9th Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems (SiRF09)

January 19-21, 2009

Monday, January 19, 2009

Session 1: RWW PLENARY
Salon A/B
8:00AM – 9:45 AM

Opening Remarks
Salon D
Guofu Niu / Basanth Jagannathan
10:10AM

Session 2: mm-Wave Circuit-1
Salon D
Chairs: Chein-Nan Kuo / Peter Russer
10:20AM
A Comparison of Si CMOS and SiGe BiCMOS Technologies for Automotive Radars (Invited)
Alexandros Margomenos, Toyota Research Institute North America, United States

10:40AM
Design and Analysis of a Silicon-Based Millimeter-Wave Divide-by-3 Injection-Locked Frequency Divider
Chun-Cheng Wang, Zhiming Chen, Vipul Jain, and Payam Heydari, UC Irvine, United States

11:00AM
A 60GHz Miller Effect Based VCO in 65nm CMOS with 10.5% Tuning Range
Maarten Lon1, Reza Mahmoudi1, Edwin Heijden, van der2, Anton Graauw, de2, Pooyan Sakian1, Peter Baltus1, and Arthur Roermund, van der2, Mixed-signal Microelectronics, Eindhoven University of Technology, The Netherlands, 2NXP Research, High-Tech Campus 37, The Netherlands

11:20AM
60GHz-Pulse Detector Based on CMOS Nonlinear Amplifier
Ahnet Oucu, B.B.M. Wasanthamala Badalawa, and Minoru Fujisaka, University of Tokyo, Japan

11:40AM
Fully Integrated Millimeter-Wave VCO with 32% Tuning Range
Gang Liu1, Sebastien Chartier2, Andreas Trasser1, and Hermann Schumacher, 1University of Ulm, Germany, 2Fraunhofer-Institut IAF, Germany

Session 3: SiRF POSTER SESSION
Salon C
1:30-3:30pm
Chairs: Robert Plana/Hasan Sharifi

A Low Phase Noise and Wide-Bandwidth BiCMOS SiGe:C 0.25um Digital Frequency Divider For An On-Chip Phase-Noise Measurement Circuit.
Sylvain Godet1, Eric Tournier1, Olivier Llopis1, Andrèia Cathelin1, and Julien Juyon1, Université de Toulouse, France, 2STMicroelectronics - Crolles, France

A Compact CMOS K-Band Bandpass Filter Using Meandered Thin Film Microstrip and UC-PBG Structures
Shuiliang Lin1, Xiaowei Sun1, and Liwu Yang2, 1Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China, 2Semiconductor Manufacturing International Corporation, Shanghai, China

Three-Bit and Six-Bit Tunable Matching Networks with Tapered Lines
Wesley N. Allen and Dimitrios Peroulis, Purdue University, United States

Integration of WCDMA Band VIII Duplexer on an LTCC Platform
Arun Prakash Dharmalingam, Walter Puffer, Andreas Przadka, and Andreas Waldherr, Epcos AG, Germany

On-chip RMS Detector using CMOS Quad for RF Testing
Venkatesh Acharya, Su Cui, and Bhaskar Banerjee, UTD, United States

Stabilized Linear Operation of CMOS Power Amplifiers for Si-RF Transceiver Integration
Kazuhiko Abe, Tadahiro Sasaki and Kazuhiko Itaya, Université de Toulouse, France

A fully integrated S-band vector phase shifter in CMOS technology
Gideon Yong, and Carlos Saavedra, Queen's University, Canada

ESD-protected 24 GHz LNA for Radar Applications in SiGe:C Technology
Vadim Issakov1, Herbert Knapp2, Maciej Wojnowsk1, Andreas Thiede1, Werner Simbürger1, Günter Haider1 and Linus Maurer1, 1University Paderborn, Germany, 2Infineon Technologies AG, Germany, 3DICE GmbH, Austria

A Low-Cost, high Resolution, 360° Phase/Gain Shifter in SiGe BiCMOS
Holger Erkens, Ralf Wunderlich, and Stefan Heinen, Chair of Integrated Analog Circuits, RWTH Aachen University, Germany

Low Voltage Class-E Power Amplifiers for DECT and Bluetooth in 130nm CMOS
Jonas Fritzin, and Atila Alivandpour, Linköping University, Sweden

A 45GHz, 14mW Rotary Wave Voltage-Controlled Oscillator
Neda Nouri, and James Buckwalter, UCSD, United States

A 5 GHz 11-Stage CML VCO with 40% frequency tuning in 0.13um SOI CMOS
Daekim Kim1, Jonghae Kim2, and Choongyeun Cho1, IBM, United States, 2Qualcomm, United States

LSMO Thin Film Tunability Characterization Integrated on Silicon Substrate
Mahmoud Al Ahmad, CNRS, France

Piezoelectric Displacement of Aluminum Nitride Thin Film Integrated on Silicon
Mahmoud Al Ahmad, CNRS, France

3D Group-Cross Symmetrical Interleaved Inductor in Advanced 45 nm RF CMOS Technology: A New Compact Inductor Architecture Improving Self-Resonance Frequency
Frederic Gianesello, and Daniel Gloria, STMicroelectronics, France

Nonlinear Behavior of CRF Device at High Power Level
Loïc Mounot1, Pierre Bar2, Alexandre Giry2, Guy Para2, Stéphane Bila1, and Jean-François Carpenter2, XLM/UMR 6172, France, 1STMicroelectronics, 2TCE-LETI Minatel,

A New Model for Contribution of Triode Noise to Phase Noise of CMOS LC Oscillators
Hooman Rashitain, and Rasoul Dehghani, Isfahan University of Technology, Iran

Enhancement of SiGe HBT Linearity Characteristics with Current Source Bias
Guoxuan Qin, Guogong Wang, and Zhenqiang Ma, University of Wisconsin-Madison, United States

Integrated THz Schottky Diodes for RECTENNA (rectifying antenna)
Hongya Xu, Alim Karmous, Michael Morschbach, Olaf Kirfel, Stefan Spiessberger, and Erich Kasper, Universität Stuttgart, Germany

A K-band nMOS SPDT Switch and Phase Shifter Implemented in 130nm SiGe BiCMOS Technology
Prabir K. Saha, Jonathan P. Comeau, Wei-Min Lance Kuo, and John D. Cressler, Georgia Institute of Technology, United States

Integrated T/R Switches using Silicon-on-Insulator for mm-Wave Applications
Wenhao Zhang, Ru Chen, and S. Jay产业结构, Colorado, United States

Cryogenic RF Small-Signal Modeling and Parameter Extraction of SiGe HBTs
Ziyun Xu1, Guofu Niu1, Lan Luo1, Partha S. Chakraborty2, Peng Cheng2, Dylan Thomas2, and John D. Cressler1, 1Auburn University, United States, 2Georgia Institute of Technology, United States
SiRF09 Student Paper Competition

Salon C
1:30-3:30pm

Chairs: Xun Gong/Jack Ma

Continuing the tremendous success from the past three years, SiRF09 is proud to present its Student Paper Competition. The papers in the competition represent the accomplishments of individual students and undergo an arduous review process to identify and acknowledge the best and brightest students in our research community. The high standards of reviewers and judges ensure that the best papers of the Student Paper Competition also rank among the best papers of the SiRF09.

The student finalists will present their papers at their appropriate regular sessions, and also make special presentations at the Poster Session on January 19, from 1:30 to 3:30 PM. All SiRF09 participants are welcome and encouraged to visit the student papers during the Poster Session, at which time they will also be evaluated by a group of judges. The winners will be selected to receive cash awards, certificates, and gifts. These will be announced and presented during the SiRF09 Banquet.

We are very pleased to announce the finalists for the SiRF09 Student Paper Competition:

A 136-GHz Dynamic Divider in SiGe Technology
Ekaterina Laskin1, and Alexander Rylyakov2,
1University of Toronto, Canada, 2IBM, United States

An 18-20 GHz Subharmonic Satellite Down-Converter in 0.18um SiGe Technology
Sang Young Kim, and Gabriel M. Rebeiz, UCSD, United States

A High-Linearity, X-band, SiGe Low-Noise Amplifier for Improved Dynamic Range in Next-Generation Radar and Wireless Systems
Tushar Thirvikraman, Curtis Gren, Wei-Min Lance Kuo, Joel Andrews, and John Cressler, Georgia Institute of Technology, United States

A 60GHz-Pulse Detector Based on CMOS Nonlinear Amplifier
Ahmet Oncu, B.B.M. Wasanthamala Badalawa, and Minoru Fujishima, University of Tokyo, Japan

A 2.5 Gpulses/s, 25pJ/pulse, 0.18um CMOS Impulse Radio UWB Transmitter Based on Dual-Polarity Distributed Waveform Generator
Yunliang Zha, Jianyun Hu, and Hui Wu, University of Rochester, United States

A CMOS Amplifier with Third-Order Intermmodulation Distortion Cancellation
Brad R. Jackson and Carlos E. Saavedra, Queen's University, Canada

Low-Loss Coplanar Waveguide Transmission Lines and Vertical Interconnects on Multi-Layer Parylene-N
Rosa Lahiji1, Hasan Sharifi1, Saeed Mohammadi1, and Linda Katehi1, 1Birck Nanotechnology Center, Purdue University, United States, 2University of Illinois at Urbana-Champaign, United States

AM/PM Nonlinearities in SiGe HBTs
Stephen Horst, and John Cressler, Georgia Institute of Technology, United States

A Tunable CMOS Resistor with Wide Tuning Range for Low Pass Filter Application
Desheng Ma, Bogdan Wilamowski, and Foster Dai, Auburn University, United States

A Baseband Ultra-Low Noise SiGe:C BICMOS 0.25um Amplifier And Its Application For An On-Chip Phase-Noise Measurement Circuit
Sylvain Godot1, Eric Tournaire1, Olivier Llopis1, Andrée Cathelin2, and Julien Juyon1, 1Université de Toulouse, France, 2STMicroelectronics – Crolles, France

Folded-slot Integrated Antenna Array for Millimeter-Wave CMOS Applications on Standard HR SOI Silicon Substrate
Romain Pilar, Sebastien Montuschat, Daniel Gloria, Francois Le Pennec, and Christian Person, STMicroelectronics - Lab-STICC/MOM, France

A Fully Integrated Pinless Long-Range Power Supply with On-Chip Antenna for Scavenging-based RFID Tag Powering
Soheil Radiom, Christophe De Roover, Guillaume Saavedra, Queen’s University, Canada, 2Eindhoven University, Netherlands

Tuesday, January 20, 2009

Session 5: RF Building Blocks-1
Salon D

Chairs: Ching-Kuang C. Tsuang /Chein-Nan Kuo

8:00 AM
GPS/Galileo System-on-Chip with UMTS/GSM Support for Location Based Services Applications
Anna Miskiewicz1, Andreas Holm1, Eric Tournier1, Claus Stoeger1, 1University of Erlangen-Nuremberg, Germany

8:20 AM
A Baseband Ultra-Low Noise SiGe:C BICMOS 0.25um Amplifier And Its Application For An On-Chip Phase-Noise Measurement Circuit
Sylvain Godot1, Eric Tournaire1, Olivier Llopis1, Andrée Cathelin2, and Julien Juyon1, 1Université de Toulouse, France, 2STMicroelectronics – Crolles, France

8:40 AM
Modified-Nauta Operational Transconductance Amplifier for 400 MHz High-Q VHF Filter
Jung-Woo Park, and Hyun-Kyu Yu, ETRI, Republic of Korea

9:00 AM
An 18-20 GHz Subharmonic Satellite Down-Converter in 0.18um SiGe Technology
Sang Young Kim, and Gabriel M. Rebeiz, UCSD, United States

9:20 AM
A 12GHz Low Power Multi-Modulus Divider Implemented in 0.12um SiGe Technology
Mark Ray, William Souder, Marcus Rateleiff, Foster Dai and J. David Irwin, Auburn University, United States

Session 4: Passives-1
Salon D

Chairs: Robert Plana/Xun Gong

3:50PM
Overview and status of numerical electromagnetic field simulation methods applied to integrated circuits (Invited)
Peter Russer, Technische Universität München, Germany

4:10PM
High Performance and High Current Integrated Inductors using a Double Ultra Thick Copper Module in an Advanced 65 nm RF CMOS Technology
Carine Pastore, Frédéric Giannesello, Daniel Gloria, Jean-Christophe Giraudin, Olivier Noblan, and Philippe Benech, STMicroelectronics/IMEP-LAHC, France

4:30 PM
Monolithic transformers for high frequency bulk CMOS circuits
Hannad M. Cheema, Erwin Janssen, Reza Mahmoudi, and Arthur van Roermund, Eindhoven University of Technology, Netherlands

5:10 PM
In-situ and at-speed modeling and characterization of logic interconnect device considering front-end/back-end interaction
Chongyuen Cho1, Daeik Kim1,2, and Jonghae Kim2, 1IBM SRDC, United States, 2 qualcomm, United States

RWW Reception
Monday, January 19, 2009
Time: 6:00-8:00pm

Session 6: RF Switches
Salon D

Chairs: Katsuyoshi Washio / G. Dambrine

10:20 AM
A Thin-film SOI 180nm CMOS RF Switch Technology (Invited)
Alan Botula, Alvin Joseph, Jim Slinkman, and Randy Wolf, IBM Microelectronics, United States

10:40 AM
A compact DC-30 GHz 0.13-um CMOS SP4T Switch
Byung-Wook Min Min1, and Gabriel Rebeiz2, 1Qualcomm Inc., United States, 2UCSD, United States

11:00 AM
A Thin-film SOI 180nm CMOS RF Switch
Randy Wolf, Alvin Joseph, Alan Botula and James Slinkman, IBM, United States
Session 7: mm-Wave Circuits -2
Salon D
Chairs: Xun Gong/Alexandros Margomenos

1:30 PM
Folded-slot Integrated Antenna Array for Millimeter-Wave CMOS Applications on Standard HR SOI Silicon Substrate
Romain Pilard, Sebastien Montusclat, Daniel Gloria, Francois Le Pennec, and Christian Person, STMicroelectronics - Lab-STICC/MOM, France

2:10 PM
A 136-GHz Dynamic Divider in SiGe Technology
Ekaterina Laskin1, and Alexander Rylyakov2, 1University of Toronto, Canada, 2IBM, United States

Session 8: RF Devices and Characterization
Salon D
Chairs: Julio Costa/Basangan Jagannathan

3:50 PM
Overview of Carbon Nanotubes for high frequency Electronics (Invited)
Gilles Dambrinne, IEMN, France

Wednesday, January 21, 2009

Session 9: Passives-2
Salon D
Chairs: Sergio Pacheco/Hasan Sharifi

8:00 AM
Ultrananocrystalline Diamond Based RF MEMS Devices (Invited)
Orlando Auciello, Argonne National Labs, United States

8:20 AM
Low-Loss Coplanar Waveguide Transmission Lines and Vertical Interconnects on Multi-Layer Parylene-N
Rosa Lahiji1, Hasan Sharifi2, Saeed Mohammadi1 and Linda Katehi1, 1Purdue University, Birck Nanotechnology Center, United States, 2University of Illinois at Urbana-Champaign, United States

4:10 PM
High Temperature DC and RF Behavior of Partially Depleted SOI versus Deep n-Well Protected Bulk MOSFETs
Mostafa EMAM, Danielle Vanhovenacker-Janvier, and Jean-Pierre Raskin, EMIC, UCL, Belgium

Session 10: RF Building Blocks-2
Salon D
Chairs: Alexandros Margomenos/Donald Lie

10:20 AM
Influences of Dummy Metal Fills on CMOS VCO (Invited)
Sen Wang, and Ching-Kuang C. Tzuang. National Taiwan University, Taiwan

3:50 PM
AM/PM Nonlinearities in SiGe HBTs for Power Amplifier Applications
Curtis Greens, Peng Cheng, and John Cressler, Georgia Tech, United States

Session 11: Join Session SiRF/RWS
Salon B
1:30 PM – 3:30 PM

Session 12: PA Design
Salon D
Chairs: Donald Lie/Katsuyoshi Washio

3:50 PM
Design Options for High Efficiency Linear Handset Power Amplifiers (Invited)
Peter Asbeck, USC, United States

4:10 PM
A 15GHz Bandwidth High Efficiency Power Distributed Amplifier for Ultra-Wideband Applications Using A Low-Cost SiGe BiCMOS Technology
Benjamin Sewiolo, and Robert Weigel, University of Erlangen-Nuremberg, Germany