

2025 IEEE Radio Frequency Integrated Circuits Symposium (RFIC 2025)

**San Francisco, California, USA
15-17 June 2025**



**IEEE Catalog Number: CFP25MMW-POD
ISBN: 979-8-3315-1412-9**

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IEEE Catalog Number:	CFP25MMW-POD
ISBN (Print-On-Demand):	979-8-3315-1412-9
ISBN (Online):	979-8-3315-1411-2
ISSN:	1529-2517

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RFIC Plenary

Chair: François Rivet, University of Bordeaux — Co-Chair: Mohyee Mikhemar, Broadcom
Esplanade Ballroom, 17:30–19:00, Sunday, 15 June 2025

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- C** RFIC in the Age of 6G: Challenges, Innovations, and Future Directions
John Smee, Qualcomm, USA 

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- C** Next-Gen RFICs: Redefining Data Centers and Wireless Networks for the AI Era
Maryam Rofougaran, Movandi, USA 

RMo1A: Digital Transmitters and Power Amplifiers

Chair: Andreia Cathelin, STMicroelectronics, France — Co-Chair: Xun Luo, UESTC, China
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- C** A 71–86GHz 1024QAM Direct-Carrier Phase-Modulating Transmitter with Digital-to-Phase Converters and Constant-Envelope Phasors
Jia Zhou¹, Chao-Jen Tien¹, Christopher Chen¹, Jieqiong Du¹, Jhih-Wei Chen¹, Arhison Bharathan¹, Adrian J. Tang², Sai-Wang Tam³, Mau-Chung Frank Chang¹
¹University of California, Los Angeles, USA ; ²Jet Propulsion Laboratory, USA ; ³NXP Semiconductors, USA 

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- C** A 50–64GHz 21.4dBm, 20.6% SE Intrinsically Linear Digital Cartesian Transmitter with 6.5° System AM-PM Distortion Using Impedance-Compensated RFDAC in 40-nm CMOS
Deshan Tang, Bingzheng Yang, Xun Luo, UESTC, China 

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- C** An 802.15.4/4z-Compliant UWB All-Digital Transmitter with Hybrid FIR Filtering Achieving 47dBr Sidelobe Suppression
Ziying Huang, Wei Deng, Haikun Jia, Baoyong Chi, Tsinghua University, China 

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- C** A Fully Integrated Optimal Modulation Bits-to-RF Digital Transmitter Using Time-Interleaved Multi-Subharmonic-Switching DPA
Timur Zirtiloglu¹, Arman Tan¹, Basak Ozaydin², Ken Duffy³, Muriel Medard², Rabia Tugce Yazicigil¹
¹Boston University, USA ; ²MIT, USA ; ³Northeastern University, USA 

RMo1B: Reconfigurable Phased Arrays for Satellite Communication

Chair: Kostas Doris, NXP Semiconductors, The Netherlands — Co-Chair: Aarno Pärssinen, University of Oulu, Finland
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- C** A 19GHz Circular Polarized 256-Element CMOS Phased-Array Transmitter with 11W Average Power Consumption for LEO Satellite Terminal
Xiaolin Wang¹, Dongwon You¹, Xi Fu¹, Takeshi Ota¹, Michihiro Ide¹, Sena Kato¹, Jill Mayeda¹, Makoto Higaki², Jumpei Sudo², Hiroshi Takizawa², Masashi Shirakura², Takashi Tomura¹, Hiroyuki Sakai¹, Kazuaki Kunihiro¹, Kenichi Okada¹, Atsushi Shirane¹
¹Science Tokyo, Japan ; ²Axelspace, Japan 

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- C** A Ka-Band 64-Element 4-Beam Polarization-Reconfigurable Phased Array Based on 65-nm CMOS Tx RFICs for SATCOM
Zixian Ma¹, Xinhong Xie¹, Huiyan Gao², Bing Lan¹, Nayu Li³, Haotian Chen¹, Chunyi Song³, Zhiwei Xu¹
¹Zhejiang University, China ; ²Georgia Tech, USA ; ³Donghai Laboratory, China 

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- C** An 18-to-50GHz 2-Element Phased-Array CMOS Transceiver with Dual-Resonator T/R Switch with Three-Port Reconfigurable Network and Embedded Tunable Image Rejection Filter
Junlong Gong, Wei Deng, Fuyuan Zhao, Haikun Jia, Weiqi Zheng, Linjun Gu, Shulin Yao, Dongfang Li, Hongliang Wu, Baoyong Chi, Tsinghua University, China 

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- C** An 18–32-GHz Reconfigurable Multi-Beam Phased-Array Transceiver in 65-nm CMOS for Wideband Wireless Communications
Nayu Li¹, Botao Yang², Yiwei Liu², Zixian Ma², Xinhong Xie², Huiyan Gao³, Shaogang Wang², Hang Lu², Bing Lan², Na Yan⁴, Qun Jane Gu³, Chunyi Song¹, Zhiwei Xu¹
¹Donghai Laboratory, China ; ²Zhejiang University, China ; ³Georgia Tech, USA ; ⁴Fudan University, China 

RMo1C: mm-Wave Circuit Advances in Industry

Chair: Travis Forbes, Sandia National Laboratories, USA — Co-Chair: Justin Wu, Amlogic, Taiwan
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S. Yamashita, Y. Tsukui, Y. Kawamura, K. Mori, A. Hirai, Mitsubishi Electric, Japan 
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- C** A 60GHz Fully Integrated Low-IF CMOS Radar Transceiver with -6dBm IP1dB and -14 to 5dBm Power Control for Ultra-Short-Range Applications
Byeong-Taek Moon¹, Kyunghwan Kim¹, Jaeyeon Jeong¹, Goeun Baek¹, Doyoon Kim¹, Hongkie Lim¹, Junseong Kim¹, Minseob Lee¹, Seungyeon Jung¹, Kyungwoo Yoo¹, Taewoo Yu¹, Taeyeon Kim¹, Sungjoo Kim¹, Yoonki Lee¹, Woncheol Lee¹, Oren Eliezer², Hyun-Chul Park¹, Chan-Hong Park¹
¹Samsung, Korea ; ²Samsung, USA 
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- C** A CMOS-Enabled Heterogeneously-Integrated InP HEMT W-Band LNA with 2.8-dB Noise Figure at 7.7-dB Gain and 4.5 mW P_{DC}
Justin J. Kim, Alex Dinkelacker, Nicholas Vong, Michael D. Hodge, Matthew H. Tom, Bennett C. Coy, Mark R. Soler, Christopher Maxey, Florian Herrault, James F. Buckwalter, PseudolithiC, USA 
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Shahriar Shahramian, Michael J. Holyoak, Mustafa Sayginer, Mike Zierdt, Chris Adams, Muhammad Waleed Mansha, Joe Weiner, Ayush Rai, Ismail Kartam, Yves Baeyens, Nokia Bell Labs, USA 

RMo2A: High Performance Power Amplifiers and Front-End Modules

Chair: Debopriyo Chowdhury, Broadcom, USA — Co-Chair: Rocco Tam, NXP Semiconductors, USA
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Jungsik Kim, Kyung Pil Jung, Seung Hun Kim, Sungjae Oh, Seong-Kyun Kim, Dongjin Jung, Dae Young Lee, Samsung, Korea 
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- C** A 13-GHz Harmonic Tuned Asymmetric Doherty Power Amplifier with Compact and Precise Matching Network for 6G Application
Seung Hun Kim, Kyung Pil Jung, Sungjae Oh, Jungsik Kim, Seong-Kyun Kim, Dongjin Jung, Dongki Kim, Dae Young Lee, Samsung, Korea 
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- C** A Ku-Band 2-Stage Differential Doherty Power Amplifier with Compact Asymmetric Doherty Combiner Based on Virtual Stub in 0.15- μ m GaAs pHEMT
Sungjae Oh, Seung Hun Kim, Kyung Pil Jung, Jungsik Kim, Hyeong Jin Kim, Seong-Kyun Kim, Dongjin Jung, Dongki Kim, Dae Young Lee, Samsung, Korea 
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Pascal Reynier, Ayssar Serhan, Alexandre Giry, CEA-Leti, France 
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- C** An Ultra-Compact, >17dBm P_{OUT}, >30% PAE, Single Transformer-Based Doherty PA in 28-nm CMOS FD-SOI for 5G FR2 UE AiP Products
Han-Woong Choi, Jongwon Yun, Jaeyeon Jeong, Iljin Lee, Geonho Park, Youngsub Kim, Hongmin Choi, Hyun-Chul Park, Chan-Hong Park, Samsung, Korea 

RMo2B: Advances in VCO Design at Microwave, mm-Wave, and Sub-THz Frequencies

Chair: Alexandre Siligaris, CEA-Leti, France — Co-Chair: Hamidreza Aghasi, University of California, Irvine, USA
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- C** A 60-GHz Area-Efficient Coupled Standing-Wave-Oscillators LO Distribution Network for a 240-GHz 2-D Phased-Array
Ying-Han You¹, Pin-Yu Lin¹, Sih-Ying Chen¹, Wei-Yu Lin², Jun-Chau Chien²
¹National Taiwan University, Taiwan ; ²University of California, Berkeley, USA 
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- C** A Compact 190GHz Push-Push Colpitts VCO in 130-nm BiCMOS with 3.5%-DC-to-RF Efficiency and 3.9-dBm Peak Output Power
Hanlin Yang¹, Hao He¹, Jianbo Huang¹, Yi Liu², Zhou Shu¹, Howard Cam Luong², Kevin Chai³, Yongxin Guo⁴
¹NUS, Singapore ; ²HKUST, China ; ³A*STAR, Singapore ; ⁴CityUHK, China 
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- C** An Image-Reused Phase-Tuning mm-Wave QVCO with a FoM_T of -204 dBc/Hz
Yue Zhu¹, Yuri Lu¹, Chunqi Shi¹, Leilei Huang¹, Hao Deng², Jinghong Chen², Runxi Zhang¹
¹East China Normal University, China ; ²University of Houston, USA 
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- C** A 580-μW 13.8–16.2-GHz Series-Tank-Assisted Transformer-Based Oscillator Achieving -188 dBc/Hz FoM and 50MHz/V Supply Pushing
Sayan Kumar, Sumit Dash, Robert Bogdan Staszewski, Teerachot Siriburanon, University College Dublin, Ireland 

RMo2C: mm-Wave Building Blocks and Components

Chair: Mohamed Elkhoully, Broadcom, USA — Co-Chair: Giuseppe Gramegna, imec, Belgium
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Tao Zhang, Haohui Chen, Depeng Sun, Lisheng Chen, Ruixue Ding, Shubin Liu, Zhangming Zhu, Xidian University, China 
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- C** A V-Band Transmitter Front-End IC for Phased-Array FMCW Radar with Impedance-Invariant Variable-Gain Phase Shifter
Mingyu Lee¹, Subin Lim¹, Euijin Oh¹, Goo-Han Ko², Si-Keuk Ryu², Eun-Taek Sung³, Donghyun Baek², Jong-Ryul Yang⁴, Seungchan Lee¹, Jinseok Park¹
¹Chonnam National University, Korea ; ²Chung-Ang University, Korea ; ³ETRI, Korea ; ⁴Konkuk University, Korea 
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- C** A Compact 25–32GHz Frequency Doubler with up to 32% Efficiency and >39 dBc Harmonic Rejection in 22nm FDSOI
Mohammed Helal, Gabriel M. Rebeiz, University of California, San Diego, USA 
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- C** A 24–31GHz Compact Low-Power Complex Impedance Sensor for Beamforming Transmitters in 22nm FD-SOI
Xuepu Wu¹, Yang Zhang¹, Giovanni Mangraviti¹, Rana ElKashlan¹, Dries Peumans², Piet Wambacq¹
¹imec, Belgium ; ²Vrije Universiteit Brussel, Belgium 
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- C** An Ultra-Compact and Broadband C-X-Band Wilkinson Power Divider/Combiner Using a Folded Two-Section Mechanism in 65-nm Bulk CMOS Technology
Jiazhi Ying, Zhiqiang Zhao, Yikun Wang, Kaiqiang Zhu, Houjun Sun, Beijing Institute of Technology, China 

RMo3A: Advanced Frequency Generation in Sub-10nm CMOS and SiGe BiCMOS

Chair: Bichoy Bahr, Texas Instruments, USA — Co-Chair: Steven Turner, BAE Systems, USA

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- C A 13.5 to 23GHz Compact PLL Based on a 0.006mm^2 Transformer-Based Dual-Resonator Tuned LC VCO in 5nm CMOS**
Armagan Dascurcu, Bodhisatwa Sadhu, Herschel Ainspan, Gary Kurtzman, John Borkenhagen, Zheng Xu, Jim Strom, IBM, USA 
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- C A 16–22GHz Fractional-N PLL in 8nm FinFET with 68 fs_{rms} Jitter**
Wanghua Wu¹, Zhiyu Chen¹, Kyumin Kwon¹, Suoping Hu¹, Pak-Kim Lau¹, Changhun Song¹, Ali Binaie¹, Santosh Kumpatla¹, Juyeop Kim¹, Jeiyoun Lee², Chih-Wei Yao¹, Sangwon Son¹, Joonhoi Hur¹
¹Samsung, USA ; ²Samsung, Korea 
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- C A 210–320GHz Power-Combining Distributed Frequency Doubler with Tuned Pre-Amplification in $0.13\mu\text{m}$ SiGe BiCMOS**
Akshay Visweswaran, Yves Baeyens, Mustafa Sayginer, Hernan Castro, Ayush Rai, Shahriar Shahramian, Nokia Bell Labs, USA 
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- C Design Technology Co-Optimization for RF/mmWave Circuits with Circuit Under Inductor (CUI) in FinFET CMOS Technologies**
Hsieh-Hung Hsieh¹, Wei-Ling Chang¹, Kai-Chun Chang¹, Wen-Sheng Chen¹, Yen-Jen Chen¹, Tzu-Jin Yeh¹, Shenggao Li², Shih-Hsien Yang¹, Hua-Chou Tseng¹, Cho-Ying Lu¹, Hwa-Yu Yang¹, Guo-Wei Huang³
¹TSMC, Taiwan ; ²TSMC, USA ; ³NARLabs-TSRI, Taiwan 

RMo3B: mm-Wave Transmitter and Receiver Front-Ends

Chair: Swaminathan Sankaran, Texas Instruments, USA — Co-Chair: Shahriar Shahramian, Nokia Bell Labs, USA

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- C A 15–50GHz LNA with 2.4dB NF and $25.4 \pm 1.4\text{dB}$ Gain in $0.15\mu\text{m}$ GaAs pHEMT Process**
Nengyuan Zhong¹, Yao Li¹, Shiwei Hu¹, Chenhao Gao¹, Xiang Wang², Yanjie Wang¹
¹SCUT, China ; ²NJUST, China 
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Haitao Lin¹, Li Gao¹, Xinyang Liu², Xiu Yin Zhang¹
¹SCUT, China ; ²Sanechips Technology, China 
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Aoran Han, Qingxian Li, Jie Zhou, Xun Luo, UESTC, China 
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- C A 22-to-50GHz Bi-Directional Beamforming CMOS Front-End with Distributed Impedance Reshaping Technique for 5G NR FR2 Applications**
WeiQi Zheng, Wei Deng, Junlong Gong, Haikun Jia, Dongze Li, Hongliang Wu, Baoyong Chi, Tsinghua University, China 

RMo3C: High Speed and Domain Specific Data Converters

Chair: Emily Naviasky, IBM T.J. Watson Research Center, USA — Co-Chair: Antoine Frappé, Université de Lille, France
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C A 40GS/s 8bit Time-Interleaved Time-Domain ADC Featuring SFDR-Enhanced Sample-and-Hold Circuit and Power-Efficient Adaptive Pulse Generator in 28nm CMOS

Chenghao Zhang¹, Maliang Liu¹, Yuan Chang¹, Yihang Yang¹, Yintang Yang¹, Yong Chen²

¹Xidian University, China  ; ²Tsinghua University, China 

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C A 12-Bit 6-GS/s Time-Interleaved SAR ADC with On-Chip Mismatch Calibration in 28nm CMOS Technology

Sebastian Linnhoff¹, Frowin Buballa¹, Michael Reinhold², Rene Spanl², Erik Sippel³, Friedel Gerfers¹

¹Technische Universität Berlin, Germany  ; ²Robert Bosch, Germany  ; ³FAU Erlangen-Nürnberg, Germany 

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C Mostly Digital, Calibration-Free, Band-Pass Delta-Sigma Modulator Using Dual Time-Interleaved Noise-Shaping SAR ADCs

Matt Kinsinger, Anoop Bengaluru, Jia-Ching Chuang, Sumukh Bhanushali, Arindam Sanyal, Arizona State University, USA 

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C Circuits-Informed Machine Learning Technique for Blind Open-Loop Digital Calibration of SAR ADC

Sumukh Bhanushali¹, Debnath Maiti¹, Phaneendra Bikkina², Esko Mikkola², Arindam Sanyal¹

¹Arizona State University, USA  ; ²Alphacore, USA 

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C A 17mW 8-Element 2-Beam Hybrid Slepian Beamforming Receiver with SAR-ADC-Based Charge-Domain Multiply and Accumulation

Zhengqi Xu¹, Zhiyuan Zhao¹, Michael A. Laun¹, Coleman DeLude², Justin Romberg², Michael P. Flynn¹

¹University of Michigan, USA  ; ²Georgia Tech, USA 

RMo4A: Transmitters Beyond 100GHz

Chair: Aritra Banerjee, University of Illinois at Chicago, USA — Co-Chair: Andrea Mazzanti, Università di Pavia, Italy
203, 15:40–17:20, Monday, 16 June 2025

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- C** A D-Band Direct-Modulation 64-QAM Transmitter with On-Chip Digital Calibration in 16nm FinFET Technology
Runzhou Chen¹, Hao-Yu Chien¹, Chao-Jen Tien¹, Hong-Shen Chen², Hsieh-Hung Hsieh², Tzu-Jin Yeh², Mau-Chung Frank Chang¹
¹University of California, Los Angeles, USA ; ²TSMC, Taiwan 
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- C** A 110 to 122-GHz Four-Channel Oversampling Digital-to-Phase Transmitter for Scalable, Energy-Efficient Arrays
Justin J. Kim¹, Alex Dinkelacker¹, Jeff Shih-Chieh Chien², James F. Buckwalter¹
¹University of California, Santa Barbara, USA ; ²Samsung, USA 
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Haoling Li, Najme Ebrahimi, Northeastern University, USA 
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- C** A 200-GHz Phased Array Transmitter with Element-Level Scanning Antenna for $\pm 45^\circ$ Scanning Range with $0.71\lambda_0$ Antenna Pitch
Si-Yuan Tang, Peigen Zhou, Rui Zhou, Rui Zhang, Zongxiang Wang, Dawei Tang, Long Wang, Xiaoyue Xia, Wentao Zhu, Jirui Li, Jinben Li, Pinpin Yan, Hao Gao, Jixin Chen, Wei Hong, Southeast University, China 
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- C** A 270-to-300GHz Amplifier-Last Transmitter with 6.7dBm Peak Output Power Using 130nm SiGe Process
Peigen Zhou, Jixin Chen, Zuojun Wang, Jiayang Yu, Zhe Chen, Hao Gao, Wei Hong, Southeast University, China 

RMo4B: Design Techniques of RF/mm-Wave Low-Noise Amplifiers (LNAs) and Front-End Modules (FEMs)

Chair: Hsieh-Hung Hsieh, TSMC, Taiwan — Co-Chair: Ying Chen, Samsung, USA
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Yongchun Li, Taotao Xu, Pei Qin, Quan Xue, Wenquan Che, SCUT, China 
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- C** A 3.23dB Average NF and 2.32dB Minimum NF V-/E-Band Common-Gate/Common-Source Joint-Feeding LNA with Three-Line Coupler Input Matching for Simultaneous Noise/Power Matching
Boce Lin, Niccolò Villaggi, Tzu-yuan Huang, Hua Wang, ETH Zürich, Switzerland 
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- C** A 22-nm CMOS 3.5–7.2GHz Wideband FEM with a Balanced-Power-Combining DPA and a Dual-Resonant Input Matching LNA
Kangjie Zhao¹, Can Liu¹, Linfeng Zou¹, Kai Liu¹, Yuan Xu¹, Xinyi Jiang¹, Ruilai Xu¹, Wangdong Xie¹, Yang Zhou¹, Hao Deng², Leilei Huang¹, Chunqi Shi¹, Lei Chen³, Jinghong Chen², Runxi Zhang¹
¹East China Normal University, China ; ²University of Houston, USA ; ³SUEP, China 
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- C** An Ultra-Compact Switchless Bidirectional PA-LNA with 8-Shaped Transformer-Based Inter-Stage Matching Networks for W-Band Applications
Lingtao Jiang, Lihong Chen, Xianfeng Que, Quan Xue, Yanjie Wang, SCUT, China 
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- C** A 24–30GHz GaN-on-SiC T/R Front-End Module with 37.1-dBm Output Power and 34.4% PAE
Cheng-jie Hu, Hui-Yang Li, Jin-Xu Xu, Run-Feng Chen, Jun-Ming Zhu, Xiu Yin Zhang, SCUT, China 

RMo4C: Unleashing Energy Efficiency and High Linearity in IoT RFICs

Chair: Yao-Hong Liu, imec, The Netherlands — Co-Chair: Pierluigi Nuzzo, University of California, Berkeley, USA
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- C** A Single-Side-Band Frequency Translated 64-QAM Backscatter Communication IC with Phase-Rotation Time-Variant Reflector and LUT-Based Digital Predistortion
Shuangfeng Kong, Fengjun Chen, Zhiqiang Huang, HKUST Guangzhou, China 
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Siyu Wang, David D. Wentzloff, University of Michigan, USA 
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- C** A Harmonic-Suppressing Gain-Boosted N-Path Receiver with Clock Bootstrapping for IoT Applications
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- C** A 1.9–4GHz Receiver with Enhanced In-Band and Out-of-Band Linearity Using Double Sampling and Time-Domain Processing
Sreeni Poolakkal¹, Dipan Kar¹, Arpit Rao¹, Daniel Mazidi¹, Praveen Venkatachala², Subhanshu Gupta¹
¹Washington State University, USA ; ²Skyworks Solutions, USA 
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17:00
- C** A 5.75mW Fully-Integrated Galvanic Isolator for Gate Drivers with Asynchronous 66.7/66.7Mb/s Full-Duplex Communication
Lucrezia Navarin¹, Karl Norling², Marco Parenzan², Alexander Uran², Stefano Ruzzu², Krithika Rathinam², Andrea Neviani¹, Andrea Bevilacqua¹
¹Università di Padova, Italy ; ²Infineon Technologies, Austria 

RTu1A: mm-Wave Power Amplifiers and Transmitters

Chair: Song Hu, Apple, USA — Co-Chair: Hyun-Chul Park, Samsung, Korea
203, 08:00–09:40, Tuesday, 17 June 2025

- PAGE 219
RTu1A-1
8:00
- C** A 10 to 40GHz Stacked Push-Pull Class-B Power Amplifier in 45-nm CMOS SOI with 20.4dBm P_{SAT} and Continuously Supporting 72Gb/s 64-QAM and 10Gb/s 1024-QAM Signals
Saleh Hassanzadehyamchi¹, Hadi Bameri¹, Ali M. Niknejad², Omeed Momeni¹
¹University of California, Davis, USA ; ²University of California, Berkeley, USA 
- PAGE 223
RTu1A-2
8:20
- C** A Wideband Dual-Mode Power Amplifier with Slotline-Based Series-Parallel Combiner in 28-nm Bulk CMOS Technology
Gunwoo Park, Sanggeun Jeon, Korea University, Korea 
- PAGE 227
RTu1A-3
8:40
- C** A K-Band Process-Corner Robust Balanced Power Amplifier Utilizing Current-Mode Adaptive Biasing Network in 65-nm CMOS
Jiankai Zhao, Haikun Jia, Qiuyu Peng, Wei Deng, Zhan Gao, Xiaochuan Duo, Zhihua Wang, Baoyong Chi, Tsinghua University, China 
- PAGE 231
RTu1A-4
9:00
- C** A D-Band Guanella Transformer Based Stacked Doherty Power Amplifier with Adaptive Bias Network in 250-nm InP DHBT
Senne Gielen¹, Berke Gungor², Yang Zhang¹, Mark Ingels¹, Patrick Reynaert²
¹imec, Belgium ; ²KU Leuven, Belgium 
- PAGE 235
RTu1A-5
9:20
- C** A 23.6–30.0GHz Phased-Array Transmitter with Wide-Angle-Scanning Load-Compensation Technique Achieving OTA-Tested 2.9dB Array-Gain Enhancement and 1.2dB EVM Improvement
Mengqian Geng, Yiming Yu, Bohan Sun, Riqi Wang, Huihua Liu, Yunqiu Wu, Chenxi Zhao, Kai Kang, UESTC, China 

RTu1B: High-Performance RF Oscillators

Chair: Hanli Liu, Zhejiang University, China — Co-Chair: Teerachot Siriburanon, University College Dublin, Ireland
205, 08:00–09:40, Tuesday, 17 June 2025

- PAGE 239
RTu1B-1
8:00
- C** **An Inverse Class-F VCO with Reduced Third Harmonic Detriment Using a High Fundamental and Second Harmonic Q-Factor Resonator Achieving a 198.9dBc/Hz Peak FoM**
Yue Wu, Yatao Peng, Fengen Yuan, Jiawei Li, Jun Yin, Rui P. Martins, Pui In Mak, University of Macau, China **A**
- PAGE 243
RTu1B-2
8:20
- C** **A 4.21-to-15.18GHz Pure Magnetic-Coupling and Fully Symmetrical Quad-Core Quad-Mode VCO Achieving 220.5dBc/Hz FoM_{TA@10MHz}**
Shijin Huang, Pei Qin, Haoshen Zhu, Xiang Yi, Wenjie Feng, Wenquan Che, Quan Xue, SCUT, China **A**
- PAGE 247
RTu1B-3
8:40
- C** **7.8-to-10.7GHz Reliable-Mode-Switching Series Resonance Oscillator with Bidirectional Inductive-Mode-Pulling Achieving -156.5dBc/Hz Phase Noise and 199.2dBc/Hz FoM_T at 10MHz Offset in 40-nm CMOS**
Qiao Leng, Yiyang Shu, Yu Wang, Xun Luo, UESTC, China **A**
- PAGE 251
RTu1B-4
9:00
- C** **A Compact VCO Using Coupling-Canceling Common-Mode Resonance Expansion Achieving 120–155kHz 1/f³ Corner and 0.27dB FoM Variation Without Harmonic Tuning**
Xiangjian Kong¹, Kai Xu², Hao Lian¹, Fa Dai¹, Chunbing Guo¹
¹GDUT, China **A** ; ²King's College London, UK **A**
- PAGE 255
RTu1B-5
9:20
- C** **A Multi-Tap-Transformer Based Quad-Core Dual-Mode VCO Achieving 213.1dBc/Hz FoM_{TA@100kHz} and Wideband 1/f³ Noise Suppression**
Yuhui Li, Pei Qin, Haoshen Zhu, Xiang Yi, Wenjie Feng, Wenquan Che, Quan Xue, SCUT, China **A**

RTu1C: Pushing RFIC Boundaries with Out-of-the-Box Innovation

Chair: Aly Ismail, Apple, USA — Co-Chair: Jin Zhou, MediaTek, USA
207, 08:00–09:40, Tuesday, 17 June 2025

- PAGE 259
RTu1C-1
8:00
- C** **An Ultra Low Power Analog/Mixed-Signal Processor for a Smart RF Signal Classification System in the ISM Band**
N. Pekcokguler¹, C. Dehollain², A. Burg², P. Courouve³, D. Morche³
¹Analog Devices, Germany **A** ; ²EPFL, Switzerland **A** ; ³CEA-Leti, France **A**
- PAGE 263
RTu1C-2
8:20
- C** **Enabling Fast Steering of Arbitrary Beams with Phased Arrays**
Arun Paidimarri, Bodhisatwa Sadhu, Mark Yeck, Alberto Valdes-Garcia, IBM, USA **A**
- PAGE 267
RTu1C-3
8:40
- C** **An 8-Lane 58Gb/s/Lane 0.66pJ/bit Modulator Driver Electrical-IC for a 3-D Integrated Silicon Photonic Transmitter in 22nm FD-SOI Process**
Laszlo Szilagyi¹, Bartek J. Pawlak², Luc Pauwels³, Pieter Bex³, Chiara Marchese³, Guy Lepage³, Yoojin Ban³, Dimitrios Velenis³, Nikos Argyris⁴, Dimitrios Kalavrouziotis⁴, Konstantinos Tokas⁴, Paraskevas Bakopoulos⁴
¹GlobalFoundries, Germany **A** ; ²GlobalFoundries, Belgium **A** ; ³imec, Belgium **A** ; ⁴NVIDIA, Greece **A**
- PAGE 271
RTu1C-4
9:00
- C** **A 6.5 to 9GHz IEEE 802.15.4/4z Compatible IR-UWB SoC Capable of Handling -22dBm WiFi-5 or -24 to -17dBm LTE Blocker Levels**
Babak Vakili-Amini¹, Maxime Vignasse¹, Syed Enam¹, Amit Sarkar¹, Jaydeep Dalwadi¹, Javier Velandia², Mahdi Bagheri¹, Sebastien Darfeuille², Yi-Wen Chen¹, Melina Apostolidou³, Jan van Sinderen³, Henrik Jensen¹, Rozi Roufoogaran¹
¹NXP Semiconductors, USA **A** ; ²NXP Semiconductors, Austria **A** ; ³NXP Semiconductors, The Netherlands **A**

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RTu1C-5
9:20

C Fully-Integrated Autonomous K-Band Complex Permittivity Sensor in 22nm FDSOI for Biomedical Body Parameter Monitoring Applications

Adilet Dossanov, Moritz Weißbrich, Alexander Meyer, Liubov Bakhchova, Finn-Niclas Stapelfeldt, Guillermo Payá-Vayá, Vadim Issakov, Technische Universität Braunschweig, Germany 

RTu2A: Design Techniques for High Performance SiGe PAs

Chair: Tolga Dinc, Texas Instruments, USA — Co-Chair: Shintaro Shinjo, Mitsubishi Electric, Japan
203, 10:10–11:50, Tuesday, 17 June 2025

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RTu2A-1
10:10

C Topology-Optimized Nonintuitive Multilayered mm-Wave Power Amplifiers

Vinay Chenna, Hossein Hashemi, University of Southern California, USA 

PAGE 283
RTu2A-2
10:30

C 31.7 and 36.7dBm Ka-Band SiGe BiCMOS Power Amplifiers Using Resonated Amplifier Cores and Optimized Power Combining

Alexander Haag¹, Ahmet Çağrı Ulusoy²
¹milli IC, Germany ; ²KIT, Germany 

PAGE 287
RTu2A-3
10:50

C A SiGe Common-Collector-Common-Base Linear Power Amplifier with 17–28-GHz P_{1dB} 3-dB Bandwidth and Enhanced Large-Signal Stability

Tsung-Ching Tsai, Ahmet Çağrı Ulusoy, KIT, Germany 

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RTu2A-4
11:10

C A Linear Q-Band Balanced Power Amplifier in a 130nm SiGe BiCMOS Technology Using Two-Tone Load-Pull Optimization

Alexander Haag¹, Ahmet Çağrı Ulusoy²
¹milli IC, Germany ; ²KIT, Germany 

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RTu2A-5
11:30

C A 5/6GHz Compact, Dual-Band, and Highly Linear Wi-Fi 6E SiGe HBT Power Amplifier Using Q-Modulated Switched Capacitor Interstage Matching Network and Optimized Output Stage

Yoongoo Kang, Hanjung Lee, Inchan Ju, Ajou University, Korea 

RTu2B: mm-Wave and Sub-THz Radar SoCs and Sensing Techniques

Chair: Yahya Tousi, University of Minnesota, USA — Co-Chair: Oren Eliezer, Samsung, USA

205, 10:10–11:30, Tuesday, 17 June 2025

- PAGE 299
RTu2B-1
10:10
- C** A 4.6mW 232GHz Autodyne Complementary Self-Injection-Locked Radar for Micrometer-Level Displacement Sensing and Imaging
Sidharth Thomas, Wei Sun, Aydin Babakhani, University of California, Los Angeles, USA **A**
- PAGE 303
RTu2B-2
10:30
- C** 400-GHz Concurrent Transceiver Imaging Pixel with Improved Noise Performance and Increased Injection Locking Range
Goutham Murugesan¹, Muhammad Awais¹, Sarfraz Shariff¹, Yukun Zhu¹, Pranith Reddy Byreddy¹, Frank Zhang¹, Wooyeol Choi², Kenneth K. O¹
¹University of Texas at Dallas, USA **A** ; ²Seoul National University, Korea **A**
- PAGE 307
RTu2B-4
10:50
- C** A 140GHz FMCW Radar with 22dB Wideband RF-Domain Multipath Self-Interference Cancellation in 28nm CMOS
Yikuan Chen, Hesham Beshary, Ethan Chou, Meng Wei, Nima Baniasadi, Ali M. Niknejad, University of California, Berkeley, USA **A**
- PAGE 311
RTu2B-5
11:10
- C** An E-Band Phase-Modulated Bistatic Radar with 10mW/Channel Fast-Time Baseband Processing
Wen Zhou, Yahya Tousi, University of Minnesota, USA **A**

RTu2C: Heterogeneous Integration for RF/mm-Wave Applications and Measurement Techniques

Chair: Duane Howard, Astranis Space Technologies, USA — Co-Chair: Florian Voineau, STMicroelectronics, France

207, 10:10–11:50, Tuesday, 17 June 2025

- PAGE 315
RTu2C-1
10:10
- C** A 3D Heterogeneously Integrated Power Amplifier Module Using BiCMOS and RF SOI CMOS Technologies for 5G Applications
Antoine Le Ravallec, Sébastien Sadlo, David Gaidioz, Christophe Arricastes, Romain Coffy, Frédéric Paillardet, Olivier Noblanc, STMicroelectronics, France **A**
- PAGE 319
RTu2C-2
10:30
- C** Heterogeneous Integration of a 0.15μm GaN Circulator and a 45nm RF SOI Voltage-Boosted Clock Generation IC
Nishant Patil, Armagan Dascurcu, Nusrat Jahan, Harish Krishnaswamy, Columbia University, USA **A**
- PAGE 323
RTu2C-3
10:50
- C** Heterogeneously-Integrated Amplifier-on-Glass with Embedded Gallium Nitride (GaN) Dielet for mmWave Applications
Xingchen Li¹, Pradyot Yadav², Tomás Palacios², Madhavan Swaminathan¹
¹Georgia Tech, USA **A** ; ²MIT, USA **A**
- PAGE 327
RTu2C-4
11:10
- C** 3D-Millimeter Wave Integrated Circuit (3D-mmWIC): A Gold-Free 3D-Integration Platform for Scaled RF GaN-on-Si Dielets with Intel 16 Si CMOS
Pradyot Yadav¹, Jinchun Wang¹, Danish A. Baig², Juan Pastrana-Gonzalez³, John Niroula¹, Patrick Darmawi-Isakandar¹, Ulrich L. Rohde⁴, Ahmad Islam³, Muhannad Bakir², Ruonan Han¹, Tomás Palacios¹
¹MIT, USA **A** ; ²Georgia Tech, USA **A** ; ³AFRL, USA **A** ; ⁴Universität der Bundeswehr München, Germany **A**

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RTu2C-5
11:30

- C** **Determination of the Thermal Noise Parameters of FD-SOI MOSFET Through Hybrid Noise Matrix**
B. Dormieu, J. Azevedo Gonçalves, C. Belem Gonçalves, P. Scheer, F. Paolini, G. Gouget, STMicroelectronics, France 

RTu3A: PLLs and Frequency Multipliers

Chair: Ahmed Elkholy, Broadcom, USA — Co-Chair: Jingzhi Zhang, UESTC, China
203, 13:30–15:10, Tuesday, 17 June 2025

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RTu3A-1
13:30

- C** **A 116–132GHz -193.6dBc/Hz-FoM_T -252.8dB-FoM_J Frequency Synthesizer Using a 114fs-Jitter 60-GHz Double-Sampling PLL with Magnetic Parabolic Tuning and Injection-Locked Frequency Doubler**
Zhiyu Liu, Howard Cam Luong, HKUST, China 

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RTu3A-2
13:50

- C** **A 324-to-360-GHz -6-dBm Output Power THz Phase-Locked Loop in 40-nm CMOS**
Wei-Tang Tseng¹, Te-Yen Chiu², Chun Wang², Chun-Hsing Li¹
¹National Taiwan University, Taiwan ; ²National Tsing Hua University, Taiwan 

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RTu3A-3
14:10

- C** **A 28–38GHz Digitally-Assisted Frequency Tripler with Background Calibration in 55nm SiGe BiCMOS**
D. Lodi Rizzini¹, F. Tesolin¹, M. Rossoni¹, B. Nanino¹, P. Granata¹, R. Moleri¹, A. Mazzanti², A.L. Lacaita¹, S.M. Dartizio¹, S. Levantino¹
¹Politecnico di Milano, Italy ; ²Università di Pavia, Italy 

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RTu3A-4
14:30

- C** **A 35.2–51.4GHz Frequency-Tracking Injection-Locked Frequency Tripler Achieving >28.5dBc Harmonic Rejection Ratios, -7.3dBm Output Power, and 4.3dB Output Power Variation**
Zixi Jing, Yi Liu, Howard Cam Luong, HKUST, China 

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RTu3A-5
14:50

- C** **A High-Conversion-Gain Compact W-Band Distributed Doubler with Second Harmonic Positive Feedback Using Cross-Coupled Capacitor**
Dongho Yoo, Byung-Wook Min, Yonsei University, Korea 

RTu3B: D-Band Circuits and Systems for Sensing and Communications

Chair: Vadim Issakov, Technische Universität Braunschweig, Germany — Co-Chair: Zeshan Ahmad, Coherent, USA
205, 13:30–15:10, Tuesday, 17 June 2025

- PAGE 355
RTu3B-1
13:30
- C** **A Low-Power D-Band Radar Transceiver with TL-MCR Matching Technique and Output Phase Shifting**
Zesen Chen¹, Likang Du¹, Nayu Li², Qun Jane Gu³, Chunyi Song¹, Zhiwei Xu¹
¹Zhejiang University, China **A**; ²Donghai Laboratory, China **A**; ³Georgia Tech, USA **A**
- PAGE 359
RTu3B-2
13:50
- C** **A Terahertz FMCW Radar with 169-GHz Synthetic Bandwidth and Reconfigurable Polarization in 40-nm CMOS**
Aguan Hong¹, Xiang Yi¹, Yanjun Wang¹, Jianmin Hu², Zhantao He¹, Guohao He¹, Yang Yang³, Jiexin Lai³, Hongli He¹, Lina Su¹, Zhenyu Deng², Jingting Xie², Shaqi Yang², Hongkun Zhou², Lingeng Zheng², Sicheng He¹, Pei Qin¹, Haoshen Zhu¹
¹SCUT, China **A**; ²CAS, China **A**; ³UTS, Australia **A**
- PAGE 363
RTu3B-3
14:10
- C** **A 108-to-141.8GHz 27.1%-Tuning-Range Synthesizer Employing a Dual-Reference-FTL Sub-Sampling PLL and 3rd-Harmonic-Enhancement Class-F VCO and Injection-Locked Frequency Tripler**
*Khoi T. Phan, Howard Cam Luong, HKUST, China **A***
- PAGE 367
RTu3B-4
14:30
- C** **A Fully Integrated 263-GHz Retro-Backscatter Circuit with 105°/82° Reading Angle and 12-dB Conversion Loss**
*Mingran Jia, Jincheng Wang, Jaehong Jung, Xibi Chen, Eunseok Lee, Anantha P. Chandrakasan, Ruonan Han, MIT, USA **A***
- PAGE 371
RTu3B-5
14:50
- C** **A 127-to-156GHz 64QAM/256QAM Zero-IF CMOS Transceiver Chipset Achieving 42dB IRR and 17.8dBm Output Power**
*Ziyuan Guo, Wei Deng, Weiqi Zheng, Xinyu Jiang, Haikun Jia, Fuyuan Zhao, Hongliang Wu, Baoyong Chi, Tsinghua University, China **A***

RTu3C: High-Speed Circuits and Systems for Photonic and Quantum Applications

Chair: Sushil Subramanian, Intel, USA — Co-Chair: Bahar Jalali Farahani, Cisco, USA
207, 13:30–15:10, Tuesday, 17 June 2025

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13:30
- C** **A 19.4-fs_{RMS} Jitter 0.1-to-44GHz Cryo-CMOS Fractional-N CP-PLL Featuring Automatic Bleed Calibration for Quantum Computing**
Jinhai Xiao¹, Yong Chen², Ningyi Zhang¹, Rui Liu¹, Yuhao Zhang¹, Peng Luo¹, Maliang Liu¹, Yintang Yang¹, Xiaohua Ma¹, Yue Hao¹
¹Xidian University, China **A**; ²Tsinghua University, China **A**
- PAGE 379
RTu3C-2
13:50
- C** **A Low-Power High-Dynamic-Range Analog Correlator Based on Parametric Multiplication and Integration**
*Amirhossein Aalipour Hafshejani, Yuanxun Ethan Wang, University of California, Los Angeles, USA **A***
- PAGE 383
RTu3C-3
14:10
- C** **A 204GS/s 1-to-2 Analog Demultiplexer in 22nm FDSOI CMOS**
*Truman Jian, Rafid A. Khan, Ashley Rivera, Danylo Tkachenko, Sorin P. Voinigescu, University of Toronto, Canada **A***
- PAGE 387
RTu3C-4
14:30
- C** **A 224-Gb/s PAM-4 Linear Distributed Driver for Silicon-Photonic Modulators in SiGe BiCMOS**
Han Liu¹, Ruogu Deng², Zizheng Dong¹, Guike Li¹, Jian Liu¹, Nanjian Wu¹, Wim F. Cops³, Tao Chen³, Liyuan Liu¹, Nan Qi¹
¹CAS, China **A**; ²UCAS, China **A**; ³Shenzhen Sibroad Microelectronics, China **A**
- PAGE 391
RTu3C-5
14:50
- C** **A ±1V-DC to 20-GHz Front-End Chipset with 1.5-Vpp AC and 0.5-to-1V DC Outputs for Direct Sampling Real-Time Oscilloscopes**
Zhaowu Wang¹, Xinyan Li¹, Chi Zhang¹, Xiaochen Tang¹, Ronglin Chen¹, Ze Yu¹, Ruilin Liao¹, Zhenyu Wang¹, Yicheng Wang¹, Xinyi Jiang¹, Yiming Xu¹, Zhiyu Wang², Shengchuan Chen², Kai Kang¹, Yue Zhang², Yong Wang¹
¹UESTC, China **A**; ²Jiujin Technology, China **A**

RTu4A: Circuit Techniques for Radar and Phased Array

Chair: Roxann Broughton-Blanchard, Analog Devices, USA

Co-Chair: Chun-Huat Heng, National University of Singapore, Singapore

203, 15:40-17:20, Tuesday, 17 June 2025

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15:40

C A 15/30/60-GHz 1TX/4RX Radar Chipset Achieving 6° Angular Resolution Using Frequency Dimension for Virtual Aperture Expansion

Ruilin Liao¹, Haoran Wang¹, Jingzhi Zhang¹, Wei-Han Yu², Yue Song¹, Hongyang An¹, Huihua Liu¹, Kai Kang¹

¹UESTC, China ; ²University of Macau, China 

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RTu4A-2
16:00

C An 8-Element 800MHz BW 0.083mm²/element Scalable Current-Mode True-Time-Delay Analog Combiner for Low SWaP-C Antenna Arrays

Ajinkya Kharalkar¹, Paavan Gouniyal¹, Sumit Khalapure¹, Shubham Jain¹, Rajesh Zele¹, Sreeni Poolakkal², Soumen Mohapatra², Subhanshu Gupta²

¹IIT Bombay, India ; ²Washington State University, USA 

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RTu4A-3
16:20

C A Compact, 17.8TOPS/W, 2Gbps Programmable Analog Matched Filter and Coherent Accumulator for 79GHz PMCW Radar

Hongzhe Jiang, Chuhan Xue, Jingyi Huang, Peter R. Kinget, Columbia University, USA



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16:40

C A 28-nm 9-mm High-Resolution Multi-Mode IR-UWB Radar SoC with 16-GS/s Equivalent-Time Sampling for Non-Contact Detection of Human Vital Signs

Peng Luo¹, Yong Chen², Yuyang Liu¹, Ruan Jiang¹, Jinhai Xiao¹, Maliang Liu¹, Yintang Yang¹, Xiaohua Ma¹, Yue Hao¹

¹Xidian University, China ; ²Tsinghua University, China 

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RTu4A-5
17:00

C A Fully-Integrated Doppler-Assisted FMCW Radar with Low Hertz Range Noise Figure for Indoor Localization and Vital Sign Sensing

Yuqin Zhang¹, Zitong Zhang¹, Zhiluo Zhang¹, Zhenyu Zhang¹, Yue Zhu¹, Ruilai Xu¹, Ying Liu¹, Shixiang Ding¹, Jikun Wang¹, Kaige Wang¹, Dalin Li¹, Peng Wang¹, Guangsheng Chen¹, Hao Deng², Leilei Huang¹, Chunqi Shi¹, Jinghong Chen², Runxi Zhang¹

¹East China Normal University, China ; ²University of Houston, USA 

RTu4B: Circuit Blocks for D-Band Integrated Systems

Chair: Muhammad Waleed Mansha, Nokia Bell Labs, USA — Co-Chair: Kenichi Okada, Science Tokyo, Japan
205, 15:40–17:20, Tuesday, 17 June 2025

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RTu4B-1
15:40
- C** 110-to-140GHz Frequency Tripler with 13% Efficiency, 7.2dBm Psat Using Adaptive Biasing and 3rd Harmonic Boosting in 22nm FDSOI
Victor Lasserre, Sarah Koop-Brinkmann, Christian Ziegler, Finn-Niclas Stapelfeldt, Vadim Issakov, Technische Universität Braunschweig, Germany **A**
- PAGE 419
RTu4B-2
16:00
- C** A 126–137GHz Regenerative Frequency Shifter in 22nm FDSOI
Victor Lasserre¹, Finn-Niclas Stapelfeldt¹, Sarah Koop-Brinkmann¹, M. Dimić², F. Padovan², Vadim Issakov¹
¹Technische Universität Braunschweig, Germany **A** ; ²Infineon Technologies, Austria **A**
- PAGE 423
RTu4B-3
16:20
- C** A 200GHz Quasi-Circulator with a Widely Tunable Termination for >30dB Isolation and 8.3dB SNR Degradation in a 22nm FD SOI Process
Hyunwoo Seo, Omeed Momeni, University of California, Davis, USA **A**
- PAGE 427
RTu4B-4
16:40
- C** An Ultra-Compact and Wideband D-Band Power Amplifier in 28nm CMOS with Area-Efficient Coupled Line-Based Matching Network
Hyo-Ryeong Jeon¹, Hokeun Lee¹, Sang-Gug Lee¹, Kyung-Sik Choi²
¹KAIST, Korea **A** ; ²Yonsei University, Korea **A**
- PAGE 431
RTu4B-5
17:00
- C** A 110-to-203-GHz 18.3-dBm Broadband Power Amplifier Using Modified Three-Conductor Baluns in 130-nm SiGe BiCMOS
Shuyang Li¹, Shouqing Fu¹, Xin Liu², Quanqin Liao³, Huibo Wu¹, Shunhua Hu¹, Wenhua Chen¹
¹Tsinghua University, China **A** ; ²Xidian University, China **A** ; ³Wuhan University, China **A**

RTu4C: Innovations in Low-Power, High-Performance Receiver Front-Ends

Chair: Marcus Granger-Jones, Qorvo, USA — Co-Chair: Andrea Bevilacqua, Università di Padova, Italy
207, 15:40–17:20, Tuesday, 17 June 2025

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RTu4C-1
15:40
- C** A 2.4GHz 676μW Receiver Front-End with Passive Analog FIR Filtering Embedded in Down-Converter Achieving >60dB Blocker Rejection
Wenjing Zhang, Chao Chen, Yu Guo, Yan Zhao, Wenhan Yang, Southeast University, China **A**
- PAGE 439
RTu4C-2
16:00
- C** 10-to-30-GHz Blocker-Tolerant Mixer-First Receivers with 40-dB/Decade Transition-Band Roll-Off and Maximum 61.7-dB LO-to-RF Isolation
Kai Li, Shaoquan Wang, Keping Wang, Tianjin University, China **A**
- PAGE 443
RTu4C-3
16:20
- C** An 11.5mW 12.3–14.5GHz Passive Mixer-First Receiver Front End Achieving 4.2dB NF and -5dBm B1dB
Alain H. Antón, Jamie C. Ye, Sanaz Sadeghi, Alyosha C. Molnar, Cornell University, USA **A**
- PAGE 447
RTu4C-4
16:40
- C** A 4.2dB NF and 39dB Passive Gain Ultra-Low Power Receiver Front-End with an RF-IF Dual-Stage Capacitive Stacking Technique
Jin Jin, Zhepu Xu, Haipeng Bai, Bowei Xiao, Wen Wu, Tongde Huang, NJUST, China **A**
- PAGE 451
RTu4C-5
17:00
- C** A 0.2–6GHz 65nm CMOS Active-Feedback LNA with Threefold Balun-Error Correction and Implicit Post-Distortion Technique
Benqing Guo, CUIT, China **A**