

2003 Microwave Symposium Technical Program Schedule



Session TH1A Microwave Filter Synthesis Techniques

8:00 – 9:40am

Room 201A

Thursday, June 12, 2003

Chair: A. Atia, Orbital Sciences Corp.
Co-chair: S. Kanamaluru, Sarnoff Corp.

TH1A-1	Generalized Inverter-Coupled Bandpass Filters	1455
8:00 AM	R. Levy	
TH1A-2	Understanding Transmission Zero Movement In Cross-Coupled Filters	1459
8:20 AM	R.J. Wenzel	
TH1A-3	Coupling Matrix Extraction for Cascaded Triplet (CT) Topology	1463
8:40 AM	R.N. Gajaweera and L.F. Lind	
TH1A-4	A Powerful Tool for the Synthesis of Prototype Filters with Arbitrary Topology	1467
9:00 AM	G. Macchiarella	
TH1A-5	Nonradiative Dielectric (NRD) Waveguide Diplexer for Millimeter-Wave Applications	1471
9:20 AM	F. Boone and K. Wu	

Session TH2A

RF-MEMS Phase Shifters and Micromachined Inductors

8:00 – 9:40am

Room 201C

Thursday, June 12, 2003

Chair: T. Weller, University of South Florida
Co-chair: K. Varian, Raytheon Co.

TH2A-1	A 4-Bit Miniature X-Band MEMS Phase Shifter Using Switched-LC Networks	1477
8:00 AM	G-L. Tan, R.E. Mihailovich, J.B. Hacker, J.F. DeNatale, and G.M. Rebeiz	
TH2A-2	A V-Band CPS Distributed Analog MEMS Phase Shifter	1481
8:20 AM	H-T. Kim, S. Lee, J-M. Kim, J-H. Park, Y-K. Kim, and Y. Kwon	
TH2A-3	W-Band Microstrip RF-MEMS Switches and Phase Shifters	1485
8:40 AM	J.B. Rizk and G.M. Rebeiz	
TH2A-4	Integrated RF MEMS Phase Shifters with Constant Phase Shift	1489
9:00 AM	Y-J. Ko, J-Y. Park, and J-U. Bu	
TH2A-5	A 15-to-45 GHz Low-Loss Analog Reflection-Type MEMS Phase Shifter	1493
9:10 AM	S. Lee, J-H. Park, H-T. Kim, J-M. Kim, Y-K. Kim, and Y. Kwon	
TH2A-6	Very High Q Inductor Using RF-MEMS Technology for System-on-Package Wireless Communication Integrated Module	1497
9:20 AM	S.A. Pinel, F. Cros, S. Nuttinck, S. Yoon, M. Allen, and J. Laskar	

Session TH3A

Focused Session – High Speed Sampling Circuits and Techniques

8:00 – 9:40am

Room 204A

Thursday, June 12, 2003

Chair: M. Kahrs, University of Pgh
Co-chair: K. Goverdhanam, University of Pgh

TH3A-1	Applications of RF and Microwave Sampling to Instrumentation and Measurement	1503
8:00 AM	M. Kahrs	
TH3A-2	Sampling Oscilloscope Models and Calibrations	1507
8:20 AM	K.A. Remley and D.F. Williams	
TH3A-3	Rapid Millimetre-wave Sampler Response Characterization to Well Beyond 120GHz Using an Improved Nose-to-nose Method	1511
8:40 AM	J.B. Scott	
TH3A-4	Flip-chip bonded Si Schottky diode sampling circuits for high speed demultiplexers	1515
9:00 AM	J. Choi, C-J. Weiske, G.R. Olbrich, and P. Russer	
TH3A-5	100 GHz Through-Line Sampler System with Sampling Rates in Excess of 10 Gsamples/second	1519
9:20 AM	A. Agoston, S. Pepper, R. Norton, J. Ebner, and K. Schoen	

Session TH4A

Advanced Array Techniques

8:00 – 9:40am

Room 204C

Thursday, June 12, 2003

Chair: R. Sudbury, MIT Lincoln Laboratory

TH4A-1	Mitigation of Correlated Non-Linearities in Digital Phased Arrays Using Channel-Dependent Phase Shifts	1525
8:00 AM	L.C. Howard, N. Simon, and D.J. Rabideau	
TH4A-2	Implementation of a Smart Antenna System with an Improved NCMA Algorithm	1529
8:20 AM	T. Eireiner, T. Müller, J-F. Luy, and F. Owens	
TH4A-3	Experimental Demonstration of a Direction of Arrival Estimation Algorithm for mm-wave Broadband Communication Systems	1533
8:40 AM	P. Sanchis, V. Polo, J. Herrera, J. Corral, M-S. Choi, and J. Marti	
TH4A-4	Hybrid Smart Antenna System using Directional Elements	1537
9:00 AM	Z. Zhang, M. Iskander, Z. Yun, and A. Host-Madsen	
TH4A-5	A Self-Calibration Antenna Array System with Moving Apertures	1541
9:20 AM	W. Yao, Y. Wang, and T. Itoh	

Session TH5A

Advances in Semiconductor Technology for Wireless Systems

8:00 – 9:40am

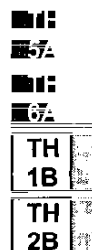
Room 202A

Thursday, June 12, 2003

Chair: B.D. Geller, Mitsubishi Electric-US

Co-chair: R.G. Ranson, Filtronic

TH5A-1	Flip Chip Design of Dual Band/Tri mode SiGe BiCMOS Transmitter IC for CDMA Wireless Applications	1547
8:00 AM	M. Megahed, F. Van Gieson, M. Reddy, and D. Yates	
TH5A-2	Development of 5.8GHz SiGe BiCMOS Direct Conversion Receivers	1551
8:20 AM	S. Chakraborty, S. Reynolds, H. Ainspan, and J. Laskar	
TH5A-3	A very low distortion SiGe BiCMOS Down Converter for W-CDMA Applications	1555
8:40 AM	D. Watanabe, I. Imanishi, J. Ito, T. Nakatani, and T. Saeki	
TH5A-4	A Low-Power and Variable-Gain Transceiver Front-End Chip for 5-GHz-Band WLAN Applications	1559
9:00 AM	H. Dodo, Y. Aoki, N. Hayama, M. Fujii, Y. Yamaguchi, Y. Sasaki, H. Ohba, and H. Hida	
TH5A-5	Low Distortion RF-LDMOS Power Transistor for Wireless Communications Base Station Applications	1563
9:20 AM	J.R. Gajadharsing	



Session TH6A

Low Noise Components Based on Si, GaAs, and InP Technologies

8:00 – 9:40am

Room 202B

Thursday, June 12, 2003

Chair: P. Smith, BAE Systems

Co-chair: A. Riddle, Macallan Consulting

TH6A-1	A Low-Cost-Packaged 4.9-6GHz LNA for WLAN applications	1569
8:00 AM	E. Imbs, I. Telliez, S. Detout, and Y. Imbs	
TH6A-2	Development of IEEE802.11a WLAN LNA in Silicon based Processes	1573
8:20 AM	B. Banerjee, B. Matinpour, C-H. Lee, S. Venkataraman, S. Chakraborty, and J. Laskar	
TH6A-3	Enhancement mode GaAs PHEMT LNA with linearity Control (IP3) and Phased matched Mitigated Bypass Switch and Differential Active Mixer	1577
8:30 AM	S. Kumar, M. Vice, H. Morkner, and W. Lam	
TH6A-4	A Coplanar 94 GHz Low-Noise Amplifier MMIC Using 0.07 μm Metamorphic Cascode HEMTs	1581
8:50 AM	A. Tessmann, A. Leuther, C. Schwoerer, H. Massler, S. Kudzus, W. Reinert, and M. Schlechtweg	
TH6A-5	Cryogenic Measurements of 183 GHz MMIC Low Noise Amplifiers	1585
9:10 AM	D.E. Dawson, T. Gaier, R. Raja, M. Nishimoto, R. Lai, and M. Wells	
TH6A-6	Development of a Receiver Downconverter Module for Ka Band Satellite Payload	1589
9:20 AM	D-P. Chang, I-B. Yom, and S-P. Lee	

Session TH1B

Planar and Periodic Filters

10:10 – 11:50am

Room 201A

Thursday, June 12, 2003

Chair: R. Mansour, University of Waterloo

Co-chair: V. Boria, Universidad Politecnica de Valencia

TH1B-1	Miniaturized Slot-line and Folded-Slot Band-pass Filters	1595
10:10 AM	R. Azadegan and K. Sarabandi	
TH1B-2	Accessing to UMTS filtering Specifications Using New Microstrip Miniaturized Loop-Filters	1599
10:30 AM	E. Goron, J-P. Coupez, C. Person, Y. Toutain, H. Lattard, and F. Perrot	
TH1B-3	A New Simple Microstrip Open-Loop Resonators Filter for High Selectivity Applications	1603
10:50 AM	D.C. Cañete-Rebenaque, A. Álvarez-Melcón, and M. Guglielmi	
TH1B-4	Small-Sized Wideband CVT- and CCT-Ring Filters	1607
11:10 AM	H-R. Ahn, I. Wolff, and N-H. Myung	
TH1B-5	Narrow Ka Bandpass Filters Using Periodically Loaded Substrates	1611
11:20 AM	W.J. Chappell, X. Gong, and L.P.B. Katehi	
TH1B-6	Optimized Etched Hole Size for Suppressing the Periodicity in the Frequency Response in Photonic Bandgap Microstrip Structures	1615
11:30 AM	C. Lee, S. Kim, and C. Shin	
TH1B-7	Coplanar waveguide periodic structures with resonant elements and their application in microwave filters	1619
11:40 AM	B.M. Karyampudi and J-S. Hong	

Session TH2B

Focused Session - Future Material Technologies for RF-MEMS

10:10 – 11:50am

Room 201C

Thursday, June 12, 2003

Chair: N.S. Baker, University of Virginia

Co-chair: L.P.B. Katehi, Purdue University

TH2B-1	Evaluation of CVD Diamond for Heavy Duty Microwave Switches	1625
10:10 AM	E. Kohn, W. Menzel, F-J. Hernandez-Guillen, R. Müller, A. Munding, P. Schmid, D. Grobe, and J. Kusterer	
TH2B-2	Silicon Carbide for RF MEMS	1629
10:30 AM	J.M. Melzak	
TH2B-5	Low Cost RF MEMS Switches Using Photodefinable Mixed Oxide Dielectrics	1633
11:30 AM	G. Wang, S. Barstow, A. Jeyakumar, J. Papapolymerou, and C. Henderson	
TH2B-6	Encapsulation of the Micromachined Air-Suspended Inductors	1637
11:40 AM	Y-S. Choi, E. Yoon, and J-B. Yoon	

Time Domain and Nonlinear Measurement Techniques

Chair: J. Martens, Anritsu Co.
Co-chair: R. Henderson, Motorola, Inc.

TH3B-1 10:10 AM	A n-state Time-Domain Measurement Test-Bench for Characterization of Intermodulation Distortion on Device Level T. Merkle, S. Ramberger, M. Kuri, and F. van Raay	1643
TH3B-2 10:30 AM	Proving the Usefulness of a 3-port Nonlinear Vectorial Network Analyser through Mixer Measurements W. Van Moer and Y. Rolain	1647
TH3B-3 10:50 AM	Large Signal Pulsed RF And DC Load Pull Characterization of High Voltage 10W GaAs-GaN P HBTs T. Gasseling, S. Heckmann, D. Barataud, J. Nebus, J. Villotte, R. Quere, D. Floriot, and P. Auxemery	1651
TH3B-4 11:00 AM	New Methods & Non-Linear Measurements for Active Differential Devices J.P. Dunsmore	1655
TH3B-5 11:20 AM	Calibration of a Gigahertz-Bandwidth Vector Signal Generation and Analysis System J. Qiu, D. Abe, T. Antonsen, Jr., B.G. Danly, and B. Levush	1659
TH3B-6 11:30 AM	A New Characterization Technique of "Four Hot S Parameters" for the Study of Nonlinear Parametric behaviors of Microwave devices. T.A. Gasseling, D. Barataud, S. Mons, J. Nebus, J. Villotte, and R. Quere	1663



Advances in Beamsteering and Beamforming Arrays

Chair: W. Shiroma, University of Hawaii
Co-chair: R. Miyamoto, University of Hawaii at Manoa

TH4B-1 10:10 AM	Multi-Beam Discrete Lens Arrays with Amplitude-Controlled Steering S. Romisch, D. Popovic, N. Shino, R. Lee, and Z. Popovic	1669
TH4B-2 10:30 AM	A High-Speed Adaptive Antenna Array with Simultaneous Multiple-Beamforming Capability T. Nishio, Y. Wang, and T. Itoh	1673
TH4B-3 10:50 AM	A 60 GHz Integrated Antenna Array for High-Speed Digital Beamforming Applications J.-Y. Park, Y. Wang, and T. Itoh	1677
TH4B-4 11:10 AM	Multipath Communications Using a Phase Conjugate Array J. Tuovinen, G.S. Shiroma, W.E. Forsyth, and W.A. Shiroma	1681
TH4B-5 11:30 AM	An Active Self-Steering Array Using Self-Oscillating Mixers G.S. Shiroma, C. Song, R. Miyamoto, and W.A. Shiroma	1685
TH4B-6 11:40 AM	Coupled Phase-Locked Loop Arrays for Beam Steering P.F. Maccarini, J. Buckwalter, and R.A. York	1689

Session TH5B

Techniques for Enhancing Wireless System Performance

10:10 – 11:50am

Room 202A

Thursday, June 12, 2003

Chair: S. March, Texas Instruments
Co-chair: J.B. Horton, J.B. Horton Group

TH5B-1	Digital Predistortion Linearization of Frequency Multipliers	1695
10:10 AM	Y. Park, K. Low, and J. Kenney	
TH5B-2	Baseband Digital Predistortion Using Subband Filtering Technique	1699
10:30 AM	O. Hammi, S. Boumaiza, M. Jaidane, and M. Ghannouchi	
TH5B-3	SDR Transmitter Based on LINC Amplifier with Bias Control	1703
10:50 AM	Y. Woo, J. Yi, Y. Yang, and B. Kim	
TH5B-4	Design Considerations for Single Package Radio (SPR) EGSM/DCS Dual Band Cellular Phones	1707
11:10 AM	M. Megahed, E. Ngompe, M. Ayvazian, and M. Glasberner	
TH5B-5	A Compact Wideband MEM Switched Diversity Antenna for Indoor Mobile Channels	1711
11:30 AM	B.A. Cetiner, J.Y. Qian, S. Liu, L. Jofre, G. Li, and F. De Flaviis	

Session TH6B

RF Power Amplifiers and Techniques

10:10 – 11:50am

Room 202B

Thursday, June 12, 2003

Chair: R. Campbell, TriQuint Semiconductor
Co-chair: J. Whelehan, JJW Consulting

TH6B-1	High-efficiency linear amplification by dynamic load modulation	1717
10:10 AM	F.H. Raab	
TH6B-2	Amplitude Modulator Utilizing a High-Q Class-E DC-DC Converter	1721
10:30 AM	W.H. Cantrell and W. Davis	
TH6B-3	Analytic Expressions for the Optimum Source & Load Impedance and Associated Large-Signal Gain of an RF Power Transistor	1725
10:50 AM	J. Walker	
TH6B-4	Accurate, Wideband Characterization and Optimization of High Power LDMOS Amplifier Memory Properties	1729
11:10 AM	M. Eron, E. Martony, Y. Fogel, E. Jeckeln, and M. Hrybenko	
TH6B-5	Method for Modeling Amplitude and Bandwidth Dependent Distortion in Nonlinear RF Devices	1733
11:20 AM	E.G. Jeckeln, H-Y. Shih, E. Martony, and M. Eron	
TH6B-6	Exact analysis of a simple class E circuit version for device characterization purposes	1737
11:30 AM	P. Molina-Gaudo, C. Bernal, and A. Mediano	
TH6B-7	Using Amplifiers with Poor Linearity to Linearize Amplifiers with Good Linearity	1741
11:40 AM	T.P. Weldon and K. Miehle	

Session TH1C

Active and Tunable Filters

1:20 – 3:00pm

Room 201A

Thursday, June 12, 2003

Chair: D. Swanson, Forem USA

Co-chair: H. Dayal, BAE Systems-CNI

TH1C-1	A Novel Bandpass Filter Using Active Capacitance	1747
1:20 PM	J-R. Lee, Y-H. Chun, and S-W. Yun	
TH1C-2	A 60 GHz-band Coplanar MMIC Active Filter	1751
1:40 PM	M. Ito, K. Maruhashi, S. Kishimoto, and K. Ohata	
TH1C-3	Implementation of a tunable coplanar Filter	1755
2:00 PM	T. Paillot, P. Blondy, D. Cros, P. Guillon, J. Orlianges, C. Champeaux, and A. Catherinot	
TH1C-4	Performance of Polygonal-Shaped TFBARs and On-Wafer Tuning Inductors	1759
2:10 PM	J-S. Kim, K-W. Kim, M-G. Gu, J-G. Yook, and H-K. Park	
TH1C-5	Tunable Duplexer Having Multilayer Structure Using LTCC	1763
2:20 PM	K. Saitou and K. Kageyama	
TH1C-6	Electronically Tunable LTCC Based Multilayer filter for Mobile Handset application	1767
2:30 PM	M.M. Rahman and K. Shamsaifar	
TH1C-7	On the Design of LTCC Filter for Millimeter-Waves	1771
2:40 PM	V. Kondratyev, M. Lahti, and T. Jaakola	
TH1C-8	Compact, Broad-Stopband Elliptic-Function Lowpass Filters Using Microstrip Stepped Impedance Hairpin Resonators	1775
2:50 PM	L-H. Hsieh and K. Chang	

Session TH2C

MEMS Techniques for Tunable Filters and Resonators

1:20 – 3:00pm

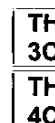
Room 201C

Thursday, June 12, 2003

Chair: V. Lubecke, University of Hawaii

Co-chair: J. DeNatale, Rockwell Scientific

TH2C-1	Low-Loss Bandpass RF Filter Using MEMS Capacitance Switches To Achieve A One-Octave Tuning Range And Independently Variable Bandwidth	1781
1:20 PM	R.M. Young, J. Adam, C.R. Vale, T.T. Braggins, S.V. Krishnaswamy, C.E. Milton, D.W. Bever, L.G. Chorosinski, L-S. Chen, D.E. Crockett, C.B. Freidhoff, S.H. Talisa, E. Capelle, R. Tranchini, J.R. Fende, J.M. Lorthioir, and A.R. Torres	
TH2C-2	A High Performance MEMS Miniature Tunable Bandpass Filter	1785
1:40 PM	A. Abbaspour-Tamijani, L. Dussopt, and G.M. Rebeiz	
TH2C-3	Tunable Bandpass Filter Using Distributed MEMS Transmission Lines	1789
2:00 PM	B. Lakshminarayanan and T. Weller	
TH2C-4	Electrostatically-Tunable Analog RF MEMS Varactors with Measured Capacitance Range of 300%	1793
2:20 PM	D. Peroulis and L.P.B. Katehi	
TH2C-5	MEMS Based Thin Film 2GHz Resonator for CMOS Integration	1797
2:40 PM	M. Hara, J. Kuypers, T. Abe, and M. Esashi	
TH2C-6	3D Silicon Micromachined RF Resonators	1801
2:50 PM	K.M. Strohm, F. Schmueckle, O. Yaglioglu, J-F. Luy, and W. Heinrich	



Session TH3C

Microwave Measurement Techniques

1:20 – 3:00pm

Room 204A

Thursday, June 12, 2003

Chair: L. Hayden, Cascade Microtech, Inc.

Co-chair: A. Ferrero, Polito University

TH3C-1	Harmonic Load/Source Pull Strategies For High Efficiency PAs Design	1807
1:20 PM	P. Colantonio, A. Ferrero, F. Giannini, E. Limiti, and V. Teppati	
TH3C-2	Characterization of a Microwave Probe up to Frequencies of 400 GHz	1811
1:40 PM	M. Bieler, M. Spitzer, G. Hein, and U. Siegner	
TH3C-3	GSOLT: The Calibration Procedure for all Multi-Port Vector Network Analyzers	1815
2:00 PM	H. Heuermann	
TH3C-4	An Optimal Multiline TRL Calibration Algorithm	1819
2:10 PM	D.F. Williams, C.M. Wang, and U. Arz	
TH3C-5	A new empirical method for extracting unloaded resonant frequencies from microwave resonant cavities	1823
2:30 PM	A.J. Canós, J. Catalá-Civera, F.L. Peñaranda-Foix, J. Monzó-Cabrera, and E. De los Reyes	
TH3C-6	Novel mode content analysis technique for multimode waveguides	1827
2:40 PM	P.V. Nikitin, D.D. Stancil, A.G. Cepni, A.E. Xhafa, O.K. Tonguz, and D. Brodtkorb	

Session TH4C

Beam Steering, Metamaterials and Smart Antenna Characterization

1:20 – 3:00pm

Room 204C

Thursday, June 12, 2003

Chair: B.S. Perlman, US Army CECOM

TH4C-1	Experimental Demonstration of a 35 GHz Holographic Antenna	1833
1:20 PM	A.E. Fathy, M. El sherbiny, A. Rosen, G. Ayers, and S. Perlow	
TH4C-2	Tailoring the dielectric properties of Meta Materials	1837
1:40 PM	J.K. Abraham, R. Tellakula, K. Vinoy, Y. Sha, and V.K. Varadan	
TH4C-3	Array Antenna Characterization Technique Based on Evanescent Reactive-Near-Field Probing in an Ultra-Small Anechoic Box	1841
2:00 PM	Q. Han, K. Inagaki, and T. Ohira	
TH4C-4	Investigation of an experimental setup of a smart antenna	1845
2:20 PM	M. Piasecki and J. Modelski	
TH4C-5	A Novel Phased Array Based on the Extended Resonance Power Dividing Technique	1849
2:40 PM	A. Tombak and A. Mortazawi	
TH4C-6	Variable Periphery Amplifier With Built-In Phase Shifting Capability For Ultra Compact Transceiver Module	1853
2:50 PM	J.M. Yang, X. Lan, R. Wang, R. Kagiwada, and C.C. Yang	

Session TH5C

Spatial Power Combining

1:20 – 3:00pm

Room 202B

Thursday, June 12, 2003

Chair: E. Biebl, TU Muenchen

Co-chair: S. Kawasaki, University of Tokai

TH5C-1 1:20 PM	A High-Power W-Band Quasi-Optical Frequency Tripler J.B. Hacker, A.L. Sailer, B. Brar, G. Nagy, R.L. Pierson, and A. Higgins	1859
TH5C-2 1:40 PM	V-band Transmission and Reflection Grid Amplifier Packaged in Waveguide C. Cheung, R. Tsai, R. Kagiwada, and D.B. Rutledge	1863
TH5C-3 2:00 PM	Numerical and Experimental Investigation of Losses in a Tray Based Spatial Power Amplifier A. Al-Zayed, S. Ortiz, M. Ozkar, and A. Mortazawi	1867
TH5C-4 2:20 PM	Broadband High Power Amplifier using Spatial Power Combining Technique P. Jia, L-Y. Chen, A. Alexanian, and R. York	1871
TH5C-5 2:40 PM	A Negative Reflective/Refractive "Meta-Interface" Using a Bi-Directional Phase-Conjugating Array C.A. Allen, K.K.H. Leong, and T. Itoh	1875

Session TH1D
Superconducting and Novel Planar Filters

3:30 – 5:10pm

Room 201A

Thursday, June 12, 2003

Chair: J.F. Davis, Jet Propulsion Lab

Co-chair: C. Jackson, Ditrans Corp.

TH1D-1 3:30 PM	An Ultra-narrowband HTS Bandpass Filter K. Dustakar and S. Berkowitz	1881
TH1D-2 3:50 PM	New Advances in HTS Microstrip Filter Design S. Ye and C. Sans	1885
TH1D-3 4:10 PM	Superconducting Microstrip Filters Using Compact Resonators with Double-Spiral Inductors and Interdigital Capacitors J. Zhou, M.J. Lancaster, and F. Huang	1889
TH1D-4 4:20 PM	A Superconducting Thin Film Filter of Very High Wide-Band Rejection H. Yi, S. Remillard, and A. Abdelmonem	1893
TH1D-5 4:30 PM	Field-Simulation-Based Strategy for Designing Microstrip Filters E. Semouchkina, G. Semouchkin, M. Lanagan, and R. Mittra	1897
TH1D-6 4:40 PM	Dual-mode microstrip triangular patch resonators and filters J-S. Hong and S. Li	1901
TH1D-7 4:50 PM	Meandered Line Microstrip Filter With Suppression of Harmonic Passband Response P. Vincent, J. Culver, and S. Eason	1905
TH1D-8 5:00 PM	Microwave Coplanar Filters on Si Substrates K-T. Chan, A. Chin, J. Kuo, C. Chang, D. Duh, W. Lin, C. Zhu, M. Li, and D-L. Kwong	1909



Session TH2D

Modeling and Packaging of MEMS Components

3:30 – 5:10pm

Room 201C

Thursday, June 12, 2003

Chair: C. Goldsmith, MEMtronics

Co-chair: J. Papapolymerou, Georgia Institute of Technology

TH2D-1	Power Handling and Linearity of MEM Capacitive Series Switches	1915
3:30 PM	J. Muldavin, R. Boisvert, C. Bozler, S. Rabe, and C. Keast	
TH2D-2	RF Actuation of Capacitive MEMS Switches	1919
3:50 PM	J.R. Reid, L. Starnan, and R.T. Webster	
TH2D-3	Electro/Thermal Measurements of RF MEMS Capacitive Switches	1923
4:10 PM	R.M. Reano, D. Peroulis, J.F. Whitaker, and L.P.B. Katehi	
TH2D-4	Post-Enabled Precision Flip-Chip Assembly for Variable MEMS Capacitor	1927
4:30 PM	F.F. Faheem, N.D. Hoivik, Y. Lee, and K. Gupta	
TH2D-5	High Frequency Parasitic Effects for On-Wafer Packaging of RF MEMS Switches	1931
4:50 PM	A. Margomenos and L.P.B. Katehi	
TH2D-6	A Packaged, High-Lifetime Ohmic MEMS RF Switch	1935
5:00 PM	S. Majumder, J. Lampen, R. Morrison, and J. Maciel	

Session TH3D

Microwave and Millimeter-Wave Sensor Applications

3:30 – 5:10pm

Room 204A

Thursday, June 12, 2003

Chair: G.D. Hopkins, Georgia Tech Research Institute

Co-chair: H. Kondoh, Hitachi Central Research Lab

TH3D-1	A Novel Direct-Imaging Radar Sensor with Frequency Scanned Antenna	1941
3:30 PM	W. Mayer, M. Wetzel, and W. Menzel	
TH3D-2	Range Correlation Effect on ISM Band I/Q CMOS Radar for Non-Contact Vital Signs Sensing	1945
3:50 PM	A.D. Droitcour, O. Boric-Lubecke, V.M. Lubecke, J. Lin, and G.T.A. Kovacs	
TH3D-3	77GHz MMIC Transceiver Modules with Thick-Film Multi-Layer Ceramic Substrate for Automotive Radar Applications	1949
4:10 PM	H. Nagaishi, H. Shinoda, H. Kondoh, and K. Takano	
TH3D-4	A 24-GHz Tank Level Gauging System with State-Space Frequency Estimation and a Novel Adaptive Model Order Selection Algorithm	1953
4:30 PM	M. Pichler, P. Gulden, M. Vossiek, and A. Stelzer	

Session TH4D

Room 204C

Thursday, June 12, 2003

Chair: A. Gopinath, University of Minnesota
Co-chair: R. Sorrentino, University of Perugia

TH4D-1 3:30 PM	A Novel Effective Surface Impedance Formulation for Efficient Broadband Modeling of Lossy Thick Strip Conductors A. Rong, A.C. Cangellaris, and L. Dong	1959
TH4D-2 3:50 PM	Integral Equations and State Variables in the S-Domain Modeling of Passive Multilayered Components G. Conciauro, P. Arcioni, and M. Bressan	1963
TH4D-3 4:10 PM	MoL-Analysis of Periodic Structures L.A. Greda and R. Pregla	1967
TH4D-4 4:20 PM	Efficient MLFMA Analysis of Coupled Rectangular and Circular Apertures in a Finite Screen I. Rullhusen and F. Arndt	1971
TH4D-5 4:40 PM	Analysis of Substrate Integrated Slab Waveguides (SISW) by the BI-RME Method M. Bozzi, D. Deslandes, P. Arcioni, L. Perregrini, K. Wu, and G. Conciauro	1975
TH4D-6 4:50 PM	Fast Computation of MoM Matrix Elements over a Wide Frequency Range using a New Interpolation Technique J. Yeo and R. Mittra	1979
TH4D-7 5:00 PM	Analysis of Finite Microstrip Structures using an Efficient Implementation of the Integral Equation Technique F-D. Quesada-Pereira and A. Alvarez-Melcon	1983

Session TH5D

Room 202A

Thursday, June 12, 2003

Chair: R. York, University of California-Santa Barbara
Co-chair: C. Ruppel, EPCOS AG

TH5D-1 3:30 PM	A Reduced Intermodulation Distortion Tunable Ferroelectric Capacitor: Architecture and Demonstration Y-K. Yoon, D. Kim, M.G. Allen, and J.S. Kenney	1989
TH5D-2 3:50 PM	Compact Ferroelectric Reflection Phase Shifters at X-Band J.L. Serraiocco, P.J. Hansen, T.R. Taylor, J.S. Speck, and R.A. York	1993
TH5D-3 4:10 PM	Tunable Ferroelectric Components in LTCC Technology A.N. Deleniv, T. Hu, H. Jantunen, S. Leppävuori, and S. Gevorgian	1997
TH5D-4 4:20 PM	Bulk-Acoustic-Wave Filters: Performance Optimization and Volume Manufacturing R. Aigner, J. Kaitila, J. Ella, L. Elbrecht, W. Nessler, M. Handtmann, T-R. Herzog, and S. Marksteiner	2001
TH5D-5 4:40 PM	Comparison of Micromachined FBAR Band Pass Filters with Different Structural Geometry J.Y. Park, H.M. Lee, H.C. Lee, K.H. Lee, Y.J. Ko, J.H. Shin, S.H. Moon, and J.U. Bu	2005
TH5D-6 5:00 PM	Accurate Modeling and Simulation of SAW RF Filters M. Pitschi, J. Kiwitt, C. Ruppel, and K. Wagner	2009

Session TH6D

Advanced Millimeter-Wave Transceiver and Source Technology

3:30 – 5:10pm

Room 202B

Thursday, June 12, 2003

Chair: R. Emrick, Motorola Labs

Co-chair: F. Sullivan, Raytheon Systems

TH6D-1	A Compact Transceiver for Wide Bandwidth and High Power K-, Ka-, and V-Band Applications	2015
3:30 PM	D. Yamauchi, R. Quon, Y-H. Chung, M. Nishimoto, C. Romo, J. Swift, R. Grundbacher, D. Lee, and L.C. Liu	
TH6D-2	Fully Terminated Ka Band High Isolation, High Power MMIC SPDT Switch in GaAs PIN Technology	2019
3:50 PM	O. Levy, A. Madjar, D. Kryger, and S. Matarasso	
TH6D-3	A V-Band GaAs HEMT Uniplanar Monolithic Integrated Antenna and Receiver Front End	2023
4:00 PM	I-J. Chen, H. Wang, and P. Hsu	
TH6D-4	A New Millimeter-Wave Stripline Resonator With Embedded Air Cavities In LTCC Multilayer Structure	2027
4:20 PM	Y. Lee and C. Park	
TH6D-5	A Heterostructure Barrier Varactor Sideband Generator	2031
4:30 PM	H. Xu, J.L. Hesler, Y. Duan, T.W. Crowe, and R.M. Weikle, II	
TH6D-6	60GHz Ultra Compact Transmitter / Receiver with a Low Phase Noise PLL-Oscillator	2035
4:50 PM	A. Yamada, E. Suematsu, K. Sato, M. Yamamoto, and H. Sato	

Session THIF

Thursday Interactive Forum

1:30 – 4:30pm

Grand Hall

Thursday, June 12, 2003

Chair: A. Katz, The College of New Jersey

Co-chair: Z. Turski, Sarnoff Corp.

THIF-1	Leakage and Guidance Properties of Unbalanced Insulated NRD-Guide for Co-Layered Integrated Circuits	2041
1:30 PM	P. Yang, D. Li, and K. Wu	
THIF-2	The Propagation Characteristics of Substrate Integrated Waveguide Based on LTCC	2045
1:30 PM	H. Li, W. Hong, T. Cui, K. Wu, Y.L. Zhang, and L. Yan	
THIF-3	Analysis of Guided Wave Problems in Substrate Integrated Waveguides ;^a Numerical Simulations and Experimental Results	2049
1:30 PM	Y. Zhang, W. Hong, F. Xu, K. Wu, and T. Cui	
THIF-4	Mode Coupling Phenomenon in High Permittivity NRD Guide with Asymmetrically Remained Small Air Gap	2053
1:30 PM	F. Kuroki, K. Yamaoka, M. Yamaguchi, and T. Yoneyama	
THIF-5	Calculation and demonstration of dynamic behavior of time dependent electromagnetic field distribution in H-plane rectangular waveguide circuit	2057
1:30 PM	T. Hiraoka and J-P. Hsu	
THIF-6	Novel Artificial Embedded Circuit Meta-Material for Design of Tunable Electro-Ferromagnetic Permeability Medium	2061
1:30 PM	K. Sarabandi and H. Mosallaei	

THIF-7 1:30 PM	Modal Computation of Arbitrary Waveguides Composed of Linear, Circular and Elliptical Arcs S. Cogollos, S. Marini, P. Soto, H. Esteban, J.V. Morro, V.E. Boria, and B. Gimeno	2065
THIF-8 1:30 PM	TLM simulation of electromagnetic wave propagation in anisotropic moving media A.C. L. Cabeceira, I. Barba, A. Grande, and J. Represa	2069
THIF-9 1:30 PM	A New Radiation Boundary Condition for FDTD based on Self-Teleportation of fields R. Diaz and I. Scherbatko	2073
THIF-10 1:30 PM	Extending SPICE with FDTD and Generalized Characteristic Model for Coupled Microstrip Lines Simulation S. IP and F. Chang	2077
THIF-11 1:30 PM	A Composite-Cell Multiresolution Time-Domain Technique for Design of Electromagnetic Band-Gap and Via-Array Structures N.A. Bushyager, M. Tentzeris, and J. Papapolymerou	2081
THIF-12 1:30 PM	A Standard Cell Hardware Implementation for Finite-Difference Time Domain (FDTD) Calculation L. Verducci, P. Placidi, P. Ciampolini, A. Scorzoni, and L. Roselli	2085
THIF-13 1:30 PM	A Wavelet-Transformed FDTD Scheme with a static Multi-Resolution Grid A. Rennings, F. Wittmann, M. Walter, P. Waldow, and I. Wolff	2089
THIF-14 1:30 PM	An Effective 3-D Solver for MMIC Interconnects – EVFE Technique with PML W. Yao and Y. Wang	2093
THIF-15 1:30 PM	A hybrid approach for modeling complex antenna systems on vehicular platforms W. Thiel, L.P.B. Katehi, and K. Sabet	2097
THIF-16 1:30 PM	A Simplified Analytic CAD Model for Linearly Tapered Microstrip Lines C.L. Edwards, M.L. Edwards, S. Cheng, R. Stilwell, and C.C. Davis	2101
THIF-17 1:30 PM	A scalable model for the substrate resistance in multi-finger RF MOSFETs J. Han and H. Shin	2105
THIF-18 1:30 PM	Accurate Small-Signal Model and Its Parameter Extraction in RF Silicon MOSFETs J. Jang, Z. Yu, and R. Dutton	2109
THIF-19 1:30 PM	Modeling the Drain Current of the Dual-Gate GaAs MESFET M. Ibrahim, B. Syrett, and J. Bennett	2113
THIF-20 1:30 PM	A Scalable Model for Silicon Spiral Inductors A. Scuderi, T. Biondi, E. Ragonese, and G. Palmisano	2117
THIF-21 1:30 PM	Steady State Analysis Of Multitone Nonlinear Periodic Circuits In Wavelet Domain N. Soveiko and M. Nakhla	2121
THIF-22 1:30 PM	CAD Identification and Validation of a Non-Linear Dynamic Model for Performance Analysis of Large-Signal Amplifiers C. Florian, F. Filicori, D. Mirri, T.J. Brazil, and M. Wren	2125
THIF-23 1:30 PM	GMRES Preconditioners for Multivariate Steady-State Time-Domain Method A. Lehtovuori, J. Virtanen, and M. Valtonen	2129
THIF-24 1:30 PM	Modeling Nonlinear Behavior or Band-Pass Memoryless and Dynamic Systems J. Pedro, N. Carvalho, and P. Lavrador	2133
THIF-25 1:30 PM	Noise and Distortion Figure – An Extension of Noise Figure Definition for Nonlinear Devices P. Lavrador, N. de Carvalho, and J. Pedro	2137
THIF-26 1:30 PM	Multisine Excitation for ACPR Measurements K.A. Remley	2141
THIF-27 1:30 PM	Optimum Component Values for a Lossy Class E Power Amplifier P. Alinikula	2145
THIF-28 1:30 PM	Influence of time and processing mismatches between phase and envelope signals in linearization systems using Envelope Elimination and Restoration, application to hiperlan2 G. Baudoin, C. Berland, M. Villegas, and A. Diet	2149
THIF-29 1:30 PM	Efficient analysis of phase-locked loops through a novel time-frequency approach, based on two envelope transient formulations S. Sancho and A. Suárez	2153

THIF-30 1:30 PM	Nonlinear simulation techniques for the optimized design of push-push oscillators F. Ramírez, J. Garcia, T. Fernández, and A. Suarez	2157
THIF-31 1:30 PM	Folded Microstrip Resonator B.S. Virdee and C. Grassopolous	2161
THIF-32 1:30 PM	Inductance-Enhanced High-Impedance Surfaces for Broadband Simultaneous Switching Noise Mitigation in Power Planes T. Kamgaing and O.M. Ramahi	2165
THIF-33 1:30 PM	An Nth-harmonic Oscillator Using An N-push Coupled Oscillator Array with Voltage-clamping Circuits S-C. Yen and T-H. Chu	2169
THIF-35 1:30 PM	PLL and Injection Locked PLL (ILPLL) Operations of a Push-Pull Self Oscillating Mixer (SOM) M-R. Tofighi and A. Daryoush	2173
THIF-36 1:30 PM	Multi-harmonic generator based on the synchronization of a nonlinear bipolar oscillator E. de Cos, F.A. Ramírez, and A. Suárez	2177
THIF-37 1:30 PM	Efficiency Enhanced and Harmonic Suppressed Differential VCO with Novel Buffer Scheme using Transformers for IEEE 802.11a S-W. Yoon, S. Hong, and J. Laskar	2181
THIF-38 1:30 PM	Tunable, Ultra-Low Phase Noise YIG Based Opto-Electronic Oscillator D. Eliyahu and L. Maleki	2185
THIF-39 1:30 PM	A Low Phase Noise 19 GHz-band VCO using Two Different Frequency Resonators S. Hamano, K. Kawakami, and T. Takagi	2189
THIF-40 1:30 PM	Low Phase Noise Ku band Frequency Multiplied and Divided MMIC VCOs using InGaP/GaAs HBT Technology D. Baek, J. Kim, D. Kang, and S. Hong	2193
THIF-41 1:30 PM	An InGaP/GaAs Collector-up Tunneling-collector HBT and Sub-transistor Via-hole Structure for Small and Highly Efficient Power Amplifiers K. Tanaka, K. Mochizuki, C. Takubo, H. Matsumoto, T. Tanoue, and I. Ohbu	2197
THIF-42 1:30 PM	A 1 Watt, 3.2 VDC, High Efficiency Distributed Power PHEMT Amplifier Fabricated Using LTCC Technology L. Zhao, A. Pavio, and W. Thompson	2201
THIF-43 1:30 PM	High-efficiency Power Characteristics for WCDMA Applications of SiGe HBT Devices Using a Novel Form of Base-bias Resistance M. Kondo, I. Miyashita, M. Koshimizu, Y. Kagotoshi, H. Nagai, and K. Washio	2205
THIF-44 1:30 PM	MMIC Power Amplifier Adaptively Linearized With RF Coupled Active Bias Circuit For W-CDMA Mobile Terminals Applications J. Kim, J.H. Kim, Y.S. Noh, and C. Park	2209
THIF-45 1:30 PM	Single-Tone Optimisation of an Adaptive Bias Doherty Structure J. Lees, M. Goss, J. Benedikt, and P.J. Tasker	2213
THIF-46 1:30 PM	Power and Linearity Performance of a Cascode InGaP/GaAs HBT Distributed Amplifier for Instrument Applications L. Boglione	2217
THIF-47 1:30 PM	A Design of Predistortion HPA using Frequency Up-Conversion Mixing Operation G. Seo, J. Kim, Y. Jeong, and C.D. Kim	2221
THIF-48 1:30 PM	A W-band Ultra Low Noise Amplifier MMIC Using GaAs pHEMT N. Tanahashi, K. Kanaya, T. Matsuzuka, T. Katoh, Y. Notani, T. Ishida, T. Oku, T. Ishikawa, M. Komaru, and Y. Matsuda	2225
THIF-49 1:30 PM	A 38/77 GHz MMIC Transmitter Chip Set for Automotive Applications J. Udomoto, T. Matsuzuka, S. Chaki, K. Kanaya, T. Katoh, Y. Notani, T. Hisaka, T. Oku, T. Ishikawa, M. Komaru, and Y. Matsuda	2229
THIF-50 1:30 PM	25.5 to 76.5 GHz Active Frequency Tripler for Automotive Radar Applications D.L. Allen, D. Bryant, and W. Gaiowski	2233

THIF-51 1:30 PM	A Broadband Integrated LTCC Laminated Waveguide to Metallic Waveguide Transition Y. Huang and K-L. Wu	2237
THIF-52 1:30 PM	Millimeter-Wave Phase Shifters Utilizing Planar Integrated Schottky Barrier Diodes Z. Liu, J.C. Midkiff, and R. Weikle II	2241
THIF-53 1:30 PM	A Broadband 100 GHz Phase Switch/Mixer Using a Uniplanar Slotline Transition T. Gaier, D. Dawson, and M. Wells	2245
THIF-54 1:30 PM	Nonreciprocal GaAs Phase-Shifters and Isolators for Millimetric and Sub-Millimetric Wavelengths V. Mok and L.E. Davis	2249
THIF-55 1:30 PM	Application of CPW Based Spiral-Shaped Defected Ground Structure to The Reduction of Phase Noise in V-band MMIC Oscillator Y-T. Lee, J-S. Lim, S. Kim, J. Lee, S. Nam, K-S. Seo, and D. Ahn	2253
THIF-56 1:30 PM	High-Q LTCC Resonators For Millimeter Wave Applications A.M. El-Tager, J. Bray, and L. Roy	2257
THIF-57 1:30 PM	A 1V Monolithic Transformer-Coupled 30-Gb/s 2:1 Multiplexer in 120nm CMOS D. Kehrer, H-D. Wohlmuth, C. Kienmayer, and A.L. Scholtz	2261
THIF-58 1:30 PM	Novel Direct-Coupled Current Switch Architecture for a Series-Connected Voltage-Balancing Pulse Driver Y. Umeda, A. Kanda, and T. Enoki	2265
THIF-59 1:30 PM	Effect of Output Buffer Design on 40Gb/s Limiting Amplifiers Designed with InP HBT Technology G.E. Georgiou, V. Houtsma, R. Pullela, Q-H. Lee, A. Leven, J. Weiner, R. Kopf, A. Tate, Y. Yang, Y. Baeyens, and Y-K. Chen	2269
THIF-60 1:30 PM	Liquid Crystal Polymer (LCP) for Microwave/Millimeter Wave Multi-layer Packaging Z. Wei and A-v. Pham	2273
THIF-61 1:30 PM	High Performance Multilayered High Temperature Cofired Ceramic for Wide Band Packaging C. Tavernier, F. Valentin, M. Mazouz, R. Vigo, W. Muffato, P. Maeder, and M. Havasi	2277
THIF-62 1:30 PM	Microshield Transmission Line and Spiral Inductor Integrated on Polymer Thick Film J-H. Ko, S-H. Shin, and Y-S. Kwon	2281

