraft

Co-Chair

L. Kushner

MIT Lincoln Laboratory

The trend toward higher power, increased efficiency, and broad bandwidth continues. But no device or fabrication technology has emerged as a clear-cut winner. Excellent results have been achieved with GaAs FETs, HFETs, PHEMTs and HBTs using discrete devices, partially-matched devices, and full-MMIC implementations. This session includes work from 1.5 to 18 GHz at power levels of 2 to 60 watts.

Session TH3D

Topics in Microwave Measurement

Chair

M. Solomon

The Mitre Corp.

Co-Chair

D. Wait

National Institute of Standards and Technology

Topics in microwave measurements includes measurements characterizing micro-machined waveguides, amplifiers, and active antenna elements.

Session TH3E

HBT/HEMT Modeling

Chair

A.K. Sharma

TRW ES & TD

This session addresses design and modeling of HBT and HEMT devices. The HBT device performance is enhanced through the application of the Taguchi Method. Accurate HBT device models are obtained by including the effects due to distributed capacitance and temperature. Small and large signal bias and temperature dependent noise models are also included. Electro-thermal models of both HBT and HEMT devices are also presented.

Session TH3F

Interactive Forum II

Chair

John Norgard

University of Colorado, Colorado Springs

Session TH4A

Antennas and Systems for Personal Communication

Chair

R.K. Gupta

COMSAT Laboratories

Co-Chair

W. Ou

Ote Telecom

This session focuses on recent progress made in design and analysis of antennas and systems for personal communications. Specific topics include adaptive antenna systems, shielded cellular antennas, GPS and PCS antennas for mobile communications and nonlinear analysis of CDMA systems.

Session TH4D
(Joint ARFTG and IMS Session)

Crosstalk, Coupling and Multiconductor Transmission Line Characterization

Chair

D. Williams

National Institute of Standards and Technology

Co-Chair

J. Laskar

Georgia Institute of Technology

This joint IMS/ARFTG session provides a forum for the latest developments in the theory and measurement of cross talk and coupling. The session begins by focusing on measurements for the characterization of lossy coupled multiconductor transmission lines. It also features theoretical treatments of multi-conductor lines, coupling between devices, and simulation of multiconductor systems.

Session TH4E

Numerical Methods in Frequency Domain II

Chair

H.-Y. Yang

University of Illinois-Chicago

There are many advantages in applying the moment method to various integrated circuit structures. Wavelet-Band Modeling, Prony's Method, and multilevel method, have found important applications in frequency-domain numerical modeling. Novel ideas for the modeling of lossy and irregular structures are also proposed.