



IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES

NOVEMBER 1974

VOLUME MTT-22

NUMBER 11

A PUBLICATION OF THE IEEE MICROWAVE THEORY AND TECHNIQUES SOCIETY



PAPERS

- Hollow-Cylinder Waveguide Isolators for Use at Millimeter Wavelengths..... *M. Kanda and W. G. May* 913
- The Interaction of Surface Magnetostatic Waves with Drifting Carriers in Semiconductors..... *K. Kawasaki, H. Takagi, and M. Umeno* 918
- Passband Control of Surface Magnetostatic Waves by Spacing a Metal Plate Apart from the Ferrite Surface..... *K. Kawasaki, H. Takagi, and M. Umeno* 924
- A Method for the Computation of the Characteristic Immittance Matrix of Multiconductor Striplines with Arbitrary Widths..... *L. J. P. Linnér* 930
- Analysis of Wave Propagation in Inhomogeneous Optical Fibers Using a Variational Method.. *T. Okoshi and K. Okamoto* 938
- Analysis of Microstrip Resonators..... *T. Itoh* 946

SHORT PAPERS

- Analysis of Lossy Inhomogeneous Waveguides Using Shooting Methods..... *R. E. McIntosh and L. J. Turgeon* 952
- Operation Modes of a Waveguide Y Circulator..... *Y. Akaiwa* 954
- Experimental Distinction Between Crossed-Field and In-Line Three-Port Circuit Models for Interdigital Transducers..... *W. R. Smith* 960
- Normalized Impedance Graphs for Exponential Transmission Lines..... *R. P. Arnold, W. L. Bailey, and R. L. Vaitkus* 964
- Transmission Characteristics of Spherical TE and TM Modes in Conical Waveguides..... *M. S. Narasimhan and K. S. Balasubramanya* 965
- Simple Stabilizing Method for Solid-State Microwave Oscillators..... *A. Kondo, T. Ishii, and K. Shirahata* 970

LETTERS

- Comments on "Rectangular Waveguides with Impedance Walls"..... *P. R. McIsaac* 972
- Comments on "Rectangular Waveguides with Impedance Walls"..... *M. S. Narasimhan and V. V. Rao* 973
- Surface Acoustic Wave Properties of Tantalum Pentoxide Thin Films on YX Quartz..... *J. F. Weller and T. G. Giallorenzi* 973
- Comments on "Scattering by a Ferrimagnetic Circular Cylinder in a Rectangular Waveguide"..... *P. Bhartia* 975
- A Circuit for Rapid Evaluation of TRAPATT Diodes..... *W. C. Jenkins and K. R. Gleason* 976
- Transmission Line Impedance Matching Using the Smith Chart..... *R. M. Arnold* 977
- Useful Alternate to an Expression in "Sandwich Slot Line"..... *R. D. Moyer* 978
- Author's Reply..... *S. B. Cohn* 978

CONTRIBUTORS..... 979



IEEE MICROWAVE THEORY AND TECHNIQUES SOCIETY

The Microwave Theory and Techniques Society is an organization, within the framework of the IEEE, of members with principal professional interest in the field of microwave theory and techniques. All members of the IEEE are eligible for membership in the Society and will receive this TRANSACTIONS upon payment of the annual Society membership fee of \$7.00. Affiliate membership is available upon payment of the annual affiliate fee of \$18.00. For information on joining write to the IEEE at the address below.

ADMINISTRATIVE COMMITTEE

R. A. RIVERS, *President*

H. W. COOPER, *Vice President*

H. STINEHELPER, *Secretary-Treasurer*

S. F. ADAM
J. L. ALLEN
R. W. BEATTY
A. CLAVIN*

A. W. GUY
G. I. HADDAD
J. B. HORTON*
R. M. KNOX

N. LIPETZ
S. OKWIT*
H. G. OLTMAN
D. PARKER

G. P. RODRIGUE
F. J. ROSENBAUM
H. SOBOL
R. A. SPARKS

J. J. TAUB
D. F. WAIT
L. R. WHICKER

* *Ex officio (past chairmen)*

Honorary Life Members

A. C. BECK
D. D. KING

W. W. MUMFORD
T. S. SAAD

K. TOMIYASU

National Lecturer

JOHN L. ALLEN

S-MTT Chapter Chairmen

Atlanta
Baltimore
Boston
Boulder-Denver
Chicago
Columbus
Connecticut
Dallas
Houston
Huntsville
India

F. L. CAIN
J. E. DEGENFORD
H. E. STINEHELPER, SR.
A. Y. RUMFELT
S. R. LAXPATI
R. C. RUDDUCK
M. GILDEN
M. L. WALLACE
W. L. WILSON, JR.
J. M. LOOMIS
V. P. KODALI

NY/Long Island
Los Angeles Council
Milwaukee
Montreal
N. J. Coast
North Jersey
Orange County
Orlando
Ottawa
Philadelphia
Phoenix

E. W. MARKARD
D. G. KELLING
K. W. HSU
A. G. ENGELHARDT
M. V. SCHNEIDER
H. S. JELORIC
J. A. SANGUINET
W. H. RHODEN
W. J. STEENAART
W. J. SOOHOO
G. W. WILLIAMS, JR.

St. Louis
San Diego
San Francisco
Schenectady
Seattle
S. E. Michigan
Syracuse
Tel Aviv
Tokyo, Japan
Tucson
Washington, D. C.

F. J. ROSENBAUM
D. RUBIN
J. H. LEPOFF
A. L. ARMSTRONG
J. C. LAMBERT
N. A. MASNARI
J. A. KINZEL
A. I. MADJAR
S. SAITO
E. P. PIERCE
D. W. MAKI

IEEE TRANSACTIONS® ON MICROWAVE THEORY AND TECHNIQUES

Editor

F. J. ROSENBAUM

H. G. OLTMAN
(*Institutional Listings*)

J. W. BANDLER
(*Computer Program
Descriptions*)

Associate Editors

M. CAULTON
(*Special Issues*)

T. OKOSHI
(*Abstracts Editor—Asia*)

Address all manuscripts to D. Parker, Stanford Res. Inst., Building 406B, 333 Ravenswood Ave., Menlo Park, Calif. 94025. Submission of three copies of manuscripts, including figures, will expedite the review.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

Officers

JOHN J. GUARRERA, *President*
JOHN D. RYDER, *Vice President*
ARTHUR P. STERN, *Vice President, Regional Activities*
ROBERT F. COTELLESA, *Vice President, Technical Activities*

FRANK S. BARNES, *Vice President, Publication Activities*
SEYMOUR CAMBIAS, JR., *Secretary*
JOSEPH K. DILLARD, *Treasurer*

Headquarters Staff

DONALD G. FINK, *Executive Director*

ELWOOD K. GANNETT, *Director, Publishing Services*
WILLIAM J. KEYES, *Director, Administrative Services*
JOHN M. KINN, *Director, Educational Service*
CHARLES F. STEWART, JR., *Director, Member and Field Services*

BETTY J. STILLMAN, *Executive Assistant to the Executive Director*
RICHARD M. EMBERSON, *Director, Technical Services*
EDWIN D. MACDONALD, *Conference Services*
SAVA I. SHERR, *Standards*

Editorial Department

H. JAMES CARTER, *Manager, Editorial Services*

Senior Editors: NANCY B. BUDDE*, ANN H. BURGMAYER, CAROLYNE ELENOWITZ, GAIL S. FERENC
Associate Editors: CLARA FEGER, HELEN S. GOLDMAN, TRUMBULL ROGERS

* *Responsible for this Transactions*

IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES is published monthly by The Institute of Electrical and Electronics Engineers, Inc., 345 East 47 Street, New York, N. Y. 10017. Responsibility for the contents rests upon the authors and not upon the IEEE, the Society, or its members. This journal is available in either microfiche or printed form. Individual copies may be purchased at \$3.00 (first copy only) by IEEE members and \$6.00 per copy by nonmembers. Annual subscription price: IEEE members dues plus Society fee. Price for nonmembers available on request. Abstracting is permitted with mention of source. All rights, including translation, are reserved by the IEEE. Requests for republication permission should be addressed to the IEEE Editorial Department, 345 East 47 Street, New York, N. Y. 10017. Copyright © 1974 by The Institute of Electrical and Electronics Engineers, Inc. Printed in U.S.A. Second-class postage paid at New York, N. Y., and at additional mailing offices.