



1993 IEEE MTT-S International Microwave Symposium Digest

Technical Program

Technical Program Contents

Session A

(Plenary)

World Congress Center Auditorium

9:00 a.m. to 10:30 a.m.

Tuesday, June 15, 1993

Chairman: G.P. Rodrigue

“The Global Reach of Microwaves”

Speakers: John Day, Consultant, Strategies Unlimited

Richard Snelling, Retired Executive Vice President, Bell South Telecommunications

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Session B

(Joint with MMWMC Symposium)

Advanced MMIC Technology Auditorium

11:00 a.m. to 12:00 p.m.

Tuesday, June 15, 1993

Chairman: M. Kumar—Paramax Systems Corp., Great Neck, NY

Co-Chairman: W. C. Niehaus—AT&T Bell Laboratories, Reading, PA

B-1: A Highly-Efficient 7-Watt 16 GHz Monolithic Pseudomorphic HEMT Amplifier 87
11:00 a.m. H.Q. Tserng and P. Saunier

B-2: The Inductive Connection Effects of a Mounted SPDT in a Plastic SO8 Package 91
11:20 a.m. F. Ndagijimana, J. Engdahl, A. Ahmadouche and J. Chilo

B-3: An MMIC Linearized Amplifier Using Active Feedback 95
11:40 a.m. J.C. Pedro and J. Perez

Session C

(Special Session)

Intelligent Vehicle Highway Systems

Room: 216/217

11:00 a.m. to 12:00 p.m.

Tuesday, June 15, 1993

Chairman: R.A. Sparks—Anro, Lexington, MA

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11:00 a.m. J.M. Sussman

C-2: Spectrum Allocations for IVHS *
11:30 a.m. D.J. Chadwick

C-3: Potential System Architectures for IVHS *
12:00 p.m. M.F. McGuire

*Paper not available at time of printing.

Session D
(Special Session)

Microwave Power Modules (MPM)
Room: 202

11:00 a.m. to 12:00 p.m. **Tuesday, June 15, 1993**

Chairman: R.K. Parker—Naval Research Laboratory, Washington, DC

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| 11:20 a.m. | L. Cosby | |
| D-3: | MPM Technology Developments: An Industry Perspective | 115 |
| 11:40 a.m. | J.A Christiansen, T.J. Grant, P.M. Lally, P. Puri, G. Dohler and S. Ludvik | |

Session E

Manufacturing Methods, Production and Packaging
Room: 218/219

11:00 a.m. to 12:00 p.m. **Tuesday, June 15, 1993**

Chairman: T.C.Cisco—Hughes Aircraft Company, El Segundo, CA

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| 11:40 a.m. | S.R. Smith and M.T. Murphy | |

Session F

(Joint with MMWMC Symposium)

Broadband MMIC Circuits

Auditorium

1:30 p.m. to 3:00 p.m.

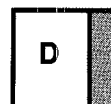
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Chairman: D. Meharry—Lockheed-Sanders, Nashua, NH

Co-Chairman: H.-L. Hung—COMSAT Laboratories, Clarksburg, MD

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Session G

Millimeter-Wave Systems and Techniques

Room: 216/217

1:30 p.m. to 3:00 p.m.

Tuesday, June 15, 1993

Chairman: A.J. Gasiewski—Georgia Tech, Atlanta, GA

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*Paper not available at time of printing.

Session H

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Room: 202

1:30 p.m. to 3:00 p.m. Tuesday, June 15, 1993

Chairman: Y.-C. Shih—Hughes Aircraft Company, Los Angeles, CA

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Session I

Special Session-Status of Microwave Ferrite Technology

Room: 218/219

1:30 p.m. to 3:00 p.m. Tuesday, June 15, 1993

Chairman: J.E. Pippin—Electromagnetic Sciences, Inc., Norcross, GA

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*Paper not available at time of printing.

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Interactive Forum I

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*Paper not available at time of printing.

Session J

(Joint with MMWMC Symposium)

MMIC Control Circuits Auditorium

3:30 p.m. to 5:00 p.m.

Tuesday, June 15, 1993

Chairman E. Switzer—Electromagnetic Sciences, Inc., Norcross, GA

Co-Chairman: C. Huang—Anadigics, Warren, NJ

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Session K

Analysis of Quasi-Planar and Quasi-Optical Structures Room 216/217

3:30 p.m. to 5:00 p.m.

Tuesday, June 15, 1993

Chairman: J.W. Mink—Army Research Office, Research Triangle Park, NC

Co-Chairman: A.S. Omar—Tech. University of Hamburg-Harburg, Hamburg, Germany

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Session L

High Q Filters for Communication Systems

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3:30 p.m. to 5:00 p.m.

Tuesday, June 15, 1993

Chairman: H.C. Bell—Loral Microwave, Rancho Cordura, CA

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Session M

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Room 218/219

3:30 p.m. to 5:00 p.m.

Tuesday, June 15, 1993

Chairman: J.T. Vaughn—Electromagnetic Sciences, Inc., Norcross, GA

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Session N

Phased Arrays I

Room 202

8:30 a.m. to 10:00 a.m.

Wednesday, June 16, 1993

Chairman: J.D. Adams—Georgia Tech Research Institute, Atlanta, GA

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8:30 a.m.	D. Bates, D. McPherson, D. Helms, W. Kopp, B. Cleaveland, B. Edward, J. Komiak, R. Brown and R. Csongor	
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*Paper not available at time of printing.

Session O

Millimeter-Wave Amplifier and Receiver Technology Room 216/217

8:30 a.m. to 10:00 a.m.

Wednesday, June 16, 1993

Chairman: E.C. Niehenke—Westinghouse ESG, Baltimore, MD

Co-Chairman: M.N. Afsar—Tufts University, Medford, MA

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Session P

Solid State Devices and Circuits

Room 218/219

8:30 a.m. to 10:00 a.m.

Wednesday, June 16, 1993

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Session Q

(Focused Session)

Developments in Global Communications

Room 205

8:30 a.m. to 10:00 a.m.

Wednesday, June 16, 1993

Chairman: G.L. Heiter—AT&T Bell Labs., North Andover, MA

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Session R

Passive Components

Room 215

8:30 a.m. to 10:00 a.m.

Wednesday, June 16, 1993

Chairman: L.P.B. Katehi, University of Michigan, Ann Arbor, MI

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9:00 a.m.	J.W. Gippich	
R-4:	Folded Stubs for Compact Suspended Stripline Circuits	593
9:10 a.m.	W. Menzel and F. Bögelsack	
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Session S

Phased Arrays II

Room 202

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Wednesday, June 16, 1993

Chairman: D. Rutledge—Cal. Tech., Pasadena, CA

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S-3:	A 100-Element HBT Grid Amplifier	615
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Non-Linear Modeling and Analysis

Room 216/217

10:30 a.m. to 12:00 p.m.

Wednesday, June 16, 1993

Chairman: M. Calcaterra, USAF Wright Lab., Dayton, OH

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T-3:	Analysis of Nonlinear Microwave Circuits Using the Compression Approach	637
11:10 a.m.	J. Kunisch, A. Bahr, M. Rittweger and I. Wolff	
T-4:	Nonlinear Model for Predicting Intermodulation Distortion in GaAs FET RF Switch	
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Solid State Oscillators

Room 218/219

10:30 a.m. to 12:00 p.m.

Wednesday, June 16, 1993

Chairman: A.P.S. Khanna—Avantek/HP, Santa Clara, CA

U-1:	A General Method Based on Harmonic Balance Techniques to Simulate Noise in	
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Focused Session

Wireless Local Area Networks

Room 205

10:30 a.m. to 12:00 p.m.

Wednesday, June 16, 1993

Chairman: J.B. Horton—TRW, Redondo Beach, CA

- | | | |
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| 10:50 a.m. | R.A. Batchelor, J.W. Archer, T.S Bird, S. Giugni, J.S. Kot, N. Nikolic, D.I. Ostry, T.M. Percival and A.C. Young | |
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Session W

Coplanar Structures

Room 215

10:30 a.m. to 12:00 p.m.

Wednesday, June 16, 1993

Chairman: T.A. Brunasso—Electromagnetic Sciences, Inc., Norcross, GA

- | | | |
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| | T. Becks and I. Wolff | |
| W-3: | Effects of Ground Equalization on the Electrical Performance of Asymmetric CPW | |
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| | N. Dib, M. Gupta, G. Ponchak and L. Katehi | |
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| | M. Yu, R. Vahldieck and J. Huang | |
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High Speed Fiber Optic Links-Systems

Room 202

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Wednesday, June 16, 1993

Chairman: P.R. Herczfeld—Drexel University, Philadelphia, PA

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X-4:	Microwave Signal Distribution Using an Optical Amplifier	731
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Field Theoretic CAD

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Wednesday, June 16, 1993

Chairman: K.C. Gupta—University of Colorado, Boulder, CO

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Low Noise mmW Receivers

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Wednesday, June 16, 1993

Chairman: J.J. Whelehan—AIL Systems, Deer Park, NY

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Wednesday, June 16, 1993

Chairman: J.K. McKinney—Maury Microwave Corp., Ontario, Canada

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Session BB

Planar Structures

Room 215

1:30 p.m. to 3:00 p.m.

Wednesday, June 16, 1993

Chairman: J. Taub—AIL Systems, Deer Park, NY

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Interactive Forum II

GWCC Ballroom

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Session CC

High Speed Fiber Optic Links-Components Session Room 202

3:30 p.m. to 5:00 p.m.

Wednesday, June 16, 1993

Chairman: H. Sobol—University of Texas at Arlington, Arlington, TX

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Session DD

CAD of Passive Components Room 216/217

3:30 p.m. to 5:00 p.m.

Wednesday, June 16, 1993

Chairman: I. Wolff—Düsseldorf University, Düsseldorf, Germany

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Session EE

Receiver Components Room 218/219

3:30 p.m. to 5:00 p.m.

Wednesday, June 16, 1993

Chairman: E.W. Rezek—TRW, Torrence, CA

EE-1: 3:30 p.m.	Low Noise Device and Amplifier Characterization for Deep Space Communication Applications J. Laskar, J.J. Bautista, B. Fujiwara, D. Scherrer and M. Feng	1095
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EE-3: 4:10 p.m.	A 7 to 11 GHz AlInAs/GaInAs/InP MMIC Low Noise Amplifier S.E. Rosenbaum, C.S. Chou, C.M. Ngo, L.E. Larson, T. Liu and M.A. Thompson	1103
EE-4: 4:20 p.m.	A Low Power GaAs MESFET Monolithic Downconverter for Digital Handheld Telephone Applications J. Birkeland	1105
EE-5: 4:30 p.m.	3 to 5 GHz Compact Microwave Delay Line J.L. Merenda, J. Pierro, S.M. Weiner and C. Fenniman	1109
EE-6: 4:50 p.m.	VCO Based Chirp Generation for Broad Bandwidth Compressive Receiver Applications J.S. Levy, P.J. Burke, L.D. Cohen and R. Cecchini	1113

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Session FF

Selected Russian Microwave Technologies

Room 205

3:30 p.m. to 5:00 p.m.

Wednesday, June 16, 1993

Chairman: G.W. Ewell—Georgia Tech Research Institute, Atlanta, GA

FF-1:	High-Power Millimeter Wave Tubes	1119
3:30 p.m.	M.I. Lopin, B.A. Belyavsky, K.G. Simonov, V.A. Cherepenin, A.D. Zakurdayev, B.S. Grishin, A.A. Negirev and A.S. Pobedonostsev	
FF-2:	A New Class of Self-Protecting Low-Noise Microwave Amplifiers	1123
2:50 p.m.	Y.A. Budzinsky and S.P. Kantyuk	
FF-3:	“Istok” – A Leading Russian Microwave R&D Facility	1127
4:10 p.m.	A.N. Korolyov	
FF-4:	Istok Achievements in Solid-State Microwave Devices	1129
4:30 p.m.	S.A. Zaytsev, V.N. Lebedev, I.A. Ledov, A.S. Negirev, A.D. Rodyonov, E.I. Ryzhik and A.M. Temnov	
FF-5:	Multiple-Beam Microwave Tubes	1131
4:50 p.m.	A.S. Pobedonostsev, A.E. Gelvich, M.I. Lopin, A.M. Alexeyenko, A.A. Negirev and B.V. Sazonov	

Session GG

Biological Effects and Medical Applications

Room 215

3:30 p.m. to 5:00 p.m.

Wednesday, June 16, 1993

Chairman: A. Rosen—David Sarnoff Research Center, Princeton, NJ

GG-1:	(Invited) Microwave Bioelectromagnetics in Europe	1137
3:30 p.m.	A. Vander Vorst	
GG-2:	An Improved Diffraction Tomography for Imaging of High-Contrast Dielectric Objects	1141
3:50 p.m.	K.-W. Suh, S.-Y. Kim and J.W. Ra	
GG-3:	Dielectric Imaging for the Localisation and Detection of Breast Tumours	1145
4:00 p.m.	A.W. Preece, R.H. Johnson, J.L. Green and M.P. Robinson	
GG-4:	Thermal Modelling of Non-Ideal Interstitial Microwave Antenna Array Hyperthermia for the Treatment of Cancer	1147
4:10 p.m.	K.L. Clibbon and A. McCowen	
GG-5:	Finite Difference Time Domain Modelling of Hyperthermia Applicators for Cancer Therapy	1151
4:30 p.m.	N.M. Potheary and C.J. Railton	
GG-6:	RF and Microwave Ablation for the Treatment of Ventricular Tachycardia	1155
4:40 p.m.	R.M. Rosenbaum, A.J. Greenspon, S. Hsu, P. Walinsky and A. Rosen	
GG-7:	Nonlinear Dynamical Formulation for Describing Growth of Cancer Cells Based on Intracellular Constituents	1159
4:50 p.m.	C.M. Krowne and A.P. Krowne	

Session HH

Device Modeling and CAD

Room 218/219

8:30 a.m. to 10:00 a.m.

Thursday, June 17, 1993

Chairman: L. Dunleavy—University of South Florida, Tampa, FL

HH-1:	Millimetre-Wave Device Modelling Differences in Microstrip and Coplanar Waveguide	1173
8:30 a.m.	P.C. Walters, R.D. Pollard, J.R. Richardson and G. Gatti	
HH-2:	Accurate and Efficient Modeling of Hetero-FETs	1177
8:50 a.m.	A. Abou-Elnour and K. Schuenemann	
HH-3:	Characterization of Thermal Effects on Microwave Transistor Performance Using an Efficient Physical Model	1181
9:10 a.m.	J.S. Atherton, C.M. Snowden and J.R. Richardson	
HH-4:	Instabilities Diagnosis and the Role of K in Microwave Circuits	1185
9:30 a.m.	A. Platzker, W. Struble and K.T. Hetzler	
HH-5:	Convolution-Based Black-Box Approach for Incorporating Linear Circuit Blocks Described by Frequency-Domain Data into a Non-Linear Transient Time-Domain Simulator	1189
9:40 a.m.	P. Halloran and T.J. Brazil	

Session II

Coupling and Packaging Effects

Room 202

8:30 a.m. to 10:00 a.m.

Thursday, June 17, 1993

Chairman: A.A. Oliner—Polytechnic University, Brooklyn, NY

II-1:	Packaged Printed Transmission Lines: Modal Phenomena and Relation to Leakage	1195
8:30 a.m.	L. Carin, A.A. Oliner, G.W. Slade and K.J. Webb	
II-2:	Resonant Phenomena in Conductor-Backed Coplanar Waveguide (CBCPW)	1199
8:50 a.m.	W.-T. Lo, C.-K.C. Tzuang, S.-T. Peng, C.-C. Chang, J.W. Huang and C.-C. Tien	
II-3:	Coupling Phenomena in Conductor-Backed Slotline Structures	1203
9:10 a.m.	Y. Liu, T. Hirota and T. Itoh	
II-4:	Measurement of NRD-Guide Leaky Wave Coupler in Ka Band	1207
9:30 a.m.	D.-C. Niu, T. Yoneyama and T. Itoh	

Session JJ

High Power Sources and Control Components Room 216/217

8:30 a.m. to 10:00 a.m.

Thursday, June 17, 1993

Chairman: J. Goel—TRW, Redondo Beach, CA

JJ-1:	12 KW S-Band Solid State Transmitter for Modern Radar Systems	1213
8:30 a.m.	M. Hanczor and M. Kumar	
JJ-2:	High Power 14 GHz SSPA for SATCOM Applications	1217
8:50 a.m.	R. Mallavarpu and M.P. Puri	
JJ-3:	Monolithic Photoconductive Ultra-Wideband RF Device	1221
9:10 a.m.	A. Kim, L. Di Domenico, R. Youmans, A. Balekdjian, M. Weiner and L. Jasper	
JJ-4:	Solid State 6x6 Transfer Switch for Cylindrical Array Radar	1225
9:30 a.m.	M.E. Knox, P.J. Sbuttoni, J.J. Stangel, M. Kumar and P. Valentino	
JJ-5:	Shunt-Mounted Harmonically-Tuned Power Rectifier for Distributed Power	
9:50 a.m.	Converters	1229
	D.P. Garrison, A. Lam, J.M. Borrego and R.J. Gutmann	

Session KK

Microwave Measurements Room 215

8:30 a.m. to 10:00 a.m.

Thursday, June 17, 1993

Chairman: D. Wait—NIST, Boulder, CO

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KK-1: 8:30 a.m.	A Broad Band Time Domain Technique for the Measurement of the Frequency Dependent Complex Permittivity in Lossy Transmission Line Systems K.M. Lape and T. Rahal-Arabi	1235
KK-2: 8:40 a.m.	Ultra-Wideband Characterization of Lossy Materials: Short-Pulse Microwave Measurements D. Kralj and L. Carin	1239
KK-3: 8:50 a.m.	MM-Wave Confocal Resonators for Vertical Structure Profiling in Semiconducting and Superconducting Materials J.S. Martens, L. Lee, K. Char, R. Withers, D. Zhang, V.M. Hietala, C.P. Tigges and J. Zolper	1243
KK-4: 9:00 a.m.	Finite Element Analysis of Open-Ended Coaxial Lines D. Blackham	1247
KK-5: 9:10 a.m.	Transistor Noise Parameter Extraction Using a 50 Ohm Measurement System P.J. Tasker, W. Reinert, B. Hughes, J. Braunstein and M. Schlectweg	1251
KK-6: 9:30 a.m.	A Novel Technique for Measuring Small Singal S-Parameters of an RF/ Microwave, Transistor, Power Amplifying Stage for use in Power Amplifier Stability Analysis G. Collinson and M. Jones	1255
KK-7: 9:40 a.m.	A Systematic Error Analysis of HP8510 Time-Domain Gating Techniques with Experimental Verification K. Lu and T.J. Brazil	1259
KK-8: 9:50 a.m.	A Robust Six- to Four-Port Reduction Algorithm C.M. Potter and G. Hji pieries	1263



Session LL

Superconducting Filters

Room 218/219

10:30 a.m. to 12:00 p.m.

Thursday, June 17, 1993

Chairman: R. Withers—Conductus, Inc., Sunnyvale, CA

- | | | |
|------------|--|------|
| LL-1: | Novel Staggered Resonator Array Superconducting 2.3-GHz Bandpass Filter | 1269 |
| 10:30 a.m. | G.L. Matthaei and G.L. Hey-Shipton | |
| LL-2: | High Temp. Superconducting 8.45-GHz Bandpass Filter for the Deep Space | |
| 10:50 a.m. | Network | 1273 |
| | G.L. Matthaei and G.L. Hey-Shipton | |
| LL-3: | Superconducting Narrow Band Pass Filters for Advanced Multiplexers | 1277 |
| 11:00 a.m. | A. Fathy, D. Kalokitis, V. Pendrick, E. Belohoubek, A. Pique and M. Mathur | |
| LL-4: | Design of Hybrid-Coupled Multiplexers and Diplexers Using Asymmetrical | |
| 11:20 a.m. | Superconducting Filters | 1281 |
| | R.R. Mansour, F. Rammo and V. Dokas | |
| LL-5: | Narrow-Band YBCO Superconducting Parallel-Coupled Coplanar Waveguide | |
| 11:40 a.m. | Band-Pass Filters at 10 GHz | 1285 |
| | R. Weigel, M. Nalezinski, A.A. Valenzuela and P. Russer | |

Session MM

New Structures and Leaky Modes

Room 202

10:30 a.m. to 12:00 p.m.

Thursday, June 17, 1993

Chairman: M. Dydyk—Motorola, Inc., Scottsdale, AZ

- | | | |
|------------|--|------|
| MM-1: | Existence of a Leaky Dominant Mode on Microstrip Line with an Isotropic | 1291 |
| 10:30 a.m. | Substrate: Theory and Measurements | |
| | D. Nghiem, J.T. Williams, D.R. Jackson and A.A. Oliner | |
| MM-2: | Simultaneous Propagation of Both Bound and Leaky Dominant Modes on | |
| 10:50 a.m. | Conductor-Backed Coplanar Strips | 1295 |
| | M. Tsuji, H. Sigesawa and A.A. Oliner | |
| MM-3: | Channelized Coplanar Waveguides (CCPW) — A New Transmission Line for | |
| 11:10 a.m. | Wideband Applications in Integrated Microwave & Millimeter-Wave Circuits | * |
| | K. Wu, Y. Xu and R.G. Bosisio | |
| MM-4: | Microstrip Discontinuities on Cylindrical Surfaces | 1299 |
| 11:30 a.m. | J. Huang, R. Vahldieck and H. Jin | |
| MM-5: | Analysis of Wave Propagation Effects on Microwave Field-Effect Transistors | 1303 |
| 11:40 a.m. | M.S. Hakim and S.M. El-Ghazaly | |

*Paper not available at time of printing.

Session NN

Microwave Integrated Circuits

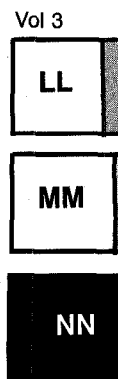
Room 216/217

10:30 a.m. to 12:00 p.m.

Thursday, June 17, 1993

Chairman: J. Pierro—AIL Systems, Deer Park, NY

NN-1:	A Novel Approach for Integrating High-Q Band-Pass Filters into Microwave	
10:30 a.m.	Integrated Circuit Assemblies	1309
	G.E. Johnson, M.D. Meldey, R. Levy, R.W. Larson, P. Ng and D.S. Mackie	
NN-2:	A Microwave Active Bandstop Filter with Tunable Centre Frequency	1313
10:40 a.m.	R.G. Arnold and S.P. Marsh	
NN-3:	Coplanar Waveguide Filters	1317
11:00 a.m.	A.K. Rayit and N.J. McEwan	
NN-4:	Physically Based Circuit Model of GaAs MESFET as an Optical Port for Microwave	
11:10 a.m.	Systems	1553
	K.A.R. Razzooqi, N.J. Gomes and P.A. Davies	
NN-5:	Slot-Coupled Double-Sided Microstrip Interconnects and Couplers	1321
11:20 a.m.	C.-H. Ho, L. Fan and K. Chang	
NN-6:	A GHz-Band Ceramic Multi-Layer Substrate and Its Applications to a Hybrid IC	1325
11:30 a.m.	Y. Taguchi, K. Mayauchi, K. Eda and T. Ishida	
NN-7:	A 6.8-10.7 GHz EW Module Using 72 MMICs	1329
11:50 a.m.	G. Garbe, R. Becker, M. Patel, W. Guthrie, S. Moghe, R. Williams and G. Giacomino	



Session OO

Microwave Probe Measurements Room 215

10:30 a.m. to 12:00 p.m.

Thursday, June 17, 1993

Chairman: M.A. Maury, Jr.—Maury Microwave Corp., Ontario, Canada

- | | | |
|-------------------|---|-------------|
| OO-1: | A New Probe for W-Band On-Wafer Measurements | 1335 |
| 10:30 a.m. | S.M.J. Liu and G.G. Boll | |
| OO-2: | Full Two-Port On-Wafer Vector Network Analysis to 120 GHz Using Active Probes | 1339 |
| 10:50 a.m. | R. Yu, M. Reddy, J. Puhl, S. Allen, M. Case and M. Rodwell | |
| OO-3: | Ka-Band Power PHEMT On-Wafer Characterization Using Prematched Structures | 1343 |
| 11:00 a.m. | A.K. Sharma, G.S. Dow, M. Aust, J. Canyon, B. Allen, S. Pak, D. Yang, Y. Hwang and K. Tan | |
| OO-4: | Non-Invasive Waveform Probing for Nonlinear Network Analysis | 1347 |
| 11:10 a.m. | C.J. Wei, Y.A. Tkachenko and J.C.M. Hwang | |
| OO-5: | Probe Tip Invasiveness at Indirect Electro-Optics Sampling MMIC | 1351 |
| 11:20 a.m. | W. Mertin, C. Roths, F. Taenzler and E. Kubalek | |
| OO-6: | 300-GHz-Bandwidth Network Analysis Using Time-Domain Electro-Optic Sampling | 1355 |
| 11:30 a.m. | H.-J. Cheng and J.F. Whitaker | |
| OO-7: | Time-Domain Network Analysis of MM-Wave Circuits Based on a Photoconductive Probe Sampling Technique | 1359 |
| 11:50 a.m. | J. Kim, J. Son, S. Wakana, J. Nees, S. Williamson, J. Whitaker, Y. Kwon and D. Pavlidis | |

Session PP

Transistor Power Amplifiers I Room 216/217

1:30 p.m. to 3:00 p.m.

Thursday, June 17, 1993

Chairman: D. Cahana—Avantek, Santa Clara, CA

- | | | |
|------------------|---|-------------|
| PP-1: | C-X Band 14W Power Amplifier Having Flat Gain and Power Response | 1365 |
| 1:30 p.m. | M. Mochizuki, Y. Itoh, M. Kohno, H. Masuno and T. Takagi | |
| PP-2: | A Power Amplifier Yields 10 Watts Over 8–14 GHz Using GAAS MMICS in an LTCC Serial Combiner/Divider Network | 1369 |
| 1:50 p.m. | J.W. Gippich, L.E. Dickins, J.A. Faulkner | |
| PP-3: | Ku-Band Monolithic 7-Watt Power Amplifier Using AlGaAs/GaAs 0.25-μm T-GATE Heterostructure FET Technology | 1373 |
| 2:10 p.m. | D.T. Bryant, K. Salzman and R. Hudgens | |
| PP-4: | 20 GHz High Power High Efficiency HEMT Module | 1377 |
| 2:30 p.m. | C.H. Chen, H.C. Yen, K. Tan, L. Callejo, G. Onak, D.C. Streit, P.H. Liu and J.M. Schellenberg | |
| PP-5: | Four-Watt 20-GHz Partial Monolithic Amplifier | 1381 |
| 2:40 p.m. | R. Yarborough, P. Saunier, H.Q. Tserng, K. Salzman, B. Smith and D. Heston | |

Session QQ

Optical Characterization and Device Modeling Room 202

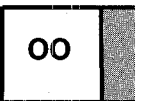
1:30 p.m. to 3:00 p.m.

Thursday, June 17, 1993

Chairman: A. Paoletta—Army Research Laboratory, Ft. Monmouth, NJ

- | | | |
|------------------|---|-------------|
| QQ-1: | Broadband and Real-Time Waveform Sampling Using Optic-Microwave | |
| 1:30 p.m. | Phase-Locking | 1387 |
| | S.L. Huang, H.-L.A. Hung and C.H. Lee | |
| QQ-2: | Noninvasive Probing System for Ultra-High Speed Testing of MMIC's and MCM's | * |
| 1:50 p.m. | M.K. Ravel, S.H. Pepper and M.D. Jones | |
| QQ-3: | Design and On-Wafer Testing of Millimeter-Wave External Optical Modulators | 1391 |
| 2:00 p.m. | D. Polifko, K. Matsui and H. Ogawa | |
| QQ-4: | Picosecond Photoconductive Switches Designed for On-Wafer Characterization of | |
| 2:10 p.m. | High Frequency Interconnects | 1395 |
| | L.P. Golob, S.L. Huang, C.H. Lee, W.H. Chang, K. Jones, M. Taysing Lara and T. DeAnni | |
| QQ-5: | MESFET as an Optically Activated Microwave Switch—Theory and Experiment | 1399 |
| 2:20 p.m. | A. Madjar, A. Paoletta and P.R. Herczfeld | |
| QQ-6: | A Study on the Negative Photoresponse of AlGaAs/GaAs MODFETs | 1403 |
| 2:40 p.m. | M.A. Romero and P.R. Herczfeld | |
| QQ-7: | A New Lightwave-Microwave Signal Conversion Method | 1407 |
| 2:50 p.m. | T. Berceli, M. Izutsu and T. Sueta | |

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*Paper not available at time of printing.

Session RR

Superconducting Sub-System Technology

Room 218/219

1:30 p.m. to 3:00 p.m.

Thursday, June 17, 1993

Chairman: C.M. Jackson—TRW, Hawthorne, CA

- | | | |
|------------------|---|-------------|
| RR-1: | Superconductive Digital Instantaneous Frequency-Measurement Subsystem | 1413 |
| 1:30 p.m. | G.-C. Liang, C.F. Shih, R.S. Withers, B.F. Cole, M.E. Johansson and L.P. Suppan | |
| RR-2: | High-Temperature Superconducting Matching Networks for Electrically Short Monopole Antennas | 1417 |
| 1:50 p.m. | A.Y. Piatnacia, S.H. Talisa, J.R. Gavaler, M.A. Janocko, J. Talvacchio, M.J. Buckley, K.M. Leader, J.A. Moellers and M.R. Schrote | |
| RR-3: | Tunable High Temperature Superconductor Microstrip Resonators | 1421 |
| 2:00 p.m. | J.A. Beall, R.H. Ono, D. Galt and J.C. Price | |
| RR-4: | Parametric Interactions in High-Tc Superconducting Step Edge Junctions at X Band | 1425 |
| 2:10 p.m. | A.Z. Kain and H.R. Fetterman | |
| RR-5: | Noise Figure of HTS JJ MMIC Downconverter at 12GHz | 1429 |
| 2:20 p.m. | K. Suzuki, S. Yoshikawa, K. Yamaguchi, K. Hayashi, S. Fujino, T. Takenaka, T. Mitsuzuka, Y. Enomoto, K. Imai, F. Sugino-shita and N. Yazawa | |

Session SS

EM Analytical and Numerical Techniques I Room 215

1:30 p.m. to 3:00 p.m.

Thursday, June 17, 1993

Chairman: M. Goetz—Stratedge Corp., San Diego, CA

SS-1:	The FDTD Diakoptics Method	1435
1:30 p.m.	T.-W. Huang, B. Houshmand and T. Itoh	
SS-2:	Performance Study of One-Way Absorbing Boundary Equations in 3-D TLM for	
1:50 p.m.	Dispersive Guiding Structures	1439
	C. Eswarappa and W.J.R. Hoefer	
SS-3:	A New Look at the 3D Condensed Node TLM Scattering	1443
2:00 p.m.	P.P.M. So and W.J.R. Hoefer	
SS-4:	Rigorous and Efficient Analysis of Hybrid T-Junctions	1447
2:10 p.m.	F. Alessandri, M. Barba, M. Mongiardo and R. Sorrentino	
SS-5:	A Rigorous Analysis of the Higher Order Modes and Attenuation of Stripline of	
2:20 p.m.	Arbitrary Dimensions	1451
	M.H. Burchett, S.R. Pennock and P.R. Shepherd	
SS-6:	Two-Dimensional Transmission Line Matrix (TLM) Simulation of the	
2:30 p.m.	Electromagnetic Fields in a Rectangular Section of a Discretized GaAs MESFET	
	Channel with Arbitrary Doping Profile	1455
	S. Dindo and M. Ney	

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Session TT

Transistor Power Amplifiers II

Room 216/217

3:30 p.m. to 5:00 p.m.

Thursday, June 17, 1993

Chairman: L.J. Kushner—MIT Lincoln Labs., Lexington, MA

TT-1:	Low Voltage GaAs Power Amplifier for Personal Communications at 1.9GHz	1461
3:30 p.m.	D. Ngo, B. Bechwith, P. O'Neil and N. Camilleri	
TT-2:	3V Operation L-Band Power Double-Doped Double Heterjunction FETs	1465
3:50 p.m.	N. Iwata, K. Inosako and M. Kuzuhara	
TT-3:	4GHz High-Power High-Efficiency Pseudomorphic Power HEMT	1469
4:00 p.m.	S.T. Fu, W.F. Kopp, M.Y. Kao, K.H.G. Duh, P.M. Smith, P.C. Chao and T.H. Yu	
TT-4:	Broadband High-Efficiency HBT MMIC Power Applifier Fabricated with Re-Aligned Process	1473
4:10 p.m.	J.J. Komiak, L.W. Yang, R.S. Brozovich, S.T. Fu and D.P. Smith	
TT-5:	X-Band GaInP/GaAs Power Heterojunction Bipolar Transistor	1477
4:30 p.m.	W. Lui, A. Khatibzadeh, T. Henderson, S.-K. Fan and D. Davito	
TT-6:	Quarter-Micron WSi/Au Gate AlGaAs/InGaAs HJFETs for Q-Band Power Applications	1481
4:50 p.m.	T. Matsumura, M. Kanamori, Y. Oikawa and S. Shinozaki	

Session UU

Simulation and CAD Frameworks

Room 202

3:30 p.m. to 5:00 p.m.

Thursday, June 17, 1993

Chairman: B.S. Perlman—Army Research Laboratory, Ft. Monmouth, NJ

UU-1:	An Introduction to MHDL	1487
3:30 p.m.	D.L. Barton and D.D. Dunlop	
UU-2:	The Globalizstion of Microwave CAD	*
3:50 p.m.	L. Carmichaels and P. Dueme	
UU-3:	Object-Oriented Design of Microwave Circuit Simulators	1491
4:10 p.m.	P. Carvalho, E. Ngoya, J. Rousset and J. Obregon	
UU-4:	Electromagnetic Simulator Interfacing to a General CAD Framework: Automatic, Electromagnetic-Based Mesh Generation	1495
4:30 p.m.	P. Draxler	

*Paper not available at time of printing.

Session VV

Acoustic Filters and Resonators Room 218/219

3:30 a.m. to 5:00 a.m.

Thursday, June 17, 1993

Chairman: T. Lukaszek—US Army Research Laboratory, Ft. Monmouth, NJ

VV-1: 3:30 p.m.	A New Low Loss SAW Filter Structure with Extremely Wide Bandwidth for Mobile Communication Systems J. Machui, G. Müller, W. Ruile, L. Reindl, R. Weigel and P. Russer	1501
VV-2: 3:50 p.m.	Design and Performance of Wide-Band IIDT-Type SAW Filters with Low Loss and Improved Sidelobe Suppression R. Weigel, B. Bader, G. Fischerauer and P. Russer	1505
VV-3: 4:00 p.m.	Transverse and Longitudinal Modes in Waveguide-Coupled Resonators W.D. Hunt, T. Cameron, J.C.B. Saw, Y. Kim and M.S. Suthers	1509
VV-4: 4:10 p.m.	A Physically-Based Small-Signal Circuit Model for Heterostructure Acoustic Charge Transport Devices J.S. Kenney and W.D. Hunt	1513
VV-5: 4:20 p.m.	High Q Microwave Acoustic Resonators and Filters K.M. Lakin, G.R. Kline and K.T. McCarron	1517

Session WW

EM Analytical and Numerical Techniques II Room 215

3:30 p.m. to 5:00 p.m.

Thursday, June 17, 1993

Chairman: W. Hoefer—University of Victoria, Victoria B.C., Canada

WW-1: 3:30 p.m.	A Novel Treatment of Open Dielectric Waveguides K. Sabetfakhiri and P.B. Katehi	1523
WW-2: 3:50 p.m.	Full Wave Characterization of Microstrip Open End Discontinuities Patterned on Anisotropic Substrates Using Potential Theory S.S. Toncich, R.E. Collin and K.B. Bhasin	1527
WW-3: 4:00 p.m.	CPW Resonator Modelling on GaAs Using the Mixed Potential Integral Equation S. Sattler, T. Felgentreff and P. Russer	1531
WW-4: 4:10 p.m.	Vector Surface Integral Approach to Computing Inductances of General 3-D Structures S. Kim, S. Ali and J. White	1535
WW-5: 4:20 p.m.	A New Full-Wave Integral Equation Method for the Analysis of Coplanar Strip Circuit Using the Mixed-Potentials Eigenfunction Expansion Technique W.-T. Lo and C.-K.C. Tzuang	1539
WW-6: 4:30 p.m.	An Expression for the S-Parameters of Arbitrarily Oriented Microstrip Lines L.C. Howard and J.M. Dunn	1543

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