



IMS Technical Program Preview

2015 International Microwave Symposium (IMS2015)
17-22 May 2015, Phoenix, AZ.



Tuesday

Technical Sessions

0800-0940

Room: 132 ABC

Room: 131 ABC

Room: 128 AB

Room: 127 ABC

0800-0820

TU1A: Modeling of Active and Passive Devices for High-Frequency Applications
Chair: Fabrizio Bonani, *Politecnico di Torino*
Co-Chair: Robert Leoni, *Raytheon Company*

TU1B: Components and Technologies for HF, VHF and UHF Applications
Chair: Marc Franco, *Qorvo*
Co-Chair: Rick Campbell, *Portland State University*

TU1C: Signal Quality Enhancement Techniques for Mixed Signal Circuits
Chair: Hermann Boss, *Rohde & Schwarz*
Co-Chair: Markus Gardill, *Friedrich-Alexander-University Erlangen-Nürnberg*

TU1D: MEMS Tunable Filters, Oscillators, and Switches
Chair: John Ebel, *Air Force Research Laboratory*
Co-Chair: Venkata Chivukula, *Qorvo Inc*

TU1A-1: 300-GHz MOSFET Model Extracted by an Accurate Cold-Bias De-embedding Technique
K. Katayama, S. Amakawa, K. Takano, M. Fujishima, *Hiroshima University, Higashihiroshima, Japan*

TU1B-1: Broadband Class-E Power Amplifier Designed by Lumped-element Network Transforms and GaN FETs
R. A. Beltran, *Skyworks Solutions Inc, Newbury Park, United States*

TU1C-1: A 9.8 Gbps, 6.5 mW Forward-clock Receiver with Phase Interpolator and Equalized Current Sampler in 65 nm CMOS
S. Ma¹, J. Ren¹, S. Manojd², H. Yu², R. Weerasekera³, ¹*Fudan University, Shanghai, China*, ²*Nanyang Technological University, Singapore*, ³*A STAR Institute of Microelectronics, Singapore, Singapore*

TU1D-1: A 1-1.2 GHz RF MEMS VCO with Accurate Noise Characterization
C. Ko¹, B. Ku¹, R. Gaddi², G. M. Rebeiz³, ¹*Qualcomm Corp., San Diego, United States*, ²*Cavendish Kinetics, San Jose, United States*, ³*University of California San Diego, La Jolla, United States*

0820-0840

TU1A-2: Distributed Modeling of Submillimeter-Wave HEMT Parasitics Based on Full-Wave Electromagnetic Analysis
Y. Karisan, C. Caglayan, G. Trichopoulos, K. Sertel, *The Ohio State University ElectroScience Laboratory, Columbus, United States*

TU1B-2: A Planar 75% Efficient GaN 1.2-GHz DC-DC Converter With Self-Synchronous Rectifier
I. Ramos¹, M. Ruiz², J. A. Garcia², D. Maksimovic¹, Z. Popovic¹, ¹*University of Colorado at Boulder, Boulder, United States*, ²*University of Cantabria, Santander, Spain*

TU1C-2: A Reconfigurable Programmable-Gain Amplifier with Gain Step Adjustment and Binary-Weighted Power Consumption
H. Liu¹, X. Zhu², C. Boon¹, ¹*Nanyang Technological University, Singapore, Singapore*, ²*Macquarie University, Sydney, Australia*

TU1D-2: High Order Mode Distortion Characterization of the Open State of Capacitive RF MEMS Switches
D. Molinero, S. Cunningham, D. DeReus, A. Morris, *Wispy, Inc, Irvine, United States*

0840-0900

TU1A-3: Low-Cost EM-Driven Surrogate Modeling and Optimization of Planar Inductors
P. Kurgan¹, S. Koziel^{3,1}, J. W. Bandler², ¹*Gdansk University of Technology, Gdansk, Poland*, ²*McMaster University, Hamilton, Canada*, ³*Reykjavik University, Reykjavik, Iceland*

TU1B-3: A 40W Ultra Broadband Power Amplifier
T. Shi, K. Li, *Freescale Semiconductor Inc, Shanghai, China*

TU1C-3: Relaxing All-Digital Transmitter Filtering Requirements through Improved PWM Waveforms
R. F. Cordeiro, A. S. Oliveira, J. N. Vieira, *Instituto de Telecomunicações, Aveiro, Portugal*

TU1D-3: Tunable High-Isolation W-Band Bandstop Filters
M. D. Hickle, M. D. Sinanis, D. Peroulis, *Purdue University, West Lafayette, United States*

0900-0910

TU1A-4: An Improved Equivalent Circuit Model Based on the CMOS On-Chip Multiple Coupled Inductors from DC to Millimeter-Wave Region
Z. Z. Gao, X. Cao, Y. Q. Wu, K. Kang, *University of Electronic Science and Technology of China, Chengdu, China*

TU1B-4: HF-VHF-UHF IQ Mixer with a Single SPDT Switch
R. L. Campbell, *Portland State University, Portland, United States*

TU1C-4: Inter-Band Carrier Aggregation Digital Transmitter Architecture with Concurrent Multi-Band Delta-Sigma Modulation Using Out-of-Band Noise Cancellation
S. Chung^{1,2}, R. Ma¹, ¹*Mitsubishi Electric Research Laboratories, Cambridge, United States*, ²*Massachusetts Institute of Technology, Cambridge, United States*

TU1D-4: Toward Reconfigurable Filter Banks with a Notch Filter Using High- Q Lithium Niobate Resonators
S. Yen¹, T. Mukherjee¹, G. Piazza¹, G. K. Fedder^{1,2}, ¹*Carnegie Mellon University, Pittsburgh, United States*, ²*Carnegie Mellon University, Pittsburgh, United States*

0910-0920

TU1A-5: RF Characterization and Modeling of CMOS Schottky Diodes
Y. Tang, J. Liu, D. Wang, Y. Wang, *Tsinghua University, Beijing, China*

TU1B-5: Low-Loss, Broadly-Tunable Cavity Filter Operating at UHF Frequencies
D. Scarbrough¹, D. Psychogiou², D. Peroulis², C. Goldsmith¹, ¹*MEMtronics Corporation, Richardson, United States*, ²*Purdue University, West Lafayette, United States*

TU1C-5: Improving DPD Performance by Compensating Feedback Loop Impairments in RF ADCs
A. Prata, D. C. Ribeiro, P. M. Cruz, A. S. Oliveira, N. B. Carvalho, *Universidade de Aveiro, Aveiro, Portugal*

TU1D-5: 500-600 GHz RF MEMS Based Tunable Stub Integrated in Micromachined Rectangular Waveguide
U. Shah¹, E. Decrossas², C. Jung-Kubiak², T. Reck², G. Chattopadhyay¹, I. Mehdii², J. Oberhammer¹, ¹*KTH Royal Institute of Technology, Stockholm, Sweden*, ²*Jet Propulsion Laboratory, Pasadena, United States*

0920-0930

TU1A-6: New Approach for an Accurate Schottky Barrier Height's Extraction by I-V-T Measurements
O. Lazar¹, J. Tartarin¹, B. Lambert², C. Moreau³, J. Roux⁴, J. Muraro⁵, ¹*LAAS-CNRS and University of Toulouse (UPS), Toulouse, France*, ²*UMS, Villebon-sur-Yvette, France*, ³*DGA, Rennes, France*, ⁴*CNES, Toulouse, France*, ⁵*Thales Alenia Space, Toulouse, France*

TU1B-5: Low-Loss, Broadly-Tunable Cavity Filter Operating at UHF Frequencies
D. Scarbrough¹, D. Psychogiou², D. Peroulis², C. Goldsmith¹, ¹*MEMtronics Corporation, Richardson, United States*, ²*Purdue University, West Lafayette, United States*

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0930-0940

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D. Scarbrough¹, D. Psychogiou², D. Peroulis², C. Goldsmith¹, ¹*MEMtronics Corporation, Richardson, United States*, ²*Purdue University, West Lafayette, United States*

TU1C-6: Automated Symbolic Optimization and High Level Synthesis of Single- and Multi-Band Digital Pre-Distortion Hardware in an FPGA
B. Fehri^{1,2}, S. Boumaiza¹, ¹*University of Waterloo, Waterloo, Canada*, ²*Ericsson Canada, Kanata, Canada*

TU1D-6: Commercialization of a Reliable RF MEMS Switch with Integrated Driver Circuitry in a Miniature QFN Package for RF Instrumentation Applications
E. Carty¹, R. Goggin², P. Fitzgerald¹, B. Stenson¹, P. McDaid¹, ¹*Analog Devices, Limerick, Ireland*, ²*Analog Devices, Cork, Ireland*

Tuesday

Technical Sessions

1010-1150

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<p>TU2A: Nonlinear Modeling of Power Amplifiers Behaviors Chair: Christopher P. Silva, <i>The Aerospace Corporation</i> Co-Chair: Almudena Suarez, <i>University of Cantabria</i></p>	<p>TU2B: Advances in Millimeter Wave Sources Chair: Scott Wetenkamp, <i>SCEAN</i> Co-Chair: Bert Henderson, <i>Cobham Advanced Electronics Systems</i></p>	<p>TU2C: Celebrating the 150th Anniversary of Maxwell's Equations Chair: James C. Rautio, <i>Sonnet Software</i> Co-Chair: Magdalena Salazar-Palma, <i>University of Catedrático</i></p>	<p>TU2D: Substrate Integrated Waveguide (SIW) and Balanced Filters Chair: Kamal K Samanta, <i>Milmega Ltd UK</i> Co-Chair: Huiwen Yao, <i>Orbital ATK Inc.</i></p>	
<p>TU2A-1: Modeling Envelope Tracking PAs A. Soury, <i>Keysight Technologies, Les Ulis, France</i></p>	<p>TU2B-1: A 0.7-V Low-Phase-Noise Multi-Mode Coupled Class-B/Class-C Voltage-Controlled Oscillator for Millimeter-Wave Application S. Chien, J. Liu, <i>National Tsing Hua University, Hsinchu, Taiwan</i></p>	<p>TU2C-1: The Genesis of Maxwell's Equations M. S. Palma¹, T. K. Sarkar², ¹Univ Carlos III, Madrid, Spain, ²Syracuse University, Syracuse, United States</p>	<p>TU2D-1: An Ultra-Miniature Quarter-Mode SIW Bandpass Filter Operating at First Negative Order Resonance A. Pourghorban Saghati, A. Pourghorban Saghati, K. Entesari, <i>Texas A&M University, College Station, United States</i></p>	1010-1030
<p>TU2A-2: A Lattice-Based Memory Polynomial Behavioral Model for Nonlinear MIMO Transmitters Using Fixed Point Arithmetic A. Abdelhafiz¹, F. Ghannouchi¹, O. Hammi², ¹Radio Lab, <i>University of Calgary, Calgary, Canada</i>, ²King Fahd University of Petroleum and Minerals, Dhahran, Canada</p>	<p>TU2B-2: A 64 GHz 5 mW Low Phase Noise GM-Boosted Colpitts CMOS VCO with Self-Switched Biasing Technique T. N. Nguyen, D. Heo, <i>Washington State University, Pullman, United States</i></p>	<p>TU2C-2: Maxwell's Legacy: The Heart and Soul of the EM Discipline R. C. Scully, <i>IEEE EMC Society, Piscataway, United States</i></p>	<p>TU2D-2: Quasi-Elliptic Filter Based on SIW Combine Resonators Using a Coplanar Line Cross-Coupling S. Sirci¹, F. Gentili², J. D. Martinez³, V. E. Boria¹, R. Sorrentino⁴, ¹Universitat Politècnica de Valencia, Valencia, Spain, ²Graz University of Technology, Graz, Austria, ³Universitat Politècnica de Valencia, Valencia, Spain, ⁴University of Perugia, Perugia, Italy</p>	1030-1050
<p>TU2A-3: Γ_L -Dependent Polynomial Behavioral Model for RF Power Transistors J. Cai, M. Yang, A. Zhu, T. J. Brazil, <i>University College Dublin, Dublin, Ireland</i></p>	<p>TU2B-3: 25.3 GHz, 4.1 mW VCO with 34.8% Tuning Range using a Switched Substrate-Shield Inductor P. Agarwal, D. Heo, <i>Washington State University, Pullman, United States</i></p>	<p>TU2C-3: Some Aspects of the History of Maxwell's Equations J. C. Rautio, <i>Sonnet Software, Inc., North Syracuse, United States</i></p>	<p>TU2D-3: E-Band Filters Based on Substrate Integrated Waveguide Octagonal Cavities Loaded by Complementary Split-Ring Resonators H. Kitumarsi¹, K. Wasa², H. Ito¹, N. Ishihara¹, K. Masu¹, ¹Tokyo Institute of Technology, Yokohama, Japan, ²TECDIA Inc., Tokyo, Japan</p>	1050-1100
			<p>TU2D-4: Size-Reduced Bandpass Filters using Quarter-Mode Substrate Integrated Waveguide Loaded with Different Defected Ground Structure Patterns Y. Huang^{1,2}, Z. Shao¹, C. You¹, G. Wang³, ¹University of Electronic Science and Technology of China, Chengdu, China, ²University of South Carolina, Columbia, United States</p>	1110-1110
<p>TU2A-4: Modeling and Suppression of Transmitter Leakage in Concurrent Dual-Band Transceivers with Carrier Aggregation C. Yu, A. Zhu, <i>University College Dublin, Dublin, Ireland</i></p>	<p>TU2B-4: A 206 ~ 220 GHz CMOS VCO Using Body-Bias Technique for Frequency Tuning P. Chiang^{2,1}, J. Cheng¹, C. Chiong², W. Liu³, G. Huang³, T. Huang¹, H. Wang¹, ¹National Taiwan University, Taipei, Taiwan, ²Academia Sinica Institute of Astronomy and Astrophysics, Taipei, Taiwan, ³National Nano Device Laboratories, Hsinchu, Taiwan</p>	<p>TU2C-4: The Evolution and Blossoming of Maxwell's Macroscopic View to the Modern Microscopic Theory Based on Electrons T. K. Sarkar¹, M. S. Palma², ¹Syracuse University, Syracuse, United States, ²Univ Carlos III, Madrid, Spain</p>	<p>TU2D-5: A Compact Slow-Wave Substrate Integrated Waveguide Cavity Filter M. Bertrand¹, Z. Liu¹, E. Pistono¹, D. Kaddour², P. Ferrari¹, ¹Grenoble-Alpes University, IMEP-LAHC, Grenoble, France, ²Grenoble-Alpes University, LCIS, Valence, France</p>	1110-1130
<p>TU2A-5: Parametric Hysteresis in Power Amplifiers J. de Cos, A. Suárez, J. García, <i>University of Cantabria, Santander, Spain</i></p>	<p>TU2B-5: A Wide-band 65nm CMOS 28-34 GHz Synthesizer Module Enabling Low Power Heterodyne Spectrometers for Planetary Exploration Z. Chen¹, A. Tang^{1,2}, Y. Kim¹, G. Virbila¹, T. Reck², J. Ye³, Y. Du¹, G. Chattopadhyay², M. Chang¹, ¹University of California Los Angeles, Los Angeles, United States, ²Jet Propulsion Laboratory, California Institute of Technology, Pasadena, United States, ³National Taiwan University, Taipei City, Taiwan</p>		<p>TU2D-6: Balanced Filter Circuit Based on Open/Shorted Loaded Stubs W. Feng¹, W. Che¹, H. Chen¹, Q. Xue^{2,2}, ¹Nanjing University of Science & Technology, Nanjing, China, ²City University of Hong Kong, Hong Kong, China</p>	1130-1150

Tuesday

Technical Sessions

1330-1510

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1350-1410

1410-1430

1430-1450

1450-1510

TU3A: CAD and Optimization Algorithms
Chair: Jose E. Rayas-Sanchez, *ITESO - The Jesuit University of Guadalajara*
Co-Chair: John W. Bandler, *McMaster University*

TU3A-1: Gaussian Processes Regression for Optimizing Harmonic Impedance Trajectories in Continuous Class-F Power Amplifier Design
P. Chen, T. J. Brazil, *University College Dublin, Dublin, Ireland*

TU3A-2: Fast EM-Driven Design Optimization of Microwave Filters Using Adjoint Sensitivity and Response Features
S. Koziel¹, J. W. Bandler², ¹Reykjavik University, Reykjavik, Iceland, ²McMaster University, Hamilton, Canada

TU3A-3: Parallel Gradient-Based Local Search Accelerating Particle Swarm Optimization for Training Microwave Neural Network Models
J. Zhang¹, K. Ma¹, F. Feng^{1,2}, Q. Zhang², ¹Tianjin University, Tianjin, China, ²Carleton University, Ottawa, Canada

TU3A-4: Expedited Multi-Objective Design Optimization of Miniaturized Microwave Structures Using Physics-Based Surrogates
S. Koziel^{1,2}, A. Bekasiewicz², P. Kurgan¹, J. W. Bandler³, ¹Gdansk University of Technology, Gdansk, Poland, ²Reykjavik University, Reykjavik, Iceland, ³McMaster University, Hamilton, Canada

TU3A-5: Size Reduction of Microwave Couplers by EM-Driven Optimization
S. Koziel^{1,2}, A. Bekasiewicz^{1,2}, P. Kurgan², ¹Reykjavik University, Reykjavik, Iceland, ²Gdansk University of Technology, Gdansk, Poland

TU3B: Advances in CMOS Power Amplifiers
Chair: Douglas Teeter, *Qorvo*
Co-Chair: Youngwoo Kwon, *Seoul National University*

TU3B-1: A Single-Chain Multiband Reconfigurable Linear Power Amplifier in SOI CMOS
U. Kim, J. Woo, S. Park, Y. Kwon, *Seoul National University, Seoul, Republic of Korea*

TU3B-2: A 1.85GHz CMOS Power Amplifier with Zero-Voltage-Switching Contour-Based Outphasing Control to Improve Back-Off Efficiency
S. Shim, S. Pamarti, *University of California Los Angeles, Los Angeles, United States*

TU3B-3: A Low Power Programmable Gain High PAE K-/Ka-Band Stacked Amplifier in 0.18 μm SiGe BiCMOS Technology
B. Thangarasu¹, K. Ma¹, K. Yeo^{2,1}, ¹Nanyang Technological University, Singapore, Singapore, ²Singapore University of Technology and Design, Singapore, Singapore

TU3B-4: A 60GHz Digitally-Assisted Power Amplifier with 17.2dBm Psat, 11.3% PAE in 65nm CMOS
Y. Liang¹, N. Li¹, W. Fei¹, H. Yu¹, X. Li², ¹Nanyang Technological University, Singapore, Singapore, ²eijing University of Posts and Telecommunications, Beijing, China

TU3B-4: A New Compact High-Efficiency mmWave Power Amplifier in 65 nm CMOS Process
T. Xi¹, S. Huang¹, S. Guo¹, P. Gui¹, J. Zhang², W. Choi², D. Huang³, Y. Fan⁴, K. K. O², ¹Souther Methodist University, Dallas, United States, ²University of Texas at Dallas, Dallas, United States, ³Samsung Research America, Dallas, United States, ⁴Texas Instruments, Dallas, United States

TU3C: Novel Transmitter and Receiver Architectures for Wireless Communications
Chair: Y. Ethan Wang, *UCLA*
Co-Chair: Shoichi Narahashi, *NTT DOCOMO, INC.*

TU3C-1: A T/R Antenna Pair with Polarization-Based Reconfigurable Wideband Self-Interference Cancellation for Simultaneous Transmit and Receive
T. Dinc, H. Krishnaswamy, *Columbia University, New York, United States*

TU3C-2: Simultaneous Transmit and Receive (STAR) System Architecture using Multiple Analog Cancellation Layers
K. E. Kolodziej, B. T. Perry, J. S. Herd, *MIT Lincoln Laboratory, Lexington, United States*

TU3C-3: Suppressing Transmitter Intermodulations with Channelized Active Noise Elimination (CANE)
R. Zhu, Y. Song, Y. E. Wang, *University of California Los Angeles, Los Angeles, United States*

TU3C-3: Digital Signal Injection Technique for Cancellation of Receive-Band Spurious Emissions in FDD Cellular Transmitters
H. Gheid¹, S. Farsi², Y. Liu¹, P. Gudem^{2,1}, P. M. Asbeck¹, ¹University of California San Diego, La Jolla, United States, ²Qualcomm Technologies Inc., San Diego, United States

TU3C-4: A Dual-Phase Pulse-Modulated Polar Transmitter with High Efficiency and Linearity Using Power Recycling
H. Yang¹, C. Chang¹, Y. E. Chen², J. Chen¹, ¹National Taiwan University, Taipei, Taiwan, ²National Taiwan University, Taipei, Taiwan

TU3D: New Tuning Structures and Techniques for Tunable Filters
Chair: Roberto Gomez-Garcia, *University of Alcalá*
Co-Chair: Erick Emmanuel Djoumessi, *Intel Corporation*

TU3D-1: Positive-to-Zero Continuously Tunable Inter-Resonator Coupling Structure for Applications in Filter Array Systems
B. Koh, B. Lee, S. Nam, J. Lee, *Korea University, Seoul, Republic of Korea*

TU3D-2: A Tunable 0.6 GHz - 1.7 GHz Bandpass Filter with a Constant Bandwidth Using Switchable Varactor-Tuned Resonators
F. Lin, M. Rais-Zadeh, *University of Michigan, Ann Arbor, United States*

TU3D-3: Real-Time Temperature Compensation Control System for Tunable Cavity-Based High-Q Filters
Y. Wu, M. Abu Khater, D. Peroulis, *Purdue University, West Lafayette, United States*

TU3D-4: A Reconfigurable Quarter-Mode Substrate Integrated Waveguide Cavity Filter Employing Liquid-Metal Capacitive Loading
A. Pourghorban Saghati, S. Baghbani Kordmahale, J. Kameoka, K. Entesari, *Texas A&M University, College Station, United States*

TU3D-5: A Tunable X-Band Substrate Integrated Waveguide Cavity Filter using Reconfigurable Liquid-Metal Perturbing Posts
J. H. Dang, R. C. Gough, A. M. Morishita, A. T. Ohta, W. A. Shiroma, *University of Hawaii at Manoa, Honolulu, United States*

Tuesday

Technical Sessions

1330-1510

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TU3E: Women in Microwaves Special Session: On the Leading Edge of 5G Technology and Beyond Chair: Olga Boric-Lubecke, <i>UH Manoa</i> Co-Chair: Lora Schulwitz, <i>MDA Information Systems</i>	TU3F: Cellular-Level Microwave Measurements Chair: Chiao Jung-Chih, <i>University of Texas</i> Pothier Arnaud, <i>XLIM Research Institute</i>	TU3G: Microwave Photonic Devices and Systems Chair: Mona Jarrahi, <i>UCLA</i> Co-Chair: Adil Karim, <i>JHU/APL</i>	TU3H: Enabling Technologies for Mobile Communications Beyond 6GHz Chair: Farshid Aryanfar, <i>Samsung Research America</i> Co-Chair: Gabriel Rebeiz, <i>UCSD</i>	
TU3E-1: 5G Wireless Technologies D. Choudhury, <i>Intel Corporation, Hillsboro, United States</i>	TU3F-1: Improved Broadband Electrical Detection of Individual Biological Cells Y. Ning, X. Ma, C. R. Multari, X. Luo, V. Gholizadeh, C. Palego, X. Cheng, J. C. Hwang, <i>Lehigh University, Bethlehem, United States</i>	TU3G-1: A Bandstop Microwave Photonic Delay-Line Filter With Both Tunable Stop-Band Rejection Ratio and Tunable Frequency W. Liu, W. Zhang, J. Yao, <i>University of Ottawa, Ottawa, Canada</i>	TU3H-1: Millimeter-Wave Large-Scale Phased Arrays for 5G Systems G. Rebeiz, <i>University of California San Diego, La Jolla, United States</i>	1330-1350
TU3E-2: Wirelessly Powering: An Enabling Technology for Zero-Power Electronics, IoT and D2D Communication A. Costanzo, D. Masotti, <i>University of Bologna, Bologna, Italy</i>	TU3F-2: Microwave Dielectric Spectroscopy of a Single Biological Cell with Improved Sensitivity up to 40 GHz W. Chen, D. Dubuc, K. Grenier, <i>LAAS-CNRS and Toulouse University, Toulouse, France</i>	TU3G-2: Photonic Generation of a Linearly Chirped Microwave Waveform with Long Temporal Duration Using a Dispersive Loop J. Zhang, O. Coutinho, J. Yao, <i>University of Ottawa, Ottawa, Canada</i>	TU3H-2: A Wideband Low Cost E-Band SIW Antenna Array for High Capacity mmWave Radio V. MirafTAB, W. Zhai, M. Repeta, <i>Huawei Technologies Canada, Ottawa, Canada</i>	1350-1410
TU3E-3: GaN Power Amplifiers with Supply Modulation Z. Popovic, <i>University of Colorado, Boulder, United States</i>	TU3F-3: A Microwave Reconfigurable Dielectric-Based Glucose Sensor with 20 mg/dL Sensitivity at Sub-nL Sensing Volume in CMOS J. Chien ¹ , E. Yeh ¹ , M. Anwar ^{2,1} , L. P. Lee ¹ , A. M. Niknejad ¹ , <i>University of California Berkeley, Berkeley, United States</i> , <i>University of California San Francisco, San Francisco, United States</i>	TU3G-3: Novel Broadband Analog Predistortion Circuit for Radio-Over-Fiber Systems X. Zhang ^{1,2} , R. Zhu ¹ , Z. Xuan ¹ , D. Shen ² , <i>Concordia University, Montreal, Canada</i> , <i>Yunnan University, Kunming, China</i>	TU3H-3: Millimeter-Wave Base Station for Mobile Broadband Communication F. Aryanfar, Z. Pi, H. Zhou, T. Henige, G. Xu, S. Abu-Surra, D. Psychoudakis, F. Khan, <i>Samsung Research America, Richardson, United States</i>	1410-1430
TU3E-4: Contactless Medical Sensing D. Schreurs, M. Mercuri, <i>KU Leuven, Leuven, Belgium</i>	TU3F-4: Multi-Frequency DEP Cytometer Employing a Microwave Interferometer for the Dielectric Analysis of Micro Particles S. Afshar ¹ , E. Salimi ¹ , K. Braasch ² , M. Butler ² , D. J. Thomson ¹ , G. E. Bridges ¹ , <i>University of Manitoba, Winnipeg, Canada</i> , <i>University of Manitoba, Winnipeg, Canada</i>	TU3G-4: Photonic Downconverting Link with Digital Linearization T. P. McKenna ¹ , J. H. Kalkavage ¹ , D. Novak ² , R. B. Waterhouse ² , T. R. Clark ¹ , <i>JHU Applied Physics Laboratory, Laurel, United States</i> , <i>Pharad, LLC, Hanover, United States</i>	TU3H-4: Study of Coexistence between 5G Small-Cell Systems and Systems of the Fixed Service at 39 GHz Band J. Kim ¹ , L. Xian ¹ , A. Maltsev ^{1,2} , R. Arefi ¹ , A. S. Sadri ¹ , <i>Intel Corporation, Santa Clara, United States</i> , <i>Nizhny Novgorod State University, Nizhny Novgorod, Russian Federation</i>	1430-1450
TU3E-5: Sub-Millimeter Wave InP Technologies and Integration Techniques V. Radisic, K. M. Leong, D. W. Scott, C. Monier, G. Mei, W. R. Deal, A. Gutierrez-Aitken, <i>Northrop Grumman Aerospace System, Redondo Beach, United States</i>	TU3F-5: Delivery System Setup and Characterization for Biological Cells Exposed to Nanosecond Pulsed Electric Field D. Arnaud-Cormos ¹ , M. Soueid ¹ , R. O'Connor ^{1,2} , Y. Percherancier ² , I. Lagroye ³ , B. Veyret ³ , P. Leveque ¹ , <i>XLIM, Université de Limoges - CNRS, Limoges, France</i> , <i>LABEX Sigma-LIM, Limoges, France</i> , <i>IMS, Université de Bordeaux - CNRS, Talence, France</i>		TU3H-5: Ultra-Thin Dual Polarized Millimeter-Wave Phased Array System-in-Package with Embedded Transceiver Chip T. Kamgaing ¹ , A. A. Elsherbini ¹ , S. N. Oster ¹ , B. M. Rawlings ¹ , K. Lee ² , <i>Intel Corporation, Chandler, United States</i> , <i>Intel Corporation, Chandler, United States</i>	1450-1510

Tuesday

Technical Sessions

1555-1735

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1715-1725

1725-1735

TU4A: New Design and Analysis of Guided-Wave Structures
Chair: Clive Tzuang, *University of Chinese Academy of Sciences*
Co-Chair: Ingo Wolff, *IMST GmbH*

TU4A-1: A Compact Planar Magic-T Using One-Third Triangular Resonator of Substrate Integrated Waveguide and Slotline Transition
C. Y. Zheng, F. Xu, *Nanjing University of Posts and Telecommunications, Nanjing, China*

TU4A-2: A New Type of Capacitively-Loaded Half-Mode Substrate Integrated Waveguide for Miniaturized Guided Wave Applications
T. R. Jones, M. Daneshmand, *University of Alberta, Edmonton, Canada*

TU4A-3: A Full-Order Equivalent Circuit Approach for Transmission Lines in Printed Circuit Boards
X. Xu, W. Thiel, E. Bracken, *Ansys, Inc., Canonsburg, United States*

TU4A-4: Surface Impedance Concept for Modeling Conductor Roughness
G. Gold, K. Helmreich, *University Erlangen-Nuremberg, Erlangen, Germany*

TU4B: Broadband High-Efficiency GaN Power Amplifiers
Chair: Debasish Dawn, *North Dakota State University*
Co-Chair: Raghu Mallavarpu, *Raytheon Corporation*

TU4B-1: A Class-J Power Amplifier with Varactor-based Dynamic Load Modulation Across a Large Bandwidth
W. Hallberg¹, D. Gustafsson², M. Ozen¹, C. M. Andersson³, D. Kuylenstierna⁴, C. Fager¹, ¹*Chalmers University of Technology, Gothenburg, Sweden*, ²*Ericsson AB, Stockholm, Sweden*, ³*Mitsubishi Electric Corporation, Kamakura, Japan*

TU4B-2: Broadband High-Efficiency Power Amplifiers Design Based on Hybrid Continuous Modes Utilizing the Optimal Impedances at Package Plane
J. Chen, S. He, *University of Electronic Science and Technology of China, Chengdu, China*

TU4B-3: A 6-18 GHz GaN pHEMT Power Amplifier Using Non-Foster Matching
S. Lee, H. Park, J. Kim, Y. Kwon, *Seoul National University, Seoul, Republic of Korea*

TU4B-4: A 3.4--3.6-GHz High Efficiency Gallium Nitride Power Amplifier Using Bandpass Output Matching Network
Q. Wu, X. Liu, *University of California Davis, Davis, United States*

TU4B-5: A Highly Efficient Concurrent Dual-Band Class-F Power Amplifier for Applications at 1.7 and 2.14 GHz
S. Zhu, Q. Cheng, H. Fu, H. Wu, J. Ma, *Tianjin University, Tianjin, China*

TU4C: Near-Field WPT, Energy Harvesting and Communications
Chair: Manos Tentzeris, *Georgia Tech*
Co-Chair: Allesandra Costanzo, *University of Bologna*

TU4C-1: Ambient Energy Harvesting from a Two-Way Talk Radio for Flexible Wearable Devices utilizing Inkjet Printing Masking
J. Bito, J. G. Hester, M. M. Tentzeris, *Georgia Institute of Technology, Atlanta, United States*

TU4C-2: Wireless Sensing and Power Transfer in a Rotary Tool
R. Trevisan^{1,2}, A. Costanzo¹, ¹*University of Bologna, Bologna, Italy*, ²*IMA SpA, Ozzano dell'Emilia, Italy*

TU4C-3: A 95% Efficient Inverter with 300-W Power Output for 6.78-MHz Magnetic Resonant Wireless Power Transfer System
Y. Akuzawa, K. Tsuji, H. Matsumori, Y. Ito, T. Ezoe, K. Sakai, *Mitsubishi Electric Engineering Co. Ltd, Kamakura, Japan*

TU4C-4: A Planar Magnetically Coupled Resonant Wireless Power Transfer Using Array of Resonators for Efficiency Enhancement
F. Jolani¹, Y. Yu^{2,1}, Z. Chen^{1,3}, ¹*Dalhousie University, Halifax, Canada*, ²*East China Jiao Tong University, Nan Chang, China*, ³*University of Electronic Science and Technology, Chengdu, China*

TU4C-5: Electrical Duffing Resonator Circuits for Wideband Wireless Power Harvesting
X. Wang, A. Mortazawi, *University of Michigan, Ann Arbor, United States*

TU4D: Passive Techniques for Divider, Combiner, and Balun Structures
Chair: Nickolas Kingsley, *BAE Systems*
Co-Chair: Guoan Wang, *University of South Carolina*

TU4D-1: A Transformer-Based Poly-Phase Network for Ultra-Broadband Quadrature Signal Generation
J. Park, H. Wang, *Georgia Institute of Technology, Atlanta, United States*

TU4D-2: Divider/Combiner with Enhanced Isolation and Reflection Cancellation
A. M. Darwish¹, A. A. Ibrahim², J. Qiu¹, E. Viveiros¹, H. A. Hung¹, ¹*Army Research Lab, Adelphi, United States*, ²*University of Michigan, Ann Arbor, United States*

TU4D-3: A 46:1 Bandwidth Ratio Balun on Multilayer Organic Substrate
C. V. Pham¹, B. Pham¹, A. V. Pham¹, R. E. Leoni, III², ¹*University of California-Davis, Davis, United States*, ²*Raytheon Company, Andover, United States*

TU4D-4: A General Isolation Network for N-way Power Combiners/Dividers
R. D. Beyers, D. I. de Villiers, *Stellenbosch University, Stellenbosch, South Africa*

TU4D-5: A Compact and Harmonic Suppression Wilkinson Power Divider with General Pi Type Structure
X. Wang¹, Z. Ma², I. Sakagami³, ¹*University of Tsukuba, Tsukuba, Japan*, ²*Saitama University, Saitama, Japan*, ³*University of Toyama, Toyama, Japan*

Technical Track Key:

Field, Device and Circuit Tech.

Passive Components

Active Components

Systems & Applications

Emerging Technical Areas

Special Sessions

Tuesday

Technical Sessions

1555-1735

Room: 126 ABC

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Room: 121 ABC

<p>TU4E: Wireless and Sensor Technologies for Internet of Things (IoT) Chair: Kavita Goverdhanam, <i>US Army CERDEC</i> Co-Chair: Victor Lubecke, <i>University of Hawaii</i></p>	<p>TU4F: Interconnect Modeling and Low-Cost Interconnects for Practical Applications Chair: Hiroshi Kondoh, <i>EHF Consulting</i> Co-Chair: Sergio Palma Pacheco, <i>Freescale</i></p>	<p>TU4G: Recent Advancements in 3D Manufacturing for Microwave Applications Chair: Roberto Sorrentino, <i>University of Perugia</i> Co-Chair: Tom Weller, <i>University of South Florida</i></p>	<p>TU4H: Advanced CMOS and SiGe Millimeter Wave Systems Chair: Ed Niehenke, <i>Niehenke Consulting</i> Co-Chair: Adam Young, <i>Teledyne</i></p>	
<p>TU4E-1: Wearable Wireless Electronics (invited) V. Lubecke, <i>University of Hawaii, Honolulu, United States</i></p>	<p>TU4F-1: Stamped Metal Antenna Including A Feeding Transmission Line D. Lo Hine Tong, P. Minard, P. Morin, J. Le Foulgoc, <i>Technicolor Connected Home, Cesson Sevigne, France</i></p>	<p>TU4G-1: Ultra-Compact G-Band 16 Way Power Splitter/Combiner Module Fabricated through a New Method of 3D-Copper Additive Manufacturing H. Kazemi¹, D. Miller¹, A. Mohan¹, Y. Jin², M. Crawford², M. Wagenseil³, S. Long³, ¹Nuvotronics LLC, Camarillo, United States, ²Nuvotronics LLC, Radford, United States, ³Nuvotronics LLC, Durham, United States, ⁴Triquint, Newbury Park, United States, ⁵S2 Engineering and Consulting, Camarillo, United States</p>	<p>TU4H-1: A Waveform-Shaping Millimeter-Wave Oscillator with 184.7dBc/Hz FOM in 40nm Digital CMOS Process X. Luo, H. Qian, R. B. Staszewski, <i>Delft University of Technology, Delft, Netherlands</i></p>	<p>1555-1615</p>
<p>TU4E-2: Wireless Sensor Nodes for Environmental Monitoring in Internet of Things C. M. Nguyen¹, J. Mays¹, D. Plesa², S. Rao¹, M. Nguyen¹, J. C. Chiao¹, ¹University of Texas at Arlington, Arlington, United States, ²Mirabeau B. Lamar High School, Arlington, United States</p>	<p>TU4F-2: A Light Weight Electromagnetic Shield using High Density Carbon Nanotube Fence-Wall for RF Packaging D. Tan^{1,2}, J. Yu¹, D. Hee¹, Z. Liu¹, P. Eudeline³, D. Bailargeat⁴, B. Tay^{3,2}, ¹Thales Solutions Asia, Singapore, Singapore, ²CNRS-International NTU Thales Research Alliance, Singapore, Singapore, ³Nanyang Technological University, Singapore, Singapore, ⁴XLIM UMR 7262 CNRS/University of Limoges, Limoges, France, ⁵Thales Air Systems, Ymare, France, ⁶Singapore-MIT Alliance, Singapore, Singapore</p>	<p>TU4G-2: 3-D Metal-Direct-Printed Wideband and High-Efficiency Wave-Guide-Fed Antenna Array G. Huang^{1,2}, S. Zhou¹, T. Chio¹, T. Yeo², ¹National University of Singapore, Singapore, Singapore, ²National University of Singapore, Singapore, Singapore</p>	<p>TU4H-2: 94 GHz Bidirectional Variable Gain Amplifier in 0.13-um SiGe BiCMOS for Phased Array Transmit and Receive (T/R) Applications S. Afroz, K. Koh, <i>Virginia Tech, Blacksburg, United States</i></p>	<p>1615-1635</p>
<p>TU4E-3: A Secure Miniaturized Wireless Sensor Node for a Smart Home Demonstrator A. Jonjic^{1,2}, J. Grosinger², T. Herndl¹, G. Holweg¹, W. Boesch², ¹Infinion Technologies AG, Graz, Austria, ²Graz Technical University, Graz, Austria</p>	<p>TU4F-3: A Low-Cost Broadband Bond-Wire Interconnect for THz Heterogeneous System Integration C. Li¹, C. Lai², C. Kuo², ¹National Central University, Jhongli City, Taiwan, ²National Chiao Tung University, Hsinchu City, Taiwan</p>	<p>TU4G-3: A Low Loss X-Band filter using 3-D Polyjet Technology F. Cai, W. T. Khan, J. Papapolymerou, <i>Georgia Institute of Technology, Atlanta, United States</i></p>	<p>TU4H-3: A W-Band Integrated Silicon-Germanium Loop-Back and Front-End Transmit-Receive Switch for Built-In-Self-Test R. L. Schmid, P. Song, C. T. Coen, A. C. Ulusoy, J. D. Cressler, <i>Georgia Institute of Technology, Atlanta, United States</i></p>	<p>1635-1645</p>
<p>TU4E-4: Wearable Sensor System for Monitoring Body Kinematics R. Nakata^{1,2}, I. Mostafanezhad², ¹Oahu Group LLC, Honolulu, United States, ²University of Hawaii, Honolulu, United States</p>				<p>1645-1655</p>
<p>TU4E-5: Passive Ranging by Low-Directivity Antennas with Quality Estimate Y. Ma, E. C. Kan, <i>Cornell University, Ithaca, United States</i></p>	<p>TU4F-4: Modeling the Effect of Charges in the Back Side Passivation Layer on Through Silicon Via (TSV) Capacitance after Wafer Thinning M. Rack¹, J. Raskin¹, X. Sun², C. Roda Neve³, G. Vander Plas³, M. Stucchi², ¹Université catholique de Louvain, Louvain-la-Neuve, Belgium, ²Imec, Heverlee, Belgium</p>	<p>TU4G-4: 3D Printed Multilayer Microstrip Line Structure with Vertical Transition toward Integrated System M. Liang¹, X. Yu¹, C. Shemelya², D. Roberson², R. Wicker², E. MacDonald², H. Xin¹, ¹University of Arizona, Tucson, United States, ²The University of Texas at El Paso, El Paso, United States</p>	<p>TU4H-4: A 40-110 GHz High-Isolation CMOS Traveling Wave T/R Switch by Using Parallel Inductor W. Lai, H. Chuang, <i>National Cheng Kung University, Tainan, Taiwan</i></p>	<p>1655-1705</p>
			<p>TU4H-5: A 700MHz Output Bandwidth, 30dB Dynamic Range, Common-Base mm-Wave Power Detector A. Serhan, J. Fournier, E. Lauga-larroze, <i>Université Grenoble Alpes, IMEP-LAHC, Grenoble, France</i></p>	<p>1655-1715</p>
<p>TU4E-6: Additively Manufactured Multilayer High Performance RF Passive Components on Cellulose Substrates for Internet-of-Things Electronic Circuits C. Mariotti¹, F. Alimenti¹, L. Roselli¹, M. M. Tentzeris², ¹University of Perugia, Perugia, Italy, ²Georgia Institute of Technology, Atlanta, United States</p>	<p>TU4F-5: Modeling Annular Through-Silicon Via Pairs in 3-D Integration A. Chen¹, F. Liang¹, G. Wang², B. Wang¹, ¹University of Electronic Science and Technology of China, Chengdu, China, ²Hangzhou Dianzi University, Hangzhou, China</p>		<p>TU4H-6: A 45-GHz Si/SiGe 256-QAM Transmitter with Digital Predistortion P. Wu, Y. Liu, B. Hanafi, H. Dabag, P. M. Asbeck, J. F. Buckwalter, <i>University of California San Diego, La Jolla, United States</i></p>	<p>1715-1725</p>
	<p>TU4F-6: Analytical Modeling of Vertical Interconnect in Single-Ended Applications K. Chen¹, T. Horng¹, K. Lu², ¹National Sun Yat-sen University, Kaohsiung, Taiwan, ²Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan</p>			<p>1725-1735</p>

Wednesday

Technical Sessions

0800-0940

Room: 132 ABC

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	WE1A: Advances in THz Nanoelectronics Chair: Luca Pierantoni, <i>Università Politecnica delle Marche</i> Co-Chair: Goutam Chattopadhyay	WE1B: Innovative Developments in Silicon Integrated Circuits Chair: Jonathan Comeau, <i>Anokiwave</i> Co-Chair: George Duh, <i>BAE Systems</i>	WE1C: Integrated Waveguide and Transition Techniques Chair: Christian Damm, <i>Technische Universität Darmstadt</i> Co-Chair: Jan Machac, <i>Czech Technical University in Prague</i>	WE1D: Novel Synthesis Techniques of Filters and Diplexers Chair: Giuseppe Macchiarella, <i>Politecnico di Milano</i> Co-Chair: Richard Snyder, <i>RS Microwaves</i>
0800-0820	WE1A-1: High-Efficiency Terahertz Sources based on Plasmonic Contact Electrodes M. Jarrahi, <i>University of California Los Angeles, Los Angeles, United States</i>	WE1B-1: Programmable Picosecond Pulse Generator in CMOS X. Wu, K. Sengupta, <i>Princeton University, Princeton, United States</i>	WE1C-1: Compact Wideband Single-Ended and Differential Microstrip-to-Waveguide Transitions at W-Band M. Giese, T. Meinhardt, A. F. Jacob, <i>Hamburg University of Technology, Hamburg, Germany</i>	WE1D-1: Design of Generalised Chebyshev Lowpass Filters Using Coupled Line/Stub Sections E. Musonda, I. C. Hunter, <i>University of Leeds, Leeds, United Kingdom</i>
0820-0840	WE1A-2: Semiconductor and Graphene Devices for Nanoscale Terahertz Imaging and Spectroscopy Y. Kawano, <i>Tokyo Institute of Technology, Tokyo, Japan</i>	WE1B-2: A 0.3-to-5.5 GHz Digital Frequency Discriminator IC with Time to Digital Converter A. Hirai, K. Tsutsumi, H. Nakamizo, E. Taniguchi, <i>Mitsubhishi Electric Corporation, Kamakura, Japan</i>	WE1C-2: Broadband and Low-Loss Rectangular Waveguide to Substrate Integrated Waveguide Transition with Fin Line X. Peng, J. Chen, H. Tang, D. Hou, P. Yan, W. Hong, <i>Southeast University, Nanjing, China</i>	WE1D-2: Synthesis of General Chebyshev Characteristic Function for Dual (Single) Bandpass Filters E. Musonda, I. Hunter, <i>University of Leeds, Leeds, United Kingdom</i>
0840-0900	WE1A-3: Zero-Bias 0.2 THz Detection using Graphene Transistors J. Moon, H. Seo, K. Son, D. Le, B. Yang, M. Antcliffe, <i>HRL Laboratories, Malibu, United States</i>	WE1B-3: A 0.54-0.55 THz 2x4 Coherent Source Array with EIRP of 24.4 dBm in 65nm CMOS Technology Y. Zhao ^{1,1} , H. Lu ^{2,2} , H. Chen ^{2,2} , Y. Chang ^{2,2} , R. Huang ^{1,1} , H. Chen ^{3,3} , C. Jou ^{3,3} , F. Hsueh ^{3,3} , M. F. Chang ^{1,1} , <i>1University of California Los Angeles, Los Angeles, United States, 2National Taiwan University, Taipei, Taiwan, 3TSMC Limited, Hsinchu, Taiwan</i>	WE1C-3: Low Loss Dielectric Ridge Waveguide Based on High Resistivity Silicon for Ey11 Mode Propagation at 750-1000GHz H. Zhu ^{1,3} , Q. Xue ^{1,3} , J. Hui ^{1,3} , S. W. Pang ^{1,3} , X. Zhao ^{1,3} , <i>1City University of Hong Kong, Hong Kong, Hong Kong, 2State Key Laboratory of Millimeter Waves, Hong Kong, Hong Kong, 3Centre for Biosystems, Neuroscience, and Nanotechnology, Hong Kong, Hong Kong</i>	WE1D-3: Synthesis of Coupling Matrix for Lossy Filter Networks M. Meng, I. Hunter, <i>Institute of Microwaves and Photonics, Leeds, United Kingdom</i>
0900-0920	WE1A-4: Antenna-Coupled Terahertz Thermocouples J. A. Russer ¹ , C. Jirauschek ¹ , G. P. Szakmany ² , A. O. Orlov ² , G. H. Bernstein ² , W. Porod ² , P. Lugli ¹ , P. Russer ¹ , <i>1Technische Universität München, Munich, Germany, 2University of Notre Dame, Notre Dame, United States</i>	WE1B-4: A D-Band (110 to 170 GHz) SPDT Switch in 32 nm CMOS SOI W. T. Khan, A. C. Ulusoy, R. Schmid, T. Chi, J. D. Cressler, H. Wang, J. Papapolymerou, <i>Georgia Institute of Technology, Atlanta, United States</i>	WE1C-4: Comparison of Fabrication Tolerance Sensitivity between Substrate Integrated Waveguide and Microstrip Circuits A. Ben Alaya ¹ , M. Bozzi ² , L. Perregrini ² , N. Raveu ¹ , K. Wu ³ , <i>1Institut National Polytechnique de Toulouse, Toulouse, France, 2University of Pavia, Pavia, Italy, 3Ecole Polytechnique de Montreal, Montreal, Canada</i>	WE1D-4: Circuit Model Extraction for Computer-Aided Tuning of a Coupled-Resonator Diplexer P. Zhao, K. Wu, <i>The Chinese University of Hong Kong, Hong Kong, Hong Kong</i>
0920-0930	WE1A-5: Innovative Full Wave Modeling of Plasmon Propagation in Graphene by Dielectric Permittivity Simulations based on Density Functional Theory D. Mencarelli ^{1,3} , L. Pierantoni ^{1,3} , A. Sindona ^{2,3} , M. Gravina ^{2,3} , M. Pisarra ^{2,3} , C. Vaquacela-Gomez ² , S. Bellucci ³ , <i>1Università Politecnica delle Marche, Ancona, Italy, 2Università della Calabria, Rende, Italy, 3Istituto Nazionale di Fisica Nucleare (INFN), Frascati, Italy</i>	WE1B-5: A Divide-By-3 Injection-Locked Frequency Divider in 0.18 um CMOS Process for K Band Applications Y. Chang, Y. Chiang, <i>National Chung Hsing University, Taichung, Taiwan</i>		WE1D-5: Improvement of Dual-Manifold Architecture for the Design of Reconfigurable Diplexers A. Morini ¹ , M. Baldelli ¹ , G. Venanzoni ¹ , M. Farina ¹ , L. Cifola ¹ , G. Macchiarella ² , P. M. Iglesias ³ , C. Ernst ³ , <i>1Università Politecnica delle Marche, Ancona, Italy, 2Politecnico di Milano, Milano, Italy, 3European Space Agency, Noordwijk, Netherlands</i>
0930-0940				

Technical Track Key:

Field, Device and Circuit Tech.

Passive Components

Active Components

Systems & Applications

Emerging Technical Areas

Special Sessions

Wednesday

Technical Sessions

0800-0940

Room: 126 ABC

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<p>WE1E: The Evolution of Power Amplifiers: History, Innovations and Challenges I Chair: Edward C. Niehenke, <i>Niehenke Consulting</i> Co-Chair: Raymond Pengelly, <i>Prism Consulting</i></p>	<p>WE1F: Far-Field WPT and Energy Harvesting Components and Systems Chair: Zoya Popovic, <i>University of Colorado</i> Co-Chair: Ana Collado, <i>CTTC</i></p>	<p>WE1G: Advanced Technologies for Microwave Sensors Chair: Mojgan Daneshmand, <i>University of Alberta</i> Co-Chair: Lei Liu, <i>University of Notre Dame</i></p>	<p>WE1H: Active and Passive Components and Circuits at Terahertz Frequencies Chair: Goutam Chattopadhyay, <i>NASA-JPL, California Institute of Technology</i> Co-Chair: Joe Qiu, <i>US Army Research Laboratory</i></p>	
<p>WE1E-1: The Evolution of Transistors for Power Amplifiers: 1947 to Today E. C. Niehenke, <i>Niehenke Consulting, ElkrIDGE, United States</i></p>	<p>WE1F-1: A 2.4 GHz CMOS Class D Synchronous Rectifier S. Dehghani, T. E. Johnson, <i>University of British Columbia, Kelowna, Canada</i></p>	<p>WE1G-1: Human Gesture Sensor using Ambient Wireless Signals based on Passive Radar Technology M. Tang, F. Wang, T. Horng, <i>National Sun Yat-Sen University, Kaohsiung, Taiwan</i></p>	<p>WE1H-1: InP HBT Transferred Substrate Amplifiers Operating to 600 GHz V. Radisic, D. W. Scott, C. Monier, S. Wang, A. Cavus, A. Gutierrez-Aitken, W. R. Deal, <i>Northrop Grumman Aerospace Systems, Redondo Beach, United States</i></p>	<p>0800-0820</p>
<p>WE1E-2: Wideband Power Amplifiers – 1948 to the Present Day J. J. Komiak, <i>BAE Systems, Nashua, United States</i></p>	<p>WE1F-2: Overcoming the Efficiency Limitation of Low Microwave Power Harvesting with Backward Tunnel Diodes C. H. Lorenz¹, S. Hemour¹, P. Fay², K. Wu¹, ¹<i>École Polytechnique de Montréal, Montreal, Canada</i>, ²<i>University of Notre Dame, Notre Dame, United States</i></p>	<p>WE1G-2: 3D Scanning Radar for the Remote Reading of Passive Electromagnetic Sensors D. Henry^{1,2}, H. Aubert^{1,2}, P. Pons¹, ¹<i>Laboratoire d'analyse et d'architecture des systèmes (LAAS-CNRS), Toulouse, France</i>, ²<i>University of Toulouse; UPS, INSA, INP, ISAE, Toulouse, France</i></p>	<p>WE1H-2: A x18 340 GHz InP HEMT Multiplier Chain A. Zamora, X. Mei, K. M. Leong, M. Lange, J. Lee, W. H. Yoshida, B. S. Gorospe, W. R. Deal, <i>Northrop Grumman Corporation, Redondo Beach, United States</i></p>	<p>0820-0840</p>
<p>WE1E-3: The Evolution of the Push-Pull Power Amplifier S. C. Cripps, <i>Cardiff University, Cardiff, United Kingdom</i></p>	<p>WE1F-3: Two-Stage High-Efficiency X-Band GaN MMIC PA / Rectifier M. Coffey, S. Schafer, Z. Popovic, <i>University of Colorado Boulder, Boulder, United States</i></p>	<p>WE1G-3: Non-Contact Liquid Sensing using High Resolution Microwave Microstrip Resonator M. H. Zarifi, M. Daneshmand, <i>University of Alberta, Edmonton, Canada</i></p>	<p>WE1H-3: 500-600 GHz Submillimeter-Wave 3.3 bit RF MEMS Phase Shifter Integrated in Micromachined Waveguide U. Shah¹, E. Decrossas², C. Jung-Kubiak², T. Reck², G. Chattopadhyay², I. Mehdi², J. Oberhammer¹, ¹<i>KTH Royal Institute of Technology, Stockholm, Sweden</i>, ²<i>Jet Propulsion Laboratory, Pasadena, United States</i></p>	<p>0840-0900</p>
<p>WE1E-4: The Evolution of Power Combining Techniques: From the 60s to Today J. Schellenberg, <i>QuinStar Technology, Inc., Torrance, United States</i></p>	<p>WE1F-4: Energy-Autonomous Bi-Directional Wireless Power Transmission (WPT) and Energy Harvesting Circuit M. del Prete¹, A. Georgiadis², A. Costanzo¹, A. Collado², Z. Popovic³, D. Masotti¹, ¹<i>Università di Bologna, Bologna, Italy</i>, ²<i>Centre Tecnologic de Telecomunicacions de Catalunya (CTTC), Castelldefels, Spain</i>, ³<i>University of Colorado, Boulder, United States</i></p>	<p>WE1G-4: Microstrip Split Ring Resonator for Microsphere Detection and Characterization A. A. Abduljabar<SUP>1</SUP>, >2</SUP>, X. Yang¹, D. Barrow¹, A. Porch¹, ¹<i>Cardiff University, Cardiff, United Kingdom</i>, ²<i>University of Basrah, Basrah, Iraq</i></p>	<p>WE1H-4: 200-260GHz Solid State Amplifier with 700mW of Output Power K. W. Brown¹, D. M. Gritters¹, E. H. Ko¹, Z. M. Griffith², M. E. Urteaga², ¹<i>Raytheon Missile Systems, Rancho Cucamonga, United States</i>, ²<i>Teledyne Scientific and Imaging, Thousand Oaks, United States</i></p>	<p>0900-0920</p>
<p>WE1E-5 Network Synthesis of Power Amplifier Matching Circuits – Standing on the Shoulders of Giants G. F. Collins, <i>MTT-5, La Jolla, United States</i></p>	<p>WE1F-5: Small-Footprint Wideband 94GHz Rectifier for Swarm Micro-Robotics S. Hemour, C. H. Lorenz, K. Wu, <i>Poly-Grames Research Center, Montréal, Canada</i></p>	<p>WE1G-5: Polymeric Sensing Material-Based Selectivity-Enhanced RF Resonant Cavity Sensor for Volatile Organic Compound (VOC) Detection W. Chen¹, K. M. Stewart², R. R. Mansour¹, A. Penlidis², ¹<i>Centre of Integrated RF Engineering, University of Waterloo, Waterloo, Canada</i>, ²<i>Advanced Polymer Institute, University of Waterloo, Waterloo, Canada</i></p>	<p>WE1H-5: 350mW G-band Medium Power Amplifier Fabricated through a New Method of 3D Copper Additive Manufacturing H. Kazemi¹, D. Miller¹, A. Mohan², Z. Griffith³, Y. Jin², J. Kwiatkowski¹, L. Tran³, M. Crawford², ¹<i>Nuvotronics, Camarillo, United States</i>, ²<i>Nuvotronics, Radford, United States</i>, ³<i>Teledyne Scientific and Imaging, Thousand Oaks, United States</i>, ⁴<i>Triquint, Newbury Park, United States</i></p>	<p>0920-0930</p>
		<p>WE1G-6: Non-Contact Measurement of Permittivity and Thickness Using Planar Resonators C. Lee, C. Yang, K. Chen, <i>National Cheng Kung University, Tainan, Taiwan</i></p>		<p>0930-0940</p>

Wednesday

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	<p>WE2A: Numerical Techniques for Microwave Engineering: Advances and Applications Chair: Wolfgang Hofer, <i>University of Victoria</i> Co-Chair: Costas Sarris, <i>University of Toronto</i></p>	<p>WE2B: New Developments in High Power Amplifier Techniques Chair: Gayle Collins, <i>MaXentric</i> Co-Chair: James Schellenberg, <i>QuinStar</i></p>	<p>WE2C: Control Components using Phase Change Materials and Ferrites Chair: Harvey Newman, <i>Naval Research Laboratory</i> Co-Chair: Steven Stitzer, <i>Northrop Grumman ES</i></p>	<p>WE2D: Miniaturized and Multi-mode Filters Chair: Sanghoon Shin, <i>US Naval Research Laboratory</i> Co-Chair: Chi Wang, <i>Orbital ATK Inc.</i></p>
1010-1030	<p>WE2A-1: Reconstruction of Non-Simultaneous Impulsive Sources with Superresolution in TLM by Computational Time Reversal W. Hofer¹, P. So², ¹<i>Faustus Scientific Corporation, Victoria, Canada</i>, ²<i>University of Victoria, Victoria, Canada</i></p>	<p>WE2B-1: High Power and High Efficiency Ka Band Power Amplifier S. Din, M. Wojtowicz, M. K. Siddiqui, <i>Northrop Grumman Corporation, Redondo Beach, United States</i></p>	<p>WE2C-1: 11 THz Figure-of-Merit Phase-change RF Switches for Reconfigurable Wireless Front Ends J. Moon, H. Seo, D. Le, H. Fung, A. Schimitz, T. Oh, D. Zehnder, S. Kim, K. Son, K. Lee, <i>HRL Laboratories, Malibu, United States</i></p>	<p>WE2D-1: A Novel Microstrip Filter Structure Consisting of Transversal Resonator Array and its Fully Canonical Bandpass Filter Design M. Ohira, T. Kato, Z. Ma, <i>Saitama University, Saitama, Japan</i></p>
1030-1050	<p>WE2A-2: Wideband Second-Order Adjoint Sensitivity Analysis of High-Frequency Structures using FDTD M. Bakr, Y. Zhang, <i>McMaster University, Hamilton, Canada</i></p>	<p>WE2B-2: An RF-Input Outphasing Power Amplifier with RF Signal Decomposition Network T. W. Barton¹, D. J. Perreault², ¹<i>University of Texas at Dallas, Richardson, United States</i>, ²<i>Massachusetts Institute of Technology, Cambridge, United States</i></p>	<p>WE2C-2: Performance Measurements and Non-Linearity Modeling of GeTe Phase Change RF Switches with Direct and Indirect Heating Schemes M. Wang¹, F. Lin¹, M. Rais-Zadeh^{1,2}, ¹<i>University of Michigan, Ann Arbor, United States</i>, ²<i>University of Michigan, Ann Arbor, United States</i></p>	<p>WE2D-2: Design of Differential-Mode Wideband Bandpass Filters with Wide Stop Band and Common-Mode Suppression by means of Multisection Mirrored Stepped Impedance Resonators (SIRs) P. Velez, J. Selga, M. Sans, J. Bonache, F. Martin, <i>Universidad Autonoma de Barcelona, Bellaterra, Spain</i></p>
1050-1110	<p>WE2A-3: An Alternative Method for making an Explicit FDTD Unconditionally Stable M. Gaffar, D. Jiao, <i>Purdue University, West Lafayette, United States</i></p>	<p>WE2B-3: A 100 W Tri-Band LDMOS Integrated Doherty Amplifier for LTE-Advanced Applications X. Moronval¹, J. van der Zanden², M. Ercoli¹, ¹<i>NXP Semiconductors, Colomiers, France</i>, ²<i>NXP Semiconductors, Nijmegen, Netherlands</i></p>	<p>WE2C-3: A Novel 4-Port Lumped Element Circulator for High-Isolation Duplex Architecture Y. Kusumoto, T. Wada, H. Obiya, M. Koshino, M. Kawashima, <i>Murata Manufacturing Co., Ltd., Nagaokakyo-shi, Japan</i></p>	<p>WE2D-3: Transmission-Line Equivalent and Microstrip Structure for Planar Mobius Loop Resonator K. Dhawaj, H. Lee, L. Jiang, T. Itoh, <i>University of California Los Angeles, Los Angeles, United States</i></p>
1110-1130	<p>WE2A-4: A Robust Meshless Method with QR-Decomposed Radial Basis Functions S. Yang^{1,2}, Z. Chen^{1,2}, Y. Yu², S. Ponomarenko¹, ¹<i>Dalhousie University, Halifax, Canada</i>, ²<i>University of Electronic Science and Technology, Chengdu, China</i></p>	<p>WE2B-4: A 600W Broadband Three-Way Doherty Power Amplifier for Multi-Standard Wireless Communications J. Li¹, J. Liu², W. Chen¹, G. Su¹, Z. Wang¹, ¹<i>Tsinghua University, Beijing, China</i>, ²<i>ZTE Corporation, Xi'an, China</i></p>	<p>WE2C-4: Modeling and Characterization of Self-Biased Circulators in the mm-Wave Range V. Laur¹, G. Vérissimo¹, P. Quéffelec¹, L. Farhat², H. Alaeddine², J. Reihs², E. Laroche², G. Martin², R. Lebourgeois³, J. Ganne³, ¹<i>Lab-STICC / UBO, Brest, France</i>, ²<i>Chelton Telecom & Microwave, Villebon-sur-Yvette, France</i>, ³<i>Thales Research & Technology, Palaiseau, France</i></p>	<p>WE2D-4: Microwave Bandstop Filters with Minimum Through-Line Length E. J. Naglich, A. C. Guyette, S. Shin, <i>U. S. Naval Research Laboratory, Washington, United States</i></p>
1130-1140	<p>WE2A-5: Accurate Matrix-Free Time-Domain Method in Unstructured Meshes J. Yan, D. Jiao, <i>Purdue University, West Lafayette, United States</i></p>	<p>WE2B-5: A Wideband 700W Push-Pull Doherty Amplifier J. He¹, J. H. Qureshi¹, W. Sneijers¹, D. A. Calvil-lo-Cortes², L. C. N. de Vreede², ¹<i>NXP Semiconductor, Nijmegen, Netherlands</i>, ²<i>TU Delft, Delft, Netherlands</i></p>	<p>WE2C-5: Theory and Design of a Half-Mode SIW Ferrite LTCC Phase Shifter F. Abdul Ghaffar, A. Shamim, <i>King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia</i></p>	<p>WE2D-5: A Novel Design of UWB Bandpass Filter with Notch Band D. Li¹, Y. Zhang¹, K. Song¹, Y. Fan¹, L. Li², ¹<i>EHF Key Lab of Science, Chengdu, China</i>, ²<i>Institute of Electromagnetics, Chengdu, China</i></p>
1140-1150	<p>WE2A-6: Multi-Parametric Uncertainty Quantification with a Hybrid Monte-Carlo / Polynomial Chaos Expansion FDTD Method Z. Gu, C. D. Sarris, <i>University of Toronto, Toronto, Canada</i></p>			<p>WE2D-6: Compact and Highly Selective Microstrip Bandpass Filter and Diplexer Using Two-Stage Twist Modified Split-Ring Resonators Y. Huang, G. Wen, J. Li, <i>University of Electronic Science and Technology of China, Chengdu, China</i></p>

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<p>WE2E: Advances in Small Satellite Technology Development Chair: Kavita Goverdhanam, <i>US Army CERDEC</i> Co-Chair: Raine Simons, <i>NASA</i></p>	<p>WE2F: Emerging Areas in Wireless Communications Chair: Kate A. Remley, <i>NIST</i> Co-Chair: Olga Boric-Lubecke, <i>University of Hawaii at Manoa</i></p>	<p>WE2G: Advances in RFID Technologies Chair: Luca Roselli, <i>University of Perugia</i> Co-Chair: Kazuya Yamamoto, <i>Mitsubishi Electric Corporation</i></p>	<p>WE2H: Si-Based Millimeter- and Submillimeter-wave Circuits and Systems Chair: Joseph Bardin, <i>University of Massachusetts Amherst</i> Co-Chair: Imran Mehdi, <i>Jet Propulsion Laboratory</i></p>	
<p>WE2E-1: Applications of Nano-Satellites and Cube-Satellites in Microwave and RF Domains K. Goverdhanam, <i>US Army, Aberdeen Proving Ground, United States</i></p>	<p>WE2F-1: Wideband, High Data-Rate, Six-Port Direct-Conversion Receiver with Improved Output Matching and Sensitivity S. Qayyum, Y. Chen, M. Wei, R. Negra, <i>RWTH Aachen University, Aachen, Germany</i></p>	<p>WE2G-1: RF Voltage Limiters for Passive Differential UHF RFID Front-Ends in a 40 nm CMOS Technology L. Zöschner^{1,2}, J. Grosinger¹, U. Muehlmann², H. Watzinger², W. Bösch¹, ¹<i>Graz University of Technology, Graz, Austria</i>, ²<i>NXP Semiconductors Austria, Gratkorn, Austria</i></p>	<p>WE2H-1: An 8-Element 400 GHz Phased-Array in 45nm CMOS SOI Y. Yang, O. D. Gurbuz, G. Rebeiz, <i>University of California San Diego, La Jolla, United States</i></p>	1010-1030
<p>WE2E-2: High Rate Communications System for CubeSats S. Palo, <i>University of Colorado, Boulder, United States</i></p>	<p>WE2F-2: Robust Low Power Dual-Mode GNSS Receiver in 65-nm CMOS for Multi-Radio SoC Integration V. E. Issakov¹, H. Doppke¹, A. Leyk¹, G. Lias Villar², V. Christ¹, G. Finn², Z. Gu¹, H. Kirchoff¹, Y. Wang², J. M. Tomasik¹, S. Devegoda², A. Hadjizada¹, M. Hammes¹, R. Kreienkamp¹, ¹<i>Intel Mobile Communications GmbH, Duisburg, Germany</i>, ²<i>Intel Mobile Communications GmbH, Neubiberg, Germany</i></p>	<p>WE2G-2: Frequency Hopped Wireless Passive Sensing System with Harmonic Transponder Antenna Sensor H. Huang¹, P. Chen², C. Hung¹, R. Gharpurey¹, D. Akinwande¹, ¹<i>the University of Texas at Austin, Austin, United States</i>, ²<i>Wayne State University, Detroit, United States</i></p>	<p>WE2H-2: A 95 GHz Centimeter Scale Precision Confined Pathway System-on-Chip Navigation Processor for Autonomous Vehicles in 65nm CMOS A. Tang^{1,2}, F. Hsiao¹, Y. Kim¹, L. Du¹, L. Kong¹, G. Virbila¹, Y. Kuan¹, C. Lee², G. Chattopadhyay², N. Chahat², T. Reck², I. Mehdi², M. F. Chang¹, ¹<i>University of California Los Angeles, Los Angeles, United States</i>, ²<i>Jet Propulsion Lab, Pasadena, United States</i></p>	1030-1050
<p>WE2E-3: Millimeter-Wave Receivers for Low-Cost CubeSat Platforms W. J. Blackwell¹, N. R. Erickson², C. J. Galbraith¹, R. V. Leslie¹, I. A. Osaretin¹, ¹<i>MIT Lincoln Laboratory, Lexington, United States</i>, ²<i>University of Massachusetts, Amherst, Amherst, United States</i></p>	<p>WE2F-3: Multi-Gigabit E-band Wireless Data Transmission F. Boes¹, J. Antes¹, T. Messinger¹, D. Meier¹, R. Henneberger², A. Tessmann², I. Kallfass¹, ¹<i>University of Stuttgart, Stuttgart, Germany</i>, ²<i>Radiometer Physics GmbH, Meckenheim, Germany</i>, ³<i>Fraunhofer Institute for Applied Solid State Physics, Freiburg, Germany</i></p>	<p>WE2G-3: Demonstration of a High Dynamic Range Chipless RFID Sensor in Paper Substrate based on the Harmonic Radar Concept V. Palazzi, P. Mezzanotte, <i>University of Perugia, Perugia, Italy</i></p>	<p>WE2H-3: A Phase and Power Difference Detection Technique using Symmetric Mixer with Input Level Switching for Millimeter-Wave Phased-Array Calibration T. Shimura, Y. Ohashi, T. Ohshima, <i>Fujitsu Laboratories Ltd., Kawasaki, Japan</i></p>	1050-1110
		<p>WE2G-4: RCS Magnitude Coding for Chipless RFID Based on Depolarizing Tag O. Rance, R. Siragusa, E. Perret, P. Lemaitre-Auger, <i>Université Grenoble Alpes, Valence, France</i></p>		1100-1110
<p>WE2E-4: Novel Deployable Reflectarray Antennas for CubeSat Communications R. E. Hodges, <i>Jet Propulsion Laboratory, Pasadena, United States</i></p>	<p>WE2F-4: High Performance Microwave Point-to-Point Link for 5G Backhaul with Flexible Spectrum Aggregation S. J. Alves, F. A. Martins, A. I. Prata, S. I. Lopes, J. C. Duarte, A. S. Oliveira, N. B. Carvalho, <i>University of Aveiro, Aveiro, Portugal</i></p>	<p>WE2G-5: On a Compact Printable Dual-Polarized Chipless RFID Tag Using Slot Length Variation Encoding Technique for Barcode Replacement M. Islam¹, N. Karmakar¹, ¹<i>Monash University, Clayton, Australia</i>, ²<i>Monash University, Clayton, Australia</i></p>	<p>WE2H-4: A Packaged 106-110 GHz Bi-Directional 10Gbps 0.11 pJ/bit/cm CMOS Transceiver N. Weissman, S. Jameson, E. Socher, <i>Tel Aviv University, Tel Aviv, Israel</i></p>	1110-1130
<p>WE2E-5: 3D Multi-Layer Additive Manufacturing of a 2.45 GHz RF Front End N. Arnal¹, T. Ketterl¹, Y. Vega¹, C. Perkowski², P. Deffenbaugh³, K. Church², T. Weller¹, ¹<i>University of South Florida, Tampa, United States</i>, ²<i>Sciperio, Orlando, United States</i></p>	<p>WE2F-5: A Distributed Positioning System based on Real-Time RSSI Enabling Decimetric Precision in Unmodified IEEE 802.11 Networks S. Maddio, M. Passafiume, A. Cidonali, G. Manes, <i>MIDRA - University of Florence, Florence, Italy</i></p>	<p>WE2G-6: Novel MIMO-Based Technique for EM-Imaging of Chipless RFID M. Zomorodi, N. C. Karmakar, <i>Monash University, Melbourne, Australia</i></p>	<p>WE2H-5: A 330 GHz Hetero-Integrated Source in InP-on-BiCMOS Technology M. Hossain¹, N. Weimann¹, M. Lisker², C. Meliani², B. Tillack², V. Krozer¹, W. Heinrich¹, ¹<i>Ferdinand-Braun-Institut, Berlin, Germany</i>, ²<i>IHP Microelectronics GmbH, Frankfurt (Oder), Germany</i></p>	1130-1140
			<p>WE2H-6: A Novel Method for Chip Integration and Packaging for Millimeter-Wave to Terahertz Band Applications A. Jam, J. East, K. Sarabandi, <i>Radiation Laboratory of the University of Michigan, Ann Arbor, United States</i></p>	1140-1150

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1500-1510

WE3A: Modeling of Power FETS
Chair: David Root, *Keysight Technologies*
Co-Chair: Peter Aaen, *University of Surrey*

WE3A-1: Non-Intrusive Near-Field Characterization of Distributed Effects in Large-Periphery LDMOS RF Power Transistors
R. Hou¹, M. Spirito¹, F. van Rijts², R. Heeres², L. C. de Vreede¹, ¹Delft University of Technology, Delft, Netherlands, ²NXP Semiconductors, Nijmegen, Netherlands

WE3A-2: Large-Signal Modeling of On-Wafer Microwave Transistors based on Response Surface Methodology
P. Barmuta^{1,2}, G. Avolio¹, F. Ferranti³, A. Lewandowski², D. Schreurs¹, ¹KU Leuven, Leuven, Belgium, ²Warsaw University of Technology, Warsaw, Poland, ³Vrije Universiteit Brussel, Brussels, Belgium

WE3A-3: A New Nonlinear Model Extraction Methodology for GaN HEMTs Subject to Trapping Effects
L. C. Nunes, J. M. Gomes, P. M. Cabral, J. C. Pedro, Universidade de Aveiro, Aveiro, Portugal

WE3A-4: A New Description of Fast Charge-Trapping Effects in GaN FETs
G. Bosi, A. Raffo, V. Vadalà, G. Vannini, *University of Ferrara, Ferrara, Italy*

WE3A-5: AlGaIn/GaN HEMT Nonlinear Model Fitting Including a Trap Model
J. Tarazi^{1,2}, B. K. Schwitter², A. E. Parker¹, S. J. Mahon², ¹Macquarie University, Sydney, Australia, ²Macom Technology Solutions Inc., Sydney, Australia

WE3A-6: Extraction of Accurate GaN HEMT Model for High-Efficiency Power Amplifier Design
V. Vadalà¹, A. Raffo¹, G. Avolio², M. Marchetti³, D. Schreurs², G. Vannini¹, ¹University of Ferrara, Ferrara, Italy, ²KU Leuven, Leuven, Belgium, ³Anteverta-mw B.V., Delft, Netherlands

WE3B: Low Noise Achievements Across Device Technologies
Chair: Luciano Boglione, *Naval Research Laboratory*
Co-Chair: Francois Danneville, *IEMN, UMR CNRS 8520*

WE3B-1: An MMIC Low-Noise Amplifier Design Technique
M. Varonen^{1,2}, R. Reeves³, P. Kangaslahti², L. Samoska², K. Cleary³, A. Akgiray³, R. Gawande³, A. Fung², T. Gaier², S. Weinreb³, A. Readhead³, C. Lawrence², S. Sarkozy⁴, R. Lai⁴, ¹Aalto University, Espoo, Finland, ²Jet Propulsion Laboratory, Pasadena, United States, ³California Institute of Technology, Pasadena, United States, ⁴Northrop Grumman Corporation, Redondo Beach, United States

WE3B-2: A High-Gain Low-Noise Distributed Amplifier with Low DC Power in 0.18- μ m CMOS for Vital Sign Detection Radar
T. Huang, Y. Lin, J. Cheng, J. Kao, T. Huang, H. Wang, *National Taiwan University, Taipei, Taiwan*

WE3B-3: A BiCMOS Monolithic Ka-Band Down-Converter for Satellite Communication Systems
P. Wang¹, Y. Shen¹, M. Chou¹, T. Wu¹, Y. Chang^{1,2}, D. Chang², S. S. Hsu¹, ¹National Tsing Hua University, Hsinchu, Taiwan, ²National Applied Research Laboratories, Hsinchu, Taiwan

WE3B-4: Robust Stacked GaN-Based Low-Noise Amplifier MMIC for Receiver Applications
C. Andrei¹, O. Bengtsson², R. Doerner², M. Rudolph^{1,2}, ¹Brandenburg University of Technology, Cottbus, Germany, ²Ferdinand-Braun-Institute, Berlin, Germany

WE3C: New Advances in Reconfigurable Integrated Filters
Chair: Shamsur Mazumder
Co-Chair: Xun Gong

WE3C-1: Integrated C-Band (4-8 GHz) Frequency-Tunable & Bandwidth-Tunable Active Band-Stop Filter in 0.13- μ m SiGe BiCMOS
L. Mohammadi, K. Koh, *Virginia Tech, Blacksburg, United States*

WE3C-2: Compact Tunable Bandstop Filter with Wideband Balun using IPD Technology for Frequency Agile Applications
K. Wong¹, R. Mansour¹, G. Weale², ¹University of Waterloo, Waterloo, Canada, ²ON Semiconductor, Waterloo, Canada

WE3C-3: 1-2 GHz Tuning Frequency Band Pass Filter with Controllable Pass Band and High Stopband Rejection
J. Chen¹, C. Chen¹, ¹Wright State University, Fairborn, United States, ²Wright State University, Fairborn, United States

WE3C-4: Integrated Non-Reciprocal Dual H- and E-Field Tunable Bandpass Filter with Ultra-Wideband Isolation
H. Lin¹, J. Wu², X. Yang², Z. Hu¹, T. Nan¹, S. Emori¹, Y. Gao¹, R. Guo¹, X. Wang¹, N. X. Sun¹, ¹Northwestern University, Boston, United States, ²Avago Technologies, San Jose, United States, ³University of California Los Angeles, Los Angeles, United States

WE3C-5: Design of High-Q Absorptive Bandstop Filters with Static and Reconfigurable Attenuation
D. Psychogiou¹, R. Gómez-García², D. Scarbrough³, C. L. Goldsmith³, D. Peroulis¹, ¹Purdue University, West Lafayette, United States, ²University of Alcalá, Alcalá de Henares, Spain, ³MEMtronics Corporation, Dallas, United States

WE3D: Microwave Techniques and Systems for Wireless Health Monitoring
Chair: Changzhi Li, *Texas Tech University*
Co-Chair: H. Alfred Hung, *ARL*

WE3D-1: Non-Invasive Detection of Cardiac and Respiratory Rates from Stepped Frequency Continuous Wave Radar Measurements using the State Space Method
L. Ren¹, H. Wang², K. Naishadham², Q. Liu³, A. Fathy¹, ¹University of Tennessee, Knoxville, United States, ²Georgia Institute of Technology, Atlanta, United States, ³Beijing Institute of Technology, Beijing, China

WE3D-2: A Wireless ECG Recording System for Small Animal Models of Heart Regeneration
H. Cao¹, Y. Zhao¹, A. B. Kouki¹, Y. Tai³, T. K. Hsiai⁴, ¹ETS, Montreal, Canada, ²Shenzhen Institutes of Advanced Technology, Shenzhen, China, ³Caltech, Pasadena, United States, ⁴UCLA, Los Angeles, United States

WE3D-3: Dual-Mode Wireless Sensor Network for Real-time Contactless Indoor Health Monitoring
M. Mercuri¹, M. Rajabi¹, P. Karsmakers¹, P. Soh², B. Vanrumste¹, P. Leroux¹, D. Schreurs¹, ¹KU Leuven, Leuven, Belgium, ²Universiti Malaysia Perlis, Perlis, Malaysia

WE3D-4: A Phased Array Non-Contact Vital Sign Sensor with Automatic Beam Steering
T. J. Hall, B. T. Nukala, C. Stout, N. Brewer, J. Tsay, J. Lopez, R. Banister, T. Nguyen, D. Lie, *Texas Tech University, Lubbock, United States*

WE3D-5: Digitally Assisted Low IF Architecture for Noncontact Vital Sign Detection
C. Wei, J. Lin, *University of Florida, Gainesville, United States*

WE3D-6: AC Coupled Quadrature Doppler Radar Displacement Estimation
X. Gao, O. Boric-Lubecke, *University of Hawaii at Manoa, Honolulu, United States*

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Technical Sessions

1330-1510

Room: 126 ABC

Room: 125 AB

Room: 122 ABC

Room: 121 ABC

WE3E: Special Tribute Session to Prof. John R. Tucker
 Chair: Gregory Lyons, *MIT Lincoln Laboratory*
 Co-Chair: Marian Pospieszalski, *National Radio Astronomy Observatory*

WE3F: Phased Array and Integration Techniques
 Chair: Glenn D. Hopkins, *Georgia Tech Research Institute*
 Co-Chair: Wayne A. Shiroma, *University of Hawaii*

WE3G: Frequency Conversion and Control Circuits
 Chair: Hiroshi Okazaki, *NTT DOCOMO, INC.*
 Co-Chair: Chinchun Meng, *National Chiao Tung University*

WE3H: New Advancements in Optical Modulation, Tunable GaN Amplification, and Plasma Monitoring
 Chair: Ken Mays, *Sonnet Software*
 Co-Chair: Ajay Poddar, *Synergy*

WE3E-1: The Genesis of SIS Mixers – The Legacy of John Tucker in Radio Astronomy
 A. R. Kerr¹, S. Pan¹, G. Lyons², ¹*National Radio Astronomy Observatory, Charlottesville, United States*,
²*MIT Lincoln Laboratory, Lexington, United States*

WE3F-1: Transmit/Receive (T/R) Modules Architectures for Dual-Polarized Weather Phased Array Radars
 J. L. Salazar-Cerreno¹, R. H. Medina², E. Loew³,
¹*University of Oklahoma, Norman, United States*,
²*University of Puerto Rico Mayaguez, Mayaguez, United States*,
³*National Center for Atmospheric Research (NCAR), Boulder, United States*

WE3G-1: A W-Band High Conversion Gain, Single-Balanced Subharmonically Gate-Pumped Mixer with Novel Size-Reduced Marchand Balun
 J. Zhang, Y. Ye, X. Sun, *Shanghai Institute of Microsystem and Information Technology, Shanghai, China*

WE3H-1: A 40 Gb/s 4 Vpp IQ Modulator Driver in 0.13 μm SiGe:C BiCMOS Technology for 25 Ω Mach Zehnder Modulators
 P. Rito, I. García López, D. Micusik, J. Borngräber, L. Zimmermann, *IHP, Frankfurt (Oder), Germany*

1330-1350

WE3E-2: Millimeter Radio Astronomy and the Genesis of ALMA
 R. L. Dickman, *National Radio Astronomy Observatory, Charlottesville, United States*

WE3F-2: A 60 GHz 64-Element Wafer-Scale Phased-Array with Full-Reticle Design
 S. Zihir¹, O. D. Gurbuz², A. Karrooy², S. Raman³, G. Rebeiz¹,
¹*University of California San Diego, La Jolla, United States*,
²*TowerJazz, Newport Beach, United States*,
³*Virginia Tech, Arlington, United States*

WE3G-2: A 60-GHz Vector Summing Phase Shifter with Digital Tunable Current-Splitting and Current-Reuse Techniques in 90 nm CMOS
 Y. Yu, Q. Zheng, K. Kang, C. Zhao, *University of Electronic Science and Technology of China, Chengdu, China*

WE3H-2: Microfluidically Reconfigurable GaN Power Amplifier on Multilayer Organic Substrate for L-Band and C-Band Applications
 O. Lemtiri Chlieh, W. T. Khan, J. Papapolymerou, *Georgia Institute of Technology, Atlanta, United States*

1350-1410

WE3E-3: The High-Frequency Limits of SIS Receivers
 J. Zmuidzinas, *California Institute of Technology, Pasadena, United States*

WE3F-3: Design of a Compact, Low Complexity Scalable Phased Array Antenna
 F. Akbar, A. Mortazawi, *University of Michigan, Ann Arbor, United States*

WE3G-3: A High Suppression Frequency Tripler for 60-GHz Transceivers
 N. Mazor, O. Katz, B. Sheinman, R. Carmon, R. Ben-Yishay, R. Levinger, S. Pivnik, A. Bruebart, D. Elad, *IBM Haifa Labs, Haifa, Israel*

WE3H-3: Size Reduction and Dual Mode Degeneracy in Microstrip Patch Antenna using Periodically Rippled Silicon Substrate
 M. Yazdani, A. Navabi, P. Khalili, K. L. Wang, *University of California Los Angeles, Los Angeles, United States*

1410-1430

WE3E-4: ALMA Band 9 Receiver Design and Performance
 A. Baryshev^{2,2}, R. Hesper¹, T. Klapwijk³, W. Wild^{4,2},
¹*kapteyn Astronomical Institute, Groningen, Netherlands*,
²*SRON, Groningen, Netherlands*,
³*Delft Technical University, Delft, Netherlands*,
⁴*ESO, Garching, Greece*

WE3F-4: Indented Quasi-Yagi Antenna Array for High-Isolation Full-Duplex Radios
 Q. Xu, S. Qin, Y. E. Wang, *UCLA, Los Angeles, United States*

WE3G-4: A 31.2% Locking Range K-Band Divide-by-6 Injection-Locked Frequency Divider Using 90 nm CMOS Technology
 C. Chan, H. Chang, *National Central University, Jhongli, Taiwan*

WE3H-4: Parallelization Concept for Spatially Resolved In-Situ Plasma Measurements
 C. Schulz, J. Runkel, I. Rolfes, *Ruhr-University Bochum, Bochum, Germany*

1430-1450

WE3E-5: SuperCam: A 64 Pixel SIS Receiver Array for Submillimeter-Wave Astronomy
 C. K. Walker, *University of Arizona, Tucson, United States*

WE3F-5: Phase Compensated Serially Fed Array Using the Antenna as a Part of Negative Group Delay Circuit
 A. Taslimi, W. Alomar, A. Mortazawi, *University of Michigan, Ann Arbor, United States*

WE3G-5: Method to Reduce Control Voltage for High Power GaN RF Switches
 C. F. Campbell, *Qorvo, Richardson, United States*

WE3H-5: A 2.5 Vppd Broadband 32 GHz BiCMOS Linear Driver with Tunable Delay line for InP Segmented Mach Zehnder Modulators
 I. García López, P. Rito, D. Micusik, J. Borngräber, L. Zimmermann, *IHP, Frankfurt Oder, Germany*

1450-1500

WE3E-6: Ultra-Wide IF Bandwidth - The Next Frontier for SIS Receivers
 C. E. Tong, P. K. Grimes, J. Weintraub, R. Blundell, *Harvard-Smithsonian Center for Astrophysics, Cambridge, United States*

WE3F-6: A Linear Polarization Continuously Sweeping Antenna with a Variable Power Divider Based on CRLH Transmission Line
 Y. Jiang, X. Lin, Y. Fan, *University of Electronic Science and Technology of China, Chendu, China*

1500-1510

Wednesday

Technical Sessions

1555-1715

Room: 132 ABC

Room: 131 ABC

Room: 128 AB

Room: 127 ABC

1555-1615

1615-1635

1635-1645

1645-1655

1655-1705

1705-1715

	Room: 132 ABC	Room: 131 ABC	Room: 128 AB	Room: 127 ABC
	<p>WE4A: Advances in Non-Foster Networks and their Applications Chair: Jay Banwait, <i>SSLMDA</i> Co-Chair: Stephen D. Stearns, <i>Northrop Grumman</i></p>	<p>WE4B: New VCO Approaches using BiCMOS, CMOS and GaN Technologies up to Ku Band Chair: Brad Nelson, <i>Qorvo</i> Co-Chair: Danny Elad, <i>IBM</i></p>	<p>WE4C: Terahertz Plasmonics for Ultra High Speed Wireless and Other Applications Chair: Taiichi Otsuji, <i>Tohoku University</i> Co-Chair: Michael Shur, <i>RPI</i></p>	<p>WE4D: Multi-Band Filters and Multiplexers Chair: Christopher Galbraith, <i>MIT Lincoln Laboratory</i> Co-Chair: Kamal Samanta, <i>Milmeqa Ltd UK</i></p>
1555-1615	<p>WE4A-1: Stability Analysis and Parasitic Effects of Negative Impedance Converter Circuits Q. Tang, H. Xin, <i>University of Arizona, Tucson, United States</i></p>	<p>WE4B-1: Electronic Frequency Tuning of a High-Power 2.45GHz GaN Oscillator C. Bansleben, W. Heinrich, <i>Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik, Berlin, Germany</i></p>	<p>WE4C-1: 3.8 mW Terahertz Radiation Generation over a 5 THz Radiation Bandwidth through Large Area Plasmonic Photoconductive Antennas N. T. Yardimci, M. Jarrahi, <i>University of California Los Angeles, Los Angeles, United States</i></p>	<p>WE4D-1: A Multilayered Triplexer based on Interdigital Filter Topology with PCB Technology S. C. Aksoy, I. Yildiz, <i>Meteksan Defence Ind. Inc., Ankara, Turkey</i></p>
1615-1635	<p>WE4A-2: Successful Realization of Non-Foster Circuits for Wideband Antenna Applications A. M. Elfrgani, R. G. Rojas, <i>The Ohio State University, Columbus, United States</i></p>	<p>WE4B-2: Low Phase Noise Power-Efficient MMIC GaN-HEMT Oscillator at 15 GHz based on a Quasi-Lumped On-Chip Resonator M. Hörberg^{1,2}, D. Kuylenstierna¹, ¹<i>Chalmers University of Technology, Gothenburg, Sweden</i>, ²<i>Ericsson AB, Gothenburg, Sweden</i></p>	<p>WE4C-2: Characterization of Integrated Antenna-Coupled Plasma-Wave Detectors with Wide Bandwidth Amplification in 130nm CMOS S. Nahar¹, D. Coquillat², S. Blin³, A. Pénarier³, W. Knap², M. M. Hella¹, ¹<i>Rensselaer Polytechnic Institute, Troy, United States</i>, ²<i>L2C, Université Montpellier 2, Montpellier, France</i>, ³<i>IES, Université Montpellier 2, Montpellier, France</i></p>	<p>WE4D-2: Design of Six-Channel Triplexer Based on Multipath-Embedded Stub Loaded Resonators Y. Chen¹, C. Lin², Z. Dai², L. Jian², H. Wu², H. Lee¹, ¹<i>Cheng Kung University, Tainan City, Taiwan</i>, ²<i>Kun Shan University, Tainan City, Taiwan</i></p>
1635-1645	<p>WE4A-3: An S-Band Negative-Inductance Integrated Circuit C. R. White, M. W. Yung, <i>HRL Laboratories, LLC, Malibu, United States</i></p>	<p>WE4B-3: Two Compact Power-Combining CMOS VCOs with excellent 2nd-Harmonic Rejection using Three-Conductor Coupled Line R. Chang, S. Wang, C. Teng, <i>National Taipei University of Technology, Taipei, Taiwan</i></p>	<p>WE4C-3: InGaAs channel HEMTs for Photonic Frequency Double Mixing Conversion over the Sub-THz Band T. Kawasaki¹, T. Yoshida¹, T. Watanabe¹, K. Sugawara¹, H. Wako¹, J. Kani², J. Terada², S. Kuwano², K. Iwatsuki³, T. Suemitsu¹, T. Otsuji^{3,1}, ¹<i>Tohoku University, Sendai, Japan</i>, ²<i>NTT Corporation, Yokosuka, Japan</i>, ³<i>Tohoku University, Sendai, Japan</i></p>	<p>WE4D-3: Compact Microstrip Diplexer Based on a Novel Coupling Topology W. Jiang¹, L. Zhou², G. Wang¹, ¹<i>Smart Microwave and RF Technology Lab, Columbia, United States</i>, ²<i>Key Laboratory of Ministry of Education of Design and Electromagnetic Compatibility of High Speed Electronic Systems, Shanghai, China</i></p>
1645-1655				<p>WE4D-4: Collinearly Fed Dual-Mode Dual-Band Bandpass Filter based on a Quadruple-Mode Half-Circular Ring Resonator F. Liu², H. Li², D. Li¹, ¹<i>EHF Key Lab of Science, Chengdu, China</i>, ²<i>School of Electronic Engineering, Chengdu, China</i></p>
1655-1705	<p>WE4A-4: Stability Criteria for Power Amplifiers under Mismatch Effects A. Suarez, F. Ramirez, S. Sancho, <i>Universidad de Cantabria, Santander, Spain</i></p>	<p>WE4B-4: A New Class-C Very Low Phase-Noise Ku-band VCO in 0.25 μm SiGe:C BiCMOS Technology J. Hyvert^{1,2}, D. Cordeau², J. Paillot², P. Philippe¹, ¹<i>NXP Semiconductors, Caen, France</i>, ²<i>University of Poitiers, CNRS-XLIM UMR 7252, Angouleme, France</i></p>		<p>WE4D-5: Compact, Quasi-Elliptic Dual-Band Bandpass Filter with Improved Isolation S. Cheap, P. Wong, <i>Universiti Teknologi PETRONAS, Tronoh, Malaysia</i></p>
1705-1715				<p>WE4D-6: Dual-Mode Dual-Band Balanced Filter with High Differential-Mode Frequency Selectivity and Enhanced Common-Mode Suppression W. Jiang, G. Wang, <i>Smart Microwave and RF Technology Lab, Columbia, United States</i></p>

Technical Track Key:

Field, Device and Circuit Tech.

Passive Components

Active Components

Systems & Applications

Emerging Technical Areas

Special Sessions

Wednesday

Technical Sessions

1555-1715

Room: 125 AB	Room: 122 ABC	Room: 121 ABC	
<p>WE4F: 100 Gbps Wireless Technologies Chair: Jeffrey Nanzer, <i>Johns Hopkins University APL</i> Co-Chair: Martin Vossiek, <i>University of Erlangen</i></p>	<p>WE4G: System and Circuit Trends in 3D Printed Technology Chair: Telesphor Kamgaing, <i>Intel Corporation</i> Co-Chair: Rashaunda Henderson, <i>University of Texas at Dallas</i></p>	<p>WE4H: Emerging Technologies for Energy Harvesting Chair: Brian Sequeira, <i>JHU/APL</i> Co-Chair: Zaher Bardai, <i>IMN Epiphany</i></p>	
<p>WE4F-1: Integrated Millimeter-Wave Transceiver Concepts and Technologies for Wireless Multi-Gbps Communication D. Kissinger^{1,2}, T. Girg³, C. Beck³, I. Nasr⁴, H. Forstner⁴, M. Wojnowski⁴, K. Pressel⁵, R. Weigel⁶, ¹<i>IHP, Frankfurt (Oder), Germany</i>, ²<i>Technische Universität Berlin, Berlin, Germany</i>, ³<i>FAU Erlangen-Nuremberg, Erlangen, Germany</i>, ⁴<i>Infineon Technologies, Neubiberg, Germany</i>, ⁵<i>Infineon Technologies, Regensburg, Germany</i></p>	<p>WE4G-1: 3D/Inkjet-Printed Origami Antennas for Multi-Direction RF Harvesting J. Kimionis¹, A. Georgiadis², M. Isakov³, H. J. Qi³, M. M. Tentzeris¹, ¹<i>Georgia Institute of Technology, Atlanta, United States</i>, ²<i>Centre Tecnologic de Telecomunicacions de Catalunya, Castelldefels, Spain</i>, ³<i>Georgia Institute of Technology, Atlanta, United States</i></p>	<p>WE4H-1: Multi-Knots Möbius Strips: Applications in Oscillator Circuits A. K. Poddar¹, U. L. Rohde², ¹<i>Synergy Microwave Corp., Paterson, United States</i>, ²<i>Brandenburg University of Technology, Cottbus, Germany</i></p>	1555-1615
<p>WE4F-2: Concept for a Novel Low-Complexity QAM Transceiver Architecture Suitable for Close to Transition Frequency Operation C. Carlowitz, M. Vossiek, <i>Friedrich-Alexander University Erlangen-Nürnberg (FAU), Erlangen, Germany</i></p>	<p>WE4G-2: Ka-Band Characterization and RF Design of Acrylonitrile Butadiene Styrene (ABS) A. L. Vera Lopez¹, E. A. Rojas Nastrucci², T. Weller³, J. Papapolymerou¹, ¹<i>Georgia Institute of Technology, Atlanta, United States</i>, ²<i>University of South Florida, Tampa, United States</i></p>	<p>WE4H-2: 1-TX and 2-RX In-Band Full-Duplex Radio Front-End With 60 dB Self-Interference Cancellation D. Lee, B. Min, <i>Yonsei University, Seoul, Republic of Korea</i></p>	1615-1635
<p>WE4F-3: Ultra-Compact High Speed mmW Transceiver Using GaN Power Amplifier Technology A. K. Brown, K. W. Brown, T. B. Feenstra, D. M. Gritters, E. H. Ko, S. A. O'Connor, A. L. Pierce, A. R. Sanders, M. J. Sotelo, <i>Raytheon Missile Systems, Rancho Cucamonga, United States</i></p>	<p>WE4G-3: Inkjet-Printed Trisection Bandpass Filter on Multilayer Liquid Crystal Polymer Substrate H. Kao¹, C. Cho², L. Chang³, Y. Wu², ¹<i>Chang Gung University, Tao-Yuan, Taiwan</i>, ²<i>National Tsing Hua University, Hsin-Chu, Taiwan</i>, ³<i>Ming Chi University of Technology, New Taipei, Taiwan</i></p>	<p>WE4H-3: On-Chip Non-Reciprocal Components Based on Angular-Momentum Biasing N. A. Estep, D. L. Sounas, A. Alu, <i>The University of Texas at Austin, Austin, United States</i></p>	1635-1645
			1645-1655
<p>WE4F-4: Photonic Millimeter Wave System for High Capacity Wireless Communications T. R. Clark, T. P. McKenna, J. A. Nanzer, <i>JHU Applied Physics Laboratory, Laurel, United States</i></p>	<p>WE4G-4: 40 GHz Laminate Power Divider Circuits using Integrated Resistors J. Arzola, C. Miller, R. Henderson, <i>University of Texas at Dallas, Richardson, United States</i></p>	<p>WE4H-4: High Cut-Off Frequency RF Switches integrating a Metal-Insulator Transition Material A. Mennai, A. Bessaudou, F. Cosset, C. Guines, D. Passerieux, P. Blondy, A. Crunteanu, <i>XLIM Research Institute - CNRS/ University of Limoges, 123 Av. Albert Thomas, France</i></p>	1655-1705
		<p>WE4H-5: Cooperative Integration of Harvesting Sections for Passive RFID Communication G. Andia-Vera¹, Y. Duroc^{2,3}, A. Georgiadis³, S. Tedjini¹, ¹<i>University of Grenoble, Alpes, LCIS, Valence, France</i>, ²<i>University Claude Bernard Lyon, Villeurbanne, France</i>, ³<i>Centre Tecnologic de Telecomunicacions de Catalunya, Castelldefels, Spain</i></p>	1705-1715

Technical Track Key:

Field, Device and Circuit Tech.	Passive Components	Active Components	Systems & Applications	Emerging Technical Areas	Special Sessions
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INTERACTIVE FORUM

Wednesday | Time: 1400-1600

Room: Hall 6

Chair: Jason Stillwell, *General Dynamics*

Co-Chair: Monica CdeBaca, *Freescale*

WEPC: An Improved Fabrication Method of High-k and Low-Loss Polymer Composites with Sintered Ceramic Fillers for Microwave Applications

J. Castro, J. Wang, T. Weller, *Center for Wireless and Microwave Information Systems, Tampa, United States*

WEPG: Temperature Dependent Characteristics of Intrinsically Switchable Ferroelectric Composite FBARS

S. Lee, M. Zolfaghar, S. A. Sis, V. Lee, A. Mortazawi, *The University of Michigan, Ann Arbor, United States*

WEPJ: A X-Band GaN Power Amplifier with Bitstream Modulations and Active Noise Filtering

Y. Song, Z. Rui, Y. E. Wang, *University of California Los Angeles, Los Angeles, United States*

WEPM: Microstrip Patch Antennas Feed to Optical Waveguides in Electro-Optic Modulator for Millimeter-Wave Radar System

Y. N. Wijayanto¹, A. Kanno¹, T. Kawanishi¹, H. Murata², Y. Okamura², ¹National Institute of Information and Communications Technology, Koganei, Japan, ²Osaka University, Toyonaka, Japan

WEPD: Decorrelation and Mitigation of Spurious Products in Phased Arrays with Direct Conversion Transceivers

B. A. James, C. J. Fulton, *The University of Oklahoma, Norman, United States*

WEPH: A Q-Band RF-MEMS Tapered True Time Delay Line for Fusion Plasma Diagnostics Systems

D. Fu, Y. A. Bey, C. Domier, N. C. Luhmann, X. Liu, *University of California Davis, Davis, United States*

WEPK: Electronically Beam Steerable Lens Antenna for 71-76/81-86 GHz Backhaul Applications

A. Artemenko, A. Mozharovskiy, V. Ssorin, A. Sevastyanov, R. Maslennikov, *Radio Gigabit Inc., Nizhny Novgorod, Russian Federation*

WEPN: Oscillator Phase Noise Reduction using Optical Feedback with Dual Drive Mach-Zehnder Modulator

T. Sun¹, L. Zhang¹, K. Receveur¹, A. K. Poddar², U. L. Rohde², A. S. Daryoush¹, ¹Drexel University, Philadelphia, United States, ²Synergy Microwave Corp., Paterson, United States

WEPD: Tuning Limits of Shunt Varactor Diodes for Maintaining High OIP3 in Arbitrary Circuits

W. N. Allen, D. Peroulis, *Purdue University, West Lafayette, United States*

WEPH: Simple Creep Parameters Extraction in Metal Contact RF-MEMS Switches

E. Lemoine^{2,1}, A. Pothier¹, A. Crunteanu¹, P. Blondy¹, N. Saillen², L. Marchand², ¹XLIM - CNRS Universite de Limoges, Limoges, France, ²ESA - Estec, Noordwijk, Netherlands

WEPK: A Terahertz Reconfigurable Photo-Induced Fresnel-Zone-Plate Antenna for Dynamic Two-Dimensional Beam Steering and Forming

M. Shams, Z. Jiang, J. Qayyum, S. Rahman, P. Fay, L. Liu, *University of Notre Dame, Notre Dame, United States*

WEPF: Hybrid Structure-Based Broadband Field-Rotation Balun for Millimeter-Wave Applications

J. Moghaddasi, K. Wu, *Poly-Grames Research Center, Center for Radiofrequency Electronics Research of Quebec (CREER), Ecole Polytechnique (University of Montreal), Montreal, Canada*

WEPJ: Optimized Doherty Power Amplifier with a New Offset Line

Y. Park¹, J. Lee², S. Jee², S. Kim², B. Kim^{2,1}, ¹Pohang University of Science and Technology, Pohang, Republic of Korea, ²Pohang University of Science and Technology, Pohang, Republic of Korea

WEPK: On-Chip CMOS THz Resonant Cell Using Hybrid Coplanar-Waveguide T-Stub/Defected Ground Structure

X. Luo, *Delft University of Technology, Delft, Netherlands*

WEPF: A Wideband Microstrip Dual Balun Structure

P. Wu, S. Liao, Q. Xue, *City University of Hong Kong, Hong Kong, China*

WEPJ: 1 GHz Instantaneous Bandwidth Digital Pre-Distortion for Multi-Concurrent Channel Wideband Power Amplifiers

S. R. Velazquez¹, G. M. Hegazi², ¹Innovation Digital, San Diego, United States, ²Aethercomm, San Diego, United States

WEPK: Compact and Low-Loss Bandpass Filter Realized in Silica-Based Post-Wall Waveguide for 60-GHz applications

Y. Uemichi¹, O. Nukaga¹, K. Nakamura¹, X. Han¹, R. Hosono¹, N. Guan¹, S. Amakawa², ¹Fujikura Ltd., Sakura-shi, Japan, ²Hiroshima University, Higashihiroshima-shi, Japan

WEPG: Liquid Crystal Enabled Substrate Integrated Waveguide Variable Phase Shifter for Millimeter-Wave Application at 60GHz and Beyond

K. Wang, K. Wu, *Poly-Grames Research Center, Montreal, Canada*

WEPJ: P-Band GaN High Power Amplifiers for Space-Borne Radar Applications

N. Ayllon¹, P. Arpesi², ¹European Space Agency (ESA-ESTEC), Noordwijk, Netherlands, ²Selex-ES, Nerviano, Italy

WEPK: A V-Band Compact Bandpass Filter in Si-BCB Technology using the Coupled-line Resonators

C. Yoo¹, J. Park², Y. Rhee³, K. Seo⁴, ¹Korea Electronics Technology Institute, Seongnam-si, Republic of Korea, ²Wavetech, Anyang-si, Republic of Korea, ³Kyungnam University, Changwon-si, Republic of Korea, ⁴Seoul National University, Seoul, Republic of Korea

INTERACTIVE FORUM

Wednesday | Time: 1400-1600

Room: Hall 6

Chair: Jason Stillwell, *General Dynamics*

Co-Chair: Monica CdeBaca, *Freescale*

WEPN: Digital Predistorter Characterization Using Extended Orthogonal Chebyshev Polynomials

L. Ding, F. Mujica, Z. Yang, *Texas Instruments, Dallas, United States*

WEPS: Compact Quasi-Chipless Harmonic Radar Sensor with a Dielectric Resonator Antenna

B. Kubina, M. Schüßler, C. Mandel, R. Jakoby, *TU Darmstadt, Darmstadt, Germany*

WEPX: Self-Powered Batteryless Wireless Communication Systems for Internet of Things Based on Piezoelectric Energy Harvester

K. Chen, J. Chen, Y. Yeh, Y. Chen, C. Yang, *National Cheng Kung University, Tainan, Taiwan*

WEPQ: High Frequency Microfluidic Biosensors for Intracellular Dielectric Spectroscopy

J. Leroy¹, A. Landoulsi¹, F. Hjeij¹, C. Melin², C. Dalmay¹, A. Bessaudou¹, F. Lalloué², P. Blondy¹, A. Pothier¹, ¹XLIM – UMR 7252 Limoges University / CNRS, Limoges, France, ²Homéostasie cellulaire et Pathologies EA 3842, Limoges University, Limoges, France

WEPS: A Novel Time Domain Reflectometry Based Chipless RFID Soil Moisture Sensor

S. Dey, P. Kalansuriya, N. C. Karmakar, *Monash University, Melbourne, Australia*

WEPQ: Microwave Hyperthermia versus Nanosecond Pulsed Electric Field for In Vivo Tumors Applications

M. Soueïd¹, J. Jacques², C. Yardin³, S. Fontanier², R. O'Connor², P. Leveque¹, D. Aumaud-Comos¹, ¹XLIM, Université de Limoges - CNRS, Limoges, France, ²LABEX Sigma-LIM, Limoges, France, ³Université Limoges, CHU Limoges, Équipe de Recherche Médicale Appliquée, Limoges, France

WEPT: Development of a Microwave System for In-Situ Dielectric and Calorimetric Measurements

V. Ramopoulos¹, S. Soldatov¹, G. Link¹, T. Kayser¹, M. Gehringer¹, J. Jelonnek^{1,1}, ¹Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany, ²Karlsruhe Institute of Technology, Karlsruhe, Germany

WEPQ: Microwave Heater at 20 GHz for Nanoliter Scale Digital Microfluidics

T. Marković¹, S. Liu¹, P. Barmuta¹, I. Ocket^{2,1}, M. Cauwe³, D. Schreurs¹, B. Nauwelaers¹, ¹KU Leuven, Leuven, Belgium, ²Imec, Leuven, Belgium, ³Ghent University, Ghent, Belgium

WEPT: Cylindrical Cavity Microwave Power Combiner with Microstrip Line Inputs and Rectangular Waveguide Output

V. Ravindra¹, J. Hirokawa², Z. Miao², H. Saito^{3,1}, ¹University of Tokyo, Tokyo, Japan, ²Tokyo Institute of Technology, Tokyo, Japan, ³Institute of Space and Astronautical Science / Japan Aerospace Exploration Agency, Sagami-hara, Japan

WEPR: QPSK-OFDM Carrier Aggregation Using a Single Transmission Chain

M. Abdi Abyaneh, B. Huyart, J. Cousin, *Telecom-Paristech, Paris, France*

WEPV: 3D Printing for Microwave: Materials Characterization and Application in the Field of Absorbers

Y. Arbaoui, V. Laur, A. Maalouf, P. Queffelec, *Lab-STICC / UBO, Brest, France*

WEPR: A Study on Novel Low Rx-Band Noise Power Amplifier for Reconfigurable RF Front-End Circuit

H. Obiya, S. Hitomi, T. Wada, Y. Kusumoto, M. Koshino, M. Kawashima, *Murata, Nagaokakyo-shi, Japan*

WEPV: Low-Cost mm-Wave Coplanar Waveguide Bandpass Filter using Inkjet Printing of Silver Nano-Particles on Flexible Plastic Substrate

K. Hettak¹, T. Ross², ¹Communication Research Centre, Ottawa, Canada, ²Carleton University, Ottawa, Canada

Thursday

Technical Sessions

0800-0940

Room: 132 ABC

Room: 131 ABC

Room: 128 AB

Room: 127 ABC

0800-0820

0820-0840

0840-0900

0900-0920

0920-0930

0930-0940

<p>TH1A: High Performance Microwave Measurement Chair: Andrea Ferrero, <i>Keysight Technologies</i> Co-Chair: Nuno Carvalho, <i>Universidade de Aveiro</i></p>	<p>TH1B: Novel Compound Semiconductor Devices and Circuits Chair: Shahed Reza, <i>Raytheon Company</i> Co-Chair: Amin Ezzeddine, <i>Amcom Communications</i></p>	<p>TH1C: CMOS, Reconfigurable and Active Transmission Line Techniques Chair: George Eleftheriades, <i>University of Toronto</i> Co-Chair: Luca Perreggini, <i>University of Pavia</i></p>	<p>TH1D: Planar Filter Design and Techniques Chair: H. Clark Bell, <i>HF+</i> Co-Chair: Magdalena Salazar-Palma, <i>Universidad Carlos III de Madrid</i></p>
<p>TH1A-1: Traceable Phase Calibration of a Wide-Bandwidth Microwave Vector Signal Analyzer M. Vanden Bossche¹, F. Verbeyst¹, A. Samant², ¹National Instruments Belgium, Zaventem, Belgium, ²National Instruments, Austin, United States</p>	<p>TH1B-1: High Power Fast Flexible Electronics: Transparent RF AlGaIn/GaN HEMTs on Plastic Substrates T. Chang¹, K. Xiong¹, S. Park², H. Mi¹, H. Zhang¹, S. Mikael¹, Y. Jung¹, J. Han², Z. Ma¹, ¹University of Wisconsin-Madison, Madison, United States, ²Yale University, New Haven, United States</p>	<p>TH1C-1: An Accurate Parametric Electrical Model for Slow-Wave CPW A. Bautista¹, A. Franc², P. Ferrari¹, ¹Université Grenoble-Alpes, IMEP-LAHC, Grenoble, France, ²Université de Toulouse; INPT, UPS; LAPLACE, Toulouse, France</p>	<p>TH1D-1: Lowloss Planar Bandpass Filters for Millimeter-Wave Application M. Sharifi Sorkherizi, A. Kishk, <i>Concordia University, Montreal, Canada</i></p>
<p>TH1A-2: An I/Q-Mixer-Steering Interferometric Technique for High-Sensitivity Measurement of Extreme Impedances G. Vlachogiannakis, H. Thippur Shivamurthy, M. Alonso Del Pino, M. Spirito, <i>Delft University of Technology, Delft, Netherlands</i></p>	<p>TH1B-2: Stacked GaAs pHEMTs: Design of K-band Power Amplifier and Experimental Characterization of Mismatch Effects T. Fersch¹, R. Quaglia², M. Pirola², V. Camarchia², C. Ramella², G. Ghione¹, ¹University of Erlangen-Nuremberg, Erlangen, Germany, ²Politecnico di Torino, Torino, Italy</p>	<p>TH1C-2: Liquid-Metal-Based Phase Shifter with Reconfigurable EBG Filling Factor J. H. Dang, A. M. Morishita, R. C. Gough, A. T. Ohta, W. A. Shiroma, <i>University of Hawaii at Manoa, Honolulu, United States</i></p>	<p>TH1D-2: A Novel Planar Contiguous Diplexer DC-67-100 GHz Using Organic Liquid Crystal Polymer (LCP) I. Ashiq, A. Khanna, <i>National Instruments, Santa Clara, United States</i></p>
<p>TH1A-3: Improved Characterization of Differential Multi-GHz Integrated Amplifiers and Filters N. Rajesh¹, S. Pavan¹, ¹Indian Institute of Technology Madras, Chennai, India, ²Indian Institute of Technology Madras, Chennai, India</p>	<p>TH1B-3: A H-Band Vector Modulator MMIC for Phase-Shifting Applications D. Mueller¹, A. Tessmann², A. Leuther², T. Zwick¹, I. Kallfass¹, ¹Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, ²Fraunhofer Institute for Applied Solid-State Physics, Freiburg, Germany, ³University of Stuttgart, Stuttgart, Germany</p>	<p>TH1C-3: Analysis of a Frequency Divider by Two based on a Differential Nonlinear Transmission Line M. Ponton, A. Suarez, <i>University of Cantabria, Santander, Spain</i></p>	<p>TH1D-3: Design of a Chebyshev Microstrip Filter using the Reflected Group Delay Method and the Aggressive Space Mapping Technique X. Fan, P. D. Laforge, <i>University of Regina, Regina, Canada</i></p>
<p>TH1A-4: GaN Transistor Large-Signal Characterization Under Multi-Frequency Excitation S. R. Schafer, Z. Popovic, <i>University of Colorado Boulder, Boulder, United States</i></p>	<p>TH1B-4: Novel Destructive-Interference-Envelope Detector for High Data Rate ASK Demodulation in Wireless Communication Receivers F. Thome^{1,2}, S. Maroldt¹, O. Ambacher^{1,2}, ¹Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany, ²University of Freiburg, Freiburg, Germany</p>	<p>TH1C-4: Wideband CMOS Decoupling Power Line for Millimeter-Wave Applications S. Amakawa, R. Goda, K. Katayama, K. Takano, T. Yoshida, M. Fujishima, <i>Hiroshima University, Higashihiroshima, Japan</i></p>	<p>TH1D-4: Microwave Filter Design based on Coupling Topologies with Multiple Solutions M. Caenepeel^{1,2}, F. Seyfert², Y. Rolain¹, M. Olivi², ¹Vrije Universiteit Brussel, Elsene, Belgium, ²Inria Sophia Antipolis-Méditerranée, Sophia Antipolis, France</p>
<p>TH1B-5: Microwave Monolithic Integrated Gallium Nitride Switches for Low Static Power Reconfigurable Switch Matrix with Transparent State for Power Failure Redundancy S. Kaleem¹, M. Hein¹, J. Kühn², R. Quay², ¹Ilmenau University of Technology, Ilmenau, Germany, ²Fraunhofer Society for the advancement of applied research, Freiburg, Germany</p>	<p>TH1C-5: A 1-20 GHz, 400 ps True-Time Delay with Small Delay Error in 0.13 μm CMOS for Ultra-Broadband Phased Array Antennas F. Hu, K. Mouthaan, <i>National University of Singapore, Singapore, Singapore</i></p>	<p>TH1D-5: Double Conversion Method for Synthesis of Inverse Filters S. Saeedi^{1,1}, J. Lee^{2,2}, H. H. Sigmarsson^{1,1}, ¹The University of Oklahoma, Norman, United States, ²Korea University, Seoul, Republic of Korea</p>	

Technical Track Key:

Field, Device and Circuit Tech.

Passive Components

Active Components

Systems & Applications

Emerging Technical Areas

Special Sessions Tech

Thursday

Technical Sessions

0800-0940

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Room: 125 AB

Room: 122 ABC

<p>TH1E: The Evolution of Power Amplifiers: History, Innovations and Challenges 2 Chair: Edward C. Niehenke, <i>Niehenke Consulting</i> Co-Chair: James Komiak, <i>BAE Systems</i></p>	<p>TH1F: Energy Efficient and Controllable Microwave High Power Applications Chair: Monika Willert-Porada, <i>University of Bayreuth</i> Co-Chair: Vadim Yakovlev, <i>Worcester Polytechnic Institute</i></p>	<p>TH1G: Advances in Radar and Communications Systems Chair: Arne Jacob, <i>Hamburg University of Technology</i> Co-Chair: Martin Vossiek, <i>University of Erlangen</i></p>	<p>0800-0820</p>
<p>TH1E-1: The Doherty Power Amplifier - 1936 to the Present Day R. S. Pengelly, <i>Prism Consulting NC, LLC, Hillsborough, United States</i></p>	<p>TH1F-1: X-Band All-Waveguide Radial Combiner for High Power Applications R. Kazemi^{1,1}, A. E. Fathy^{2,2}, G. M. Hegazi^{3,3}, ¹University of Tabriz, Tabriz, Iran, ²University of Tennessee, Knoxville, United States, ³Aethercomm, Inc., Carlsbad, United States</p>	<p>TH1G-1: A 24 GHz SIMO Radar Tachometer for Precise Transponder Localization C. M. Reustle¹, D. Shmakov², M. Vossiek¹, ¹Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Erlangen, Germany, ²Symeo GmbH, Neubiberg, Germany</p>	
<p>TH1E-2: History and State-of-the-Art in Large Signal Modeling for RF/Microwave Power Amplifier Development M. Golio¹, L. Dunleavy^{2,4}, T. Gneiting³, ¹Golio Endeavors, Mesa, United States, ²Modelithics, Inc., Tampa, United States, ³AdMOS GmbH, Frickenhausen, Germany, ⁴University of South Florida, Tampa, United States</p>	<p>TH1F-2: Design of an Applicator for Microwave-Assisted Bituminous Surface Thermal Bonding B. Salski¹, M. Olszewska-Placha², J. Rudnicki², W. Gwarek¹, T. Karpisz¹, S. Reszewicz¹, ¹Warsaw University of Technology, Warsaw, Poland, ²QWED Sp. z o.o., Warsaw, Poland</p>	<p>TH1G-2: A Novel Interlaced Chirp Sequence Radar Concept with Range-Doppler Processing for Automotive Applications K. Thurn¹, D. Shmakov², G. Li¹, S. Max³, M. Meinecke³, M. Vossiek¹, ¹Friedrich-Alexander University Erlangen-Nürnberg (FAU), Erlangen, Germany, ²Symeo GmbH, Neubiberg, Germany, ³Volkswagen AG, Wolfsburg, Germany</p>	<p>0840-0900</p>
<p>TH1E-3: The Evolution of Linearizers for High Power Amplifiers A. Katz^{2,1}, D. Chokola¹, ¹Linearizer Technology, Inc., Hamilton, United States, ²The College of New Jersey, Ewing, United States</p>	<p>TH1F-3: Frequency Control over the Heating Patterns in a Solid-State Dual-Source Microwave Oven V. V. Yakovlev, <i>Worcester Polytechnic Institute, Worcester, United States</i></p>	<p>TH1G-3: Millimeter Wave Phase-Coded CW MIMO Radar Using Zero Correlation Zone Sequence Sets H. Haderer, R. Feger, C. Pfeffer, A. Stelzer, <i>Johannes Kepler University Linz, Linz, Austria</i></p>	
<p>TH1E-4: Digital Pre-Distortion of RF Power Amplifiers: Progress to Date and Future Challenges J. Wood, <i>Maxim Integrated, San Jose, United States</i></p>	<p>TH1F-4: Additive Manufacturing of Ceramic Composites by Laser Assisted Microwave Plasma Processing, LAMPP. M. A. Willert-Porada, A. A. Rosin, P. P. Pontiller, C. C. Richter, J. J. Böckler, <i>University of Bayreuth, Bayreuth, Germany</i></p>	<p>TH1G-4: A Packaged 86-98 GHz CMOS Transmitter for FMCW Radar Applications with 30 dBm of EIRP S. Jameson, E. Socher, <i>Tel Aviv University, Tel Aviv, Israel</i></p>	<p>0900-0920</p>
	<p>TH1F-5: Real-Time Impedance Measurement and Frequency Control in an Automotive Plasma Ignition System R. Williams¹, Y. Ikeda², ¹IXP Semiconductors, Smithfield, United States, ²Imaging Inc, Kobe, Japan</p>	<p>TH1G-5: A Wideband and Low Power Dual-Band ASK Transceiver for Intra/Inter-Chip Communication S. Ma¹, N. Li¹, F. Ye¹, J. Ren¹, H. Yu², ¹Fudan University, Shanghai, China, ²University of California Davis, Davis, USA</p>	<p>0920-0930</p>
	<p>TH1F-6: Microwave Power Combining System based on Two Injection-locked 15 kW CW Magnetrons H. Huang, L. Liu, F. Huo, Z. Liu, C. Liu, <i>Sichuan University, Chengdu, China</i></p>		<p>0930-0940</p>

Thursday

Technical Sessions

1010-1150

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1010-1030

TH2A: Probe-Based Microwave Measurement

Chair: Tibault Reveyrand, *University of Colorado at Boulder*
Co-Chair: Jon Martens, *Anritsu Company*

TH2B: GaN Based Doherty, Outphasing and Digital PAs.

Chair: Paul Draxler, *Qualcomm Technologies*
Co-Chair: Leo de Vreede, *Delft University of Technology*

TH2C: Novel Applications and Characterization of Metasurfaces and Artificial Materials

Chair: David R. Jackson, *University of Houston*
Co-Chair: Tapan K Sarkar, *Syracuse University*

TH2D: Advanced Realizations and Modeling of Non-Planar Filters

Chair: Ming Yu, *COM DEV*
Co-Chair: Vicente Boria, *Technical University of Valencia*

1030-1050

TH2A-1: A Single-Element CMOS-Based Electronic De-Embedding Technique with TRL Level of Accuracy

J. Chien, A. M. Niknejad, *University of California at Berkeley, Berkeley, United States*

TH2B-1: Broadband, Wide Efficiency Range, Doherty Amplifier Design Using Frequency-Varying Complex Combining Load

X. Fang, K. Cheng, *The Chinese University of Hongkong, Hongkong, Hong Kong*

TH2C-1: Photonic Band Gap Structures and their Application for Measuring Parameters of Semiconductor Layers

D. A. Usanov¹, S. A. Nikitov², A. V. Skripal¹, D. V. Ponomarev¹, E. V. Latsysheva¹, ¹Saratov State University, Saratov, Russian Federation, ²Kotel'nikov Institute of Radio Engineering and Electronics, Russian Academy of Sciences, Moscow, Russian Federation

TH2D-1: Pseudo-Elliptic In-Line Filters with Dielectric Resonators in Propagating Waveguide

C. Tomassoni¹, S. Bastioli², R. Snyder², ¹University of Perugia, Perugia, Italy, ²RS Microwave Company Inc., Butler, United States

1050-1100

TH2A-2: On-Wafer Probes for Submillimeter-Wave On-Chip Antennas

Y. Shiao, J. Liao, G. Huang, *National Nano Device Laboratories, Hsin-Chu, Taiwan*

TH2B-2: GaN-MMIC Doherty Power Amplifier with Integrated Reconfigurable Input Network for Microwave Backhaul Applications

R. Giofrè¹, L. Piazzon¹, P. Colantonio¹, F. Giannini¹, V. Camarchia², R. Quaglia², M. Pirola², C. Ramella², ¹University of Roma Tor Vergata, Roma, Italy, ²Politecnico di Turin, Turin, Italy

TH2C-2: Chiral Polarization Control using Cascaded Tensor Impedance Surfaces

M. Selvanayagam, G. V. Eleftheriades, *University of Toronto, Toronto, Canada*

TH2D-2: Low-Loss Compact Ku-Band Waveguide Low-Pass Filter

F. Teberio¹, I. Arregui¹, A. Gomez-Torrent¹, E. Menargues¹, I. Arnedo¹, M. Chudzik¹, M. Zedler², F. Görtz², R. Jost², T. Lopetegui¹, M. Laso¹, ¹Public University of Navarre, Pamplona, Spain, ²Tesat-Spacecom GmbH & Co., Backnang, Germany

1100-1110

TH2A-3: Robotic On-Wafer Probe Station for Microwave Characterization in a Scanning Electron Microscope

K. Haddadi, A. el Fellahi, J. Marzouk, S. Arscott, C. Boyaval, T. Lasri, G. Dambine, *IEMN - University Lille 1, Villeneuve d'Ascq, France*

TH2B-3: X-Band Outphasing GaN MMIC PA with Power Recycling

M. Litchfield, Z. Popovic, *University of Colorado at Boulder, Boulder, United States*

TH2C-3: Application of Metamaterials in Spatial Harmonic Magnetrons

N. Nasr Esfahani, K. Schuenemann, *Technische Universität Hamburg Harburg (TUHH), Hamburg, Germany*

TH2D-3: Practical Design of Rectangular Waveguide Filters with a Capacitive Building Block providing an Extra Transmission Zero

P. Soto¹, V. E. Boria¹, D. Smacchia², C. Carceller¹, S. Cogollos¹, M. Guglielmi³, ¹Universidad Politècnica de Valencia, Valencia, Spain, ²Val-Space Consortium, Valencia, Spain, ³European Space Agency, Noordwijk, Netherlands

1110-1130

TH2A-4: A Novel In-Situ Calibration Technique for a High Resolution E-Field Probe

N. Dehghan, S. C. Cripps, *Cardiff University, Cardiff, United Kingdom*

TH2B-4: Outphasing Combiner Synthesis from Transistor Load Pull Data

M. Pampin-Gonzalez¹, M. Ozen², C. Sanchez-Perez², J. Chani-Cahuana², C. Fager², ¹University of Cantabria, Santander, Spain, ²Chalmers University of Technology, Gothenburg, Sweden

TH2C-4: Effective Permittivity Determination of Randomized Mixed Materials using 3D Electromagnetic Simulations

C. Baer¹, B. Hattenhorst¹, C. Schulz², B. Will³, I. Rolfes², T. Musch¹, ¹Ruhr-University Bochum, Bochum, Germany, ²Ruhr-University Bochum, Bochum, Germany, ³South Westphalia University of Applied Sciences, Meschede, Germany

TH2D-4: High Rejection Stacked Bandpass Filter Tuned by Group Delay Response

M. Sharif Sorkherizi¹, A. Kishk¹, M. Saad², ¹Concordia University, Montreal, Canada, ²Scientific Microwave Corporation, Montreal, Canada

1130-1150

TH2B-5: A Flexible GaN MMIC Enabling Digital Power Amplifiers for the Future Wireless Infrastructure

A. Wentzel, S. Chevtchenko, P. Kurpas, W. Heinrich, *Ferdinand-Braun-Institut, Leibniz-Institut fuer Hochfrequenztechnik, Berlin, Germany*

TH2C-5: Metamaterial Made of BC-SRRs with Randomly Dispersed Resonant Frequencies

J. Machac, L. Jelinek, *Czech Technical University in Prague, Prague, Czech Republic*

TH2D-5: Modeling of Waveguide Dual-Mode Bandpass Filters over Wide Frequency Range

S. Li^{1,2}, Y. Wang¹, M. Yu², ¹University of Ontario Institute of Technology, Oshawa, Canada, ²COM DEV Ltd., Cambridge, Canada

Technical Track Key:

Field, Device and Circuit Tech.

Passive Components

Active Components

Systems & Applications

Emerging Technical Areas

Special Sessions

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<p>TH2E: Ambient RF Energy Harvesting and Transfer Chair: Apostolos Georgiadis, <i>CTTC</i> Co-Chair: Manos Tentzeris, <i>Georgia Tech</i></p>	<p>TH2F: Diagnostic Imaging Techniques and Systems Chair: Anand Gopinath, <i>University of Minnesota</i> Co-Chair: Robert Caverly, <i>Villanova University</i></p>	<p>TH2G: Low Noise Receivers for Remote Sensing of Earth's Atmosphere from Small Satellites Chair: Steven C. Reising, <i>Colorado State University</i> Co-Chair: Pekka Kangaslahti, <i>JPL</i></p>	
<p>TH2E-1: Active Power Summation for Efficient Multiband RF Energy Harvesting A. N. Parks¹, J. R. Smith^{2,1}, ¹University of Washington, Seattle, United States, ²University of Washington, Seattle, United States</p>	<p>TH2F-1: Travelling-Wave Excitation for 16.4T Small-Bore MRI P. Bluem¹, A. Tonyushkin², D. Deelchand³, G. Adriany³, P. Van de Moortele³, A. J. Kiruluta², Z. Popovic¹, ¹University of Colorado, Boulder, United States, ²Massachusetts General Hospital, Harvard Medical School, Boston, United States, ³University of Minnesota Medical School, Minneapolis, United States</p>	<p>TH2G-1: The MicroMAS and MiRaTA CubeSat Atmospheric Profiling Missions W. Blackwell¹, K. Cahoy², ¹MIT Lincoln Laboratory, Lexington, United States, ²MIT, Cambridge, United States</p>	1010-1030
<p>TH2E-2: Ultra Compact Ku band Rectenna A. Takacs^{1,2}, H. Aubert^{1,3}, S. Charlot¹, ¹Cnrs Laas, Toulouse, France, ²Univ de Toulouse, Toulouse, France, ³Univ de Toulouse, Toulouse, France</p>	<p>TH2F-2: Improved High B+ Field Generator using Stepped Impedance Metamaterial Resonators for 7T MRI V. Panda, A. Gopinath, <i>University of Minnesota - Twin Cities Campus, Minneapolis, United States</i></p>	<p>TH2G-2: Overview of the Delay Doppler Mapping Instrument (DDMI) for the Cyclone Global Navigation Satellite Systems Mission (CYGNSS) S. Gleason¹, C. Ruf², ¹Southwest Research Institute, Boulder, United States, ²University of Michigan, Ann Arbor, United States</p>	1030-1050
<p>TH2E-3: Backscatter Wireless Sensor Network with WPT Capabilities R. J. Correia¹, G. Fukuda², A. Miyaji², S. Kawasaki², N. B. Carvalho¹, ¹Instituto de Telecomunicacoes, Aveiro, Portugal, ²Institute of Space and Astronautical Science (ISAS), Japan Aerospace Exploration Agency (JAXA), Sagami-hara, Japan</p>	<p>TH2F-3: Optimal Arrangement of Finite Element Loop Arrays for Parallel Magnetic Resonance Imaging in the Human Head at 400 MHz A. Pfommer¹, A. Henning^{1,2}, ¹Max Planck Institute for Biological Cybernetics, Tuebingen, Germany, ²University and ETH Zurich, Zurich, Switzerland</p>	<p>TH2G-3: Application of InP HEMT to Sub-Millimeter Wave Atmospheric Sensing K. Leong, X. B. Mei, A. Zamora, S. Shih, W. Deal, <i>Northrop Grumman Corporation, Redondo Beach, United States</i></p>	1050-1100
<p>TH2E-4: A Flexible Hybrid Printed RF Energy Harvester Utilizing Catalyst-Based Copper Printing Technologies for Far-Field RF Energy Harvesting Applications S. Kim¹, J. Bito¹, S. Jeong¹, M. M. Tentzeris¹, A. Georgiadis², ¹Georgia Institute of Technology, Atlanta, United States, ²Centre Tecnologic de Telecomunicacions Catalunya (CTTC), Castelldefels, Spain</p>	<p>TH2F-4: Experimental Terahertz Z-Scan Imaging of Three-Dimensional Paraffin Embedded Breast Cancer Tissue T. C. Bowman¹, M. El-Shenawee¹, L. K. Campbell², ¹University of Arkansas, Fayetteville, United States, ²Northwest Arkansas Pathology Associates, P.A., Fayetteville, United States</p>	<p>TH2G-4: The Radiometer Atmospheric CubeSat Experiment (RACE) Pre-Launch Performance B. Lim, S. Statham, S. Misra, J. Clark, K. Donahue, J. Steinkraus, <i>Jet Propulsion Laboratory, Pasadena, United States</i></p>	1100-1110
<p>TH2E-5: Simultaneous UHF Energy Harvesting and UWB-RFID Communication M. Fantuzzi¹, D. Masotti¹, A. Costanzo², ¹University of Bologna, Bologna, Italy, ²University of Bologna, Cesena, Italy</p>	<p>TH2F-5: A High-Sensitivity Fully Passive Wireless Neurosensing System for Unobtrusive Brain Signal Monitoring C. Lee¹, A. Kiourti¹, J. Chae², J. L. Volakis¹, ¹The Ohio State University, Columbus, United States, ²Arizona State University, Tempe, United States</p>	<p>TH2G-5: Overview of Temporal Experiment for Storms and Tropical Systems (TEMPEST) CubeSat Constellation Mission S. C. Reising¹, T. C. Gaier², C. D. Kummerow³, C. V. Chandra¹, S. T. Brown², S. Padmanabhan², B. H. Lim², S. C. van den Heever³, T. S. L'Ecuyer⁴, C. S. Ruf⁵, Z. S. Haddad², Z. J. Luo⁶, S. J. Munchak⁷, G. Berg⁸, T. C. Koch², S. A. Boukabara⁹, ¹Colorado State University, Fort Collins, United States, ²NASA Caltech/Jet Propulsion Laboratory, Pasadena, United States, ³Colorado State University, Fort Collins, United States, ⁴University of Wisconsin, Madison, United States, ⁵University of Michigan, Ann Arbor, United States, ⁶City College of New York, CUNY, New York, United States, ⁷University of Maryland, College Park, United States, ⁸Boeing Company, Huntington Beach, United States, ⁹National Oceanic and Atmospheric Administration, College Park, United States</p>	1130-1150

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1500-1510

TH3B: Advanced Topics in Power Amplifier Linearization
Chair: Jose Carlos Pedro, IT - University of Aveiro
Co-Chair: John Wood, Maxim Integrated

TH3B-1: A Comparison of Indirect Learning and Closed Loop Estimators used in Digital Predistortion of Power Amplifiers
R. N. Braithwaite, Qualcomm Technologies Inc., San Diego, United States

TH3B-2: Novel Multiband Linearization Technique for Closely Spaced Dual-Band Signals of Wide Bandwidth
Y. Liu^{1,2}, P. Roblin¹, H. Yu¹, S. Shao², Y. Tang², ¹The Ohio State University, Columbus, United States, ²University of Electronic Science and Technology of China, Chengdu, China

TH3B-3: Linear Filter Assisted Envelope Memory Polynomial for Analog/Radio Frequency Predistortion of Power Amplifiers
H. Huang, A. Islam, J. Xia, P. Levine, S. Boumaiza, University of Waterloo, Waterloo, Canada

TH3B-4: DPD Tuning with Frequency Selective Distortion Minimization
T. R. Cunha, F. M. Barradas, J. C. Pedro, Universidade de Aveiro - Instituto de Telecomunicações, Aveiro, Portugal

TH3B-5: A Comparison for a Doherty Power Amplifier Linearized using Digital Predistortion and Feedforward Compensation
R. N. Braithwaite, Qualcomm Technologies Inc, San Diego, United States

TH3C : Progress in RF Nanotechnology
Chair: Fabio Coccetti, LAAS-CNRS
Co-Chair: Trang Thai, GE Global Research

TH3C-1: Time-Domain Reflectometry for Near-Field Scanning Microwave Microscopy
M. Farina¹, A. Di Donato¹, D. Mencarelli¹, G. Venanzoni¹, T. Pietrangelo², A. Morini¹, ¹Università Politecnica delle Marche, Ancona, Italy, ²Università "G. D'Annunzio", Chieti, Italy

TH3C-2: Comparison of Rigorous vs Approximate Methods for Accurate Calculation of 2D-Materials Band Structures and Applications to THz Nanoelectronics
L. Pierantoni^{1,3}, D. Mencarelli^{1,3}, A. Sindona^{2,3}, S. Bellucci³, ¹Università Politecnica delle Marche, Ancona, Italy, ²Università della Calabria, Rende, Italy, ³Istituto Nazionale di Fisica Nucleare (INFN), Frascati, Italy

TH3C-3: High-Q K-band Integrated Inductors Using Cu/Ni Nano-Superlattice Conductors
A. Rahimi, Y. Yoon, University of Florida, Gainesville, United States

TH3C-4: Uncooled Ni-Cr Micro/Nano-Bolometers with NEP of 14 pW/root(Hz)
H. Yang, G. M. Rebeiz, UC San Diego, La Jolla, United States

TH3D: RF BAW Components
Chair: Amelie Hagelauer, University of Erlangen
Co-Chair: Clemens Ruppel, EPCOS AG (retired)

TH3D-1: A Wideband Bulk Acoustic Wave Filter with Modified Lattice Configuration
Q. Yang, W. Pang, D. Zhang, H. Zhang, Tianjin University, Tianjin, China

TH3D-2: Highly C-Axis Oriented ScAlN Thin Films Deposited Using a Sc-Al Alloy Target
S. Fujii^{1,4}, M. Sumisaka⁴, G. Tang^{2,4}, Y. Suzuki³, S. Otomo³, T. Omori⁴, K. Hashimoto⁴, ¹Tokyo Institute of Technology, Meguro, Japan, ²Shanghai Jianotong University, Shanghai, China, ³Furuya Metal Company Ltd., Toshima, Japan, ⁴Chiba university, Chiba, Japan

TH3D-3: A Compact Dual-Passband Filter based on Bulk Acoustic Wave Technology
Y. Sun, Q. Yang, W. Pang, D. Zhang, H. Zhang, Tianjin University, Tianjin, China

TH3D-4: High-Q Bandpass Filters using Hybrid Acoustic-Wave-Lumped-Element Resonators (AWLRs) for UHF Applications
D. Psychogiou¹, R. Gómez-García², D. Peroulis¹, ¹Purdue University, West Lafayette, United States, ²University of Alcalá, Alcalá de Henares, Spain

TH3D-5: Polyharmonic Distortion Modeling of RF BAW Components
A. Tag¹, W. Akstaller¹, C. Musolff¹, B. Bader², M. Pitschi², R. Weigel¹, A. Hagelauer¹, ¹Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany, ²TDK Corporation, Munich, Germany

TH3D-6: Quality Factor Optimization of Composite Piezoelectric Single-Crystal Silicon Micro-Resonators
O. Mortada¹, P. Blondy¹, J. Orlianges², M. Chatras¹, A. Crunteanu Stanescu¹, XLIM UMR 7252, University of Limoges/CNRS, Limoges, France, ²SPECTS UMR 7513, University of Limoges/CNRS, Limoges, France

Room: 126 ABC

Room: 125 AB

Room: 122 ABC

TH3E : Microwave Research and Development in Latin America
 Chair: Roberto S. Murphy, *INAOE*
 Co-Chair: Jose E. Rayas-Sanchez, *ITESO*

TH3F: Components for Adaptable Front Ends for Military Applications
 Chair: Kavita Goverdhanam, *US Army CERDEC*
 Co-Chair: Rainee Simons, *NASA*

TH3G: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 Chair: Samir El-Ghazaly, *University of Arkansas*

TH3E-1: A Bird's-Eye View of Microwave R&D in Latin America
 R. S. Murphy, *Instituto Nacional de Astrofísica, Óptica y Electrónica, Tonantzintla, Mexico*

TH3F-1: Reconfigurable Ultra-Wideband Array with Tunable Band Rejection across a 7:1 Bandwidth
 D. K. Papantonis, N. Ghalichechian, J. L. Volakis, *The Ohio State University, Columbus, United States*

TH3G-1: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

1330-1350

TH3E-2: Educating Signal Integrity Engineers for Challenges in High-Speed Electronics
 R. Torres-Torres, *INAOE, Tonantzintla, Mexico*

TH3F-2: Reconfigurable RF with 12.5 THz Cutoff Frequency 2nd Generation GeTe Inline Phase-Change Switch
 N. El-Hinnawy¹, P. Borodulin¹, E. B. Jones¹, B. P. Wagner¹, M. R. King¹, J. S. Mason, Jr.¹, J. Bain², J. Paramesh², T. E. Schlesinger³, R. S. Howell¹, M. J. Lee¹, R. M. Young¹, ¹Northrop Grumman Electronic Systems, Linthicum, United States, ²Carnegie Mellon University, Pittsburgh, United States, ³Johns Hopkins University, Baltimore, United States

TH3G-2: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

1350-1410

TH3E-3: Enhanced Procedure to Set up the Simulation Bounding Box and the Meshing Scheme of a 3D Finite Element EM Simulator for Planar Microwave Structures
 Z. Brito-Brito, J. E. Rayas-Sanchez, J. L. Chavez-Hurtado, *ITESO (Instituto Tecnológico y de Estudios Superiores de Occidente), Tlaquepaque, Mexico*

TH3F-3: A Wide Spectral Range, Multi-Function Adaptive RF Front-End for Agile Spectrum Access and RF Interference Mitigation
 M. C. St.John¹, K. E. Rudd², ¹The MITRE Corporation, McLean, United States, ²Office of Naval Research, Arlington, United States

TH3G-3: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

1410-1420

TH3E-4: Correction of DC Extracted Parameters for Microwave MOSFETs Based on S-Parameter Measurements
 F. Zárate-Rincón, R. S. Murphy-Arteaga, R. Torres-Torres, *Instituto Nacional de Astrofísica, Óptica y Electrónica, San Andrés Cholula, Mexico*

TH3F-4: Tunable Magnetic Resonance in Microwave Spintronic Devices
 Y. Chen¹, X. Fan², Y. Xie¹, J. D. Wilson³, R. N. Simons³, S. T. Chui¹, J. Q. Xiao¹, ¹University of Delaware, Newark, United States, ²University of Denver, Denver, United States, ³NASA Glenn Research Center, Cleveland, United States

TH3G-4: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

1420-1430

TH3E-5: A New Method for Extracting R_i and R_{gd} of the Intrinsic Transistor Model of GaN HEMT based on Extrema Points of Intrinsic Y-Parameters
 J. Reynoso-Hernández¹, J. Estrada-Mendoza¹, M. Maya-Sánchez¹, M. Pulido-Gaytán¹, J. Loo-Yau², J. Zúñiga-Juárez¹, J. Valle-Padilla², ¹Center for Scientific Research and Higher Education at Ensenada, Baja California (CICSE), Ensenada, Mexico, ²Center for Research and Advanced Studies of the National Polytechnic Institute (Cinvestav) - Campus Guadalajara, Guadalajara, Mexico

TH3F-5: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

TH3G-5: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

1430-1450

TH3E-6: New Technique for the Implementation of Nonlinear Models for Microwave Transistors for Broadband Data Communication
 G. Rafael-Valdivia, Z. Su, A. Urquiza-Enriquez, T. Mendoza-Gamero, *La Salle University, Arequipa, Peru*

TH3F-6: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

TH3G-6: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

1450-1510

TH3E-7: Experimental Study of the Capabilities of the Real-Valued NARX Neural Network for Behavioral Modeling of Multi-Standard RF Power Amplifier
 L. M. Aguilar-Lobo¹, J. R. Loo-Yau¹, P. Moreno¹, J. A. Reynoso-Hernandez^{2,3}, ¹Centro de Investigación y de Estudios Avanzados del I. P. N. Unidad Guadalajara, Zapopan, Mexico, ²Centro de Investigación Científica y de Educación Superior de Ensenada, Ensenada, Mexico

TH3F-7: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

TH3G-7: Honorary Session: Tatsuo Itoh Serving the MTT-S for 40 Years
 S. M. El-Ghazaly, *University of Arkansas, Fayetteville, United States*

INTERACTIVE FORUM

Thursday | Time: 1300-1500

Room: Hall 6

Chair: Jason Stillwell, *General Dynamics*

Co-Chair: Monica CdeBaca, *Freescale*

THPA: Evolution of Transverse Correlation in Stochastic Electromagnetic Fields J. A. Russer ¹ , G. Gradoni ² , G. Tanner ³ , S. C. Creagh ² , D. Thomas ³ , C. Smart ³ , P. Russer ¹ , ¹ Technische Universität München, Munich, Germany, ² University of Nottingham, Nottingham, United Kingdom, ³ University of Nottingham, Nottingham, United Kingdom	THPD: Switchable Tri-Band Bandpass Filter with Wide Stopband T. Du, W. Tu, <i>National Central University, Taoyuan, Taiwan</i>	THPF: Reconfigurable Filter Design using Resonators as Coupling Structures T. Lee, W. Yang, D. Peroulis, <i>Purdue University, West Lafayette, United States</i>	THPH: Dispersion-Engineered CRLH Stub Resonator for Low Phase-Noise Oscillators S. Tanaka, H. Nishizawa, K. Takata, K. Saito, <i>Shibaura Institute of Technology, Tokyo, Japan</i>
THPA: Broadband Sensitivity Analysis in a single FDTD Simulation with the Complex Step Derivative Approximation C. D. Sarris, H. D. Lang, <i>University of Toronto, Toronto, Canada</i>	THPD: A Planar and Tunable Bandpass Filter on a Ferrite Substrate with Integrated Windings E. Arabi, A. Syed, A. Shamim, <i>King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia</i>	THPF: Spectrum-Aware Jammer Suppression using Evanescent-Mode Cavity Filters M. Abu Khater, D. Peroulis, <i>Purdue University, West Lafayette, United States</i>	THPK: Mixed-Mode Class E-F-1 High Efficiency GaN Power Amplifier for P-Band Space Applications G. F. Formicone, J. Custer, <i>Integra Technologies Inc., El Segundo, United States</i>
THPB: A Semi Double-Ridged Quasi TE-Waveguide based Microwave Bulk Material Characterization System A. Talai ¹ , S. Mann ¹ , F. Steinhäuser ² , A. Bittner ² , U. Schmid ² , R. Weigel ¹ , A. Koelpin ¹ , ¹ University Erlangen-Nuremberg, Erlangen, Germany, ² Vienna University of Technology, Vienna, Austria	THPD: Development of Low Loss Ka-Band Narrowband Bandpass Filter using a Dual Mode Coplanar Type Circular Slot Resonator T. Shimizu, Y. Kogami, <i>Utsunomiya University, Utsunomiya, Japan</i>	THPF: On-Chip Transformer-Coupled Balun Bandpass Filter for 5-GHz Applications C. Chang, Y. Lin, <i>National Central University, Taoyuan, Taiwan</i>	THPL: A High Voltage mm-Wave Stacked HEMT Power Amplifier in 0.1 μm InGaAs Technology M. Gavelli ^{1,2} , I. Angelov ^{2,1} , M. Ferndahl ^{1,2} , H. Zirath ^{2,1} , ¹ Gotmic AB, Gothenburg, Sweden, ² Chalmers University of Technology, Gothenburg, Sweden
THPB: Trap characterization of AlGaN/GaN HEMTs through Drain Current Measurements under Pulsed-RF Large-Signal excitation A. Benvegnu ^{1,2} , S. Laurent ¹ , D. Barataud ¹ , E. Zanoni ² , R. Quere ¹ , ¹ Xlim Laboratory, Limoges, France, ² University of Padova, Padova, Italy	THPE: Design of Pseudo-Elliptical Bandpass Filter using Higher-Order Modes of Photonic Crystal Point Defect Cavity for Sub-Terahertz Bands C. Chen, T. Anada, S. Greedy, T. Benson, <i>Kanagawa University, Yokohama, Japan</i>	THPF: On-Chip Transformer-Coupled Balun Bandpass Filter for 5-GHz Applications C. Chang, Y. Lin, <i>National Central University, Taoyuan, Taiwan</i>	THPL: A K-Band Adaptive-Bias Power Amplifier with Enhanced Linearizer Using 0.18-μm CMOS Process T. Huang, Y. Lin, H. Wang, <i>National Taiwan University, Taipei, Taiwan</i>
THPB: Ultra-Short-Range, Precise Displacement Measurement Setup with a Near Field Slot-Line Antenna and a Dedicated Spiral Calibration S. Linz, F. Lurz, M. Sporer, S. Lindner, S. Mann, R. Weigel, A. Koelpin, <i>Friedrich-Alexander University of Erlangen-Nuremberg, Erlangen, Germany</i>	THPE: Modal Analysis of Two-Dimensional Filter Networks I. C. Hunter ¹ , J. D. Rhodes ¹ , R. V. Snyder ² , M. Meng ¹ , ¹ Leeds University, Leeds, United Kingdom, ² RS Microwave Company, Inc., Butler, United States	THPF: Capacitively Coupled Coaxial-Cavity Bandstop Filters with Tunable Center Frequency and Bandwidth A. Anand, X. Liu, <i>University of California Davis, Davis, United States</i>	THPL: A 24 GHz CMOS Power Amplifier with Successive IM2 Feed-Forward IMD3 Cancellation Y. Chen, K. Kao, C. Chao, K. Lin, <i>National Taiwan University, Taipei, Taiwan</i>
THPC: Accurate Modeling of Microwave Structures Using Variable-Fidelity Response Features S. Koziel ¹ , J. W. Bandler ² , ¹ Reykjavik University, Reykjavik, Iceland, ² McMaster University, Hamilton, Canada	THPE: Basic Study on Novel Base-Station Filter using Artificial Dielectrics T. Ishizaki, S. Nojiri, Y. Nakagawa, <i>Ryukoku University, Otsu, Japan</i>	THPH: A 12 Gbps Analog QPSK Baseband Receiver based on Injection-Locked VCO Z. S. He, S. Lai, D. Kuylenstierna, H. Zirath, <i>Chalmers University of Technology, Gothenburg, Sweden</i>	THPL: A SOI CMOS Reconfigurable Output Matching Network for Multimode Multiband Power Amplifiers G. Tant ¹ , A. Giry ¹ , P. Ferris ¹ , G. Pares ¹ , J. Arnold ² , J. Fournier ² , C. Raynaud ¹ , P. Vincent ¹ , ¹ CEA, LETI-Minatec, Grenoble, France, ² Grenoble Institute of Technology Minatec, Grenoble, France

Technical Track Key:

Field, Device and Circuit Tech.

Passive Components

Active Components

Systems & Applications

Emerging Technical Areas

Special Sessions

INTERACTIVE FORUM

Thursday | Time: 1300-1500

Room: Hall 6

Chair: Jason Stillwell, *General Dynamics*

Co-Chair: Monica CdeBaca, *Freescale*

<p>THPL: 5.0 to 10.6 GHz 0.18 μm CMOS Power Amplifier with Excellent Group Delay for UWB Applications</p> <p>H. Mosalam¹, A. Allam¹, H. Jia^{2,1}, A. Abdel-Rahman¹, R. K. Pokharel¹, ¹Egypt-Japan University of Science and Technology (E-JUST), New Borg El-Arab, Egypt, ²Kyushu University, Fukuoka, Japan</p>	<p>THPP: Millimeter-Wave Smart Antennas for Advanced Satellite Communications</p> <p>Q. Luo, L. Zhang, S. Gao, <i>University of Kent, Canterbury, United Kingdom</i></p>	<p>THPR: Low Cost Low Sampling Noise UWB Chipless RFID Reader</p> <p>M. Garbati¹, R. Siragusa¹, E. Perret^{1,2}, C. Halope³, ¹Univ. Grenoble Alpes, LCIS., Valence, France, ²Institut d'Electronique du Sud, Montpellier, France, ³Arjowiggins Security, Apprieu, France</p>	<p>THPU: 24-GHz CW Radar Front-Ends on Cellulose-Based Substrates: a New Technology for Low-Cost Applications</p> <p>F. Alimenti, V. Palazzi, C. Mariotti, M. Virili, G. Orcchini, L. Roselli, P. Mezzanotte, <i>University of Perugia, Perugia, Italy</i></p>
<p>THPM: Active Bias Control for Improved Pulse Droop Performance of GaN HEMT Transistor</p> <p>E. Hokenson, B. Achiriloaie, <i>MACOM Technology Solutions, Long Beach, United States</i></p>	<p>THPP: Cost Efficiency Adaptive Antenna System based on Active Frequency Selective Surface</p> <p>L. Zhang¹, Q. H. Liu², Y. Liu¹, L. Hai¹, ¹Xiamen University, Xiamen, China, ²Duke University, Durham, United States</p>	<p>THPR: RFID Integrated QR Code Tag Antenna</p> <p>A. Numan-Al-Mobin¹, W. M. Cross², J. J. Kellar³, D. E. Anagnostou⁴, ¹South Dakota School of Mines & Technology, Rapid City, United States, ²South Dakota School of Mines & Technology, Rapid City, United States, ³South Dakota School of Mines & Technology, Rapid City, United States, ⁴South Dakota School of Mines & Technology, Rapid City, United States</p>	<p>THPU: Large Frequency Tuning of a Millimeter-Wave Antenna using Dielectric Liquids in Integrated Micro-Channels</p> <p>G. Dufour¹, N. Tiercelin¹, W. T. Khan², P. Pernod¹, P. Coquet^{3,1}, J. Papapolymerou², ¹Institut d'Electronique de Microelectronique et de Nanotechnologie, CNRS UMR 8520, Villeneuve d'Ascq, France, ²Georgia Institute of Technology, Atlanta, United States, ³CINTRA, CNRS/NTU/THALES, UMI 3288, Nanyang Technological University, Singapore, Singapore</p>
<p>THPM: Experimental Evaluation of Direct Liquid Cooling on GaN HEMT Based Power Amplifier MMIC</p> <p>C. Xie, R. Wilcoxon, <i>Rockwell Collins, Inc, Cedar Rapids, United States</i></p>	<p>THPP: Multi-beam 4 GHz Microwave Apertures Using Current-Mode DFT Approximation on 65 nm CMOS</p> <p>V. Ariyaratna¹, S. Kulasekera¹, A. Madanayake¹, L. Belostotski², K. Lee³, R. J. Cintra³, D. Suarez², F. M. Bayer², ¹University of Akron, Akron, United States, ²University of Calgary, Calgary, Canada, ³Universidade Federal de Pernambuco, Recife, Brazil, ⁴Universidad Nacional de Colombia, Bogota, Colombia, ⁵Universidade Federal de Santa Maria, Santa Maria, Brazil</p>	<p>THPS: Energy Evaporation: the New Concept of Indoor WPT and EH by Exploiting Dual Frequency Antennas Embedded Into the Floor</p> <p>C. Mariotti¹, R. Gonçalves², L. Roselli¹, N. B. Carvalho², P. Pinho³, ¹University of Perugia, Perugia, Italy, ²University of Aveiro, Aveiro, Portugal, ³Instituto Superior de Engenharia de Lisboa, Lisbon, Portugal</p>	
<p>THPM: A Highly Linear Dual-band Doherty Power Amplifier for Femto-Cell Base Stations</p> <p>S. Jee, Y. Park, Y. Cho, J. Lee, S. Kim, B. Kim, <i>Pohang University of Science and Technology, Pohang, Republic of Korea</i></p>	<p>THPQ: Design of a Short-Range Radar System for Wing-Beat Frequency Detection</p> <p>Y. Su¹, C. Chang^{1,2}, J. Kuo¹, S. Chang^{1,2}, ¹National Chung Cheng University, Chia-Yi, Taiwan, ²National Chung Cheng University, Chia-Yi, Taiwan, ³National Chung Cheng University, Chia-Yi, Taiwan</p>	<p>THPT: Chest-Worn Health Monitor Based on a Bistatic Self-Injection-Locked Radar</p> <p>F. Wang, Y. Chou, Y. Chiu, M. Tang, T. Horng, <i>National Sun Yat-Sen University, Kaohsiung, Taiwan</i></p>	
<p>THPM: A 120 Watt GaN Power Amplifier MMIC Utilizing Harmonic Tuning Circuits For S-band Applications</p> <p>A. Alexander, J. G. Leckey, <i>Macom Technology Solutions, Belfast, United Kingdom</i></p>	<p>THPR: Graphene-Based Dipole Antenna for a UHF RFID Tag</p> <p>P. Kopyt¹, B. Salski¹, M. Olszewska-Placha², D. Janczak³, M. Sloma³, T. Kurkus⁴, M. Jakubowska³, W. K. Gwarek¹, ¹Warsaw Univ. of Technology, Warsaw, Poland, ²QWED Sp. z o.o., Warsaw, Poland, ³Warsaw Univ. of Technology, Warsaw, Poland, ⁴Polish Security Printing Works, Warsaw, Poland</p>	<p>THPU: Flexible Microwave Filters on Ultra Thin Liquid Crystal Polymer substrate</p> <p>Y. Lan, Y. Xu, C. Wang, Z. Wen, Y. Qiu, Y. Wu, R. Xu, <i>University of Electronic Science Technology of China, Chengdu, China</i></p>	
<p>THPP: Bandwidth Enhancement of Dual-Polarized Microstrip Antenna Lattice</p> <p>I. Slomian, S. Gruszczynski, K. Wincza, <i>AGH University of Science and Technology, Krakow, Poland</i></p>	<p>THPR: Compact Chipless RFID Tag based on Open Ring Resonator Spectrum</p> <p>U. Martinez-Iranzo, B. Moradi, J. Garcia-Garcia, <i>Universidad Autónoma de Barcelona, Cerdanyona Del Valles, Spain</i></p>	<p>THPU: 3D SAR Imaging for Dry Wall Inspection Using an 80 GHz FMCW Radar with 25 GHz Bandwidth</p> <p>S. A. Lang¹, M. Demming¹, T. Jaeschke², K. M. Noujeim³, A. Konynenberg³, N. Pohl¹, ¹Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, Wachtberg, Germany, ²Ruhr-University Bochum, Bochum, Germany, ³Anritsu Company, Morgan Hill, United States</p>	

WORKSHOPS

Sunday, 17 May 2015

| Time: 0800 – 1700

WORKSHOPS

WSA

RF Interference Mitigation Techniques

Full-day

Sponsor: RFIC

| 0800-1700

WSI

mmWave to THz, which Applications with which Technology

Full-day

Sponsor: N/A

| 0800-1700

WSB

Digital and Analog Techniques for Power-Efficiency Enhancement in Wireless Transmitters

Full-day

Sponsor: RFIC

| 0800-1700

WSJ

Modern Radar Systems for High Resolution Ranging, Indoor Localization, and Vital Signs Detection

Full-day

Sponsor: MTT-10 Biological Effects and Medical Applications

| 0800-1700

WSC

Highly Efficient RF Frequency Generation in Nanometer CMOS Technologies

Full-day

Sponsor: RFIC

| 0800-1700

WSK

RF System Miniaturization with Integrated-Passive-Device (IPD), Through-Silicon-Via (TSV), and System-in Package (SiP)

Full-day

Sponsor: N/A

| 0800-1700

WSD

Multi-Gbps Wireline Transceivers: Inching Closer to RF/MM-wave IC Domain

Half-day

Sponsor: RFIC

| 0800-1200

WSL

Wearable Electronics

Full-day

Sponsors: MTT-10 Biological Effects and Medical Applications, MTT-20 Wireless Communications

| 0800-1700

WSE

Mixed-Signal Power Amplifiers and RF-DACs

Full-day

Sponsor: RFIC

| 0800-1700

WSM

Current Trends in GaN PA Packaging

Half-day

Sponsors: MTT-6 Microwave and Millimeter-Wave Integrated Circuits, MTT-12 Microwave and Millimeter-Wave Packaging and Manufacturing

| 1300-1700

WSF

Next Generation 77-81 GHz Automotive Radars

Full-day

Sponsor: MTT-27 Wireless-Enabled Automotive and Vehicular Applications

| 0800-1700

WSN

Technologies for Tunable and Reconfigurable RF/Microwave Filters

Full-day

Sponsors: RFIC, MTT-8 Filters and Passive Components, MTT-21 RF MEMS

| 0800-1700

WSG

Performance Metrics for mm-wave Devices and Circuits from the Perspective of the International Technology Roadmap for Semiconductors (ITRS)

Full-day

Sponsor: MTT-7 Microwave and Millimeter-Wave Solid State Devices

| 0800-1700

WSO

Towards 5G: Circuits, Systems, MIMO and Beamforming Techniques

Full-day

Sponsor: RFIC, MTT-6 Microwave and Millimeter-Wave Integrated Circuits, MTT-21 RF MEMS

| 0800-1700

WSH

Nanopackaging: Multifunctional Nanomaterials and Devices Towards 3D System Minaturization

Half-day

Sponsors: MTT-12 Microwave and Millimeter-Wave Packaging and Manufacturing, MTT-25 RF Nanotechnology

| 0800-1200

WSP

Microwave Photonics for Broadband Measurement

Half-day

Sponsors: MTT-3 Microwave Photonics

| 0800-1200

WORKSHOPS

Monday, 18 May 2015 | Time: 0800 – 1700

WORKSHOPS

WMA | 0800-1700

Direct Extraction of FET Circuit Models from Microwave and Baseband Large-Signal Measurements for Model-Based Microwave Power Amplifier Design

Full-day

Sponsors: ARFTG, MTT-1 Computer-Aided Design, MTT-7 Microwave and Millimeter-Wave Solid State Devices, MTT-11 Microwave Measurements

WMB | 0800-1700

Terahertz-Wave Wireless Communications

Full-day

Sponsor: MTT-4 Terahertz Technology and Applications

WMC | 0800-1200

Micro and Nanowatt Smart RF Transceiver ICs for Internet of Thing

Half-day

Sponsor: RFIC

WMD | 0800-1700

Emerging and Silicon Technologies for Bio-sensing from RF to Millimeter-wave Frequencies

Full-day

Sponsors: MTT-6 Microwave and Millimeter-Wave Integrated Circuits, MTT-10 Biological Effects and Medical Applications

WME | 0800-1700

Emerging Systems, Methods, and Applications for Microwave and THz Imaging

Full-day

Sponsor: N/A

WMF | 0800-1700

Application of Waveform Engineering in Design of High Power Doherty PAs

Full-day

Sponsors: MTT-5 Microwave High-Power Techniques, MTT-23 RFIC

WMG | 0800-1700

Antenna and Packaging Technologies for mmWave Front-End Integration

Full-day

Sponsor: MTT-12 Microwave and Millimeter-Wave Packaging and Manufacturing

WMH | 0800-1200

Microwave Backhaul: Trends and Enabling Technologies

Half-day

Sponsor: IMS

WMI | 0800-1700

Advances of Microwave and Millimeter-Wave Technologies for Vehicular Communication and Safety Driving

Full-day

Sponsors: MTT-20 Wireless Communications, MTT-27 Wireless-Enabled Automotive and Vehicular Applications

WMJ | 1300-1700

Measurement-Based Modeling in SI Applications

Half-day

Sponsor: N/A

WORKSHOPS

Friday, 22 May 2015

Time: 0800 – 1700

WORKSHOPS

WFA

| 0800-1700

T/R Module Panel Architecture and Associated Technology

Full-day

Sponsors: MTT-6 Microwave and Millimeter-Wave Integrated Circuits, MTT-12 Microwave and Millimeter-Wave Packaging and Manufacturing, MTT-16 Microwave Systems, MTT-20 Wireless Communications

WFB

| 0800-1700

Recent Advancements on Millimeter-Wave 3D Heterogeneous and Multilayer MCM Integrations

Full-day

Sponsors: MTT-6 Microwave and Millimeter-Wave Integrated Circuits, MTT-12 Microwave and Millimeter-Wave Packaging and Manufacturing

WFC

| 0800-1700

Non Linear RFID Systems, Characterization and Exploitations

Full-day

Sponsors: MTT-20 Wireless Communications, MTT-24 RFID Technologies, MTT-26 Wireless Energy Transfer and Conversion

WFD

| 0800-1700

Radar in a Communications-Driven Spectrum: Innovative System, Component, and Circuit Design for the Evolving Spectrum Environment

Full-day

Sponsors: MTT-5 Microwave High-Power Techniques, MTT-9 Digital Signal Processing, MTT-16 Microwave Systems, MTT-20 Wireless Communications, MTT-21 RF MEMS

WFE

| 0800-1200

Thermal Management of High Power Density Electronic Assemblies

Half-day

Sponsors: MTT-6 Microwave and Millimeter-Wave Integrated Circuits, MTT-12 Microwave and Millimeter-Wave Packaging and Manufacturing

WFF

| 0800-1700

RF Acoustic for Mobile Communication: Challenges and Modern Solutions

Full-day

Sponsors: MTT-2 Microwave Acoustics, MTT-17 HF-VHF-UHF Technology, MTT-21 RF MEMS, MTT-22 Signal Generation & Frequency Conversion

WFG

| 0800-1700

Advances in Microwave Multiplexers and Combiners for High Power using Quasi-Optic, Radial and SIW Structures

Full-day

Sponsors: MTT-5 Microwave High-Power Techniques, MTT-8 Filters and Passive Components

WFH

| 0800-1700

Wireless Power Transmission and Scavenging

Full-day

Sponsor: MTT-26 Wireless Energy Transfer and Conversion

WFI

| 0800-1700

EM-Based Tuning Techniques, Computer-Aided Tuning and Tuning Space Mapping

Full-day

Sponsors: MTT-1 Computer-Aided Design, MTT-8 Filters and Passive Components, MTT-15 Microwave Field Theory

WFJ

| 0800-1200

Nanosecond Pulsed Electric Fields (nsPEF) - from Modeling to Applications: Biology, Medicine, Plasma and Apparatus

Half-day

Sponsor: MTT-10 Biological Effects and Medical Applications

WFK

| 0800-1700

New Technology Developments for Space

Full-day

Sponsors: MTT-20 Wireless Communications, MTT-26 Wireless Energy Transfer and Conversion

SHORT COURSES

SUNDAY

Time: 0800 – 1700

SSA | 1300-1700
Dynamic Power Supply Transmitter Design
Half-day
Sponsor:N/A

MONDAY

Time: 0800 – 1700

SMA | 1300-1700
Near Field Probes: Useful Tools for RF/MW Engineers
Half-day
Sponsor: N/A

SMB | 0800-1700
Theory and Design of Phase Locked Loops
Full-day
Sponsor:N/A

FRIDAY

Time: 0800 – 1700

SFA | 0800-1200
A Hands-on Approach to Spectrum Regulation for Innovative Microwave Engineers
Half-day
Sponsor:MTT-20 Wireless Communications

SFB | 0800-1700
The Dynamics, Bifurcation, and Practical Stability Analysis/Design of Nonlinear Microwave Circuits and Networks
Full-day
Sponsor: MTT-16 Microwave Systems

SFC | 0800-1200
Flexible 5G mmWave Waveform Testbed and Active Device Characterization
Half-day
Sponsor:N/A

IMS PANEL SESSIONS

Internet of Things Tuesday - Hype or Boom to Come? (Joint RFIC/IMS Panel)	Tuesday, 1200-1330
Wearable Electronics- Is it a Fad or the Future of Electronics?	Tuesday, 1200-1330
Diversity in Microwaves: Let's Talk About the Demographics	Tuesday, 1530-1700
Next Grand challenges in Microwave, RFIC, Sensors, and Communications	Wednesday, 1200-1330
Recent News in Millimeter Wave Regulations & Standards for Fixed & Mobile Use	Wednesday, 1200-1330
Millimeter Wave RFIC Industrial Test: A Roadblock for Mass Adoption?	Thursday, 1200-1330

IMS2015 EXHIBITOR LIST

AS OF 16 FEBRUARY 2015

3D Glass Solutions
3GMetalworx Inc.
A.J. Tuck Co.
A.T. Wall Company
A1 Microwave Ltd.
A-Alpha Waveguide Co.
ABF Elettronica Srl
Accel-RF Instruments Corp.
Accurate Circuit Engineering
ACEWAVETECH
Adamant Co.,Ltd.
ADMOTEC Co.Ltd
AdTech Ceramics
Advanced Circuitry International
*Advanced Metal Etching, Inc
("AME")
Advanced Test Equipment Rentals
Aeroflex Inc.
Aethercomm Inc.
Agilent Technologies (Agilent's
EMG is now Keysight
Technologies)
AI Technology, Inc.
AIR-VAC Engineering Co.
AKON, Inc.
Aldetec, Inc.
Aliner Industries, Inc.
Altair Engineering
AMCAD Engineering
Amcom Communications Inc.
American Beryllia, Inc.
American Microwave Corp.
American Standard Circuits, Inc.
Ametek Electronic Packaging
*Amkor Technology
AmpliTech Inc.
AMTI Microwave Circuits
Analog Devices, Inc.
Analog Devices, Inc.
Anapico Ltd.
Anaren
Anokiwave
Anritsu Co.
ANSYS, Inc.
*AO Technologies
APA Wireless Technologies

API Technologies
Applied Thin-Film Products (ATP)
AR RF/Microwave Instrumentation
ARC Technologies, Inc.
Arlon Materials for Electronics
*Arralis
Artech House
*ART-Fi
ASB Inc.
Ascotech Elec. Ltd.
Aselsan
Association of Old Crows/Naylor
Pub.
Astra Microwave Products Ltd.
Astronics Test Systems
ATC
ATE Systems
Atlanta Micro, Inc.
Auriga Microwave
Aurora Software & Testing, SL
Avago Technologies
Averna
AVX Corp.
Axiom Test Equipment, Inc.
B&Z Technologies
Barry Industries, Inc.
Beijing Aumiwalker Technology
Co., Ltd
Berkeley Nucleonics
Besser Associates, Inc.
BJG Electronics
Bliley Technologies, Inc.
Boeing
Bowel Integrated Circuits Co., Ltd.
BSC Filters Ltd.
C W Swift
Cadence Design Systems, Inc.
California Eastern Laboratories
Cambridge University Press
CapeSym, Inc.
Cascade Microtech, Inc.
CEMWorks Inc.
Centellax, Inc.
Centerline Technologies, LLC
*Century Seals, Inc.
Ceramic Magnetics Inc.

Cernex & Cernexwave
Charter Engineering, Inc.
Chengdu Filter Technology Co.,
Ltd.
Chengdu Hengwei Microwave
Electronic Co.
Chin Nan Precision Electronics
Co., Ltd.
*Chi-Shuai Enterprise Co., Ltd.
*ChoiceRight Electronics Inc.
Ciao Wireless, Inc.
Cinch Connectivity Solutions
Cirexx International, Inc.
Coaxial Components Corp.
Coilcraft, Inc.
Coining, Inc.
Coleman Cable/Southwire LLC
Communications & Power
Industries
Compex Corp.
Component Distributors Inc.
Connectronics, Inc.
Copper Mountain Technologies
Corning Inc.
Corry Micronics Inc
Crane Aerospace & Electronics
Crane Polyflon
Cree, Inc.
Crystek Corp.
CST of America, Inc.
CTS Electronic Components
CTT Inc.
Cuming Microwave
Custom Cable Assemblies, Inc.
Custom Microwave Components,
Inc.
Custom MMIC
Custom Systems Integration-CSI
Daa-Sheen Technology Co., Ltd.
DAPU Telecom Tech. Co.,Ltd
dBm
Dbwave Technologies Co., Ltd.
Delcross Technologies, LLC
DELFMEMS
Delta Electronics Mfg. Corp.
Delta Microwave Inc.
Delta-Sigma Inc.

Design Workshop Technologies
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DeWeyl Tool Company, Inc.
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Diamond Antenna & Microwave
Corp.
Diamond Microwave Devices
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Dielectric Laboratories, Inc.
Dino-Lite Scopes (BigC)
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DiTom Microwave Inc.
Dong Jin Technology Innovation
Co., Ltd.
Dow-Key Microwave
Ducommun Incorporated
DuPont Electronic Technologies
Dyconex AG
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Dynamwave Inc.
Dyne Tech Co., LTD
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Eastern Optx Inc.
*ECHO Microwave Co., Ltd.
Eclipse Microwave, Inc.
*ECROWN Technologies Ltd.
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ElectroMagneticWorks Inc.
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EM Research, Inc.
Empower RF Systems
EMSCAN
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Epoxy Technology, Inc.
Erzia Technologies, S.L.
ETL Systems
ETS-Lindgren
European Microwave Week
Evaluation Engineering
Everything RF / Microwaves 101
Excalibur Engineering Inc.
Exelis Inc. – Specialty Applications

* First time exhibitors

Exodus Advanced Communications, Corp.
EZ Form Cable Corp.
F&K Delvotec, Inc.
Farran Technology Ltd.
FECO ELASI
FEI-Elcom Tech Inc.
Ferrite Microwave Technologies
*Filtronic
Flexco Microwave Inc.
Focus Microwaves Inc.
Fort Wayne Metals
Freescale Semiconductor
Frontier Electronics, Corp.
Frontlynk Technologies Inc.
FTG Corp.
Gap Wireless
Geib Refining Corp.
Genmix Technology Co., Ltd
GEROTRON Communication GmbH
*GEYER Electronic America, Inc.
GGB Industries, Inc.
GigaLane Co., Ltd.
GigOptix, Inc.
Global Communication Semiconductors, LLC
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Greenray Industries Inc.
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High Frequency Electronics
*High Speed Interconnects
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Insulectro
Integra Technologies Inc.
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Intercept Technology Inc.
International Manufacturing Services Inc.
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IQD Frequency Products Inc.
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Isola
ISOTEC Corp.
ITEM Media
ITF Co., Ltd.
iTherm Technologies
IW Insulated Wire Microwave Products Div.
Jebsee Electronics Co., Ltd.
JFW Industries, Inc.
*Jiaxing Glead Electronics Co., Ltd.
Johanson MFG
Johanson Technology Inc.
JQL Electronics Inc.
K&L Microwave Inc.
KCB Solutions
KEYCOM Corp.
Keysight Technologies
Kingsignal Technology Co., Ltd.
Komax Wire
Krytar Inc.
KVG Quartz Crystal Technology GmbH
Kyocera America, Inc.
L-3 Electron Devices
L-3 Narda-MITEQ
LadyBug Technologies LLC
Laird
Lake Shore Cryotronics, Inc.
Lanjian Electronics
Lansdale Semi Inc.
Lark Engineering Co.

Laser Processing Technology, Inc.
Laser Services, Inc.
Leader Tech. Inc.
Liberty Test Equipment Inc.
Linear Photonics, LLC
Linearizer Technology, Inc.
Lintek Pty Ltd.
Linwave Technology Ltd.
LitePoint
Logus Microwave
Lorentz Solution, Inc.
LPKF Laser & Electronics
M2 Global Technology Ltd.
MACOM
Magvention*
Marcel Electronics International
Marki Microwave, Inc.
Massachusetts Bay Technologies
Materion
MathWorks
Maury Microwave Corp.
MaXentric Technologies LLC
*Maxim Integrated
*MCS Ltd.
MCV Microwave
MECA Electronics, Inc.
Mega Circuit Inc.
MegaPhase
Meggitt Safety Systems, Inc.
*MEMtronics Corporation
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METALLIFE, Inc.
Metallix Refining Inc.
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Metropole Products Inc.
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Micro Communications, Inc.
Micro Hybrid Dimensions, Inc.
Micro Lambda Wireless, Inc.
MicroApps
Micro-Coax Inc.
MicroFab Inc.
Micro-Mode
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Microsemi Corp. - RF Integrated Solutions
Microtech, Inc.
Microtool Inc.
Microwave Applications Group

Microwave Communications Labs, Inc.
Microwave Development Labs Inc.
Microwave Dynamics
Microwave Engineering Europe
Microwave Journal
Microwave Product Digest
Microwavefilters & TVC S.r.l.
Microwaves & RF
MIG Microwave Innovation Group
Millimeter Wave Products Inc.
Mini-Circuits
Mini-Systems Inc.
Mitsubishi Electric US, Inc.
MJS Designs, Inc.
Modelithics, Inc.
Modular Components National Inc.
Molex RF/Microwave Business Unit
Momentive Performance Materials
Morion, Inc.
MOSIS
Mouser Electronics, Inc.
MPDevice Co., Ltd.
MPI Corp.
MRSI Systems LLC
MtronPTI
MWI Laboratories
NAMICS Technologies, Inc.
Nanjing Jiexi Technologies Co., Ltd.
Natel EMS
National Instruments
National Reconnaissance Office
Networks International Corp. (NIC)
*newFASANT
Noise XT
Norden Millimeter Inc.
Northrop Grumman Systems Corp.
Nova Microwave, Inc.
NRC Canada GaN Foundry
Nuhertz Technologies, LLC
Nuvotronics
NXP Semiconductors
OEwaves Inc.
Ohmega Technologies Inc.
OML, Inc.
OMMIC S.A.S
*ON Semiconductor
OPHIR RF Inc.
Orban Microwave Inc.
Orbel Corp.
Orient Microwave Corp.

* First time exhibitors

P/M Industries Inc.
 P1dB, Inc.
 *Pacific Test Equipment Corp.
 Palomar Technologies
 ParkerVision, Inc.
 *Pasquali Microwave Systems
 Passive Plus Inc.
 Pasternack Enterprises, Inc.
 Peopleworks
 Peregrine Semiconductor Corp.
 Photo Sciences, Inc
 Pickering Interfaces, Inc.
 Pico Technology
 Piconics Inc.
 Pivotone Communication Tech., Inc.
 PJC Technologies, Inc.
 Planar Monolithics Industries, Inc.
 Plextek RFI
 Pole/Zero Corp.
 Polyfet RF Devices
 Precision Connector, Inc.
 *Premix Oy
 Presidio Components, Inc.
 Presto Engineering Inc.
 Q Microwave, Inc.
 Qorvo
 QRC Technologies
 Quest Microwave Inc.
 Questech Services Corp.
 Quik-Pak
 QuinStar Technology, Inc.
 QWED Sp. z o.o
 R&D Altanova
 R&K Company Ltd.
 *R.S. Technology Co., Ltd.
 Ranatec Instruments AB
 Reactel, Inc.
 RelComm Technologies Inc.
 Remcom, Inc.
 Remtec, Inc.
 Resin Systems Corp.
 Res-Net Microwave, Inc.
 Response Microwave Inc.
 RF Bay, Inc.
 RF Depot Inc.
 RF Globalnet
 RF Morecom Corea
 Rfcore Co., Ltd.
 RFHIC Corp.
 Rflight Communication Electronic Co.,Ltd
 RFMW, Ltd.

RFS Ferrocom Ferrite Division
 Richardson RFPD
 Rigol Technologies
 RJR Polymers Inc.
 RK Technologies LLC
 RLC Electronics, Inc.
 RN2 Technologies
 Rogers Corp.
 Rohde & Schwarz
 Roos Instruments Inc.
 Rosenberger North America LLC
 Roswin, Inc.
 SAGE Millimeter, Inc.
 *Saint-Gobain
 Sainity-Tech Communications Ltd.
 Samtec, Inc.
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 San-tron Inc.
 Sawmics Inc.
 Scientific Microwave Corp.
 Semi Dice Inc.
 SemiGen, Inc.
 SemiProbe Inc.
 SGMC Microwave
 Shanghai Huaxiang Computer Comm. Eng.
 Shanghai JinYou Fluorine Materials Co., Ltd.
 *Shanghai Xin Xun Microwave Technology Co., Ltd.
 Shenzhen Huayang Tech. Development Co.
 Shenzhen Superlink Connector Co.,Ltd.
 Shenzhen Yulongtong Electron Co.,Ltd.
 Shoulder Electronics Limited
 Sichuan Keenlion Microwave Tech. Co., Ltd
 Signal Hound
 SignalCore Inc.
 Signatone
 Sinclair Manufacturing Co.
 SIPAT Co.
 SJM Prewell*
 Skyworks Solutions, Inc.
 Smiths Microwave
 SOMACIS
 Sonnet Software Inc.
 Soontai Tech Co., Ltd
 SOURIAU PA&E
 Southwest Microwave, Inc.
 *SpaceForest

SPEAG-Schmid & Partner Engineering AG
 Spectrum Elektrotechnik GmbH
 SRI Connector Gage Company
 SRTechnology Corp.
 SSI Cable Corp.
 Standard Printed Circuits, Inc.
 State Of The Art Inc.
 Statek Corp.
 Stellar Industries Corp.
 StratEdge Corp.
 Sumitomo Electric Device Innovations
 Suron
 SV Microwave Inc.
 Synergy Microwave Corp.
 Taconic
 Tai-Saw Technology Co., Ltd.
 TDK-Lambda Americas
 Tecdia Inc.
 *TechPlus Microwave, Inc.
 *Tech-X Corporation
 Teledyne Coax
 Teledyne LeCroy
 Teledyne Microelectronics
 Teledyne Microwave Solutions
 Teledyne Paradise Datacom
 Teledyne Relays
 Teledyne Scientific
 Teledyne Storm Microwave
 Teledyne Technologies
 Telegartner, Inc.
 Telemakus, LLC.
 TestEquity LLC
 Testworld, Inc.
 Texas Instruments
 The Prince & Izant Companies, NuTEC
 Ticer Technologies
 Times Microwave Systems
 TMD Technologies
 Top Dog Test
 Tosfy Technology Inc.
 Toshiba America Electronic Cmpts., Inc.
 TowerJazz
 Transcom, Inc.
 Transline Technology Inc.
 Trescal, Inc.
 Tronser, Inc.
 TRU Corp.
 TTE Filters, LLC
 T-Tech Inc.
 Ulbrich Stainless Steels & Special

Metals, Inc.
 UltraSource Inc.
 UMS (United Monolithic Semiconductors)
 Unimetal Surface Finishing LLC
 UTE Microwave Inc.
 Varioprint AG
 Vaunix Technology Corp.
 Vectron International
 Venturtec North America
 *Vicomm Technology Co., Ltd.
 VIDA Products, Inc.
 Viking Tech America Corp.
 VIMA Co., Ltd.
 Viper RF Limited
 Virginia Diodes Inc.
 Vishay Intertechnology, Inc.
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 Winchester Electronics Corporations
 Windfreak Technologies, LLC
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 Wireless Telecom Group
 X5 Systems, Inc.
 Xi'an Forstar S&T Co., Ltd.
 Xi'an HengDa Microwave Tech. Dev. Co.
 *X-Microwave, LLC
 Xpeedic Technology, Inc.
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 Yokowo Co., Ltd.
 Z-Communications, Inc.
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 Zik, Inc.

* First time exhibitors