

Panel Sessions

Panel Session 1—U.S. Competitiveness—Some Views

Date: Wednesday, May 25, 1988, 12:00 to 2:00 PM
Location: Technical Meeting Room 2
Sponsor: PACE
Organizer: Robert A. Moore, Westinghouse Defense & Electronics Center
Panelists: Joseph A. Saloom, Panel Moderator, Vice President, M/A-COM, Inc. Also, Chairman, CORTECH Council on Research and Technology
Bruno O. Weinschel, Chairman, IEEE Committee on U.S. Competitiveness, Past President IEEE.
Robert M. Rosenzweig, President, Association of American Universities.
Ted G. Berlincourt, Director, Research and Laboratory Management, The Pentagon.
Lawrence P. Grayson, IEEE Fellow, U.S. Congress, Office of Congressman Jack Kemp

Abstract:

With many U.S. Companies producing off shore and imports increasing their share of the U.S. market, U.S. competitiveness has become a serious issue as regards the future of our economy. Our success as microwave engineers is very much a function of the competitiveness of the microwave industry and is tightly coupled to the health of the total industrial community, which is both a supplier and a customer. What is the problem? Do U.S. tax policies encourage industry toward capital commitment needed for long-term product development and plant updating? Does U.S. society provide a quality education for our work force both to work in and make use of the technological environment we are creating?

The program will begin with each speaker providing views on a selection of topics such as:

- Is the competitiveness problem government, industrial management, social or other?
- What is the competitiveness value of DoD supported research?
- Is there a need for tax credit to encourage industry support of basic research in the universities?
- How can companies be encouraged to invest more into process and material research. How can we encourage facility updating and use of new technologies?
- What changes are needed in our approach to education at all levels?
- Does government have a role in maintaining a level world trading field? Should government assist in developing trading opportunities for U.S. companies, by collecting and distributing technical and marketing information from foreign sources?

After the speakers' comments, the panel will be open for questions from the audience.

Panel Sessions

Panel Session 2—The Business of Microwaves: The Better Mousetrap is No Longer Enough

Date: Thursday, May 26, 1988, 12:00 to 2:00 PM

Location: Technical Meeting Room 2

Sponsor: PACE

Organizer: Bert Berson, Berson & Associates

Panelists: Bert Berson, Berson & Associates
Alan Sherman, Stanford University
Jack Moore, PRTM

Abstract:

We intend to wake up the industry to the fact that being good technically is no longer enough. Companies have equally good technology and that is no longer the road to distinction and success. Microwave companies must now become more well-rounded and more managerially sophisticated if they are going to make it in the late 80's and early 90's. Each speaker will give a 20 minute talk and will allow up to ten minutes for questions. After the three speakers have each taken their allotted time we will have a 30 minute open discussion session based on questions from the floor.

Panel Session 3—Heterojunction Bipolar Transistor Circuits

Date: Thursday, May 26, 1988, 12:00 to 2:00 PM

Location: Technical Meeting Room 4

Sponsor: MTT-6 Microwave and Millimeter-Wave Integrated Circuits
MTT-7 Microwave and Millimeter-Wave Devices

Organizer: F. Sullivan, Raytheon Co., Missile Systems Division
D. Hornbuckle, Hewlett Packard Co. Microwave Technology Div. ILS
Hua Quen Tserng, Texas Instruments, Inc., Central Research Lab

Panelists: P. Asbeck, Rockwell
B. Batraklaroglu, Texas Instruments
M. Kim, TRW
S. Kofol, Hewlett-Packard
M. Rocchi, LET

Abstract:

The discussion will focus on both the device technology and its implementation into monolithic microwave integrated circuits. Key topics of discussion will include application in microwave and millimeter wave power amplifiers with higher efficiency than currently obtained with FETs, its potential use in microwave oscillators with low 1/F noise, its potential digital applications, and device modeling. The state-of-the-art of device performance, potential reliability issues, and limitations in monolithic circuit processing will also be addressed.

Panel Sessions

Panel Session 4—Noise And Its Measurement

Date: Friday, May 27, 1988, 12:00 to 2:00 PM
Location: Technical Meeting Room 2
Sponsor: MTT-11 Microwave Measurements
Organizer: Stephen F. Adam
Adam Microwave Consulting, Inc.
Panelists: Stephen F. Adam, Adam Microwave Consulting, Inc.
Dieter Scherer, Hewlett-Packard Company
Fred L. Walls, National Bureau of Standards
David F. Wait, National Bureau of Standards
Robert A. Pucel, Raytheon Company
Wendell D. Seal, TRW Defense and Space Sector

Abstract:

The panel will discuss the relationship between noise figure and modulation processes and the generation of phase noise sidebands. The contribution of multipliers, dividers, and PLL components to system phase noise will also be quantified. Commonly used measures of phase noise will be defined and their relationships explained. Several techniques and hardware solutions for making highly accurate phase noise measurements in oscillators and other components from 0.1 to 100 GHz will be presented. Techniques for the highly accurate measurement of thermal noise from noise standards, with accuracies that are nearly independent of connector type, will be addressed. A quantitative analysis with supporting graphs will be presented which clarifies the underlying basis for the gain-noise figure trade-offs one routinely makes in a tuned GaAs FET amplifier.

Panel Session 5—Ferrites At Millimeter Frequencies

Date: Friday, May 27, 1988, 12:00 to 2:00 PM
Location: Technical Meeting Room 4
Sponsor: MTT-13 Microwave Ferrites
Organizer: William E. Hord, Microwave Applications Group
Panelists: John Owens, Santa Clara University (Moderator)
Mohammed Afsar, Tufts University
Adalbert Beyer, Duisburg University
Nutan Bhiwandker, Ampex Corporation
Gordon Harrison, Electromagnetic Sciences
Russ West, Trans-Tech

Abstract:

The state-of-the-art of the application of ferrite materials in the millimeter-wave region will be reviewed. Advances in material properties and processes will be presented by representatives of ferrite manufacturers. The status of ferrite components in the millimeter frequency range will be explored. New device development in various transmission media will be examined.

Workshops

M-1: Superconductivity and Microwaves

Date: Monday, May 23, 1988, 8:30 AM to 5:00 PM

Location: 9th Floor Ballroom

Sponsors: MTT-6 Microwave and Millimeter Wave Integrated Circuits

MTT-8 Microwave Network Theory

MTT-15 Microwave Field Theory

Organizers: E. Belohoubek
David Sarnoff Research Center
Princeton, NJ 08540

M. Nissenoff
Naval Research Laboratory
Code 6854
Washington, DC 20375-5000

A. E. Williams, COMSAT Laboratories
22300 Comsat Drive
Clarksburg, MD 20871

Speakers: D. U. Gubser, Naval Research Laboratory
A. H. Silver, TRW
R. Ralston, MIT Lincoln Laboratory
P. Richards, University of California
S. M. Faris, Hypres, Inc.

Abstract:

Superconductivity at temperatures unheard of just a few months ago! High T_c fever is sweeping the world! What challenges and problems await the microwave engineer? A group of internationally known experts on superconductivity have been invited to describe the state-of-the-art in superconducting materials and the R. F. properties of high temperature (and, also, low temperature) superconductors and to outline the potential microwave and millimeter wave applications of these materials. Formal presentations will be made in the morning session while contributions from the audience and informal discussions will be encouraged during the afternoon session. Contact the organizers for additional information.

Workshops

M-2: MIC and MMIC FET High-Power Amplifier Design Techniques

Date: Monday, May 23, 1988, 8:30 AM to 5:00 PM
Location: Gramercy/Herald/Soho
Sponsors: MTT-6 Technical Committee on Microwave and Millimeter-Wave Integrated Circuits
Organizers: Edward C. Niehenke, Westinghouse Electric Corporation
P.O. Box 746, MS-75
Baltimore, MD 21203
Hiroyo Ogawa
NTT Networks Systems Development Center
1-2356 Take, Yokosuka-shi
238-03, Japan
Speakers: Walter Curtice, Microwave Semiconductor Corporation
Ron Freitag, Westinghouse Electric Corp.
Hideaki Kohzu, Nippon Electric Corporation
Jim Komiak, General Electric Corp.
Randall Lehmann, Texas Instruments Corp.
Toshino Nojima, NTT
Toshiyuki Saito, Fujitsu

Abstract:

Developments in material and active device technology combined with requirements for reliable, efficient, and high-power systems have paved the way for advances in high-power solid state design techniques, circuits, and performance. This workshop will first focus on the latest design techniques to realize FET high-power devices including the device structure, material technology, and fabrication processes. The large-signal device modeling and measurement will be explored in great depth followed by the latest high-power and high-efficiency amplifier design procedures. Various power combining techniques to increase the overall power capability will be explored and compared with examples. Finally, the latest FET MIC and MMIC state-of-the-art developments will be presented with examples of high-power systems.

Workshops

M-3: Designing MMICs Through Foundries

Date: Monday, May 23, 1988, 8:30 AM to 5:00 PM

Location: Astor Ballroom

Sponsor: MTT-6 Microwave and Millimeter-Wave Integrated Circuits

Organizers:
W. Horton Prather
Electromagnetic Sciences, Inc.
125 Technology Park
Norcross, GA 30092

Dilek Barias, Adams-Russell
80 Cambridge Street
Burlington, MA 01802

Frank Sullivan
Raytheon Co.
Missile Systems Division
Hartwell Road
Bedford, MA 01730

Speakers:
Ray Pengelly, Tachonics
Jafed Patel, Anadigics
Dilek Barias, Adams-Russell
Arthur Fraser, TriQuint Semiconductor
Richard Dougherty, Motorola

Abstract:

The workshop will address key issues of interest in the design of MMICs through foundries. These include specific topics in the areas of Modeling and Design Rules, Artwork Generation, Fabrication Processes, and Business Considerations of Yields, Costs and Risks. The speakers, with audience participation, will guide the discussions in the basic areas of CAD/Modeling, Customer Interface/Applications, MMIC Processing and experiences of previous foundry users.

The afternoon session will be divided into discussion groups on major topics of interest to allow more detailed technical discussion and interaction among participants. Results of these discussions will be reported at the conclusion of the workshop. The workshop will provide a useful interchange between MIC designers, technical managers, and companies providing MMIC foundry services.

Workshops

M-4: Packaging Hybrid and Monolithic Microwave and Millimeter Wave Components

Date: Monday, May 23, 1988, 8:30 AM to 5:00 PM

Location: Duffy/Columbia

Sponsor: MTT-12 Microwave and Millimeter-Wave Packaging

Organizers: Bert Berson
Berson and Associates
181 Centre Street, Suite 20
Mountain View, CA 94041

Doug Maki
Tachonics
107 Morgan Lane
Plainsboro, NJ 08536-3331

Fred Rosenbaum
Washington University
Box 1127
St. Louis, MO 63130

Speakers: Frank Bachner, Ceramic Process Systems (Moderator)
S. Amari and F. J. Rosenbaum, Packaging Center, Washington University
J. Elenberger, Hewlett-Packard Microwave Semiconductor Division
Sarjit Bharj, Anadigics (Moderator)
R. L. O'Nan and T. R. Glauner, Sandia National Laboratories
B. Ziegner, M/A-COM

Abstract:

This workshop will address the state-of-the-art in packaging discrete devices, monolithic circuits, hybrid circuits, and systems at microwave and millimeter wave frequencies. Speakers will discuss recent advances and the implications of these advances in achieving maximum performance from devices and combinations of devices. Workshop participants are encouraged to bring two viewgraphs describing their work and will be given the opportunity for brief informal presentations.

Workshops

T-1: FET Structures and Their Modeling

Date: Tuesday, May 24, 1988, 8:30 AM to 5:00 PM
Location: Gramercy/Herald/Soho
Sponsor: MTT-6 Microwave and Millimeter-Wave Integrated Circuits
Organizer: Jitendra Goel
TRW
One Space Park
Redondo Beach, CA 90278
Speakers: F. Capasso, AT&T Bell Laboratories
L. F. Eastman, Cornell University
C. Hess, University of Illinois
R. Kiehl, IBM, T. J. Watson Center
K. Kotzebu, Hewlett-Packard
H. Morkoc, California Institute of Technology
F. J. Rosenbaum, Washington University
N. Shah, AT&T Bell Laboratories

Abstract:

Recent advances in GaAs compound semiconductor materials and improved processing technologies have resulted in several novel FET structures. Some of these structures have matured enough to be extensively used in hybrid and monolithic integrated circuits at microwave and millimeter-wave frequencies, while others have been precluded from being used mainly due to lack of awareness and insufficient design information.

The intent of this workshop is to stimulate those uninitiated in the area and also provide a forum for discussions for those already familiar with the area. Tutorial discussions on MESFET, HEMT, HBT, MISFET and MODFET device structures will be presented with emphasis on their characterization, analytical modeling and equivalent circuits. An overview of the technical advances achieved to date will be presented. Emphasis will be placed on problems and bottleneck issues in potential device performance. Possible solutions, future directions and their impact on microwave/millimeter-wave circuit designs will be outlined by the speakers in their areas of expertise. Participants will be strongly encouraged to explain their view and share their experience following each speaker.

Workshops

T-2: CAD Oriented Modeling of Discontinuities in Microwave and Millimeter Wave Transmission Structures

Date: Tuesday, May 24, 1988, 8:30 AM to 5:00 PM

Location: 9th Floor Ballroom

Sponsors: MTT-15 Microwave Field Theory
MTT-1 Computer-Aided Design

Organizers: K. C. Gupta
Dept. of Elec. and Comp. Eng.
University of Colorado
Boulder, CO 80309-0425 USA

R. Sorrentino
Dept. of Electronic Engr.
Univ. of Rome 'Tor Vergata'
Via Orazio Raimondo
00173 Roma, Italy

Speakers: I. J. Bahl, ITT
D. C. Chang, University of Colorado
K. C. Gupta, University of Colorado
W. J. R. Hoefer, University of Ottawa
T. Itoh, University of Texas
A. M. Pavio, TI
R. H. Jansen, Plessey Research
Y. C. Shih, Hughes
R. Sorrentino, University of Rome
I. Wolff, University of Duisburg

Abstract:

It is well recognized that accurate modeling of discontinuities/junctions in microstrip lines (and in other transmission structures) is one of the key bottle-neck problems in the successful implementation of CAD for microwave/mm-wave integrated circuits. The purpose of this Workshop is to review the state-of-the-art in modeling of discontinuities and to discuss the current problems in characterization and implementation of discontinuity models in CAD of monolithic circuits. Four speakers in the morning session will review various aspects of discontinuity characterization. The afternoon session will be in the form of a panel discussion (hopefully with considerable audience participation). Current issues in modeling of discontinuities and in implementation of discontinuity models in microwave/mm-wave circuit CAD will be emphasized. Participants are encouraged to bring a viewgraph or two and express their point of view.

Workshops

T-3: High Volume Microwave Applications

Date: Tuesday, May 24, 1988, 8:30 AM to 5:00 PM

Location: Empire/Hudson/Chelsea

Organizers: George D. Vendelin
Avantek Incorporated
3175 Bowers Avenue
Santa Clara, CA 95054

John Eisenberg
John A. Eisenberg & Associates
25 Parsons Way
Los Altos, CA 94022

Speakers: Val Peterson, Hewlett-Packard
John Eisenberg, Eisenberg & Associates
Steve Nelson, Texas Instruments
Chuck Seashore, Honeywell
Stu Wemple, AT&T Bell Labs
Paul Schumaker & Dennis Falls, MSD/Maxon
Jerry Chin, Microelectronics Technology Inc
Richard Chou, Calif. Eastern Labs
Isamu Nagasako, NEC
David Rowe and Ray Eastwood, Magnavox

Abstract:

This workshop will identify and describe several microwave applications that represent high volume production. The emphasis of the workshop will be on how these products are manufactured in high volume at a cost that the marketplace can afford. The material will address the impact of automated manufacturing and testing techniques, GaAs MMIC insertion, and off-shore fabrication on reducing the manufacturing cost of microwave products. The morning session will cover principally military applications while the afternoon session will address a wide range of current commercial products including Police Radar Detectors, TVRO and satellite communication systems. Each session will be followed by a panel discussion with audience participation during which an interchange of ideas can take place. The speakers will comment on how their products have been designed to meet their performance, quality, and economic objectives. Attendees may then share their experiences and viewpoints on the issues during the panel discussion periods.

Workshops

T-4: Developments in Linearizers for Microwave Power Amplifiers

Date: Tuesday, May 24, 1988, 8:30 AM to 5:00 PM

Location: Duffy/Columbia

Sponsor: MTT-5 High Power

Organizer: A. Katz
Electrical Engineering Tech. Department
Trenton State College
Trenton, NJ 08650-4700

Speakers: P. Caporossi, GE Astro Space Division
A. Katz, Trenton State College
M. Kumar, Microwave Semiconductor Corp.
J. Potukuchi, COMSAT Laboratories
J. Smith, Anadigics
T. Nojima, MMT Radio Communication System Lab.
R. Inada, NEC Space and Laser Communications Div.
Y. Lee, COMSAT Information Systems Div.

Abstract:

The workshop will cover developments in both predistortion and feedback/forward linearizers. Topics to be covered will include a tutorial overview, the use of linearizers with both TWTA and solid state power amplifiers, high and moderate linearity applications, the advantages of combining limiters and linearizers, adaptive linearizer techniques, the evaluation of linearizer performance with multi-carrier and noise signals and their effect on spectral spreading.