



# MICROWAVE AND GUIDED WAVE LETTERS<sup>®</sup>

A PUBLICATION OF THE IEEE MICROWAVE THEORY AND TECHNIQUES SOCIETY



AUGUST

VOLUME 4

NUMBER 8

IMGLE3

(ISSN 1051-8207)

---

## LETTERS

|                                                                                                                                 |                                                                                                                            |     |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-----|
| Wideband Characterization of Mutual Coupling Between High Density Bonding Wires .....                                           | <i>H.-Y. Lee</i>                                                                                                           | 265 |
| Validation and Extension to Three Dimensions of the Berenger PML Absorbing Boundary Condition for FD-TD Meshes .....            | <i>D. S. Katz, E. T. Thiele, and A. Taflove</i>                                                                            | 268 |
| Phase Noise Measurements of a <i>D</i> -Band Backward Wave Oscillator .....                                                     | <i>A. R. Harvey, G. M. Smith, and J. C. G. Lesurf</i>                                                                      | 271 |
| 35–40 GHz Monolithic VCO's Utilizing High-Speed GaInP/GaAs HBT's .....                                                          | <i>K. Riepe, H. Leier, A. Marten, U. Güttich, J. M. Dieudonné, and K. H. Bachem</i>                                        | 274 |
| 44-GHz High-Efficiency InP-HEMT MMIC Power Amplifier .....                                                                      | <i>W. Lam, M. Matloubian, A. Igawa, C. Chou, A. Kurdoghlian, C. Ngo, L. Jelloian, A. Brown, M. Thompson, and L. Larson</i> | 277 |
| Stability Condition for the Explicit Algorithms of the Time Domain Analysis of Maxwell's Equations.....                         | <i>M. Mrozowski</i>                                                                                                        | 279 |
| 100–300 GHz Gunn Oscillator Simulation Through Harmonic Balance Circuit Analysis Linked to a Hydrodynamic Device Simulator..... | <i>M. F. Zybura, S. H. Jones, G. B. Tait, and J. R. Jones</i>                                                              | 282 |

---

|                        |                    |     |
|------------------------|--------------------|-----|
| PATENT ABSTRACTS ..... | <i>W. H. Meise</i> | 285 |
|------------------------|--------------------|-----|

---

|                                                                                                   |  |     |
|---------------------------------------------------------------------------------------------------|--|-----|
| Call for Papers—1995 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference ..... |  | 291 |
|---------------------------------------------------------------------------------------------------|--|-----|

---



The Microwave Theory and Techniques Society is an organization, within the framework of the IEEE, of members with principal professional interests in the field of microwave theory and techniques. All members of the IEEE are eligible for membership in the Society and will receive the LETTERS upon payment of the annual Society membership fee of \$20.00. Affiliate membership is available upon payment of the annual affiliate fee of \$33.00, plus the Society fee of \$20.00. For information on joining, write to the IEEE at the address below. *Member copies of Transactions/Journals are for personal use only.*

**ADMINISTRATIVE COMMITTEE**

E. J. CRESCENZI, JR

C. D. COHEN, *Vice President*S. J. FIEDZIUSZKO, *Secretary*J. T. BARR  
R. E. BRYAN  
E. D. COHENE. J. CRESCENZI, JR  
M. GOLIO  
D. HORNBUCKLER  
R. H. JANSENM. A. MAURY, JR  
B. S. PERLMAN  
R. POLLARD  
E. A. REZEKM. SCHINDLER  
R. SUDBURY  
D. G. SWANSON  
G. THORENJ. W. WASSEL  
D. WEBB  
E. YAMASHITA*Honorary Life Members*A. C. BECK  
S. B. COHN  
A. A. OLINER  
T. S. SAAD  
K. TOMIYASU  
L. YOUNG*Distinguished Lecturers*W. CURTICE  
P. GOLDSMITH  
F. IVANEK  
V. RIZZOLI  
J. R. WHINNERY*Past Presidents*P. W. STAECKER (1993)  
R. S. KAGIWADA (1992)  
F. IVANEK (1991)**S-MTT Chapter Chairmen**Albuquerque: M. A. DINALLO  
Atlanta: A. J. GASIEWSKI  
Baltimore: S. L. ANTHONISEN  
Beijing: Y.-R. ZHONG  
Benelux: K. VAN T. KLOOSTER  
Buffalo: M. R. GILLETTE  
Central Iowa/Cedar Rapids: D. OLIVER  
Central & South Italy: P. LAMPARIELLO  
Central New England/Boston: R. T. WEBSTER  
Chicago: T. G. JURGENS  
Cleveland: D. A. FORCE  
Columbus: T.-H. LEE  
Dallas: G. A. TRUITT  
Dayton: G. R. SIMPSON  
Denver-Boulder: R. G. GEYER  
Egypt: O. L. EL-SAYED  
Finland: E. T. KEMPPINEN  
Foothill: S. M. SAAD  
Florida West Coast: R. HENNING  
France: V. F. HANNA  
Germany: F. ARNDT  
Greece: N. K. UZUNOGLU  
Houston: J. T. WILLIAMS  
Hungary: I. FRIGYES  
Huntsville: H. L. BENNETT  
India: S. K. KOUL  
Indonesia: S. NATANAGARAIsrael: E. LEVINE  
Ithaca: L. PALAMATEER  
Kitchner-Waterloo: C. R. SELVAKUMAR  
Y. L. CHOW  
Los Angeles: H. J. DE LOS SANTOS  
Milwaukee: J. RICHIE  
Montreal: G. L. YIP  
New Hampshire: T. O. PERKINS  
New Jersey Coast: T. FITCH  
New South Wales: C. D. WILSON  
New York/Long Island: F. J. WINTER  
North Italy: C. N. NALDI  
North Jersey: R. V. SNYDER  
Oregon: K. SHENAI  
Orlando: D. L. DUNN  
Ottawa: D. H. REEKIE  
Philadelphia: A. S. DARYOUSH  
Phoenix: G. MARACAS  
Poland: J. W. MODELSKI  
Portland: D. SHENAI  
Princeton: A. KATZ  
Rio de Janeiro: J. R. BERGMANN  
San Diego: A. CLAVIN  
San Fernando Valley: A. M. MADNI  
Santa Clara Valley/San Francisco: W. OUSchenectady: R. J. GUTMANN  
Seattle: D. T. HARVEY  
Seoul: J. S. MYUNG  
Singapore: L. M. SENG  
South Africa: A. J. BOOYSEN  
South Australia: B. D. BATES  
South Brazil: D. CONSONI  
Southeastern Michigan: E. J. ROTHWELL  
Spain: M. P. SIERRA  
Springfield: K. M. LAU  
St. Louis: R. INDECK  
Sweden: P. T. LEWIN  
Switzerland: L. PROST  
Syracuse: D. W. FERGUSON  
Taipei: C. C. TZUANG  
Tokyo: T. YONEYAMA  
Tucson: H. C. KOHLBACHER  
Turkey: A. BUYUKAKSOY  
Twin Cities: A. GOPINATH  
United Kingdom/Ireland: T. H. OXLEY  
Utah/Salt Lake City: M. F. ISKANDER  
Venezuela: A. N. BIANCHI  
Virginia Mountain: I. J. BAHAL  
Washington/Northern Virginia: J. I. UPSHUR  
Winnipeg: G. BRIDGES  
Yugoslavia: B. JOCANOVIC**IEEE MICROWAVE AND GUIDED WAVE LETTERS****Editor-in-Chief**T. ITOH  
Assistant  
D. BINDER**Associate Editors**M. KOSHIBA (*Asia-Pacific Abstracts*)  
Sub-Associate Editor  
S. XUW. H. MEISE (*Patent Abstracts*)**THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.****Officers**H. TROY NAGLE, *President*  
JAMES T. CAIN, *President-Elect*  
LUIS T. GANDIA, *Secretary*  
V. THOMAS RHYNE, *Treasurer*  
KENNETH R. LAKER, *Vice President, Educational Activities*CHARLES K. ALEXANDER, *Vice President, Professional Activities*  
LLOYD A. MORLEY, *Vice President, Publication Activities*  
VIJAY K. BHARGAVA, *Vice President, Regional Activities*  
WALLACE S. READ, *Vice President, Standards Activities*  
DONALD M. BOLLE, *Vice President, Technical Activities*W. KENNETH DAWSON, *Director, Division IV—Electromagnetics and Radiation***Executive Staff**JOHN H. POWERS, *Executive Director and General Manager*  
PHYLLIS HALL, *Staff Executive, Publications*  
FRANK R. MOORE, *Staff Executive, Volunteer Activities*  
RICHARD D. SCHWARTZ, *Staff Executive, Business Administration*IRVING ENGELSON, *Staff Director, Corporate Activities*  
W. R. HABINGREITHER, *Staff Director, Customer Service Center*  
PETER A. LEWIS, *Staff Director, Educational Activities*  
MELVIN I. OLKEN, *Staff Director, Regional Activities*ANDREW G. SALEM, *Staff Director, Standards Activities*  
W. THOMAS SUTTLE, *Staff Director, Professional Activities*  
ROBERT T. WANGEMANN, *Staff Director, Technical Activities***Transactions/Journals Department**

Director: PATRICIA WALKER

Manager: GAIL S. FERENC

Electronic Production Manager: JERI L. UZZO

Managing Editor: VALERIE CAMMARATA

Associate Editor: ROBERT W. DAVIDSON

IEEE MICROWAVE AND GUIDED WAVE LETTERS is published monthly by The Institute of Electrical and Electronics Engineers, Inc. Responsibility for the contents rests upon the authors and not upon the IEEE, the Society/Council, or its members. **IEEE Corporate Office:** 345 East 47th Street, New York, NY 10017-2394. **IEEE Operations Center:** 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. **NJ Telephone:** 908-981-0060. **Price/Publication Information:** Individual copies: IEEE Members \$10.00 (first copy only), nonmembers \$20.00 per copy. (Note: Add \$4.00 postage and handling charge to any order from \$1.00 to \$50.00, including prepaid orders.) Member and nonmember subscription prices available on request. Available in microfiche and microfilm. **Copyright and Reprint Permissions:** Abstracting is permitted with credit to the source. Libraries are permitted to photocopy for private use of patrons, provided the per-copy fee indicated in the code at the bottom of the first page is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. For all other copying, reprint, or republication permission, write to Copyrights and Permissions Department, IEEE Publications Administration, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. Copyright © 1994 by The Institute of Electrical and Electronics Engineers, Inc. All rights reserved. Second-class postage paid at New York, NY, and at additional mailing offices. **Postmaster:** Send address changes to IEEE MICROWAVE AND GUIDED WAVE LETTERS, IEEE, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331. GST Registration No. 125634188. Printed in U.S.A.