

Session M

Advanced GaAs ICs

Convention Center, Terrace Theater

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

Wednesday, June 14, 1989

Chairman: Roger Sudbury—M.I.T. Lincoln Laboratories

M-1 8:30 a.m.	Monolithic Millimeter-Wave CPW Circuits M. Riazat, E. Par, G. Zdasiuk, S. Bandy and M. Glenn Varian Research Center Palo Alto, CA	525
M-2 8:50 a.m.	A Monolithic Variable Gain Ku-Band LNA R. D. Eppich and D. D. Heston Texas Instruments Inc. Dallas, TX	529
M-3 9:00 a.m.	Ka-Band Monolithic Broadband LNA Modules N. Camilleri, and P. Chye Avantek Inc. Folsom, CA	533
M-4 9:10 a.m.	A GaAs HBT Monolithic Log IF (0.5 to 1.5 GHz) Amplifier With 60 dB Dynamic Range and 400 mW Power Consumption G. M. Gorman, A. K. Oki, E. M. Mrozek, J. B. Camou, D. K. Umemoto, M. E. Kim TRW Redondo Beach, CA	537
M-5 9:30 a.m.	An L-Band Temperature-Compensated Ultra Low Power Successive Detection Logarithmic Amplifier R. Michels, N. Scheinberg and J. Gluck ANADIGICS, Inc. Warren, NJ	541

Session N

Microwave Properties of Superconductors Convention Center, California Room

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

Wednesday, June 14, 1989

Chairman: Clifford M. Krowne—Naval Research Laboratory

- | | | |
|--------------------------------|--|------------|
| N-1
8:30 a.m. | New Experimental Results for Microwave Conductivity of High-T_c Superconductors and Consequences for Applications to Linear Devices
H. Chaloupka, G. Müller, U. Klein* and H. Piel
University of Wuppertal
*Interatom GmbH
Bergisch-Gladbach, FRG | 547 |
| N-2
8:50 a.m. | Surface Impedance of High T_c Superconductors
L. Drabeck, J. Carini, and G. Gruner
Dept. of Physics
University of California
Los Angeles, CA

T. L. Hylton, A. Kapitulnik, and M. R. Beasley
Stanford University
Stanford, CA | 551 |
| N-3
9:00 a.m. | RF Properties of High T_c Superconductors
J.R. Delayen and C.L. Bohn
Argonne National Laboratory
Argonne, IL
(Paper not available at the time of printing) | |
| N-4
9:20 a.m. | Dielectric Resonator Used As a Probe for High-T_c Superconductor Measurements
S. J. Fiedziuszko and P. Heidmann
Ford Aerospace Corp.
Palo Alto, CA | 555 |
| N-5
9:30 a.m. | Microwave Surface Resistance Measurement Technique for Cylindrical High-T_c Superconductor
K. Aida and T. Ono
NTT
Kanagawa, Japan | 559 |

Session O

Computer-Aided Modeling and Design of Active Circuits

Convention Center, Center Theater

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

Wednesday, June 14, 1989

Chairman: Rowan Gilmore—Compact Software

O-1 8:30 a.m.	Computer-Aided Design of MESFET Distributed Amplifier M-K Vai and S. Prasad Northeastern University Boston, MA	565
O-2 8:40 a.m.	FET Power Performance Prediction Using a Linearized Device Model H. Kondoh Hewlett-Packard Microwave Technology Division Santa Rosa, CA	569
O-3 8:50 a.m.	A Large Signal Physical MESFET Model for CAD and its Applications R. R. Pantoja, M. J. Howes, J. R. Richardson and C. M. Snowden Dept. of Electrical & Electronic Engr. University of Leeds, UK	573
O-4 9:10 a.m.	Efficient Large-Signal FET Parameter Extraction Using Harmonics J. W. Bandler*, Q. J. Zhang, S. YE* and S. H. Chen Optimization Systems Associates, Inc. Dundas, Ontario, Canada *also with Mc Master University Hamilton, Ontario, Canada	577
O-5 9:30 a.m.	Waveform-Balance Method for Nonlinear MESFET Amplifier Simulation V. D. Hwang* and T. Itoh** *Huges Aircraft Co. Torrance, CA **University of Texas Austin, TX	581
O-6 9:40 a.m.	Computer-Aided Design of Class-C Microwave Transistor Amplifiers by Direct Numerical Optimization V. Rizzoli, C. Cecchetti and A. Costanzo University of Bologna Bologna, Italy	585

Session P

Advanced Filter Technology Convention Center, Pacific Room

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

Wednesday, June 14, 1989

Chairman: H. Clark Bell—Loral Microwave-Wavecom

P-1 8:30 a.m.	Dielectric Receiving Filter With Sharp Stop Band Using Active Feedback Resonator Method for Cellular Base Stations Y. Ishikawa, T. Nishikawa, J. Hattori and K. Wakino Murata Mfg. Co., Ltd. Kyoto, Japan	591
P-2 8:50 a.m.	Notch Filters With Variable Center Frequency and Attenuation S. Toyoda Dept. of Electrical Engr. Osaka Institute of Technology Osaka, Japan	595
P-3 9:10 a.m.	A New Class of E-Plane Integrated Millimeter-Wave Filters J. Bornemann University of Victoria Victoria, Canada	599
P-4 9:40 a.m.	Rigorous Design of Evanescent-Mode E-Plane Finned Waveguide Bandpass Filters J. Bornemann*, and F. Arndt** *Dept. of E. C. E. University of Victoria Victoria, B.C., Canada **Microwave Dept. University of Bremen Bremen, W. Germany	603

Session Q

European Microwave Session Convention Center, Terrace Theater

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

Wednesday, June 14, 1989

Chairman: Richard Sparks—Raytheon Company

Q-1 10:30 a.m.	Recent European Developments in Active Microwave Imaging J. C. Bolomey University of Paris, France	609
Q-2 10:50 a.m.	Modeling of Microwave and Millimeter-Wave Passive Components R. Sorrentino Tor Vergata University Rome, Italy	613
Q-3 11:10 a.m.	Solid-State Local Oscillator Sources for Millimeter and Sub-Millimeter Waves in Europe A. Räisänen Helsinki University of Technology Finland	617

Session R

Microwave Applications of Superconductors Convention Center, California Room

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

Wednesday, June 14, 1989

Chairman: Dennis Webb—Naval Research Laboratory

- | | | |
|---------------------------------|---|------------|
| R-1
10:40 a.m. | Experiments With a 31-CM High-T_c Superconducting Thin Film Transmission Line
L. A. Hornak, M. Hatamian, S. K. Tewksbury, E. G. Burkhardt,
R. E. Howard, P. M. Mankiewich, B. L. Straughn, and C. D. Brandle
AT&T Bell Laboratories
Holmdel, NJ | 623 |
| R-2
11:00 a.m. | Superconducting Stripline Resonators and High-T_c Materials
D. E. Oates, A. C. Anderson, and B. S. Shih
MIT Lincoln Laboratory
Lexington, MA | 627 |
| R-3
11:10 a.m. | A 77 K Computer-Controlled MM-Wave Spectral Josephson Detector Using Microstrip Technique, Preliminary Results
M. Daginnus and J. H. Hinken
Technical University of Braunschweig
Braunschweig, FRG | 631 |
| R-4
11:20 a.m. | Microwave Detectors Based on Granular High-T_c Thin Films
J. Konopka, R. Sobolewski, G. Jung, W. Kula, A. Konopka, P. Gierlowski, and
S. J. Lewandowski
Instytut Fizyki, PAN
Warszawa, Poland | 635 |
| R-5
11:30 a.m. | Superconducting Frequency Tunable SAW Filter and Dispersion Line
H-P. Baum, B. K. Sarma and M. Levy
University of Wisconsin
Milwaukee, WI | 639 |
| R-6
11:40 a.m. | An Analysis of High T_c Superconductors for Superdirective Array Applications
R. J. Dinger
Naval Weapons Center
China Lake, CA
(Paper not available at the time of printing) | |

Session S

CAD Methods

Convention Center, Center Theater

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

Wednesday, June 14, 1989

Chairman: William H. Childs—EEsof Inc.

S-1 10:30 a.m.	Parallel Processing Application to Non-Linear Microwave Network Design M. I. Sobhy and Y. A. R. El-Sawy Electronic Engineering Laboratories University of Kent at Canterbury, UK	645
S-2 10:50 a.m.	Yield Optimization of Nonlinear Circuits With Statistically Characterized Devices J. W. Bandler*, Q. J. Zhang, J. Song* and R. M. Biernacki* Optimization systems Associates Inc. Dundas, Ontario, Canada *also with McMaster University Hamilton, Ontario, Canada	649
S-3 11:10 a.m.	The Generalized Method of Characteristics for Waveform Relaxation Analysis of Lossy Coupled Transmission Lines F-Y. Chang IBM East Fishkill, NY	653
S-4 11:30 a.m.	Considering Some Undesired Effects Due to Dense Packing in Supported Co-planar Waveguide MMICs by Using Combined Methods I. Wolff, D. Kiefer, and S. S. Bedair Electrical Engineering Dept. Duisburg University, W. Germany	657
S-5 11:50 a.m.	Computer-Aided Design of Square Spiral Transformers and Inductors E. Frlan*, S. Meszaros*, M. Cuhaci*, and J. S. Wight** *Communications Research Centre Ottawa, Ont. Canada **Department of Electronics Carleton University Ottawa, Ont. Canada	661

Session T

Filter Applications

Convention Center, Pacific Room

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

Wednesday, June 14, 1989

Chairman: George L. Matthaei—University of California, Santa Barbara

T-1 10:30 a.m.	Minaturized Hair-Pin Resonator Filters and Their Applications to Reciever Front-End MIC's K. Takahashi, M. Sagawa and M. Makimoto Tokyo Research Lab. Matsushita Electric Ind. Co. Higasimita, Japan	667
T-2 10:50 a.m.	Thin-Film Lumped-Element Microwave Filters D. Swanson Avantek, Inc. Milpitas, CA	671
T-3 11:10 a.m.	Logarithmic-Periodic Contiguous-Channel Microwave Multiplexers C. Rauscher Naval Research Laboratory Washington, DC	675
T-4 11:30 a.m.	Capacitively-Compensated High-Performance Parallel Coupled Microstrip Filters I. J. Bahl ITT-GaAs Technology Center Roanoke, VA	679
T-5 11:40 a.m.	Satellite L-Band Output Multiplexer Utilizing Single and Dual Mode Dielectric Resonators S. J. Fiedziuszko, D. Doust, and S. Holme Ford Aerospace Corp. Palo Alto, CA	683

Session U

Lightwave Links

Convention Center, Terrace Theater

2:00 p.m. to 3:30 p.m.

Wednesday, June 14, 1989

Chairman: Art Paoletta—U. S. Army LABCOM

U-1	Paper was withdrawn	
U-2 2:20 p.m.	A Theoretical and Experimental Comparison of Directly and Externally Modulated Fiber Optic Links C. H. Cox III, L. M. Johnson and G. E. Betts MIT Lincoln Laboratory Lexington, MA	689
U-3 2:40 p.m.	Long Microwave Delay Fiber Optic Link for Radar Testing I. L. Newberg Hughes Aircraft Company Los Angeles, CA C. M. Gee, G. D. Thurmond and H. W. Yen Hughes Research Laboratories Malibu, CA	693
U-4 3:00 p.m.	Multi-Gigabit Fiber-Optic Video Distribution Network Using BPSK Microwave Subcarriers D. D. Tang GTE Laboratories Waltham, MA	697
U-5 3:20 p.m.	Integrated Fiber Optic Transmission of FM HDTV and 622 Mb/S Data C. N. Lo and L. S. Smoot Bellcore Morristown, NJ	703

Session V

Analysis Methods for Guiding Structures Convention Center, California Room

2:00 p.m. to 3:30 p.m.

Wednesday, June 14, 1989

Chairman: Michael Dydyk—Motorola, Inc.

V-1 2:00 p.m.	Multiport Network Model for Evaluating Radiation Loss and Spurious Coupling Between Discontinuities in Microstrip Circuits A. Sabban and K. C. Gupta Dept. of Electrical and Computer Engr. University of Colorado Boulder, CO	707
V-2 2:20 p.m.	A New Hybrid Mode Boundary Integral Method for Analysis of MMIC Waveguides With Complicated Crosssection W. Schroeder, and I. Wolff Dept. of Electrical Engineering Duisburg University Duisburg, FRG	711
V-3 2:40 p.m.	A Mixed Spectral Domain Method Applied to Analysis of Generalized Dielectric-Loaded Ridged Waveguides K. T. Ng* and C. H. Chan** *University of Virginia Charlottesville, VA **University of Illinois Urbana, IL	715
V-4 3:00 p.m.	Characterization of Coupled Asymmetric Suspended Strip Lines Having Three Thick-Strip Conductors and Side-Wall Grooves M. Nakajima and E. Yamashita University of Electrocommunications Tokyo, Japan	719

Session W

Millimeter-Wave Source Technology Convention Center, Center Theater

2:00 p.m. to 3:30 p.m.

Wednesday, June 14, 1989

Chairman: Samuel Dixon, Jr.—U. S. Army LABCOM

W-1 2:00 p.m.	25–42 GHz GaAs Heterojunction Bipolar Transistor Low Phase Noise Push-Push VCOs D. M. Smith, J. C. Canyon and D. L. Tait TRW, Inc. Redondo Beach, CA	725
W-2 2:20 p.m.	MMIC-Compatible 55mW InP and GaAs 30–40 GHz Field Controlled TE Oscillators K. Lübke, H. Scheiber, D. Grützmacher*, C. Diskus and H. Thim Universität Linz Austria *Inst. für Halbleitertechnik Aachen, W. Germany	729
W-3 2:40 p.m.	Design and Performance of a 94 GHz HEMT Mixer P. D. Chow, D. Garske, J. Velebir, E. Hsieh, Y. C. Ngan and H.C. Yen TRW Electronic Systems Group Redondo Beach, CA	731
W-4 3:00 p.m.	Theory of Subharmonic Synchronization of Nonlinear Oscillators A.S. Daryoush, T. Berceli, R. Saedi, P.R. Herczfeld, and A. Rosen(*) E.C.E. Dept. Drexel University Philadelphia, PA (*) David Sarnoff Research Center Princeton, NJ	735
W-5 3:20 p.m.	Monolithic Impatt Millimeter-Wave Oscillator Stabilized by Open-Cavity Resonator W. P. Shillue, S-C. Wong and K. D. Stephan University of Massachusetts Amherst, MA	739

Session X

Special Session in Honor of Dr. Seymour B. Cohn Convention Center, Pacific Room

2:00 p.m. to 3:30 p.m.

Wednesday, June 14, 1989

Chairman: Peter M. LaTourrette, Consultant

X-1 2:10 p.m.	An Admirable Microwave Engineer K. Tomiyasu General Electric Co. Philadelphia, PA	743
X-2 2:30 p.m.	An Overview of Some Important Contributions to Microwave Engineering G. L. Mathaei Dept. of Electrical and Computer Engr. University of California Santa Barbara, California	745
X-3 2:50 p.m.	The Rantec Years—Dr. Seymour B. Cohn (1960 to 1967) W. H. Harrison Loral Wavecom Div. Northridge, CA	749
X-4 3:10 p.m.	Novel Contributions to Microwave Circuit Design J. K. Hunton GTE Government Systems Mountain View, CA	753
X-Ref	S. B. Cohn Reference List	757

Session Y

Manufacturing Microwave Components and Subsystems

Convention Center, Terrace Theater

4:00 p.m. to 5:30 p.m.

Wednesday, June 14, 1989

Chairman: Douglas W. Maki—M/A Com

Y-1 4:00 p.m.	Excellent Reliability With High Throughput Techniques and Materials for Alloy Attachment J. S. Pavio Texas Instruments Dallas, TX	761
Y-2 4:20 p.m.	An Automatic Technique for Post Production Tuning of Microwave Circuits E. C. Gominho Westinghouse Electric Corp. Baltimore, MD	765
Y-3 4:40 p.m.	High Volume Manufacturing of a High-Efficiency, X-Band Power Module for Phased Array Applications J. L. Vorhaus Avantek, Inc. Santa Clara, CA	769
Y-4 5:00 p.m.	Microwave Amplifier Manufacturing With Advanced Thin-Film MIC and Elementary MMIC Technology E. J. Crescenzi, Jr., S. E. Beam, R. L. Fenton, T. R. Kritzer and T. A. Maddox Watkins-Johnson Co. Palo Alto, CA	773

Session Z

Leakage and Package-Mode Effects in Millimeter-Wave ICs Convention Center, California Room

4:00 p.m. to 5:30 p.m.

Wednesday, June 14, 1989

Chairman: Pisti B. Katehi—University of Michigan

- | | | |
|--------------------------------|--|------------|
| Z-1
4:00 p.m. | Full-Wave Theory Based Development of mm-Wave Circuit Models for Microstrip Open End, Gap, Step, Bend and Tee
R. H. Jansen* and L. Wiemer**
*Plessey Research Caswell
Caswell, Great Britain
**Jansen Microwave
Ratingen, W. Germany | 779 |
| Z-2
4:20 p.m. | Printed-Circuit Waveguides With Anisotropic Substrates: A New Leakage Effect
M. Tsuji and H. Shigesawa
Doshisha University
Kyoto, Japan

A. A. Oliner
Polytechnic University
Brooklyn, NY | 783 |
| Z-3
4:40 p.m. | Rigorous Analysis of Open Microstrip Lines of Arbitrary Cross-Section in Bound and Leaky Regimes
K. A. Michalski and D. Zheng
Texas A&M University
College Station, TX | 787 |
| Z-4
4:50 p.m. | Analysis of Radiating End Effects of Symmetric and Asymmetric Coplanar Waveguide Using Integral Equations Technique
M. Drissi, V. Fouad Hanna, and J. Citerne*
C.N.E.T.
Division E.T.R.
Moulineaux, France
*Laboratoire Structures Rayonnantes
Rennes, France | 791 |
| Z-5
5:00 p.m. | Theoretically Zero-Loss Design of Planar Dielectric Waveguide Y-Branch; Amazing Effect of Serpentine-Shaped Taper
H. Shigesawa, M. Tsuji, and O. Tanaka
Doshisha University
Kyoto, Japan | 795 |
| Z-6
5:20 p.m. | Shunt Posts in Microstrip Transmission Lines
K. L. Finch and N. G. Alexopoulos
University of California
Los Angeles, CA
(Paper not available at the time of printing) | |

Session AA

Millimeter-Wave Amplifier Technology Convention Center, Center Theater

4:00 p.m. to 5:30 p.m.

Wednesday, June 14, 1989

Chairman: Apostle G. Cardiasmenos—Raytheon Company

AA-1 4:00 p.m.	High-Performance V-Band Low Noise Amplifiers S. A. Vaughn, and K. White Hughes Aircraft Co. Space and Comm. Group Los Angeles, CA U. K. Mishra, M. J. Delaney, P. Greiling, and S. Rosenbaum Hughes Research Laboratories Malibu, CA	801
AA-2 4:20 p.m.	High Performance InP-Based HEMT Millimeter-Wave Low-Noise Amplifiers K.H.G. Duh, P. C. Chao, P. Ho, M. Y. Kao, P. M. Smith, J. M. Ballingall and A. A. Jabra GE Electronics Lab. Syracuse, NY	805
AA-3 4:40 p.m.	Q-Band Coplanar Waveguide Amplifier G. S. Dow, T. N. Ton, and K. Nakano TRW, Inc. Redondo Beach, CA	809
AA-4 5:00 p.m.	Millimeter-Wave Noise Parameters of High Performance HEMT's at 300 K and 17 K S. Weinreb*, R. Harris**, and M. Rothman** *Martin Marietta Laboratory Baltimore, MD **National Radio Astronomy Observatory Charlottesville, VA	813
AA-5 5:20 p.m.	Possibility of Silicon Monolithic Millimeter-wave Integrated Circuits S. A. Campbell and A. Gopinath University of Minnesota Minneapolis MN	817

Session BB

Microwave Integrated Circuit Measurements Convention Center, Pacific Room

4:00 p.m. to 5:30 p.m.

Wednesday, June 14, 1989

Chairman: Harry M. Cronson—The MITRE Corporation

BB-1 4:10 p.m.	A Non-Contacting Probe for Measurements on High-Frequency Planar Circuits S. S. Osofsky and S. E. Schwarz University of California Berkeley, CA	823
BB-2 4:30 p.m.	Accuracy Factors in Microwave Noise Parameter Measurements A. Davidson, B. Leake and E. Strid Cascade Microtech, Inc. Beaverton, OR	827
BB-3 4:50 p.m.	On-Wafer Large-Signal Pulsed Measurements J. F. Vidalou*, F. Grossier**, M. Camiade**, and J. Obregon* *IRCOM-CNRS University of Limoges France **Thomson Hybrids Massy, France	831
BB-4 5:10 p.m.	Large-Signal Characterization of Millimeter-Wave Transistors Using an Active Load-Pull Measurement System R. Actis, R. A. McMorran, R. A. Murphy, M. A. Hollis, R. W. Chick, C. O. Bozler and K. B. Nichols Lincoln Lab. MIT Lexington, MA	835

Session CC

Advances in FET Amplifiers Convention Center, Terrace Theater

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

Thursday, June 15, 1989

Chairman: Richard Van Wagoner—Department of Defense

CC-1 8:40 a.m.	Performance of a 2–18 GHz Ultra Low-Noise Amplifier Module K. B. Niclas and R. R. Pereira Watkins-Johnson Co Palo Alto, CA	841
CC-2 9:00 a.m.	A Balanced Cascade 26–40 GHz Amplifier D. M. F. McCann Marconi Electronic Devices Ltd Lincoln, England	845
CC-3 9:10 a.m.	A 1 to 40 GHz MESFET Hybrid Distributed Amplifier H. Brouzes, G. Deredec and Y. W. Bender Thomson-CSF Malakoff, France	849
CC-4 9:30 a.m.	A Cryogenic 43-GHz-Band Low-Noise Amplifier for Radio Astronomy T. Saito, Y. Oohashi, H. Kurihara and Y. Hirachi Fujitsu Laboratories, Kawasaki, Japan T. Kasuga and K. Miyazawa Nobeyama Radio Observatory National Astronomical Observatory Minamimaki-mura, Japan	853
CC-5 9:50 a.m.	High-Efficiency Power Amplification for Microwave and Millimeter Frequencies W. S. Kopp and S. D. Pritchett Texas Instruments Dallas, TX	857

Session DD (Focused Session)

High-Power Microwave Convention Center, California Room

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

Thursday, June 15, 1989

Chairman: Jitendra Goel—TRW/ESG

DD-1 8:30 a.m.	Operation of Solid State Power Amplifiers at Cryogenic Temperatures (Invited) J. H. Johnson P. D'Anna Microwave Modules & Devices	861
DD-2 8:40 a.m.	Power Amplifier Linearization Using If Feedback K. G. Voyce and J. H. McCandless Boeing Electronics Co Seattle, WA	863
DD-3 8:50 a.m.	A Production 30 KW L-Band Solid-State Transmitter S. Bird and M. Reinhart Westinghouse ESG Baltimore, MD	867
DD-4 9:10 a.m.	Progress in the Development of Gyrokystrons Producing High Energy Microwave Pulses (20–200J) (Invited) V. L. Granatstein, W. Lawson, P. E. Latham, D. Welsh, J. Calame, Y. Carmel, C. D. Striffler, and M. Reiser University of Maryland College Park, MD A. Mondelli and D. Chernin Science Appl.Int'l, VA (Paper not available at the time of printing)	
DD-5 9:20 a.m.	The Sophisticated Properties of the Microwave Oven Magnetron W. C. Brown Consultant, Microwave Power Transmission Systems Weston, MA	871
DD-6 9:30 a.m.	High-Power Microwave Diagnostic System Based on Compact, Single-Unit, Radiate-And-Receive Devices T. A. Treado*, R. S. Smith III*, W. O. Doggett, and D. J. Jenkins* North Carolina State University Raleigh *Varian Beverly Microwave Division Beverly, MA	875
DD-7 9:40 a.m.	Microstrip Plasma Limiter S. D. Patel*, L. Dubrowsky*, S. E. Sadow**, R. Kaul**, and R. V. Garver** *Westinghouse ESG Baltimore, MD **Harry Diamond Labs Adelphi, MD	879

Session EE

Microwave Measurements Convention Center, Center Theater

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

Thursday, June 15, 1989

Chairman: Stephen F. Adam—Adam Microwave Consulting

EE-1 8:30 a.m.	Measurement of Memory Effects in Predistortion Linearizers W. Boesch and G. Gatti RF Systems Division ESA/ESTEC, Noordwijk, The Netherlands	885
EE-2 8:50 a.m.	Picosecond Optoelectronic Characterization of a Heterojunction Bipolar Transistor M. Matloubian and H. Fetterman Dept. of Electrical Engineering University of California, Los Angeles M. Kim, A. Oki and J. Camou TRW, Inc. Redondo Beach, CA S. Moss, D. Smith and J. Knudsen The Aerospace Corporation Los Angeles, CA	889
EE-3 9:10 a.m.	Noise Characterization Uncertainty of Microwave Devices Under Low Current Operation R. Lucero, C. Moyer, R. Vaitkus, and M. Dydyk Motorola Phoenix Corporate Research Laboratories Tempe, AZ	893
EE-4 9:20 a.m.	A Parameter Extraction Technique for Heterojunction Bipolar Transistors R. J. Trew, U. K. Mishra and W. L. Pribble North Carolina State University Raleigh, NC J. F. Jensen Hughes Research Laboratories Malibu, CA	897
EE-5 9:30 a.m.	Advances in NIST Dielectric Measurement Capability Using a Mode-Filtered Cylindrical Cavity E. J. Vanzura and W. A. Kissick National Institute of Standards and Technology Boulder CO	901
EE-6 9:40 a.m.	Microstrip Noncontacting Thickness Monitor R. B. Hurley, I. Kaufman and R. P. Roy Arizona State University Tempe, AZ	905

Session FF

Losses in Guided-Wave Structures Convention Center, Pacific Room

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

Thursday, June 15, 1989

Chairman: Arvind K. Sharma—TRW/ESG

FF-1 8:30 a.m.	Full-Wave Analysis of Conductor Losses on MMIC Transmission Lines W. Heinrich Technische Hochschule Darmstadt Darmstadt, West Germany	911
FF-2 8:40 a.m.	Channelized Coplanar Waveguide: Discontinuities, Junctions, and Propagation Characteristics R. N. Simons, G. E. Ponchak, K. S. Martzaklis and R. R. Romanofsky NASA Lewis Research Center Cleveland, OH	915
FF-3 9:00 a.m.	High Frequency Conductor and Dielectric Losses in Shielded Microstrip T. E. van Deventer*, P. B. Katehi*, and A. C. Cangellaris** *Radiation Laboratory University of Michigan Ann Arbor, MI **Electrical and Computer Engineering Department University of Arizona Tucson, AZ	919
FF-4 9:20 a.m.	Analysis of the "Microstrip Loaded Inset Dielectric Waveguide" T. Rozzi, R. De Leo, and A. Morini Dipartimento di Elettronica ed Automatica University of Ancona Italy	923
FF-5 9:30 a.m.	Complex Guidance Properties of the Slitted Asymmetric Ridge Waveguide F. Frezza*, M. Guglielmi** and P. Lampariello* *University of Rome Rome, Italy **New Jersey Institute of Technology Newark, NJ	927

Session GG

Power FET Amplifiers Convention Center, Terrace Theater

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

Thursday, June 15, 1989

Chairman: Karl B. Niclas—Watkins-Johnson Company

GG-1 10:30 a.m.	A 12-Watt 20 GHz GaAs FET Power Amplifier R. Auricchio and R. A. Rhodes Hughes Aircraft Co. El Segundo, CA D. S. Day Avantek, Inc. Santa Clara, CA	933
GG-2 10:50 a.m.	Broadband Power Amplifiers Based on a New Monolithic Ceramic Technology F. N. Sechi and M. Bujatti Microwave Power, Inc. Santa Clara, CA	937
GG-3 11:10 a.m.	Design Technique for High Power, High Efficiency, Broadband Distributed Amplifiers J. B. Cole and A. Platzker Raytheon Co. Research Division Lexington, MA	941
GG-4 11:30 a.m.	Monolithic High-Voltage FET Power Amplifiers K. E. Peterson, H-L. Hung, F. R. Phelleps, T. F. Noble and H. C. Huang COMSAT Laboratories Clarksburg, MD	945
GG-5 11:40 a.m.	A Technique for the Maintenance of FET Power Amplifier Efficiency Under Backoff B. D. Geller, F. T. Assal, R. K. Gupta and P. K. Cline COMSAT Lab. Clarksburg, MD	949

Session HH

Microwave Integrated Circuits—I Convention Center, California Room

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

Thursday, June 15, 1989

Chairman: Harlan Howe, Jr.—Adams-Russell

HH-1 10:40 a.m.	Lossless, Broadband Monolithic Microwave Active Inductors S. Hara, T. Tokumitsu and M. Aikawa ATR Optical and Radio Communication Research Laboratories Kyoto, Japan	955
HH-2 11:00 a.m.	A 2–18 GHz 180 Degree Phase Splitter Network S. S. Bharj, S. P. Tan and B. Thompson Anadigics, Inc. Warren, NJ	959
HH-3 11:20 a.m.	Very Small, Ultra-Wideband MMIC Magic-T and Applications to Combiners and Dividers T. Tokumitsu, S. Hara and M. Aikawa ATR Optical and Radio Communications Research Laboratories Kyoto, Japan	963
HH-4 11:30 a.m.	A New Coplanar Waveguide/Slotline Double-Balanced Mixer D. Cahana AVANTEK, Inc. Milpitas, CA	967
HH-5 11:50 a.m.	Recrystallized Silicon-On-Alumina as a Monolithic Circuit Technology T. J. Letavic, S. Wu, E. W. Maby, and R. J. Gutmann Dept. of Electrical, Computer and Systems Engineering Rensselaer Polytechnic Institute Troy, NY	969

Session II
HEMT Technology
Convention Center, Center Theater

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

Thursday, June 15, 1989

Chairman: Ronald L. Carter—University of Texas at Arlington

II-1 10:40 a.m.	Ultra-Low-Noise Millimeter-Wave Pseudomorphic HEMTs R. E. Lee and R. S. Beaubien Linear Monolithics, Inc. Westlake Village, CA R. H. Norton and J. W. Bacon Varian Research Center Palo Alto, CA	975
II-2 11:00 a.m.	Low-Noise InGaAs HEMT Using the New Off-Set Recess Gate Process O. Ishikawa, K. Nishii, T. Matsuno, C. Azuma, Y. Ikeda, S. Nanbu, and K. Inoue Semiconductor Research Center Matsushita Electric Industrial Co. Ltd. Osaka, Japan	979
II-3 11:10 a.m.	A 0.15 μm Gate Length Pseudomorphic HEMT P. M. Smith, M. Y. Kao, P. Ho, P. C. Chao, K. H. G. Duh, A. A. Jabra, R. P. Smith, and J. M. Ballingall General Electric Co. Syracuse, NY	983
II-4 11:30 a.m.	44 GHz Hybrid HEMT Power Amplifiers D. W. Ferguson, P. M. Smith, P. C. Chao, L. F. Lester, R. P. Smith, P. Ho, A. Jabra and J. M. Ballingall GE Aerospace Syracuse, NY	987
II-5 11:40 a.m.	Theoretical Comparison of 0.35 μm Gate Length GaAs and GaInAs HEMTs D. H. Park and K. F. Brennan School of Electrical Engineering Georgia Institute of Technology Atlanta, GA	991

Session JJ

The Time Domain and Electromagnetics Convention Center, Pacific Room

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

Thursday, June 15, 1989

Chairman: James C. Rautio—Sonnet Software

JJ-1 10:40 a.m.	Time-Domain Method of Lines Applied to the Uniform Microstrip Line and its Step Discontinuity S. Nam, H. Ling and T. Itoh University of Texas Austin, TX	997
JJ-2 11:00 a.m.	Distortion of Transient Signals on Multilayer Coupled Symmetric Microstrip Transmission Lines J. P. Gilb and C. A. Balanis Arizona State University Tempe, AZ	1001
JJ-3 11:20 a.m.	Analysis of Coplanar Waveguide by Time-Domain Finite Difference Method G.C. Liang, Y.W. Liu, and K.K. Mei Dept. of Electrical Engineering, Computer Sciences and the Electronics Research Laboratory Univ. of California Berkeley, CA	1005
JJ-4 11:40 a.m.	Analysis of Microstrip Discontinuities Using the Finite Difference Time Domain Technique C. J. Railton and J. P. McGeehan Dept. of Electrical Engineering University of Bristol, UK	1009
JJ-5 11:50 a.m.	Accurate Calculation of the Capacitance Matrix of a Multiconductor Transmission Line in a Multilayered Dielectric Medium W. Delbare, and D. De Zutter Lab of Electromagnetism and Acoustics University of Ghent Ghent, Belgium	1013

Session KK

FET Devices and Applications Convention Center, Terrace Theater

2:00 p.m. to 3:30 p.m.

Thursday, June 15, 1989

Chairman: Joseph A. Calviello—Eaton Corporation/AIL

KK-1 2:05 p.m.	The Effects of P Co-Implants Upon the RF Performance of Ion-Implanted GaAs Power FETs T. A. Winslow and R. J. Trew North Carolina State University Raleigh, NC I. J. Bahl, A. E. Geissberger and M. L. Balzan ITT,GTC Roanoke, VA	1019
KK-2 2:25 p.m.	A True Off-Set Self-Aligned Process for High-Efficiency Ku-Band Power FETS K. Wakamoto, K. Imura, M. Yamamoto, S. Shimoyama, T. Kameyama, M. Isomae, Y. Okubo, M. Ohoka and T. Nagashima Nippon Mining Co. Toda, Saitama, Japan D. A. Figueredo, L. H. McCarty, C-Y. Su, M. Yam and S. Kakihana Menlo Industries, Inc. Fremont, CA	1023
KK-3 2:45 p.m.	Zero Bias GaInAs MISFET Mixers K. W. Chang, B. R. Epstein, E. J. Denlinger and P. D. Gardner David Sarnoff Research Center Princeton, NJ	1027
KK-4 3:05 p.m.	A Practical Distributed FET Mixer for MMIC Applications I. D. Robertson and A. H. Aghvami University of London, King's College London, England	1031
KK-5 3:15 p.m.	An Easy-To-Use FET DRO Design Procedure Suited to Most CAD Programs P. G. Wilson and R. D. Carver British Telecom Research Labs Ipswich, UK	1033

Session LL

Microwave Integrated Circuits—II Convention Center, California Room

2:00 p.m. to 3:30 p.m.

Thursday, June 15, 1989

Chairman: John A. Pierro—Eaton Corporation/AIL

LL-1 2:00 p.m.	Taper and Forward-Feed in GaAs MMIC Distributed Amplifiers M. Ross*, R. G. Harrison**, and R. K. Surridge*** *Northern Telecom Ltd. St.-Laurent, Quebec, Canada **Dept. of Electronics Carleton Univ. Ottawa, Ontario, Canada ***Bell-Northern Research Ottawa, Ontario, Canada	1039
LL-2 2:20 p.m.	Active Broadband Impedance Transformations Using Distributed Techniques K. R. Cioffi Rockwell International Anaheim, CA	1043
LL-3 2:40 p.m.	A Ku-Band MMIC PLL Frequency Synthesizer T. Ohira, M. Muraguchi, T. Hirota, K. Osafune*, and M. Ino* NTT Radio Communication System Lab. Yokosuka, Japan *NTT LSI Laboratories Atsugi, Japan	1047
LL-4 3:00 p.m.	An Octave Band GaAs Analog Phase Shifter S. T. Salvage, R. J. Hash and B. E. Petted Harris Corp. Melbourne, FL	1051

PP-13	Distortion Characteristics in Directly Modulated Laser Diodes by Microwave Signals M. L. Majewski and L. A. Coldren* Dept. of Electrical Engineering University of Queensland St. Lucia, Australia *Department of Electrical and Computer Engineering University of California Santa Barbara, CA	1167
PP-14	Microwave Characteristics of Planar Electrooptic Modulator R. Delrue, E. Paleczny, J. F. Legier, P. Pribetich, and P. Kennis Centre Hyperfrequences et Semiconductors U.A. CNRS Villevueuve D'Ascq, France	1171
PP-15	Dispersion Studies Of a Single-Mode Triangular-Core Fiber with a Trench By The Vector Mode Analysis G. L. Yip and J. W. Jiang Dept. of Electrical Engineering McGill University Montreal, Que., Canada	1175
PP-16	An 8 mm FM and AM Noise Measuring Equipment D. Minren and X. Dezhong Beijing Institute of Radio Metrology and Measurement Beijing, China	1179
PP-17	Direct Measurement of the Optimum Source Impedance for Minimum Noise Figure O. Ishikawa, H. Yagita, T. Tanbo and T. Onuma Semiconductor Research Center Matsushita Electric Industrial Co. Osaka, Japan	1183
PP-18	Establishing the Complex Measurement Ability of a Homodyne Network Analyzer Via Self-Calibration H. J. Eul Ruhr-Universität Bochum Bochum, FRG	1187
PP-19	Theoretical and Experimental Characterization of Radial-Resonator Waveguide Mounting Structures A. Ko and B. D. Bates Department of Electrical and Electronic Engineering The University of Melbourne Victoria, Australia	1191

PP-20	Vector Measurements of Microwave Devices at Cryogenic Temperatures J. W. Smuk, M. G. Stubbs and J. S. Wight* Communications Research Centre Ottawa, Canada *Dept. of Electronics Carleton University Ottawa, Canada	1195
PP-21	A Multipath Fading Microwave Simulator for Studying Space Diversity Systems J. C. Guillard and X. Le Polozec ALCATEL ATFH Levallois Perret, France	1199
PP-22	A New W-Band Coplanar Waveguide Test Fixture J. V. Bellantoni*, R. C. Compton* and H. M. Levy** *School of Electrical Engineering Cornell University Ithaca, NY **Siemens Corporate Research and Support, Inc. Princeton, NJ	1203
PP-23	Varactor-Tuned Planar W-Band Oscillator J. Buechler*, J. F. Luy**, and K. M. Strohm** *Technische Universität München München, FRG **AEG Research Center Ulm, FRG	1205
PP-24	High-Performance Millimeter-Wave Local Oscillator Module for EW Applications E. Boch, and T. Stajcer COM DEV, Cambridge Ontario, Canada	1207
PP-25	A Novel W-Band Suspended Substrate Microstripline Second Harmonic GaAs Gunn Oscillator Y. Shu and Y. Wang Dept. of Radio Engineering South-East University Nanjing, China	1211
PP-26	A W-Band Dielectric Resonator Power Combiner D. Cros, P. Auxemery, X. H. Jiao, B. Jarry and P. Guillon University of Limoges Limoges Cédex, France	1215

PP-27	Theoretical and Experimental Characterization of Nonsymmetrically Shielded Coplanar Waveguides for Millimeter Wave-Circuits F. Alessandri*, U. Goebel**, F. Melai*** and R. Sorrentino* *Tor Vergata University of Rome Rome, Italy **Technical University Hamburg-Harburg Harburg, W. Germany ***Micrel S.p.a., Firenze, Italy	1219
PP-28	Higher-Order Frequency Multipliers—A Solution for MM-and Submm-Wave Local-Oscillator Signal Generation T. Tolmunen, A. Räisänen and M. Sironen Helsinki University of Technology Espoo, Finland	1223
PP-29	A Tunable, Temperature-Compensated Hybrid-Mode Dielectric Resonator S. W. Chen and K. A. Zaki University of Maryland College Park, MD R. West Trans-Tech, Inc. Adamstown, MD	1227
PP-30	Unloaded Q's of Axially Asymmetric Modes of Dielectric Resonators H. C. Chang and K. A. Zaki Electrical Engineering Dept. University of Maryland College Park, MD	1231
PP-31	Numerical Analysis of the Tubular Dielectric Resonator With a Dielectric Tuning Rod D. Kajfez* and J. Lebaric** *University of Mississippi University, MS **Rose Hulman Institute of Technology Terre Haute, IN	1235
PP-32	Frequency and Low-Temperature Characteristics of High-Q Dielectric Resonators Y. Kobayashi, Y. Kabe, Y. Kogami, and T. Yamagishi Department of Electrical Engineering Saitama University Urawa, Saitama, Japan	1239
PP-33	180° Lumped-Element Hybrids S. J. Parisi MITRE Corp. Bedford, MA	1243

PP-34	Unilateral Microstrip Balanced and Doubly Balanced Mixers R. Knöchel, B. Mayer and U. Goebel Technische Universität Hamburg-Harburg Arbeitsbereich Hochfrequenztechnik Postfach, Hamburg, West Germany	1247
PP-35	The Power Transfer Mechanism of MMIC Spiral Transformers and Adjacent Spiral Inductors G. E. Howard, J. Dai, Y. L. Chow, and M. G. Stubbs University of Waterloo, University of Tianjin and Communications Research Centre of Canada	1251
PP-36	Focusing Mirrors for Gaussian Beams M. Boheim AEG Aktiengesellschaft Ulm, W. Germany	1255
PP-37	Parasitic Effects Induced by Power Strips Current Switching in Full Wafer Package J. Chilo and G. Angenieux LEMO Grenoble, France	1259
PP-38	Suppression of Resonant Modes in Microwave Packages D. F. Williams and D. W. Paananen Ball Communications Systems Division Broomfield, CO	1263
PP-39	Lossy Model of Diode Packages: An Alternative Method for Exact Evaluation of Active Chip Parameters K. Kazi, B. B. Szendrenyi, I. Mojzes Research Institute for Technical Physics Hungarian Academy of Sciences Budapest, Hungary	1267
PP-40	Dispersion in Anisotropic NRD Waveguide A. C. César School of Engineering of São Carlos, USP Brazil R. F. Souza School of Electrical Engineering, UNICAMP Brazil	1271
PP-42	Analysis and Tuning Efficiency Optimization of Magnetically-Tuned, Printed E-Plane Circuit Filters J. Uher and W. J. R. Hoefer Laboratory for Electromagnetics and Microwaves University of Ottawa, Canada	1273

PP-43	Design and Low Power Testing of a Microwave Vlasov Mode Converter	1277
	B. G. Ruth, R. K. Dahlstrom, C. D. Schlesiger and L. F. Libelo Harry Diamond Laboratories Adelphi, MD	
PP-44	50-W Class Multi-Port Amplifier for Multi-Beam Satellite Communications	1281
	K. Yamamoto and M. Tanaka NTT Radio Communication Systems Laboratories Take, Japan	

Session QQ
Solid-State Circuits
Convention Center, Center Theater

4:00 p.m. to 5:30 p.m.

Thursday, June 15, 1989

Chairman: Natalino Camilleri—Avantek

QQ-1 4:10 p.m.	Millimeter-Wave, Lumped Element, Gunn VCO'S With Ultrawideband (20 GHz) Tuning L. D. Cohen and E. Sard AIL Systems, Inc. Melville, NY	1287
QQ-2 4:30 p.m.	Second-Harmonic Reflector Type High-Gain FET Frequency Doubler Operating in K-Band Y. Iyama, A. Iida, T. Takagi and S. Urasaki Mitsubishi Electric Corp. Kanagawa Prefecture, Japan	1291
QQ-3 4:50 p.m.	A Monolithic DC-1.6 GHz Digital Attenuator J. Bayruns, P. Wallace, and N. Schienburg Anadigics, Inc. Warren, NJ	1295
QQ-4 5:10 p.m.	A Balanced 11 GHZ HEMT Up-Converter P. Bura and B. Vassilakis Transmission Networks Division Northern Telecom Montreal, Canada	1299
QQ-5 5:20 p.m.	Transient Response of PIN Limiter Diodes R. J. Tan, A. L. Ward, and R. Kaul Harry Diamond Laboratories Adelphi, MD	1303