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**Sunday, 2 June 2013**

**18:00**
Washington State Convention Center (WSCC) — Room 6BC

**RFIC Plenary**
Chair: Jacques C. Rudell, University of Washington  
Co-Chair: Lawrence Kushner, BAE Systems  
Co-Chair: Bertan Bakkaloglu, Arizona State University

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<td>Welcome Message from General and TPC Chairs, Student Paper Awards</td>
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<td>18:30</td>
<td>RSU5A-1</td>
<td>Wireless Spectrum Challenges &amp; Opportunities: Maximizing Assets for Growth</td>
<td>Neville Ray, T-Mobile</td>
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<td>RSU5A-2</td>
<td>Microwave Technologies: The First Century</td>
<td>Barrie Gilbert, Analog Devices Inc.</td>
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**19:30**
Washington State Convention Center (WSCC) — Room 6E

RFIC Reception
Monday, 3 June 2013
08:00–09:40
Room 618-620
Session RMO1A: Low-Power Pulse-Based Radios
Chair: Gernot Hueber, NXP Semiconductors
Co-Chair: Pedram Mohseni, Case Western Reserve University

**RMO1A-1 08:00**
A High-Resolution Short-Range CMOS Impulse Radar for Human Walk Tracking
Piljae Park, Sungdo Kim, Sungchul Woo, Cheonsoo Kim
ETRI, Korea

**RMO1A-2 08:20**
An All-Digital IR-UWB Transmitter with a Waveform-Synthesis Pulse Generator in 90nm CMOS for High-Density Brain Monitoring
Ali Ebrazeh, Pedram Mohseni
Case Western Reserve University, USA

**RMO1A-3 08:40**
A 0.32nJ/bit Noncoherent UWB Impulse Radio Transceiver with Baseband Synchronization and a Fully Digital Transmitter
Ashutosh Mehra¹, Martin Sturm¹, Dan Hedin², Ramesh Harjani¹
¹University of Minnesota, USA, ²Advanced Medical Electronics, USA

**RMO1A-4 09:00**
A 0.7V Intermittently Operating LNA with Optimal On-Time Controller for Pulse-Based Inductive-Coupling Transceiver
Teruo Jyo, Tadahiro Kuroda, Hiroki Ishikuro
Keio University, Japan
Monday, 3 June 2013
08:00–09:40
Room 611-612
Session RMO1C: Phase Noise Reduction Techniques
Chair: Timothy M. Hancock, MIT Lincoln Laboratory
Co-Chair: Kamran Entesari, Texas A&M University

RMO1C-1 08:00
A Wideband Voltage-Biased LC Oscillator with Reduced Flicker Noise Up-Conversion
F. Pepe, A. Bonfanti, S. Levantino, C. Samori, A.L. Lacaita
Politecnico di Milano, Italy

RMO1C-2 08:20
A 220dB FOM, 1.9GHz Oscillator Using a Phase Noise Reduction Technique for High-Q Oscillators
Kannan Sankaragomathi¹, Lori Callaghan², Richard Ruby², Brian Otis¹
¹University of Washington, USA, ²Avago Technologies, USA

RMO1C-3 08:40
A Current-Reuse Class-C LC-VCO with an Adaptive Bias Scheme
Teerachot Siriburanon, Wei Deng, Kenichi Okada, Akira Matsuzawa
Tokyo Institute of Technology, Japan

RMO1C-4 09:00
A 0.5V, 2.41GHz, 196.3dBc/Hz FoM Differential Colpitts VCO with an Output Voltage Swing Exceeding Supply and Ground Potential Requiring No Additional Inductor
Joo-Myoung Kim, Seong-Joong Kim, Seok-Kyun Han, Sang-Gug Lee
KAIST, Korea

RMO1C-5 09:20
Ultra-Low Phase Noise 7.2–8.7GHz Clip-and-Restore Oscillator with 191dBc/Hz FoM
Masoud Babaie¹, Akshay Visweswaran¹, Zhuohiao He², Robert Bogdan Staszewski¹
¹Technische Universiteit Delft, The Netherlands, ²HiSilicon, China
Session RMO1D: Active and Passive Device Modeling for RFIC Applications
Chair: Francis Rotella, Peregrine Semiconductor
Co-Chair: Harish Krishnaswamy, Columbia University

RM01D-1 08:00
HF Mismatch Characterization and Modeling of Bipolar Transistors for RFIC Design
Tzung-Yin Lee, Yuh-Yue Chen
Skyworks Solutions Inc., USA

RM01D-2 08:20
CMOS RF Noise, Scaling, and Compact Modeling for RFIC Design
Angelos Antonopoulos¹, Matthias Bucher¹, Konstantinos Papathanasiou¹, Nikolaos Makris¹, Rupendra K. Sharma¹, Paulius Sakalas², Michael Schröter²
¹Technical University of Crete, Greece, ²Technische Universität Dresden, Germany

RM01D-3 08:40
An Automatic Parameter Extraction and Scalable Modeling Method for Transformers in RF Circuit
Jian Yao, Zuochang Ye, Yan Wang
Tsinghua University, China

RM01D-4 09:00
A 12ps True-Time-Delay Phase Shifter with 6.6% Delay Variation at 20–40GHz
Qian Ma, Domine M.W. Leenaerts, R. Mahmoudi
Technische Universiteit Eindhoven, The Netherlands
Monday, 3 June 2013
10:10–11:50
Room 618-620

Session RMO2A: Low-Power Transceivers for Wireless Applications
Chair: Li-Wu Yang, Shanghai Jiao Tong University
Co-Chair: Jenshan Lin, University of Florida

RMO2A-1  10:10
A PLL-Based BFSK Transmitter with Reconfigurable and PVT-Tolerant Class-C PA for MedRadio & ISM (433MHz) Standards
Karthik Natarajan, Daibashish Gangopadhyay, David Allstot
University of Washington, USA

RMO2A-2  10:30
A Low Power Miniaturized 1.95mm² Fully Integrated Transceiver with fastPLL Mode for IEEE 802.15.4 / Bluetooth Smart and Proprietary 2.4GHz Applications
Franz Pengg, David Barras, Martin Kucera, Nicola Scolari, Alexandre Vouilloz
CSEM, Switzerland

RMO2A-3  10:50
A 1.9nJ/bit, 5Mbps Multi-Standard ISM Band Wireless Transmitter Using Fully Digital PLL
Sudipto Chakraborty¹, Viral Parikh¹, Swaminathan Sankaran¹, Tomas Motos¹, Indu Prathapan¹, Krishnaswamy Nagaraj¹, Frank Zhang², Oddgeir Fikstvedt¹, Ryan Smith¹, Srividya Sundar¹, Danielle Griffith¹, Patrick Cruise¹
¹Texas Instruments Incorporated, USA, ²NVIDIA Incorporated, USA

RMO2A-4  11:10
Jaesik Lee¹, Inseop Lee¹, Jubong Park², Junho Moon², Seungsoo Kim², Jaeyoung Lee²
¹Navitas Solutions, USA, ²Navitas Solutions, Korea
### RMO2B-1 10:10
A Receiver with In-Band $I_{P3}>20$dBm, Exploiting Cancelling of OpAmp Finite-Gain-Induced Distortion via Negative Conductance
Dlovan H. Mahrof, Eric A.M. Klumperink, Mark S. Oude Alink, Bram Nauta
University of Twente, The Netherlands

### RMO2B-2 10:30
A Current-Mode mm-Wave Direct-Conversion Receiver with 7.5GHz Bandwidth, 3.8dB Minimum Noise-Figure and $+1$dBm $P_{1dB, out}$ Linearity for High Data Rate Communications
Hao Wu$^1$, Ning-Yi Wang$^2$, Yuan Du$^1$, Yen-Cheng Kuan$^1$, Frank Hsiao$^1$, Sheau-Jiung Lee$^1$, Ming-Hsien Tsai$^3$, Chewn-Pu Jou$^3$, Mau-Chung Frank Chang$^1$
$^1$University of California at Los Angeles, USA, $^2$Broadcom, USA, $^3$TSMC, Taiwan

### RMO2B-3 10:50
Co-Design of 60GHz Wideband Front-End IC with On-Chip Tx/Rx Switch Based on Passive Macro-Modeling
Lixue Kuang$^1$, Baoyong Chi$^1$, Haikun Jia$^1$, Zuochang Ye$^1$, Wen Jia$^2$, Zhihua Wang$^1$
$^1$Tsinghua University, China, $^2$RITS, China

### RMO2B-4 11:10
A 0.18-$\mu$m CMOS Fully Integrated Antenna Pulse Transceiver with Leakage-Cancellation Technique for Wide-Band Microwave Range Sensing Radar
Nguyen Ngoc Mai Khanh, Kunihiro Asada
University of Tokyo, Japan

### RMO2B-5 11:30
245GHz Subharmonic Receivers in SiGe
Yanfei Mao$^1$, K. Schmalz$^2$, J. Borngräber$^1$, J. Christoph Scheytt$^2$, Chafik Meliani$^1$
$^1$IHP, Germany, $^2$Universität Paderborn, Germany
Monday, 3 June 2013
10:10–11:50
Room 611-612
Session RMO2C: Frequency Generation Circuits
Chair: Jaber Khoja, Qualcomm
Co-Chair: Chun-Ming Hsu, IBM

RMO2C-1 10:10
A mm-Wave FMCW Radar Transmitter Based on a Multirate ADPLL
Wanghua Wu¹, Xuefei Bai², Robert Bogdan Staszewski¹, John R. Long¹
¹Technische Universiteit Delft, The Netherlands, ²USTC, China

RMO2C-2 10:30
A 440-μW 60-GHz Injection-Locked Frequency Divider in 65nm CMOS
Yue Chao, Howard C. Luong
HKUST, China

RMO2C-3 10:50
An Automatically Placed-and-Routed ADPLL for the MedRadio Band Using PWM to Enhance DCO Resolution
Muhammad Faisal, David D. Wentzloff
University of Michigan, USA

RMO2C-4 11:10
A 2.4-GHz Low Power High Performance Frequency Synthesizer Based on Current-Reuse VCO and Symmetric Charge Pump
Ye Zhang, Lei Liao, Muh-Dey Wei, Jan Henning Mueller, Bastian Mohr, Aytac Atac, Yifan Wang, Martin Schleyer, Ralf Wunderlich, Renato Negra, Stefan Heinen
RWTH Aachen University, Germany

RMO2C-5 11:30
A 73.9–83.5GHz Synthesizer with -111dBc/Hz Phase Noise at 10MHz Offset in a 130nm SiGe BiCMOS Technology
J.-O. Plouchart, Mark Ferriss, Bodhisatwa Sadhu, Mihai Sanduleanu, Benjamin Parker, Scott Reynolds
IBM, USA
Monday, 3 June 2013
10:10–11:50
Room 613-614
Session RMO2D: Mobile & Wireless Connectivity
Chair: Julian Tham, Broadcom
Co-Chair: Li Lin, Marvell Semiconductor

RMO2D-1 10:10
A 60nm WiFi/BT/GPS/FM Combo Connectivity SOC with Integrated Power Amplifiers, Virtual SP3T Switch, and Merged WiFi-BT Transceiver
Chia-Hsin Wu1, Tsung-Ming Chen1, Wei-Kai Hong1, Chih-Hsien Shen1, Jui-Lin Hsu1, Jen-Che Tsai1, Kuo-Hao Chen1, Yi-An Li1, Sheng-Hao Chen1, Chun-Hao Liao1, Hung-Pin Ma1, Hui-Hsien Liu1, Min-Shun Hsu1, Sheng-Yuan Su1, Albert Jerng2, George Chien2
1MediaTek, Taiwan, 2MediaTek, USA

RMO2D-2 10:30
Novel Silicon-on-Insulator SP5T Switch-LNA Front-End IC Enabling Concurrent Dual-Band 256-QAM 802.11ac WLAN Radio Operations
Chun-Wen Paul Huang, Joe Soricelli, Lui Lam, Mark Doherty, Phil Antognetti, William Vaillancourt
Skyworks Solutions Inc., USA

RMO2D-3 10:50
A Digitally-Calibrated 20-Gb/s 60-GHz Direct-Conversion Transceiver in 65-nm CMOS
Seitaro Kawai, Ryo Minami, Yuki Tsukui, Yasuaki Takeuchi, Hiroki Asada, Ahmed Musa, Rui Murakami, Takahiro Sato, Qinghong Bu, Ning Li, Masaya Miyahara, Kenichi Okada, Akira Matsuzawa
Tokyo Institute of Technology, Japan

RMO2D-4 11:10
A Low-Current Digitally Predistorted 3G-4G Transmitter in 40nm CMOS
Manel Collados1, Hongli Zhang2, Bernard Tenbroek1, Hsiang-Hui Chang1
1MediaTek, UK, 2MediaTek, Singapore, 3MediaTek, Taiwan

RMO2D-5 11:30
A Passive Mixer-First Receiver Front-End without External Components for Mobile TV Applications
Inyoung Choi, Bumman Kim
POSTECH, Korea
Session RMO3A: Advances in RF Data Converter Circuits
Chair: Eric Fogleman, MaxLinear
Co-Chair: Ed Balboni, Analog Devices Inc.

**RMO3A-1  13:30**
**A 2-D GRO Vernier Time-to-Digital Converter with Large Input Range and Small Latency**
Ping Lu¹, Pietro Andreani¹, Antonio Liscidini²
¹Lund University, Sweden, ²University of Toronto, Canada

**RMO3A-2  13:50**
**A 130nm CMOS Polar Quantizer for Cellular Applications**
Peyman Nazari, Byung-Kwan Chun, Vipul Kumar, Eric Middleton, Zheng Wang, Payam Heydari
University of California at Irvine, USA

**RMO3A-3  14:10**
**A 6GHz Input Bandwidth 2V_{pp-diff} Input Range 6.4 GS/s Track-and-Hold Circuit in 0.25µm BiCMOS**
Matthias Buck¹, Markus Grözing¹, Manfred Berroth¹, Michael Epp², Sébastien Chartier²
¹Universität Stuttgart, Germany, ²Cassidian, Germany

**RMO3A-4  14:30**
**A 10-b, 300-MS/s Power DAC with 6-V_{pp} Differential Swing**
Mohammad S. Mehrjoo, James F. Buckwalter
University of California at San Diego, USA

**RMO3A-5  14:50**
**A 2×13-bit All-Digital I/Q RF-DAC in 65-nm CMOS**
Morteza S. Alavi, George Voicu, Robert Bogdan Staszewski, Leo C.N. de Vreede, John R. Long
Technische Universiteit Delft, The Netherlands
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<td>Co-Chair: Domine Leenaerts, NXP Semiconductors</td>
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<td>Ultra-Low Voltage and Low Power UWB CMOS LNA Using Forward Body Biases</td>
<td>Chih-Shiang Chang, Jyh-Chyurn Guo</td>
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<td>RMO3B-2</td>
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<td>A DC-9.5GHz Noise-Canceling Distributed LNA in 65nm CMOS</td>
<td>Jianxun Zhu, Harish Krishnaswamy, Peter R. Kinget</td>
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<td>Columbia University, USA</td>
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<td>RMO3B-3</td>
<td>14:10</td>
<td>A Highly Linear Low-Noise Amplifier Using a Wideband Linearization Technique with Tunable Multiple Gated Transistors</td>
<td>Jaeyoung Lee¹, Jeiyoung Lee², Bonkee Kim³, Bo-Eun Kim⁴, Cam Nguyen¹</td>
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<td></td>
<td>¹Texas A&amp;M University, USA, ²Samsung, Korea, ³HiDeep Inc., Korea, ⁴RAONTECH Inc., Korea</td>
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<td>RMO3B-4</td>
<td>14:30</td>
<td>A Highly Selective LNTA Capable of Large-Signal Handling for RF Receiver Front-Ends</td>
<td>M. Mehrpoo, Robert Bogdan Staszewski</td>
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<td>Technische Universiteit Delft, The Netherlands</td>
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<td>A 62GHz Inductor-Peaked Rectifier with 7% Efficiency</td>
<td>Hao Gao, Marion K. Matters-Kammerer, Dusan Milosevic, Arthur van Roermund, Peter Baltus</td>
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Monday, 3 June 2013  
13:30–15:10  
Room 611-612  
Session RMO3C: Wideband VCO Circuits and Architectures  
Chair: Jane Gu, University of California at Davis  
Co-Chair: Fred Lee, Fairchild Semiconductor

**RMO3C-1 13:30**
A 5.12–12.95GHz Triple-Resonance Low Phase Noise CMOS VCO for Software-Defined Radio Applications  
M. Moslehi Bajestan, K. Entesari  
Texas A&M University, USA

**RMO3C-2 13:50**
A -189dBc/Hz FOM, Wide Tuning Range Ka-Band VCO Using Tunable Negative Capacitance and Inductance Redistribution  
Qiyang Wu¹, Salma Elabd¹, Tony K. Quach², Aji Mattamana², Steve R. Dooley², Jamin McCue³, Pompei L. Orlando³, Gregory L. Creech¹, Waleed Khalil¹  
¹Ohio State University, USA, ²AFRL, USA

**RMO3C-3 14:10**
A Dual-Band LO Generation System Using a 40GHz VCO with a Phase Noise of -106.8dBc/Hz at 1-MHz  
Ying Chen, Yu Pei, Domine M.W. Leenaerts  
NXP Semiconductors, The Netherlands

**RMO3C-4 14:30**
A 120GHz Quadrature Frequency Generator with 16.2GHz Tuning Range in 45nm CMOS  
Wouter Volkaerts, Michiel Steyaert, Patrick Reynaert  
Katholieke Universiteit Leuven, Belgium
Monday, 3 June 2013
15:40–17:20
Room 618-620
Session RMO4A: Baseband Circuits and Modulators/Demodulators
Chair: Madhukar Reddy, MaxLinear
Co-Chair: Ayman Fayed, Iowa State University

RMO4A-1 15:40
An FM Demodulator Operating Across 2–10GHz IF
Akshay Visweswaran, John R. Long, Luca Galatro, Marco Spirito, Robert Bogdan Staszewski
Technische Universiteit Delft, The Netherlands

RMO4A-2 16:00
A 3.4mW 65nm CMOS 5th Order Programmable Active-RC Channel Select Filter for LTE Receivers
Mohammed Abdulaziz, Anders Nejdel, Markus Törmänen, Henrik Sjöland
Lund University, Sweden

RMO4A-3 16:20
A Low-Q Resonant Tank Phase Modulator for Outphasing Transmitters
Gilad Yahalom, Joel L. Dawson
MIT, USA

RMO4A-4 16:40
A Linear-in-dB Analog Baseband Circuit for Low Power 60GHz Receiver in Standard 65nm CMOS
Yanjie Wang¹, Chris Hull¹, Glenn Murata¹, Shmuel Ravid²
¹Intel Corporation, USA, ²Intel Corporation, Israel
Session RMO4C: Reactively-Coupled Oscillators
Chair: Waleed Khalil, Ohio State University
Co-Chair: Reynold Kagiwada, Northrop Grumman

RMO4C-1  15:40
A 100GHz Active-Varactor VCO and a Bi-Directionally Injection-Locked Loop in 65nm CMOS
Shinwon Kang, Ali M. Niknejad
University of California at Berkeley, USA

RMO4C-2  16:00
A Multichannel, Multicore mm-Wave Clustered VCO with Phase Noise, Tuning Range, and Lifetime Reliability Enhancements
Farid Shirinifar¹, Med Nariman², Tirdad Sowlati², Maryam Rofougaran², Reza Rofougaran², Sudhakar Pamarti¹
¹University of California at Los Angeles, USA, ²Broadcom, USA

RMO4C-3  16:20
A 105GHz VCO with 9.5% Tuning Range and 2.8mW Peak Output Power Using Coupled Colpitts Oscillators in 65nm Bulk CMOS
Muhammad Adnan, Ehsan Afshari
Cornell University, USA

RMO4C-4  16:40
Dual-Core High-Swing Class-C Oscillator with Ultra-Low Phase Noise
Massoud Tohidian, Seyed Amir Reza Ahmadi Mehr, Robert Bogdan Staszewski
Technische Universiteit Delft, The Netherlands
**Monday, 3 June 2013**

**15:40—17:20**

**Room 613-614**

**Session RMO4D: High-Speed Data Transceiver Circuits**

Chair: Steven Turner, BAE Systems

Co-Chair: Ramesh Harjani, University of Minnesota

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**RMO4D-1  15:40**

A 42 to 47-GHz, 8-bit I/Q Digital-to-RF Converter with 21-dBm \( P_{\text{sat}} \) and 16% PAE in 45-nm SOI CMOS

Amir Agah\(^1\), Wei Wang\(^1\), Peter M. Asbeck\(^1\), Lawrence Larson\(^2\), James F. Buckwalter\(^1\)

\(^1\)University of California at San Diego, USA, \(^2\)Brown University, USA

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**RMO4D-2  16:00**

A 32-Gbps 4×4 Passive Cross-Point Switch in 45-nm SOI CMOS

Donghyup Shin, Gabriel M. Rebeiz

University of California at San Diego, USA

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**RMO4D-3  16:20**

A 20Gb/s 136fJ/b 12.5Gb/s/\( \mu \text{m} \) On-Chip Link in 28nm CMOS

Meisam Honarvar Nazari, Azita Emami-Neyestanak

California Institute of Technology, USA

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**RMO4D-4  16:40**

A Wideband Injection Locking Scheme and Quadrature Phase Generation in 65nm CMOS

Mayank Raj, Azita Emami-Neyestanak

California Institute of Technology, USA

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**RMO4D-5  17:00**

Electronic Laser Phase Noise Reduction

Firooz Aflatouni\(^1\), Behrooz Abiri\(^1\), Angad Rekhi\(^1\), Hooman Abediasl\(^2\), Hossein Hashemi\(^2\), Ali Hajimiri\(^1\)

\(^1\)California Institute of Technology, USA, \(^2\)University of Southern California, USA
Session RTU1B: mm-Wave Power Amplifiers
Chair: Jyoti Mondal, Northrop Grumman
Co-Chair: Gary Zhang, Guangdong University of Technology

RTU1B-1  08:00  271
A 53-to-73GHz Power Amplifier with 74.5mW/μm² Output Power Density by 2D Differential Power Combining in 65nm CMOS
Wei Fei¹, Hao Yu¹, Wei Meng Lim¹, Junyan Ren²
¹Nanyang Technological University, Singapore, ²Fudan University, China

RTU1B-2  08:20  275
Analysis, Design and Implementation of mm-Wave SiGe Stacked Class-E Power Amplifiers
Kunal Datta, Jonathan Roderick, Hossein Hashemi
University of Southern California, USA

RTU1B-3  08:40  279
A Fully Integrated 22.6dBm mm-Wave PA in 40nm CMOS
Farid Shirinfar¹, Med Nariman³, Tirdad Sowlati², Maryam Rofougaran², Reza Rofougaran², Sudhakar Pamarti¹
¹University of California at Los Angeles, USA, ²Broadcom, USA

RTU1B-4  09:00  283
Large-Scale Power-Combining and Linearization in Watt-Class mmWave CMOS Power Amplifiers
Ritesh Bhat, Anandaroop Chakrabarti, Harish Krishnaswamy
Columbia University, USA

RTU1B-5  09:20  287
A 135–170GHz Power Amplifier in an Advanced SiGe HBT Technology
Neelanjan Sarmah¹, Bernd Heinemann², Ullrich R. Pfeiffer¹
¹Bergische Universität Wuppertal, Germany, ²IHP, Germany
Session RTU1C: Millimeter and Sub-Millimeter Wave Transceivers
Chair: Jeyanandh Paramesh, Carnegie Mellon University
Co-Chair: Hua Wang, Georgia Institute of Technology

RTU1C-1 08:00
24GHz CMOS Transceiver with Novel T/R Switching Concept for Indoor Localization
Amin Hamidian¹, Randolf Ebelt², Denys Shmakov², Martin Vossiek², Tao Zhang¹, Viswanathan Subramanian¹, Georg Boeck¹
¹Technische Universität Berlin, Germany, ²Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

RTU1C-2 08:20
A Low Power 60-GHz 2.2-Gbps UWB Transceiver with Integrated Antennas for Short Range Communications
Alexandre Siligaris, Fabrice Chaix, Michaël Pelissier, Vincent Puyal, José Zevallos, Laurent Dussopt, Pierre Vincent
CEA-LETI, France

RTU1C-3 08:40
A 283GHz Low Power Heterodyne Receiver with On-Chip Local Oscillator in 65nm CMOS Process
José Moron Guerra¹, Alexandre Siligaris¹, Jean-François Lampin¹, François Danneville², Pierre Vincent¹
¹CEA-LETI, France, ²IEMN, France

RTU1C-4 09:00
A 240GHz Direct Conversion IQ Receiver in 0.13μm SiGe BiCMOS Technology
Mohamed Elkhouly¹, Yanfei Mao¹, Srdjan Glisic¹, Chafik Meliani¹, Frank Ellinger², J. Christoph Scheytt³
¹IHP, Germany, ²Technische Universität Dresden, Germany, ³Universität Paderborn, Germany

RTU1C-5 09:20
A 240GHz Single-Chip Radar Transceiver in a SiGe Bipolar Technology with On-Chip Antennas and Ultra-Wide Tuning Range
Christian Bredendiek¹, Nils Pohl², Timo Jaeschke¹, Klaus Aufinger³, Attila Bilgic⁴
¹Ruhr-Universität Bochum, Germany, ²Fraunhofer FHR, Germany, ³Infineon Technologies, Germany, ⁴KROHNE Messtechnik, Germany
Tuesday, 4 June 2013
10:10–11:50
Room 618-620
Session RTU2A: Reconfigurable and Software-Defined Radio Front-End Techniques
Chair: Oren Eliezer, Xtendwave
Co-Chair: Eric Klumperink, University of Twente

RTU2A-1  10:10
A 0.5-to-3GHz Software-Defined Radio Receiver Using Sample Domain Signal Processing
Run Chen, Hossein Hashemi
University of Southern California, USA

RTU2A-2  10:30
A 5–9-mW, 0.2–2.5-GHz CMOS Low-IF Receiver for Spectrum-Sensing Cognitive Radio Sensor Networks
Masaki Kitsunezuka, Kazuaki Kunihiro
NEC Corporation, Japan

RTU2A-3  10:50
A 65nm CMOS High-IF Superheterodyne Receiver with a High-Q Complex BPF
Iman Madadi, Massoud Tohidian, Robert Bogdan Staszewski
Technische Universiteit Delft, The Netherlands

RTU2A-4  11:10
A Multi-Path Multi-Rate CMOS Polar DPA for Wideband Multi-Standard RF Transmitters
Arnaud Werquin, Antoine Frappé, Andreas Kaiser
IEMN, France

RTU2A-5  11:30
A Frequency-Agile RF Frontend for Multi-Band TDD Radios in 45nm SOI CMOS
Sushmit Goswami¹, Helen Kim², Joel L. Dawson¹
¹MIT, USA, ²MIT Lincoln Laboratory, USA
RTU2B-1 10:10
A Single Chip HBT Power Amplifier with Integrated Power Control
David S. Ripley
Skyworks Solutions Inc., USA

RTU2B-2 10:30
A Novel Load Insensitive RF Power Amplifier Using a Load Mismatch Detection and Curing Technique
Donghyeon Ji¹, Jooyoung Jeon², Junghyun Kim¹
¹Hanyang University, Korea, ²Avago Technologies, Korea

RTU2B-3 10:50
A WLAN RF CMOS PA with Adaptive Power Cells
Taehwan Joo¹, Bonhoon Koo², Songcheol Hong¹
¹KAIST, Korea, ²Qualcomm, USA

RTU2B-4 11:10
A Ka-Band Doherty Power Amplifier with 25.1dBm Output Power, 38% Peak PAE and 27% Back-Off PAE
Jeffery Curtis¹, Anh-Vu Pham¹, Mohan Chirala², Farshid Aryanfar², Zhouyue Pi²
¹Davis Millimeter-Wave Research Center, USA, ²Samsung, USA

RTU2B-5 11:30
High Efficiency GaN Switching Converter IC with Bootstrap Driver for Envelope Tracking Applications
Young-Pyo Hong¹, Kenji Mukai¹, Hamed Gheidi¹, Shintaro Shinjo², Peter M. Asbeck¹
¹University of California at San Diego, USA, ²Mitsubishi Electric Corporation, Japan
**Tuesday, 4 June 2013**

10:10–11:50  
Room 611-612  
Session RTU2C: Millimeter-Wave Beamforming and Power Combining Techniques  
Chair: Arun Natarajan, Oregon State University  
Co-Chair: Pierre Busson, STMicroelectronics

**RTU2C-1  10:10**  
A 45GHz CMOS Transmitter SoC with Digitally-Assisted Power Amplifiers for 64QAM Efficiency Improvement  
Tim LaRocca¹, Yi-Cheng Wu¹, Rob Snyder¹, Jasmine Patel¹, Khanh Thai¹, Colin Wong¹, Yeat Yang¹, Leland Gilreath¹, Monte Watanabe¹, Hao Wu², Mau-Chung Frank Chang²  
¹Northrop Grumman, USA, ²University of California at Los Angeles, USA

**RTU2C-2  10:30**  
A 163–180GHz 2×2 Amplifier-Doubler Array with Peak EIRP of +5dBm  
F. Golcuk, J.M. Edwards, B. Cetinoneri, Y.A. Atesal, Gabriel M. Rebeiz  
University of California at San Diego, USA

**RTU2C-3  10:50**  
A Self-Steering I/Q Receiver Array in 45-nm CMOS SOI  
Arpit K. Gupta, James F. Buckwalter  
University of California at San Diego, USA

**RTU2C-4  11:10**  
75–85GHz Flip-Chip Phased Array RFIC with Simultaneous 8-Transmit and 8-Receive Paths for Automotive Radar Applications  
Bon-Hyun Ku, Ozgur Inac, Michael Chang, Gabriel M. Rebeiz  
University of California at San Diego, USA

**RTU2C-5  11:30**  
A Fully-Integrated Dual-Polarization 16-Element W-Band Phased-Array Transceiver in SiGe BiCMOS  
Alberto Valdes-Garcia¹, Arun Natarajan², Duixian Liu¹, Mihai Sanduleanu¹, Xiaoxiong Gu¹, Mark Ferriss¹, Benjamin Parker¹, Christian Baks¹, J.-O. Plouchart¹, Herschel Ainspan¹, Bodhisatwa Sadhu¹, MD. R. Islam¹, Scott Reynolds¹  
¹IBM, USA, ²Oregon State University, USA
Session RTU2D: Advanced Silicon Devices for High Speed, High Power, ESD and MEMS Applications
Chair: Aditya Gupta, Northrop Grumman
Co-Chair: Richard Chan, BAE Systems

RTU2D-1 10:10 A 130nm SiGe BiCMOS Technology for mm-Wave Applications Featuring HBT with $f_T/f_{MAX}$ of 260/320GHz
Panglijen Candra, Vibhor Jain, Peng Cheng, John Pekarik, R. Camillo-Castillo, Peter Gray, Thomas Kessler, Jeffrey Gambino, James Dunn, David Harame
IBM, USA

RTU2D-2 10:30 Power Handling Capability of an SOI RF Switch
Alvin Joseph, Alan Botula, James Slinkman, Randy Wolf, Rick Phelps, Michel Abou-Khalil, John Ellis-Monaghan, Steven Moss, Mark Jaffe
IBM, USA

RTU2D-3 10:50 Nano Switching Crossbar Array ESD Protection Structures
University of California at Riverside, USA

RTU2D-4 11:10 Reconfigurable Sensors for Extraction of Dielectric Material and Liquid Properties
Laurent Leyssenne¹, Sidina Wane¹, Damienne Bajon², Philippe Descamps¹, Rosine Coq-Germanicus¹
¹NXP Semiconductors, France, ²Université de Toulouse, France

RTU2D-5 11:30 A Sticking-Free and High-Quality Factor MEMS Variable Capacitor with Metal-Insulator-Metal Dots as Dielectric Layer
Fumihiko Nakazawa, Takeaki Shimanouchi, Takashi Katsuki, Osamu Toyoda, Satoshi Ueda
ASET, Japan
Tuesday, 4 June 2013
13:30–17:00
Room 6E
Session RTUIF: Interactive Forum
Chair: David Wentzloff, University of Michigan
Co-Chair: Danilo Manstretta, University of Pavia

RTUIF-1  13:30  403
A 71GHz RF Energy Harvesting Tag with 8% Efficiency for Wireless Temperature Sensors in 65nm CMOS
Hao Gao, Marion K. Matters-Kammerer, Pieter Harpe, Dusan Milosevic, Ulf Johannsen, Arthur van Roermund, Peter Baltus
Technische Universiteit Eindhoven, The Netherlands

RTUIF-2  13:30  407
A Compact Millimeter-Wave Energy Transmission System for Wireless Applications
Med Nariman¹, Farid Shirinfar², Sudhakar Pamarti³, Maryam Rofougaran¹, Reza Rofougaran³, Franco De Flaviis¹
¹University of California at Irvine, USA, ²University of California at Los Angeles, USA, ³Broadcom, USA

RTUIF-3  13:30  411
A 0.5GHz–1.5GHz Order Scalable Harmonic Rejection Mixer
Teng Yang, Karthik Tripurari, Harish Krishnaswamy, Peter R. Kinget
Columbia University, USA

RTUIF-4  13:30  415
V-Band Dual-Conversion Down-Converter with Low-Doped N-Well Schottky Diode in 0.18μm CMOS Process
Yu-Chih Hsiao¹, Chinchun Meng¹, Hung-Ju Wei¹, Ta-Wei Wang¹, Guo-Wei Huang², Mau-Chung Frank Chang³
¹National Chiao Tung University, Taiwan, ²National Nano Device Laboratories, Taiwan, ³University of California at Los Angeles, USA

RTUIF-5  13:30  419
A Fully Digital PWM-Based 1 to 3GHz Multistandard Transmitter in 40-nm CMOS
Pieter A.J. Nuyts, Patrick Reynaert, Wim Dehaene
Katholieke Universiteit Leuven, Belgium
RTUIF-6 13:30
An UWB CMOS Impulse Radar
Chenliang Du, Hossein Hashemi
University of Southern California, USA

RTUIF-7 13:30
Simultaneous Linearity and Efficiency Enhancement of a Digitally-Assisted GaN Power Amplifier for 64-QAM
Monte Watanabe, Rob Snyder, Tim LaRocca
Northrop Grumman, USA

RTUIF-8 13:30
A Low-Noise FBAR-CMOS Frequency/Phase Discriminator for Phase Noise Measurement and Cancellation
Alireza Imani, Hossein Hashemi
University of Southern California, USA

RTUIF-9 13:30
A 36GHz/mW Single-Phase Prescaler Using Implication Logic in 0.13μm CMOS
Elkim Roa, Wu-Hsin Chen, Byunghoo Jung
Purdue University, USA

RTUIF-10 13:30
A Sub-1mW 5.5-GHz PLL with Digitally-Calibrated ILFD and Linearized Varactor for Low Supply Voltage Operation
Sho Ikeda, Tatsuya Kamimura, Sangeop Lee, Hiroyuki Ito, Noboru Ishihara, Kazuya Masu
Tokyo Institute of Technology, Japan

RTUIF-11 13:30
Effect of Drift Region Resistance on Temperature Characteristics of RF Power LDMOS Transistors
Kun-Ming Chen1, Bo-Yuan Chen1, Hsueh-Wei Chen1, Chia-Sung Chiu1, Guo-Wei Huang1, Chia-Hao Chang2, Hsin-Hui Hu2
1National Nano Device Laboratories, Taiwan, 2National Taipei University of Technology, Taiwan

RTUIF-12 13:30
A -78dBm Sensitivity Super-Regenerative Receiver at 96GHz with Quench-Controlled Metamaterial Oscillator in 65nm CMOS
Yang Shang1, Haipeng Fu2, Hao Yu1, Junyan Ren2
1Nanyang Technological University, Singapore, 2Fudan University, China
A T-DMB Mobile TV SoC Tuner with Compact Size, Low Power and BoM in 65nm CMOS
Jeonghoon Lee¹, Shinil Chang¹, Jaehwan Lee¹, Jisun Ryu², Kihyeok Ha³, Yongchang Choi¹, Younghoon Kim¹, Sanghyun Hwang¹, Hongju Song¹, Kiwon Choi¹, Sangyoub Lee¹
¹I&C Technology Inc., Korea, ²Qualcomm, Korea, ³Samsung, Korea

A Highly-Linear CMOS RF Programmable-Gain Driver Amplifier with a Digital-Step Differential Attenuator for RF Transmitters
Sunbo Shim¹, Bonhoon Koo², Songcheol Hong³
¹University of California at Los Angeles, USA, ²Qualcomm, USA, ³KAIST, Korea