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Technical Program

MONDAY, JUNE 9, 2003

8:00 am–9:40 am

Room 103ABC

SESSION MO1A: 2003 RFIC SYMPOSIUM PLENARY

Chair: N. Camilleri, *RF & Wireless Design Services*

Co-Chair: S. L. Lloyd, *Skyworks Solutions, Inc.*

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10:10 am–11:50 am

Room 108AB

SESSION MO1B: RECEIVERS FOR 2G & 3G APPLICATIONS

Chair: J. Mondal, *Motorola, Inc.*

Co-Chair: F. Ali, *Nokia*

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Room 107AB

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MONDAY, JUNE 9, 2003

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Room 105AB

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Chair: K. Kornegay, *Cornell University*

Co-Chair: D.K. Shaeffer, *Big Bear Networks*

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MONDAY, JUNE 9, 2003

10:10 am–11:50 am

Room 104AB

SESSION MO4B: RF VCO's

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Co-Chair: Y. Deval, *Laboratories IXL*

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MONDAY, JUNE 9, 2003

1:20 pm–3:00 pm

Room 108AB

SESSION MO1C: NOVEL SMALL SIGNAL CIRCUITS

Chair: L. Boglione, *Aglient Technologies*

Co-Chair: V. Nair, *Motorola, Inc.*

MO1C-1 1:20 pm	23GHz Front-end Circuits in SiGe BiCMOS Technology Y. Li, M. Bao, M. Ferndahl*, and A. Cathelin†, <i>Ericsson AB, Ericsson Research, Mölndal, Sweden</i> ; * <i>Chalmers University of Technology, Microwave Electronics Laboratory, Göteborg, Sweden</i> ; † <i>STMicroelectronics, Crolles, France</i>	99
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Room 107AB

SESSION MO2C: POWER AMPLIFIERS FOR WIRELESS APPLICATIONS

Chair: T. Quach, *Motorola, Inc.*

Co-Chair: D. Ngo, *RFMD*

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Room 104AB

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Co-Chair: D. Nobbe, *Peregrine Semiconductor*

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Co-Chair: A. Jerng, *MIT*

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Room 107AB

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Co-Chair: R. Kagiwada, *Northrop Grumman*

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Room 105AB

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MONDAY, JUNE 9, 2003

3:30 pm–5:10 pm

Room 104AB

SESSION MO4D: ADVANCED VCOs AND SYNTHESIZERS

Chair: Y. Deval, *Laboratory IXL*

Co-Chair: S.L. Lloyd, *Skyworks Solutions, Inc.*

MO4D-1 3:30 pm	25 GHz Inductorless VCO in a 45 GHz SiGe Technology N. Saniei, H. Djahanshahi*, and C.A.T. Salama, <i>Edward S. Rogers Sr. Department of Electrical & Computer Engineering, University of Toronto, Toronto, ON, Canada;</i> <i>*PMC-Sierra, Inc., Burnaby, BC, Canada</i>	269
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TUESDAY, JUNE 10, 2003

10:10 am–11:50 am

Room 108AB

SESSION TU1B: RF VCO's AND SYNTHESIZERS

Chair: S. Heinen, *Aachen University of Technology*

Co-Chair: S.L. Lloyd, *Skyworks Solutions, Inc.*

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R. Murji and M.J. Deen, <i>McMaster University, Department of Electrical and Computer Engineering, Hamilton, Ontario</i> | 291 |
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J.-H. Chang, Y.-S. Youn*, M.-Y. Park*, and C.-K. Kim, <i>Department of EECS, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Republic of Korea;</i>
<i>*Electronics and Telecommunications Research Institute (ETRI), Daejeon, Republic of Korea</i> | 295 |
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S. Dosanjh, W. Kung*, T. Manku*, and C. Snyder*, <i>University of Waterloo, Waterloo, Ontario, Canada;</i> <i>*SiRiFIC Wireless Corporation, Waterloo, Ontario, Canada</i> | 299 |
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A. Gothandaraman and S.K. Islam, <i>Department of Electrical & Computer Engineering, University of Tennessee, Knoxville, TN</i> | 303 |
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10:10 am–11:50 am

Room 107AB

SESSION TU2B: OPTICAL SYSTEM IC'S

Chair: J. Ou, Intel

Co-Chair: L. Liu, Northrop Grumman

TU2B-1 10:10 am	(Invited) An Innovative Open-Loop CDR Based on Injection-Locked Oscillator for High-Speed Data Link Applications J.-B. Bégueret, Y. Deval, C. Scarabello, J.-Y. Le Gall*, and M. Pignol†, <i>IXL Laboratory, University of Bordeaux, France; *Alcatel Space Industries, DOB/TNN, Toulouse, France; CNES—DTS/AE/SEA/IL, Toulouse, France</i>	313
TU2B-2 10:40 am	A 10 Gb/s CDR in SiGe BiCMOS Commercial Technology with Multistandard Capability F. Centurelli*, A. Golfarelli†, J. Guinea, L. Masini†, D. Morigi†, M. Pozzoni, G. Scotti*, and A. Trifiletti*, <i>STMicroelectronics, Cornaredo, Italy; *Dipartimento di Ingegneria Elettronica, Università "La Sapienza" di Roma, Roma, Italy; †Laboratori Fondazione Guglielmo Marconi, Pontecchio Marconi, Italy</i>	317
TU2B-3 11:00 am	A SiGe 10-Gb/s Multi-Pattern Bit Error Rate Tester R. Malasani, C. Bourdé, and G. Gutierrez, <i>Centellax Inc., Carlsbad, CA</i>	321
TU2B-4 11:20 am	Novel High Gain and Broadband GaAs MMIC Distributed Amplifiers with Traveling-Wave Gain Stages K.-L. Deng, T.-W. Huang, and H. Wang, <i>Dept. of Electrical Engineering and Graduate Institute of Communication Engineering, National Taiwan University, Taipei, Taiwan</i>	325
TU2B-5 11:40 am	A Power-Efficient 33 GHz 2:1 Static Frequency Divider in 0.12-μm SOI CMOS J.-O. Plouchart, J. Kim, H. Recoules*, N. Zamdmer, Y. Tan, M. Sherony, A. Ray, and L. Wagner, <i>IBM Semiconductor Research and Development Center, Hopewell Junction, NY; *IBM Essonnes Components Technology Laboratory, Corbeil, France</i>	329

TUESDAY, JUNE 10, 2003

10:10 am–11:50 am

Room 105AB

SESSION TU3B: RFIC DEVICE TECHNOLOGIES

Chair: E. Reese, *Triquint*

Co-Chair: M. Kumar, *Lockheed Martin*

- | | | |
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| TU3B-1 | 1.14-GHz Self-Aligned Vibrating Micromechanical Disk Resonator | 335 |
| 10:10 am | J. Wang, Z. Ren, and C.T.-C. Nguyen, <i>Center for Wireless Integrated Microsystems (WIMS), Dept. of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI</i> | |
| TU3B-2 | Characterizing and Optimizing High Q Inductors for RFIC Design in Silicon Processes | 339 |
| 10:30 am | F. Rotella, D. Howard*, M. Racanelli*, and P. Zampardi, <i>Skyworks Solutions, Irvine, CA; *Jazz Semiconductor, Newport Beach, CA</i> | |
| TU3B-3 | A Highly Efficient Noise Suppression Technique for Si-based RFIC | 343 |
| 10:50 am | T.-S. Chen, C.-Y. Lee, C.-H. Kao, D.-S. Deng, C.-H. Wu, G.-W. Huang*, and K.-M. Chen*, <i>Semiconductor Lab, Chung-Cheng Institute of Technology, Taoyuan, Taiwan; *National Nano-Device Lab, Hsing-Chu, Taiwan</i> | |
| TU3B-4 | A Systematic Study of ESD Protection Structures for RF ICs | 347 |
| 11:10 am | G. Chen, H. Feng, and A. Wang, <i>Dept. of ECE, Illinois Institute of Technology, Chicago, IL</i> | |
| TU3B-5 | RF Modeling of Ball Grid Array Packages Using a Coupled Transmission Line Model | 351 |
| 11:30 am | Y.-L. Lai, C.-L. Wu*, and K. Chiang†, <i>Department of Mechatronics Engineering, National Changhua University of Education, Changhua, Taiwan; *Department of Electrical Engineering, National Chung Hsing University, Taichung, Taiwan; †R&D Division, Siliconware Precision Industries Co., Ltd., Taichung, Taiwan</i> | |

TUESDAY, JUNE 10, 2003

10:10 am–11:50 am

Room 104AB

SESSION TU4B: ACTIVE DEVICE MODELING

Chair: P. Murphy, *University College Cork*

Co-Chair: J. Staudinger, *Motorola*

TU4B-1 10:10 am	A Simple 4-Port Parasitic De-embedding Methodology for High-Frequency Characterization of SiGe HBTs Q. Liang, J.D. Cressler, G. Niu*, Y. Lu, G. Freeman†, D. Ahlgren†, R.M. Malladi§, K. Newton§, and D.L. Harame§, <i>School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA</i> ; *Auburn University, Auburn, AL; †IBM Microelectronics, Hopewell Junction, NY; §IBM Microelectronics, Essex Junction, VT	357
TU4B-2 10:30 am	Transient Analysis of Nonlinear Microwave Circuits Using Small-Signal Scattering Parameters P. Wang, V.S. Kaper, S.J. Richard, and E.C. Kan, <i>School of Electrical and Computer Engineering, Cornell University, Ithaca, NY</i>	361
TU4B-3 10:50 am	A Non-Quasi-Static Small-Signal MOSFET Model for Radio and Microwave Frequencies Including Spreading Gate Resistances and Capacitances W.J. Kordalski and T. Stefański*, <i>Gdańsk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Gdańsk</i> ; *R&D Marine Technology Centre, Gdynia	365
TU4B-4 11:10 am	Broadband Small-Signal Model and Parameter Extraction for Deep Sub-micron MOSFETs Valid up to 110 GHz M.T. Yang, P.P.C. Ho, Y.J. Wang, T.J. Yeh, and Y.T. Chia, <i>Taiwan Semiconductor Manufacture Company, Ltd., Hsin-Chu, Taiwan</i>	369
TU4B-5 11:30 am	The Minimum Noise Figure and Mechanism as Scaling RF MOSFETs from 0.18 to 0.13 μm Technology Nodes C.H. Huang, K.T. Chan, C.Y. Chen, A. Chin, G.W. Huang*, C. Tseng†, V. Liang†, J.K. Chen†, and S.C. Chien†, <i>Dept. of Electronics Eng., National Chiao Tung Univ., Hsinchu, Taiwan</i> ; *National Nano Device Lab, Hsinchu, Taiwan; †United Microelectronics Cooperation, Hsinchu, Taiwan	373
TU4B-6 11:40 am	Reliability Evaluation of Voltage Controlled Oscillators Based On a Device Degradation Sub-Circuit Model W.-C. Lin, L.-J. Du, and Y.-C. King, <i>Microelectronics Laboratory, Semiconductor Technology Application Research (STAR) Group, Department of Electrical Engineering, National Tsing-Hua University, Hsin-Chu, Taiwan</i>	377

TUESDAY, JUNE 10, 2003

1:20 pm–3:00 pm

Room 105AB

SESSION TU1C: TRANSCEIVERS FOR CELLULAR 2G AND 3G SYSTEMS

Chair: J.C. Rudel, *Berkana Wireless*

Co-Chair: F. Ali, *Nokia*

TU1C-1 1:20 pm	(Invited) Polaris Total Radio™, A highly Integrated RF Solution for GSM/GPRS and EDGE B. Wilkins, <i>RF Micro Devices, Scotts Valley, CA</i>	383
TU1C-2 1:40 pm	(Invited) Architecture and Performance Overview of a Highly Integrated 13×13mm Single-Package Radio (SPR) Module for Dualband EGSM900/GSM1800 Applications E. Ngompe, M. Ayvazian, M. Glasbrener, M. Megahed, N. Vakilian, and W. Domino, <i>Skyworks Solutions, Inc., Irvine, CA</i>	387
TU1C-3 2:00 pm	A Dual-band Tri-mode CDMA IF Receiver with Programmable Channel-Match Filter J. Cho, P. Good, M. Kamat, E. McCarthy, K. Rampmeier*, W. Cops†, A. El Moznine†, H. Truong, Y. He, D. Yates, G. Taskov, C.-H. Lee, D. Koh, and S. Lloyd, <i>Skyworks Solutions, Inc., Irvine, CA</i> ; * <i>RF Magic, Inc., San Diego, CA</i> ; † <i>Conexant Systems, Newport Beach, CA</i>	391
TU1C-4 2:20 pm	Fully Differential Direct Conversion Receiver for W-CDMA using an Active Harmonic Mixer H. Yoshida, T. Kato, T. Toyoda, I. Seto, R. Fujimoto, T. Kimura, O. Watanabe, T. Arai*, T. Itakura, and H. Tsurumi, <i>Corporate Research & Development Center, TOSHIBA Corp., Kawasaki, Japan</i> ; * <i>Toshiba Semiconductor Company, TOSHIBA Corp., Yokohama, Japan</i>	395
TU1C-5 2:40 pm	W-CDMA 1chip SiGe TX-IC with High Dynamic Range and Accurate Temperature Compensation VGA H. Nakamizo, T. Ueda, K. Ninomiya, Y. Takahashi, Y. Matsunami, H. Joba, K. Itoh, D.S. Malhi*, and D. Wang*, <i>Mobile Terminal Center, Mitsubishi Electric Corporation, Hyogo, Japan</i> ; * <i>Boston Design Center, TriQuint Semiconductor, Lowell, MA</i>	399

TUESDAY, JUNE 10, 2003

1:20 pm–3:00 pm

Room 107AB

SESSION TU2C: MIXERS AND MODULATORS FOR CELLULAR APPLICATIONS

Chair: D. Nobbe, *Peregrine Semiconductor*

Co-Chair: K. Ashby, *Microtune*

TU2C-1 1:20 pm	Highly Linear Upconverter MMIC Designs with Complete Package and Test Board Effects for CDMA Applications J.M. Wu, J.K. Jau, T.S. Horng, and C.C. Tu*, <i>Department of Electrical Engineering, National Sun Yat-Sen University, Taiwan; *Optimal Corporation, Kaohsiung Office, Kaohsiung, Taiwan</i>	405
TU2C-2 1:40 pm	A Low Noise Vector Modulator with Integrated Basebandfilter in 120 nm CMOS Technology M. Simon and R. Weigel, <i>Infineon Technologies, Munich, Germany; University Erlangen-Nuremberg, Erlangen, Germany</i>	409
TU2C-3 2:00 pm	High Linearity, Low Noise IF transmitter for WCDMA Application P. Filoramo, A. Granata, T. Chiarillo, P. Aliberti, G. Scuderi, P. De Vita, and S. Cosentino, <i>STMicroelectronics, Catania, Italy</i>	413
TU2C-4 2:20 pm	A Si/SiGe BiCMOS Mixer with 3rd-Order Nonlinearity Cancellation for WCDMA Applications (Student Paper) L. Sheng and L.E. Larson, <i>Center for Wireless Communications, University of California–San Diego, La Jolla, CA</i>	417
TU2C-5 2:40 pm	High Linearity CMOS SOI Mixer D. Lovelace, D. Lossner*, and D. Kelly†, <i>Standard Microsystems, Inc., Analog Technology Center, Phoenix, AZ; *Peregrine Semiconductor, San Diego, CA; †Lone Star RFIC, Keller, TX</i>	421

TUESDAY, JUNE 10, 2003

1:20 pm–3:00 pm

Room 105AB

SESSION TU3C: CHIP SETS FOR WIRELESS DATA APPLICATIONS

Chair: J. Lin, *Agere*

Co-Chair: B. Xavier, *National*

- | | | |
|----------------|---|------------|
| TU3C-1 | (Invited) A CMOS Dual-Band Tri-mode Chipset for IEEE 802.11a/b/g Wireless LAN | 427 |
| 1:20 pm | S. Mehta, M. Zargari, S. Jen, B. Kaczynski, M. Lee, M. Mack, S. Mendis, K. Onodera, H. Samavati, W. Si, K. Singh, M. Terrovitis, D. Weber, and D. Su, <i>Atheros Communications, Sunnyvale, CA</i> | |
| TU3C-2 | An RF CMOS Transmitter Integrating a Power Amplifier and a Transmit/Receive Switch for 802.11b Wireless Local Area Network Applications | 431 |
| 1:50 pm | R. Point*, Z. Li*†, W. Foley*, B. Ingersoll*, J. Borelli*, D. Segarra*, D. Donoghue*, C. Liss*, M. Mendes*, J. Feigin*, A. Georgiadis*, M. Valery*, E. Dawe*, D. Losanno*, R. Quintal*, M. Nikitin*, R. Jabor*, M. Morin*, K.K. O*†, and G. Dawe*, <i>*Global Communication Devices Inc., North Andover, MA; †Silicon Microwave Integrated Circuits and Systems Research Group, Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL</i> | |
| TU3C-3 | 5–6 GHz Monolithically Integrated Calibratable Low-Noise Downconverter for Smart Antenna Arrays | 435 |
| 2:10 pm | T. Brauner, R. Vogt, and W. Bächtold, <i>Laboratory for Electromagnetic Fields and Microwave Electronics, Swiss Federal Institute of Technology (ETH), Zürich, Switzerland</i> | |
| TU3C-4 | A Fully Integrated Variable Gain 5.75-GHz LNA with on chip Active Balun for WLAN | 439 |
| 2:30 pm | M.K. Raja, T.T.C. Boon, K.N. Kumar, and W.S. Jau, <i>Institute of MicroElectronics (IME), Singapore</i> | |
| TU3C-5 | A 4.9mW 270MHz CMOS Frequency Synthesizer/FSK Modulator | 443 |
| 2:50 pm | H. Choi, S. Shin, Y. Ku, M. Jeong, and K. Lee, <i>Dept. of EECS, Korea Advanced Institute of Science and Technology, Also with MICROS Research Center, Daejeon, Korea</i> | |

TUESDAY, JUNE 10, 2003

3:30 pm–5:10 pm

Room 108AB

SESSION TU1D: MIXERS FOR WIRELESS LAN AND BROADBAND APPLICATIONS

Chair: K. Ashby, *Microtune*

Co-Chair: D. Nobbe, *Peregrine Semiconductor*

TU1D-1 3:30 pm	A Broadband Upconverter Unit for a Cable-Modem Double-Conversion Receiver K. Stadius, A. Malinen, P. Paatsila*, and K. Halonen, <i>Electronic Circuit Design Laboratory, Helsinki University of Technology, Finland; *ATMEL Finland Design Center</i>	449
TU1D-2 3:50 pm	A 5-GHz Monolithic Silicon Bipolar Down-converter with a 3.2-dB Noise Figure A. Italia, E. Ragonese, G. Girlando*, and G. Palmisano, <i>Università di Catania, Facoltà di Ingegneria, Catania, Italia; *STMicroelectronics, Catania, Italia</i>	453
TU1D-3 4:10 pm	A High-Performance Low-Power CMOS Double-Balanced IQ Down-Conversion Mixer for 2.45-GHz ISM Band Applications C.G. Tan, <i>Institute of Microelectronics, Singapore</i>	457
TU1D-4 4:30 pm	A 17-GHz Direct Down-Conversion Mixer in a 47-GHz SiGe Process M.W. Lynch*†, C.D. Holdenried*†, and J.W. Haslett*†, <i>*Dept. of Electrical and Computer Engineering, University of Calgary, Alberta, Canada; †TRLabs—Wireless Research Centre, Calgary, Alberta, Canada</i>	461
TU1D-5 4:50 pm	A Differential Implementation of the CMOS Active-Load Body-Effect Mixer T. Taris, J.-B. Begueret, H. Lapuyade, and Y. Deval, <i>IXL Laboratory, University of Bordeaux, Talence, France</i>	465

TUESDAY, JUNE 10, 2003

3:30 pm–5:10 pm

Room 107AB

SESSION TU2D: DIVIDERS AND VCOS

Chair: Y. Deval, *Laboratory IXL*

Co-Chair: N. Camilleri, *RF & Wireless Design Services, Inc.*

TU2D-1 3:30 pm	A High Speed Dual Modulus Divider in SOI CMOS with Stacked Current Steering Phase Selection Architecture K. Mistry*, W. Redman-White*, J. Benson*, and N. D'Halleweyn*†, <i>*Microelectronics, ECS, University of Southampton, Highfield, Southampton, UK; †Now with Arnold & Siedsma, Antwerp, Belgium</i>	471.
TU2D-2 3:50 pm	A 2.4GHz Dual-Modulus Divide-by-127/128 Prescaler in 0.35μm CMOS Technology R.S. Rana and Z.C. Jian*, <i>Institute of Microelectronics, Singapore; *Now with Cadence Design Systems, Singapore</i>	475
TU2D-3 4:10 pm	A 17 GHz Dual-Modulus Prescaler in 120 nm CMOS H.-D. Wohlmuth*, D. Kehrer*†, R. Thüringer*†, and W. Simbürger*, <i>*INFINEON Technologies AG, Corporate Research, Munich, Germany; †Technical University Vienna, Institute of Communications and Radio-Frequency Engineering, Vienna, Austria</i>	479
TU2D-4 4:30 pm	A 5.84 GHz Tunable SAW Oscillator with Frequency Doubler for a DSRC System J. Steinkamp, F. Henkel, U. Stehr, C. Eube, P. Waldow, H. Uda*, H. Hayashi*, R. Kimura†, and K. Mizuno†, <i>IMST GmbH, Kamp-Lintfort, Germany; *Toyota Central R&D Labs., Inc., Aichi, Japan; †Denso Corporation, Aichi, Japan</i>	483
TU2D-5 4:50 pm	Monolithic Millimeterwave Frequency tripler using a 0.35 μm BiCMOS SiGe Technology A. Coustou*, D. Dubuc*, J. Graffeuil*¶, E. Tournier*¶, O. Llopis*, C. Boulanger§, R. Plana*¶, and I. Telliez†, <i>*LAAS CNRS, Toulouse; †STMicroelectronics, Crolles, Cedex; §CNES Toulouse; ¶Université P. Sabatier, Toulouse, France</i>	487

TUESDAY, JUNE 10, 2003

3:30 pm–5:10 pm

Room 204C

SESSION TU4D: (JOINT IMS-RFIC SESSION) FOCUSED SESSION—ULTRA-WIDEBAND COMMUNICATIONS & RADAR: ENTERING THE MARKETPLACE

Chair: G. Lyons, *MIT Lincoln Laboratory*

Co-Chair: R. Kaul, *Johns Hopkins University*

TU4D-1	(Invited) Ultrawideband—The Next Step in Short-Range Wireless	493
3:30 pm	D.G. Leeper, <i>Intel Corporation, Chandler, AZ</i>	
TU4D-2	(Invited) Challenges for Ultra-wideband (UWB) CMOS Integration	497
3:50 pm	G.R. Aiello, <i>Discrete Time Communications Inc., San Diego, CA</i>	
TU4D-3	(Invited) UWB Path Loss Characterization in Residential Environments	501
4:10 pm	S.S. Ghassemzadeh and V. Tarokh, <i>Senior Member, IEEE</i>	
TU4D-5	Ultra Wide Band 24GHz Automotive Radar Front-End	505
4:30 pm	I. Gresham, A. Jenkins, R. Egri, C. Eswarappa, F. Kolak, R. Wohlert, J. Bennett, and J-P. Lanteri, <i>M/A-COM Corporate Research and Development, Lowell, MA</i>	
TU4D-6	1.25Gbps Wireless Gigabit Ethernet Link at 60GHz-Band	509
4:50 pm	K. Ohata, K. Maruhashi, M. Ito, S. Kishimoto, K. Ikuina*, T. Hashiguchi*, K. Ikeda†, and N. Takahashi†, <i>Photonic and Wireless Devices Research Labs., NEC Corporation, Otsu, Japan; *Functional Materials Research Labs., NEC Corporation, Kawasaki, Japan; †NEC Engineering Ltd., Kawasaki, Japan</i>	

TUESDAY, JUNE 10, 2003

1:30 pm–4:30 pm

Grand Hall

SESSION IFTU: (JOINT WITH IMS) TUESDAY INTERACTIVE FORUM

Chair: A. Katz, *The College of New Jersey*

Co-Chair: Z. Turski, *Sarnoff Corp.*

IFTU-49 1:30 pm	Fully Integrated Sigma-Delta Synthesizer Suitable for “Indirect VCO Modulation” in 2.5G Application B. Bisanti, S. Cipriani, L. Carpineto, F. Coppola, E. Duvivier, N. Mouralis, D. Ercole, G. Puccio, V. Roussel, and S. Cercelaru, <i>Texas Instruments France, Villeneuve Loubet, France</i>	515
IFTU-50 1:30 pm	An Antenna Switch MMIC Using E/D Mode p-HEMT for GSM/DCS/PCS/WCDMA Bands Application H. Tosaka, T. Fujii, K. Miyakoshi*, K. Ikenaka, and M. Takahashi, <i>Microwave & Optoelectronic Device Division, New Japan Radio Co., Ltd.; *Semiconductor Technology Headquarters, New Japan Radio Co., Ltd.</i>	519
IFTU-51 1:30 pm	New Results on MMIC Six-Port’s used in Ka Band Direct Conversion Receivers S.O. Tatu, E. Moldovan, G. Brehm*, K. Wu, and R.G. Bosisio, <i>Poly-Grames Research Center, Département de Génie Electrique, École Polytechnique, Montréal, Qc., Canada; *TriQuint Semiconductor, Richardson, TX</i>	523
IFTU-52 1:30 pm	Design and Analysis of On-Chip Symmetric Parallel-Plate Coupled-Line Balun for Silicon RF Integrated Circuits H.Y.D. Yang and J.A. Castaneda, <i>Broadcom Corporation, El Segundo, CA</i>	527
IFTU-53 1:30 pm	Analysis and Verification on Side Effect of Anti-Backlash Delay in Phase-Frequency Detector X. Zhang, <i>Munich, Germany</i>	531
IFTU-54 1:30 pm	A CMOS Voltage-to-Frequency Linearizing Preprocessor for Parallel Plate RF MEMS Varactors M.S. McCorquodale, M.K. Ding, and R.B. Brown, <i>Department of Electrical Engineering and Computer Science, Solid State Electronics Laboratory, University of Michigan, Ann Arbor, MI</i>	535
IFTU-55 1:30 pm	Third Generation Wireless Signal Profiling C.Y. Ho*, T.K.K. Lam, and V.N. Tran*, <i>*Microwave Group; Industrial Research Institute Swinburne, Swinburne University of Technology, Melbourne, Australia</i>	539
IFTU-56 1:30 pm	Characterization and Modeling of Size Effect on the Performances of 0.10 μm RF MOSFETs for SOC Applications Y.-S. Lin*, H.-Y. Tu, H.-W. Chiu, and S.-S. Lu, <i>*Department of Electrical Engineering, National Chi-Nan University, Puli, Taiwan, R.O.C.; Department of Electrical Engineering, National Taiwan University, Taipei, Taiwan, R.O.C.</i>	543
IFTU-57 1:30 pm	Design and Modeling of a High-Q On-Chip Hairpin Inductor for RFIC Applications W. Ni, X. Yuan, Y.V. Tretiakov*, R. Groves†, and L.E. Larson§, <i>IBM La Jolla Foundry Application Center, IBM Microelectronics, San Diego, CA; *IBM Microelectronics, Essex Junction, VT; †IBM Microelectronics, Hopewell Junction, NY; §University of California of San Diego, La Jolla, CA</i>	547

IFTU-58 1:30 pm	Design Techniques to Combat Process, Temperature and Supply Variations in Bluetooth RFIC Y.T. Tee, Y.H. Seng, L.P. Boon, T.K. Hung, S. Tachi, K.S. Ling, T. Murakami, S.J. Hui, L.C. Tiong, T.L. Choon, W.W. Kheng, X.Q. Jun, L.C. Meng, L.S. Hwi, X. Wei, and M. Itoh, <i>RFIC Development & Design Department, OKI Techno Centre (Singapore) Pte Ltd, Teletech Park, Singapore Science Park II, Singapore</i>	551
IFTU-59 1:30 pm	Wideband CMOS Integrated RF Combiner for LINC Transmitters S. Hamed-Hagh, C.A.T. Salama, Edward S. Rogers Sr. <i>Department of Electrical and Computer Engineering, University of Toronto, Ontario, Canada</i>	555
IFTU-60 1:30 pm	Second Order Nonlinearity Analysis of Gilbert Mixer S. Kang and B. Kim*, <i>RF/Analog PT System LSI Division, Device Solution Network, Samsung Electronics CO., LTD., Gyeonggi, Korea</i> ; * <i>Department of Electronic and Electrical Engineering and Microwave Application Research Center, Pohang University of Science and Technology, Pohang, Kyungpuk, Korea</i>	559
IFTU-61 1:30 pm	Improving the Isolation of GPS Receivers for Integration with Wireless Communication Systems S. Spiegel, A. Thiel, S. Nussbaumer, I. Kovacs, and M. Durler, <i>u-blox AG, Thalwil, Switzerland</i>	563
IFTU-62 1:30 pm	An Improved but Reliable Model for MESFET Parasitic Capacitance Extraction B.L. Ooi and J.Y. Ma, <i>Department of Electrical and Computer Engineering, National University of Singapore, Singapore</i>	567
IFTU-63 1:30 pm	Straightforward Transient & Noise Analysis for $\Sigma\Delta$ PLL-Based Synthesizers of Multiple Feedback and Feedforward Structures K.S.H. Tsang and T.S. Ng, <i>Department of Electrical & Electronic Engineering, The University of Hong Kong, Hong Kong</i>	571
IFTU-64 1:30 pm	RF Circuit Design in Reliability E. Xiao and J.S. Yuan, <i>Chip Design and Reliability Laboratory, School of Electrical Engineering and Computer Science, University of Central Florida, Orlando, FL</i>	575
IFTU-65 1:30 pm	Piecewise Continuous Linear Interpolation of the Sine Function for Direct Digital Frequency Synthesis J.M.P. Langlois and D. Al-Khalili, <i>Department of Electrical and Computer Engineering, Royal Military College of Canada, Kingston (Ontario), Canada</i>	579
IFTU-66 1:30 pm	An Integrated Wideband-IF-Receiver Architecture for Mobile Terminals R. Richter, and H.-J. Jentschel, <i>Dresden University of Technology, Dresden, Germany</i>	583
IFTU-67 1:30 pm	Multiple-Chip Module Design Optimizations Using A Novel Layout Parameterization Technique C.-W.P. Huang, G.S. Dow, J. Bao, S. Kuran, and J. Sercu*, <i>ANADIGICS, Inc., Warren, NJ</i> ; * <i>Agilent Technologies, EEsof EDA, Ghent, Belgium</i>	587
IFTU-68 1:30 pm	High-Performance Three-Dimensional On-Chip Inductors in SOI CMOS Technology for Monolithic RF Circuit Applications J. Kim, J.-O. Plouchart*, N. Zamdmer, N. Fong†, L.-H. Lu, Y. Tan, K.A. Jenkins*, M. Sherony, R. Groves, M. Kumar, and A. Ray, <i>IBM Semiconductor Research and Development Center, Hopewell Junction, NY</i> ; * <i>IBM T.J. Watson Research Center, Yorktown Height, NY</i> ; † <i>Carleton University, Department of Electronics, Ottawa, Ontario, Canada</i>	591

IFTU-69 1:30 pm	Non-Ideality Analysis of Clock-Jitter Suppressing Sampler for Wideband $\Sigma\Delta$ Analog-to-Digital Converters A. Strak and H. Tenhunen, <i>Laboratory of Electronics and Computer Systems, Royal Institute of Technology, Kista, Sweden</i>	595
IFTU-70 1:30 pm	Symmetric 3D Passive Components for RF ICs Application W.-Z. Chen* and W.-H. Chen, <i>*Department of Electronics Engineering, National Chiao-Tung University, Hsin-Chu, Taiwan; Department of Electrical Engineering, National Central University, Chung-Li, Taiwan</i>	599
IFTU-71 1:30 pm	Monolithic Supply Modulated RF Power Amplifier and DC-DC Power Converter IC S. Abedinpour, I. Deligoz, J. Desai, M. Figiel, and S. Kiaei, <i>College of Engineering and Applied Sciences, Electrical Engineering, Arizona State University, Tempe, AZ</i>	603
IFTU-72 1:30 pm	Toroidal Inductors for Integrated Radio Frequency and Microwave Circuits J. Suryanarayanan, W.Y. Liu*, J. Nath, B.N. Johnson†, S. Mohammadi*, L.P.B. Katehi§, and M.B. Steer, <i>Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC; *Radiation Laboratory, Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI; †Department of Chemical Engineering, University of Michigan, Ann Arbor, MI; §Schools of Engineering, West Lafayette, IN</i>	607
IFTU-73 1:30 pm	CMOS-Compatible RF-MEMS Tunable Capacitors A. Oz* and G.K. Fedder*†, <i>*Department of Electrical and Computer Engineering; †The Robotics Institute MEMS Laboratory, Carnegie Mellon University, Pittsburgh, PA</i>	611
IFTU-74 1:30 pm	The Performance Comparison of CMOS Vs Bipolar VCO In SiGe BiCMOS Technology D. Wang and X. Wang, <i>TriQuint Semiconductor, Boston Design Center, Lowell, MA</i>	615
IFTU-75 1:30 pm	A High Isolation CMFB Downconversion Micromixer Using 0.18-μm Deep N-well CMOS Technology C.C. Meng, S.K. Xu*, T.H. Wu*, M.H. Chao†, and G.W. Huang†, <i>Department of Communications Engineering, National Chiao Tung University, Hsin-Chu, Taiwan, R.O.C.; *Department of Electrical Engineering, National Chung-Hsing University, Taichung, Taiwan, R.O.C.; †National Nano Device Laboratories, Hsin-Chu, Taiwan, R.O.C.</i>	619
IFTU-76 1:30 pm	The Design of 5 GHz Voltage Controlled Ring Oscillator Using Source Capacitively Coupled Current Amplifier R. Tao and M. Berroth, <i>Institute of Electrical and Optical Communication Engineering, University of Stuttgart, Stuttgart, Germany</i>	623
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