The Industry Showcase

Chair: Domine Leenaerts, NXP Semiconductors

The RFIC Industry Showcase Session, held concurrently with the plenary reception, will highlight the 10 outstanding paper finalists listed below, submitted by authors from the industry. In this interactive session, authors will present their innovative work in poster format, and some will also show a demonstration. These 10 paper finalists were nominated by the RFIC Technical Program Committee to enter the final contest and a committee of eleven judges have selected the top three among them after rigorous reviews and discussions. The top three will be announced during the RFIC Plenary Session preceding the Industry Showcase, and each winner will receive a plaque. This year’s Industry Paper Award finalists are:

An 802.11ba 495μW -92.6dBm-Sensitivity Blocker-Tolerant Wake-Up Radio Receiver Fully Integrated with Wi-Fi Transceiver
1Intel, USA, 2Intel, Mexico
Renzhi Liu1, Asma Beevi K.T.1, Richard Dorrance1, Deepak Dasalukunte1, Mario A. Santana Lopez2, Vinod Krishen1, Shahmar Azizi1, Minyoung Park1, Brent R. Carlton1

Reconfigurable 60-GHz Radar Transmitter SoC with Broadband Frequency Tripler in 45nm SOI CMOS
IBM TJ. Watson Research Center, USA
Wooram Lee, Tolga Dinc, Alberto Valdes-Garcia

22nm Fully-Depleted SOI High Frequency Noise Modeling up to 90GHz Enabling Ultra Low Noise Millimetre-Wave LNA Design
1GLOBALFOUNDRIES, Singapore, 2GLOBALFOUNDRIES, USA, 3Research Foundation CUNY, USA
L.H.K. Chan1, S.N. Ong1, W.L. Oo1, K.W.J. Chew1, Chi Zhang2, Abdellatif Bellaouar2, W.H. Chow1, T. Chen2, R. Rassel2, J.S. Wong1, C.K. Lim1, C.W.F. Wan1, J. Kim1, W.H. Seet1, David L. Harame3

A 26dBm 39GHz Power Amplifier with 26.6% PAE for 5G Applications in 28nm Bulk CMOS
Intel, USA
Kaushik Dasgupta, Saeid Daneshgar, Chintan Thakkar, James Jaussi, Bryan Casper

Direct Digital Synthesizer with 14GS/s Sampling Rate Heterogeneously Integrated in InP HBT and GaN HEMT on CMOS
BAE Systems, USA
Steven Eugene Turner, Mark E. Stuenkel, Gary M. Madison, Justin A. Cartwright, Richard L. Harwood, Joseph D. Cali, Steve A. Chadwick, Michael Oh, John T. Matta, James M. Meredith, Justin M. Byrd, Lawrence J. Kushner

Excellent 22FDX Hot-Carrier Reliability for PA Applications
1GLOBALFOUNDRIES, USA, 2GLOBALFOUNDRIES, Germany, 3GLOBALFOUNDRIES, Singapore
T. Chen1, Chi Zhang1, W. Arfaoui2, Abdellatif Bellaouar2, S. Embabi2, G. Bossu2, M. Siddabathula2, K.W.J. Chew3, S.N. Ong3, M. Mantravadi1, K. Barnett1, J. Bordelon1, R. Taylor1, S. Janardhanan1

Sunday, 2 June 2019 19:00–21:00 BCEC Ballroom Foyer
A 1.04–4V, Digital-Intensive Dual-Mode BLE 5.0/IEEE 802.15.4 Transceiver SoC with Extended Range in 28nm CMOS

1Samsung, Korea, 2Samsung, USA
Nam-Seog Kim1, Myoung-Gyun Kim1, Ashutosh Verma2, Gyungseon Seol1, Shinwoong Kim1, Seokwon Lee1, Chilun Lo1, Jaeyeol Han1, Ikkyun Jo1, Chulho Kim1, Chih-Wei Yao2, Jongwoo Lee1

A High Efficiency 39GHz CMOS Cascode Power Amplifier for 5G Applications

Samsung, Korea
Hyun-chul Park, Byungjoon Park, Yunsung Cho, Jae-hong Park, Jihoon Kim, Jeong Ho Lee, Juho Son, Kyu Hwan An, Sung-Gi Yang

A Low Power Fully-Integrated 76–81GHz ADPLL for Automotive Radar Applications with 150MHz/μs FMCW Chirp Rate and -95dBc/Hz Phase Noise at 1MHz Offset in FDSOI

1GLOBALFOUNDRIES, USA, 2Mantric Technology, Canada
Ahmed R. Fridi1, Chi Zhang1, Abdellatif Bellaouar1, Man Tran2

X-Band NMOS and CMOS Cross-Coupled DCO’s with a “Folded” Common-Mode Resonator Exhibiting 188.5dBc/Hz FoM with 29.5% Tuning Range in 16-nm CMOS FinFet

Intel, Israel

Industry Paper Contest Eligibility: The first author must have an industry affiliation. The first author must also be the lead author of the paper and must present the paper at the symposium.
The Student Paper Award Finalists Showcase
Chair: Osama Shana’a, MediaTek

The RFIC Symposium’s Student Paper Award is devised to encourage student paper submissions to the conference as well as to give the authors of the finalist papers a chance to promote their research work with the conference attendees after the plenary session during the reception time. Twelve outstanding student paper finalists were nominated this year by the RFIC Technical Program Committee to enter the final contest. A committee of eleven judges selected the top three papers after rigorous reviews and discussions. All finalists benefit from a complimentary RFIC registration. The top three Student Papers will be announced during the RFIC Plenary Session, and each winner will receive an honorarium and a plaque. This year’s Student Paper Award finalists are:

A 4×4×4-mm³ Fully Integrated Sensor-to-Sensor Radio Using Carrier Frequency Interlocking IF Receiver with -94dBm Sensitivity
Li-Xuan Chuo¹, Yejoong Kim¹, Nikolaos Chiotellis¹, Makoto Yasuda², Satoru Miyoshi³, Masaru Kawaminami¹, Anthony Grbic¹, David Wentzloff³, Hun-Seok Kim¹, David Blaauw¹
¹University of Michigan, USA, ²Mie Fujitsu Semiconductor, Japan, ³Fujitsu Electronics, USA

A 24–43GHz LNA with 3.1–3.7dB Noise Figure and Embedded 3-Pole Elliptic High-Pass Response for 5G Applications in 22nm FDSOI
Li Gao, Gabriel M. Rebeiz
University of California, San Diego, USA

A 77dB-SFDR Multi-Phase-Sampling 16-Element Digital Beamformer with 64 4GS/s 100MHz-BW Continuous-Time Band-Pass ΔΣ ADCs
Rundao Lu, Sunmin Jang, Yun Hao, Michael P. Flynn
University of Michigan, USA

A Sub-mW All-Passive RF Front End with Implicit Capacitive Stacking Achieving 13dB Gain, 5dB NF and +25dBm OOB-IIP3
Vijaya Kumar Purushothaman, Eric Klumperink, Berta Trullas Clavera, Bram Nauta
University of Twente, The Netherlands

Enhanced Passive Mixer-First Receiver Driving an Impedance with 40dB/Decade Roll-Off, Achieving +12dBm Blocker-P1dB, +33dBm IIP3 and Sub-2dB NF Degradation for a 0dBm Blocker
Sashank Krishnamurthy, Ali M. Niknejad
University of California, Berkeley, USA

A Quadrature Class-G Complex-Domain Doherty Digital Power Amplifier
Shih-Chang Hung, Si-Wook Yoo, Sang-Min Yoo
Michigan State University, USA
A Coupler-Based Differential Doherty Power Amplifier with Built-In Baluns for High mm-Wave Linear-Yet-Efficient Gbit/s Amplifications
Huy Thong Nguyen, Hua Wang
Georgia Tech, USA

A 350mV Complementary 4–5GHz VCO Based on a 4-Port Transformer Resonator with 195.8dBc/Hz Peak FOM in 22nm FDSOI
Omar El-Aassar, Gabriel M. Rebeiz
University of California, San Diego, USA

A 39GHz 64-Element Phased-Array CMOS Transceiver with Built-In Calibration for Large-Array 5G NR
Yun Wang¹, Rui Wu¹, Jian Pang¹, Dongwon You¹, Ashbir Aviat Fadila¹, Rattanan Saengchan¹, Xi Fu¹, Daiki Matsumoto¹, Takeshi Nakamura¹, Ryo Kubozoe¹, Masaru Kawabuchi¹, Bangan Liu¹, Haosheng Zhang¹, Junjun Qiu¹, Hanli Liu¹, Wei Deng¹, Naoki Oshima², Keiichi Motoi², Shinichi Hori², Kazuaki Kunihiro², Tomoya Kaneko², Atsushi Shirane¹, Kenichi Okada¹
¹Tokyo Institute of Technology, Japan, ²NEC, Japan

A 24.5–43.5GHz Compact RX with Calibration-Free 32–56dB Full-Frequency Instantaneously Wideband Image Rejection Supporting Multi-Gb/s 64-QAM/256-QAM for Multi-Band 5G Massive MIMO
Min-Yu Huang¹, Taiyun Chi², Fei Wang¹, Sensen Li¹, Tzu-Yuan Huang¹, Hua Wang¹
¹Georgia Tech, USA, ²Speedlink Technology, USA

A 51.5–64.5GHz Active Phase Shifter Using Linear Phase Control Technique with 1.4° Phase Resolution in 65-nm CMOS
Tianjun Wu, Chenxi Zhao, Huihua Liu, Yunqiu Wu, Yiming Yu, Kai Kang
UESTC, China

A 6.5-GHz Cryogenic All-Pass Filter Circulator in 40-nm CMOS for Quantum Computing Applications
Andrea Ruffino¹, Yatao Peng¹, Fabio Sebastiano², Masoud Babaie², Edoardo Charbon¹
¹EPFL, Switzerland, ²Technische Universiteit Delft, The Netherlands

Student Paper Contest Eligibility: The student must have been a full-time student (9 hours/term graduate, 12 hours/term undergraduate) during the time the work was performed. The student must also be the lead author of the paper and must present the paper at the Symposium.