

2013 European Microwave Conference











(EuMC 2013)

**Nuremberg, Germany
6-10 October 2013**


Pages 1231-1870



**IEEE Catalog Number: CFP13455-POD
ISBN: 978-1-4799-0264-4**

- 1231  **© Wideband Analysis of Scattering Problems Using an Eigenmode Projection Technique**
Mamdouh H. Nasr, Islam A. Eshrah, Tamer M. Abuelfadl, Cairo University, Egypt
- 1235  **© Planar Transmission Line Pickups for Beam Position Monitoring in Particle Accelerators**
*Aleksandar Angelovski¹, Andreas Penirschke¹, Cezary Sydlo², Uros Mavric²,
Christopher Gerth², Rolf Jakoby¹*
¹Technische Universität Darmstadt, Germany; ²DESY, Germany
-
- 1239  **© Improved Field Homogeneity for Microstrip Transceiver Array for 7T MRI Using Particle Swarm Optimization**
James F. Stack Jr., Remcom Inc., USA
- 1243  **© Broadband Detector Array Concept for 3D Holographic Imaging at THz Frequencies**
C. Schildbach, Jan Schür, Lorenz-Peter Schmidt, FAU Erlangen-Nürnberg, Germany
- 1247  **© A Novel FFT/IFFT Size Efficient Technique to Generate Real Time Optical OFDM Signals Compatible with IM/DD Systems**
*Fatima Barrami¹, Yannis Le Guennec², Emil Novakov², Jean-Marc Duchamp²,
Pierre Busson¹*
¹STMicroelectronics, France; ²IMEP-LAHC, France
- 1251  **© Transformation of Gaussian-Like Pulses by a Nonlinear Dielectric Layer**
D. Zolotariov, A. Nerukh, KNURE, Ukraine
- 1255  **© Modified Spiral RFID Tag Antenna Optimal Design Using Artificial Bee Colony Optimization**
Sotirios K. Goudos¹, Katherine Siakavara¹, John N. Sahalos²
¹Aristotle University of Thessaloniki, Greece; ²University of Nicosia, Cyprus
- 1259  **© Considerations of Small Cell Strategy in Mobile Communication Systems**
*Hiroyuki Otsuka, Yuki Ichimura, Yukihiro Sakamoto, Katsunori Kikuchi, Kogakuin
University, Japan*
- 1263  **© Reduction of Human Body Effect on Mobile Handset Antennas**
Andrey Grigoriev, St. Petersburg Electrotechnical University, Russia
- 1267  **© Reducing the Interference in Compact MIMO Antennas of CRLH-TL-Based Broadside-Capacitive and Slot Couplings**
Kyeongnam Jang¹, S. Kahng¹, K.-S. Kahng¹, Inkyu Yang¹, Yongjin Kim²
¹University of Incheon, Korea; ²Inha Technical College, Korea



-
- 1271  **Effective Utilization of Coaxial Connector for Millimeter Wave Multilayer Device Testing**
Andrey Mozharovskiy, Vladimir Ssorin, Alexey Artemenko, Roman Maslennikov, Alexey Sevastyanov, Radio Gigabit LLC, Russia
- 1275  **Evaluation of Electromagnetic Field Characteristics Inside Carbon Fiber Reinforced Plastic Structure Using Reverberation Chamber Method**
Shunichi Futatsumori, Akiko Kohmura, Naruto Yonemoto, ENRI, Japan
- 1279  **New Verification Routine for Pulsed I-V and Transient Current Measurement Setup Applied to a THz Schottky Diode**
Subash Khanal¹, Tero Kiuru², Juha Mallat¹, Antti V. Räsänen¹, Tapani Närhi³
¹Aalto University, Finland; ²VTT Technical Research Centre of Finland, Finland; ³ESA, The Netherlands
- 1283  **Digitally-Controlled Calibrator for Measurement and Testing of CW Doppler Radars**
Vojtech Jenik, Zdenek Plhak, Premysl Hudec, Petr Cerny, Czech Technical University in Prague, Czech Republic
- 1287  **A Proposal of a New Permittivity Measurement Method for Low-Loss Materials**
Yuto Kato, Michitaka Ameya, Masahiro Horibe, Satoru Kurokawa, AIST, Japan
- 1291  **Improved Gain-Transfer Method for Long Antennas**
Gordon Mayhew-Ridgers¹, Paul A. van Jaarsveld¹, Johann W. Odendaal², Johan Joubert²
¹Vodacom Pty. Ltd., South Africa; ²University of Pretoria, South Africa
- 1295  **OROTRON Intracavity Millimeter-Wave Spectroscopy of Weakly Bound Complexes and Small Clusters**
L.A. Surin, Russian Academy of Sciences, Russia
-

- 1299  **1mm Coaxial Matches with an Excellent Absorption Behavior over the Frequency Range 0-110GHz**
Andreas Tag¹, Jens Leinhos², Gerd Hechtfischer², Martin Leibfritz², Thomas Eibert³
¹FAU Erlangen-Nürnberg, Germany; ²Rohde & Schwarz, Germany; ³Technische Universität München, Germany

EuMC/EuMIC01 : Switch-Mode Power Amplifiers

Chair: Marc van Heijningen, TNO — Co-Chair: Denis Barataud, XLIM











Venue Kiew, Time 08:30 - 10:10, Tuesday 8th October 2013

- 1303   **Concurrent Dual-Band High Efficiency Class-E Power Amplifier**
Fatemeh Norouzzian, Peter Gardner, University of Birmingham, UK
- 1307   **Wideband Class-E Power Amplifier Covering the Whole UHF Broadcast Band**
Jiafeng Zhou¹, Kevin Morris¹, Gavin T. Watkins², Keiichi Yamaguchi³
¹University of Bristol, UK; ²Toshiba Research Europe Ltd., UK; ³Toshiba Corporation, Japan
- 1311   **Statistical Harmonic Load Termination Analysis of Switch-Mode Power Amplifiers Employing Bandpass-Pulse-Length Modulation**
Sebastian Krause¹, Stephan Maroldt¹, Christian Zech¹, Rüdiger Quay¹, Matthias A. Hein²
¹Fraunhofer IAF, Germany; ²Technische Universität Ilmenau, Germany
- 1315   **Supply Modulator for Envelope-Tracking Operation of Dual-Mode Handset Power Amplifier**
Jooseung Kim¹, Dongsu Kim¹, Yunsung Cho¹, Daehyun Kang², Byungjoon Park¹, Kyunghoon Moon¹, Bumman Kim¹
¹POSTECH, Korea; ²Broadcom Corporation, USA
-

EuMC/EuMIC02 : RF MEMS Based Components

Chair: Larissa Vietzorreck, TU Munich — Co-Chair: Lluís Pradell, Polytech. University of Catalonia











Venue Riga, Time 08:30 - 10:10, Tuesday 8th October 2013

- 1319   **High Power GaN Monolithically Integrated RF MEMS Switches**
A.M. Mahmoud Mohamed¹, S. Boumaiza¹, Raafat R. Mansour¹, I. Zine-El-Abidine²
¹University of Waterloo, Canada; ²CMC Microsystems, Canada
- 1323   **Characterization of High-Q Laterally Moving RF MEMS Tuneable Capacitor**
U. Shah, J. Oberhammer, KTH, Sweden
- 1327   **High Capacitance Ratio RF MEMS Dielectric-Less Switched Capacitor**
Mansour Fall¹, Siamak Fouladi², Frédéric Domingue¹, Christel Dieppedale³, Bruno Reig³, Raafat R. Mansour²
¹Université du Québec à Trois-Rivières, Canada; ²University of Waterloo, Canada; ³CEA-LETI, France
- 1331   **A Novel Self Collapsed Corrugated MEMS Phase Shifter**
Maher Bakri-Kassem¹, Raafat R. Mansour²
¹American University of Sharjah, UAE; ²University of Waterloo, Canada
- 1335   **Reliability of Nanocrystalline Diamond MEMS Capacitive Switches**
L. Michalas¹, S. Saada², M. Koutsourelis¹, C. Mer², A. Leuliet³, P. Martins³, S. Bansropun³, G. Papaioannou¹, P. Bergonzo², A. Ziaei³
¹University of Athens, Greece; ²CEA-LIST, France; ³Thales Research and Technology, France

EuMC/EuMIC03: Ferroelectric Materials and Modeling

Chair: Francisco Medina, University of Seville — Co-Chair: Rolf Jakoby, TU Darmstadt










Venue Istanbul, Time 08:30 - 10:10, Tuesday 8th October 2013

- 1339   **Tunable FBARs Based on Sol-Gel Grown PMN-PT Films**
A. Vorobiev¹, Spartak Gevorgian¹, M. Spreitzer², A. Veber², D. Suvorov²
¹Chalmers University of Technology, Sweden; ²Jožef Stefan Institute, Slovenia
- 1343   **Loss Balance in Tunable Ferroelectric FBARs**
Spartak Gevorgian, A. Vorobiev, Chalmers University of Technology, Sweden
- 1347   **Lateral Mode Intrinsically Switchable Barium Titanate Film Bulk Acoustic Wave Resonators**
Victor Lee¹, Seyit Ahmet Sis¹, Seungku Lee¹, Amir Mortazawi¹, Xinen Zhu²
¹University of Michigan, USA; ²Shanghai Jiao Tong University, China
- 1351   **Thick-Film Barium-Strontium-Titanate Varactors for RF Power Transistors**
Alex Wiens¹, Olof Bengtsson², Holger Maune¹, Mohsen Sazegar¹, Wolfgang Heinrich², Rolf Jakoby¹
¹Technische Universität Darmstadt, Germany; ²FBH, Germany
- 1355   **A Simple Nonlinear mBVD Model Parameter Extraction Method for Intrinsically Switchable Ferroelectric FBARs**
Seungku Lee, Victor Lee, Seyit Ahmet Sis, Amir Mortazawi, University of Michigan, USA
-

EuMC/EuMIC04: Nonlinear Device Characterisation

Chair: Dominique Schreurs, KU Leuven — Co-Chair: Johannes Benedikt, Cardiff University






Venue Copenhagen, Time 08:30 - 10:10, Tuesday 8th October 2013

- 1359   **Benefits and Validation of 4-Dummies De-Embedding Method for Characterization of SiGe HBT in G-Band**
Marina Deng¹, Sylvie Lepilliet¹, François Danneville¹, Gilles Dambrine¹, Daniel Gloria², Nicolas Derrier², Pascal Chevalier²
¹IEMN, France; ²STMicroelectronics, France
- 1363   **On High Resolution, Pulse-Profiled mm-Wave Intermodulation Measurements**
J. Martens, Anritsu Company, USA
- 1367   **Low Cost AM/AM and AM/PM Characterization Setup Based on Scalar Measurements**
Riccardo Danieli, Luca Piazzon, R. Giofrè, Paolo Colantonio, Franco Giannini, Università di Roma "Tor Vergata", Italy
- 1371   **94-GHz Load Pull Measurements of SiGe HBT by Extracting Output Power Density in W-Band**
Issam Hasnaoui¹, Elodie Canderle¹, Pascal Chevalier², Daniel Gloria², Christophe Gaquiere¹
¹IEMN, France; ²STMicroelectronics, France
- 1375   **Nonlinear Charge Trapping Effects on Pulsed I/V Characteristics of GaN FETs**
Alberto Santarelli¹, Rafael Cignani¹, Gian Piero Gibiino¹, Daniel Niessen¹, Pier Andrea Traverso¹, Corrado Florian¹, Claudio Lanzieri², Antonio Nanni², Dominique Schreurs³, Fabio Filicori¹
¹Università di Bologna, Italy; ²Selex ES, Italy; ³Katholieke Universiteit Leuven, Belgium

EuMC/EuMIC05: Innovative Design Approaches for GaN Power Amplifiers

Chair: Ernesto Limiti, University of Rome — Co-Chair: Renato Negra, RWTH





Venue Kiew, Time 13:50 - 15:30, Tuesday 8th October 2013

- 1379  **Ⓞ L-Band AlGaIn/GaN Power Amplifier with Protection Against Load Mismatch**
M. van Heijningen¹, G. van der Bent¹, Eric H. van der Houwen¹, A. Chowdhary², F.E. van Vliet¹
¹TNO, The Netherlands; ²ESA, The Netherlands
- 1383  **Ⓞ A 65-100GHz Impedance Transforming Hybrid Coupler for a V-/W-Band AlGaIn/GaN MMIC**
P. Pahl¹, S. Diebold¹, D. Schwantuschke², Sandrine Wagner², R. Lozar², Rüdiger Quay², Ingmar Kallfass³, Thomas Zwick¹
¹KIT, Germany; ²Fraunhofer IAF, Germany; ³Universität Stuttgart, Germany
- 1387  **Ⓞ Load-Modulated GaN Power Amplifier Implementing Tunable Thick Film BST Components**
Mhd. Tareq Arnous¹, Alex Wiens², Sebastian Preis¹, Holger Maune², Khaled Bathich¹, M. Nikfalazar², Rolf Jakoby², Georg Boeck¹
¹Technische Universität Berlin, Germany; ²Technische Universität Darmstadt, Germany
- 1391  **Ⓞ Class-BJ Power Amplifier Modes: The IMD Behavior of Reactive Terminations**
Vincenzo Carrubba, Stephan Maroldt, Rüdiger Quay, Oliver Ambacher, Fraunhofer IAF, Germany
- 1395  **Ⓞ Wideband High Efficiency High Power GaN Amplifiers Using MIC and Quasi-MMIC Technologies**
C. Berrached¹, D. Bouw¹, M. Camiade¹, Denis Barataud²
¹United Monolithic Semiconductors, France; ²XLIM, France

EuMC/EuMIC06: III-V Transceiver Circuits














Chair: Ingmar Kallfass, University of Stuttgart — Co-Chair: Rüdiger Quay, Fraunhofer IAF















Venue Riga, Time 13:50 - 15:30, Tuesday 8th October 2013








- 1399  **Ⓞ QFN-Packaged Highly-Linear Cascode GaN LNA MMIC from 0.5 to 3GHz**
Stephan Maroldt¹, Beatriz Aja², Friedbert van Raay¹, Sebastian Krause¹, Peter Brückner¹, Rüdiger Quay¹
¹Fraunhofer IAF, Germany; ²Universidad de Cantabria, Spain
- 1403  **Ⓞ A 0-Level Packaged RF-MEMS Switched Wideband GaAs LNA MMIC**
A. Gustafsson¹, C. Samuelsson², R. Malmqvist¹, S. Seok³, M. Fryziel³, N. Rolland³, B. Grandchamp⁴, Tauno Vähä-Heikkilä⁵, R. Baggen⁶
¹FOI, Sweden; ²SAAB Aerosystems, Sweden; ³IEMN, France; ⁴OMMIC, France; ⁵VTT Technical Research Centre of Finland, Finland; ⁶IMST GmbH, Germany
- 1407  **Ⓞ A Compact 94GHz FMCW Radar MMIC Based on 100nm InGaAs mHEMT Technology with Integrated Transmission Signal Conditioning**
Christian Zech, Axel Hülsmann, Rainer Weber, A. Tessmann, Sandrine Wagner, Michael Schlechtweg, Arnulf Leuther, Oliver Ambacher, Fraunhofer IAF, Germany
- 1411  **Ⓞ A 240GHz Quadrature Receiver and Transmitter for Data Transmission up to 40Gbit/s**
D. Lopez-Diaz¹, A. Tessmann¹, Arnulf Leuther¹, Sandrine Wagner¹, Michael Schlechtweg¹, Oliver Ambacher¹, F. Kurz², S. Koenig³, J. Antes³, F. Boes³, R. Henneberger⁴, Ingmar Kallfass⁵
¹Fraunhofer IAF, Germany; ²Siemens AG, Germany; ³KIT, Germany; ⁴Radiometer Physics GmbH, Germany; ⁵Universität Stuttgart, Germany

EuMIC/EuMC Poster01 : EuMIC/EuMC Poster Session

Chair: Alexander Kölpin, University of Erlangen Nürnberg — Co-Chair: Dietmar Kissinger, University of Erlangen Nürnberg
Venue Exhibition Hall, Time 10:00 - 18:00, Tuesday 8th October 2013









- 1415  **Antenna Design and Characterization for a 61GHz Transceiver in eWLB Package**
M. Pourmousavi¹, M. Wojnowski², Roman Agethen¹, G. Sommer², Robert Weigel¹, A. Hagelauer¹
¹FAU Erlangen-Nürnberg, Germany; ²Infineon Technologies, Germany
- 1419  **Transmission Lines on Flexible Substrates with Minimized Dispersion and Losses**
Heinrich Wolf, Horst Gieser, Linus Maurer, Fraunhofer EMFT, Germany
- 1423  **Liquid Crystal and Infrared Thermography on Coated SAW Devices**
C. Huck¹, H.P. Zidek², Thomas Ebner², Karl C. Wagner², Achim Wixforth¹
¹Universität Augsburg, Germany; ²TDK Corporation, Germany
- 1427  **A Novel Method to Improve the Power Capabilities of Microwave Components**
Rui Wang¹, Yun Li¹, Na Zhang¹, Wanzhao Cui¹, Ye Ming², Yongning He²
¹CAST, China; ²Xi'an Jiaotong University, China
- 1431  **Microwave Characterization of Ferroelectric Thin Films for Novel Compact Tunable BST Filters**
Rosa De Paolis¹, Fabio Coccetti¹, Sandrine Payan², Anthony Rousseau², Mario Maglione², Guillaume Guegan³
¹LAAS, France; ²ICMCB, France; ³STMicroelectronics, France
- 1435  **A New Fail-Safe Switch for Fast Ethernet Networks with a Defined State in Case of DC-Power Loss: Design and Test**
M. Balducci¹, W. Fischer², P. Klose², S. Schneele³, Roberto Sorrentino⁴, Volker Ziegler³
¹Universität Ulm, Germany; ²Airbus Deutschland, Germany; ³EADS Innovation Works, Germany; ⁴Università di Perugia, Italy
-
- 1439  **Resonant Substrate-Integrated Near-Field Sensors with Improved Sensitivity**
Nora Haase, Arne F. Jacob, Technische Universität Hamburg-Harburg, Germany
- 1443  **Terahertz Range Diode Based on Electron Field Emission of AlGaN Microcathode**
N.M. Goncharuk, V.V. Malyshko, V.A. Orehovskiy, N.F. Karushkin, RI "Orion", Ukraine
- 1447  **Flexible Polyethylene Terephthalate-Based Inkjet Printed CPW-Fed Monopole Antenna for 60GHz ISM Applications**
K. Hettak¹, Tyler N. Ross², R. James¹, A. Momciu¹, J. Wight²
¹Communications Research Centre Canada, Canada; ²Carleton University, Canada
- 1451  **Pneumatically Switched Microwave and Antenna Structures**
Wayne S.T. Rowe, Xutao Tang, RMIT University, Australia
- 1455  **Towards a Large-Signal Noise Model for GaN HEMT Devices**
Matthias Rudolph¹, Ralf Doerner²
¹Brandenburgische Technische Universität, Germany; ²FBH, Germany
- 1459  **Extension of the Load-Line Theory by Investigating the Impact of the Knee-Voltage on Output-Power and Efficiency**
Pinarello Sandro¹, Jan-Erik Mueller¹, Robert Weigel²
¹Intel Mobile Communications, Germany; ²FAU Erlangen-Nürnberg, Germany
- 1463  **High-Efficiency Power Amplifier MMICs in 100nm GaN Technology at Ka-Band Frequencies**
Jérôme Chéron¹, Michel Campovecchio¹, Raymond Quéré¹, D. Schwantuschke², Rüdiger Quay², Oliver Ambacher²

-
- 1467  **Ⓢ** **A Robust Ku-Band Low Noise Amplifier Using an Industrial 0.25- μ m AlGaIn/GaN on SiC Process**
Davide Resca¹, Francesco Scappaviva¹, Corrado Florian², Stéphane Rochette³, Jean-Luc Muraro³, Valeria Di Giacomo Brunel⁴, Christophe Chang⁴, Didier Baglieri⁴
¹MEC, Italy; ²Università di Bologna, Italy; ³Thales Alenia Space, France; ⁴United Monolithic Semiconductors, France
- 1471  **Ⓢ** **Nonlinear Transistor Modeling for Industrial 0.25- μ m AlGaIn-GaN HEMTs**
Christophe Chang¹, Valeria Di Giacomo Brunel¹, Didier Floriot¹, Jan Grünenpütt², Michael Hosch², Hervé Blanck²
¹United Monolithic Semiconductors, France; ²United Monolithic Semiconductors, Germany
- 1475  **Ⓢ** **A Novel Topology of Matching Network for Realizing Broadband High Efficiency Continuous Class-F Power Amplifiers**
Renbin Tong, Songbai He, Bohai Zhang, Zhongpo Jiang, Xianyun Hou, Fei You, UESTC, China
- 1479  **Ⓢ** **A Simplified Procedure for the Design of Continuous Class-F Power Amplifiers**
B. Merrick, J. King, T. Brazil, University College Dublin, Ireland
- 1483  **Ⓢ** **Design Methodology for Distributed Power Amplifier in Software-Defined Radio Applications**
Diego Palombini, Andrea Bentini, Mirko Palomba, Sergio Dibello, Ernesto Limiti, Università di Roma "Tor Vergata", Italy
- 1487  **Ⓢ** **Microwave Watt-Level Rectifiers for Power Recycling Applications**
Junfeng Xu¹, Wei Tai², David S. Ricketts³
¹MIT, USA; ²Carnegie Mellon University, USA; ³North Carolina State University, USA
-
- 1491  **Ⓢ** **Efficiency Enhancement of an Envelope Tracking Power Amplifier Combining Supply Shaping and Dynamic Biasing**
F.F. Tafuri, D. Sira, O.K. Jensen, T. Larsen, Aalborg University, Denmark
- 1495  **Ⓢ** **Wideband High Efficiency Multi-Band, Multi-Mode (LTE/WCDMA/GSM) Power Amplifier for Mobile Terminals**
John C. Clifton¹, Alan Lawrenson¹, Hideshi Motoyama², Kazumasa Kohama²
¹Sony Europe, UK; ²Sony Corporation, Japan
- 1499  **Ⓢ** **A Low Phase Noise Quadrature Ring Oscillator Using 0.5 μ m GaN-on-Si HEMT**
Fan-Hsiu Huang, Guan-Ting Lee, Hsien-Chin Chiu, Chang Gung University, Taiwan
- 1503  **Ⓢ** **Variable Gain Amplifier Architecture with Constant Matching and Insertion Phase**
Mirko Palomba¹, Andrea Bentini¹, Riccardo Cleriti¹, Ernesto Limiti¹, Mauro Ferrari²
¹Università di Roma "Tor Vergata", Italy; ²Elettronica S.p.A., Italy
- 1507  **Ⓢ** **A 159-169GHz Frequency Source with 1.26mW Peak Output Power in 65nm CMOS**
Bassam Khamaisi, Eran Socher, Tel Aviv University, Israel
- 1511  **Ⓢ** **A Monolithic DC-70-GHz Broadband Distributed Amplifier Using 90-nm CMOS Process**
Si-Hua Chen¹, Shou-Hsien Weng¹, Yu-Cheng Liu¹, Hong-Yeh Chang¹, Jeng-Han Tsai², Meng-Han Li¹, Shu-Yan Huang¹
¹National Central University, Taiwan; ²National Taiwan Normal University, Taiwan
- 1515  **Ⓢ** **Criteria for Maximum Spurious Free Dynamic Range of a Receiver System**
Justin R. Magers, National Instruments, USA
- 1519  **Ⓢ** **Integrated RF Tunable Filter Based on Recursive Architecture and its Application**
Tatsuya Omori¹, Shinichiro Nishiuma¹, Ken Seo¹, Chang-Jun Ahn¹, Ken-ya Hashimoto¹, Mikio Kamada²

-
- 1523  **Concurrent Dual-Band 1-Bit Digital Transmitter Using Band-Pass Delta-Sigma Modulator**
Takashi Maehata¹, Kazuyuki Totani¹, Suguru Kameda², Noriharu Suematsu²
¹Sumitomo Electric Industries Ltd., Japan; ²Tohoku University, Japan
- 1527  **Blind Nonlinear Compensation Technique for RF Receiver Front-End**
Yuelin Ma, Yasushi Yamao, University of Electro-Communications, Japan
- 1531  **Design of a 24GHz Analog Frontend for an Optically Powered RFID Transponder for the Integration into Metallic Components**
Johannes Meyer, Quang Huy Dao, Bernd Geck, Leibniz Universität Hannover, Germany
- 1535  **Frequency Enhancement of a 40-nm CMOS Static Frequency Divider by Negative Capacitance**
V. Issakov¹, G. Mangraviti¹, V. Szortyka¹, V. Vidojkovic¹, G. Vandersteen², P. Wambacq¹
¹IMEC, Belgium; ²Vrije Universiteit Brussel, Belgium
- 1539  **InP DHBT TIA-DMUX Integrated Circuit for 100-Gb/s Optical Communication Systems**
J.-Y. Dupuy¹, A. Konczykowska¹, F. Jorge¹, M. Riet¹, P. Berdager¹, V. Nodjadjim¹, J. Godin¹, A. Ouslimani²
¹III-V Lab, France; ²ECS-Lab (EA 3649), France
- 1543  **Design and Breakdown Behavior of 77GHz Variable Gain Power Amplifiers in SiGe-Technology**
K. Borutta¹, B. Laemmle¹, Christoph Wagner², Linus Maurer², Robert Weigel¹, Dietmar Kissinger¹
¹FAU Erlangen-Nürnberg, Germany; ²DICE, Austria
- 1547  **180GHz Frequency Doubler in Transferred-Substrate InP HBT Technology with 4dBm Output Power**
T. Jensen, Tomas Kraemer, Viktor Krozer, Wolfgang Heinrich, FBH, Germany
-
- 1551  **An Efficient SiGe Double-Balanced Mixer with a Differential Rat-Race Coupler**
Herman Jalli Ng¹, Martin Jahn¹, Reinhard Feger¹, Christoph Wagner², Andreas Stelzer¹
¹Johannes Kepler Universität Linz, Austria; ²DICE, Austria
- 1555  **A 60-GHz High-Gain, Low-Power, 3.7-dB Noise-Figure Low-Noise Amplifier in 90-nm CMOS**
Hsin-Chih Kuo, Huey-Ru Chuang, National Cheng Kung University, Taiwan
- 1559  **E-Band Receiver and Transmitter Modules with Simply Reflow-Soldered 3-D WLCSP MMIC's**
K. Tsukashima¹, M. Kubota¹, O. Baba¹, T. Kawasaki¹, A. Yonamine¹, T. Tokumitsu¹, Y. Hasegawa²
¹Sumitomo Electric Industries Ltd., Japan; ²Sumitomo Electric Device Innovations Inc., Japan
- 1563  **An Improved Switched Injection-Locked Oscillator for Ranging and Communication Systems**
Alexander Esswein, Robert Weigel, Thomas Ussmüller, Christian Carlowitz, Martin Vossiek, FAU Erlangen-Nürnberg, Germany
- 1567  **Next-Generation CMOS-on-Insulator Multi-Element Network for Broadband Antenna Tuning**
Tero Ranta, Richard Whatley, Chih-Chieh Cheng, Marc Facchini, Peregrine Semiconductor Corporation, USA











EuMC/EuRAD01 : RF Engineering and Education

Chair: Dietmar Kissinger, University of Erlangen Nürnberg — Co-Chair: Bianca Will, Ruhr-University Bochum
Venue Oslo, Time 16:00 - 17:40, Wednesday 9th October 2013

- 1571   **Active Learning, Hardware Projects and Reverse Instruction in Microwave/RF Education**
Branimir Pejcinovic, Richard L. Campbell, Portland State University, USA
- 1575   **Activating Teaching for Quality Learning**
Vitaliy Zhurbenko, Technical University of Denmark, Denmark
- 1579   **Using UltraWideband to Teach Electromagnetics**
Alan Petroff, Time Domain, USA
- 1583   **Photonic Crystal Waveguide Design: A Didactic Microwave Approach**
*T.P. Pasetto¹, A.S.B. Sombra², V.F. Rodríguez-Esquerre³, S.E. Barbin⁴,
H.E. Hernández-Figueroa¹*
¹UNICAMP, Brazil; ²UFC, Brazil; ³UFBA, Brazil; ⁴USP, Brazil
-

EuMC/EuRAD02 : Advances in Six-Port Technology






Chair: Alexander Kölpin, University of Erlangen-Nürnberg
Co-Chair: Serioja Tatu, Institut national de la recherche scientifique
Venue St. Petersburg, Time 08:30 - 10:10, Thursday 10th October 2013

- 1587   **Six-Port Technology for Precise Geometrical Measurement Applications — A Overview**
*Alexander Koelpin, G. Vinci, S. Lindner, S. Mann, Francesco Barbon, Sarah Linz,
Florian Oesterle, Robert Weigel, FAU Erlangen-Nürnberg, Germany*
- 1591   **Six-Port Technology for Millimeter Wave MIMO Systems**
T. Jiang¹, D. Hammou², C. Hannachi², M. Nedil², J.-F. Frigon¹, Ke Wu¹, S.O. Tatu
¹École Polytechnique de Montréal, Canada; ²INRS-EMT, Canada
- 1595   **Six-Port and Five-Port Receivers for UWB and Optical Communications**
*I. Molina-Fernández, A. Moscoso-Mártir, J.M. Avila-Ruiz, R. Halir, P. Reyes-Iglesias
L. Moreno-Pozas, J. de-Oliva-Rubio, A. Ortega-Moñux, Universidad de Málaga, Spain*
- 1599   **Six-Port Microwave Interferometer Radar for Mechanical Vibration Analysis**
*G. Vinci¹, S. Lindner², S. Mann², Francesco Barbon², Sarah Linz², Robert Weigel
Alexander Koelpin²*
¹InnoSenT GmbH, Germany; ²FAU Erlangen-Nürnberg, Germany
- 1603   **Three-Paths Microwave Interferometric System Based on a Six-Port Technique**
Kamel Haddadi, Tuami Lasri, IEMN, France

EuMC/EuRAD03 : Millimeter-Wave Phased Arrays for Communications and Radar

Chair: Philippe Eudeline, Thales Air Systems — Co-Chair: Wolfgang Menzel, University of Ulm






Venue Copenhagen, Time 08:30 - 10:10, Thursday 10th October 2013

- 1607  **Ⓞ Full-Space Scanning Phased Array System for Future Integrated High Data Rate Communication over E-Band and Beyond**
Ajay Babu Guntupalli, Ke Wu, École Polytechnique de Montréal, Canada
- 1611  **Ⓞ A SiGe-Based 16-Channel Phased Array Radar System at W-Band for Automotive Applications**
Paul Schmalenberg, Jae Seung Lee, Koji Shiozaki, TEMA, USA
- 1615  **Ⓞ 79GHz CMOS Circuits for Phase/Amplitude Calibration in High-Resolution Beamforming Radar Systems**
Masaki Kanemaru¹, Junji Sato¹, Kenji Takahashi², Toshiakira Ando¹, Hiroshi Komori¹, Michiaki Matsuo¹
¹Panasonic Corporation, Japan; ²Panasonic System Networks Co. Ltd., Japan
- 1619  **Ⓞ A 60GHz Band 2×4 Planar Dipole Phased Array Antenna Using Flip Chip Mounted MMIC Mixers**
Yuya Suzuki, Satoshi Yoshida, Tuan Thanh Ta, Shoichi Tanifuji, Suguru Kameda, Noriharu Suematsu, Tadashi Takagi, Kazuo Tsubouchi, Tohoku University, Japan
- 1623  **Ⓞ A Prototype of 60GHz Multiple-Beam Phased Array for Limited Scan**
Qinghua Lai, Pei Li, Mouping Jin, Chu Gao, Tongli Yuan, ECRIEE, China
-

EuMC/EuRAD04 : Microwave Imaging Principles and Systems

Chair: Alexander Yarovoy, Delft University of Technology — Co-Chair: Volker Ziegler, EADS Innovation Works











Venue Helsinki, Time 08:30 - 10:10, Thursday 10th October 2013

- 1627  **Ⓞ Increasing Measurement Speed in mm-Wave Imaging Systems by Means of Frequency Multiplexing**
Tobias Koepfel¹, Sebastian Methfessel¹, Andreas Schiessl², Lorenz-Peter Schmidt¹
¹FAU Erlangen-Nürnberg, Germany; ²Rohde & Schwarz, Germany
- 1631  **Ⓞ Phase Error Sensitivity in Multistatic Microwave Imaging Systems**
Andreas Schiessl¹, Andreas Genghammer¹, Sherif Sayed Ahmed¹, Lorenz-Peter Schmidt²
¹Rohde & Schwarz, Germany; ²FAU Erlangen-Nürnberg, Germany
- 1635  **Ⓞ SUMIRAD — A Fast Imaging MMW Radiometer for Security and Safety Applications**
Stephan Dill, Markus Peichl, Daniel Rudolf, DLR, Germany
- 1639  **Ⓞ 79GHz-Band Coded Pulse Compression Radar System Performance in Outdoor for Pedestrian Detection**
Kiyotaka Kobayashi, Tadashi Morita, Hirohito Mukai, Takaaki Kishigami, Yoichi Nakagawa, Panasonic Corporation, Japan
- 1643  **Ⓞ Environmental Imaging with a Mobile UWB Security Robot for Indoor Localisation and Positioning Applications**
Rahmi Salman¹, Ingolf Willms¹, Takuya Sakamoto², Toru Sato², Alexander G. Yarovoy³
¹Universität Duisburg-Essen, Germany; ²Kyoto University, Japan; ³Technische Universiteit Delft, The Netherlands

EuMC/EuRAD05 : Beam Forming Techniques for Phased Array Antennas

Chair: Jean-Yves Dauvignac, University of Nice-Sophia Antipolis — Co-Chair: Heinz-Peter Feldle, Cassidian











Venue Hongkong, Time 10:40 - 12:20, Thursday 10th October 2013

- 1647   **Horn Antenna Array for Imaging Reflector Antenna Engineering Model in 21-GHz Band**
Masafumi Nagasaka, Susumu Nakazawa, Masashi Kamei, Shoji Tanaka, Yasuhiro Ito, NHK, Japan
- 1651   **A Multiport Approach to Modelling of Phased Antenna Array for Radio Astronomy**
Peter L. Tokarsky, Serge N. Yerin, National Academy of Sciences of Ukraine, Ukraine
- 1655   **Synthesis of Radiation Pattern Including Error Effect of Current Excitation with Jamming Suppression Ability for Application in Radar Systems**
O. Vendik, D. Kozlov, S. Kalinin, St. Petersburg Electrotechnical University, Russia
- 1659   **Design Methodology for Phased Subarray Antennas with Optimized Element Phase Control**
Won-Seok Lee, Seung-Tae Khang, Kyoung-Sub Oh, Jong-Won Yu, KAIST, Korea
- 1663   **Group Delay Dispersion Engineered Antenna Array**
Chung-Tse Michael Wu, Sam Gharavi, Babak Daneshhrad, Tatsuo Itoh, University of California at Los Angeles, USA
-

EuMC/EuRAD06 : Dielectric and Lens Antennas

Chair: Arne Jacob, TU Hamburg-Harburg — Co-Chair: Yoke Leen Sit, Karlsruhe Institute of Technology





Venue Copenhagen, Time 10:40 - 12:20, Thursday 10th October 2013

- 1667   **Static and Electronic Shaping of the Radiated Electromagnetic Fields in Radial Arrays of Substrate Integrated Leaky-Wave Antennas**
Alejandro Javier Martinez-Ros, Raúl Guzmán-Quirós, José Luis Gómez-Tornero, Universidad Politécnica de Cartagena, Spain
- 1671   **High Performance 60-GHz Dielectric Rod Antenna with Dual Circular Polarization**
M.W. Rousstia, M.H.A.J. Herben, Technische Universiteit Eindhoven, The Netherlands
- 1675   **Broadband Metal-Plate Lens with Short Focal Length**
H. Onoue, N. Kamiya, R. Suga, O. Hashimoto, Aoyama Gakuin University, Japan
- 1679   **Electromagnetic Characterization of Supershaped Lens Antennas for High-Frequency Applications**
P. Bia¹, Diego Caratelli², Luciano Mescia¹, J. Gielis³
¹Politecnico di Bari, Italy; ²Technische Universiteit Delft, The Netherlands; ³Universiteit Antwerpen, Belgium
- 1683   **A Feeding Concept of a Dielectric Hemispherical Lens Antenna for Polarimetric Radar Applications**
C. Dahl, Christian Schulz, Bianca Will, Ilona Rolfes, Christoph Baer, Thomas Musch, Ruhr-Universität Bochum, Germany

EuMC/EuRAD07: Antenna Arrays for Radar and Radiometry

Chair: Peter Knott, Fraunhofer FHR — Co-Chair: Bianca Will, Ruhr-Universität Bochum








Venue Copenhagen, Time 13:50–15:30, Thursday 10th October 2013
















- 1687  **Ⓞ Submillimeter Wave 8×1 Antenna Array with Dielectric Rods to Improve the Radiation Pattern**
R. Cambior, S. Ver Hoeye, C. Vázquez, G. Hotopan, M. Fernández, A. Hadarig, F. Las-Heras, Universidad de Oviedo, Spain
- 1691  **Ⓞ The Design of a Broadband Slotted Waveguide Antenna for Electronical Beam Steering Applications in MW Radiometry**
Eric Schreiber, Matthias Jirousek, Markus Peichl, Helmut Süß, DLR, Germany
- 1695  **Ⓞ 2-D Antenna Array Geometries for MIMO Radar Imaging by Digital Beamforming**
*Marlene Harter¹, Tobias Mahler¹, Tom Schipper¹, Andreas Zirotz², Thomas Zwick¹
¹KIT, Germany; ²Siemens AG, Germany*
- 1699  **Ⓞ Design of a Cosecant Square-Shaped Beam Pattern SAR Antenna Array Fed with Square Coaxial Feeder Network**
Anil Kumar Pandey, Agilent Technologies, India
-

EuRAD/EuMC Poster01: EuRAD/EuMC Poster Session





Chair: Christian Friesicke, TU Hamburg-Harburg — Co-Chair: Co-Chair: Arne Jacob, TU Hamburg-Harburg

Venue Exhibition Hall, Time 10:00–18:00, Thursday 10th October 2013

- 1703  **Ⓞ Advanced Polarization Estimation Method Using Spatial Polarization Characteristic of Antenna**
Yuliang Chang, Longfei Shi, Jian Dong, Xuesong Wang, Shunping Xiao, NUDT, China
- 1707  **Ⓞ The Measurement Method of Polarization Characteristics of Practical Radar Antenna**
Huanyao Dai, Xujian Shen, Jinliang Li, Liandong Wang, State Key Laboratory of Complex Electromagnetic Environmental Effects on Electronics & Information System, China
- 1711  **Ⓞ A Novel Cheeseholes Type Hemispherical Dielectric Resonator Antenna for Wireless Applications**
Biswajeet Mukherjee, Pragati Patel, Jayanta Mukherjee, IIT Bombay, India
- 1715  **Ⓞ Four-Arm 2nd-Mode Conical Spiral Antenna Feeding with Split Tapered Coax Balun**
Xu Zhao, Ming Li, Ning Chen, Qingyu Hou, Nanjing Electronic Equipment Institute, China
- 1719  **Ⓞ Spiral Antenna with Parasitic Radiating Elements**
*V. Callec¹, E. Fourn¹, R. Gillard¹, H. Diez²
¹IETR, France; ²CNES, France*
- 1723  **Ⓞ Parametric and Dispersion Analysis of a Dual-Pol Cavity-Backed Slot-Fed UWB Patch Antenna**
*Philipp Franz Freidl¹, Ivan Russo¹, Erich Leitgeb¹, Wolfgang Bösch¹, Thomas Gigl², Gerhard Schultes²
¹Technische Universität Graz, Austria; ²Maxim Integrated GmbH, Austria*
- 1727  **Ⓞ Ultra-Wideband Signals Radiation by Linear Arrays of Aperture Stacked Patch Antennas**
Artem Vilenskiy, Andrey Kletsov, Samsung R&D Institute Russia, Russia

- 1731  **© Circularly Polarized Dipole-Loop Antenna**
Hsuan-Lin Chang, Yachi Shen, Wanchu Hong, Min-Hua Ho, National Changhua University of Education, Taiwan
- 1735  **© Ultra Wide Band Low-Power Amplifier Integrated on Miniaturized Antenna for Biomedical Applications**
Mohamed Hamouda¹, Francesco Scotto di Clemente², Matthias A. Hein², Georg Fischer¹, Robert Weigel¹, Thomas Ussmüller¹
¹FAU Erlangen-Nürnberg, Germany; ²Technische Universität Ilmenau, Germany
- 1739  **© Size-Reduction and Suppression of Cavity-Resonances in Hybrid mm-Wave Antennas for Polarimetric Measurements**
Sebastian Methfessel, Lorenz-Peter Schmidt, FAU Erlangen-Nürnberg, Germany
- 1743  **© Analysis and Optimization of a Focusing Metal-Dielectric Probe for Near-Field Terahertz Imaging**
B. Zhu¹, J. Stiens¹, R. Vounckx¹, G. He²
¹Vrije Universiteit Brussel, Belgium; ²UESTC, China
- 1747  **© Fabrication Techniques for Wearable Antennas**
Giuseppina Monti, Laura Corchia, Luciano Tarricone, Università del Salento, Italy
- 1751  **© Slot Dual Dipole Antenna with Miniature Elliptical Substrate Lenses for Millimeter-Wave Imaging**
Jiali Lai, Calvin Domier, Neville C. Luhmann Jr., University of California at Davis, USA
- 1755  **© Phase-Only Pattern Synthesis Using a Modified Least Squares Method for Phased Arrays**
Bruno Pompeo¹, Leandro Pralon¹, Mariana Pralon¹, Rafael Mendes²
¹Brazilian Army Technological Center, Brazil; ²UNICAMP, Brazil
-
- 1759  **© A Novel Detection Algorithm of LFM Signal Based on Cubic Phase Function**
Qingyu Hou, Ming Li, Xu Zhao, Ning Chen, Nanjing Electronic Equipment Institute, China
- 1763  **© Long-Time Integration by Short-Time Cross-Correlation and Two-Step Doppler Processing for Passive Bistatic Radar**
Takehiro Hoshino, Kei Suwa, Shohei Nakamura, Ryuhei Takahashi, Shinichi Morita, Kazuhiko Yamamoto, Toshio Wakayama, Mitsubishi Electric Corporation, Japan
- 1767  **© Experimental Result of Passive Bistatic Radar with Unknown Transmitting Radar Pulse**
Toshihiro Ito, Ryuhei Takahashi, Shinichi Morita, Kazufumi Hirata, Mitsubishi Electric Corporation, Japan
- 1771  **© Performance Analysis of Multisite Radar Systems**
I. Ivashko, Oleg A. Krasnov, Alexander G. Yarovoy, Technische Universiteit Delft, The Netherlands
- 1775  **© Mission-Driven System Design During Runtime for Reconfigurable Radars and Antennas**
T.H. de Groot, Oleg A. Krasnov, Alexander G. Yarovoy, Technische Universiteit Delft, The Netherlands
- 1779  **© LFM CW Based MIMO Imaging Processing with Keystone Transform**
Philip van Dorp, TNO, The Netherlands
- 1783  **© Indoor Radar SLAM: A Radar Application for Vision and GPS Denied Environments**
Jan Willem Marck, Ali Mohamoud, Eric H. van der Houwen, Rob van Heijster, TNO, The Netherlands
- 1787  **© Through-the-Wall Moving Target Surveillance Using GPR**
V.E. Ivashchuk¹, V.P. Prokhorenko¹, A.A. Pitertsev², F.J. Yanovsky²
¹Transient Technologies LLC, Ukraine; ²National Aviation University, Ukraine

-
- 1791  **© Unified Radar-Communication (RadCom) Multi-Port Interferometer Transceiver**
Jaber Moghaddasi, Ke Wu, École Polytechnique de Montréal, Canada
- 1795  **© Joint Polarization for Micro-Doppler Signature Enhancement**
Xu Cheng, Yuliang Chang, Bin Rao, Jin Liu, Yongzhen Li, NUDT, China
- N/A  **© A Robust Phase Unwrapping Method for 3D Borehole Radar Interferometric imaging**
Qiang Hou, He Ping Pan, China University of Geosciences, China
- 1803  **© Almost Perfect Auto-Correlation Sequences for Binary Phase-Modulated Continuous Wave Radar**
W. Van Thillo, P. Gioffré, V. Giannini, D. Guermandi, S. Brebels, A. Bourdoux, Imec, Belgium
- 1807  **© Optimal Peak Sidelobe Level Sequences up to Length 74**
Anatolii N. Leukhin, Egor N. Potekhin, Volga State University of Technology, Russia
- 1811  **© Sensor Selection Algorithm for Optimal Management of the Tracking Capability in Multisensor Radar System**
Alexey S. Narykov, Alexander G. Yarovoy, Technische Universiteit Delft, The Netherlands
- 1815  **© Enhancement of Stepped-Frequency SAR Imaging Based on Compressive Sensing**
Bo Pang, DaHai Dai, ShiQi Xing, Yongzhen Li, Xuesong Wang, Jian Dong, NUDT, China
- 1819  **© Estimation of Trihedral Pose Angle from Virtual Aperture Radar Image**
Bo Chen, Tian Jin, Zhimin Zhou, Biying Lu, NUDT, China
- 1823  **© SINR Rank Ordering Metric for Signal Dependent Sub-Optimum STAP**
Nicola Battisti, Rainer Maria Rossi, MBDA Missile Systems, Italy
-
- 1827  **© Support Vector Machine Based Micro-Doppler Signature Classification of Ground Targets**
Aamir Javed, Sidrah Liaqat, Mojeeb Bin Ihsan, NUST, Pakistan
- 1831  **© Radar Cross-Section Model of the Sea in the Centimeter and Millimeter Waves at Small Grazing Angles**
V.I. Lutsenko¹, D.O. Popov¹, I.V. Lutsenko¹, Cong Liu²
¹National Academy of Sciences of Ukraine, Ukraine; ²National Aerospace University "KhAI", Ukraine
- 1835  **© Multi-Sensor Surveillance Radar Based on MISO Sensors and Kalman Filtration**
Vojtech Jenik, Filip Kozak, Premysl Hudec, Czech Technical University in Prague, Czech Republic
- 1839  **© A Comparison of Beamforming Methods for Microwave Breast Cancer Detection in Homogeneous and Heterogeneous Tissue**
Jochen Moll, Christian Kexel, Viktor Krozer, Goethe-Universität Frankfurt, Germany
- 1843  **© Radar Subsurface Imaging by Phase Shift Migration Algorithm**
Hui Zhang¹, Wolf-Stefan Benedix¹, Dirk Plettemeier¹, Valérie Ciarletti²
¹Technische Universität Dresden, Germany; ²LATMOS, France
- 1847  **© Advanced Ground Penetrating Radar: Open Issues and New Research Opportunities in Europe**
Lara Pajewski, Andrea Benedetto, Università di Roma Tre, Italy
- 1851  **© A Synthetic Aperture Interferometric Radiometer Test at X-Band for Potential Improvements at W-Band**
Yassine Aouial, Stéphane Méric, Olivier Lafond, Mohamed Himdi, IETR, France

-
- 1855  **© Investigation of MW Imaging Capabilities for the Estimation of Truckload**
Markus Peichl, Stephan Dill, Timo Kempf, DLR, Germany
- 1859  **© Measurement of Rain Parameters by Active-Passive Remote Sensing**
A. Linkova, G. Khlopov, National Academy of Sciences of Ukraine, Ukraine
- 1863  **© Automatic Radar Horizontal Alignment Scheme Using Stationary Target on Public Road**
Kwang-rok Choi, Gi-hyun Seo, Jae-eun Lee, Seong-hee Jeong, Joon-nam Oh, Mando, Korea
- 1867  **© Scattering Characteristics of Atmospheric Pressure Dielectric Barrier Discharge Plasma**
Soo-Min Lee¹, Il-Young Oh¹, Jong-Gwan Yook¹, Yongjun Hong²
¹Yonsei University, Korea; ²Agency for Defense and Development, Korea