



# RFIC RECEPTION, JOINT INDUSTRY SHOWCASE & INTERACTIVE FORUM



19:30–21:30 | Sunday, 4 June 2017

Hilton Hawaiian Village Waikiki Beach Resort, Coral Lounge

**Chair:** Brian Floyd, *North Carolina State University*

The Industry Showcase Session, held concurrently with the plenary reception and the Interactive Forum, will highlight 10 selected papers submitted by authors from industry. Authors of these papers will be present to discuss their innovative work, summarized in poster format, and some will also show a demonstration. The media will cover this event, making it an excellent opportunity to announce the latest RFIC developments and breakthroughs. The Best Industry Paper Award will be awarded to the author of one selected paper among these. This year's Industry Showcase papers are listed below.

**A 28GHz CMOS Direct Conversion Transceiver with Packaged Antenna Arrays for 5G Cellular System (RMO1A-3)**

Hong-Teuk Kim, Byoung-Sun Park, Seung-Min Oh, Seong-Sik Song, Jong-Moon Kim, So-Hyeong Kim, Tak-Su Moon, Seung-Yeon Kim, Ji-Young Chang, Sung-Woong Kim, Woo-Seong Kang, Seung-Yoon Jung, Geum-Young Tak, Jin-Kyoung Du, Yu-Suhk Suh, Yo-Chuol Ho; *LG Electronics, Korea*

**A 73GHz PA for 5G Phased Arrays in 14nm FinFET CMOS (RTU2D-5)**

Steven Callender, Stefano Pellerano, Christopher Hull; *Intel, USA*

**A Fully Integrated 75–83GHz FMCW Synthesizer for Automotive Radar Applications with -97dBc/Hz Phase Noise at 1MHz Offset and 100GHz/mSec Maximal Chirp Rate (RMO1D-2)**

Jakob Vovnoboy, Run Levinger, Nadav Mazor, Danny Elad; *ON Semiconductor, Israel*

**A 200µm × 200µm × 100µm, 63nW, 2.4GHz Injectable Fully-Monolithic Wireless Bio-Sensing System (RMO4B-3)**

S. O'Driscoll<sup>1</sup>, S. Korhummel<sup>1</sup>, P. Cong<sup>1</sup>, Y. Zou<sup>1</sup>, K. Sankaragomathi<sup>1</sup>, J. Zhu<sup>2</sup>, T. Deyle<sup>3</sup>, A. Dastgheib<sup>1</sup>, B. Lu<sup>1</sup>, M. Tierney<sup>1</sup>, J. Shao<sup>1</sup>, C. Gutierrez<sup>1</sup>, S. Jones<sup>1</sup>, H. Yao<sup>1</sup>; <sup>1</sup>Verily, USA, <sup>2</sup>Google, USA, <sup>3</sup>Cobalt Robotics, USA

**95µW 802.11g/n Compliant Fully-Integrated Wake-Up Receiver with -72dBm Sensitivity in 14nm FinFET CMOS (RMO3A-2)**

Erkan Alpman<sup>1</sup>, Ahmad Khairi<sup>2</sup>, Minyoung Park<sup>1</sup>, V. Srinivasa Somayazulu<sup>1</sup>, Jeffrey R. Foerster<sup>1</sup>, Ashoke Ravi<sup>1</sup>, Stefano Pellerano<sup>1</sup>; <sup>1</sup>Intel, USA, <sup>2</sup>Carnegie Mellon University, USA

**A 4mW-RX 7mW-TX IEEE 802.11ah Fully-Integrated RF Transceiver (RMO4A-2)**

Ao Ba, Kia Salimi, Paul Mateman, Pepijn Boer, Johan van den Heuvel, Jordy Gloudemans, Johan Dijkhuis, Ming Ding, Yao-Hong Liu, Christian Bachmann, Guido Dolmans, Kathleen Philips; *Holst Centre, The Netherlands*

**A Wideband SiGe BiCMOS Transceiver Chip-Set for High-Performance Microwave Links in the 5.6–43.5GHz Range (RTU2B-3)**

Y. Baeyens<sup>1</sup>, S. Shahramian<sup>1</sup>, B. Jalali<sup>1</sup>, P. Roux<sup>1</sup>, J. Weiner<sup>1</sup>, A. Singh<sup>1</sup>, M. Moretto<sup>2</sup>, P. Boutet<sup>2</sup>, P. Lopez<sup>2</sup>; <sup>1</sup>Nokia Bell Labs, USA, <sup>2</sup>Nokia, France

**A 12-b, 1-GS/s 6.1mW Current-Steering DAC in 14nm FinFET with 80dB SFDR for 2G/3G/4G Cellular Application (RMO4B-1)**

Jaekwon Kim, Woojin Jang, Yanghun Lee, Seunghyun Oh, Jongwoo Lee, Thomas Byunghak Cho; *Samsung, Korea*

**RF-pFET in Fully Depleted SOI Demonstrates 420GHz FT (RMO1B-3)**

Josef Watts<sup>1</sup>, Kumaran Sundaram<sup>2</sup>, Kok Wai Johnny Chew<sup>2</sup>, Steffen Lehmann<sup>3</sup>, Shih Ni Ong<sup>2</sup>, Wai Heng Chow<sup>2</sup>, Lye Hock Chan<sup>2</sup>, Jerome Mazurier<sup>4</sup>, Christoph Schwan<sup>3</sup>, Yogadissen Andee<sup>4</sup>, Thomas Feudel<sup>3</sup>, Luca Pirro<sup>4</sup>, Elke Erben<sup>3</sup>, Edward Nowak<sup>1</sup>, Elliot Smith<sup>3</sup>, El Mehdi Bazizi<sup>3</sup>, Thorsten Kammler<sup>3</sup>, Richard Taylor III<sup>1</sup>, Bryan Rice<sup>3</sup>, David Harame<sup>3</sup>; <sup>1</sup>GLOBALFOUNDRIES, USA, <sup>2</sup>GLOBALFOUNDRIES, Singapore, <sup>3</sup>GLOBALFOUNDRIES, Germany, <sup>4</sup>CEA-LETI, France

**A Precision 140MHz Relaxation Oscillator in 40nm CMOS with 28ppm/°C Frequency Stability for Automotive SoC Applications (RSUIF-15)**

Dmytro Cherniak, Roberto Nonis, Fabio Padovan; *Infineon Technologies, Austria*



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SUNDAY

**Chair:** Waleed Khalil, Ohio State University

**Co-Chair:** Jennifer Kitchen, Arizona State University

## An FTNC Receiver with +32.5dBm Effective OB-IIP3 Using Baseband IM3 Cancellation (RSUIF-1)

Yudong Zhang, Jianxun Zhu, Peter R. Kinget; *Columbia University, USA*

## Envelope Time-Domain Characterizations to Assess In-Band Linearity Performances of Pre-Matched MASMOS Power Amplifier (RSUIF-2)

F. Simbélie<sup>1</sup>, V. Gillet<sup>1</sup>, S. Laurent<sup>1</sup>, P. Médrel<sup>1</sup>, Y. Creveuil<sup>2</sup>, M. Régis<sup>2</sup>, M. Prigent<sup>1</sup>, R. Quéré<sup>1</sup>; <sup>1</sup>XLIM, France, <sup>2</sup>ACCO Semiconductor, France

## Improving the Linearity of Wideband Receiver Systems by Component IM3 Phasor Manipulation (RSUIF-3)

Gabor Varga, Fabian Speicher, Arun Ashok, Iyappan Subbiah, Moritz Schrey, Ralf Wunderlich, Stefan Heinen; *RWTH Aachen University, Germany*

## A Fully-Integrated SOI CMOS Complex-Impedance Detector for Matching Network Tuning in LTE Power Amplifier (RSUIF-4)

D. Nicolas<sup>1</sup>, A. Serhan<sup>1</sup>, A. Giry<sup>1</sup>, T. Parra<sup>2</sup>, E. Mercier<sup>1</sup>; <sup>1</sup>CEA-LETI, France, <sup>2</sup>LAAS, France

## V-Band Flip-Chip pHEMT Balanced Power Amplifier with CPWG-MS-CPWG Topology and CPWG Lange Couplers (RSUIF-5)

Wei-Ling Chang<sup>1</sup>, Jen-Yi Su<sup>1</sup>, Chinchun Meng<sup>1</sup>, Chia-Hung Chang<sup>1</sup>, Guo-Wei Huang<sup>2</sup>; <sup>1</sup>National Chiao Tung University, Taiwan, <sup>2</sup>National Nano Device Laboratories, Taiwan

## Multi-Standard 5Gbps to 28.2Gbps Adaptive, Single Voltage SerDes Transceiver with Analog FIR and 2-Tap Unrolled DFE in 28nm CMOS (RSUIF-6)

Mohammad Mahani<sup>1</sup>, Rod Zavari<sup>1</sup>, Su-Tarn Lim<sup>1</sup>, David Hong<sup>1</sup>, Karl Scheffer<sup>1</sup>, Peter Graumann<sup>1</sup>, Hans Ransijn<sup>2</sup>, Tomas Dusatko<sup>3</sup>, Stanley Ho<sup>3</sup>, Philip Snyder<sup>2</sup>, Jomy Joy<sup>4</sup>, Suresh Nalluri<sup>4</sup>, Tony Zortea<sup>2</sup>; <sup>1</sup>Microsemi, Canada, <sup>2</sup>Multiply, USA, <sup>3</sup>Inphi, Canada, <sup>4</sup>Texas Instruments, India

## A Harmonic-Selective Wireless Full-Band-Capture Receiver with Digital Harmonic Rejection Calibration (RSUIF-7)

Hao Wu, David Murphy, Hooman Darabi; *Broadcom, USA*

## A 40GHz PLL with -92.5dBc/Hz In-Band Phase Noise and 104fs-RMS-Jitter (RSUIF-8)

Ying Chen<sup>1</sup>, Louis Praamsma<sup>1</sup>, Nikola Ivanisevic<sup>2</sup>, Domine M.W. Leenaerts<sup>1</sup>; <sup>1</sup>NXP Semiconductors, The Netherlands, <sup>2</sup>KTH, Sweden

## A High-Efficiency Linear Power Amplifier for 28GHz Mobile Communications in 40nm CMOS (RSUIF-9)

Yang Zhang, Patrick Reynaert; *Katholieke Universiteit Leuven, Belgium*

## An Analysis of Phase Noise Requirements for Ultra-Low-Power FSK Radios (RSUIF-10)

Xing Chen, Hun-Seok Kim, David D. Wentzloff; *University of Michigan, USA*

## A Ka-Band 4-Ch Bi-Directional CMOS T/R Chipset for 5G Beamforming System (RSUIF-11)

JangHoon Han, JinHyun Kim, Jeongsoo Park, JeongGeun Kim; *Kwangwoon University, Korea*

## A 32GHz 20dBm-PSAT Transformer-Based Doherty Power Amplifier for Multi-Gb/s 5G Applications in 28nm Bulk CMOS (RSUIF-12)

Paramartha Indirayanti, Patrick Reynaert; *Katholieke Universiteit Leuven, Belgium*

## A 10–40GHz Frequency Quadrupler Source with Switchable Bandpass Filters and >30dBc Harmonic Rejection (RSUIF-13)

Hyunchul Chung, Qian Ma, Gabriel M. Rebeiz; *University of California, San Diego, USA*

## Joint TX and Feedback RX IQ Mismatch Compensation for Integrated Direct Conversion Transmitters (RSUIF-14)

Hunsoo Choo, Charles Sestok, Xiaoxi Zhang, Nikolaus Klemmer; *Texas Instruments, USA*

## A Precision 140MHz Relaxation Oscillator in 40nm CMOS with 28ppm/°C Frequency Stability for Automotive SoC Applications (RSUIF-15)

Dmytro Cherniak, Roberto Nonis, Fabio Padovan; *Infineon Technologies, Austria*

