

2001 Microwave Symposium Technical Program Schedule

TH	1C
TH	1D

Session TH1A Microwave Signal Sources

8:00–9:40 am Ballroom Thursday, May 24, 2001

Chair: J.-F. Luy, Daimler-Chrysler Research and Technology, Microwave Techniques, Ulm
Co-Chair: O. Llopis, LAAS-CNRS, Toulouse

TH1A-1 8:00 am	Low Phase Noise, Fully Integrated Monolithic VCO in X Band Based on HBT Technology	1415
	Z. Ouarch, F. Arlot, M. Borgarino, M. Prigent, L. Bary, and M. Camiade	
TH1A-2 8:20 am	Conditions for Broadband MMIC Voltage-Controlled Oscillators Based on Theory and Experiments	1419
	A. Megej, K. Beilenhoff, and H.L. Hartnagel	
TH1A-3 8:40 am	Solid-State High Power RF Oscillator	1423
	A. Gitsevich, D. Kirkpatrick, L. Dymond, Jr.	
TH1A-4 9:00 am	High-Power AlGaIn/GaN FET-Based VCO Sources	1427
	J.B. Shealy, J.A. Smart, and J.R. Shealy	
TH1A-5 9:20 am	Reduced Flicker Noise in Microwave Oscillators Using Feedforward Amplifiers	1431
	J.K.A. Everard and C. Broomfield	
TH1A-6 9:30 am	A Wideband Voltage-Tunable Dielectric Resonator Oscillator Controlled by a Piezoelectric Transducer	1435
	T.-Y. Yun, K. Chang, and R.S. Tahim	

Session TH1B Active and Tunable Filters

8:00–9:40 am Room Tucson 36–38 Thursday, May 24, 2001

Chair: M. Guglielmi
Co-Chair: P. Guillon, IRCOM

TH1B-1 8:00 am	Compact High-Order Planar Ring-Resonator Filters Optimized in Noise in Coplanar Technology	1441
	L. Nénert, L. Billonnet, B. Jarry, P. Guillon, C. Quendo, E. Rius, and G. Tanné	
TH1B-2 8:10 am	Tunable Active Filters Having Multilayer Structure Using LTCC	1445
	K. Kageyama, K. Saito, H. Murase, H. Utaki, and T. Yamamoto	
TH1B-3 8:20 am	Full Wave Analysis and Design of RF Tunable Filters	1449
	J. Xu, X.-P. Liang, and K. Shamsaifar	
TH1B-4 8:40 am	Tunable RF Filters Using Thin Film Barium Strontium Titanate Based Capacitors	1453
	A. Tombak, F.T. Ayguavives, J.-P. Maria, G.T. Stauf, A.I. Kingon, and A. Mortazawi	
TH1B-5 8:50 am	Hybrid Resonator Microstrip Line Electrically Tunable Filter	1457
	X.-P. Liang and Y. Zhu	
TH1B-6 9:10 am	Design of Tunable Ferroelectric Filters with a Constant Fractional Band Width	1461
	I. Vendik, O. Vendik, V. Pleskachev, A. Svishchev, and R. Wördenweber	

Session TH1C

Passive Filters and Multiplexers 1

8:00–9:40 am

Room Tucson 40–41

Thursday, May 24, 2001

Chair: R.V. Snyder, RS Microwave

Co-Chair: C. Wang, Radio Frequency Systems, Inc.

TH1C-1	Design of CT and CQ Filters Using Approximation and Optimization	1467
8:00 am	R. Levy and P. Petre	
TH1C-2	A Method for the Direct Synthesis of General Sections	1471
8:20 am	T. Reeves, N. van Stigt, and C. Rossiter	
TH1C-3	Temperature Characteristics of Combline Resonators and Filters	1475
8:40 am	H.-W. Yao and A.E. Atia	
TH1C-4	Periodic Structures for Original Design of Voluminous and Planar Microwave Filters	1479
8:50 am	B. Lenoir, D. Baillargeat, S. Verdeyme, P. Guillon, C. Zanchi, and J. Puech	
TH1C-5	A Design of Planar Elliptic Bandpass Filter Using SMD Type Partially Metallized Rectangular Dielectric Resonators	1483
9:00 am	H.Y. Hwang, S. Yun, and I. Chang	
TH1C-6	Full-Wave Design of Canonical Waveguide Filters by Optimization	1487
9:10 am	T. Shen, K.A. Zaki, and A.E. Atia	
TH1C-7	Length Reduction of Evanescent-Mode Ridge Waveguide Bandpass Filters	1491
9:20 am	T. Shen and K.A. Zaki	
TH1C-8	Zolotarev Bandpass Filters	1495
9:30 am	H.C. Bell	

Session TH1D

HF/VHF/UHF Power Amplifiers

8:00–9:40 am

Room Tucson 42–43

Thursday, May 24, 2001

Chair: F.H. Raab, Green Mountain Radio Research Co.

Co-Chair: M. Eron, Ericsson Amplifier Technology

TH1D-1	Current Status and Emerging Trends in RF Power FET Technologies	1501
8:00 am	K. Shenai and E. McShane	
TH1D-2	7-MHz, 1.1-kW Demonstration of the New $E/F_{2,odd}$ Switching Amplifier Class	1505
8:20 am	S.D. Kee, I. Aoki, and D. Rutledge	
TH1D-3	High-Efficiency High-Level Modulator for Use in Dynamic Envelope Tracking CDMA RF Power Amplifiers	1509
8:40 am	D.R. Anderson and W.H. Cantrell	
TH1D-4	Electronically Tunable Class-E Power Amplifier	1513
9:00 am	F.H. Raab	
TH1D-5	A GSM-EDGE High Power Amplifier Utilising Digital Linearisation	1517
9:20 am	P.B. Kenington, M. Cope, R.M. Bennett, and J. Bishop	

Session TH1E **Joint IMS/ARFTG Session:** **Probing and Automated Measurements**

8:00–9:40 am

Room Yuma 26–29, 31–34

Thursday, May 24, 2001

Chair: E. Strid, Cascade Microtech

Co-Chair: B. Szendrenyi, Agilent Technologies

TH1E-1	Integrated Electro-Thermal Probe	1523
8:00 am	R.M. Reano, K. Yang, J.F. Whitaker, and L.P.B. Katehi	
TH1E-2	Calibrating Electro-Optic Sampling Systems	1527
8:20 am	D.F. Williams, P.D. Hale, T.S. Clement, and J.M. Morgan	
TH1E-3	A Three-Port Vector Network Analyzer–Measurement System, Calibration and Results	1531
8:40 am	W.-K. Deng and T.-H. Chu	
TH1E-4	Microwave On-Wafer Characterization of Three-Port Devices Using Shield-Based Test-Fixtures	1535
8:50 am	T.E. Kolding, M.B. Jenner, and S. Laursen	
TH1E-5	Accurate Transmission Line Characterization on High and Low-Resistivity Substrates	1539
9:00 am	G. Carchon, W. De Raedt, and B. Nauwelaers	
TH1E-6	Automated Test and Tuning System for Microwave Filters	1543
9:20 am	P. Harscher, R. Vahldieck, and S. Amari	



Session TH1F **Al Gross Memorial Special Session**

Thursday, May 24, 2001

Chair: V. Nair, Motorola Inc.

TH1F	Abstract	1547
-------------	-----------------	-------------

Session TH2A

Millimeter Wave Signal Sources

10:20 am–12:50 pm

Ballroom

Thursday, May 24, 2001

Chair: J.H. Kuno, Quinstar, Inc.

Co-Chair: R. Alm, Raytheon Co.

TH2A-1	Low Phase-Noise GaInP/GaAs-HBT MMIC Oscillators up to 36 GHz	1551
11:20 am	H. Kuhnert, F. Lenk, J. Hilsenbeck, J. Würfl, and W. Heinrich	
TH2A-2	Monolithic 38 GHz Coplanar Feedback VCOs Fabricated by a Production PHEMT Technology	1555
11:40 am	H.J. Siweris, H. Tischer, and E. Rohrer	
TH2A-3	Low Phase-Noise PHEMT-Based MMIC VCOs for LMDS Applications	1559
12:00 pm	A. Boudiaf, M. Ahdjoudj, and P. Pouvil	
TH2A-4	Coplanar and Microstrip Oscillators in SiGe SIMMWIC Technology	1563
12:20 pm	K.M. Strohm, C.N. Rheinfelder, J.-F. Luy, P. Nuechter, T. Hess, W. Heinrich, H. Kuhnert, M. Nadarassin, C. Warns, and W. Menzel	
TH2A-5	Low Jitter Silicon Bipolar Based VCOs for Applications in High Speed Optical Communication Systems	1567
12:30 pm	A.P.S. Khanna, E. Topacio, E. Gane, and D. Elad	
TH2A-6	Push-Push Oscillators for 94 and 140 GHz Applications Using Standard Pseudomorphic GaAs HEMTs	1571
12:50 pm	S. Kudzusz, W.H. Haydl, A. Tessmann, W. Bronner, and M. Schlechtweg	

Session TH2B

Active and Planar Filters

10:20 am–12:50 pm

Room Tucson 36–38

Thursday, May 24, 2001

Chair: D.G. Swanson, Jr., Bartley R.F. Systems, Inc.

TH2B-1	Negative Resistance Optimized in Noise for Losses Compensation in Microstrip Resonators	1577
10:20 am	A. Zaitsev, B. Kapilevich, L. Billonnet, B. Jarry, and P. Guillon	
TH2B-2	Using a Negative Capacitance to Increase the Tuning Range of a Varactor Diode in MMIC Technology	1581
10:40 am	S. Kolev, B. Delacressonnière, and J.-L. Gautier	
TH2B-3	Compact MMIC Active Inductor	1585
11:00 am	G. Avitabile, B. Chellini, E. Limiti, and F. Giannini	
TH2B-4	Microstrip Miniaturized Loop-Filters with High Out-of-Band Rejection for Future 3G Mobile Terminals	1589
11:10 am	Y. Toutain, J.-P. Coupez, and C. Person	
TH2B-5	Wideband Bandpass Filter Design with Three-Line Microstrip Structures	1593
11:20 am	J.-T. Kuo and E. Shih	
TH2B-6	A 60 GHz-Band Planar Dielectric Waveguide Filter for Flip-Chip Modules	1597
11:30 am	M. Ito, K. Maruhashi, K. Ikuina, T. Hashiguchi, S. Iwanaga, and K. Ohata	

Session TH2C

Passive Filters and Multiplexers 2

10:20 am–12:50 pm

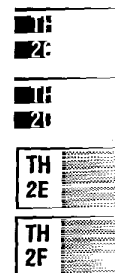
Room Tucson 40–41

Thursday, May 24, 2001

Chair: J. Modelski, Warsaw University of Technology

Co-Chair: H. Clark Bell, HF Plus

TH2C-1	Design of Coupled Resonators Group Delay Equalizers	1603
11:20 am	H.-T. Hsu, H.-W. Yao, K.A. Zaki, and A.E. Atia	
TH2C-2	High Power C-Band Dielectric Resonator Filters for Output Multiplexers	1607
11:40 am	Y. Latouche, D. Gasperoni, and J.J. Herren	
TH2C-3	Analysis of Power Handling Capacity of Band Pass Filters	1611
12:00 pm	C. Wang and K.A. Zaki	
TH2C-4	Low-Loss Filters in Rectangular Waveguide with Rigorous Control of Spurious Responses through a Smart Modal Filter	1615
12:10 pm	F. Alessandri, M. Comparini, and F. Vitulli	
TH2C-5	Observations on the Stopband Performance of Tapped Line Filters	1619
12:20 pm	R.J. Wenzel and D.G. Swanson, Jr.	
TH2C-6	Stop-Band Improvement of Rectangular Waveguide Filters Using Different Width Resonators: Selection of Resonator Widths	1623
12:30 pm	M. Morelli, I. Hunter, R. Parry, and V. Postoyalko	
TH2C-7	Diplexer Design Using Pre-Synthesized Waveguide Filters with Strongly Dispersive Inverters	1627
12:40 pm	S. Amari, J. Bornemann, W. Menzel, and F. Alessandri	
TH2C-8	Filter Topologies with Minimum Peak Stored Energy	1631
12:50 pm	C. Ernst, V. Postoyalko, R. Parry, and I. Hunter	



Session TH2D

Millimeter Wave Multipliers and Mixers

10:20 am–12:50 pm

Room Tucson 42–43

Thursday, May 24, 2001

Chair: D. Choudhury, HRL Laboratories

Co-Chair: P. Saunier, TriQuint Semiconductor

TH2D-1	2.7 THz Waveguide Tripler Using Monolithic Membrane Diodes	1637
10:20 am	F. Maiwald, S. Martin, J. Bruston, A. Maestrini, T. Crawford, and P.H. Siegel	
TH2D-2	Fabrication of 200 to 2700 GHz Multiplier Devices Using GaAs and Metal Membranes	1641
10:30 am	S. Martin, B. Nakamura, A. Fung, P. Smith, J. Bruston, A. Maestrini, F. Maiwald, P. Siegel, E. Schlecht, and I. Mehdi	
TH2D-3	A 200–300 GHz SIS Mixer-Preamplifier with 8 GHz IF Bandwidth	1645
10:40 am	E.F. Lauria, A.R. Kerr, M.W. Pospieszalski, S.-K. Pan, J.E. Effland, and A.W. Lichtenberger	
TH2D-4	200, 400 and 800 GHz Schottky Diode “Substrateless” Multipliers: Design and Results	1649
11:00 am	E. Schlecht, G. Chattopadhyay, A. Maestrini, A. Fung, S. Martin, D. Pukala, J. Bruston, and I. Mehdi	
TH2D-5	An I-Q Mixer at 76.5 GHz Using Flip-Chip Mounted Silicon Schottky Diodes	1653
11:20 am	M.M. Kaleja, A.J. Herb, R.H. Raschofer, and E.M. Biebl	
TH2D-6	Performance of a 1.2 THz Frequency Tripler Using a GaAs Frameless Membrane Monolithic Circuit	1657
11:40 am	A. Maestrini, J. Bruston, D. Pukala, S. Martin, and I. Mehdi	
TH2D-7	A 5mW-290 GHz Heterostructure Barrier Tripler in a Waveguide Configuration	1661
11:50 am	T. David, M. Guillon, S. Arscott, A. Maestrini, T. Akalin, B. Lecomte, J. Carbonell, M. Chaubet, P. Mounaix, G. Beaudin, and D. Lippens	

Session TH2E

Joint IMS/ARFTG Session:

Measurements of Non-Linear Devices and Systems

10:20 am –12:50 pm

Room Yuma 26–29, 31–34

Thursday, May 24, 2001

Chair: J. Barr, Agilent Technologies
Co-Chair: L. Dunleavy, University of South Florida

TH2E-1	A Method to Compare Vector Nonlinear Network Analyzers	1667
10:20 am	K.A. Remley, D.C. DeGroot, J.A. Jargon, and K.C. Gupta	
TH2E-2	Analysis and Measurement of Multi-Tone Intermodulation Distortion of Microwave Frequency Converters	1671
10:40 am	J.C. Pedro and N.B. Carvalho	
TH2E-3	NPR & Co-Channel Distortion Ratio: A Happy Marriage?	1675
11:00 am	A. Geens, Y. Rolain, and W. Van Moer	
TH2E-4	Linearity Optimization of a Distributed Base Station Amplifier Using an Automated High-Speed Measurement Protocol	1679
11:10 am	M.P. van der Heijden, J.R. Gajadharsing, B. Rejaei, and L.C.N. de Vreede	
TH2E-5	Ultra-Linear Power Amplifier Characterization Using Dynamic Range Extension Techniques	1683
11:30 am	R. Hassun, N. Kuhn, R. Posner, R. Sweeney, and B. Vassilakis	
TH2E-6	Direct Measurement of the Maximum Operating Region in GaAs HBTs for RF Power Amplifiers	1687
11:40 am	A. Inoue, S. Nakatsuka, S. Suzuki, K. Yamamoto, T. Shimura, R. Hattori, and Y. Mitsui	

Session TH2F

High Speed HBT Technology and Applications

10:20 am–12:50 pm

Room Yuma 21–23

Thursday, May 24, 2001

Chair: L. Kushner, PhotonEx
Co-Chair: H.A. Hung, GTS/ARL

TH2F-1	Benefits of SiGe Over Silicon Bipolar Technology for Broadband Mixers with Bandwidth Above 10 GHz	1693
10:20 am	S. Hackl, M. Wurzer, J. Böck, T.F. Meister, H. Knapp, K. Aufinger, S. Boguth, L. Treitinger, and A.L. Scholtz	
TH2F-2	40 Gb/s 4:1 Multiplexer and 1:4 Demultiplexer IC Module Using SiGe HBTs	1697
10:30 am	T. Masuda, K. Ohhata, N. Shiramizu, E. Ohue, K. Oda, R. Hayami, H. Shimamoto, M. Kondo, T. Harada, and K. Washio	
TH2F-3	40-Gb/s Analog IC Chipset for Optical Receivers—AGC Amplifier, Full-Wave Rectifier and Decision Circuit—Implemented Using Self-Aligned SiGe HBTs	1701
10:50 am	K. Ohhata, F. Arakawa, T. Masuda, N. Shiramizu, and K. Washio	
TH2F-4	Low-Frequency Noise and Phase Noise Behavior of Advanced SiGe HBTs	1705
11:10 am	L. Bary, G. Cibiel, J. Ibarra, O. Llopis, R. Plana, J. Graffeuil, G. Niu, J.D. Cressler, Z. Jin, S. Zhang, and A.J. Joseph	
TH2F-5	SiGe Power Heterojunction Bipolar Transistors (HBT's) Fabricated by Fully Self-Aligned Double Mesa Technology	1709
11:20 am	L.-H. Lu, S. Mohammadi, Z. Ma, G.E. Ponchak, S.A. Alterovitz, K.M. Strohm, J.-F. Luy, P. Bhattacharya, and L.P.B. Katehi	
TH2F-6	185 GHz Monolithic Amplifier in InGaAs/InAlAs Transferred-Substrate HBT Technology	1713
11:40 am	M. Urteaga, D. Scott, T. Mathew, S. Krishnan, Y. Wei, and M.J.W. Rodwell	

Session TH3A

Multi-Layer Packaging Techniques

1:20–2:50 pm

Ballroom

Thursday, May 24, 2001

Chair: K. Varian, Raytheon Co.
Co-Chair: J. Pavio, Motorola, Inc.

TH3A-1 1:20 pm	A New Via Fence Structure for Crosstalk Reduction in High Density Stripline Packages J. Gipprich and D. Stevens	1719
TH3A-2 1:40 pm	Coupling Between Microstrip Lines Embedded in Polyimide Layers for 3D-MMICs on Si G.E. Ponchak, E.M. Tentzeris, and J. Papapolymerou	1723
TH3A-3 2:00 pm	Silicon Substrate Coupling Noise Modeling, Analysis, and Experimental Verification for Mixed Signal Integrated Circuit Design W. Jin, Y. Eo, J.I. Shim, W.R. Eisenstadt, M.Y. Park, and H.K. Yu	1727
TH3A-4 2:20 pm	RF-Microwave Multi-Layer Integrated Passives Using Fully Organic System on Package(SOP) Technology M.F. Davis, A. Sutono, K. Lim, J. Laskar, V. Sundaram, J. Hobbs, G.E. White, R. Tummala	1731
TH3A-5 2:30 pm	Design of Embedded High Q-Inductors in MCM-L Technology S. Dalmia, W. Kim, S.H. Min, M. Swaminathan, V. Sundaraman, F. Liu, G. White, and R. Tummala	1735
TH3A-6 2:40 pm	A Highly Integrated Transceiver Module for 5.8 GHz OFDM Communication System Using Multi-Layer Packaging Technology K. Lim, A. Obatoyinbo, A. Sutono, S. Chakraborty, C.-H. Lee, E. Gebara, A. Raghavan, and J. Laskar	1739

Session TH3B

Linear Modeling of Devices and Components

1:20–2:50 pm

Room Tucson 36–38

Thursday, May 24, 2001

Chair: M. Megahed, Conexant Co.
Co-Chair: R.W. Jackson, University of Massachusetts

TH3B-1 1:20 pm	EM-Based Multidimensional Parameterized Modeling of General Passive Planar Components T. Dhaene, J. De Geest, and D. De Zutter	1745
TH3B-2 1:40 pm	Using Efficient Multivariate Adaptive Sampling by Minimizing the Number of Computational Electromagnetic Analysis Needed to Establish Accurate Interpolation Models R. Lehmsiek and P. Meyer	1749
TH3B-3 2:00 pm	Accurate Closed-Form Expressions for the Frequency-Dependent Line Parameters of On-Chip Interconnects on Lossy Silicon Substrate A. Weisshaar and H. Lan	1753
TH3B-4 2:20 pm	Microstrip Line on Ground Plane with Closely Spaced Perforations—Simple CAD Formulas by Synthetic Asymptote Y.L. Chow, K.L. Wan, T.K. Sarkar, and B. Kolundzija	1757
TH3B-5 2:40 pm	An Extrinsic-Inductance Independent Approach for Direct Extraction of HBT Intrinsic Circuit Parameters T.S. Horng, J.M. Wu, and H.H. Huang	1761
TH3B-6 2:50 pm	Consistent Small-Signal and RF-Noise Parameter Modelling of Carbon Doped InP/InGaAs HBT M. Agethen, S. Schüller, P. Velling, W. Brockerhoff, and F.-J. Tegude	1765



Session TH3C

Passive Filters and Multiplexers 3

1:20–2:50 pm

Room Tucson 40–41

Thursday, May 24, 2001

Chair: D. Schmitt, BOSCH SatCom

Co-Chair: J.-J. Herren, Alcatel Space

TH3C-1	Dual-Mode and Quad-Mode Möbius Bandpass Filters	1771
1:20 pm	J.M. Pond, S. Liu, and N. Newman	
TH3C-2	Analysis and Design of Mass-Productible Cross-Coupled, Folded E-Plane Filters	1775
1:40 pm	E. Ofli, R. Vahldieck, and S. Amari	
TH3C-3	Modified Conductor Loaded Cavity Resonator with Improved Spurious Performance	1779
2:00 pm	H. Salehi, R.R. Mansour, and V. Dokas	
TH3C-4	A Practical Triple-Mode Monoblock Bandpass Filter for Base Station Applications	1783
2:10 pm	C. Wang, W. Wilber, and B. Engst	
TH3C-5	Low-Cost Dual-Mode Asymmetric Filters in Rectangular Waveguide	1787
2:20 pm	M. Guglielmi, O. Roquebrun, P. Jarry, E. Kerherve, M. Carpurso, and M. Piloni	
TH3C-6	Analysis and Design of Grooved Circular Waveguide Dual-Mode Filters	1791
2:30 pm	N. Yoneda and M. Miyazaki	
TH3C-7	Small Filters Based on Slotted Cylindrical Ring Resonators	1795
2:40 pm	R.F. Mostafavi, D. Mirshekar-Syahkal, and Y.C.M. Lim	
TH3C-8	Dual-Mode Filters for Cellular Base Stations Using Metallized Dielectric Resonators	1799
2:50 pm	M. Fumagalli, G. Macchiarella, and G. Resnati	

Session TH3D

Millimeter Wave Transceiver Elements and Assemblies

1:20–2:50 pm

Room Tucson 42–43

Thursday, May 24, 2001

Chair: E.C. Niehenke, Niehenke Consulting

Co-Chair: F. Sullivan, Raytheon Systems Co.

TH3D-1	65–145 GHz InP MMIC HEMT Medium Power Amplifiers	1805
1:20 pm	L. Samoska and Y.C. Leong	
TH3D-2	A New Direct Millimeter Wave Six-Port Receiver	1809
1:40 pm	S.O. Tatu, E. Moldovan, K. Wu, and R.G. Bosisio	
TH3D-3	Wireless Multi-Channel TV-Signal Distribution System by Using NRD Guide Transmitter and Receiver at 60 GHz	1813
2:00 pm	F. Kuroki, S. Shinke, E. Suematsu, H. Sato, and T. Yoneyama	
TH3D-4	Wideband Low-Phase-Noise High-Power W-Band Signal Sources	1817
2:20 pm	E.W. Bryerton, D.L. Thacker, K.S. Saini, and R.F. Bradley	
TH3D-5	155 Mbit/s Data Transmission at 60 GHz Using a 1×4 Patch Array Antenna with Variable Optical Delay Lines	1821
2:40 pm	G. Grosskopf, R. Eggemann, D. Rohde, and M.S. Choi	

Session TH3E

Spatial Combining and Active Antennas

1:20–2:50 pm

Room Yuma 26–29, 31–34

Thursday, May 24, 2001

Chair: J. Harvey, Army Research Laboratory

Co-Chair: Z. Popovic, University of Colorado

TH3E-1	Fault Tolerance Analysis and Measurement of a Spatial Power Amplifier	1827
1:20 pm	S. Ortiz, M. Ozkar, A. Yakovlev, M. Steer, and A. Mortazawi	
TH3E-2	A K-Band Full-Duplex Transmit-Receive Lens Array	1831
1:40 pm	M. Forman, J. Vian, and Z. Popović	
TH3E-3	Quasi-Optical Power Amplifier Using TEM Waveguide Concept	1835
1:50 pm	M. Belaid and K. Wu	
TH3E-4	A 16-Element Reflection Grid Amplifier with Improved Heat Sinking	1839
2:00 pm	A. Guyette, R. Swisher, F. Lecuyer, A. Al-Zayed, A. Kom, S.-T. Lei, M. Oliveira, P. Li, M. DeLisio, K. Sato, A. Oki, A. Gutierrez-Aitken, R. Kagiwada, and J. Cowles	
TH3E-5	A 1-Watt, 38-GHz Monolithic Grid Oscillator	1843
2:10 pm	B. Deckman, D. Rutledge, J.J. Rosenberg, E. Sovero, and D.S. Deakin, Jr.	
TH3E-6	A 94-GHz Overmoded Waveguide Oscillator with Gunn Diodes	1847
2:20 pm	J. Bae, M. Fujita, and K. Mizuno	
TH3E-7	A Retrodirective Diode Grid Array Using Four-Wave Mixing	1851
2:30 pm	W. Ding, S.-T.C. Lei, and M.P. DeLisio	
TH3E-8	An Experimental and Theoretical Characterization of a Broadband Arbitrarily-Polarized Rectenna Array	1855
2:40 pm	J.A. Hagerty and Z. Popović	
TH3E-9	5.8 GHz Circular Polarized Rectifying Antenna for Microwave Power Transmission	1859
2:50 pm	B. Strassner and K. Chang	

TH
3F

TH
4A

Session TH3F

High Performance MMIC Technologies

1:20–2:50 pm

Yuma 21–23

Thursday, May 24, 2001

Chair: Z. Bardai, Raytheon

Co-chair: T. Lee, Boeing Satellite Systems

TH3F-1	A 1–10GHz 0.18μm-CMOS Chipset for Multi-Mode Wireless Applications	1865
1:20 pm	M. Madihian, H. Fujii, H. Yoshida, H. Suzuki, and T. Yamazaki	
TH3F-2	A 0.18μm Foundry RF CMOS Technology with 70GHz FT for Single Chip System Solutions	1869
1:40 pm	H.-M. Hsu, J.-Y. Chang, J.-G. Su, C.-C. Tsai, S.-C. Wong, C.W. Chen, K.R. Peng, S.P. Ma, C.H. Chen, T.H. Yeh, C.H. Lin, Y.C. Sun, and C.Y. Chang	
TH3F-3	Deep Trench Guard Technology to Suppress Coupling between Inductors in Silicon RF ICs	1873
2:00 pm	C.S. Kim, P. Park, J.-W. Park, N. Hwang, and H.K. Yu	
TH3F-4	Physics and Compact Modeling of SOI Substrates with Buried Ground Plane (GPSOI) for Substrate Noise Suppression	1877
2:10 pm	S. Stefanou, J.S. Hamel, M. Bain, P. Baine, B.M. Armstrong, H.S. Gamble, R. Mauntel, and M. Huang	
TH3F-5	Low-Loss Passive Components on BCB-Based 3-D MMIC Technology	1881
2:20 pm	K. Nishikawa, S. Sugitani, K. Inoue, T. Ishii, K. Kamogawa, B. Piernas, and K. Araki	
TH3F-6	Microwave Noise and Power Performance of Metamorphic InP Heterojunction Bipolar Transistors (HBTs)	1885
2:40 pm	S. Halder, Y.Z. Xiong, G.I. Ng, H. Wang, H.Q. Zheng, K. Radhakrishnan, and J.C.M. Hwang	

Session TH4A

Packaging Interconnect Techniques

3:30–5:00 pm

Ballroom

Thursday, May 24, 2001

Chair: J. Laskar, Georgia Institute of Technology

Co-Chair: M. Harris, Georgia Institute of Technology

TH4A-1	Broadband Time-Domain Characterization of Multiple Flip-Chip Interconnects	1891
3:30 pm	P. Li, H. Wu, T. Li, K. Chin, and W. Sui	
TH4A-2	Ka Band Power pHEMT Technology for Space Power Flip-Chip Assembly	1895
3:50 pm	E. Rogeaux, J.-P. Frayssé, C. Schaffauser, S. George, D. Pons, P. Fellon, D. Geiger, D. Theron, N. Haese, S. Verdeyme, R. Quere, D. Baillargeat, E. Ngoya, S. Long, and L. Escotte	
TH4A-3	Design and Analysis of Low Cost IC Package Solution for 10 Gbit/s Applications	1899
4:00 pm	M. Megahed, P. Zilari, and M. Khaw	
TH4A-4	LTCC as MCM Substrate: Design of Strip-Line Structures and Flip-Chip Interconnects	1903
4:20 pm	F.J. Schmückle, A. Jentzsch, W. Heinrich, J. Butz, and M. Spinnler	
TH4A-5	Vertical Transitions in Low Temperature Co-Fired Ceramics for LMDS Applications	1907
4:30 pm	A. Panther, C. Glaser, M.G. Stubbs, and J.S. Wight	
TH4A-6	Characterization of High-Density Micromachined Interconnects	1911
4:40 pm	J.L. Haley and R.F. Drayton	
TH4A-7	Design and Optimization for Coaxial-to-Microstrip Transition on Multilayer Substrates	1915
4:50 pm	H. Liang, J. Laskar, H. Barnes, and D. Estreich	
TH4A-8	Temperature Compensated Planar Narrow-Band Notch Filter with Fully Automated Laser-Trimming	1919
5:00 pm	M. Schallner	

Session TH4B

Frequency Domain EM Techniques

3:30–5:00 pm

Room Tucson 36–38

Thursday, May 24, 2001

Chair: R. Sorrentino, University of Perugia

Co-Chair: J. Rautio, Sonnet Software, Inc.

TH4B-1 3:30 pm	MoM/BI-RME Analysis of Boxed Microwave Circuits Based on Arbitrarily Shaped Elements M. Bozzi, L. Perregrini, A.A. Melcón, M. Guglielmi, and G. Conciauro	1925
TH4B-2 3:50 pm	Fast Electromagnetic Analysis of Dense Shielded Integrated Circuits Using the Adaptive Integral Method (AIM) V.I. Okhmatovski and A.C. Cangellaris	1929
TH4B-3 4:10 pm	Full Wave Analysis of Electromagnetic Coupling in Realistic RF Multilayer PCB Layouts Using Cascaded Parallel Plate Waveguide Model M.R. Abdul-Gaffoor, H.K. Smith, A.A. Kishk, and A.W. Glisson	1933
TH4B-4 4:30 pm	A New Global-Analysis Model for Microwave Circuits with Lumped Elements C.-H. Wang, H. Wang, and C.H. Chen	1937
TH4B-5 4:40 pm	Analysis of Multi-Layer Integrated Inductors with Wave Concept Iterative Procedure (WCIP) S. Akatimagool, D. Bajon, and H. Baudrand	1941
TH4B-6 4:50 pm	Numerical Cost of Gradient Computation Within the Method of Moments and its Reduction by Means of a Novel Boundary-Layer Concept S. Amari	1945
TH4B-7 5:00 pm	Automated Intelligent Mode Selection for Fast Mode Matching Analysis of Waveguide Discontinuities C.A.W. Vale and P. Meyer	1949

Session TH4C

Low Noise Components and Techniques

3:30–5:00 pm

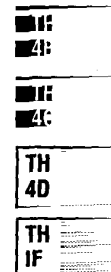
Room Tucson 42–43

Thursday, May 24, 2001

Chair: P. Smith, BAE Systems

Co-Chair: L. Boglione, Agilent Technologies

TH4C-1 3:30 pm	A 183 GHz Low Noise Amplifier Module with 5.5 dB Noise Figure for the Conical-Scanning Microwave Imager Sounder (CMIS) Program R. Raja, M. Nishimoto, B. Osgood, M. Barsky, M. Sholley, R. Quon, G. Barber, P. Liu, R. Lai, F. Hinte, G. Haviland, and B. Vacek	1955
TH4C-2 3:50 pm	Low Noise Amplifiers in InP Technology for Pseudo Correlating Millimeter Wave Radiometer P. Kangaslahti, T. Gaier, D. Dawson, J. Tuovinen, T. Karttaavi, M. Lahdes, N.J. Hughes, T.L. Cong, P. Jukkala, P. Sjöman, and S. Weinreb	1959
TH4C-3 4:10 pm	Simple Model for Dynamic Range Estimate of GaAs Amplifiers Z.M. Nosal	1963
TH4C-4 4:30 pm	Modeling of Low-Frequency Noise in GaInP/GaAs Hetero-Bipolar Transistors P. Heymann, M. Rudolph, R. Doerner, and F. Lenk	1967
TH4C-5 4:50 pm	Microwave Noise and Small-Signal Parameters Scaling of InP/InGaAs DHBT with High DC Current Gain Y.Z. Xiong, G.I. Ng, H. Wang, C.L. Law, K. Radhakrishnan, and J.S. Fu	1971



Session TH4D

Microwave Applications of Superconductivity

3:30–5:00 pm

Room Tucson 42–43

Thursday, May 24, 2001

Chair: C. Jackson, TIA Mobile

Co-Chair: M. Nisenoff, M. Nisenoff Associates

TH4D-1	An All-Cryogenic Low Phase-Noise Hybrid K-Band Oscillator for Satellite Communications	1977
3:30 pm	S. Vitusevich, K. Schieber, N. Klein, I.S. Ghosh, and M. Spinnler	
TH4D-2	Dual 5 MHz PCS Receiver Front End	1981
3:50 pm	E.R. Soares, K.F. Raihn, and J.D. Fuller	
TH4D-3	Compact Quasi-Lumped Element HTS Microstrip Filters	1985
4:10 pm	H.T. Su, F. Huang, and M.J. Lancaster	
TH4D-4	Optoelectronic RF Harmonic Generation and Mixing in High-T_c Superconducting Film	1989
4:30 pm	A.H. Majedi, S.K. Chaudhuri, R. Mansour, and S. Safavi-Naeini	
TH4D-5	Novel Method for Calculation and Measurement of Unloaded Q-Factor of Superconducting Dielectric Resonators	1993
4:40 pm	M.V. Jacob, J. Mazierska, K. Leong, and J. Krupka	

Session THIF

Interactive Forum

2:30–5:00 pm

Room Phoenix 11, 12, 16–20

Thursday, May 24, 2001

Chair: N. Tracht, Motorola

Co-Chair: P. Okrah, Motorola

THIF-1	Generalized Multi-Gridding Technique for the TLM Method Using the Symmetrical Super-Condensed Node (SSCN)	1999
2:30 pm	G.N. Mulay and K.S. Jog	
THIF-2	A Novel Adaptive Approach to Modeling MEMS Tunable Capacitors Using MRTD and FDTD Techniques	2003
2:30 pm	N. Bushyager, M.M. Tentzeris, L. Gatewood, and J. DeNatale	
THIF-3	A Multi-Threaded Time Domain TLM Algorithm for Symmetric Multi-Processing Computers	2007
2:30 pm	P.P.M. So and W.J.R. Hoefer	
THIF-4	Construction of Solutions to Electromagnetic Problems in Terms of Two Collinear Vector Potentials	2011
2:30 pm	N. Georgieva	
THIF-5	Analysis of Lumped Element Transistor Structures Using MRTD: The Equivalent Source Method	2015
2:30 pm	R.L. Robertson and L.P.B. Katehi	
THIF-6	Efficient Time-Domain Electromagnetic Analysis Using CDF Biorthogonal Wavelet Expansion	2019
2:30 pm	T. Dogaru and L. Carin	
THIF-7	A Wavelet-Based FDTD-Multigrid-Method	2023
2:30 pm	M. Walter, P. Waldow, and I. Wolff	
THIF-8	Analysis and Design of a Planar Antenna for a Millimetre-Wave Emitter Using TLM	2027
2:30 pm	K.P. Heppenheimer, L. Vietzorreck, and P. Russer	

THIF-9 2:30 pm	Analysis of Differential Vias in a Multilayer Parallel Plate Environment Using a Physics-Based CAD Model R. Abhari, G.V. Eleftheriades, and E. van Deventer-Perkins	2031
THIF-10 2:30 pm	3D-FDTD Subgidding Technique Applied to Radiating Structures M. Bonilla, M.-F. Wong, J. Wiart, G. Alquié, and V.F. Hanna	2035
THIF-11 2:30 pm	Enhanced Forward Coupling Phenomena Between Microstrip Lines on Periodically Patterned Ground Plane C.-C. Chang, Y. Qian, and T. Itoh	2039
THIF-12 2:30 pm	Coupled TLM-Thermal Analysis in the Time Domain W. Liu, P.P.M. So, and W.J.R. Hoefer	2043
THIF-13 2:30 pm	Lumped and Distributed Device Embedding Techniques in Time Domain TLM Field Models J.W. Park, P.P.M. So, and W.J.R. Hoefer	2047
THIF-14 2:30 pm	Analysis of Multiport Waveguide Structures by a Higher-Order FDTD Methodology Based on Non-Orthogonal Curvilinear Grids N.V. Kantartzis, M. Gatzianas, T.I. Kosmanis, and T.D. Tsiboukis	2051
THIF-15 2:30 pm	FDTD Study of Resonance Processes in Microstrip Ring Resonators with Different Excitation Geometries E. Semouchkina, W. Cao, and R. Mittra	2055
THIF-16 2:30 pm	An Unconditionally Stable Finite Element Time Domain Solution of Active Nonlinear Microwave Circuits Using Perfectly Matched Layers H.-P. Tsai, Y. Wang, and T. Itoh	2059
THIF-17 2:30 pm	Optimal Shape Design of Dielectric Structure Using FDTD and Topology Optimization Y.-S. Chung and C. Cheon	2063
THIF-18 2:30 pm	Electronic Design Assistance Tool for Circuit Optimization: Application to Microwave Power Amplifiers C. Duperrier, M. Campovecchio, J. Rousset, R. Quéré, S. Mons, A. Mallet, and L. Lapierre	2067
THIF-19 2:30 pm	Nonlinear Statistical Modeling of Large-Signal Device Behavior W. Stiebler, F. Rose, and J. Selin	2071
THIF-20 2:30 pm	A Computer Aided Design Technique for Hybrid and Monolithic Microwave Amplifiers Employing Distributed Equalizers with Lumped Discontinuities A. Aksen and B.S. Yarman	2075
THIF-21 2:30 pm	Statistical Construction of a Representative CAD Model from a Measured Population for RF Design Applications W. Leiker and K. Naishadham	2079
THIF-22 2:30 pm	SMX—A Novel Object-Oriented Optimization System M.H. Bakr, J.W. Bandler, Q.S. Cheng, M.A. Ismail, and J.E. Rayas-Sánchez	2083
THIF-23 2:30 pm	A Robust Algorithm for Automatic Development of Neural Network Models for Microwave Applications V. Devabhaktuni, M.C.E. Yagoub, and Q.-J. Zhang	2087
THIF-24 2:30 pm	Steady-State Determination for RF Circuits Using Krylov-Subspace Methods in SPICE M.A. Kleiner and M.N. Afsar	2091
THIF-25 2:30 pm	Interactive “Visual” Design of Matching and Compensation Networks for Microwave Active Circuits L.I. Babak and M.V. Cherkashin	2095
THIF-26 2:30 pm	Efficient Sensitivity Analysis of Lossy Multiconductor Transmission Lines with Nonlinear Terminations A. Dounavis, R. Achar, and M. Nakhla	2099
THIF-27 2:30 pm	Software Tool for the Design of Narrow Band Band-Pass Filters A. García-Lampérez, M. Salazar-Palma, M. Padilla, and I. Hidalgo-Carpintero	2103
THIF-28 2:30 pm	Optimization of Waveguide Diplexers Using Shadow Specifications D.A. Cargill, T. Dolan, and P. Pramanick	2107

THIF-29 2:30 pm	Micromachined RF MEMS Tunable Capacitors Using Piezoelectric Actuators J.Y. Park, Y.J. Yee, H.J. Nam, and J.U. Bu	2111
THIF-30 2:30 pm	Digitally Controllable Variable High-Q MEMS Capacitor for RF Applications N. Hoivik, M.A. Michalick, Y.C. Lee, K.C. Gupta, and V.M. Bright	2115
THIF-31 2:30 pm	Nonlinear Electro-Mechanical Modeling of MEMS Switches J.B. Muldavin and G.M. Rebeiz	2119
THIF-33 2:30 pm	An Electromechanical Model for MEMS Switches D. Mercier, P. Blondy, D. Cros, and P. Guillon	2123
THIF-34 2:30 pm	Digital Generation of RF Signals for Wireless Communications with Band-Pass Delta-Sigma Modulation J. Keyzer, J. Hinrichs, A. Metzger, M. Iwamoto, I. Galton, and P. Asbeck	2127
THIF-35 2:30 pm	A CMOS 6-Bit, 1 GHz ADC for IF Sampling Applications K. Uyttenhove and M. Steyaert	2131
THIF-36 2:30 pm	A Silicon-on-Insulator 28-V RF Power LDMOSFET for 1-GHz Integrated Power Amplifier Applications E. McShane, K. Shenai, and S.K. Leong	2135
THIF-37 2:30 pm	A Software GPS Receiver for Weak Signals D.M. Lin and J.B.Y. Tsui	2139
THIF-38 2:30 pm	Simple Design Equations for Broadband Class E Power Amplifiers with Reactance Compensation A. Grebennikov	2143
THIF-39 2:30 pm	Multi-Harmonic Tuning Behavior of MOSFET RF Power Amplifiers Y. Zhang and C.A.T. Salama	2147
THIF-40 2:30 pm	Study of Self-Heating Effects in GaN HEMTs S. Nuttinck, E. Gebara, J. Laskar, and M. Harris	2151
THIF-41 2:30 pm	InGaP PHEMTs for Wireless Power Applications E. Lan, B. Pitts, M. Mikhov, and O. Hartin	2155
THIF-42 2:30 pm	Novel Asymmetric Gate-Recess Engineering for Sub-Millimeter-Wave InP-Based HEMTs K. Shinohara, T. Matsui, T. Mimura, and S. Hiyamizu	2159
THIF-43 2:30 pm	A Calibrated RF/IF Monolithic Vector Analyzer J. Cowles and B. Gilbert	2163
THIF-44 2:30 pm	Design Techniques of Reducing Chip Area and Highly Integrated MMIC for W-Band Application Y. Mimino, K. Nakamura, K. Sakamoto, Y. Aoki, S. Kuroda, and T. Tokumitsu	2167
THIF-45 2:30 pm	A Novel Accurate Design Method for the Hairpin Type Coupled Line Bandpass Filter J.-S. Yun, J.-S. Park, D. Ahn, K.S. Choi, and J. Kim	2171
THIF-46 2:30 pm	Hairpin Filters with Tunable Transmission Zeros C.-M. Tsai, S.-Y. Lee, and C.-C. Tsai	2175
THIF-47 2:30 pm	Adjustment of a Temperature Compensated Ka-Band Ring Resonator VCO Using Fully Automated Laser-Trimming M. Schallner and W. Konrath	2179
THIF-48 2:30 pm	Monolithic Quantum Tunnel Diode-Based C-Band Oscillator and LNA J.I. Bergman, S. Han, J. Laskar, N. El-Zein, S. Ageno, M. Deshpande, and V. Nair	2183
THIF-49 2:30 pm	Calibrated Linear and NonLinear Pulsed RF Measurements on an Amplifier P. Vael, Y. Rolain, C. Gaquiere, and H. Gerard	2187
THIF-50 2:30 pm	Measurement of Group Velocities of Various Microwave Transmission Lines via FM Reflectometry Y.-H. Park, J.-H. Lee, J.-W. Seo, and H.-S. Tae	2191
THIF-51 2:30 pm	Millimeter Wave Measurements of Temperature Dependence of Complex Permittivity of GaAs Plates by a Circular Waveguide Method T. Shimizu and Y. Kobayashi	2195

THIF-52 2:30 pm	Infrared Temperature Characterization of High Power RF Devices M. Mahalingam and E. Mares	2199
THIF-53 2:30 pm	Near-Field Microwave Microscopy of Thin Film Resonators J.A. Herbsommer, H. Safar, P.L. Gammel, B.P. Barber, and M. Zierdt	2203
THIF-54 2:30 pm	28 GHz LMDS Channel Measurements and Modeling for Parameterized Urban Environments C. Briso-Rodríguez, M.A. Vázquez-Castro, and J.I. Alonso-Montes	2207
THIF-55 2:30 pm	C/Ku-Band Pulsed Transmitters for Poseidon 2 Altimeter A. Darbandi, G. Michaud, H. Buret, J.Y. Touchais, J. Fourcroy, and J. Bulgarelli	2211
THIF-56 2:30 pm	The RF Module Design for W-CDMA/GSM Dual Band and Dual Mode Handset X. Zhu, W. Hong, L. Jin, L. Tian, and J. Zhou	2215
THIF-57 2:30 pm	Bias Control Technique for CDMA Driver Amplifier to Decrease Current J.-S. Ko, H.-S. Kim, S.-G. Yang, B. Kim, and B.-H. Park	2219
THIF-58 2:30 pm	Multi-Carrier Microwave Breakdown in Air-Filled Components U. Jordan, T. Olsson, V.E. Semenov, D. Anderson, and M. Lisak	2223
THIF-59 2:30 pm	Analysis of Proposals to Reduce SAR Levels from GSM Terminals V.F. Pérez, L.N. Fernández, and J.V.B. Tejedor	2227
THIF-60 2:30 pm	High-Accuracy Digital 5-Bit 0.8–2 GHz MMIC RF Attenuator for Cellular Phones N. Kinayman, M. Bonilla, M.F. Kelcourse, J. Redus, and K. Anderson	2231
THIF-61 2:30 pm	Micromachined 60 GHz GaAs Power Sensor with Integrated Receiving Antenna K. Mutamba, K. Beilenhoff, A. Megej, R. Dörner, E. Genc, A. Fleckenstein, P. Heyman, J. Dickmann, C. Woelk, and H.L. Hartnagel	2235
THIF-62 2:30 pm	A Sensor System Based on SiGe MMIC's for 24 GHz Automotive Applications C.N. Rheinfelder, S. Lindenmeier, J.-F. Luy, C. Willner, and A. Schüppen	2239
THIF-63 2:30 pm	Acoustic Sensing Using Radio Frequency Detection and Capacitive Micromachined Ultrasonic Transducers S.T. Hansen, A.S. Ergun, and B.T. Khuri-Yakub	2243
THIF-64 2:30 pm	Millimeter-Wave Printed Circuit Antenna System for Automotive Applications V.V. Denisenko, A.G. Shubov, A.V. Majorov, E.N. Egorov, and N.K. Kashaev	2247
THIF-65 2:30 pm	Spectrum Correlation of Beat Signals in the FM-CW Radar Level Meter and Application for Precise Distance Measurement J.C. Chun, T.S. Kim, J.M. Kim, Z.S. Lim, and W.S. Park	2251
THIF-66 2:30 pm	K-Band Direct Detect MMIC Si Micromachined Radiometer M. Smith, T. Weller, J. Culver, B. Roeder, C. Trent, and J. Naylor	2255
THIF-67 2:30 pm	A Rugged Active Sensor for Microwave Aquametry G. Avitabile, G.B. Gentili, and N. Sottani	2259