

1998 Microwave Symposium Technical Program Schedule

TU
1A

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Session TU1A

(Plenary Session)

Progress Through Microwaves

8:00 am–9:40 am

Ballroom

Tuesday, June 9, 1998

Chair: R. Kaul, Army Research Laboratory

TU1A-1	Satellite Communications: Services, Systems & Technologies	1
8:40 am	B.A. Pontano	
TU1A-2	RF/Microwave Applications in Medicine with Emphasis on RF Ablation for the	5
9:10 am	Treatment of Cardiac Arrhythmias	
	A. Rosen and A.J. Greenspon	

Session TU2A

Modeling and Optimization for Efficient CAD

10:10 am–11:50 am

Room 307/308

Tuesday, June 9, 1998

Chair: K.C. Gupta, University of Colorado

Co-Chair: M. Mongiardo, University of Perugia, Italy

TU2A-1	Development of Knowledge Based Artificial Neural Network Models for Microwave	9
10:10 am	Components	
	P.M. Watson, K.C. Gupta and R.L. Mahajan	
TU2A-2	A Neural Network Model for CAD and Optimization of Microwave Filters	13
10:30 am	P. Burrascano, M. Dionigi, C. Fancelli and M. Mongiardo	
TU2A-3	Unrestricted Arbitrary Shape Optimization Based On 3D Electromagnetic Simulation	17
10:50 am	A. Kozak and W.K. Gwarek	
TU2A-4	Multi-Dimensional Cauchy Method and Adaptive Sampling for an Accurate Microwave	21
11:00 am	Circuit Modelling	
	S. Peik, R. Mansour and Y.L. Chow	
TU2A-5	Identifying S-Parameter Models in the Laplace Domain for High Frequency Multiport	25
11:20 am	Linear Networks	
	A. Verschueren, Y. Rolain, R. Vuerinckx and G. Vandersteen	
TU2A-6	Multigrid Technique with Local Grid Refinement for Solving Static Field Problems	29
11:30 am	R. Kulke, Th. Sporkmann and I. Wolff	
TU2A-7	A CAD Algorithm for Coupling Between Dielectric Covered MMICS in Multi-Chip	33
11:40 am	Assemblies	
	Z. Wang and R.W. Jackson	

Session TU2B

(Joint RFIC and IMS Session)

Millimeter Wave MMICs for Receiver Applications

10:10 am–11:50 am

Room 309/310

Tuesday, June 9, 1998

Chair: H.-C. Huang, AMCOM Communications
Co-Chair: M. Kumar, Lockheed Martin

TU2B-1	GaInP/GaAs HBT Broadband Monolithic Transimpedance Amplifiers and Their High Frequency Small and Large Signal Characteristics	39
10:10 am	J.-W. Park, S. Mohammadi, D. Pavlidis, C. Dua, J.L. Guyaux and J.-C. Garcia	
TU2B-2	K/Ka-Band Low-Noise Embedded Transmission Line (ETL) MMIC Amplifiers	43
10:30 am	H.-Q. Tserng, L. Witkowski, A. Ketterson, P. Saunier and T. Jones	
TU2B-3	Integrated 1.55 μm Receivers Using GaAs MMICs and Thin Film InP Detectors	47
10:50 am	C. Chun, O. Vendier, E. Moon, J. Laskar, H.C. Ki, N.M. Jokerst and M. Brooke	
TU2B-4	A Ka-Band 4-Bit Monolithic Phase Shifter Using Unresonated FET Switches	51
11:10 am	K. Maruhashi, H. Mizutani and K. Ohata	
TU2B-5	A Wideband pHEMT Downconverter MMIC for Satellite Communication Systems	55
11:30 am	C.F. Campbell	

Session TU2C

(Focused Session)

RF and Microwave Implications of Digital TV Broadcasting: European, USA, and Japanese Standards

10:10 am–11:50 am

Room 314/317

Tuesday, June 9, 1998

Chair: G. Marzocchi, DBTA, Italy

TU2C-1	Digital Video Broadcasting Standards for Satellite, Terrestrial and Cable Television Transmission (Invited)	61
10:10 am	A. Mason	
TU2C-2	VSB Transmission System: Broadcast and Microwave Applications	67
10:30 am	W. Bretl, W. Luplow and G. Sgrignoli	
TU2C-3	Digital Video Broadcasting over Europe: A Review of Some Satellite Applications (Invited)	
10:50 am	M. Lopriore and C. Elia (Paper not available at time of printing)	
TU2C-4	Development of Satellite and Terrestrial Digital Broadcasting Systems in Japan	71
11:10 am	O. Yamada, H. Matsumura and M. Sasaki	

Session TU2D

(Joint RFIC and IMS Session)

ISM Cellular PCS ICs

10:10 am–11:50 am

Room 318/323

Tuesday, June 9, 1998

Chair: J. Moniz, IBM
Co-Chair: T. Tewksbury, IBM

TU2D-1	A 900MHz ISM Band Transceiver RF IC Chip Set and RF Module	77
10:10 am	C.-K. Lee, C.-C. Ku, K.-L. Su, C.-H. Lin and K.-C. Tao	
TU2D-2	GaAs RFICs for CDMA/AMPS Dual-Band Wireless Transmitters	81
10:30 am	V. Aparin, K. Gard, G. Klemens and C. Persico	
TU2D-3	A Bipolar Upconversion Modulation Loop Transmitter for Dual-Band Mobile Communications	85
10:50 am	S. Feng, B. Kolb, H. Herrmann, W. Veit, V. Thomas, S. Herzinger, F. Volpe, G. Lipperer and J. Fenk	
TU2D-4	IF-Band MMICs for High-Speed Wireless Signal Processing	89
11:10 am	H. Hayashi and M. Muraguchi	
TU2D-5	A High Dynamic Range, Digitally Tuned, Q-Enhanced LC Bandpass Filter for Cellular/PCS Receivers	93
11:30 am	W.B. Kuhn, N.K. Yanduru and A.S. Wyszynski	

TU
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3B

Session TU2E

Planar Components

10:10 am–11:50 am

Room 327/329

Tuesday, June 9, 1998

Chair: J. Taub, Consultant

TU2E-1	New Coplanar-Like Transmission Lines for Application in Monolithic Integrated Millimeter-Wave and Submillimeter-Wave Circuits	99
10:10 am	A. Reichelt and I. Wolff	
TU2E-2	An Hermetic Coplanar Waveguide-to-HDI Microstrip Microwave Feedthrough	103
10:30 am	E. Holzman, R. Teti, B. Dufour and S. Miller	
TU2E-3	W-Band Finite Ground Coplanar Waveguide (FGCPW) to Microstrip Line Transition	107
10:40 am	G.P. Gauthier, L.P. Katehi and G.M. Rebeiz	
TU2E-4	CPS Structure Potentialities for MMICs: A CPS/CPW Transition and a Bias Network	111
10:50 am	D. Prieto, J.C. Cayrou, J.L. Cazaux, T. Parra and J. Graffeuil	
TU2E-5	Micromachined Thick-Metal Coplanar Coupled-Line Filters and Couplers	115
11:00 am	T.L. Willke, E. Onggosanusi and S.S. Gearhart	
TU2E-6	Original Techniques for Designing Wideband 3D Integrated Couplers	119
11:10 am	Ch. Person, L. Carré, E. Rius, J. Ph. Coupez and S. Toutain	
TU2E-7	Simplified Design Technique for High Performance Microstrip Multi-Section Couplers	123
11:20 am	D. Lau, S.P. Marsh, L.E. Davis and R. Sloan	
TU2E-8	MEMS Designed for Tunable Capacitors	127
11:30 am	H.D. Wu, K.F. Harsh, R.S. Irwin, W. Zhang, A.R. Mickelson, Y.C. Lee and J.B. Dobsa	
TU2E-9	Low Loss Air-Gap Spiral Inductors for MMICs Using Glass Microbump Bonding Technique	131
11:40 am	J. Chuang, S. El-Ghazaly, N. El-Zein, V. Nair, G. Maracas and H. Gronkin	

Session TU3A

Modeling and Characterization of FETs and HEMTs

1:20 pm–3:00 pm

Room 307/308

Tuesday, June 9, 1998

Chair: I. Wolff, Duisburg University
Co-Chair: A.K. Sharma, TRW/S&EG

TU3A-1	A New Analytical and Scaleable Noise Model for HFET	137
1:20 pm	R. Reuter and F.J. Tegude	
TU3A-2	A Bias and Temperature Dependent Noise Model of Heterojunction Bipolar Transistors	141
1:40 pm	R.A. Pucel, T. Daniel, A. Kain and R. Tayrani	
TU3A-3	Technology Independent Degradation of Minimum Noise Figure due to Pad Parasitics	145
1:50 pm	C.E. Biber, M.L. Schmatz, T. Morf, U. Lott, E. Morifuji and W. Bächtold	
TU3A-4	Robust, Model-Independent Generation of Intrinsic Characteristics and	
2:00 pm	Multi-Bias Parameter Extraction for MESFETs/HEMTs	149
	A. Ghazinour and R.H. Jansen	
TU3A-5	Comparison of Quasi-2D and Ensemble Monte Carlo Simulations for Deep Submicron HEMTs	153
2:20 pm	C.G. Morton and C.M. Snowden	
TU3A-6	Extrinsic Elements Extraction of DG MESFET	157
2:40 pm	W.-K. Deng and T.-H. Chu	
TU3A-7	A Systematic Scheme for Power Amplifier Design Using a Multi-Harmonic	
2:50 pm	Loadpull Simulation Technique	161
	Q. Cai, J. Gerber and S. Peng	

Session TU3B

(Joint RFIC and IMS Session)

Wireless ICs and Circuits

1:20 pm–3:00 pm

Room 309/310

Tuesday, June 9, 1998

Chair: N. Camilleri, Advanced Micro Devices
Co-Chair: M.K. Ravel, Tektronix

TU3B-1	A 2-V Operation RF Front-End GaAs MMIC for PHS Hand-Set	167
1:20 pm	T. Seshita, K. Kawakyu, H. Wakimoto, M. Nagaoka, Y. Kitaura and N. Uchitomi	
TU3B-2	A 1.9GHz Single-chip RF Front-end GaAs MMIC with Low-Distortion Cascode	
1:40 pm	FET Mixer for Personal Handy-phone System Terminals	171
	M. Nakayama, K.-i. Horiguchi, K. Yamamoto, Y. Yoshii, S. Sugiyama, N. Suematsu and T. Takagi	
TU3B-3	A Monolithic Even Harmonic Quadrature Mixer Using a Balance Type 90	
2:00 pm	Degree Phase Shifter for Direct Conversion Receivers	175
	M. Shimozawa, K. Kawakami, H. Ikematsu, K. Itoh, N. Kasai, Y. Isota and O. Ishida	
TU3B-4	An 18 GHz Si Bipolar Mold Package Prescaler	179
2:20 pm	M. Mineo, M. Okamoto, K. Hosoki and H. Ohba	
TU3B-5	A Q-Factor Enhancement Technique for MMIC Inductors	183
2:40 pm	M. Danesh, J.R. Long, R.A. Hadaway and D.L. Harnme	

Session TU3C

Wireless Components and Systems

1:20 pm–3:00 pm

Room 314/317

Tuesday, June 9, 1998

Chair: B. Geller, David Sarnoff Research Center
Co-Chair: R. Gupta, COMSAT Laboratories

TU3C-1	Design and Verification of a SAW Based Chirp Spread Spectrum System	189
1:20 pm	M. Huemer, A. Pohl, W. Gugler, A. Springer, R. Weigel and F. Seifert	
TU3C-2	The Implementation of RTU and RSU Transceiver for WLL System	193
1:40 pm	Y.-J. Chong, S.-G. Kang, I.-K. Lee, B.-K. Kim and H.-J. Hong	
TU3C-3	Ultrafast Analog-to-Digital Converter Using Resonant-Tunneling Ternary Quantizers	197
2:00 pm	T. Itoh, T. Waho, J. Osaka, H. Yokoyama and M. Yamamoto	
TU3C-4	Intelligent RF Power Module Using Automatic Bias Control (ABC) System for PCS CDMA Applications	201
2:20 pm	T. Sato, S. Yuyama, A. Nakajima, H. Ono, A. Iwai, E. Hase and C. Kusano	
TU3C-5	A 900 MHz HBT Power Amplifier MMICs With 55% Efficiency, at 3.3 V Operation	205
2:40 pm	H. Asano, S. Hara and S. Komai	

Session TU3D

(Joint RFIC and IMS Session)

Millimeter Wave MMIC Technology

1:20 pm–3:00 pm

Room 318/323

Tuesday, June 9, 1998

Chair: M. Kumar, Lockheed Martin
Co-Chair: H.-C. Huang, AMCOM Communications

TU3D-1	A 44 GHz InP-Based HBT Double-Balanced Amplifier with Novel Current Re-Use Biasing	211
1:20 pm	K.W. Kobayashi, M. Nishimoto, L.T. Tran, H. Wang, J. Cowles, T.R. Block, J. Elliott, B. Allen, A.K. Oki and D.C. Streit	
TU3D-2	A 60 GHz 256 QAM Balanced Vector Modulator for Short Range LOS Communication Applications	215
1:40 pm	S. Nam, A.E. Ashtiani, G. Passiopoulos, S. Lucyszyn and I.D. Robertson	
TU3D-3	A Single-Chip 94-GHz Frequency Source Using InP-Based HEMT-HBT Integration Technology	219
2:10 pm	H. Wang, R. Lai, L. Tran, J. Cowles, Y.C. Chen, E.W. Lin, H.H. Liao, M.K. Ke, T. Block and H.C. Yen	
TU3D-4	Fully Integrated Q-Band MMIC Transmitter and Receiver Chips using Resistive PHEMT Mixers	223
2:30 pm	S. Nam, T. Gokdemir, A.H. Baree, I.D. Robertson, A.D. Plews, M.J. Howes, C.M. Snowden, J.G. Leckey, A.D. Patterson and J.A.C Stewart	
TU3D-5	Low Cost GaAs PHEMT MMICs for Millimeter-Wave Sensor Applications	227
2:50 pm	H.J. Siweris, A. Werthof, H. Tischer, U. Schaper, A. Schäfer, L. Verweyen, T. Grave, G. Böck, M. Schlechtweg and W. Kellner	

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Session TU3E

Waveguide Components

1:20 pm–3:00 pm

Room 314/317

Tuesday, June 9, 1998

Chair: S.M. Saad, The Aerospace Corporation

TU3E-1	Generalized Multilayer Anisotropic Dielectric Resonators	233
1:20 pm	C. Wang and K.A. Zaki	
TU3E-2	Attenuation and Power-Handling Capabilities of Generalized Ridge Waveguides	237
1:40 pm	Y. Rong and K.A. Zaki	
TU3E-3	Automated Design of a Novel Dual Mode Coupler for Compact Dual Polarization Beam Forming Networks	241
2:00 pm	F. Alessandri, R. Sorrentino, M. Schiocola and L. Vanni	
TU3E-4	Coaxial-Probe to Parallel-Plate Dielectric Waveguide Transition: Analysis and Experiment	245
2:20 pm	G.K.C. Kwan and N.K. Das	
TU3E-5	A Novel Wideband TM_{01}-to-TE_{11} Mode Convertor	249
2:30 pm	R.L. Eisenhart	
TU3E-6	Wideband Crossed-Guide Waveguide Directional Couplers	253
2:40 pm	P. Meyer and J.C. Kruger	
TU3E-7	A Novel Coplanar Transmission Line to Rectangular Waveguide Transition	257
2:50 pm	W. Simon, M. Werthen and I. Wolff	

Session TU4A

Nonlinear Simulation and Modeling

3:30 pm–5:10 pm

Room 307/308

Tuesday, June 9, 1998

Chair: R. Goyal, Airway Communications, Inc.
Co-Chair: R.H. Jansen, Aachen University of Technology

TU4A-1	Global Modeling of Microwave Devices Using Wavelets	263
3:30 pm	M. Toupikov, G. Pan and S. El-Ghazaly	
TU4A-2	Nonlinear Transient Simulation of Embedded Subnetworks Characterized by S-Parameters Using Complex Frequency Hopping	267
3:50 pm	R. Achar, M. Nakhla and E. Ahmed	
TU4A-3	Chaos Detection in Microwave Circuits Using Harmonic Balance Commercial Simulators	271
4:10 pm	A. Suárez and J.-M. Collantes	
TU4A-4	A New Approach for the Extraction of Spice Compatible Models from Measured Parameters of Microwave Circuits	275
4:20 pm	J.M. Gómez and J.I. Alonso	
TU4A-5	New Extraction Method for FET Extrinsic Capacitances Using Active Bias Conditions	279
4:30 pm	F. Lenk and R. Doerner	
TU4A-6	New Versatile Model: Accurate Prediction and Synthesis Ability for Arbitrary Geometry FET	283
4:40 pm	J. Dubouloy, J.F. Villemazet, V. Grognet, M. Soulard, D. Basquet and E. Bourdel	
TU4A-7	Small-Signal Distributed FET Modeling Through Electromagnetic Analysis of the Extrinsic Structure	287
4:50 pm	A. Cidronali, G. Collodi, A. Santarelli, G. Vannini and G. Manes	
TU4A-8	Reliable Extraction of Small-Signal Elements of a Generalized Distributed FET Model	291
5:00 pm	G. Kompa	

Session TU4B

(Joint RFIC and IMS Session)

Multi-function Millimeter Wave ICs

3:30 pm–5:10 pm

Room 309/310

Tuesday, June 9, 1998

Chair: Z. Bardai, Raytheon Systems
Co-Chair: H.A. Hung, TRW

TU4B-1	A 44 GHz Low Noise Block Downconverter MMIC Suitable for EHF Satellite	
3:30 pm	Communication Applications	297
	A.R. Barnes, D.C. Bannister and M.T. Moore	
TU4B-2	A Highly Integrated Multi-Functional Chip Set for Low Cost Ka-Band Transceiver	301
3:50 pm	D.L. Ingram, L. Sjogren, J. Kraus, M. Nishimoto, M. Siddiqui, S. Sing, K. Cha, M. Huang and R. Lai	
TU4B-3	V-Band Single Chip, Direct Carrier BPSK Modulation Transmitter with Integrated Patch Antenna	305
4:10 pm	G. Passiopoulos, S. Nam, A. Georgiou, A.E. Ashtiani, I.D. Robertson and E.A. Grindrod	
TU4B-4	A Ka-Band Monolithic Single-Chip Transceiver Using Sub-Harmonic Mixer	309
4:30 pm	Y.-L. Kok, M. Ahmadi, H. Wang, B.R. Allen and T. Lin	
TU4B-5	Millimeter-Wave Three-Dimensional Masterslice MMICS	313
4:50 pm	K. Nishikawa, K. Kamogawa, K. Inoue, K. Onodera, M. Hirano, T. Tokumitsu and I. Toyoda	

Session TU4C

(Focused Session)

Low Power RF/Microwave and Millimeter Wave Wireless Techniques

3:30 pm–5:10 pm

Room 314/317

Tuesday, June 9, 1998

Chair: T. Itoh, University of California, Los Angeles
Co-Chair: J.F. Harvey, US Army Research Office

TU4C-1	The Low Power Electronics Multidisciplinary Research Initiatives (MURI's)	
3:30 pm	J. Harvey (Paper not available at time of printing)	
TU4C-2	Microwave Amplifier Low Power Considerations	
3:40 pm	R. Trew (Paper not available at time of printing)	
TU4C-3	Low Voltage Electronics for Portable Wireless Applications: An Industrial Perspective	319
3:50 pm	M. Golio	
TU4C-4	Nonlinear Effects of Power Amplification on Multicarrier Spread Spectrum Systems	323
4:10 pm	V. Borich, J.-H. Jong, J. East and W.E. Stark	
TU4C-5	Device and Circuit Approaches for Improved Linearity and Efficiency in Microwave Transmitters	327
4:30 pm	P.M. Asbeck, T. Itoh, Y. Qian, M.F. Chang, L. Milstein, G. Hanington, P.F. Chen, V. Schultz, D.W. Lee and J. Arun	
TU4C-6	MEMS and Si-Micromachined Components for Low-Power, High-Frequency Communications Systems	331
4:50 pm	L.P.B. Katehi, G.M. Rebeiz and C.T.-C. Nguyen	

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Session TU4D

(Joint RFIC and IMS Session)

Transceiver ICs

3:30 pm–5:10 pm

Room 318/323

Tuesday, June 9, 1998

Chair: S. Kiaei, Motorola
Co-Chair: D. Lovelace, Motorola

TU4D-1	X-Band Si Bipolar Transistor Single-Chip Transceiver Using Three-Dimensional MMIC Technology	337
3:30 pm	I. Toyoda, K. Nishikawa, K. Kamogawa, C. Yamaguchi, M. Hirano, K. Onodera and T. Tokumitsu	
TU4D-2	Direct Conversion for Flex Paging Receivers—A Feasibility Study	341
3:50 pm	Z. Chen and J. Lau	
TU4D-3	A Si BJT RF Dual Band Receiver IC for DAB	345
4:10 pm	W. Titus, R. Croughwell, C. Schiller and L. DeVito	
TU4D-4	A Low Voltage RF Receiver for Digital Satellite Radio	349
4:30 pm	G. Cali, G. Cantone, P. Filoramo, G. Sirna, P. Vita and G. Palmisano	
TU4D-5	A Si BJT IF Downconverter/AGC IC for DAB	353
4:50 pm	M. Goldfarb, R. Croughwell, C. Schiller, D. Livezey and G. Heiter	
TU4D-6	RF Micromachined Varactors with Wide Tuning Range	357
5:00 pm	A. Dec and K. Suyama	

Session TU4E

Wireless and Satellite Applications of Superconductivity

3:30 pm–5:10 pm

Room 327/329

Tuesday, June 9, 1998

Chair: C. Jackson, TRW
Co-Chair: A. Fathy, Sarnoff Corporation

TU4E-1	High-Q Tunable YBCO Disk Resonator Filters for Transmitter Combiners in Radio Base Station	363
3:30 pm	B.A. Aminov, A. Baumfalk, H.J. Chaloupka, M. Hein, T. Kaiser, S. Kolesov, H. Piel, H. Medelius and E. Wikborg	
TU4E-2	8-Pole Superconducting Quasi-Elliptic Function Filter for Mobile Communications Application	367
3:50 pm	J.S. Hong, M.J. Lancaster, D. Jedamzik and R.B. Greed	
TU4E-3	Direct Synthesis of Tubular Bandpass Filters with Frequency-Dependent Inductors	371
4:10 pm	Q. Huang, J.-F. Liang, D. Zhang and G.-C. Liang	
TU4E-4	A Satellite Repeater Comprising Superconducting Filters	375
4:30 pm	T. Kässer, M. Klauda, C. Neumann, E. Guha, S. Kolesov, A. Baumfalk and H. Chaloupka	
TU4E-5	Novel Superconducting Ring Filter	379
4:50 pm	G. Tsuzuki, M. Suzuki, N. Sakakibara and Y. Ueno	