

# **2010 European Microwave Integrated Circuits Conference**

**(EuMIC 2010)**

**Paris, France  
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## EuMIC01 : GaN Power Amplifiers

Chair: Klaus Beilenhoff, UMS — Co-Chair: Massimo Comparini, TAS

Venue: Darwin 4, 08:30-10:10, Monday 27 September 2010

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- 1      **Design of HEMT GaN Power Amplifiers with Wideband Control of 2<sup>nd</sup> Harmonic Impedances in S-Band**  
*J. Chéron<sup>1</sup>, M. Campovecchio<sup>1</sup>, D. Barataud<sup>1</sup>, M. Stanislawiak<sup>2</sup>, C. Tolant<sup>2</sup>, P. Eudeline<sup>2</sup>, D. Floriot<sup>3</sup>, Sylvain Heckmann<sup>3</sup>, L. Favède<sup>3</sup>, F. Temcamani<sup>4</sup>, C. Duperrier<sup>4</sup>*  
<sup>1</sup>XLIM, France; <sup>2</sup>Thales Air Systems, France; <sup>3</sup>United Monolithic Semiconductors, France; <sup>4</sup>ETIS, France
- 5      **Highly Efficient Harmonically Tuned Broadband GaN Power Amplifier**  
*Ahmed Al Tanany, Daniel Gruner, Ahmed Sayed, Georg Boeck, Technische Universität Berlin, Germany*
- 9      **GaN Power FETs for Next Generation Mobile Communication Systems**  
*M. Mußer, H. Walcher, T. Maier, Rüdiger Quay, M. Dammann, M. Mikulla, Oliver Ambacher, Fraunhofer IAF, Germany*
- 13     **A Compact S Band 100W Integrated Gallium Nitride Multistage Power Amplifier**  
*Matthew Poulton, Jay Martin, Jason Martin, David Aichele, RFMD, USA*
- 17     **GaN Power MMICs for X-Band T/R Modules**  
*O. Jardel<sup>1</sup>, J. Mazeau<sup>2</sup>, S. Piotrowicz<sup>1</sup>, D. Caban-Chastas<sup>2</sup>, E. Chartier<sup>1</sup>, E. Morvan<sup>1</sup>, Philippe Duême<sup>2</sup>, Yves Mancuso<sup>2</sup>, S.L. Delage<sup>1</sup>*  
<sup>1</sup>Alcatel-Thales III-V Lab, France; <sup>2</sup>Thales Systèmes Aéroportés, France
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## EuMIC02 : Focused Session — SiGe HBT for Applications mm-Wave: European Dotfive Project

Chair: Michael Schröter, Technical University of Dresden — Co-Chair: Alain Chantre, STMicroelectronics

Venue: Darwin 5, 08:30-10:10, Monday 27 September 2010

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- 21     **Pushing Conventional SiGe HBT Technology Towards “Dotfive” Terahertz**  
*Alain Chantre<sup>1</sup>, Pascal Chevalier<sup>1</sup>, Thomas Lacave<sup>1</sup>, Grégory Avenier<sup>1</sup>, Michel Buczko<sup>1</sup>, Yves Campidelli<sup>1</sup>, Linda Depoyan<sup>1</sup>, Ludovic Berthier<sup>1</sup>, Christophe Gacquièr<sup>2</sup>*  
<sup>1</sup>STMicroelectronics, France; <sup>2</sup>IEMN, France
- 25     **Modeling and Parameter Extraction of SiGe:C HBT's with HICUM for the Emerging Terahertz Era**  
*B. Ardouin<sup>1</sup>, C. Raya<sup>1</sup>, M. Schröter<sup>2</sup>, A. Pawlak<sup>2</sup>, D. Céli<sup>3</sup>, Franck Pourchon<sup>3</sup>, K. Aufinger<sup>4</sup>, T.F. Meister<sup>4</sup>, T. Zimmer<sup>5</sup>*  
<sup>1</sup>XMOD Technologies, France; <sup>2</sup>Technische Universität Dresden, Germany; <sup>3</sup>STMicroelectronics, France; <sup>4</sup>Infineon Technologies AG, Germany; <sup>5</sup>Laboratoire IMS, France
- 29     **TCAD Simulation and Development Within the European DOTFIVE Project on 500GHz SiGe:C HBT's**  
*M. Al-Sa'di<sup>1</sup>, V. d'Alessandro<sup>2</sup>, S. Fregonese<sup>1</sup>, S.-M. Hong<sup>3</sup>, C. Jungemann<sup>3</sup>, C. Maneux<sup>1</sup>, I. Marano<sup>2</sup>, A. Pakfar<sup>4</sup>, N. Rinaldi<sup>2</sup>, G. Sasso<sup>2</sup>, M. Schröter<sup>5</sup>, A. Sibaja-Hernandez<sup>6</sup>, C. Tavernier<sup>4</sup>, G. Wedel<sup>5</sup>*  
<sup>1</sup>Laboratoire IMS, France; <sup>2</sup>Università di Napoli “Federico II”, Italy; <sup>3</sup>Universität der Bundeswehr München, Germany; <sup>4</sup>STMicroelectronics, France; <sup>5</sup>Technische Universität Dresden, Germany; <sup>6</sup>IMEC, Belgium

## EuMIC03: Microwave Performance of Nitride Devices

Chair: *Christophe Gaquiere, IEMN* — Co-Chair: *Gaudenzio Meneghesso, University of Padua*

Venue: *Dupin 2, 08:30 - 10:10, Monday 27 September 2010*

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- 33      **Analysis of AlGaIn/GaN Epi-Material on Resistive Si(111) Substrate for MMIC Applications in Millimeter Wave Range**  
*F. Lecourt<sup>1</sup>, Y. Douvry<sup>1</sup>, N. Defrance<sup>1</sup>, V. Hoel<sup>1</sup>, Y. Cordier<sup>2</sup>, J.C. De Jaeger<sup>1</sup>*  
<sup>1</sup>IEMN, France; <sup>2</sup>CRHEA, France
- 37      **GaN-on-Si HEMTs Above 10W/mm at 2GHz Together with High Thermal Stability at 325°C**  
*F. Medjdoub<sup>1</sup>, D. Marcon<sup>1</sup>, J. Das<sup>1</sup>, J. Derluyn<sup>1</sup>, K. Cheng<sup>1</sup>, S. Degroote<sup>1</sup>, N. Vellas<sup>2</sup>, Christophe Gaquière<sup>2</sup>, M. Germain<sup>1</sup>, S. Decoutere<sup>1</sup>*  
<sup>1</sup>IMEC, Belgium; <sup>2</sup>MC2 Technologies, France
- 41      **Improved Microwave Noise and Linearity Performance in GaN MISHEMTs on Silicon with ALD Al<sub>2</sub>O<sub>3</sub> as Gate Dielectric**  
*Z.H. Liu, G.I. Ng, S. Arulkumar, Y.K.T. Maung, K.L. Teo, S.C. Foo, S. Vicknesh, Nanyang Technological University, Singapore*
- 45      **Performance Assessment of GaN HEMT Technologies for Power Limiter and Switching Applications**  
*Alessio Pantellini, Marco Peroni, Antonio Nanni, A. Bettidi, SELEX Sistemi Integrati S.p.A., Italy*
- 49      **Performances of AlInN/GaN HEMTs for Power Applications at Microwave Frequencies**  
*O. Jardel<sup>1</sup>, G. Callet<sup>2</sup>, J. Dufraisse<sup>1</sup>, N. Sarazin<sup>1</sup>, E. Chartier<sup>1</sup>, Tibault Reveyrand<sup>2</sup>, M. Oualli<sup>1</sup>, D. Lancereau<sup>1</sup>, M.A. Di Forte Poisson<sup>1</sup>, S. Piotrowicz<sup>1</sup>, E. Morvan<sup>1</sup>, S.L. Delage<sup>1</sup>*  
<sup>1</sup>Alcatel-Thales III-V Lab, France; <sup>2</sup>XLIM, France

## EuMIC04: Millimetre-Wave Front-End Solutions

Chair: *Bernd Adelseck, EADS* — Co-Chair: *Michel Prigent, Xlim*

Venue: *Dupin 3, 08:30 - 10:10, Monday 27 September 2010*

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- 53      **An All-Active MMIC-Based Chip Set for a Wideband 260-304GHz Receiver**  
*I. Kallfass<sup>1</sup>, A. Tessmann<sup>1</sup>, H. Massler<sup>1</sup>, Philipp Pahl<sup>2</sup>, A. Leuther<sup>1</sup>*  
<sup>1</sup>Fraunhofer IAF, Germany; <sup>2</sup>KIT, Germany
- 57      **AlGaIn/GaN Mixer MMICs, and RF Front-End Receivers for C-, Ku-, and Ka-Band Space Applications**  
*M.-N. Do<sup>1</sup>, M. Seelmann-Eggebert<sup>2</sup>, Rüdiger Quay<sup>2</sup>, D. Langrez<sup>1</sup>, J.-L. Cazaux<sup>1</sup>*  
<sup>1</sup>Thales Alenia Space, France; <sup>2</sup>Fraunhofer IAF, Germany
- 61      **A 40 Gsamples/s InP-DHBT Track-&Hold Amplifier**  
*Yves Bouvier<sup>1</sup>, Achour Ouslimani<sup>1</sup>, Agnieszka Konczykowska<sup>2</sup>, Jean Godin<sup>2</sup>*  
<sup>1</sup>ECS, France; <sup>2</sup>Alcatel-Thales III-V Lab, France
- 65      **Broadband, mmW Chipscale Switches**  
*T. Boles, J. Brogle, A. Rozbicki, M/A-COM Technology Solutions, USA*
- 69      **High-Isolation Low-Loss SP7T pHEMT Switch Suitable for Antenna Switch Modules**  
*Michael D. Yore, Corey A. Nevers, Philippe Cortese, TriQuint Semiconductor, USA*

## EuMIC05 : EuMIC Opening Session

Chair: Frederic Aniel, IEF — Co-Chair: Christophe Gaquière, IEMN

Venue: Darwin 3, 10:50 – 12:30, Monday 27 September 2010

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- 73      **Advances in Millimeter-Wave and Sub-Millimeter-Wave Devices and Circuits, Si to III-Vs**  
*H. Alfred Hung, US Army Research Laboratory, USA*
- 74      **Plasmonics for Beam Engineering**  
*Federico Capasso, Nanfang Yu, Harvard University, USA*

## EuMIC06 : Nonlinear Modelling and CAD

Chair: Teresa M. Martin-Guerrero, University of Malaga — Co-Chair: Fabio Filicori, University of Bologna

Venue: Dickens 5/6, 13:40 – 15:00, Monday 27 September 2010

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- 78      **Determination of Suitable mHEMT Transistor Dimensioning for Power Amplification at 210GHz by Comprehensive Measurements**  
*S. Diebold<sup>1</sup>, I. Kallfass<sup>1</sup>, H. Massler<sup>1</sup>, A. Leuther<sup>1</sup>, A. Tessmann<sup>1</sup>, Philipp Pahl<sup>2</sup>, S. Koch<sup>3</sup>, M. Siegel<sup>2</sup>, Oliver Ambacher<sup>1</sup>*  
*<sup>1</sup>Fraunhofer IAF, Germany; <sup>2</sup>KIT, Germany; <sup>3</sup>Sony Deutschland GmbH, Germany*
- 82      **Nonlinear Thermal Resistance Characterization for Compact Electrothermal GaN HEMT Modelling**  
*Alberto Santarelli, Valeria Di Giacomo, Rafael Cignani, Sara D'Angelo, Daniel Niessen, Fabio Filicori, Università di Bologna, Italy*
- 86      **Assessment of Power-Transistor Package Models: Distributed versus Lumped Approach**  
*Matthias Rudolph<sup>1</sup>, Wolfgang Heinrich<sup>2</sup>*  
*<sup>1</sup>Brandenburgische Technische Universität Cottbus, Germany; <sup>2</sup>FBH, Germany*
- 90      **Rigorous, HB-Based Nonlinear Stability Analysis of Multi-Device Power Amplifier**  
*Federica Cappelluti<sup>1</sup>, Fabio L. Traversa<sup>2</sup>, Fabrizio Bonani<sup>1</sup>, Simona Donati Guerrieri<sup>1</sup>, Giovanni Ghione<sup>1</sup>*  
*<sup>1</sup>Politecnico di Torino, Italy; <sup>2</sup>Universitat Autònoma de Barcelona, Spain*

## EuMIC07 : High-Speed & Millimetre-Wave ICs

Chair: Herbert Zirath, Chalmers University of Technology — Co-Chair: Frank Van Vliet, TNO

Venue: Darwin 4, 13:40 – 15:00, Monday 27 September 2010

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- 94      **Integrated Active Loop Sensor in SiGe Technology for Near-Field Scanning**  
*Nasir Uddin, Ahmed Awny, Andreas Thiede, Universität Paderborn, Germany*
- 98      **A Low-Noise 8–12GHz Fractional-N PLL in SiGe BiCMOS Technology**  
*Rüdiger Follmann<sup>1</sup>, Dietmar Köther<sup>1</sup>, Frank Herzel<sup>2</sup>, Frank Winkler<sup>3</sup>, Heinz-Volker Heyer<sup>4</sup>*  
*<sup>1</sup>IMST GmbH, Germany; <sup>2</sup>IHP GmbH, Germany; <sup>3</sup>Humboldt-Universität zu Berlin, Germany; <sup>4</sup>Kayser-Threde GmbH, Germany*
- 102      **Compact Variable Reflective-Type SiGe Phase Shifter Using Lumped Elements for 5GHz Applications**  
*K. Hettak<sup>1</sup>, G.A. Morin<sup>2</sup>*  
*<sup>1</sup>Communications Research Centre Canada, Canada; <sup>2</sup>Defence R&D Canada, Canada*
- 106      **BeamFormer ASIC in UHF-L Band for the Square Kilometer Array International Project**  
*Stéphane Bosse, Séverin Barth, Steve Torchinsky, Bruno Da Silva, Station de Radioastronomie de Nançay, France*

## EuMIC08: Wide Bandgap Device Technology

Chair: Michael Schlechtweg, Fraunhofer IAF — Co-Chair: Derek Smith, OMMIC

Venue: Darwin 5, 13:40-15:00, Monday 27 September 2010

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- 110      **Thermal and Trapping Phenomena Assessment on AlGaN/GaN Microwave Power Transistor**  
*Guillaume Mouginot<sup>1</sup>, Raphaël Sommet<sup>1</sup>, R. Quéré<sup>1</sup>, Zineb Ouarch<sup>2</sup>, Sylvain Heckmann<sup>2</sup>, Marc Camiade<sup>2</sup>*  
<sup>1</sup>XLIM, France; <sup>2</sup>United Monolithic Semiconductors, France
- 114      **Temperature Dependent Degradation Modes in AlGaN/GaN HEMTs**  
*Y. Douvry<sup>1</sup>, V. Hoel<sup>1</sup>, J.C. De Jaeger<sup>1</sup>, N. Defrance<sup>1</sup>, C. Sury<sup>2</sup>, N. Malbert<sup>2</sup>, N. Labat<sup>2</sup>, A. Curutchet<sup>2</sup>, C. Dua<sup>3</sup>, M. Oualli<sup>3</sup>, M. Piazza<sup>3</sup>, J.-M. Bluet<sup>4</sup>, W. Chikhaoui<sup>4</sup>, C. Bru-Chevallier<sup>4</sup>*  
<sup>1</sup>IEMN, France; <sup>2</sup>Laboratoire IMS, France; <sup>3</sup>Alcatel-Thales III-V Lab, France; <sup>4</sup>INL (UMR5270), France
- 118      **A Novel GaN-Based High Frequency Varactor Diode**  
*Chong Jin, Dimitris Pavlidis, Laurence Considine, Technische Universität Darmstadt, Germany*
- 122      **Hydrogen Terminated Diamond MESFETs: New Technology for RF Power Applications**  
*P. Calvani<sup>1</sup>, G. Conte<sup>2</sup>, D. Dominijanni<sup>2</sup>, E. Giovine<sup>2</sup>, B. Pasciuto<sup>3</sup>, Ernesto Limiti<sup>3</sup>*  
<sup>1</sup>Università di Roma Tre, Italy; <sup>2</sup>CNR-IFN, Italy; <sup>3</sup>Università di Roma "Tor Vergata", Italy

## EuMIC09: MMIC Active Device Modelling

Chair: Marco Pirola, Polytechnic of Turin — Co-Chair: Nuno Borges Carvalho, University of Aveiro

Venue: Dupin 2, 13:40-15:00, Monday 27 September 2010

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- 126      **GaAs MMIC Integrated Diode Limiters**  
*Niklas Billström, Mattias Nilsson, Krister Estmer, Saab AB, Sweden*
- 130      **Characterization of Electron Device Breakdown Under Nonlinear Dynamic Operation**  
*Antonio Raffo, Sergio Di Falco, Valeria Vadalà, Giorgio Vannini, Università di Ferrara, Italy*
- 134      **A Non Linear Power HEMT Model Operating in Multi-Bias Conditions**  
*C. Charbonniaud<sup>1</sup>, A. Xiong<sup>1</sup>, S. Dellier<sup>1</sup>, O. Jardel<sup>2</sup>, R. Quéré<sup>3</sup>*  
<sup>1</sup>AMCAD Engineering, France; <sup>2</sup>Alcatel-Thales III-V Lab, France; <sup>3</sup>XLIM, France
- 138      **A New Behavioral Model for Nonlinear Analysis of Class D Amplifiers for PWM Applications**  
*F. Arfaei Malekzadeh, Reza Mahmoudi, Arthur H.M. van Roermund, Technische Universiteit Eindhoven, The Netherlands*

## EuMIC10: Power Device Technologies

Chair: Andreas Thiede, University of Paderborn — Co-Chair: John Long, Delft University of Technology

Venue: Dupin 3, 13:40 - 15:00, Monday 27 September 2010

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- 142      **High Voltage Breakdown pHEMTs for C-Band HPA**  
*S. Lavanga<sup>1</sup>, A. Chini<sup>2</sup>, A. Coppa<sup>1</sup>, F. Corsaro<sup>1</sup>, Antonio Nanni<sup>1</sup>, Alessio Pantellini<sup>1</sup>, P. Romanini<sup>1</sup>, C. Lanzieri<sup>1</sup>*  
<sup>1</sup>SELEX Sistemi Integrati S.p.A., Italy; <sup>2</sup>Università di Modena e Reggio Emilia, Italy
- 146      **CMOS Compatible Medium Voltage LDMOS Transistors for Wireless Applications up to 5.8GHz**  
*Daniel Gruner<sup>1</sup>, Roland Sorge<sup>2</sup>, Olof Bengtsson<sup>3</sup>, Georg Boeck<sup>1</sup>*  
<sup>1</sup>Technische Universität Berlin, Germany; <sup>2</sup>IHP GmbH, Germany; <sup>3</sup>FBH, Germany
- 150      **Output Power Density Higher Than 1W/mm at 4GHz — Thanks to an Original Silicon LDMOS Transistor Layout**  
*D. Ducatteau<sup>1</sup>, D. Fournier<sup>1</sup>, G. Bekangba<sup>1</sup>, Pascal Chevalier<sup>2</sup>, Christophe Gaquière<sup>1</sup>*  
<sup>1</sup>IEMN, France; <sup>2</sup>STMicroelectronics, France
- 154      **HVVFET: A New 0.25 $\mu$ m Channel Length RF POWER MOSFET with Ultra Low Feedback Capacitance**  
*D. Rice, W.Z. Cai, B.P. Gogoi, M. Watts, P. Le, R.B. Davies, D. Lutz, HVVi Semiconductors, USA*

## EuMIC11: Advanced Device Technologies

Chair: John Atherton, WIN Semiconductors — Co-Chair: Klaus Beilenhoff, UMS GmbH

Venue: Dickens 5/6, 15:40 - 17:00, Monday 27 September 2010

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- 158      **High Performance InSb QWFETs for Low Power Dissipation Millimetre Wave Applications**  
*T. Ashley, M.T. Emeny, D.G. Hayes, K.P. Hilton, R. Jefferies, J.O. Maclean, S.J. Smith, W.H.A. Tang, P.J. Webber, G.M. Williams, QinetiQ Ltd., UK*
- 162      **High Frequency Performance of Tellurium  $\delta$ -Doped AlSb/InAs HEMTs at Low Power Supply**  
*Aurélien Olivier, A. Noudéviwa, Nicolas Wichmann, Yannick Roelens, Ludovic Desplanque, François Danneville, Gilles Dambrine, Xavier Wallart, Sylvain Bollaert, IEMN, France*
- 166      **150nm Copper Metalized GaAs pHEMT with Cu/Ge Ohmic Contacts**  
*E.V. Anichenko<sup>1</sup>, V.S. Arykov<sup>1</sup>, E.V. Erofeev<sup>1</sup>, V.A. Kagadei<sup>2</sup>*  
<sup>1</sup>Micran, Russia; <sup>2</sup>Submicron Technologies, Russia
- 170      **Graded Channel Concept for Improving RF Noise of an Industrial 0.15 $\mu$ m SOI CMOS Technology**  
*M. Emam<sup>1</sup>, P. Sakalas<sup>2</sup>, A. Kumar<sup>3</sup>, J. Ida<sup>4</sup>, D. Vanhoenacker-Janvier<sup>1</sup>, J.-P. Raskin<sup>1</sup>, François Danneville<sup>5</sup>*  
<sup>1</sup>Université Catholique de Louvain, Belgium; <sup>2</sup>Technische Universität Dresden, Germany; <sup>3</sup>University of Tokyo, Japan; <sup>4</sup>Kanazawa Institute of Technology, Japan; <sup>5</sup>IEMN, France

## EuMIC12: Modelling, Characterization and Design Techniques

Chair: Alberto Santarelli, University of Bologna — Co-Chair: Philippe Dueme, Thales Airborne Systems

Venue: Darwin 4, 15:40 - 17:00, Monday 27 September 2010

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- 174 **Temperature Dependent Small-Signal Model Parameters Analysis of AlGaAs/InGaAs pHEMTs in Multilayer 3D MMIC Technology**  
*Jimmy P.H. Tan, Junyi Yuan, Ali A. Rezazadeh, Q. Sun, University of Manchester, UK*
- 178 **Classification of Trapping Characteristic in HEMTs**  
*Sayed A. Albahrani, Anthony E. Parker, Macquarie University, Australia*
- 182 **Development of a Neural Approach for Bias-Dependent Scalable Small-Signal Equivalent Circuit Modeling of GaAs HEMTs**  
*Zlatica Marinković<sup>1</sup>, Giovanni Crupi<sup>2</sup>, Alina Caddemi<sup>2</sup>, Vera Marković<sup>1</sup>*  
<sup>1</sup>University of Niš, Serbia; <sup>2</sup>Università di Messina, Italy
- 186 **A DC-4GHz 270Ω Differential SiGe Low-Noise Amplifier for Cryogenic Applications**  
*Joseph C. Bardin, Sander Weinreb, California Institute of Technology, USA*

## EuMIC13: High Frequency Mixing Solutions

Chair: Frank Van Den Bogaart, TNO — Co-Chair: Franco Giannini, University of Roma

Venue: Darwin 5, 15:40 - 17:00, Monday 27 September 2010

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- 190 **A Balanced Resistive 210GHz Mixer with 50GHz IF Bandwidth**  
*D. Lopez-Diaz, I. Kallfass, A. Tessmann, H. Massler, A. Leuther, M. Schlechtweg, Oliver Ambacher, Fraunhofer IAF, Germany*
- 194 **Comparison on mHEMT Q-Band Sub-Harmonic Mixers with/without Delay Compensation**  
*Jin-Siang Syu, Chinchun Meng, Jen-Yi Su, Guo-Wei Huang, National Chiao Tung University, Taiwan*
- 198 **An InP HBT Sub-Harmonic Mixer for E-Band Wireless Communication**  
*Tom K. Johansen<sup>1</sup>, Viktor Krozer<sup>2</sup>*  
<sup>1</sup>Technical University of Denmark, Denmark; <sup>2</sup>Frankfurt University, Germany
- 202 **A Distributed Upconverter MMIC with Composite Right/Left Handed Transmission Lines**  
*Munenari Kawashima<sup>1</sup>, Kenjiro Nishikawa<sup>1</sup>, Shigeo Kawasaki<sup>2</sup>, Harunobu Seita<sup>3</sup>, Yoshiharu Omura<sup>1</sup>*  
<sup>1</sup>NTT Corporation, Japan; <sup>2</sup>Japan Aerospace Exploration Agency, Japan; <sup>3</sup>Kyoto University, Japan

## EuMIC14: SiGe Microwave ICs

Chair: John Long, Delft University of Technology — Co-Chair: Frank Van Vliet, TNO

Venue: Dickens 5/6, 08:30 - 10:10, Tuesday 28 September 2010

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- 206 **107-112Gbit/s Fully Integrated CDR/1:2 DEMUX Using InP-Based DHBTs**  
*R.E. Makon<sup>1</sup>, R. Driad<sup>1</sup>, C. Schubert<sup>2</sup>, J. Fischer<sup>2</sup>, R. Lösch<sup>1</sup>, H. Walcher<sup>1</sup>, J. Rosenzweig<sup>1</sup>, M. Schlechtweg<sup>1</sup>, Oliver Ambacher<sup>1</sup>*  
<sup>1</sup>Fraunhofer IAF, Germany; <sup>2</sup>Fraunhofer HHI, Germany
- 210 **A 60GHz-Band Millimeter-Wave Active Balun with  $\pm 5^\circ$  Phase Error**  
*Yanyu Jin, Marco Spirito, John R. Long, Technische Universiteit Delft, The Netherlands*
- 214 **A 3 Bit 20GS/s Flash ADC in 65nm Low Power CMOS Technology**  
*Damir Ferenci, Markus Grözing, Felix Lang, Manfred Berroth, Universität Stuttgart, Germany*
- 218 **A Low-Power Analog-to-Digital Converter for Multi-Gigabit Wireless Receiver in 90nm CMOS**  
*Kevin Chuang, David Yeh, Stephane Pinel, Joy Laskar, Georgia Institute of Technology, USA*

## EuMIC15: Focused Session — Frequency Converters and Multipliers for 100 GHz and Beyond

Chair: T. Närhi, ESA-ESTEC — Co-Chair: N. Rolland, IEMN

Venue: Darwin 5, 08:30 - 10:10, Tuesday 28 September 2010

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- 222 **Schottky Membrane Technology for Sub-mm Wave Applications**  
*John Pike<sup>1</sup>, Liam Floyd<sup>1</sup>, Dan O'Connell<sup>1</sup>, Tomasz Waliwander<sup>2</sup>, Michael Crowley<sup>2</sup>, Dimitri Lederer<sup>3</sup>*  
<sup>1</sup>Tyndall National Institute, Ireland; <sup>2</sup>Farran Technology Ltd., Ireland; <sup>3</sup>Université Catholique de Louvain, Belgium
- 226 **Development of Integrated Submillimeter Wave Diodes for Sources and Detectors**  
*Jan Stake<sup>1</sup>, Tomas Bryllert<sup>2</sup>, Peter Sobis<sup>3</sup>, Aik-Yean Tang<sup>1</sup>, Huan Zhao<sup>1</sup>, Josip Vukusic<sup>1</sup>, Aleksandra Malko<sup>1</sup>, Vladimir Drakinskiy<sup>1</sup>, Arne Øistein Olsen<sup>2</sup>, Anders Emrich<sup>2</sup>*  
<sup>1</sup>Chalmers University of Technology, Sweden; <sup>2</sup>Wasa Millimeter Wave AB, Sweden; <sup>3</sup>Omnisys Instruments AB, Sweden
- 230 **Improvements in Schottky Harmonic and Sub-Harmonic Mixers for Use up to 900GHz**  
*Hugh J.E. Gibson<sup>1</sup>, Achim Walber<sup>2</sup>, Ralph Zimmermann<sup>2</sup>, Byron Alderman<sup>3</sup>, Oleg Cojocari<sup>4</sup>*  
<sup>1</sup>Gibson Microwave Design EURL, France; <sup>2</sup>Radiometer Physics GmbH, Germany; <sup>3</sup>Rutherford Appleton Laboratory, UK; <sup>4</sup>ACST GmbH, Germany
- 232 **High Power Frequency Multipliers to 330GHz**  
*Byron Alderman<sup>1</sup>, Manju Henry<sup>1</sup>, Alain Maestrini<sup>2</sup>, Jesús Grajal<sup>3</sup>, Ralph Zimmermann<sup>4</sup>, Hosh Sanghera<sup>1</sup>, Hui Wang<sup>1</sup>, Paul Wilkinson<sup>1</sup>, David Matheson<sup>1</sup>*  
<sup>1</sup>Rutherford Appleton Laboratory, UK; <sup>2</sup>LERMA, France; <sup>3</sup>Universidad Politécnica de Madrid, Spain; <sup>4</sup>Radiometer Physics GmbH, Germany
- 234 **Single-Waveguide Power-Combined Multipliers for Next Generation LO Sources Above 100GHz**  
*José V. Siles<sup>1</sup>, Alain Maestrini<sup>1</sup>, Steven Davies<sup>2</sup>, Byron Alderman<sup>3</sup>, Hui Wang<sup>3</sup>*  
<sup>1</sup>LERMA, France; <sup>2</sup>University of Bath, UK; <sup>3</sup>Rutherford Appleton Laboratory, UK

EuMIC 2010 Table of Contents

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## EuMIC16: Distributed and EM MMIC Device Modelling

Chair: Manfred Berroth, University of Stuttgart — Co-Chair: Serge Verdeyme, XLIM

Venue: Dickens 3/4, 13:40 - 15:00, Tuesday 28 September 2010

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- 238 **Distributed Switch FET Model That Predicts Better Insertion Loss and Harmonics**  
*Ce-Jun Wei, Yu Zhu, Alex Klimashov, Hong Yin, Cindy Zhang, Dylan Bartle, Skyworks Solutions Inc., USA*
- 242 **Distributed Modeling of Layout Parasitics Effects in CMOS Power Devices**  
*Doris A. Chan, Milton Feng, University of Illinois at Urbana-Champaign, USA*
- 246 **On the Importance of Chip-Level EM-Simulations for 60-GHz CMOS Circuits**  
*Hammad M. Cheema, Reza Mahmoudi, Arthur H.M. van Roermund, Technische Universiteit Eindhoven, The Netherlands*
- 250 **Improved Measurement-Based Extraction Algorithm of a Comprehensive Extrinsic Element Network for Large-Size GaN HEMTs**  
*J. Alberto Zamudio-Flores, Günter Kompa, Universität Kassel, Germany*

EuMIC 2010 Table of Contents

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## EuMIC17: EuMIC Closing Session

Chair: Ali A. Rezazadeh, University Of Manchester — Co-Chair: Frederic Aniel, IEF

Venue: Amphi Goethe, 15:40 - 17:00, Tuesday 28 September 2010

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- 254 **Development of Wafer-Scale Graphene RF Electronics**  
*J.S. Moon<sup>1</sup>, D. Curtis<sup>1</sup>, M. Hu<sup>1</sup>, D. Wong<sup>1</sup>, C. McGuire<sup>1</sup>, P. M. Campbell<sup>2</sup>, G. Jernigan<sup>2</sup>, J. Tedesco<sup>2</sup>, B. VanMil<sup>2</sup>, R. Myers-Ward<sup>2</sup>, C. Eddy Jr.<sup>2</sup>, D.K. Gaskill<sup>2</sup>, J. Robinson<sup>3</sup>, M. Fanton<sup>3</sup>, P. Asbeck<sup>4</sup>*  
<sup>1</sup>HRL Laboratories, USA; <sup>2</sup>US Naval Research Laboratory, USA; <sup>3</sup>EOC, USA; <sup>4</sup>University of California at San Diego, USA
- 258 **Printed RF Tags and Sensors: The Confluence of Printing and Semiconductors**  
*Vivek Subramanian, Frank Liao, Huai-Yuan Tseng, University of California at Berkeley, USA*



## EuMIC Poster01 : Modelling and Characterization of MMIC Devices

Venue: Foyer Darwin, 15:00 - 18:00, Monday 27 September 2010

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- 262      **Dependence of FET/HEMT Reliability on Substrate Thickness and Gate Length**  
*Ali M. Darwish, H. Alfred Hung, US Army Research Laboratory, USA*
- 266      **Electrothermal and Large-Signal Modeling of Switchmode AlGaIn/GaN HEMTs**  
*G. Callet<sup>1</sup>, J. Faraj<sup>1</sup>, A. El Rafei<sup>1</sup>, O. Jardel<sup>2</sup>, J.C. Jacquet<sup>2</sup>, J.P. Teyssier<sup>1</sup>, E. Morvan<sup>2</sup>, S. Piotrowicz<sup>2</sup>, R. Quéré<sup>1</sup>*  
*<sup>1</sup>XLIM, France; <sup>2</sup>Alcatel-Thales III-V Lab, France*
- 270      **Nonlinear Model of InP/GaAsSb/InP DHBT Process for Design of a Q-Band MMIC Oscillator**  
*S. Laurent<sup>1</sup>, G. Callet<sup>1</sup>, J.C. Nallatamby<sup>1</sup>, M. Prigent<sup>1</sup>, V. Nodjiadjim<sup>2</sup>, M. Riet<sup>2</sup>*  
*<sup>1</sup>XLIM, France; <sup>2</sup>Alcatel-Thales III-V Lab, France*
- 274      **Physical Analysis of Substrate Noise Coupling in Mixed Circuits in SoC Technology**  
*Charif Mohamed, Bruno Barelaud, Edouard Ngoya, XLIM, France*
- 278      **Current Density Dependence of Minimum Noise Figure for Gallium Nitride HEMTs**  
*Tyler Ross<sup>1</sup>, Gabriel Cormier<sup>1</sup>, K. Hettak<sup>2</sup>, Rony E. Amaya<sup>2</sup>*  
*<sup>1</sup>Université de Moncton, Canada; <sup>2</sup>Communications Research Centre Canada, Canada*
- 282      **RF Waveform Method for the Determination of the Safe Operating Area of GaN HFET's for Amplifiers Subjected to High Output VSWR**  
*William McGenn<sup>1</sup>, Jeff Powell<sup>2</sup>, Michael Uren<sup>2</sup>, Johannes Benedikt<sup>1</sup>, Paul J. Tasker<sup>1</sup>*  
*<sup>1</sup>Cardiff University, UK; <sup>2</sup>QinetiQ Ltd., UK*

## EuMIC Poster02 : Si, III-V Technologies and Large Bandgap Devices

Venue: Foyer Darwin, 15:00 - 18:00, Monday 27 September 2010

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- 286      **Potentiality of Commercial Metamorphic HEMT at Cryogenic Temperature and Low Voltage Operation**  
*A. Noudéviwa<sup>1</sup>, Yannick Roelens<sup>1</sup>, François Danneville<sup>1</sup>, Aurélien Olivier<sup>1</sup>, Nicolas Wichmann<sup>1</sup>, N. Waldhoff<sup>1</sup>, S. Lepilliet<sup>1</sup>, Gilles Dambrine<sup>1</sup>, Ludovic Desplanque<sup>1</sup>, Xavier Wallart<sup>1</sup>, J. Bellaiche<sup>2</sup>, D. Smith<sup>2</sup>, H. Maher<sup>2</sup>, Sylvain Bollaert<sup>1</sup>*  
*<sup>1</sup>IEMN, France; <sup>2</sup>OMMIC, France*
- 290      **Multilayer Low-Resistance Ge/Au/Ni/Ti/Au Based Ohmic Contact to n-GaAs**  
*E.V. Erofeev<sup>1</sup>, S.V. Ishutkin<sup>1</sup>, V.A. Kagadei<sup>2</sup>, K.S. Nosaeva<sup>1</sup>*  
*<sup>1</sup>Micran, Russia; <sup>2</sup>Submicron Technologies, Russia*
- 294      **A 10GHz Cut-Off Frequency Transistor Based on Epitaxial Graphene Nano Ribbon**  
*Nan Meng, J. Ferrer Fernandez, Dominique Vignaud, Gilles Dambrine, Henri Happy, IEMN, France*
- 298      **Trapping Related Degradation Effects in AlGaIn/GaN HEMT**  
*G. Astre<sup>1</sup>, J.G. Tartarin<sup>1</sup>, B. Lambert<sup>2</sup>*  
*<sup>1</sup>LAAS, France; <sup>2</sup>United Monolithic Semiconductors, France*
- 302      **Development of Enhancement Mode AlGaIn/GaN MOS-HEMTs Using Localized Gate-Foot Oxidation**  
*Abhishek Banerjee<sup>1</sup>, S. Taking<sup>1</sup>, Douglas MacFarlane<sup>1</sup>, Amir M. Dabiran<sup>2</sup>, Edward Wasige<sup>1</sup>*  
*<sup>1</sup>University of Glasgow, UK; <sup>2</sup>SVT Associates Inc., USA*
- 306      **New Process for Low Sheet and Ohmic Contact Resistance of AlN/GaN MOS-HEMTs**  
*S. Taking<sup>1</sup>, A.Z. Khokhar<sup>1</sup>, Douglas MacFarlane<sup>1</sup>, S. Sharabi<sup>1</sup>, Amir M. Dabiran<sup>2</sup>, Edward Wasige<sup>1</sup>*  
*<sup>1</sup>University of Glasgow, UK; <sup>2</sup>SVT Associates Inc., USA*

## EuMIC Poster03: Hybrid and Multi-Chip Modules

Venue: Exhibition, 12:30 - 18:00, Tuesday 28 September 2010

---

- 310      **A Broadband 20–40GHz Linear Driver Amplifier MMIC in Surface Mount QFN 3×3-mm Package**  
*A. Bessemoulin, Mimix Broadband Inc., USA*
- 313      **A System-on-Package Module by Fully Embedding Chip Components in Organic Substrate**  
*Jong-In Ryu<sup>1</sup>, Dongsu Kim<sup>1</sup>, Jun-Chul Kim<sup>1</sup>, Hyeongdong Kim<sup>2</sup>, Jong-Chul Park<sup>1</sup>*  
*<sup>1</sup>KETI, Korea; <sup>2</sup>Hanyang University, Korea*
- 317      **RF Passive Components on a Low Resistivity Si Substrate with an ABF Isolation Layer**  
*Dongsu Kim, Dong Ho Kim, Jong-Min Yook, Jong-In Ryu, Se-Hoon Park, Jun-Chul Kim,*  
*KETI, Korea*
- 321      **Design and Manufacturing of Wideband Buried RF Feedthroughs for Wafer-Level RF MEMS Package**  
*H. El Gannudi<sup>1</sup>, Paola Farinelli<sup>1</sup>, I. Pieper<sup>2</sup>, E. Chiuppesi<sup>1</sup>, Roberto Sorrentino<sup>1</sup>*  
*<sup>1</sup>Università di Perugia, Italy; <sup>2</sup>Fraunhofer ISIT, Germany*
- 325      **Conformal Faraday Cage Micro-Coaxial Shielding for Combined Optimization of Routing Distribution and EM Coupling Reduction**  
*Olivier Tesson, S. Wane, NXP Semiconductors, France*
- 329      **Compact Front End Modules for WLAN Applications with Integrated Passive Devices Using Selectively Anodized Aluminum Substrate**  
*Je-In Yu<sup>1</sup>, Jong-Min Yook<sup>2</sup>, Jun-Chul Park<sup>3</sup>, Cheol-Ho Kim<sup>1</sup>, Young-Se Kwon<sup>1</sup>*  
*<sup>1</sup>KAIST, Korea; <sup>2</sup>KETI, Korea; <sup>3</sup>Samsung Electric Co. Ltd., Korea*

## EuMIC Poster04: Circuit Design and Applications 1

Venue: Exhibition, 12:30 - 18:00, Tuesday 28 September 2010

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- 333      **An MMIC Wide-Band Doubly Balanced Resistive Mixer with an Active IF Balun**  
*Jin-Cheol Jeong<sup>1</sup>, In-Bok Yom<sup>1</sup>, Kyung-Whan Yeom<sup>2</sup>*  
*<sup>1</sup>ETRI, Korea; <sup>2</sup>Chungnam National University, Korea*
- 337      **A 3–14GHz Pseudo-Differential Distributed Low Noise Amplifier**  
*Peter de Hek<sup>1</sup>, Koen Van Caekenberghe<sup>2</sup>, Raymond van Dijk<sup>1</sup>*  
*<sup>1</sup>TNO Defence, The Netherlands; <sup>2</sup>Independent Researcher, The Netherlands*
- 341      **InP DHBT Transimpedance Amplifiers with Automatic Offset Compensation for 100Gbit/s Optical Communications**  
*J.-Y. Dupuy, F. Jorge, M. Riet, Agnieszka Konczykowska, Jean Godin, Alcatel-Thales III-V Lab, France*
- 345      **Comparison of Low Phase Noise Oscillators Topologies Using BAW Resonator**  
*Mingdong Li<sup>1</sup>, Seonho Seok<sup>1</sup>, Nathalie Rolland<sup>1</sup>, Paul-Alain Rolland<sup>1</sup>,*  
*Hassan El Aabbaoui<sup>2</sup>, Emeric de Foucauld<sup>2</sup>, P. Vincent<sup>2</sup>*  
*<sup>1</sup>IEMN, France; <sup>2</sup>CEA, France*
- 349      **A Ka Band Balanced Amplifier with Six-Port Power Divider**  
*Hamid Kiumarsi, Abdolali Abdipour, Mehdi Rezvani Abkenari, Gholamreza Moradi,*  
*Amirkabir University of Technology, Iran*
- 353      **Power Detectors and Envelope Detectors in mHEMT MMIC-Technology for Millimeterwave Applications**  
*Herbert Zirath, Zhongxia He, Chalmers University of Technology, Sweden*

## EuMIC Poster05 : Circuit Design and Applications 2

Venue: Exhibition, 12:30 – 18:00, Tuesday 28 September 2010

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- 357 **Transmission Line and Lange Coupler Implementations in CMOS**  
*Mikko Kärkkäinen, Dan Sandström, Mikko Varonen, Kari A.I. Halonen, Aalto University, Finland*
- 361 **A Varactorless VCO with 15% Continuous Frequency Tuning Range and 0.2dB Output Power Variation**  
*Ying Chen<sup>1</sup>, Koen Mouthaan<sup>1</sup>, Marcel Geurts<sup>2</sup>*  
<sup>1</sup>National University of Singapore, Singapore; <sup>2</sup>NXP Semiconductors, The Netherlands
- 365 **A 52–75GHz Frequency Quadrupler in 0.25- $\mu$ m SiGe BiCMOS Process**  
*Nai-Chung Kuo<sup>1</sup>, Zuo-Min Tsai<sup>1</sup>, Klaus Schmalz<sup>2</sup>, Johann Christoph Scheytt<sup>2</sup>, Huei Wang<sup>1</sup>*  
<sup>1</sup>National Taiwan University, Taiwan; <sup>2</sup>IHP GmbH, Germany
- 369 **A Fully Integrated Multiband Frequency Synthesizer for WLAN and WiMAX Applications**  
*Emre Ozeren, Samet Zehir, Ferhat Tasdemir, Ibrahim Tekin, Yasar Gurbuz, Sabanci University, Turkey*
- 373 **Low Power Analog Front-End Circuits in 130-nm CMOS for Multi-Standard Zero-IF Receivers**  
*Seunghyun Jang<sup>1</sup>, Junsang Lee<sup>2</sup>, Joongho Choi<sup>2</sup>, Kwang-Chun Lee<sup>1</sup>*  
<sup>1</sup>ETRI, Korea; <sup>2</sup>University of Seoul, Korea

## EuMC/EuMIC01 : Modelling of Passive Integrated Devices from Microwaves to THz

Chair: Giovanni Ghione, Polytechnic of Turin — Co-Chair: Gottfried Magerl, TU Wien

Venue: Darwin 3, 08:30 – 10:10, Tuesday 28 September 2010

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- 377 **Electromagnetic Propagation in Graphene in the mm-Wave Frequency Range**  
*Dan Neculoiu<sup>1</sup>, George Deligeorgis<sup>2</sup>, Mircea Dragoman<sup>1</sup>, Daniela Dragoman<sup>3</sup>, George Konstantinidis<sup>2</sup>, Alina Cismaru<sup>1</sup>, Robert Plana<sup>4</sup>*  
<sup>1</sup>IMT Bucharest, Romania; <sup>2</sup>FORTH, Greece; <sup>3</sup>University of Bucharest, Romania; <sup>4</sup>LAAS, France
- 381 **Terahertz Three-Dimensional Plasma Resonances in InGaAs Diodes: A Hydrodynamic Study**  
*Pierre Ziadé<sup>1</sup>, Christophe Palermo<sup>2</sup>, Hugues Marinchio<sup>2</sup>, Thibault Laurent<sup>2</sup>, Giulio Sabatini<sup>2</sup>, Philippe Nouvel<sup>2</sup>, Ziad Kallassy<sup>1</sup>, Luca Varani<sup>2</sup>*  
<sup>1</sup>Lebanese University, Lebanon; <sup>2</sup>IES (UMR5214), France
- 385 **Material Adaptation and Optimisation of Passive Ka-Band Multilayer Circuit Designs Using an Efficient Modular Design Strategy**  
*Gabor Vogt, Stefan Humbla, Jens Müller, Ralf Stephan, Dirk Stöpel, Johannes F. Trabert, Matthias A. Hein, Technische Universität Ilmenau, Germany*
- 389 **Simulation and Measurement of Back Side Etched Inductors**  
*Falk Korndörfer<sup>1</sup>, Mehmet Kaynak<sup>1</sup>, Volker Mühlhaus<sup>2</sup>*  
<sup>1</sup>IHP GmbH, Germany; <sup>2</sup>Dr. Mühlhaus Consulting & Software GmbH, Germany
- 393 **Extraction of Parametric Circuit Models from Scattering Parameters of Passive RF Components**  
*Piero Triverio<sup>1</sup>, Michel Nakhla<sup>2</sup>, Stefano Grivet-Talocia<sup>1</sup>*  
<sup>1</sup>Politecnico di Torino, Italy; <sup>2</sup>Carleton University, Canada

## EuMC/EuMIC02 : Power Amplifier Developments in Industry

Chair: Klaus Beilenhoff, UMS GmbH — Co-Chair: Sylvain Delage, AT III-V Lab

Venue: Darwin 4, 08:30 – 10:10, Tuesday 28 September 2010

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- 397      **A Single Bias 20W S-Band HPA for Radar Applications**  
*A. Bettidi, A. Cetronio, S. Lavanga, Antonio Nanni, SELEX Sistemi Integrati S.p.A., Italy*
- 401      **8W 2–8GHz Solid State Amplifier for Phased Array**  
*R. Diciomma, E. Ciacia, G. Giolo, D. Baccello, B. Orobello, V. Alleva, Elettronica S.p.A., Italy*
- 404      **HPA Module for Active Antenna Applications**  
*D. Lopez<sup>1</sup>, L. Bortoli<sup>1</sup>, J.-P. Fraysse<sup>1</sup>, D. Langrez<sup>1</sup>, J.-F. Villemazet<sup>1</sup>, J.-L. Cazaux<sup>1</sup>, G. Soubercaze-Pun<sup>2</sup>, Luc Lapierre<sup>2</sup>*  
*<sup>1</sup>Thales Alenia Space, France; <sup>2</sup>CNES, France*
- 408      **50W X-Band GaN MMIC HPA: Effective Power Capability and Transient Thermal Analysis**  
*C. Costrini<sup>1</sup>, A. Cetronio<sup>1</sup>, P. Romanini<sup>1</sup>, G. Breglio<sup>2</sup>, A. Irace<sup>2</sup>, M. Riccio<sup>2</sup>*  
*<sup>1</sup>SELEX Sistemi Integrati S.p.A., Italy; <sup>2</sup>Università di Napoli “Federico II”, Italy*
- 412      **High Power, Fully Integrated SMT Amplifiers with +47dBm OIP3 at 15GHz and 6W, 38% Efficiency at 30GHz Using Low Cost, High Volume PHEMT**  
*Henrik Morkner<sup>1</sup>, Kohei Fujii<sup>2</sup>, Brent Ostermann<sup>2</sup>*  
*<sup>1</sup>M/A-COM Technology Solutions, USA; <sup>2</sup>Avago Technologies Inc., USA*

## EuMC/EuMIC03 : High Efficiency and Broadband PAs

Chair: Almudena Suarez, University of Cantabria — Co-Chair: Ruediger Quay, FhG-IAF

Venue: Dupin 2, 08:30 – 10:10, Tuesday 28 September 2010

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- 416      **GaN Based Power Amplifiers for Broadband Applications from 2GHz to 6GHz**  
*H. Sledzik<sup>1</sup>, R. Reber<sup>1</sup>, B. Bunz<sup>1</sup>, P. Schuh<sup>1</sup>, Martin Oppermann<sup>1</sup>, M. Mußer<sup>2</sup>, M. Seelmann-Eggebert<sup>2</sup>, Rüdiger Quay<sup>2</sup>*  
*<sup>1</sup>EADS Deutschland GmbH, Germany; <sup>2</sup>Fraunhofer IAF, Germany*
- 420      **A High Efficiency and Multi-Band/Multi-Mode Power Amplifier Using a Distributed Second Harmonic Termination**  
*Jangheon Kim<sup>1</sup>, Farouk Mkadem<sup>2</sup>, Slim Boumaiza<sup>2</sup>*  
*<sup>1</sup>Samsung Electronics Co. Ltd., Korea; <sup>2</sup>University of Waterloo, Canada*
- 424      **A Broadband, Efficient, Overdriven Class-J RF Power Amplifier for Burst Mode Operation**  
*Dristy Rahul Parveg<sup>1</sup>, Peter Singerl<sup>1</sup>, Andreas Wiesbauer<sup>1</sup>, Hossein Mashad Nemat<sup>2</sup>, Christian Fager<sup>2</sup>*  
*<sup>1</sup>Infineon Technologies Austria AG, Austria; <sup>2</sup>Chalmers University of Technology, Sweden*
- 428      **Theoretical and Experimental Comparison of Class F vs. Class F<sup>-1</sup> PAs**  
*Elisa Cipriani, Paolo Colantonio, Franco Giannini, Rocco Giofrè, Università di Roma “Tor Vergata”, Italy*
- 432      **The Continuous Class-F Mode Power Amplifier**  
*V. Carrubba, A.L. Clarke, M. Akmal, J. Lees, Johannes Benedikt, Paul J. Tasker, S.C. Cripps, Cardiff University, UK*

## EuMC/EuMIC04: Power Amplifiers on Silicon

Chair: Georg Boeck, Technical University of Berlin — Co-Chair: Eric Kerhervé, IMS Bordeaux

Venue: Dickens 5/6, 13:40 – 15:00, Tuesday 28 September 2010

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- 436 **An X-Band, 23.8-dBm Fully Integrated Power Amplifier with 25.8% PAE in 0.18- $\mu\text{m}$  CMOS Technology**  
*Ping-Sung Chi, Zuo-Min Tsai, Jing-Lin Kuo, Kun-You Lin, Huei Wang, National Taiwan University, Taiwan*
- 440 **K-Band CMOS-Based Power Amplifier Module with MEMS Tunable Bandpass Filter**  
*Kazukiyo Joshin<sup>1</sup>, Yoichi Kawano<sup>1</sup>, Xiaoyu Mi<sup>1</sup>, Osamu Toyoda<sup>2</sup>, Toshihide Suzuki<sup>1</sup>, Tatsuya Hirose<sup>1</sup>, Satoshi Ueda<sup>1</sup>*  
<sup>1</sup>Fujitsu Ltd., Japan; <sup>2</sup>Fujitsu Laboratories Ltd., Japan
- 444 **A 60GHz 18dBm Power Amplifier Utilizing 0.25 $\mu\text{m}$  SiGe HBT**  
*Amin Hamidian<sup>1</sup>, Viswanathan Subramanian<sup>1</sup>, Ralf Doerner<sup>2</sup>, Georg Boeck<sup>1</sup>*  
<sup>1</sup>Technische Universität Berlin, Germany; <sup>2</sup>FBH, Germany
- 448 **79GHz BiCMOS Single-Ended and Differential Power Amplifiers**  
*Nejdat Demirel<sup>1</sup>, Eric Kerhervé<sup>2</sup>, Robert Plana<sup>3</sup>, Denis Pache<sup>1</sup>*  
<sup>1</sup>STMicroelectronics, France; <sup>2</sup>Laboratoire IMS, France; <sup>3</sup>LAAS, France

## EuMC/EuMIC/EuWiT01: Design of Multiband and Reconfigurable Voltage Controlled Oscillators

Chair: Jean Christophe Nallatamby, XLIM — Co-Chair: Robert Weigel, University of Erlangen

Venue: Dickens 3/4, 08:30 – 10:10, Tuesday 28 September 2010

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- 452 **A Low Phase-Noise SiGe Colpitts VCO with Wide Tuning Range for UWB Applications**  
*Alexander Esswein<sup>1</sup>, Gunther Dehm-Andone<sup>1</sup>, Robert Weigel<sup>1</sup>, Anna Aleksieieva<sup>2</sup>, Martin Vossiek<sup>2</sup>*  
<sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; <sup>2</sup>Technische Universität Clausthal, Germany
- 456 **A Triple-Band SiGe HBT Differential VCO Using a Reconfigurable Multi-Band Resonator**  
*Yasushi Itoh, Shota Tanaka, Shonan Institute of Technology, Japan*
- 460 **A Dual-Tapped Microstrip Resonator VCO**  
*Masaomi Tsuru, Kazuhiro Nishida, Kenji Kawakami, Daisuke Yamaguchi, Masahiko Komaki, Morishige Hieda, Ryoji Hayashi, Yoshihito Hirano, Mitsubishi Electric Corporation, Japan*
- 464 **Low-Phase-Noise Wide-Frequency-Range Differential Ring-VCO with Non-Integral Subharmonic Locking in 0.18 $\mu\text{m}$  CMOS**  
*Sang\_yeop Lee, Shuhei Amakawa, Noboru Ishihara, Kazuya Masu, Tokyo Institute of Technology, Japan*
- 468 **A 484- $\mu\text{m}^2$  21-GHz LC-VCO Beneath a Stacked-Spiral Inductor**  
*Rui Murakami, Kenichi Okada, Akira Matsuzawa, Tokyo Institute of Technology, Japan*

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