

2018 IEEE/MTT-S International Microwave Symposium (IMS 2018)

**Philadelphia, Pennsylvania, USA
10-15 June 2018**

Pages 1-412



**IEEE Catalog Number: CFP18MTT-POD
ISBN: 978-1-5386-5068-4**

**Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18MTT-POD
ISBN (Print-On-Demand):	978-1-5386-5068-4
ISBN (Online):	978-1-5386-5067-7
ISSN:	0149-645X

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

Tu1C: Advances in Combiners and Dividers

Chair: Bayaner Arigong, Washington State University — Co-Chair: Guoan Wang, University of South Carolina
201C, Time 08:00–09:40, Tuesday 12 June 2018

PAGE 1 Tu1C-1 08:00	Filtering Power Divider with Wide Stopband Using Open-Stub Loaded Coupled-Line and Hybrid Microstrip T-Stub/DGS Cell <i>Liguo Fan¹, Huizhen Jenny Qian¹, Bingzheng Yang¹, Guoan Wang², Xun Luo¹</i> ¹ UESTC, China  ; ² University of South Carolina, USA 
N/A Tu1C-2 08:20	An Ultra-Compact Folded Inductor Based Wideband Gysel Power Divider for Multi-Band 5G Applications <i>Moez Karim Aziz, Min-Yu Huang, Sensen Li, Edgar Garay, Hua Wang, Georgia Tech, USA</i> 
PAGE 9 Tu1C-3 08:40	Compact Ridge Waveguide Gysel Combiner <i>Mohamed M. Fahmi, Raafat R. Mansour, University of Waterloo, Canada</i> 
PAGE 12 Tu1C-4 09:00	Wide-Band Single-Ended-to-Balanced Power Divider with Broad-Band Common-Mode Suppression <i>Wenjie Feng¹, Chenxu Wang², Wenquan Che¹, Roberto Gómez-García³, Quan Xue¹</i> ¹ SCUT, China  ; ² NJUST, China  ; ³ Universidad de Alcalá, Spain 
PAGE 16 Tu1C-5 09:10	A 3D Compact Wideband 16×16 Butler Matrix for 4G/3G Applications <i>Rafael D. Cerna, Manuel A. Yarlequé, PUCP, Peru</i> 

Tu1D: Novel Microwave and Millimeter Materials, Devices, and Radiating Structures

Chair: Jan Machac, Czech Technical University in Prague — Co-Chair: David Jackson, University of Houston
202AB, Time 08:00–09:40, Tuesday 12 June 2018

PAGE 20 Tu1D-1 08:00	Integrated Polarization Converter for Planar Cross-Polarized Millimeter Wave Components <i>Walid Dyab, Ahmed A. Sakr, Ke Wu, École Polytechnique de Montréal, Canada</i> 
PAGE 23 Tu1D-2 08:20	Design of Full-Metal Polarizing Screen Based on Circuit Modeling <i>Carlos Molero¹, T. Debogovic², María García-Vigueras¹</i> ¹ IETR (UMR 6164), France  ; ² EPFL, Switzerland 
PAGE 27 Tu1D-3 08:40	Planar Orthomode Transducer Based on Effective Polarization-Independent Coupling <i>Ahmed A. Sakr, Walid Dyab, Ke Wu, École Polytechnique de Montréal, Canada</i> 
PAGE 30 Tu1D-4 09:00	Volumetric Double Negative Metamaterial Composed of Planar Resonators <i>Jan Machac, Czech Technical University in Prague, Czech Republic</i> 
PAGE 33 Tu1D-5 09:20	Magneto-Electric-Dipole-Based Leaky-Wave Radiating Structure with Reduced Frequency-Dependent Beam Squint <i>Yue-Long Lyu¹, Fan-Yi Meng¹, Ke Wu², Qun Wu¹, Guo-Hui Yang¹, Cong Wang¹</i> ¹ Harbin Institute of Technology, China  ; ² École Polytechnique de Montréal, Canada 

Tu1G: Resonator-Based Sensors

Chair: Kamran Entesari, Texas A&M University — Co-Chair: Nils Pohl, Ruhr-Universität Bochum
204B, Time 08:00–09:40, Tuesday 12 June 2018

- | | |
|----------------------------|---|
| PAGE 36
Tu1G-1
08:00 | Sensitivity and Selectivity Enhancement in Coupling Ring Resonator Sensors Using Splitting Resonant Frequencies
<i>Mohammad H. Zarifi, University of British Columbia, Canada</i>  |
| PAGE 40
Tu1G-2
08:20 | Substrate-Integrated Liquid-Permittivity Microwave Sensor with Simultaneous Fixed-Reference Resonance
<i>Humberto Lobato-Morales, Ricardo A. Chávez-Pérez, José L. Medina Monroy, CICESE, Mexico</i>  |
| PAGE 43
Tu1G-3
08:40 | Electromagnetic Rotary Encoders Based on Split Ring Resonators (SRR) Loaded Microstrip Lines
<i>Javier Mata-Contreras, Cristian Herrojo, Ferran Martín, Universitat Autònoma de Barcelona, Spain</i>  |
| PAGE 47
Tu1G-4
09:00 | Wireless Remote Monitoring of Packaged Passive Sensor for <i>in-situ</i> Pressure Measurement in Highly Reflective Environments
<i>J. Philippe, D. Henry, M.V. De Paolis, A. Rumeau, A. Coustou, S. Charlot, P. Pons, H. Aubert, LAAS, France</i>  |

Tu1H: Advanced Structures Using Additive Manufacturing Process

Chair: Dominique Baillargeat, XLIM (UMR 7252) — Co-Chair: Carlos Saavedra, Queen's University
204C, Time 08:00–09:40, Tuesday 12 June 2018

- | | |
|----------------------------|--|
| PAGE 51
Tu1H-1
08:00 | n-RiM: A Paradigm Shift in the Realization of Fully Inkjet-Printed Broadband Tunable FSS Using Origami Structures
<i>Syed Abdullah Nauroze, Aline Eid, Manos M. Tentzeris, Georgia Tech, USA</i>  |
| PAGE 55
Tu1H-2
08:20 | Smart Floating Balls: 3D Printed Spherical Antennas and Sensors for Water Quality Monitoring
<i>Wenjing Su, Shicong Wang, Ryan Bahr, Manos M. Tentzeris, Georgia Tech, USA</i>  |
| PAGE 59
Tu1H-3
08:40 | 3D Printed Coaxial Transmission Line Using Low Loss Dielectric and Liquid Metal Conductor
<i>Junyu Shen, Dishit P. Parekh, Michael D. Dickey, David S. Ricketts, North Carolina State University, USA</i>  |
| PAGE 63
Tu1H-4
09:00 | Pushing Inkjet Printing to W-Band: An All-Printed 90-GHz Beamforming Array
<i>John Kimionis¹, Shahriar Shahramian¹, Yves Baeyens¹, Amit Singh¹, Manos M. Tentzeris²</i>
¹ Nokia Bell Labs, USA  ; ² Georgia Tech, USA  |
| PAGE 67
Tu1H-5
09:20 | 2.4GHz Band Pass Filter Architecture for Direct Print Additive Manufacturing
<i>Derar Hawatmeh, Thomas M. Weller, University of South Florida, USA</i>  |

Tu2C: Recent Developments in Passive Circuits

Chair: Holger Maune, Technische Universität Darmstadt — Co-Chair: Hualiang Zhang, UMass Lowell
201C, Time 10:10–11:50, Tuesday 12 June 2018

PAGE 71 Tu2C-1 10:10	High-Power Wideband Low-Cost Limiters Using Cold Plasma <i>Zach Vander Missen, Abbas Semnani, Dimitrios Peroulis, Purdue University, USA</i> 
PAGE 75 Tu2C-2 10:30	A Compact Quasi-Circulator with High Isolation Using Reconfigurable 180° Hybrid <i>Zhixian Deng, Huizhen Jenny Qian, Xun Luo, UESTC, China</i> 
PAGE 79 Tu2C-3 10:50	A Cascaded Self-Similar Rat-Race Hybrid Coupler Architecture and its Compact Fully Integrated Ka-Band Implementation <i>Edgar Garay, Min-Yu Huang, Hua Wang, Georgia Tech, USA</i> 
PAGE 83 Tu2C-4 11:10	A Wideband Filtering Balun Using CPW-to-Slotline Transitions <i>Jiyuan Ren, Huizhen Jenny Qian, Jie Zhou, Xun Luo, UESTC, China</i> 

Tu2D: Advances in Modeling and Design Optimization

Chair: Jose Rayas-Sanchez, ITESO — Co-Chair: Q.J. Zhang, Carleton University
202AB, Time 10:10–11:50, Tuesday 12 June 2018

PAGE 87 Tu2D-1 10:10	Efficient Simulation of Nonlinear Transmission Lines Using Empirical Interpolation and Projection-Based Model Order Reduction <i>Behzad Nouri, Michel Nakhla, Carleton University, Canada</i> 
PAGE 90 Tu2D-2 10:30	Passivity Enforcement of Loewner Matrix Macromodels Using Singular Value Perturbation <i>Yi Qing Xiao, Roni Khazaka, McGill University, Canada</i> 
PAGE 93 Tu2D-3 10:50	Sensitivity Analysis of X-Parameters Using the Harmonic Balance Derivative First Moment <i>Marco T. Kassis¹, Raffi Toukhtarian¹, Dani Tannir², Roni Khazaka¹</i> ¹ McGill University, Canada  ; ² Lebanese American University, Lebanon 
PAGE 97 Tu2D-4 11:10	Estimating Unstable Poles in Simulations of Microwave Circuits <i>Adam Cooman¹, Fabien Seyfert¹, Smain Amari²</i> ¹ Inria, France  ; ² RMCC, Canada 
PAGE 101 Tu2D-5 11:30	Rapid Design Tuning of Miniaturized Rat-Race Couplers Using Regression-Based Equivalent Network Surrogates <i>Piotr Kurgan¹, Slawomir Koziel¹, John W. Bandler²</i> ¹ Reykjavik University, Iceland  ; ² McMaster University, Canada 

Tu2E: Radio to Terahertz Waves Toward Nanoscale Sensing, Imaging and Characterization of Biological Samples

Chair: Marco Farina, Università Politecnica delle Marche — Co-Chair: Arnaud Pothier, XLIM (UMR 7252)

203AB, Time 10:10–11:50, Tuesday 12 June 2018

PAGE 104
Tu2E-1
10:10

Tracking Cancer Cells with Microfluidic High Frequency DEP Cytometer Implemented on BiCMOS Lab-on-Chip Platform

R. Manczak¹, F. Hjeij¹, T. Provent¹, S. Saada², C. Dalmay¹, B. Bessette², G. Begaud², S. Battu², P. Blondy¹, M.O. Jauberteau², F. Lalloue², M. Inac³, C. Baristiran Kaynak³, Mehmet Kaynak³, Cristiano Palego⁴, A. Pothier¹

¹XLIM (UMR 7252), France ; ²HCP (EA 3842), France ; ³IHP, Germany ; ⁴Bangor University, UK 

PAGE 108
Tu2E-2
10:30

A Miniaturized 3–10GHz Time-Domain Contact-Based Dielectric Spectroscopy System

Reza Ebrahimi Ghiri, Elif Kaya, Kamran Entesari, Texas A&M University, USA 

PAGE 111
Tu2E-3
10:50

Imaging of Sub-Cellular Structures and Organelles by an STM-Assisted Scanning Microwave Microscope at mm-Waves

Marco Farina¹, James C.M. Hwang², Andrea Di Donato¹, Eleonora Pavoni¹, Gianluca Fabi¹, Antonio Morini¹, Francesco Piacenza³, Ester Di Filippo⁴, Tiziana Pietrangelo⁴

¹Università Politecnica delle Marche, Italy ; ²Lehigh University, USA ; ³INRCA, Italy ; ⁴Università “G. d’Annunzio”, Italy 

PAGE 115
Tu2E-4
11:10

Scanning Microwave Microscopy of Vital Mitochondria in Respiration Buffer

Jinfeng Li¹, Zahra Nemati¹, Kamel Haddadi², Douglas C. Wallace³, Peter J. Burke¹

¹University of California, Irvine, USA ; ²IEMN (UMR 8520), France ; ³Children’s Hospital of Philadelphia, USA 

Tu2G: Advances in Near-Range Radar Sensors

Chair: Christian Waldschmidt, Universität Ulm — Co-Chair: Lora Schulwitz, Maxar Technologies

204B, Time 10:10–11:50, Tuesday 12 June 2018

PAGE 119
Tu2G-1
10:10

A Single-Chip Remotely Powered Transceiver with an Embedded Temperature Sensor

Hengying Shan, John Peterson III, Alice Yi-Szu Jou, Saeed Mohammadi, Purdue University, USA 

PAGE 123
Tu2G-2
10:30

Improved Throat Vibration Sensing with a Flexible 160-GHz Radar Through Harmonic Generation

Martin Geiger, Denis Schlotthauer, Christian Waldschmidt, Universität Ulm, Germany 

PAGE 127
Tu2G-3
10:50

Remote Measurement of Particle Streams with a Multistatic Dual Frequency Millimeter Wave Radar Sensor

Alwin Reinhardt, Alexander Teplyuk, Reinhard Knöchel, Michael Höft, Christian-Albrechts-Universität zu Kiel, Germany 

PAGE 131
Tu2G-4
11:10

Water Surface Velocity Estimation Using Cooperative Radar Sensors

Marc A. Mutschler¹, Christian Erhart¹, Thomas Walter¹, Christian Waldschmidt²

¹Hochschule Ulm, Germany ; ²Universität Ulm, Germany 

PAGE 135
Tu2G-5
11:30

Full-Coverage Indoor SAR Imaging with a Vehicle-Based FMCW Radar System

Jiaming Yan¹, Jiaming Hu¹, Li Sun¹, Hong Hong¹, Chen Gu¹, Changzhi Li², Xiaohua Zhu¹

¹NJUST, China ; ²Texas Tech University, USA 

PAGE 138
Tu2G-6
11:40

Hand Gesture Recognition Using a Three-Dimensional 24GHz Radar Array

Shengchang Lan¹, Zonglong He², Kai Yao¹, Weichu Chen¹

¹Harbin Institute of Technology, China ; ²KAIST, Korea 

Tu2H: 3D-Printed Waveguide Structures

Chair: Valentina Palazzi, Università di Perugia — Co-Chair: Manos Tentzeris, Georgia Tech
204C, Time 10:10–11:50, Tuesday 12 June 2018

- PAGE 141
Tu2H-1
10:10
- A 400GHz Transmitter Integrated with Flip-Chip 3D Printed Horn Antenna with an EIRP of 1.26dBm**
Alexander Standaert, Patrick Reynaert, Katholieke Universiteit Leuven, Belgium 
- PAGE 145
Tu2H-2
10:30
- Direct Metal Printed 4th Order Stepped Impedance Filter in the C/X Band**
Sebastian W. Sattler, Fabrizio Gentili, Reinhard Teschl, Wolfgang Bösch, Technische Universität Graz, Austria 
- PAGE 149
Tu2H-3
10:50
- X-Band Integrated Printed Antenna Measurement**
Michael Hollenbeck, Robert Smith, Clinton Cathey, Janos Opra, Optisys, USA 
- PAGE 152
Tu2H-4
11:10
- Compact Orthomode Transducer with Broadband Beamforming Capability**
E. Menargues¹, S. Capdevila¹, T. Debogovic¹, A. Dimitriadis¹, J.R. Mosig¹, A. Skrivervik², E. de Rijk¹
¹SWISSTo12, Switzerland  ; ²EPFL, Switzerland 

Tu3B: Nonlinear Circuit Analysis, Modeling, and Distortion Compensation

Chair: Christian Fager, Chalmers University of Technology — Co-Chair: Tushar Sharma, NXP Semiconductors
201B, Time 13:30–15:10, Tuesday 12 June 2018

- PAGE 156
Tu3B-1
13:30
- High Frequency and Wideband Modulated Signal Generation Using Frequency Doublers**
Arthur Chung¹, Marwen Ben Rejeb¹, Yehia Beltagy¹, Ali M. Darwish², H. Alfred Hung², Slim Boumaiza¹
¹University of Waterloo, Canada  ; ²U.S. Army Research Laboratory, USA 
- PAGE 160
Tu3B-2
13:50
- Adaptive Principal Component Analysis for Online Reduced Order Parameter Extraction in PA Behavioral Modeling and DPD Linearization**
Quynh Anh Pham¹, David López-Bueno², Gabriel Montoro¹, Pere L. Gilabert¹
¹Universitat Politècnica de Catalunya, Spain  ; ²CTTC, Spain 
- PAGE 164
Tu3B-3
14:10
- SISO Digital Predistortion for Concurrent Dual-Band Power Amplifier Using Baseband Stitching Technique**
Jun Peng, Songbai He, UESTC, China 
- PAGE 168
Tu3B-4
14:30
- Impact of Drain-Lag Induced Current Degradation for a Dynamically Operated GaN-HEMT Power Amplifier**
N. Wolff, T. Hoffmann, Wolfgang Heinrich, Olof Bengtsson, FBH, Germany 
- PAGE 172
Tu3B-5
14:50
- Analysis of Chirped Oscillators Under Injection Signals**
Franco Ramírez, Sergio Sancho, Mabel Pontón, Almudena Suárez, Universidad de Cantabria, Spain 

Tu3C: Advances in Millimeter-Wave Integrated Waveguide Components and Transitions

Chair: Hjalti Sigmarsson, University of Oklahoma — Co-Chair: Kamal Samanta, Sony

201C, Time 13:30–15:10, Tuesday 12 June 2018

- PAGE 176
Tu3C-1
13:30 **Dually-Polarized Hybrid Junction Based on Polarization-Selective Periodic Wall**
Ahmed A. Sakr, Walid Dyab, Ke Wu, École Polytechnique de Montréal, Canada 
- PAGE 179
Tu3C-2
13:50 **A Dielectric Waveguide Switch Based on Tunable Multimode Interference at W-Band**
Roland Reese, Matthias Jost, Ersin Polat, Matthias Nickel, Rolf Jakoby, Holger Maune, Technische Universität Darmstadt, Germany 
- PAGE 183
Tu3C-3
14:10 **A Transition Between Dielectric Microstrip Line and Substrate Integrated Waveguide for V-Band**
Haotian Zhu¹, Shu Mao², Quan Xue³, Ke Wu¹
¹École Polytechnique de Montréal, Canada ; *²CityU, China* ; *³SCUT, China* 
- PAGE 186
Tu3C-4
14:30 **A Novel V-Band Substrate Integrated Suspended Line to Rectangular Waveguide Transition**
Yinzhou Chen, Kaixue Ma, Yongqiang Wang, UESTC, China 
- PAGE 190
Tu3C-5
14:50 **Micromachined Silicon-Core Substrate-Integrated Waveguides with Coplanar-Probe Transitions at 220–330GHz**
Aleksandr Krivovitca, Umer Shah, Oleksandr Glubokov, Joachim Oberhammer, KTH, Sweden 

Tu3D: Advances in Numerical Modelling for Multi-Scale and Multi-Physics Applications

Chair: Werner Thiel, ANSYS — Co-Chair: Johannes Russer, Technische Universität München

202AB, Time 13:30–15:10, Tuesday 12 June 2018

- PAGE 194
Tu3D-1
13:30 **Efficient Sensitivity Analysis of Microwave Structures with Multiple Design Parameters in FDTD**
Kae-An Liu, Costas D. Sarris, University of Toronto, Canada 
- PAGE 197
Tu3D-2
13:50 **Accuracy Controlled Direct Integral Equation Solver of Linear Complexity with Change of Basis for Large-Scale Interconnect Extraction**
Miaomiao Ma, Dan Jiao, Purdue University, USA 
- PAGE 201
Tu3D-3
14:00 **Matrix-Free Method for Maxwell-Thermal Co-Simulation in Unstructured Meshes**
Kaiyuan Zeng, Dan Jiao, Purdue University, USA 
- PAGE 205
Tu3D-4
14:10 **New Single Source Surface Integral Equation for Solution of Scattering Problems on 3D Dielectric Objects Situated in Multilayered Media**
Shucheng Zheng, Vladimir Okhmatovski, University of Manitoba, Canada 
- PAGE 208
Tu3D-5
14:30 **Multiphysics Time-Domain Modeling of Nonlinear Permeability in Thin-Film Magnetic Material**
Zhi Yao, Han Cui, Tatsuo Itoh, Yuanxun Ethan Wang, University of California, Los Angeles, USA 
- PAGE 212
Tu3D-6
14:50 **Rigorous Model of Nonlinear Optomechanical Coupling in Micro- and Nano-Structured Resonant Cavities**
Davide Mencarelli, Matteo Stocchi, Luca Pierantoni, Università Politecnica delle Marche, Italy 
- PAGE 216
Tu3D-7
15:00 **An Embedded Domain Decomposition Method for Time-Harmonic Electromagnetic Problems**
Jiaqing Lu, Jin-Fa Lee, The Ohio State University, USA 

Tu3E: Advances in Microwave and Terahertz Applications in Nanotechnology

Chair: Davide Mencarelli, Università Politecnica delle Marche — Co-Chair: Luca Pierantoni, Università Politecnica delle Marche
203AB, Time 13:30–15:10, Tuesday 12 June 2018

- PAGE 220
Tu3E-1
13:30 **Future Antenna Miniaturization Mechanism: Magnetoelectric Antennas**
Hwaider Lin, Mohsen Zaeimbashi, Neville Sun, Xianfeng Liang, Huaihao Chen, Cunzheng Dong, Alexei Matyushov, Xinjun Wang, Yingxue Guo, Yuan Gao, Nian-Xiang Sun, Northeastern University, USA 
- PAGE 224
Tu3E-2
13:50 **Reconfigurable Spoof Surface Plasmon Polaritons Based Band Pass Filter**
Nidhi Pandit, Nagendra Prasad Pathak, IIT Roorkee, India 
- PAGE 228
Tu3E-3
14:10 **2D-Graphene Epitaxy on SiC for RF Application: Fabrication, Electrical Characterization and Noise Performance**
D. Fadil¹, W. Wei¹, M. Deng², S. Fregonese², W. Strupinski³, E. Pallecchi¹, H. Happy¹
¹IEMN (UMR 8520), France ; ²IMS (UMR 5218), France ; ³ITME, Poland 
- PAGE 232
Tu3E-4
14:30 **Modelling of Solution Processed Indium Arsenide Nanowire Microwave Switches**
H. Votsi¹, B. Mirkhaydarov¹, S. Gillespie¹, P. Young², M. Shkunov¹, Peter H. Aaen¹
¹University of Surrey, UK ; ²University of Kent, UK 
- PAGE 236
Tu3E-5
14:50 **Planar Semiconductor THz Antennas Using Spoof Plasmons for Surface Sensing**
Maximilian Bettenhausen¹, Friedhard Römer¹, Bernd Witzigmann¹, Julia Flesch², Jacob Piehler², Changjiang You², Marcin Kazmierczak³, Subhajit Guha³, Giovanni Capellini³, Thomas Schröder³
¹Universität Kassel, Germany ; ²Universität Osnabrück, Germany ; ³IHP, Germany 

Tu3F: Biomedical Radar

Chair: Chung-Tse Michael Wu, Rutgers University — Co-Chair: Alfred Huang, U.S. Army Research Laboratory
204A, Time 13:30–15:10, Tuesday 12 June 2018

- PAGE 240
Tu3F-1
13:30 **Envelope Detection for a Double-Sideband Low IF CW Radar**
Xujun Ma¹, Lianming Li¹, Xiaohu You¹, Jenshan Lin²
¹Southeast University, China ; ²University of Florida, USA 
- PAGE 244
Tu3F-2
13:50 **A Multi-Arc Method for Improving Doppler Radar Motion Measurement Accuracy**
Songjie Bi¹, Xiaomeng Gao¹, Victor M. Lubecke², Olga Boric-Lubecke², Dennis Matthews³, Xiaoguang Liu¹
¹University of California, Davis, USA ; ²University of Hawaii at Manoa, USA ; ³Cardiac Motion, USA 
- PAGE 248
Tu3F-3
14:10 **Wearable Vital Sign Sensor Using a Single-Input Multiple-Output Self-Injection-Locked Oscillator Tag**
Chung-Yi Hsu, Lih-Tyng Hwang, Fu-Kang Wang, Tzyy-Sheng Horng, National Sun Yat-sen University, Taiwan 
- PAGE 252
Tu3F-4
14:30 **Self-Injection-Locked AIA Radar Sensor Using PLL Demodulator for Noncontact Vital Sign Detection**
Chao-Hsiung Tseng, Li-Te Yu, Taiwan Tech, Taiwan 
- PAGE 255
Tu3F-5
14:40 **Noncontact Vital Sign Detection Using 24GHz Two-Dimensional Frequency Scanning Metamaterial Leaky Wave Antenna Array**
Qun Li¹, Yonghong Zhang¹, Chung-Tse Michael Wu²
¹UESTC, China ; ²Rutgers University, USA 

Tu3G: Advances in Backscattering and RFID Circuits

Chair: Kazuya Yamamoto, Mitsubishi Electric — Co-Chair: Thomas Us Mueller, Universität Innsbruck
204B, Time 13:30–15:10, Tuesday 12 June 2018

- PAGE 259
Tu3G-1
13:30 **A 5.8GHz 1.77mW AFSK-OFDM CMOS Backscatter Transmitter for Low Power IoT Applications**
A. Tang, Y. Kim, G. Virbila, Mau-Chung Frank Chang, University of California, Los Angeles, USA 
- PAGE 262
Tu3G-2
13:50 **Exploitation of Multi-Sine Intermodulation for Passive Backscattering UWB Localization**
Massimo Del Prete, Nicolò Decarli, Diego Masotti, Davide Dardari, Alessandra Costanzo, Università di Bologna, Italy 
- PAGE 266
Tu3G-3
14:10 **Spectrally Efficient 4-PAM Ambient FM Backscattering for Wireless Sensing and RFID Applications**
Spyridon N. Daskalakis¹, Ricardo Correia², George Goussetis¹, Manos M. Tentzeris³, Nuno Borges Carvalho², Apostolos Georgiadis¹
¹Heriot-Watt University, UK  *;²Universidade de Aveiro, Portugal*  *;³Georgia Tech, USA* 
- PAGE 270
Tu3G-4
14:30 **Dual-Band High Order Modulation Ambient Backscatter**
Ricardo Correia, Nuno Borges Carvalho, Universidade de Aveiro, Portugal 
- PAGE 274
Tu3G-5
14:50 **Intermodulation Uplink for Far-Field Passive RFID Applications**
Nai-Chung Kuo, Bo Zhao, Ali M. Niknejad, University of California, Berkeley, USA 
- PAGE 278
Tu3G-6
15:00 **A Wirelessly-Powered 1.46GHz Transmitter with On-Chip Antennas in 180nm CMOS**
Yuxiang Sun¹, Dai Li¹, Aydin Babakhani²
¹Rice University, USA  *;²University of California, Los Angeles, USA* 

Tu3H: Novel Package/PCB Integration Concepts

Chair: Telesphor Kamgaing, Intel — Co-Chair: Rick Sturdivant, Azusa Pacific University
204C, Time 13:30–15:10, Tuesday 12 June 2018

- PAGE 281
Tu3H-1
13:30 **A Low Loss Patch-Based Phase Shifter Based on SISL Platform**
Yongqiang Wang, Kaixue Ma, Ningning Yan, UESTC, China 
- PAGE 285
Tu3H-2
13:50 **Substrate Integrated Gap Waveguide Bandpass Filters with High Selectivity and Wide Stopband**
Ming Dong, Dongya Shen, Xiupu Zhang, Wenping Ren, Zu-hui Ma, Rongrong Qian, Hong Yuan, Yunnan University, China 
- PAGE 289
Tu3H-3
14:10 **Heterogeneously Integrated V-Band Amplifier**
Vesna Radisic, Dennis W. Scott, Eric Kaneshiro, K.K. Loi, Sujane Wang, Cedric Monier, Augusto Gutierrez-Aitken, Northrop Grumman, USA 
- N/A
Tu3H-4
14:30 **A Surface Mount 45 to 90GHz Low Noise Amplifier Using Novel Hot-Via Interconnection**
John C. Mahon, Michael Clark, Peter Katzin, Analog Devices, USA 

Tu4B: Non-Doherty Load Modulated Power Amplifiers

Chair: Roberto Quaglia, Cardiff University — Co-Chair: Taylor Barton, University of Colorado Boulder
201B, Time 15:55–17:15, Tuesday 12 June 2018

- PAGE 297
Tu4B-1
15:55 **UHF Class-E Power Amplifier Design for Wide Range Variable Resistance Operation**
David Vegas, María Pampín, Jose-Ramon Perez-Cisneros, M. Nieves Ruiz, Angel Mediavilla, José A. García, Universidad de Cantabria, Spain 
- PAGE 301
Tu4B-2
16:15 **A Waveform-Engineered Outphasing RFPA Using a Broadband Balun Combiner**
Aleksander Bogusz¹, Jonathan Lees¹, Roberto Quaglia¹, Gavin Watkins², Steve C. Cripps¹
¹Cardiff University, UK ; ²Toshiba Research Europe, UK 
- PAGE 304
Tu4B-3
16:35 **Supply Modulation of a Broadband Load Modulated Balanced Amplifier**
Tommaso Cappello¹, Prathamesh H. Pednekar¹, Corrado Florian², Zoya Popović¹, Taylor W. Barton¹
¹University of Colorado Boulder, USA ; ²Università di Bologna, Italy 
- PAGE 308
Tu4B-4
16:55 **An X-Band RF-Input Outphasing Power Amplifier**
Daniel N. Martin¹, Tommaso Cappello¹, Michael Litchfield², Taylor W. Barton¹
¹University of Colorado Boulder, USA ; ²BAE Systems, USA 

Tu4C: Integrated Waveguide Structures and Techniques

Chair: Christian Damm, Universität Ulm — Co-Chair: Jun (Brandon) Choi, SUNY Buffalo
201C, Time 15:55–17:15, Tuesday 12 June 2018

- PAGE 312
Tu4C-1
15:55 **Slab Air-Filled Substrate Integrated Waveguide**
Nhu-Huan Nguyen¹, Anthony Ghiotto², Tan-Phu Vuong¹, Anne Vilmot¹, Frédéric Parment³, Ke Wu⁴
¹IMEP-LAHC (UMR 5130), France ; ²IMS (UMR 5218), France ; ³CNES, France ; ⁴École Polytechnique de Montréal, Canada 
- PAGE 316
Tu4C-2
16:15 **Single-Layer Slow-Wave Substrate Integrated Waveguide with Enhanced Capacitance**
Xiaoqiang Li, Kirti Dhawaj, Tatsuo Itoh, University of California, Los Angeles, USA 
- PAGE 319
Tu4C-3
16:35 **Fabrication-Tolerant Reconfigurable AFSIW Filters Based on Through-Hole Mounted Metallic Posts for Versatile High Performance Systems**
Tifenn Martin¹, Anthony Ghiotto¹, Frédéric Lotz², Tan-Phu Vuong³
¹IMS (UMR 5218), France ; ²Cobham Microwave, France ; ³IMEP-LAHC (UMR 5130), France 
- PAGE 323
Tu4C-4
16:55 **The Microfabrication of Monolithic Miniaturized Ridged Half-Mode Waveguides for 5G Millimeter-Wave Communication Systems**
Thomas R. Jones, Mojgan Daneshmand, University of Alberta, Canada 

Tu4D: Novel Theoretical Approaches in Microwave Structure Analysis and Design

Chair: James Skala, Georgia Tech — Co-Chair: Tapan Sarkar, Syracuse University

202AB, Time 15:55-17:15, Tuesday 12 June 2018

- PAGE 327
Tu4D-1
15:55 **Algorithm for Locating Complex Zeros and Poles with the Use of Border Tracking on Complex Plane, and its Application in Dispersion Characteristics Calculation**
Jerzy Julian Michalski, SpaceForest, Poland 
- PAGE 330
Tu4D-2
16:15 **Interpolation and Extrapolation of S-Parameter Data of a Microwave Filter in the Frequency Domain Using the Cauchy Method**
Nicolas F. Reginelli¹, Tapan K. Sarkar¹, Magdalena Salazar-Palma²
¹Syracuse University, USA ; ²Universidad Carlos III de Madrid, Spain 
- PAGE 334
Tu4D-3
16:35 **Wideband, Periodically Arranged Self-Dual Subwavelength Waveguides**
Nasim Mohammadi Estakhri, Nader Engheta, Raphael Kastner, University of Pennsylvania, USA 
- PAGE 337
Tu4D-4
16:55 **Active Huygens' Cloaks for Arbitrary Metallic Polygonal Cylinders**
Paris Ang, George V. Eleftheriades, University of Toronto, Canada 
- PAGE 341
Tu4D-5
17:05 **Demonstration of Mode-Tunable Vortex Wave Radiation from Pseudo-Travelling Wave Ring Resonators Using Nonreciprocal Metamaterials**
Junji Yamauchi¹, Tetsuya Ueda¹, Tatsuo Itoh²
¹Kyoto Institute of Technology, Japan ; ²University of California, Los Angeles, USA 

Tu4E: Nano-Scale Devices and Antennas

Chair: Dimitris Pavlidis, Boston University — Co-Chair: Trang Thai, Intel

203AB, Time 15:55-17:15, Tuesday 12 June 2018

- PAGE 345
Tu4E-1
15:55 **MoS₂ Phase-Junction-Based Schottky Diodes for RF Electronics**
Xu Zhang¹, Jesús Grajal², Xiaoxue Wang¹, Ujwal Radhakrishna¹, Yuhao Zhang¹, Jing Kong¹, Mildred S. Dresselhaus¹, Tomás Palacios¹
¹MIT, USA ; ²Universidad Politécnica de Madrid, Spain 
- PAGE 348
Tu4E-2
16:15 **Fatigue Test on Flexible Graphene Field Effect Transistors with Bottom Gate Electrode**
W. Wei, D. Fadil, S. Mhedhbi, S. Bensalk, E. Pallecchi, H. Happy, IEMN (UMR 8520), France 
- PAGE 352
Tu4E-3
16:35 **Towards mm-Wave Nanoelectronics and RF Switches Using MoS₂ 2D Semiconductor**
Myungsoo Kim, Saungeun Park, Atresh Sanne, Sanjay Kumar Banerjee, Deji Akinwande, University of Texas at Austin, USA 
- PAGE 355
Tu4E-4
16:55 **A Zero-Bias, Completely Passive 28THz Rectenna for Energy Harvesting from Infrared (Waste Heat)**
G. Jayaswal, A. Belkadi, A. Meredov, B. Pelz, G. Moddel, Atif Shamim, KAUST, Saudi Arabia 
- PAGE 359
Tu4E-5
17:05 **Design of Dual-Band Transparent Antenna by Using Nano-Structured Thin Film Coating Technology**
Yu-Ming Lin¹, Hung-Wei Wu², Tzu-Chun Tai¹, Cheng-Yuan Hung³, Shou-Jinn Chang¹, Yeong-Her Wang¹
¹National Cheng Kung University, Taiwan ; ²Kun Shan University, Taiwan ; ³MIRDC, Taiwan 

Tu4G: Advances in Chipless and RFID Sensors

Chair: Alessandra Costanzo, Università di Bologna — Co-Chair: Smail Tedjini, LCIS (EA 3747)

204B, Time 15:55–17:15, Tuesday 12 June 2018

PAGE 363
Tu4G-1
15:55

Chipless RFID Tag Discrimination and the Performance of Resemblance Metrics to be Used for it

Zeshan Ali¹, Nicolas Barbot¹, Romain Siragusa¹, David Hely¹, Maxime Bernier², Frédéric Garet², Etienne Perret¹

¹LCIS (EA 3747), France  ; ²IMEP-LAHC (UMR 5130), France 

PAGE 367
Tu4G-2
16:15

Out-of-Sight Salt-Water Concentration Sensing Using Chipless-RFID for Pipeline Coating Integrity

Sameir Deif¹, Lorna Harron², Mojgan Daneshmand¹

¹University of Alberta, Canada  ; ²Enbridge, Canada 

PAGE 371
Tu4G-3
16:35

A General-Purpose Small RFID Epidermal Datalogger for Continuous Human Skin Monitoring in Mobility

C. Miozzi, S. Nappi, S. Amendola, G. Marrocco, Università di Roma "Tor Vergata", Italy



PAGE 374
Tu4G-4
16:55

On the Cooperative Exploitation of Antenna Sensitivity and Auto-Tuning Capability of UHF RFID Chip: Application to Temperature Sensing

Konstantinos Zannas¹, Hatem El Matbouly¹, Yvan Duroc², Smail Tedjini¹

¹LCIS (EA 3747), France  ; ²Laboratoire Ampère (UMR 5005), France 

Tu4H: Novel Interconnects for W- and D-Band

Chair: Kamal Samanta, Sony — Co-Chair: Morgan Chen, L3 Technologies

204C, Time 15:55–17:15, Tuesday 12 June 2018

PAGE 378
Tu4H-1
15:55

Millimeter-Wave Multicast Chip-to-Chip Interconnect Network Using Dielectric Slab Waveguide

Utpal Dey, Jan Hesselbarth, Universität Stuttgart, Germany 

PAGE 382
Tu4H-2
16:15

A PCB-Embedding Scheme for LCP Ribbon Waveguide at D-Band

Joren Vaes¹, Ilja Ocket¹, Wan-Ling Tsai¹, Maarten Cauwe², Patrick Reynaert¹, Bart Nauwelaers¹

¹Katholieke Universiteit Leuven, Belgium  ; ²CMST, Belgium 

PAGE 386
Tu4H-3
16:35

Novel Broadband Transition for Rectangular Dielectric Waveguide to Planar Circuit Board at D Band

Wan-Ling Tsai¹, Ilja Ocket¹, Joren Vaes¹, Maarten Cauwe², Patrick Reynaert¹, Bart Nauwelaers¹

¹Katholieke Universiteit Leuven, Belgium  ; ²CMST, Belgium 

PAGE 390
Tu4H-4
16:55

A Low-Loss D-Band Chip-to-Waveguide Transition Using Unilateral Finline Structure

Ahmed Hassona, Zhongxia Simon He, Omid Habibpour, Vincent Desmaris, Vessen Vassilev, Songyuan Yang, Victor Belitsky, Herbert Zirath, Chalmers University of Technology, Sweden 

TUIF1: Interactive Forum #1

Chair: Abbas Omar, Universität Magdeburg — Co-Chair: Aly Fathy, University of Tennessee
Exhibit Hall, Time 15:55–17:15, Tuesday 12 June 2018

- PAGE 394
TUIF1-1
POSTER
- Autonomously-Switchable Bandstop Filters with Integrated Sensor and Driver Circuitry**
Eric J. Naglich, Sanghoon Shin, Spence Albright, U.S. Naval Research Laboratory, USA

- PAGE 397
TUIF1-2
POSTER
- Fully Reconfigurable Dual-Mode Bandpass Filter**
Wentao Lin, Tae-Hak Lee, Ke Wu, École Polytechnique de Montréal, Canada 
- PAGE 401
TUIF1-3
POSTER
- An Inductor-Based Real-Time Monitoring and Control System for Tunable Cavity MEMS Filters**
Mohammad Abu Khater, Mahmoud Abdelfattah, Michael D. Sinanis, Dimitrios Peroulis, Purdue University, USA 
- PAGE 405
TUIF1-4
POSTER
- 2.4-GHz Tunable Miniature CMOS Active Bandpass Filter with Two Transmission Zeros Using Lumped Stepped-Impedance Ring Resonator**
Yu-Chih Hsiao¹, Chinchun Meng¹, Hsieh-Hsiu Chang Chien¹, Guo-Wei Huang²
¹National Chiao Tung University, Taiwan ; ²NDL, Taiwan 
- PAGE 409
TUIF1-5
POSTER
- Towards Improved Manufacturing Yield of Acoustic-Wave Ladder-Type Filters**
Mohammad J. Almalkawi, Skyworks Solutions, USA 
- PAGE 413
TUIF1-6
POSTER
- Outline Process from the Synthesis Towards the Nonlinear Modeling of Bulk Acoustic Wave Filters**
Jordi Mateu, Carlos Collado, Alberto Hueltes, Rafael Perea-Robles, David Garcia-Pastor, Marta Gonzalez-Rodriguez, Jose M. Gonzalez-Arbesú, Universitat Politècnica de Catalunya, Spain 

- PAGE 417
TUIF1-7
POSTER
- Multi-Octave GaN MMIC Circulator for Simultaneous Transmit Receive Applications**
Ali M. Darwish¹, Mathew M. Biedka², Khamsouk Kingkeo¹, John Penn¹, Edward A. Viveiros¹, H. Alfred Hung¹, Y. Ethan Wang²
¹U.S. Army Research Laboratory, USA ; ²University of California, Los Angeles, USA 
- PAGE 420
TUIF1-8
POSTER
- Nonlinearity and Power Handling Characterization of an Optically Reconfigurable Microwave Switch**
A.W. Pang, S. Bensmida, M.J. Cryan, University of Bristol, UK 
- PAGE 423
TUIF1-9
POSTER
- A 30.9dBm, 300MHz 45-nm SOI CMOS Power Modulator for Spread-Spectrum Signal Processing at the Antenna**
Cameron Hill¹, Cooper S. Levy², Hussam AlShammary¹, Ahmed Hamza¹, James F. Buckwalter¹
¹University of California, Santa Barbara, USA ; ²University of California, San Diego, USA 
- PAGE 427
TUIF1-10
POSTER
- An X-Band Low Phase Noise Oscillator with High Harmonic Suppression Using SIW Quarter-Wavelength Resonator**
Zongqi Cai¹, Xiaohong Tang¹, Ting Zhang¹, Yang Yang²
¹UESTC, China ; ²University of Technology Sydney, Australia 
- PAGE 431
TUIF1-11
POSTER
- Chip-Scale RF Correlator with Monolithically Integrated Time-Varying Transmission Line (TVTL)**
Qianteng Wu, Xiating Zou, Rui Zhu, Yuanxun Ethan Wang, University of California, Los Angeles, USA 

PAGE 435 TUIF1-12 POSTER	Comparison of Highly Linear Resistive Mixers in Depletion and Enhancement Mode GaAs and GaN pHEMTs at Ka Band <i>Matthew S. Clements¹, Anh-Vu Pham¹, J. Scott Sacks², Bert C. Henderson², Steve E. Avery²</i> ¹ University of California, Davis, USA  ; ² Cobham Advanced Electronics Solutions, USA 
PAGE 439 TUIF1-13 POSTER	Magnetless RF Isolator Design Using Grounded Transistors <i>Filipe M. Barradas, Telmo R. Cunha, Pedro M. Cabral, José C. Pedro, Universidade de Aveiro, Portugal</i> 
PAGE 443 TUIF1-14 POSTER	Design of a Low-Band Wideband Superconducting Filter Using Triple-Mode Resonator <i>Shuai Shang, Bin Wei, Bisong Cao, Xubo Guo, Tsinghua University, China</i> 
PAGE 446 TUIF1-15 POSTER	UHF Array Element Using a Reflection Coefficient Modulator <i>Madeleine Roche, Richard Campbell, Nasr Alkhafaji, Portland State University, USA</i> 
PAGE 450 TUIF1-16 POSTER	Broadband High Efficiency Post-Matching Doherty Power Amplifier Based on Mixed-Topology <i>Xin Yu Zhou¹, Wing Shing Chan¹, Shao Yong Zheng², Wenjie Feng³, Derek Ho¹</i> ¹ CityU, China  ; ² Sun Yat-sen University, China  ; ³ NJUST, China 
PAGE 454 TUIF1-17 POSTER	A 1-17GHz Stacked Distributed Power Amplifier with 19-21dBm Saturated Output Power in 45nm CMOS SOI Technology <i>Li Gao, Qian Ma, Gabriel M. Rebeiz, University of California, San Diego, USA</i> 
PAGE 457 TUIF1-18 POSTER	A Group Delay Compensation Power Amplifier with Auto Power Level Control for 24GHz FMCW Automobile Radar Application <i>Dong Chen, Yu Peng, Tianjun Wu, Ying Liu, Huihua Liu, Chenxi Zhao, Yunqiu Wu, Kai Kang, UESTC, China</i> 

PAGE 461 TUIF1-19 POSTER	Input Harmonic Sensitivity in High-Efficiency GaN Power Amplifiers <i>Tushar Sharma¹, Shishir Shukla¹, Damon G. Holmes¹, Ramzi Darraji², Jeffrey K. Jones¹, Fadhel M. Ghannouchi²</i> ¹ NXP Semiconductors, USA  ; ² University of Calgary, Canada 
PAGE 465 TUIF1-20 POSTER	A High Efficiency 3.6-4.0GHz Envelope-Tracking Power Amplifier Using GaN Soft-Switching Buck-Converter <i>Yuji Komatsuzaki¹, Sandro Lanfranco², Tapio Kolmonen³, Olli Piirainen³, Jarno K. Tanskanen³, Shuichi Sakata⁴, Rui Ma⁵, Shintaro Shinjo⁴, Koji Yamanaka⁴, Peter Asbeck¹</i> ¹ University of California, San Diego, USA  ; ² Nokia Bell Labs, USA  ; ³ Nokia Bell Labs, Finland  ; ⁴ Mitsubishi Electric, Japan  ; ⁵ MERL, USA 
PAGE 469 TUIF1-21 POSTER	A Novel Approach to Selecting Doherty Amplifier Asymmetry <i>Tim Canning¹, Bjoern Herrmann², Haedong Jang², Zulhazmi Mokhti², Richard Wilson²</i> ¹ Infineon Technologies, Germany  ; ² Infineon Technologies, USA 
PAGE 473 TUIF1-22 POSTER	An Efficient Linearized Octave-Bandwidth Power Amplifier for Carrier Aggregation <i>Maxwell R. Duffy, Eric Berry, Gregor Lasser, Zoya Popović, University of Colorado Boulder, USA</i> 
PAGE 477 TUIF1-23 POSTER	Ruggedness Characterization of Bonding Wire Arrays in LDMOSFET-Based Power Amplifiers <i>Liang Lin, Long Ren, Ampleon, China</i> 

We1A: 5G Sub-Systems: From Predistortion to Complete Link

Chair: Jonathan Comeau, Anokiwave — Co-Chair: Kate Remley, NIST

201A, Time 08:00–09:40, Wednesday 13 June 2018

PAGE 481 We1A-1 08:00	Single-Input Single-Output Digital Predistortion of Power Amplifier Arrays in Millimeter Wave RF Beamforming Transmitters <i>Eric Ng, Yehia Beltagy, Patrick Mitran, Slim Boumaiza, University of Waterloo, Canada</i> 
PAGE 485 We1A-2 08:20	Optimized DPD Feedback Loop for M-MIMO Sub-6GHz Systems <i>André Prata¹, Jordan Sveshtarov¹, Sérgio C. Pires¹, Arnaldo S.R. Oliveira², Nuno Borges Carvalho²</i> ¹ Ampleon, The Netherlands  ; ² Universidade de Aveiro, Portugal 
PAGE 489 We1A-3 08:40	A 39GHz MIMO Transceiver Based on Dynamic Multi-Beam Architecture for 5G Communication with 150 Meter Coverage <i>Xianghua Li¹, Zhilin Chen², Shoutian Sun², Chenxi Zhao², Huihua Liu², Yunqiu Wu², Nan Zhang¹, Ke Lin¹, Shitao Sun¹, Jianping Zhao¹, Kai Kang²</i> ¹ Huawei Technologies, China  ; ² UESTC, China 
PAGE 492 We1A-4 09:00	A 29–30GHz 64-Element Active Phased Array for 5G Application <i>Kuan Bao, Jun Zhou, Liangui Wang, Anfeng Sun, Qiang Zhang, Ya Shen, NEDI, China</i> 
PAGE 496 We1A-5 09:10	A Scalable 64-Element 28GHz Phased-Array Transceiver with 50dBm EIRP and 8–12Gbps 5G Link at 300 Meters without any Calibration <i>Kerim Kibaroglu, Mustafa Sayginer, Gabriel M. Rebeiz, University of California, San Diego, USA</i> 
PAGE 499 We1A-6 09:20	An FPGA-Based 1-Bit Digital Transmitter with 800-MHz Bandwidth for 5G Millimeter-Wave Active Antenna Systems <i>Masaaki Tanio, Shinichi Hori, Noriaki Tawa, Toshihide Kuwabara, Kazuaki Kunihiro, NEC, Japan</i> 

We1B: VHF/UHF Components and Analog Signal Processing

Chair: Marc Franco, Qorvo — Co-Chair: Taylor Barton, University of Colorado Boulder

201B, Time 08:00–09:40, Wednesday 13 June 2018

PAGE 503 We1B-1 08:00	Space-Angle Signal Processing Using a Modulated Scatter Array <i>Nasr Alkhafaji, Richard Campbell, Madeleine Roche, Portland State University, USA</i> 
PAGE 506 We1B-2 08:20	Low-Loss Broadband Magnetless Circulators for Full-Duplex Radios <i>Ahmed Kord, Dimitrios L. Sounas, Andrea Alù, University of Texas at Austin, USA</i> 
PAGE 510 We1B-3 08:40	400–560MHz Tunable 2-Pole RF MEMS Bandpass Filter with Improved Stopband Rejection <i>Tsu-Wei Lin¹, Li Gao¹, Roberto Gaddi², Gabriel M. Rebeiz¹</i> ¹ University of California, San Diego, USA  ; ² Cavendish Kinetic, The Netherlands 
PAGE 514 We1B-4 09:00	Continuously Tunable True-Time-Delay Phase Shifter Using Switchable Varactor-Tuned Transmission Lines <i>Huizhong Deng, Feng Lin, Beijing Institute of Technology, China</i> 
PAGE 518 We1B-5 09:10	A Compact Lumped-Component Coupler with Tunable Coupling Ratios and Reconfigurable Responses <i>Bayaner Arigong¹, Mi Zhou², Han Ren¹, Chang Chen³, Hualiang Zhang⁴</i> ¹ Washington State University, USA  ; ² University of North Texas, USA  ; ³ USTC, China  ; ⁴ UMass Lowell, USA 
PAGE 522 We1B-6 09:20	High Power Directional Coupler with Equal Tunable Coupling Value at 352MHz and 704MHz <i>Przemyslaw Kant, Karol Dobrzyniewicz, Jerzy Julian Michalski, SpaceForest, Poland</i> 

We1C: Planar Multiplexers and Multi-Band Filters

Chair: Sanghoon Shin, U.S. Naval Research Laboratory — Co-Chair: Laya Mohammadi, Qualcomm Technologies

201C, Time 08:00–09:40, Wednesday 13 June 2018

- PAGE 525
We1C-1
08:00
- A High Isolation and Low Loss Duplexer Based on SISL Platform**
Yutong Chu, Kaixue Ma, Yongqiang Wang, UESTC, China 
- PAGE 529
We1C-2
08:20
- Design of a Planar, High Isolation Diplexer in Ku Band for Application to SmartLNB**
Giuseppe Macchiarella¹, Gian Guido Gentili¹, Marco Politi¹, Marco Bonaventura², Massimo Martin²
¹Politecnico di Milano, Italy  ; ²DWave, Italy 
- PAGE 533
We1C-3
08:40
- Broadband Contiguous Multiplexer Design Using Wideband Pseudo-Highpass Channel Filters**
Sanghoon Shin, Eric J. Naglich, U.S. Naval Research Laboratory, USA 
- PAGE 537
We1C-4
09:00
- Dual-Band Bandpass Filter with Ultra-Wide Upper Stopband Using Slow-Wave Dual-Resonance Cells**
Yunbo Rao, Huizhen Jenny Qian, Roberto Gómez-García, Xun Luo, UESTC, China 
- PAGE 540
We1C-5
09:20
- Miniaturized Triple-Band Filter Design Utilizing Composite Planar Multilayered and Substrate Integrated Waveguide Structures**
Qin Ji, Yun-Sheng Xu, Chang Chen, Shan Jiang, Lingyun Zhou, Chinese Academy of Sciences, China 

We1D: Advanced Behavioral Models of Devices and Systems

Chair: Douglas Teeter, Qorvo — Co-Chair: Rob Jones, Raytheon

202AB, Time 08:00–09:40, Wednesday 13 June 2018

- PAGE 544
We1D-1
08:00
- Automating the Accurate Extraction and Verification of the Cardiff Model via the Direct Measurement of Load-Pull Power Contours**
Thoalfukar Hussein¹, Azam Al-Rawachy², Johannes Benedikt³, James Bell³, Paul Tasker³
¹Al-Furat Al-Awsat Technical University, Iraq  ; ²Mosul University, Iraq  ; ³Cardiff University, UK 
- PAGE 548
We1D-2
08:20
- Non-Quasi-Static Large-Signal Model for RF LDMOS Power Transistors**
Lei Zhang¹, Hernan Rueda¹, Kevin Kim¹, Peter H. Aaen²
¹NXP Semiconductors, USA  ; ²University of Surrey, UK 
- PAGE 551
We1D-3
08:40
- A Nonlinear Behavioral Modeling Approach for Voltage-Controlled Oscillators Using Augmented Neural Networks**
Huan Yu¹, Madhavan Swaminathan¹, Chuanyi Ji¹, David White²
¹Georgia Tech, USA  ; ²Cadence Design Systems, USA 
- PAGE 555
We1D-4
09:00
- Broadband Hammerstein-Wiener Mixer Modeling extracted by Large-Signal Vector Measurements**
Alessandro Cidronali, Giovanni Collodi, Università di Firenze, Italy 
- PAGE 559
We1D-5
09:20
- A Dual-Input Canonical Piecewise-Linear Function-Based Model for Digital Predistortion of Multi-Antenna Transmitters**
Qing Luo, Chao Yu, Xiao-Wei Zhu, Southeast University, China 

We1E: Advanced MEMS Filters, Resonators, and Waveguides

Chair: Venkata Chivukula, Qualcomm Technologies — Co-Chair: Joachim Oberhammer, KTH

203AB, Time 08:00–09:40, Wednesday 13 June 2018

PAGE 563 We1E-1 08:00	1.7GHz Y-Cut Lithium Niobate MEMS Resonators with FoM of 336 and $f \cdot Q$ of 9.15×10^{12} <i>Yansong Yang, Ruochen Lu, Tomás Manzaneque, Songbin Gong, University of Illinois at Urbana-Champaign, USA</i> 
PAGE 567 We1E-2 08:20	A 175MHz 72μW Voltage Controlled Oscillator with 1.4% Tuning Range Based on Lithium Niobate MEMS Resonator and 65nm CMOS <i>Ali Kourani, Ruochen Lu, Tomás Manzaneque, Yansong Yang, Anming Gao, Songbin Gong, University of Illinois at Urbana-Champaign, USA</i> 
PAGE 571 We1E-3 08:40	A 12–20GHz Passively-Compensated Tunable Bandstop Filter with 40-dB Notch Level <i>Mahmoud Abdelfattah¹, Mark Hickie², Michael D. Sinanis¹, Yu-Chiao Wu¹, Dimitrios Peroulis¹</i> ¹ Purdue University, USA  ; ² BAE Systems, USA 
PAGE 575 We1E-4 09:00	A Multi-Frequency MEMS-Based RF Oscillator Covering the Range from 11.7MHz to 1.9GHz <i>J. Stegner, M. Fischer, S. Gropp, U. Stehr, J. Müller, M. Hoffmann, M.A. Hein, Technische Universität Ilmenau, Germany</i> 
PAGE 579 We1E-5 09:20	Micromachined Waveguides with Integrated Silicon Absorbers and Attenuators at 220–325GHz <i>Bernhard Beuerle, Umer Shah, Joachim Oberhammer, KTH, Sweden</i> 

PAGE 583 We1E-6 09:30	An Ultra Low-Loss Silicon-Micromachined Waveguide Filter for D-Band Telecommunication Applications <i>James Campion¹, Oleksandr Glubokov¹, Adrian Gomez¹, Aleksandr Krivovitca¹, Umer Shah¹, Lars Bolander², Yinggang Li², Joachim Oberhammer¹</i> ¹ KTH, Sweden  ; ² Ericsson, Sweden 
-----------------------------	--

We1F: Si-Based MMW/THz Circuits

Chair: Joe Qiu, U.S. Army Research Office — Co-Chair: Vadim Issakov, Infineon Technologies
204A, Time 08:00–09:40, Wednesday 13 June 2018

- | | |
|-----------------------------|--|
| PAGE 587
We1F-1
08:00 | A 0.55THz Y-Vector Network Configured Beam Steering Phased Array in CMOS Technology
<i>Yan Zhao¹, Richard Al Hadi¹, Hsin-Chia Lu², Tzu-Shiuan Tseng², Yan Zhang¹, Weikang Qiao¹, Michael Kevin Lo¹, Chewn-Pu Jou³, Kevin Zhang³, Mau-Chung Frank Chang¹</i>
¹ University of California, Los Angeles, USA  ; ² National Taiwan University, Taiwan  ; ³ TSMC, Taiwan  |
| PAGE 591
We1F-2
08:20 | A Monostatic E-Band Radar Transceiver with a Tunable TX-to-RX Leakage Canceled for Automotive Applications
<i>Maciej Kucharski, Dietmar Kissinger, Herman Jalli Ng, IHP, Germany</i>  |
| PAGE 595
We1F-3
08:40 | A 35–105GHz High Image-Rejection-Ratio IQ Receiver with Integrated LO Doubler and >40dB IRR
<i>Qian Ma, Hyunchul Chung, Gabriel M. Rebeiz, University of California, San Diego, USA</i>  |
| PAGE 599
We1F-4
09:00 | A 110–125GHz 27.5dB Gain Low-Power I/Q Receiver Front-End in 65nm CMOS Technology
<i>Chae Jun Lee, Dong Min Kang, Joon Hyung Kim, Chul Woo Byeon, Chul Soon Park, KAIST, Korea</i>  |
| PAGE 603
We1F-5
09:20 | A Multi-Mode Compact Size Multi-Coil Tuned Inductive Peaking ILFD for Low Injected Power Level
<i>Nagarajan Mahalingam¹, Kaixue Ma², Kiat Seng Yeo¹</i>
¹ SUTD, Singapore  ; ² UESTC, China  |

- | | |
|-----------------------------|--|
| PAGE 606
We1F-6
09:30 | A 103-GHz Voltage Controlled Oscillator with 28% Tuning Range and 4.2dBm Peak Output Power Using SiGe BiCMOS Technology
<i>Kefei Wu, Mona Hella, Rensselaer Polytechnic Institute, USA</i>  |
|-----------------------------|--|

We1G: Enabling Array Components and Beam Forming Architectures

Chair: Glenn Hopkins, Georgia Tech — Co-Chair: Ahmed Kishk, Concordia University

204B, Time 08:00–09:40, Wednesday 13 June 2018

- PAGE 610
We1G-1
08:00 **A Ku-Band 8-Element Phased-Array Transmitter with Built-in-Self-Test Capability**
Dong Chen, Xiaoning Zhang, Lin Zhang, Zhilin Chen, Shoutian Sun, Ying Liu, Chenxi Zhao, Huihua Liu, Yunqiu Wu, Kai Kang, UESTC, China 
- PAGE 613
We1G-2
08:20 **A GaN Single-Chip Front-End for Active Electronically Scanned Arrays**
W. Ciccognani¹, S. Colangeli¹, F. Costanzo¹, R. Giofrè¹, G. Polli¹, A. Salvucci¹, M. Vittori¹, E. Limiti¹, M. Sotgia², M. Cirillo²
¹Università di Roma “Tor Vergata”, Italy ; ²Rheinmetall Italia, Italy 
- PAGE 616
We1G-3
08:40 **A Ku-Band Phased Array in Package Integrating Four 180nm CMOS Transceivers with On-Chip Antennas**
Xiaoning Zhang, Yexi Song, Chao Yu, Dong Chen, Lin Zhang, Shoutian Sun, Zhilin Chen, Huihua Liu, Chenxi Zhao, Yunqiu Wu, Kai Kang, UESTC, China 
- PAGE 620
We1G-4
08:50 **Spatial Interference Mitigation Nulling the Embedded Element Pattern**
Robin Irazoqui, Caleb Fulton, University of Oklahoma, USA 
- PAGE 624
We1G-5
09:00 **A Novel Agile Phase-Controlled Beamforming Network Intended for 360° Angular Scanning in MIMO Applications**
Valentina Palazzi, Paolo Mezzanotte, Luca Roselli, Università di Perugia, Italy 
- PAGE 628
We1G-6
09:10 **Reconfigurable Dual-Mode Integrated Beam-Steering Array**
Huy Nam Chu, Ting Heish, Tzyh-Ghuang Ma, Taiwan Tech, Taiwan 
- PAGE 632
We1G-7
09:30 **Two-Dimensional Butler Matrix Concept for Planar Array**
Kejia Ding, Ahmed Kishk, Concordia University, Canada 

We1H: High Performance Power Amplifiers

Chair: Jonwei Yan, MaXentric Technologies — Co-Chair: Joseph Staudinger, NXP Semiconductors

204C, Time 08:00–09:40, Wednesday 13 June 2018

- PAGE 636
We1H-1
08:00 **Efficiency Degradation in Wideband Power Amplifiers**
Luís C. Nunes, Diogo R. Barros, Pedro M. Cabral, José C. Pedro, Universidade de Aveiro, Portugal 
- PAGE 640
We1H-2
08:20 **A 1.4kW, Highly-Efficient, GaN, Partially-Matched FET for L-Band Applications**
Brian Henricksen, Gary Scott, Matthew Irvine, Raj Santhakumar, Qorvo, USA 
- PAGE 643
We1H-3
08:40 **An S-Band Internally Matched Packaged GaN HEMT with Over 720W Peak Power and 58% PAE**
Kwanjin Oh, Sangmin Lee, Heejun Kim, Heejae Yoon, Wavice, Korea 
- PAGE 647
We1H-4
09:00 **Design of a 5W Single Chip Front-End for C-Ku Band T/R Modules**
Diego Palombini, Daniele Rampazzo, Andrea Bentini, Patrick Ettore Longhi, Elettronica, Italy 
- PAGE 651
We1H-5
09:20 **A 60-GHz Adaptively Biased Power Amplifier with Predistortion Linearizer in 90-nm CMOS**
Shih-Min Weng, Yi-Chun Lee, Tse-Hung Chen, Jenny Yi-Chun Liu, National Tsing Hua University, Taiwan 

We2A: Multi GHz all Digital and Mixed Signal Circuits and Systems

Chair: Isar Mostafanezhad, Nalu Scientific — Co-Chair: Greg Lyons, MIT Lincoln Laboratory

201A, Time 10:10–11:50, Wednesday 13 June 2018

- PAGE 655
We2A-1
10:10 **An Over-110-GHz-Bandwidth 2:1 Analog Multiplexer in 0.25- μ m InP DHBT Technology**
M. Nagatani, H. Wakita, H. Yamazaki, M. Mutoh, M. Ida, Y. Miyamoto, Hideyuki Nosaka, NTT, Japan 
- PAGE 659
We2A-2
10:30 **An FPGA-Based Multi-Level All-Digital Transmitter with 1.25GHz of Bandwidth**
Daniel C. Dinis¹, Rui Ma¹, Koon H. Teo¹, Philip Orlik¹, Arnaldo S.R. Oliveira², José Vieira²
¹MERL, USA  ; ²Universidade de Aveiro, Portugal 
- PAGE 663
We2A-3
10:50 **An Echo-Canceller-Less NFIC-TSV Hybrid 3D Interconnect for Simultaneous Bidirectional Vertical Communication**
Srinivasan Gopal¹, Pawan Agarwal², Sheikh Nizam Ali¹, Joe Baylon¹, Deukhyoun Heo¹
¹Washington State University, USA  ; ²MaxLinear, USA 
- PAGE 667
We2A-4
11:10 **A 16-Element 2.4-GHz Digital Array Receiver Using 2-D IIR Spatially-Bandpass Plane-Wave Filter**
Sravan Pulipati, Viduneth Ariyaratna, Arjuna Madanayake, University of Akron, USA 
- PAGE 671
We2A-5
11:30 **A Wide-Range 130-nm CMOS Statistic-Based Frequency Ratio Calculator**
Yun-Chih Lu, Yen-Yu Pan, Yi-Jan Emery Chen, National Taiwan University, Taiwan 

We2B: Advances in Mixers and Frequency Multipliers

Chair: Hiroshi Okazaki, NTT DoCoMo — Co-Chair: Chinchun Meng, National Chiao Tung University

201B, Time 10:10–11:50, Wednesday 13 June 2018

- PAGE 674
We2B-1
10:10 **6–12GHz MMIC Double-Balanced Upconversion Mixer Based on Graphene Diode**
Ahmed Hamed¹, Mohamed Saeed¹, Zhenxing Wang², Mehrdad Shaygan², Daniel Neumaier², Renato Negra¹
¹RWTH Aachen University, Germany  ; ²AMO, Germany 
- PAGE 678
We2B-2
10:30 **A 10GHz Up-Conversion Mixer with 13.6dBm OIP3 Using Regulator-Based Linearized G_m Stage and Harmonic Nulling**
Jinbo Li, Ajinkya More, Shilei Hao, Qun Jane Gu, University of California, Davis, USA 
- PAGE 682
We2B-3
10:50 **An Active High Conversion Gain W-Band Up-Converting Mixer for Space Applications**
M. Hossain, M. Hrobak, D. Stoppel, Wolfgang Heinrich, V. Krozer, FBH, Germany 
- PAGE 686
We2B-4
11:10 **A High LO-to-RF Isolation 34–53GHz Cascode Mixer for ALMA Observatory Applications**
Chun-Nien Chen¹, Yu-Hsuan Lin¹, Yen-Chih Chen¹, Chau-Ching Chiong², Huei Wang¹
¹National Taiwan University, Taiwan  ; ²Academia Sinica, Taiwan 
- PAGE 690
We2B-5
11:30 **A High-Efficiency E-Band SiGe HBT Frequency Tripler with Broadband Performance**
Peigen Zhou, Jixin Chen, Huanbo Li, Debin Hou, Pinpin Yan, Chao Yu, Wei Hong, Southeast University, China 

We2C: Filter Tuning, Synthesis, and Innovative Coupling Realizations

Chair: Dimitra Psychogiou, University of Colorado Boulder — Co-Chair: Masud Hannan, Intel

201C, Time 10:10–11:50, Wednesday 13 June 2018

- PAGE 694
We2C-1
10:10
- An Efficient Technique for Tuning and Design of Wideband Filters**
Huayong Jia, Raafat R. Mansour, University of Waterloo, Canada 
- PAGE 697
We2C-2
10:20
- Coupling Matrix Extraction Technique for Auto Tuning of Highly Lossy Filters**
Ranjan Das¹, Qingfeng Zhang², Abhishek Kandwal², Haiwen Liu³
¹IIT Bombay, India ; ²SUSTech, China ; ³Xi'an Jiaotong University, China 
- PAGE 701
We2C-3
10:40
- Half-Mode SIW Filters with Resonant Couplings Implementing Transmission Zeros**
Enrico Massoni¹, Nicolò Delmonte¹, Giuseppe Macchiarella², Luca Perregrini¹, Maurizio Bozzi¹
¹Università di Pavia, Italy ; ²Politecnico di Milano, Italy 
- PAGE 704
We2C-4
10:50
- High Selectivity Filters in Coaxial SIW Based on Singlets and Doublets**
Stefano Sirci¹, Miguel A. Sánchez-Soriano², Jorge D. Martínez¹, Vicente E. Boria¹
¹Universitat Politècnica de València, Spain ; ²Universidad de Alicante, Spain 
- PAGE 708
We2C-5
11:10
- A New Microstrip Bandstop Filter for Fully Canonical Cul-de-Sac Coupling Configuration**
Masataka Ohira, Makoto Kanomata, Zhewang Ma, Xiaolong Wang, Saitama University, Japan 
- PAGE 712
We2C-6
11:30
- A Novel Microstrip Symmetric Diagonal Cross-Coupling Quadruplet Bandpass Filter Using Even/Odd-Mode Stepped Impedance Resonators**
Ryo Mikase, Masataka Ohira, Zhewang Ma, Xiaolong Wang, Saitama University, Japan 

We2D: Trapping Phenomena in GaN HEMTs

Chair: Matthias Rudolph, Brandenburgische Technische Universität — Co-Chair: Q.J. Zhang, Carleton University

202AB, Time 10:10–11:50, Wednesday 13 June 2018

- PAGE 716
We2D-1
10:10
- A Simple Method to Extract Trapping Time Constants of GaN HEMTs**
Luís C. Nunes, João L. Gomes, Pedro M. Cabral, José C. Pedro, Universidade de Aveiro, Portugal 
- PAGE 720
We2D-2
10:30
- Investigation of Fast and Slow Charge Trapping Mechanisms of GaN/AlGaN HEMTs Through Pulsed I-V Measurements and the Associated New Trap Model**
Julien Couvidat¹, Nandha Kumar Subramani¹, Vincent Gillet¹, Sylvain Laurent¹, Christophe Charbonniaud², Jean Christophe Nallatamby¹, Michel Prigent¹, Nathalie Deltimple¹, Raymond Quéré¹
¹XLIM (UMR 7252), France ; ²AMCAD Engineering, France 
- PAGE 724
We2D-3
10:50
- Modeling Buffer-Related Charge Trapping Effect by Using Threshold Voltage Shifts in AlGaN/GaN HEMTs**
Yonghao Jia¹, Yuehang Xu¹, Yongxin Guo²
¹UESTC, China ; ²National University of Singapore, Singapore 
- PAGE 728
We2D-4
11:10
- Modeling the Virtual Gate Voltage in Dispersive GaN HEMTs**
Peng Luo¹, Frank Schnieder², Olof Bengtsson², Wolfgang Heinrich², Matthias Rudolph¹
¹Brandenburgische Technische Universität, Germany ; ²FBH, Germany 
- PAGE 732
We2D-5
11:30
- Assessment of the Trap-Induced Insertion Loss Degradation of RF GaN Switches Under Operating Regimes**
Corrado Florian, Gian Piero Gibiino, Alberto Santarelli, Università di Bologna, Italy 

We2E: Ferrite, Ferroelectric, and Phase-Change Components

Chair: Shamsur Mazumder, Worcester Polytechnic Institute — Co-Chair: Steven Stitzer, Northrop Grumman Mission Systems
203AB, Time 10:10–11:50, Wednesday 13 June 2018

- PAGE 736
We2E-1
10:10
- Design, Fabrication and Characterization of a PCM-Based Compact 4-Bit Capacitor Bank**
Junwen Jiang, Raafat R. Mansour, University of Waterloo, Canada 
- PAGE 739
We2E-2
10:30
- Voltage-Tunable Parallel-Plate Capacitors Fabricated on Low-Loss MBE-Grown BST**
Cedric J.G. Meyers, Christopher R. Freeze, Susanne Stemmer, Robert A. York, University of California, Santa Barbara, USA 
- PAGE 743
We2E-3
10:40
- Intrinsically Switchable and Bandwidth Reconfigurable FBAR Filter Employing Electrostriction in Ferroelectric BST**
Milad Zolfagharloo Koohi, Suhyun Nam, Amir Mortazawi, University of Michigan, USA 
- PAGE 746
We2E-4
11:00
- Complete Methodology of Low-Loss Ultra-Wideband Junction Circulator**
Hamza Turki¹, Laure Huitema¹, Thierry Monediere¹, Bertrand Lenoir², Christophe Breuil²
¹XLIM (UMR 7252), France ; ²INOVEOS, France 
- PAGE 750
We2E-5
11:20
- Ferrimagnetic Garnets for Low Temperature Co-Fired Ceramics Microwave Circulators**
L. Qassym¹, V. Laur², R. Lebourgeois¹, P. Queffelec²
¹Thales Research & Technology, France ; ²Lab-STICC (UMR 6285), France 

We2F: THz and mm-Wave Amplification Multiplication and Control Innovations

Chair: Edward Niehenke, Niehenke Consulting — Co-Chair: Omeed Momeni, University of California, Davis
204A, Time 10:10–11:50, Wednesday 13 June 2018

- PAGE 753
We2F-1
10:10
- F-Band, GaN Power Amplifiers**
Edmar Camargo, James Schellenberg, Lani Bui, Nicholas Estella, QuinStar Technology, USA 
- PAGE 757
We2F-2
10:30
- First Full W-Band GaN Power Amplifier MMICs with Novel Broadband Radial Stubs and 50GHz of Bandwidth**
Maciej Ćwikliński, Christian Friesicke, Peter Brückner, Dirk Schwantuschke, Roger Lozar, Hermann Massler, Sandrine Wagner, Rüdiger Quay, Fraunhofer IAF, Germany 
- PAGE 761
We2F-3
10:50
- in situ Load-Pull MMIC for Large-Signal Characterization of mHEMT Devices at Submillimeter-Wave Frequencies**
Laurenz John¹, Matthias Ohlrogge¹, Sandrine Wagner¹, Christian Friesicke¹, Axel Tessmann¹, Arnulf Leuther¹, Thomas Zwick²
¹Fraunhofer IAF, Germany ; ²KIT, Germany 
- PAGE 765
We2F-4
11:10
- 220–265GHz Active ×6 Frequency Multiplier MMIC with InP HEMT Technology**
Kangseop Lee¹, Hiroshi Hamada², Hideaki Matsuzaki², Hideyuki Nosaka², Ho-Jin Song¹
¹POSTECH, Korea ; ²NTT, Japan 
- PAGE 769
We2F-5
11:30
- A 160GHz Frequency Quadrupler Based on Heterogeneous Integration of GaAs Schottky Diodes onto Silicon Using SU-8 for Epitaxy Transfer**
Souheil Nadri, Linli Xie, Masoud Jafari, Naser Alijabbari, Michael E. Cyberey, N. Scott Barker, Arthur W. Lichtenberger, Robert M. Weikle II, University of Virginia, USA 

PAGE 773
We2F-6
11:40

A 460GHz MEMS-Based Single-Pole Double-Throw Waveguide Switch
*Theodore Reck, Cecile Jung-Kubiak, Goutam Chattopadhyay, Jet Propulsion
Laboratory, USA* 

We2G: Phased Array Systems and Applications

*Chair: Roberto Vincenti Gatti, Università di Perugia — Co-Chair: Julio Navarro, Boeing
204B, Time 10:10–11:50, Wednesday 13 June 2018*

PAGE 776
We2G-1
10:10

**Heterogeneously-Integrated Phased-Array Antennas for Line-of-Sight (LOS)
Communications and Sensor Applications**
Julio Navarro, Boeing, USA 

PAGE 779
We2G-2
10:30

**Development of a Receive Phased Array Antenna for High Altitude Platform
Stations Using Integrated Beamformer Modules**
Will Theunissen¹, Vipul Jain², Gaurav Menon²
¹Facebook, USA ; ²Anokiwave, USA 

PAGE 783
We2G-3
10:50

**A Planar All-Silicon 256-Element Ka-Band Phased Array for High-Altitude Platforms
(HAPs) Application**
Matthew Stoneback¹, Kristian Madsen²
¹Facebook, USA ; ²Anokiwave, USA 

PAGE 787
We2G-4
11:10

**Intermodulation Effects and System Sensitivity Degradation in 5G Phased-Arrays
Due to Multiple Interferers**
Bhaskara Rupakula, Gabriel M. Rebeiz, University of California, San Diego, USA 

PAGE 791
We2G-5
11:30

**Linearity and Efficiency Improvements in Phased-Array Transmitters with Large
Number of Elements and Complex Modulation**
*Bhaskara Rupakula, Abdurrahman H. Aljuhani, Gabriel M. Rebeiz, University of
California, San Diego, USA* 

We2H: High Power Doherty Power Amplifiers

Chair: Slim Boumaiza, University of Waterloo — Co-Chair: Manouchehr Ghanevati, Northrop Grumman Aerospace Systems
204C, Time 10:10–11:50, Wednesday 13 June 2018

PAGE 794 We2H-1 10:10	A 150W High Efficiency Integrated Doherty Amplifier for LTE-Advanced Applications <i>Alan Xu, Marvin Lu, Eric Wang, NXP Semiconductors, China</i> 
PAGE 797 We2H-2 10:30	A 225 Watt, 1.8–2.7GHz Broadband Doherty Power Amplifier with Zero-Phase Shift Peaking Amplifier <i>Haedong Jang, Richard Wilson, Infineon Technologies, USA</i> 
PAGE 801 We2H-3 10:50	Digitally-Assisted Doherty Power Amplifier: Efficiency Enhancement and Linearity Improvement <i>Mir Masood¹, Peter Rashev¹, J. Stevenson Kenney²</i> ¹ NXP Semiconductors, USA  ; ² Georgia Tech, USA 
PAGE 805 We2H-4 11:10	A Sub-6GHz Compact GaN MMIC Doherty PA with a 49.5% 6dB Back-Off PAE for 5G Communications <i>Sih-Han Li¹, Shawn S.H. Hsu¹, Jie Zhang², Keh-Ching Huang²</i> ¹ National Tsing Hua University, Taiwan  ; ² ITRI, Taiwan 
PAGE 808 We2H-5 11:30	A Compact and Broadband Ka-Band Asymmetrical GaAs Doherty Power Amplifier MMIC for 5G Communications <i>Guansheng Lv, Wenhua Chen, Zhenghe Feng, Tsinghua University, China</i> 

We3A: Novel Microwave Circuits and Systems Applications

Chair: Kavita Goverdhanam, U.S. Army CERDEC — Co-Chair: Ajay Poddar, Synergy Microwave
201A, Time 15:55–17:15, Wednesday 13 June 2018

PAGE 812 We3A-1 15:55	Expand Horizons of Microfluidic Systems: An Inkjet Printed Flexible Energy Autonomous Micropump System for Wearable and IoT Microfluidic Applications <i>Tong-Hong Lin, Wenjing Su, Manos M. Tentzeris, Georgia Tech, USA</i> 
PAGE 816 We3A-2 16:15	An Active Microwave Imaging Technique Using Spatial Frequency Sampling <i>Stavros Vakalis, Jeffrey A. Nanzer, Michigan State University, USA</i> 
PAGE 819 We3A-3 16:35	Linearity Enhancement of GaN Doherty Amplifier by Forward Gate Current Blocking Method <i>Ibrahim Khalil, Srinidhi Embar R., Geoffery Tucker, NXP Semiconductors, USA</i> 
PAGE 822 We3A-4 16:45	An Ultra-Low-Power, High Gain Mixer for Smart Cities Applications <i>Raunak Borwankar¹, Mohammad R. Haider², Reinhold Ludwig¹, Yehia Massoud¹</i> ¹ Worcester Polytechnic Institute, USA  ; ² University of Alabama at Birmingham, USA 
PAGE 825 We3A-5 16:55	Fully Printed Microwave Sensor for Simultaneous and Independent Level Measurements of 8 Liquids <i>Muhammad Akram Karimi¹, Muhammad Arsalan², Atif Shamim¹</i> ¹ KAUST, Saudi Arabia  ; ² EXPEC ARC, Saudi Arabia 

We3B: Emerging RF Switch Technologies for 5G and Defense Applications

Chair: Jeong-sun Moon, HRL Laboratories — Co-Chair: Aly Fathy, University of Tennessee

201B, Time 15:55–17:15, Wednesday 13 June 2018

- PAGE 829
We3B-1
15:55 **Can Phase Change Materials Put the Radio into Software Defined Radio?**
William J. Chappell, Timothy M. Hancock, Roy H. Olsson III, DARPA, USA 
- PAGE 832
We3B-2
16:15 **Improvements in GeTe-Based Phase Change RF Switches**
*Robert M. Young¹, Pavel Borodulin¹, Nabil El-Hinnawy², Andy Ezis¹,
Matthew R. King³, Vivien Luu¹, Doyle T. Nichols¹*
¹Northrop Grumman, USA ; ²TowerJazz, USA ; ³Wolfspeed, USA 
- PAGE 836
We3B-3
16:35 **5THz Figure-of-Merit Reliable Phase-Change RF Switches for Millimeter-Wave Applications**
*Jeong-sun Moon, Hwa-change Seo, Kyung-ah Son, Kangmu Lee, Daniel Zehnder,
Haw Tai, HRL Laboratories, USA* 
- PAGE 839
We3B-4
16:55 **Reversible, Fast Optical Switching of Phase Change Materials for Active Control of High-Frequency Functions**
*Areski Ghalem, Cyril Guines, Damien Passerieux, Jean-Christophe Orlianges,
Laure Huitema, Aurelian Crunteanu, XLIM (UMR 7252), France* 
- PAGE 843
We3B-5
17:05 **GeTe Phase Change Research at the US Army Research Laboratory**
Leonard De La Cruz¹, A. Glen Birdwell¹, Mona Zaghloul², Tony G. Ivanov¹
¹U.S. Army Research Laboratory, USA ; ²George Washington University, USA 

We3E: Microwave Acoustic Components for Wireless Applications

Chair: Amelie Hagelauer, FAU Erlangen-Nürnberg — Co-Chair: Robert Weigel, FAU Erlangen-Nürnberg

203AB, Time 15:55–17:15, Wednesday 13 June 2018

- PAGE 846
We3E-1
15:55 **Applicability Investigation of SAW Devices in the 3 to 5GHz Range**
Tetsuya Kimura¹, Masashi Omura¹, Yutaka Kishimoto¹, Ken-ya Hashimoto²
¹Murata Manufacturing, Japan ; ²Chiba University, Japan 
- PAGE 849
We3E-2
16:15 **A Compact Intrinsically Switchable Filter Bank Employing Multifunctional Ferroelectric BST**
Milad Zolfagharloo Koochi, Amir Mortazawi, University of Michigan, USA 
- PAGE 852
We3E-3
16:35 **Input-Reflectionless Acoustic-Wave-Lumped-Element Resonator-Based Bandpass Filters**
Dimitra Psychogiou¹, Dakotah J. Simpson¹, Roberto Gómez-García²
¹University of Colorado Boulder, USA ; ²Universidad de Alcalá, Spain 
- PAGE 856
We3E-4
16:55 **Compact Size and Wideband Triplexer Using SAW Resonators and LC Components**
Youna Jang¹, Jung-Do Ha², Seok-Jae Lee², Jongsik Lim¹, Sang-Min Han¹, Dal Ahn¹
¹Soonchunhyang University, Korea ; ²Wisol, Korea 
- PAGE 860
We3E-5
17:05 **Multi-Band Acoustic-Wave-Lumped-Element Resonator-Based Bandstop Filters with Continuously Tunable Stopband Bandwidths**
Dimitra Psychogiou, Dakotah J. Simpson, University of Colorado Boulder, USA 

We3F: Terahertz and mm-Wave Technologies and Applications

Chair: John Kuno, QuinStar Technology — Co-Chair: Jae-Sung Rieh, Korea University

204A, Time 15:55–17:15, Wednesday 13 June 2018

- PAGE 864
We3F-1
15:55
- A Terahertz Microscopy Technique for Sweat Duct Detection**
Panagiotis C. Theofanopoulos, Georgios C. Trichopoulos, Arizona State University, USA

- PAGE 868
We3F-2
16:15
- D-Band 360° Phase Shifter with Uniform Insertion Loss**
Roe Ben Yishay, Danny Elad, ON Semiconductor, Israel 
- PAGE 871
We3F-3
16:35
- Silica-Based Packaging Structure for D-Band RF Module**
Masaharu Ito, Tsunehisa Marumoto, NEC, Japan 
- PAGE 875
We3F-4
16:55
- Substrate Integrated Waveguides for mm-Wave Functionalized Silicon Interposer**
Matthieu Bertrand¹, Emmanuel Pistono², Giuseppe Aciri², Darine Kaddour³, Florence Podevin², Vincent Puyal⁴, Selin Tolunay Wipf⁵, Christian Wipf⁵, Matthias Wietstruck⁵, Mehmet Kaynak⁵, Philippe Ferrari⁶
¹L2E (UR2), France ; ²IMEP-LAHC (UMR 5130), France ; ³LCIS (EA 3747), France ; ⁴CEA-LETI, France ; ⁵IHP, Germany ; ⁶TIMA, France 
- PAGE 879
We3F-5
17:05
- Multiline TRL Calibration Standards for S-Parameter Measurement of Planar Goubau Lines from 0.75THz to 1.1THz**
Juan Cabello-Sánchez, Helena Rodilla, Vladimir Drakinskiy, Jan Stake, Chalmers University of Technology, Sweden 

We3G: Broadband Radar Systems and Technologies

Chair: Rudy Emrick, Orbital ATK — Co-Chair: Nestor Lopez, MIT Lincoln Laboratory

204B, Time 15:55–17:15, Wednesday 13 June 2018

- PAGE 883
We3G-1
15:55
- A 4-Channel 10–40GHz Wideband Receiver with Integrated Frequency Quadrupler for High Resolution Millimeter-Wave Imaging Systems**
Qian Ma, Hyunchul Chung, Gabriel M. Rebeiz, University of California, San Diego, USA

- PAGE 887
We3G-2
16:15
- A Ka Band FMCW Transceiver Front-End with 2GHz Bandwidth**
Bowen Ding, Shengyue Yuan, Chen Zhao, Li Tao, Tong Tian, Chinese Academy of Sciences, China 
- PAGE 891
We3G-3
16:35
- On Hardware Implementations of Stepped-Carrier OFDM Radars**
Benedikt Schweizer¹, Daniel Schindler², Christina Knill¹, Jürgen Hasch², Christian Waldschmidt¹
¹Universität Ulm, Germany ; ²Robert Bosch, Germany 
- PAGE 895
We3G-4
16:55
- 28GHz 5G-Based Phased-Arrays for UAV Detection and Automotive Traffic-Monitoring Radars**
Yaochen Wang, Thomas Phelps, Kerim Kibaroglu, Mustafa Sayginer, Qian Ma, Gabriel M. Rebeiz, University of California, San Diego, USA 

We3H: Women in Microwaves: Research on Biomedical Applications

Chair: Katia Grenier, CNES — Co-Chair: Dominique Schreurs, Katholieke Universiteit Leuven

204C, Time 15:55–17:15, Wednesday 13 June 2018

PAGE 899
We3H-1
15:55

Cells and Electropulsation Microchambers Modeling for Linear and Non-Linear Optical Microspectroscopy

C. Merla¹, M. Liberti², F. Apollonio², L.M. Mir³

¹ENEA, Italy ; ²Università di Roma “La Sapienza”, Italy ; ³VAT (UMR 8203), France 

PAGE 903
We3H-2
16:15

Yeast Cell Growth Monitoring Using Microwave Measurements Correlated to Optical Absorbance

Xiue Bao, Ilja Ocket, Ju Zheng, Juncheng Bao, Meng Zhang, Dries Kil, Vanessa Franssens, Bob Puers, Dominique M.M.-P. Schreurs, Bart Nauwelaers, Katholieke Universiteit Leuven, Belgium 

PAGE 907
We3H-3
16:35

Label-Free Discrimination of Human Lymphoma Cell Sub-Populations with Microwave Dielectric Spectroscopy

Katia Grenier¹, François Artis¹, Mary Poupot², J.-J. Fournié², David Dubuc¹

¹LAAS, France ; ²CRCT, France 

PAGE 911
We3H-4
16:55

Characterization and Analysis of Wideband Temperature-Dependent Dielectric Properties of Liver Tissue for Next-Generation Minimally Invasive Microwave Tumor Ablation Technology

Luz Maria Neira, James Sawicki, Barry D. Van Veen, Susan C. Hagness, University of Wisconsin-Madison, USA 

WEIF1: Interactive Forum #2

Chair: Aly Fathy, University of Tennessee — Co-Chair: Kiki Ikossi, IEEE

Exhibit Hall, Time 10:10–11:50, Wednesday 13 June 2018

PAGE 915
WEIF1-1
POSTER

Real-Time Frequency-Agile Circuit Reconfiguration for S-Band Radar Using a High-Power Tunable Resonant Cavity Matching Network

Sarvin Rezayat¹, Chris Kappelmann¹, Zachary Hays¹, Lucilia Hays¹, Charles Baylis¹, Edward A. Viveiros², Abbas Semnani³, Dimitrios Peroulis³

¹Baylor University, USA ; ²U.S. Army Research Laboratory, USA ; ³Purdue University, USA 

PAGE 919
WEIF1-2
POSTER

Compact Transmitter for Pulsed-Radar Detection of On-Body Concealed Weapons

Aaron D. Pitcher, Justin J. McCombe, Eric A. Eveleigh, Natalia K. Nikolova, McMaster University, Canada 

PAGE 923
WEIF1-3
POSTER

Active HEMT Based Envelope Detector for Ultra-Wideband Wireless Communication Systems

Bruno Cimoli¹, Juan Sebastián Rodríguez Páez¹, Arsen Turhaner¹,

Tom Keinicke Johansen¹, Juan José Vegas Olmos²

¹Technical University of Denmark, Denmark ; ²Mellanox Technologies, Denmark 

PAGE 927
WEIF1-4
POSTER

Curtailed Digital Predistortion Model for Crosstalk in MIMO Transmitters

Praveen Jaraut¹, Meenakshi Rawat¹, Fadhel M. Ghannouchi²

¹IIT Roorkee, India ; ²University of Calgary, Canada 

PAGE 931
WEIF1-5
POSTER

A RF-DAC Based 40Gbps PAM Modulator with 1.2pJ/Bit Energy Efficiency at Millimeterwave Band

Frida Strömbeck, Zhongxia Simon He, Herbert Zirath, Chalmers University of Technology, Sweden 

PAGE 934 WEIF1-6 POSTER	Multiband Microwave Sensing for Surface Roughness Classification <i>Philipp A. Scharf¹, Johannes Iberle¹, Hubert Mantz¹, Thomas Walter¹, Christian Waldschmidt²</i> ¹ Hochschule Ulm, Germany  ; ² Universität Ulm, Germany 
PAGE 938 WEIF1-7 POSTER	The Influence of Metallization on Resonance Frequency and Temperature Sensitivity of GHz Operating III-Nitride SAW Based Sensor Structures <i>A. Müller¹, A. Nicoloiu¹, A. Dinescu¹, A. Stavrinidis², I. Zdru¹, G. Konstantinidis²</i> ¹ IMT Bucharest, Romania  ; ² FORTH, Greece 
PAGE 942 WEIF1-8 POSTER	55nm Ultra-Low-Power Local Oscillator for EPCglobal Gen2v2 Standardized Passive UHF RFID Tags <i>Georg Saxl, Manuel Hechenblaickner, Manuel Ferdik, Thomas Ussmueller, Universität Innsbruck, Austria</i> 
PAGE 946 WEIF1-9 POSTER	On-Wafer Measurements of Responsivity of FET-Based subTHz Detectors <i>P. Kopyt¹, B. Salski¹, P. Zagrajek², M. Bauwens³, D. Obrębski⁴, J. Marczewski⁴, N. Scott Barker⁵</i> ¹ Warsaw University of Technology, Poland  ; ² Warsaw Military University, Poland  ; ³ Dominion Microprobes, USA  ; ⁴ Institute of Electron Technology, Poland  ; ⁵ University of Virginia, USA 
N/A WEIF1-10 POSTER	Study on Wide Power Dynamic Range Coherent Power Combining Based on S-Band 20-kW Frequency Pushing Magnetrans <i>Xiaojie Chen, Zhenlong Liu, Changjun Liu, Sichuan University, China</i> 
PAGE 953 WEIF1-11 POSTER	Towards Study on Thermoacoustic Imaging Guided Focused Microwave Therapy for Breast Cancer Treatment <i>Srishti Saraswat, Jinpil Tak, Min Liang, Cheng Lyu, Russell S. Witte, Hao Xin, University of Arizona, USA</i> 

PAGE 957 WEIF1-12 POSTER	Honey-Bee Localization Using an Energy Harvesting Device and Power Based Angle of Arrival Estimation <i>Jake Shearwood, Daisy Man Yuen Hung, Paul Cross, Shaun C. Preston, Cristiano Palego, Bangor University, UK</i> 
PAGE 961 WEIF1-13 POSTER	Through The Wall Respiration Rate Detection Using Hilbert Vibrational Decomposition <i>Harikesh, Ananjan Basu, Mahesh P. Abegaonkar, Shibhan Kishen Koul, IIT Delhi, India</i> 
PAGE 964 WEIF1-14 POSTER	A Large Planar Holographic Reflectarray for Fresnel-Zone Microwave Wireless Power Transfer at 5.8GHz <i>Guy S. Lipworth¹, Joseph A. Hagerty¹, Daniel Arnitz¹, Yaroslav A. Urzhumov¹, David R. Nash¹, Russell J. Hannigan¹, Casey T. Tegreene¹, Matthew S. Reynolds²</i> ¹ Metamaterials Commercialization Center, USA  ; ² University of Washington, USA 
PAGE 968 WEIF1-15 POSTER	Mid-Range Wireless Power Transfer Based on Goubau Lines <i>Brian J. Vaughn, Dimitrios Peroulis, Alden Fisher, Purdue University, USA</i> 
PAGE 972 WEIF1-16 POSTER	Compact and Wide-Band Efficiency Improved RF Differential Rectifier for Wireless Energy Harvesting <i>Mohamed M. Mansour¹, Xavier Le Polozec², Haruichi Kanaya¹</i> ¹ Kyushu University, Japan  ; ² Ericsson, France 
PAGE 976 WEIF1-17 POSTER	Nonlinear Resonant Circuits for Coupling-Insensitive Wireless Power Transfer Circuits <i>Omar Abdelatty, Xiaoyu Wang, Amir Mortazawi, University of Michigan, USA</i> 

PAGE 980 WEIF1-18 POSTER	Performance Comparison of Two Stage of Dickson Voltage Rectifier Realized in FD-SOI 28nm and BiCMOS 55nm for RF Energy Harvesting <i>M. Awad, P. Benech, J.-M. Duchamp, N. Corrao, IMEP-LAHC (UMR 5130), France</i> 
PAGE 984 WEIF1-19 POSTER	A 4-Bit Programmable Metamaterial Based on VO₂ Mediums <i>Yong Zhang¹, Jinyu Zhang¹, Yan Wang¹, Zhiping Yu¹, Binzhen Zhang²</i> ¹ Tsinghua University, China  ; ² NUC, China 
PAGE 987 WEIF1-20 POSTER	Ultra-Wide Band On-Chip Circulators for Full-Duplex Communications <i>Mathew M. Biedka, Rui Zhu, Qiang Mark Xu, Yuanxun Ethan Wang, University of California, Los Angeles, USA</i> 
PAGE 991 WEIF1-21 POSTER	Photonic-Enabled RF Cancellor for In-Band Full-Duplex 5G Networks <i>Kenneth E. Kolodziej, Siva Yegnanarayanan, Bradley T. Perry, MIT Lincoln Laboratory, USA</i> 
PAGE 995 WEIF1-23 POSTER	A Dual-Band RF Front-End Architecture for Accurate and Reliable GPS Receivers <i>Ramón López La Valle, Javier G. García, Pedro A. Roncagliolo, UNLP, Argentina</i> 
PAGE 999 WEIF1-24 POSTER	A Polarization Independent Frequency Selective Surface Based on the Matryoshka Geometry <i>A. Gomes Neto, T.R. de Sousa, J.C. e Silva, D.F. Mamedes, IFPB, Brazil</i> 
PAGE 1003 WEIF1-25 POSTER	Josephson Junction Microwave Modulators <i>Ofer Naaman, Joshua Strong, David Ferguson, Jonathan Egan, Nancyjane Bailey, Robert Hinkey, Northrop Grumman, USA</i> 

WEIF2: Interactive Forum #3

Chair: Kiki Ikossi, IEEE — Co-Chair: Abbas Omar, Universität Magdeburg

Exhibit Hall, Time 15:55–17:15, Wednesday 13 June 2018

PAGE 1006 WEIF2-1 POSTER	Millimeter-Wave Resonant Cavity for Complex Permittivity Measurements of Materials <i>Duane C. Karns¹, James C. Weatherall¹, Joseph Greca¹, Peter R. Smith², Kevin Yam¹, Jeffrey Barber³, Barry T. Smith³</i> ¹ Battelle, USA  ; ² AASKI Technology, USA  ; ³ DHS, USA 
PAGE 1010 WEIF2-2 POSTER	Towards the Source Reconstruction with a Time-Reversal Method for Practical Applications <i>Jing-cheng Liang¹, Zhizhang Chen², Jinyan Li¹, Yiqiang Yu², Junfeng Wang¹</i> ¹ UESTC, China  ; ² Dalhousie University, Canada 
PAGE 1013 WEIF2-3 POSTER	Time-Domain Modeling of Noisy Electromagnetic Field Propagation <i>Johannes A. Russer, Michael Haider, Technische Universität München, Germany</i> 
PAGE 1017 WEIF2-4 POSTER	Towards a Unifying Computational Platform with the Node-Based Meshless Method <i>Junfeng Wang¹, Zhizhang Chen², Jinyan Li¹, Yiqiang Yu², Jing-cheng Liang¹</i> ¹ UESTC, China  ; ² Dalhousie University, Canada 
PAGE 1021 WEIF2-5 POSTER	Three Port Non-Linear Characterization of Power Amplifiers Under Modulated Excitations Using a Vector Network Analyzer Platform <i>Alberto Maria Angelotti¹, Gian Piero Gibiino¹, Troels Nielsen², Felice Francesco Tafuri², Alberto Santarelli¹</i> ¹ Università di Bologna, Italy  ; ² Keysight Technologies, Denmark 

PAGE 1025 WEIF2-6 POSTER	Rapid Dimension Scaling of Miniaturized Microstrip Couplers with Respect to Operating Conditions and Substrate Parameters <i>Slawomir Koziel¹, Adrian Bekasiewicz², John W. Bandler³</i> ¹ Reykjavik University, Iceland  ; ² Gdańsk University of Technology, Poland  ; ³ McMaster University, Canada 
PAGE 1028 WEIF2-7 POSTER	A Neural Network Modeling Approach to Power Amplifiers Taking into Account Temperature Effects <i>Shao-Hua Zhou, Hai-Peng Fu, Jian-Guo Ma, Qi-Jun Zhang, Tianjin University, China</i> 
PAGE 1032 WEIF2-8 POSTER	A Novel CAD Probe for Bidirectional Impedance and Stability Analysis <i>Thomas A. Winslow, MACOM, USA</i> 
PAGE 1036 WEIF2-9 POSTER	An Analytical Gradient Model for the Characterization of Conductor Surface Roughness Effects <i>Liang Chen, Min Tang, Junfa Mao, Shanghai Jiao Tong University, China</i> 
PAGE 1039 WEIF2-10 POSTER	Measurement & Extraction of the Low-Frequency Dynamics of an Envelope Tracking Amplifier Using Multisine Excitations <i>Piet Bronders¹, Jan Goos¹, John Lataire¹, Yves Rolain¹, Gerd Vandersteen¹, Sebastian Gustafsson², Guillaume Pailloncy³</i> ¹ Vrije Universiteit Brussel, Belgium  ; ² Chalmers University of Technology, Sweden  ; ³ National Instruments, USA 
PAGE 1043 WEIF2-11 POSTER	Electrical Characterization of Highly Efficient, Optically Transparent Nanometers-Thick Unit Cells for Antenna-on-Display Applications <i>Seung Yoon Lee¹, DooSeok Choi², Youngno Youn¹, Wonbin Hong¹</i> ¹ POSTECH, Korea  ; ² Samsung Electronics, Korea 

PAGE 1046 WEIF2-12 POSTER	RoF SpatialMux MIMO-LTE Fronthaul System Transmission Parameter Selection with Nelder-Mead Optimization Algorithm <i>Carlos Mateo, Pedro L. Carro, Paloma Garcia-Ducar, Jesus de Mingo, Iñigo Salinas, Universidad de Zaragoza, Spain</i> 
PAGE 1050 WEIF2-13 POSTER	Effective Extracting Method for Electromagnetic Parameters of Periodically Loaded Substrate Integrated Waveguide Units <i>Yuliang Zhou¹, Yong Mao Huang¹, Haiyan Jin¹, Du Xu¹, Shuai Ding¹, Lorenzo Silvestri², Maurizio Bozzi², Luca Perregrini²</i> ¹ UESTC, China  ; ² Università di Pavia, Italy 
PAGE 1054 WEIF2-14 POSTER	Microstrip Crossover for Millimeter-Wave Applications <i>Karrar Al Khanjar, Tarek Djerafi, INRS-EMT, Canada</i> 
PAGE 1057 WEIF2-15 POSTER	Propagation Characteristics of Mode-Selective Transmission Line <i>Desong Wang, Ke Wu, École Polytechnique de Montréal, Canada</i> 
PAGE 1061 WEIF2-16 POSTER	A Mix-Mode Hybrid Using Broadside-Coupled Asymmetric Coplanar Striplines <i>Lap K. Yeung, Yuanxun Ethan Wang, University of California, Los Angeles, USA</i> 
PAGE 1064 WEIF2-17 POSTER	High Selective Bandpass Filter with Controllable Transmission Zeros <i>Yiqiang Gao, Wei Shen, Liang Wu, Xiaowei Sun, Chinese Academy of Sciences, China</i> 
PAGE 1068 WEIF2-18 POSTER	Independently Controllable External Coupling for Resonant Junctions in Diplexers <i>Yun Wu¹, Yi Wang¹, Liang Sun²</i> ¹ University of Greenwich, UK  ; ² Chinese Academy of Sciences, China 
PAGE 1072 WEIF2-19 POSTER	Compact Substrate-Integrated Waveguide Triplexer Based on a Common Triple-Mode Cavity <i>Haowei Xie, Kang Zhou, Chunxia Zhou, Wen Wu, NJUST, China</i> 

PAGE 1076 WEIF2-20 POSTER	High Isolation Superconducting Diplexer Designed with Double-Side Structure <i>Xiang Wang, Bei Wei, Bisong Cao, Xubo Guo, Tsinghua University, China</i> 
PAGE 1079 WEIF2-21 POSTER	Relationship Between Band-Edge Steepness and Power-Handling Capability in Filters <i>Pengyu Ma¹, Bin Wei¹, Zhan Xu², Chenjie Luo¹, Xubo Guo¹, Bisong Cao¹</i> ¹ Tsinghua University, China  ; ² Beijing Institute of Technology, China 
PAGE 1083 WEIF2-22 POSTER	Multiband Filters with Positive or Negative Dispersive Cross-Couplings <i>Ahmad Haidar¹, Hussein Ezzeddine², Johann Sence¹, Olivier Tantot¹, Stéphane Bila¹</i> ¹ XLIM (UMR 7252), France  ; ² Jwaya University College, Lebanon 
PAGE 1087 WEIF2-23 POSTER	Design Technique for Integration of Manifold Multiplexers Considering Constraints on Inter-Channel Spacings <i>A. Cordon¹, I. Arregui¹, I. Arnedo¹, F. Teberio¹, C. Arnold², M.A.G. Laso¹, J. Lorente²</i> ¹ Universidad Pública de Navarra, Spain  ; ² Tesat Spacecom, Germany 
PAGE 1091 WEIF2-24 POSTER	A Novel Independently-Tunable Dual-Mode SIW Resonator with a Reconfigurable Bandpass Filter Application <i>Mahmoud Abdelfattah, Dimitrios Peroulis, Purdue University, USA</i> 

Th1A: Advanced Technologies for Non-Planar Filters and Diplexers

Chair: Giuseppe Macchiarella, Politecnico di Milano — Co-Chair: Richard Snyder, RS Microwave
201A, Time 08:00–09:40, Thursday 14 June 2018

PAGE 1095 Th1A-1 08:00	Integrated Third-Order Millimeter-Wave On-Chip Bandpass Filter Using 0.13-μm SiGe Bi-CMOS Technology <i>Yang Yang¹, He Zhu¹, Xi Zhu¹, Quan Xue²</i> ¹ University of Technology Sydney, Australia  ; ² SCUT, China 
PAGE 1099 Th1A-2 08:20	Pseudoelliptic Compline Filter in a Circularly Shaped Tube <i>Roman Tkadlec¹, Giuseppe Macchiarella²</i> ¹ CommScope, Italy  ; ² Politecnico di Milano, Italy 
PAGE 1103 Th1A-3 08:40	A Very Compact 3D-Printed Doublet Structure Based on a Double Iris and a Pair of Slanting Rods <i>Cristiano Tomassoni¹, Giuseppe Venanzoni¹, Marco Dionigi¹, Roberto Sorrentino²</i> ¹ Università di Perugia, Italy  ; ² RF Microtech, Italy 
PAGE 1106 Th1A-4 09:00	A Wideband Diplexer for Ka-Band Passive Intermodulation Measurement <i>D. Smacchia¹, C. Carceller², Marco Guglielmi², P. Soto², Vicente E. Boria², J. Ruiz², P. González²</i> ¹ ESA-VSC High Power RF Laboratory, Spain  ; ² Universitat Politècnica de València, Spain 
PAGE 1110 Th1A-5 09:10	A Compact 28GHz Bandpass Filter Using Quartz Folded Waveguide <i>Hiroshi Kojima, Manabu Nakahori, Kei Matsutani, Katsuhito Kuroda, Kengo Onaka, Masayoshi Koshino, Takaki Murata, Norio Nakajima, Murata Manufacturing, Japan</i> 

PAGE 1114
Th1A-6
09:20

High ModesSuppressions with Transmission Zeros Design for a Novel Quarter-Mode SIW Filter

Xiao-Long Huang, Liang Zhou, Cheng-Rui Zhang, Junfa Mao, Shanghai Jiao Tong University, China 

PAGE 1118
Th1A-7
09:30

A Compact Tunable Filtering Rat-Race Coupler

Mohamed F. Hagag, Dimitrios Peroulis, Purdue University, USA 

Th1B: Advanced Rectifiers and Energy Harvesters for Wireless Power Transfer

Chair: David Ricketts, North Carolina State University — Co-Chair: Kenjiro Nishihkawa, Kagoshima University

201B, Time 08:00–09:40, Thursday 14 June 2018

PAGE 1122
Th1B-1
08:00

Accurate Analytical Model for Hybrid Ambient Thermal and RF Energy Harvester

Xiaoqiang Gu¹, Lei Guo¹, Moussa Harouna¹, Simon Hemour², Ke Wu¹
¹École Polytechnique de Montréal, Canada ; ²IMS (UMR 5218), France 

N/A
Th1B-2
08:20

A 16.8dB Input Power Range Microwave Rectifier with a Small Capacitor in Parallel with the Diode

Pengde Wu, Changjun Liu, Sichuan University, China 

PAGE 1130
Th1B-3
08:40

A 434MHz Dual-Mode Power Harvesting System with an On-Chip Coil in 180nm CMOS SOI for mm-Sized Implants

Hamed Rahmani, Aydin Babakhani, University of California, Los Angeles, USA 

PAGE 1134
Th1B-4
08:50

GHz-Band High-Efficiency Rectifier Design Based on MHz-Band Multi-Harmonic Active Source-Pull Technique

Minato Machida, Ryo Ishikawa, Yoichiro Takayama, Kazuhiko Honjo, University of Electro-Communications, Japan 

PAGE 1138
Th1B-5
09:10

An Inverter-Based Bidirectional and Reconfigurable RF Energy Harvesting Circuit with Rectifier and Oscillator Modes

Soroush Dehghani, Aaron Clements, Thomas Johnson, University of British Columbia, Canada 

PAGE 1141
Th1B-6
09:30

Dynamic-Range Extension Technique Based on Balanced Rectifiers

Muh-Dey Wei, Renato Negra, RWTH Aachen University, Germany 

Th1C: Electromagnetic Biosensing

Chair: Arnaud Pothier, XLIM (UMR 7252) — Co-Chair: Wenquan Che, NJUST

201C, Time 08:00–09:40, Thursday 14 June 2018

PAGE 1144
Th1C-1
08:00

Real-Time kHz to GHz Monitoring of Incubated Yeast Cell Growth Using Interdigitated Capacitors

Mojtaba Chehelcheraghi, Vanessa Franssens, Ilja Ocket, Bart Nauwelaers, Katholieke Universiteit Leuven, Belgium 

PAGE 1148
Th1C-2
08:20

Ultra-Wideband Characterization, Electroporation, and Dielectrophoresis of a Live Biological Cell Using the Same Vector Network Analyzer

Xiaotian Du, Xiao Ma, Lei Li, Hang Li, Xuanhong Cheng, James C.M. Hwang, Lehigh University, USA 

PAGE 1152
Th1C-3
08:40

DEP Measurement of the Dielectric Properties of Single CHO Cells Under Thermal Stress

Samaneh Afshar¹, Elham Salimi¹, Michael Butler², Douglas Thomson¹, Greg Bridges¹
¹University of Manitoba, Canada ; *²NIBRT, Ireland* 

PAGE 1156
Th1C-4
09:00

Contactless pH Measurement Based on High Resolution Enhanced Q Microwave Resonator

Zahra Abbasi, Mojgan Daneshmand, University of Alberta, Canada 

PAGE 1160
Th1C-5
09:20

A 5×5 Microwave Permittivity Sensor Matrix in 0.14-μm CMOS

Zhebin Hu, Gerasimos Vlachogiannakis, Michiel A.P. Pertijs, Leo de Vreede, Marco Spirito, Technische Universiteit Delft, The Netherlands 

Th1D: Advanced High Frequency Large Signal Measurement Techniques

Chair: Matt King, Georgia Tech — Co-Chair: Nuno Carvalho, Universidade de Aveiro

202AB, Time 08:00–09:40, Thursday 14 June 2018

PAGE 1164
Th1D-1
08:00

On-Chip High Impedance RMS Voltage Measurements at 265–300GHz

Sandeep Kshattray, Kenneth K. O, University of Texas at Dallas, USA 

PAGE 1168
Th1D-2
08:20

Estimation of Load-Pull Reflection Coefficients for Modulated Signals

Dhecha Nopchinda, Thomas Eriksson, Koen Buisman, Chalmers University of Technology, Sweden 

PAGE 1172
Th1D-3
08:40

Removing the Random Contributions of LO Phases from Multi-Tone RF Phase Measurements Based on Down-Conversion

Yichi Zhang, Wei Zhao, Zilong Zhang, Zheng Liu, National Institute of Metrology, China 

PAGE 1176
Th1D-4
09:00

Traceable Characterization of Broadband Pulse Waveforms Suitable for Cryogenic Josephson Voltage Applications

Alirio S. Boaventura¹, Dylan F. Williams¹, Gustavo Avolio², Paul D. Hale¹
¹NIST, USA ; *²Katholieke Universiteit Leuven, Belgium* 

Th1E: Recent Advances in Terahertz and Photonics

Chair: Goutam Chattopadhyay, Jet Propulsion Laboratory — Co-Chair: Jianping Yao, University of Ottawa
203AB, Time 08:00–09:40, Thursday 14 June 2018

- PAGE 1180
Th1E-1
08:00
- 600-GHz-Band Waveguide-Output Uni-Traveling-Carrier Photodiodes and Their Applications to Wireless Communication**
Tadao Nagatsuma¹, Tsubasa Kurokawa¹, Masato Sonoda¹, Tadao Ishibashi², Makoto Shimizu², Kazutoshi Kato³
¹Osaka University, Japan ; ²NTT, Japan ; ³Kyushu University, Japan 
- PAGE 1184
Th1E-2
08:20
- Terahertz Spectroscopy with Asynchronous Optical Sampling Using a Compact Bidirectional Mode-Locked Fiber Laser**
Robert D. Baker¹, Nezih T. Yardimci², Yi-Hsin Ou¹, Mona Jarrahi², Khanh Q. Kieu¹
¹University of Arizona, USA ; ²University of California, Los Angeles, USA 
- PAGE 1188
Th1E-3
08:40
- A High Sensitivity Photonic Frequency Discriminator for Low Phase Noise Tunable Micro/mm Wave Synthesis**
Naoya Kuse, Martin E. Fermann, IMRA America, USA 
- PAGE 1192
Th1E-4
09:00
- Automatic Monitor-Based Tuning of RF Silicon Photonic True-Time-Delay Beamforming Networks**
Gihoon Choo, Christi K. Madsen, Samuel Palermo, Kamran Entesari, Texas A&M University, USA 
- PAGE 1195
Th1E-5
09:20
- A Flexible Multi-Gbps Transmitter Using Ultra-High Speed Sigma-Delta-over-Fiber**
Ibrahim Can Sezgin, Thomas Eriksson, Johan Gustavsson, Christian Fager, Chalmers University of Technology, Sweden 

Th1F: RF Transceiver Architecture for MIMO and Beam Steering

Chair: Steven Rosenau, SSL — Co-Chair: Zaher Bardai, IMN Epiphany
204A, Time 08:00–09:40, Thursday 14 June 2018

- PAGE 1199
Th1F-1
08:00
- A 4 Element Phased Array Transmitter with Efficiency Enhancement Using Beamforming for High-Bandwidth WLAN Applications**
Avraham Sayag, Emanuel Cohen, Technion, Israel 
- PAGE 1203
Th1F-2
08:20
- A Scalable Dual-Polarized 256-Element Ku-Band Phased-Array SATCOM Receiver with $\pm 70^\circ$ Beam Scanning**
Abdurrahman H. Aljuhani, Tumay Kanar, Samet Zehir, Gabriel M. Rebeiz, University of California, San Diego, USA 
- PAGE 1207
Th1F-3
08:40
- A 700–950MHz Tunable Frequency Division Duplex Transceiver Combining Passive and Active Self-Interference Cancellation**
Leo Laughlin¹, Chunqing Zhang¹, Mark A. Beach¹, Kevin A. Morris¹, John L. Haine¹, Muhammad Kalimuddin Khan²
¹University of Bristol, UK ; ²u-blox, Ireland 
- PAGE 1211
Th1F-4
09:00
- Towards Ultra-Low-Voltage and Ultra-Low-Power Discrete-Time Receivers for Internet-of-Things**
Feng-Wei Kuo¹, Sandro Binsfeld Ferreira², Ron Chen¹, Lan-chou Cho¹, Chewn-Pu Jou¹, Mark Chen¹, Masoud Babaie³, Robert Bogdan Staszewski⁴
¹TSMC, Taiwan ; ²Unisinos University, Brazil ; ³Technische Universiteit Delft, The Netherlands ; ⁴University College Dublin, Ireland 

Th1H: Doherty and Load-Modulated Power Amplifiers

Chair: Paul Draxler, Qualcomm Technologies — Co-Chair: Kenle Chen, University of Rhode Island
204C, Time 08:00-09:40, Thursday 14 June 2018

- PAGE 1215
Th1H-1
08:00 **Ultra-Wideband Doherty-Like Power Amplifier**
Paul Saad, Rui Hou, Richard Hellberg, Bo Berglund, Ericsson, Sweden 
- PAGE 1219
Th1H-2
08:20 **Broadband and Linearity Enhanced Doherty Power Amplifier Using Complex-Valued Load Modulation**
Xiaohu Fang, Hamed Golestaneh, Slim Boumaiza, University of Waterloo, Canada 
- PAGE 1222
Th1H-3
08:40 **A Highly Linear Doherty Power Amplifier with Multigated Transistors Supporting 80MSymbol/s 256-QAM**
Doohwan Jung, Huan Zhao, Hua Wang, Georgia Tech, USA 
- PAGE 1226
Th1H-4
09:00 **Digital Sequential PA for Flexible Efficiency Tuning Over Wide Power Back-Off Range**
Andreas Wentzel, Wolfgang Heinrich, FBH, Germany 
- PAGE 1230
Th1H-5
09:20 **Load Tuning Assisted Discrete-Level Supply Modulation Using BST and GaN Devices for Highly Efficient Power Amplifiers**
Sebastian Preis¹, N. Wolff¹, Felix Lenze², Alex Wiens², Rolf Jakoby², Wolfgang Heinrich¹, Olof Bengtsson¹
¹FBH, Germany  ; *²Technische Universität Darmstadt, Germany* 

Th2A: Synthesis and Design of Non-Planar Filters and Multiplexers

Chair: Ming Yu, Chinese University of Hong Kong — Co-Chair: Vicente Boria, Universitat Politècnica de València
201A, Time 10:10-11:50, Thursday 14 June 2018

- PAGE 1234
Th2A-1
10:10 **Singly Terminated Network and Contiguous Multiplexer Design**
Y. Yang¹, Q. Wu², X. Yin¹, M. Yu³
¹China Academy of Space Technology, China  ; *²Xidian University, China*  ;
³Chinese University of Hong Kong, China 
- PAGE 1238
Th2A-2
10:30 **Accurate Design Procedure for Waffle-Iron Low-Pass Filter**
F. Teberio¹, I. Arnedo¹, J.M. Percasz¹, I. Arregui¹, P. Martin-Iglesias², T. Lopetegi¹, M.A.G. Laso¹
¹Universidad Pública de Navarra, Spain  ; *²ESA-ESTEC, The Netherlands* 
- PAGE 1242
Th2A-3
10:50 **The Strongly-Coupled Resonator Triplet**
Simone Bastioli¹, Richard V. Snyder¹, Giuseppe Macchiarella²
¹RS Microwave, USA  ; *²Politecnico di Milano, Italy* 
- PAGE 1245
Th2A-4
11:10 **Improved Fully Canonical W-Band Waveguide Filter**
Daniel Miek, Alwin Reinhardt, Frank Daschner, Michael Höft, Christian-Albrechts-Universität zu Kiel, Germany 
- PAGE 1249
Th2A-5
11:30 **Miniature Triple-Mode Dielectric Resonator Filters**
Mustafa S. Bakr¹, Ian C. Hunter², Wolfgang Bösch¹
¹Technische Universität Graz, Austria  ; *²University of Leeds, UK* 
- PAGE 1253
Th2A-6
11:40 **Dielectric Tuning Screws for Microwave Filters Applications**
Javier Ossorio, Vicente E. Boria, Marco Guglielmi, Universitat Politècnica de València, Spain 

Th2B: Recent Developments in Wireless Power Transfer Techniques

Chair: Paolo Mezzanotte, Università di Perugia — Co-Chair: Kamran Ghorbani, RMIT University

201B, Time 10:10–11:50, Thursday 14 June 2018

PAGE 1257
Th2B-1
10:10

Design of Capacitive Coupler for Wireless Power Transfer Under Fresh Water Focusing on kQ Product

Masaya Tamura, Yasumasa Naka, Kousuke Murai, Toyohashi University of Technology, Japan 

PAGE 1261
Th2B-2
10:30

Dual Transmitter Free-Positioning Wireless Power Transfer System with Optimum Switching Phase Detection Technique

Ukyo Takeda, Yusuke Inada, Yusuke Kimoto, Toru Kawajiri, Hiroki Ishikuro, Keio University, Japan 

PAGE 1265
Th2B-3
10:50

The C-Band HYSIC RF Energy Harvester Based on the Space Information, Communication and Energy Harvesting Technology

Shigeo Kawasaki¹, Satoshi Yoshida², Toshihiro Nakaoka³, Kenjiro Nishikawa²

¹JAXA, Japan ; *²Kagoshima University, Japan* ; *³Sophia University, Japan* 

PAGE 1269
Th2B-4
11:00

A Low Complexity and Accurate Battery-Less Trackable Device

Daniel Belo, Diogo C. Ribeiro, Pedro Pinho, Nuno Borges Carvalho, Universidade de Aveiro, Portugal 

PAGE 1272
Th2B-5
11:20

Dynamic Impedance Matching of Multiple Loads in Wireless Power Transfer Using a Genetic Optimization Approach

Jordan Besnoff¹, Yohay Buchbut¹, Kobi Scheim¹, David S. Ricketts²

¹Potomac Technologies, USA ; *²North Carolina State University, USA* 

PAGE 1275
Th2B-6
11:40

65/30GHz Dual-Frequency Wirelessly Powered Monolithic 1.83 mm² Wireless Temperature Sensor Using a 3-Stage Inductor-Peaked Rectifier with On-Chip Antenna in 65-nm CMOS

Hao Gao, Marion K. Matters-Kammerer, Peter Baltus, Technische Universiteit Eindhoven, The Netherlands 

Th2C: Hyperthermia Treatment and Implants Wireless Powering

Chair: Robert Caverly, Technische Universität Wien — Co-Chair: Abbas Omar, Universität Magdeburg

201C, Time 10:10–11:50, Thursday 14 June 2018

PAGE 1278
Th2C-1
10:10

Microwave Ablation Applicator with Sensing Capabilities for Thermal Treatment of Malignant Tissue

Carolin Reimann¹, Martin Schüßler¹, Sönke Schmidt¹, Frank Hübner², Babak Bazrafshan², Thomas Vogl², Rolf Jakoby¹

¹Technische Universität Darmstadt, Germany ; ²Goethe-Universität Frankfurt, Germany 

PAGE 1282
Th2C-2
10:30

Experimental Validation of Computational Models of Microwave Tissue Heating with Magnetic Resonance Thermometry

Pegah Faridi, Punit Prakash, Kansas State University, USA 

PAGE 1285
Th2C-3
10:50

Dual Modality Implant for Simultaneous Magnetic Nanoparticle Heating and Brachytherapy Treatment of Tumor Resection Cavities in Brain

Paul R. Stauffer¹, Dario B. Rodrigues¹, Robert Goldstein², Thanh Nguyen¹, Laura Doyle¹, Voichita Bar-Ad¹, Wenyin Shi¹, Kevin D. Judy¹, Mark D. Hurwitz¹

¹Thomas Jefferson University, USA ; ²AMF Life Systems, USA 

PAGE 1289
Th2C-5
11:10

Design of a RF-to-DC Link for In-Body IR-WPT with a Capsule-Shaped Rotation-Insensitive Receiver

Alex Pacini, Francesca Benassi, Diego Masotti, Alessandra Costanzo, Università di Bologna, Italy 

Th2D: Innovative mm-Wave Calibration and Measurement Techniques

Chair: Jon Martens, Anritsu — Co-Chair: Andrea Ferrero, Keysight Technologies

202AB, Time 10:10–11:50, Thursday 14 June 2018

PAGE 1293
Th2D-1
10:10

Miniature Antenna Probe System for 140–220GHz On-Wafer Radiation Pattern Measurements

Yu-Shao Jerry Shiao, Kuan-Yu Chen, Guo-Wei Huang, NDL, Taiwan 

PAGE 1296
Th2D-2
10:30

Effects Degrading Accuracy of CPW mTRL Calibration at W Band

G.N. Phung¹, F.J. Schmückle¹, R. Doerner¹, Wolfgang Heinrich¹, T. Probst², U. Arz²

¹FBH, Germany ; ²PTB, Germany 

PAGE 1300
Th2D-3
10:50

A Novel TRM Calibration Method for Improvement of Modelling Accuracy at mm-Wave Frequency

Jiangtao Su¹, Baoguo Yang², Haijun Gao¹, Xiwei Huang¹, Jialin Cai¹, Xiang Wang¹, Fushun Nian²

¹Hangzhou Dianzi University, China ; ²CETC 41, China 

PAGE 1304
Th2D-4
11:10

A Single-Element VNA Electronic Calibration in CMOS

Jun-Chau Chien¹, Amin Arbabian¹, Ali M. Niknejad²

¹Stanford University, USA ; ²University of California, Berkeley, USA 

Th2E: Integrated Microwave Photonics for Millimeter-Wave and 5G Applications

Chair: James Buckwalter, University of California, Santa Barbara — Co-Chair: Ed Ackerman, Photonics

203AB, Time 10:10-11:50, Thursday 14 June 2018

PAGE 1308
Th2E-1
10:10

Plasmonics for Next-Generation Wireless Systems

Maurizio Burla¹, Romain Bonjour¹, Yannick Salamin¹, Felix Abrecht¹, Claudia Hoessbacher¹, Christian Haffner¹, Wolfgang Heni¹, Yuriy Fedoryshyn¹, Benedikt Baeuerle¹, Arne Josten¹, Delwin Elder², Larry Dalton², Juerg Leuthold¹
¹ETH Zürich, Switzerland ; ²University of Washington, USA 

PAGE 1312
Th2E-2
10:30

Monolithically Integrated Si Photonics Transmitters in 0.25 μ m BiCMOS Platform for High-Speed Optical Communications

Iria García López¹, Pedro Rito¹, Despoina Petousi¹, Stefan Lischke¹, Dieter Knoll¹, Marcel Kroh¹, Lars Zimmermann¹, Minsu Ko¹, A. Cagri Ulusoy², Dietmar Kissinger¹
¹IHP, Germany ; ²Michigan State University, USA 

PAGE 1316
Th2E-3
10:50

Towards Integrated Wideband High Resolution Optical Synthesizers

Farshid Ashtiani, Pouria Sanjari, Mohamad Hossein Idjadi, Firooz Aflatouni, University of Pennsylvania, USA 

PAGE 1320
Th2E-4
11:10

Integrated Microwave Photonics for High Performance RF Receiver Frontends

Yifei Li¹, Longtao Xu¹, Peter Herczfeld², Jeffrey Rodriguez¹
¹UMass Dartmouth, USA ; ²Drexel University, USA 

Th2F: 5G Millimeter-Wave Beamformers and Phased-Arrays

Chair: Gabriel Rebeiz, University of California, San Diego — Co-Chair: Aly Fathy, University of Tennessee

204A, Time 10:10-11:50, Thursday 14 June 2018

PAGE 1323
Th2F-1
10:10

A Software-Defined Phased Array Radio with mmWave to Software Vertical Stack Integration for 5G Experimentation

Bodhisatwa Sadhu, Arun Paidimarri, Mark Ferriss, Mark Yeck, Xiaoxiong Gu, Alberto Valdes-Garcia, IBM T.J. Watson Research Center, USA 

PAGE 1327
Th2F-2
10:30

Ultra-Compact and Modular 5G Phased-Array 4-Channel Beamformer Front-Ends with <2° RMS Phase Error

Tumay Kanar, Samet Zehir, Naveen Yanduru, IDT, USA 

PAGE 1330
Th2F-3
10:50

28GHz Phased Array Transceiver in 28nm Bulk CMOS for 5G Prototype User Equipment and Base Stations

Jeremy Dunworth¹, Bon-Hyun Ku¹, Yu-Chin Ou¹, David Lu¹, Paul Monat¹, Aliakbar Homayoun², Kaushik Chakraborty¹, Andrew Arnett¹, Gang Liu¹, Tony Segoria¹, Jongrit Lerdworatawee¹, Joung Won Park¹, Hyun-Chul Park³, Hajir Hedayati⁴, Ali Tassoudji¹, Keith Douglas¹, Vladimir Aparin¹
¹Qualcomm Technologies, USA ; ²Cypress Semiconductor, USA ; ³Samsung Electronics, Korea ; ⁴Atlazo, USA 

PAGE 1334
Th2F-4
11:10

Compact 28-GHz Phased Array Antenna for 5G Access

Risto Valkonen, Nokia Bell Labs, Finland 

PAGE 1338
Th2F-5
11:20

Test and Characterization for 5G Phased Array Antenna Systems

Michael Millhaem, Keysight Technologies, USA 

Th2H: Millimeter Wave Broadband Power Amplifiers

Chair: Charles Cambell, Qorvo — Co-Chair: Robert Leoni, Raytheon

204C, Time 10:10–11:50, Thursday 14 June 2018

PAGE 1342 Th2H-1 10:10	An 8-Way Combined E-Band Power Amplifier with 24dBm Psat and 12% PAE in 0.12μm SiGe <i>Eric C. Wagner, Gabriel M. Rebeiz, University of California, San Diego, USA</i> 
PAGE 1345 Th2H-2 10:30	A +27dBm P_{sat} 27dB Gain W-Band Power Amplifier in 0.1μm GaAs <i>Aviv Barabi¹, Noam Ross², Amity Wolfman², Ofer Shaham², Eran Socher¹</i> ¹ Tel Aviv University, Israel  ; ² Rafael Advanced Defense Systems, Israel 
PAGE 1348 Th2H-3 10:40	A 6–18GHz 40W Reactively Matched GaN MMIC Power Amplifier <i>Michael Litchfield, James J. Komiak, BAE Systems, USA</i> 
PAGE 1352 Th2H-4 10:50	6–18GHz Watt-Level Switchless Dual-Band PA MMIC Using Coupled-Line-Based Diplexer <i>Kwangseok Choi¹, Hongjong Park¹, Junghyun Kim², Youngwoo Kwon¹</i> ¹ Seoul National University, Korea  ; ² Hanyang University, Korea 
PAGE 1356 Th2H-5 11:10	A Highly Linear InP Distributed Amplifier Using Ultra-Wideband Intermodulation Feedforward Linearization <i>Duy P. Nguyen¹, Nguyen L.K. Nguyen¹, Alexander N. Stameroff², Anh-Vu Pham¹</i> ¹ University of California, Davis, USA  ; ² Keysight Technologies, USA 

Th3A: New Tuning Concepts for 3-D, Planar, and Integrated Filters and Duplexers

Chair: Eric Naglich, U.S. Naval Research Laboratory — Co-Chair: Xiaoguang Leo Liu, University of California, Davis

201A, Time 13:30–15:10, Thursday 14 June 2018

PAGE 1360 Th3A-1 13:30	A Tunable Waveguide Filter Designed with a Constant Absolute Bandwidth Using a Single Tuning Element <i>Gowrish B., Raafat R. Mansour, University of Waterloo, Canada</i> 
PAGE 1363 Th3A-2 13:50	Tunable Multiband Bandpass-to-Bandstop RF Filters <i>Dakotah J. Simpson¹, Roberto Gómez-García², Dimitra Psychogiou¹</i> ¹ University of Colorado Boulder, USA  ; ² Universidad de Alcalá, Spain 
PAGE 1367 Th3A-3 14:10	A Comblined Tunable Filter with Loss Compensation Circuit <i>Arash Fouladi Azarnaminy, Raafat R. Mansour, University of Waterloo, Canada</i> 
PAGE 1370 Th3A-4 14:30	A $\lambda/4$-Inverted N-Path Filter in 45-nm CMOS SOI for Transmit Rejection with Code Selective Filters <i>Hussam AlShammary, Cameron Hill, Ahmed Hamza, James F. Buckwalter, University of California, Santa Barbara, USA</i> 
PAGE 1374 Th3A-5 14:50	A Compact Tunable Bandpass Filter Using Switchable Varactor-Tuned Dual-Mode Resonator <i>Minjae Jung, Byung-Wook Min, Yonsei University, Korea</i> 
PAGE 1378 Th3A-6 15:00	Tunable Three-Pole Diplexer with High Selectivity and Isolation <i>Li Gao, Tsu-Wei Lin, Gabriel M. Rebeiz, University of California, San Diego, USA</i> 

Th3B: Techniques and Components for High-Power Microwave Technology

Chair: Malgorzata Celuch, QWED — Co-Chair: Vadim Yakovlev, Worcester Polytechnic Institute

201B, Time 13:30–15:10, Thursday 14 June 2018

- | | |
|---------------------------------------|---|
| <p>PAGE 1381
Th3B-1
13:30</p> | <p>Determination of the Complex Permittivity of High Loss Liquids with a Novel Reentrant Cavity
 <i>David Marqués-Villarroya, Felipe Peñaranda-Foix, Antoni J. Canós, Beatriz García-Baños, José M. Catalá-Civera, Universitat Politècnica de València, Spain</i>
 </p> |
| <p>PAGE 1385
Th3B-2
13:50</p> | <p>Effects of Average Power-Handling Capability on DC-Sputtering Aluminum Nitride Thin Film on Ceramic Substrate
 <i>Tzu-Chun Tai¹, Hung-Wei Wu², Yu-Ming Lin¹, Sin-Pei Wang², Yeong-Her Wang¹, Shouu-jinn Chang¹</i>
 ¹National Cheng Kung University, Taiwan  ; ²Kun Shan University, Taiwan </p> |
| <p>PAGE 1389
Th3B-3
14:10</p> | <p>A 2D Coupled Electromagnetic, Thermal and Fluid Flow Model: Application to Layered Microwave Heat Exchangers
 <i>Ajit A. Mohekar, Joseph M. Gaone, Burt S. Tilley, Vadim V. Yakovlev, Worcester Polytechnic Institute, USA</i>
 </p> |
| <p>PAGE 1393
Th3B-4
14:30</p> | <p>Acoustical Behavior of Fully-Printed, BST MIM Varactor Modules in High Power Matching Circuits
 <i>Daniel Kienemund¹, Nicole Bohn², Thomas Fink³, Mike Abrecht³, Walter Bigler³, Joachim R. Binder², Rolf Jakoby¹, Holger Maune¹</i>
 ¹Technische Universität Darmstadt, Germany  ; ²KIT, Germany  ; ³COMET, Switzerland </p> |
| <p>PAGE 1397
Th3B-5
14:50</p> | <p>A Novel Approach to the Modeling of a Fabry-Perot Open Resonator
 <i>T. Karpisz, B. Salski, P. Kopyt, J. Krupka, Warsaw University of Technology, Poland</i>
 </p> |

Th3C: Biomedical Devices

Chair: Changzhi Li, Texas Tech University — Co-Chair: Yanzhu Zhao, Medtronic

201C, Time 13:30–15:10, Thursday 14 June 2018

- | | |
|---------------------------------------|--|
| <p>PAGE 1401
Th3C-1
13:30</p> | <p>An Energy-Efficient Wirelessly Powered Millimeter-Scale Neurostimulator with Optimized Inductive Loop Antenna and Custom Rectifier
 <i>Hongming Lyu¹, Jigong Wang², Jun-Ho La², Jin Mo Chung², Aydin Babakhani¹</i>
 ¹University of California, Los Angeles, USA  ; ²University of Texas Medical Branch, USA </p> |
| <p>PAGE 1405
Th3C-2
13:50</p> | <p>A Programmable RF Transmitter for Wideband Thermoacoustic Spectroscopic Imaging
 <i>Hao Nan, Amin Arbabian, Stanford University, USA</i>
 </p> |
| <p>PAGE 1409
Th3C-3
14:10</p> | <p>Noncontact Pulse Transit Time Measurement Using a Single-Frequency Continuous-Wave Radar
 <i>Mu-Cyun Tang, Chien-Min Liao, Fu-Kang Wang, Tzyy-Sheng Horng, National Sun Yat-sen University, Taiwan</i>
 </p> |
| <p>PAGE 1413
Th3C-4
14:30</p> | <p>Non-Contact Beat-to-Beat Blood Pressure Measurement Using Continuous Wave Doppler Radar
 <i>Heng Zhao¹, Xu Gu¹, Hong Hong¹, Yusheng Li¹, Xiaohua Zhu¹, Changzhi Li²</i>
 ¹NJUST, China  ; ²Texas Tech University, USA </p> |
| <p>PAGE 1416
Th3C-5
14:50</p> | <p>Fingertip Pulse Signals Enhanced by Using Intermodulation Multiplication of Active High-Sensitivity Split-Ring Resonator
 <i>Ta-Chung Chang, Po-Kai Chan, Chia-Hui Chen, Kuan-Wei Chen, Chin-Lung Yang, National Cheng Kung University, Taiwan</i>
 </p> |
| <p>PAGE 1419
Th3C-6
15:00</p> | <p>Sleep Scoring with a UHF RFID Tag by Near Field Coherent Sensing
 <i>Pragya Sharma, Edwin C. Kan, Cornell University, USA</i>
 </p> |

Th3D: Advances in CMOS Microwave and Millimeter Wave Signal Sources

Chair: Deukhyoun Heo, Washington State University — Co-Chair: Yi-Jan Emery Chen, National Taiwan University
202AB, Time 13:30–15:10, Thursday 14 June 2018

- PAGE 1423
Th3D-1
13:30 **A 169.6GHz Hybrid Mode-Switching Push-Push Oscillator with 21.7% Tuning Range and 180.6dBc/Hz FoM_T in 28nm CMOS Technology**
Yiyang Shu, Huizhen Jenny Qian, Xun Luo, UESTC, China 
- PAGE 1427
Th3D-2
13:50 **A Low Power Active-Passive Dual Gm-Boosted W-Band Oscillator for Wireless Network-on-Chip Applications**
Joe Baylon, Srinivasan Gopal, Luke Renaud, Sheikh Nijam Ali, Deukhyoun Heo, Washington State University, USA 
- PAGE 1431
Th3D-3
14:10 **A Low-Phase-Noise 20GHz Phase-Locked Loop with Parasitic Capacitance Reduction Technique for V-Band Applications**
Hee Sung Lee¹, Kwang Kyu Hwang¹, Dong Min Kang¹, Seong Jun Cho¹, Chul Woo Byeon², Chul Soon Park¹
¹KAIST, Korea ; ²Wonkwang University, Korea 
- PAGE 1434
Th3D-4
14:30 **A 17.5-dBm Output Power 11.2% DC-to-RF Efficiency Low Phase Noise CMOS Quadrature Voltage-Controlled Oscillator**
Kuan-Hsueh Lu, Guan-Lin Huang, Hong-Yeh Chang, National Central University, Taiwan 
- PAGE 1438
Th3D-5
14:50 **A 60GHz Push-Push Voltage-Controlled Oscillator with Adaptive Gate Biasing in 28nm Bulk CMOS Technology**
Johannes Rimmelspacher¹, Robert Weigel¹, Amelie Hagelauer¹, Vadim Issakov²
¹FAU Erlangen-Nürnberg, Germany ; ²Infineon Technologies, Germany 

Th3E: Advances in Semiconductor Monolithic Integrated Circuit Technology

Chair: Amin Ezzeddine, Amcom Communications — Co-Chair: Cynthia Hang, Raytheon
203AB, Time 13:30–15:10, Thursday 14 June 2018

- PAGE 1441
Th3E-1
13:30 **A New Integrated K-Band Analog Vector Sum Phase Shifter**
Fatemeh Akbar, Amir Mortazawi, University of Michigan, USA 
- PAGE 1445
Th3E-2
13:50 **Tunable Delay Line Using Distributed Inductive/Capacitive Miller Effect**
Wooram Lee, Alberto Valdes-Garcia, IBM T.J. Watson Research Center, USA 
- PAGE 1449
Th3E-3
14:10 **A 50–110GHz Four-Channel Dual Injection Locked Power Amplifier with 36% PAE at 19dBm P_{sat} Using Self-Start Technique in 65nm CMOS Process**
Shunli Ma, Fan Ye, Junyan Ren, Fudan University, China 
- PAGE 1453
Th3E-4
14:30 **An 18-dBm, 57 to 85-GHz, 4-Stack FET Power Amplifier in 45-nm SOI CMOS**
Kang Ning, James F. Buckwalter, University of California, Santa Barbara, USA 
- PAGE 1457
Th3E-5
14:50 **12W, 30% PAE, 40GHz Power Amplifier MMIC Using a Commercially Available GaN/Si Process**
Joël Moron, Rémy Leblanc, François Lecourt, Peter Frijlink, OMMIC, France 
- PAGE 1461
Th3E-6
15:00 **Diamond RF Transistor Technology with f_t=41GHz and f_{max}=44GHz**
Tony G. Ivanov, James Weil, Pankaj B. Shah, A. Glen Birdwell, Khamsouk Kingkeo, Edward A. Viveiros, U.S. Army Research Laboratory, USA 

Th3F: THz and mm-Wave Sensing and Communication Systems

Chair: Steven Bowers, University of Virginia — Co-Chair: Lei Liu, University of Notre Dame

204A, Time 13:30–15:10, Thursday 14 June 2018

- PAGE 1464
Th3F-1
13:30
- A Programmable Active THz Electromagnetic Surface On-Chip for Multi-Functional Imaging**
Xue Wu¹, Huaixi Lu², Xuyang Lu¹, Kaushik Sengupta¹
¹Princeton University, USA  ; ²Peking University, China 
- PAGE 1468
Th3F-2
13:50
- Wide-Band THz Spectroscope in Silicon THz Combining Sub-Wavelength Near-Field Sensing and Robust Regression Analysis**
Xue Wu¹, Huaixi Lu², Kaushik Sengupta¹
¹Princeton University, USA  ; ²Peking University, China 
- PAGE 1472
Th3F-3
14:10
- Scalable mm-Wave 4-Channel Radar SoC with Vector Modulators and Demodulators for MIMO and Phased Array Applications**
Herman Jalli Ng¹, Reinhard Feger², Dietmar Kissinger¹
¹IHP, Germany  ; ²Johannes Kepler Universität Linz, Austria 
- PAGE 1476
Th3F-4
14:30
- A 256-QAM 39GHz Dual-Channel Transceiver Chipset with LTCC Package for 5G Communication in 65nm CMOS**
Zhilin Chen¹, Zhengdong Jiang¹, Zhiqing Liu¹, Yixuan Cheng¹, Lin Zhang¹, Dong Chen¹, Jingzhi Zhang¹, Shoutian Sun¹, Jiayu Dong¹, Pengxue Liu¹, You Zhou¹, Huihua Liu¹, Chenxi Zhao¹, Yunqiu Wu¹, Xianghua Li², Jianping Zhao², Kai Kang¹
¹UESTC, China  ; ²Huawei Technologies, China 
- PAGE 1480
Th3F-5
14:50
- 300-GHz, 100-Gb/s InP-HEMT Wireless Transceiver Using a 300-GHz Fundamental Mixer**
Hiroshi Hamada¹, Takuya Fujimura², Ibrahim Abdo², Kenichi Okada², Ho-Jin Song³, Hiroki Sugiyama¹, Hideaki Matsuzaki¹, Hideyuki Nosaka¹
¹NTT, Japan  ; ²Tokyo Institute of Technology, Japan  ; ³POSTECH, Korea 

Th3H: Advances in Low Noise Technology

Chair: James Sowers, SSL — Co-Chair: James Whelehan, Innovative Technology

204C, Time 13:30–15:10, Thursday 14 June 2018

- PAGE 1484
Th3H-1
13:30
- LNA Design with CMOS SOI Process — 1.4dB NF K/Ka Band LNA**
Chaojiang Li¹, Omar El-Aassar², Arvind Kumar¹, Myra Boenke¹, Gabriel M. Rebeiz²
¹GLOBALFOUNDRIES, USA  ; ²University of California, San Diego, USA 
- PAGE 1487
Th3H-2
13:50
- A 2–4GHz Silicon Germanium Cryogenic Low Noise Amplifier MMIC**
Shirin Montazeri, Joseph C. Bardin, UMass Amherst, USA 
- PAGE 1491
Th3H-3
14:10
- A 0.38-V, Sub-mW 5-GHz Low Noise Amplifier with 43.6% Bandwidth for Next Generation Radio Astronomical Receivers in 90-nm CMOS**
Ying Chen¹, Yu-Hsuan Lin¹, Chau-Ching Chiong², Huei Wang¹
¹National Taiwan University, Taiwan  ; ²Academia Sinica, Taiwan 
- PAGE 1495
Th3H-4
14:30
- 70–116-GHz LNAs in 35-nm and 50-nm Gate-Length Metamorphic HEMT Technologies for Cryogenic and Room-Temperature Operation**
Fabian Thome¹, Arnulf Leuther¹, Juan Daniel Gallego², Frank Schäfer³, Michael Schlechtweg¹, Oliver Ambacher¹
¹Fraunhofer IAF, Germany  ; ²Centro Astronómico de Yebes, Spain  ; ³MPI for Radio Astronomy, Germany 
- PAGE 1499
Th3H-5
14:50
- A Beyond 110GHz GaN Cascode Low-Noise Amplifier with 20.3dBm Output Power**
Rainer Weber, Maciej Ćwikliński, Sandrine Wagner, Roger Lozar, Hermann Massler, Peter Brückner, Rüdiger Quay, Fraunhofer IAF, Germany 

THIF1 : Interactive Forum #4

Chair: Aly Fathy, University of Tennessee — Co-Chair: Abbas Omar, Universität Magdeburg

Exhibit Hall, Time 10:10–11:50, Thursday 14 June 2018

- PAGE 1503
THIF1-1
POSTER
- Cryogenic Millimeter-Wave CMOS Low-Noise Amplifier**
Mikko Varonen¹, Kieran Cleary², Denizhan Karaca³, Kari A.I. Halonen³
¹VTT Technical Research Centre of Finland, Finland ; ²Caltech, USA ; ³Aalto University, Finland 
- PAGE 1507
THIF1-2
POSTER
- A Compact 0.8dB Low Noise and Self-Packaged LNA Using SISL Technology for 5GHz WLAN Application**
Zhengmin Ke, Shouxian Mou, Kaixue Ma, Fanyi Meng, UESTC, China 
- PAGE 1511
THIF1-3
POSTER
- Wideband 220–330GHz Turnstile OMT Enabled by Silicon Micromachining**
Adrian Gomez-Torrent, Umer Shah, Joachim Oberhammer, KTH, Sweden 
- PAGE 1515
THIF1-4
POSTER
- 140–220-GHz Distributed Antenna and Amplifier Co-Integrated in SiGe BiCMOS Process for UWB Receivers**
Paolo Valerio Testa, Bernhard Klein, Ronny Hahnel, Corrado Carta, Dirk Plettemeier, Frank Ellinger, Technische Universität Dresden, Germany 
- PAGE 1519
THIF1-5
POSTER
- 0.15mm², DC-70GHz, Graphene-Based Power Detector with Improved Sensitivity and Dynamic Range**
Mohamed Saeed¹, Ahmed Hamed¹, Saad Qayyum¹, Zhenxing Wang², Mehrdad Shaygan², Daniel Neumaier², Renato Negra¹
¹RWTH Aachen University, Germany ; ²AMO, Germany 

- PAGE 1523
THIF1-6
POSTER
- Spectrum Efficient D-Band Communication Link for Real-Time Multi-Gigabit Wireless Transmission**
Vessen Vassilev¹, Zhongxia Simon He¹, Sona Carpenter¹, Herbert Zirath¹, Yu Yan¹, Ahmed Hassona¹, Mingquan Bao², Thomas Emanuelsson², Jingjing Chen¹, Mikael Hörberg², Yinggang Li², Jonas Hansryd²
¹Chalmers University of Technology, Sweden ; ²Ericsson, Sweden 
- PAGE 1527
THIF1-7
POSTER
- Non-Line of Sight Terahertz Imaging from a Single Viewpoint**
Sai kiran Doddalla, Georgios C. Trichopoulos, Arizona State University, USA 
- PAGE 1530
THIF1-8
POSTER
- 2.2-pJ/Bit 30-Gbit/s Mach-Zehnder Modulator Driver in 22-nm-FDSOI**
Laszlo Szilagyi¹, Ronny Henker¹, David Harame², Frank Ellinger¹
¹Technische Universität Dresden, Germany ; ²GLOBALFOUNDRIES, Germany 
- PAGE 1534
THIF1-9
POSTER
- Photonic-Assisted Wideband Microwave Measurement**
Yihan Li, Naoya Kuse, Martin E. Fermann, IMRA America, USA 
- PAGE 1538
THIF1-10
POSTER
- An 8-Beam 2.4GHz Digital Array Receiver Based on a Fast Multiplierless Spatial DFT Approximation**
V.A. Coutinho¹, Viduneth Ariyaratna², D.F.G. Coelho³, R.J. Cintra¹, Arjuna Madanayake²
¹Universidade Federal de Pernambuco, Brazil ; ²University of Akron, USA ; ³University of Calgary, Canada 
- PAGE 1542
THIF1-11
POSTER
- A Miniature Electromagnetic Bandgap Structure Using Integrated Fan-Out Wafer-Level Package (InFO-WLP) for Gigahertz Noise Suppression**
Ming-Hsien Tsai¹, Sen-Kuei Hsu¹, Chi-Kai Shen², Pei-Shen Wei², Chan-Hong Chern¹, Tzong-Lin Wu²
¹TSMC, Taiwan ; ²National Taiwan University, Taiwan 

- PAGE 1545
THIF1-12
POSTER
- A Low-Profile Substrate Integrated Magneto-Electric Dipole Antenna Based on Folded Magnetic Wall for UWB Application**
Xiuping Li, Quanping Li, Hua Zhu, Jia Song, Zihang Qi, BUPT, China 
- PAGE 1549
THIF1-13
POSTER
- Millimeter-Wave Chip-to-Chip Interconnect Using Plastic Wire Operating in Single and Dual Mode**
Utpal Dey, Jan Hesselbarth, Universität Stuttgart, Germany 
- PAGE 1553
THIF1-14
POSTER
- Laser Assisted Additive Manufacturing of CPW mm-Wave Interdigital Capacitors**
Ramiro A. Ramirez¹, Di Lan¹, Eduardo A. Rojas-Nastrucci², Thomas M. Weller¹
¹University of South Florida, USA ; ²Embry-Riddle Aeronautical University, USA 
- PAGE 1557
THIF1-15
POSTER
- Aerosol Jet Printing of Millimeter Wave Transmission Lines on 3D Ceramic Substrates Made by Additive Manufacturing**
Anthony Delage¹, Nicolas Delhote¹, Serge Verdeyme¹, Barbara Bonnet², Ludovic Carpentier³, Cindy Schick⁴, Thierry Chartier⁵, Christophe Chaput⁴
¹XLIM (UMR 7252), France ; ²Thales Alenia Space, France ; ³CNES, France ; ⁴3DCeram, France ; ⁵IRCER (UMR 7315), France 
- PAGE 1561
THIF1-16
POSTER
- A Fully 3D Printed Multi-Chip Module with an On-Package Enhanced Dielectric Lens for mm-Wave Applications Using Multimaterial Stereolithography**
Ryan Bahr, Xuanke He, Bijan Tehrani, Manos M. Tentzeris, Georgia Tech, USA 
- PAGE 1565
THIF1-17
POSTER
- Broadband Millimeter Wave Characterization of 3-D Printed Materials**
Arthur C. Paoella, Chris Corey, Diana Foster, Joseph Desjardins, Caitlin Smith, Lauren Walters, Harris, USA 
- PAGE 1569
THIF1-18
POSTER
- Preclinical Efficacy of a Microwave and Adrenaline Based Haemostat Utilising a Novel Co-Axial Cable Structure**
Shaun C. Preston¹, Paul Sibbons², Malcolm White³, Christopher P. Hancock¹
¹Bangor University, UK ; ²NPIMR, UK ; ³Creo Medical, UK 

- PAGE 1573
THIF1-19
POSTER
- Complex Permittivity Extraction of Layered Biological Samples**
Harshitha Thippur Shivamurthy, Vincenzo Mascolo, Raffaele Romano, Andrea Neto, Marco Spirito, Technische Universiteit Delft, The Netherlands 
- PAGE 1577
THIF1-20
POSTER
- All-Digital Beam Forming for SKA1-LOW: CTPM Design and Verification**
Rui Cao¹, Manqing Wu¹, Xiaohui Tao¹, Zhuang Li¹, Jinzhong Zhang¹, Xiaozheng Liu¹, Shuai Li¹, Xiaoguang Zhang¹, Quan Wang¹, Huanpeng Tang¹, Andrew Faulkner², Eloy DeMarco², Nima Razavi-Ghods²
¹KLAASA, China ; ²University of Cambridge, UK 
- PAGE 1581
THIF1-21
POSTER
- Tunable Leaky Wave Antenna Based on Bidirectional Amplifier Enhanced Composite Right/Left Handed Transmission Line**
Dongyin Ren, Kevin Xu, Jun H. Choi, SUNY Buffalo, USA 
- PAGE 1585
THIF1-22
POSTER
- Design of a Ku-Band Compact Dual Polarized Horn Arrays with OMT**
Chang Ding, Fan-Yi Meng, Lizhong Song, Harbin Institute of Technology, China 
- PAGE 1589
THIF1-23
POSTER
- A Novel 24-GHz Air-Filled Cavity-Backed Slot Antenna Array with Out-of-Phase Power Divider for Automotive Radar System**
Ningning Yan, Kaixue Ma, Yun He, Ze Jian, UESTC, China 
- PAGE 1593
THIF1-24
POSTER
- Performance of V-Band On-Chip Antennas in GlobalFoundries 45nm CMOS SOI Process for mm-Wave 5G Applications**
Sensen Li¹, Huy Thong Nguyen¹, Taiyun Chi¹, Chaojiang Li², Ned Cahoon², Arvind Kumar², Greg Freeman², David Hamee², Hua Wang¹
¹Georgia Tech, USA ; ²GLOBALFOUNDRIES, USA 