

2014 IEEE 14th Topical Meeting on Silicon Monolithic Integrated Circuits in Rf Systems

(SiRF 2014)

**Newport Beach, California, USA
19-23 January 2014**



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SESSION LIST

- ❖ MO1B : Passives and MEMS
- ❖ MO2B : ADC and Amplifier
- ❖ MO3B : Advanced Transceiver Technologies I (RWS-SiRF Joint Session)
- ❖ MO4B : Applications and Wireless Architectures I
- ❖ TU1C : Transmitter and Receiver
- ❖ TU3C : Applications and Wireless Architectures II
- ❖ WE1C : Power Amplifier
- ❖ WE2C : Technology, Devices, and Modeling
- ❖ WE3P : Transceivers and Front-end Technologies SOC and SiP
(Joint RWW Interactive Poster Session)
- ❖ WE4C : Signal Source

MO1B: Passives and MEMS

Chair: Xun Gong, University of Central Florida, USA

Co-Chair: Mehmet Kaynak, IHP Microelectronics, Germany

Venue: Baycliff, 08:00 – 09:40, Monday 20 January 2014

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Recent Advances in Monolithic Integration of Diverse Technologies with Si CMOS (Invited Paper)

(Tahir Hussain, Dana C. Wheeler, Hasan Sharifi, Keisuke Shinohara, Zhiwei Xu, James C. Li, Pamela R. Patterson, Kenneth R. Elliott, Wonill Ha, Yakov Royter, Peter D. Brewer)

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Non-Linear Characteristics of Passive Elements on Trap-Rich High-Resistivity Si Substrates

(K. Ben Ali, C. Roda Neve, Y. Shim, M. Rais-Zadeh, J.-P. Raskin)

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High Linearity 1-Ohm RF Switches with Phase-Change Materials

(Jeong-sun Moon, H.-C. Seo, Dustin Le)

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Low Loss 67-GHz Coplanar Waveguides and Spiral Inductors on 100kΩcm Gold-Doped High Resistivity Cz-Silicon

(A. Abuelgasim, N. Hashim, H.M.C. Chong, P. Ashburn, C.H. de Groot)

MO2B: ADC and Amplifier

Chair: Jae-Sung Rieh, Korea University, South Korea

Venue: Baycliff, 10:10 – 11:50, Monday 20 January 2014

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Stacked Si MOSFET Strategies for Microwave and mm-Wave Power Amplifiers (Invited Paper)

(Peter Asbeck)

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A Process-Technology-Scaling-Tolerant Pipelined ADC Architecture Achieving 6-Bit and 4GS/s ADC in 45nm CMOS

(M.W. Chen, L.R. Carley, D.S. Ricketts)

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A 65nm CMOS 0.1–2.1GHz Linear-in-dB VGA with Active-Inductor Bandwidth Extension for the Square Kilometer Array

(Ge Wu, Leonid Belostotski, James W. Haslett)

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A Switchable-Core SiGe HBT Low-Noise Amplifier for Millimeter-Wave Radiometer Applications

(A. Çağrı Ulusoy, Robert L. Schmid, Christopher Coen, John D. Cressler)

MO3B: Advanced Transceiver Technologies I (RWS-SiRF Joint Session)

Chair: Vijay Nair, Intel Corporation, USA

Venue: Baycliff, 13:30 - 15:10, Monday 20 January 2014

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Extreme Silicon RFICs for Phased-Array Applications (*Invited Paper*)
(*Gabriel M. Rebeiz*)

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0.35dB Loss 20dB Coupling Directional Coupler Integrated in 130nm CMOS SOI Technology Targeting 3G PA SOC
(*F. Ganesello, C. Durand, D. Gloria*)

MO4B: Applications and Wireless Architectures I

Chair: Donald Lie, Texas Tech University, USA

Venue: Baycliff, 15:40 - 17:00, Monday 20 January 2014

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Wideband Envelope Tracking Power Amplifiers for Wireless Communications (*Invited Paper*)
(*L. Larson, D. Kimball, Peter Asbeck*)

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An Inductor-Less LTE Receiver Using an 8-Path Filter for TX Leakage Suppression
(*Ahmed Elmaghraby, Georg Fischer, Robert Weigel, Thomas Ussmueller*)

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A Novel THz-Enhanced Dipole Antenna Using Second-Order High Impedance Surface Resonance for MM Imaging and Sensing
(*Georges Mikhail, Yves Quere, Cédric Quendo, Christian Person*)

TU1C: Transmitter and Receiver

Chair: Pierre Blondy, University of Limoges, France

Venue: Baycliff, 08:00 – 09:40, Tuesday 21 January 2014

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Latest Development of Near-Field Communication (NFC) on Handsets Application (Invited Paper)

(M. Wiklund, M. Mofidi, R. Gaethke, A. Wong, M. Kohlmann)

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9.9-mA 5–6GHz CMOS Sub-Harmonic Direct-Conversion Receiver Using Deep N-Well BJT *(Wei-Ling Chang, Chin-Chun Meng, Jin-Siang Syu, Chia-Ling Wang, Guo-Wei Huang)*

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A Low-Power, Low-Noise, Highly-Linear Receiver for 122GHz Applications in a SiGe BiCMOS Technology

(Abhiram Chakraborty, Saverio Trotta, Klaus Aufinger, Rudolf Lachner, Robert Weigel)

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A 90-nm CMOS Multi-Standard GNSS Receiver Front-End *(Chi-Wei Cheng, Yi-Jan Emery Chen)*

TU3C: Applications and Wireless Architectures II

Chair: Hasan Sharifi, HRL Laboratories, USA

Venue: Baycliff, 13:30 – 14:50, Tuesday 21 January 2014

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A 80–95GHz Direct Quadrature Modulator in SiGe Technology

(Morteza Abbasi, Sona Carpenter, Herbert Zirath, Franz Dielacher)

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Integrated 60-GHz CMOS Variable-Gain Low-Noise Amplifier and Full 360° Phase Shifter for Phased-Array RF Receiving System

(Chun-Han Yu, Pei-Hua Lo, Jhin-Ying Lyu, Hsin-Chih Kuo, Huey-Ru Chuang)

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An X-Band 6-Bit Active Phase Shifter

(Kerim Kibaroglu, Emre Ozeren, Ilker Kalyoncu, Can Caliskan, Hüseyin Kayahan, Yasar Gurbuz)

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An Inductorless RC-Based Quadrature Phase Generator and its Application to Vector-Sum Phase Shifter

(Tzu-Chao Yan, Wei-Zhen Lin, Chien-Nan Kuo)

WE1C: Power Amplifier

Chair: Chiennan Kuo, National Chiao Tung University, Taiwan

Venue: Baycliff, 08:00 - 09:40, Wednesday 22 January 2014

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RF Performance Limits of Ballistic Si Field-Effect Transistors (*Invited Paper*)
(*Andrew Pan, Chi On Chui*)

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A 28-GHz Class-J Power Amplifier with 18-dBm Output Power and 35% Peak PAE in 120-nm SiGe BiCMOS
(*Anirban Sarkar, Brian Floyd*)

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An X to K_a-Band Fully-Integrated Stacked Power Amplifier in 45nm CMOS SOI Technology
(*Sultan R. Helmi, Jing-Hwa Chen, Saeed Mohammadi*)

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A 69-81GHz Power Amplifier Using 90nm CMOS Technology
(*Jeng-Han Tsai, Rwei-An Chang, Ji-Yang Lin*)

WE2C: Technology, Devices, and Modeling

Chair: Mehmet Kaynak, IHP Microelectronics, Germany

Co-Chair: Julio Costa, RFMD, USA

Venue: Baycliff, 10:10 - 11:50, Wednesday 22 January 2014

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TCAD-Based Roadmap for High-Speed SiGe HBTs
(*M. Schroter, T. Rosenbaum, S.P. Voinigescu, P. Chevalier*)

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Modeling and Optimization of BiCMOS Embedded Through-Silicon Vias for RF-Grounding
(*M. Wietstruck, M. Kaynak, S. Marschmeyer, C. Wipf, I. Tekin, K. Zoschke, B. Tillack*)

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An Investigation of the Temperature Dependent Linearity of Weakly-Saturated, Electrically-Matched SiGe NPN and PNP HBTs
(*Seungwoo Jung, Peter Song, Ickhyun Song, Robert L. Schmid, John D. Cressler, Jeff A. Babcock*)

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Integration of a 50V BVCEO SiGe:C HBT into a 0.25 μ m SiGe:C BiCMOS Platform
(*R. Sorge, J. Schmidt, C. Wipf, F. Korndörfer, R. Pliquett, K. Schulz, R. Barth*)

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The Analysis of Transit-Time Effect of Bipolar Base Collector Junction Breakdown
(*Xiaochuan Bi, Django Trombley, Tracey Krakowski, Doug Weiser*)

WE3P: Transceivers and Front-end Technologies SOC and SiP (Joint RWW Interactive Poster Session)

Venue: Newport Coast Ballroom, 12:50 - 14:40, Wednesday 22 January 2014

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A K-Band BiCMOS Low Duty-Cycle Resistive Mixer

(Alessandro Magnani, Christophe Viallon, Ioan Burciu, Thomas Epert, Mattia Borgarino, Thierry Parra)

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Charging Mechanisms in Nanostructured Dielectrics for MEMS Capacitive Switches

(G. Papaioannou, L. Michalas, M. Koutsourelis, S. Bansropun, A. Gantis, A. Ziaei)

WE4C: Signal Source

Chair: Hermann Schumacher, University of Ulm, Germany

Venue: Baycliff, 15:40 - 17:00, Wednesday 22 January 2014

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Novel Frequency Quadrupler Design Covering the Entire V-Band in 0.13- μ m SiGe Process

(Shuai Yuan, Hermann Schumacher)

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A 20GHz VCO and Frequency Doubler for W-Band FMCW Radar Applications

(Weihsu Wang, Yohsuke Takeda, Yi-shin Yeh, Brian Floyd)

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2.4GHz / 3.5GHz Dual-Band Wide-Tuning-Range Quadrature VCO Using Harmonic-Injection Coupling Technique

(Muh-Dey Wei, Sheng-Fuh Chang, Ye Zhang, Yung-Jih Yang, Renato Negra)

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K-Band Differential and Quadrature Digitally-Controlled Oscillator Designs in SiGe BiCMOS Technology

(Christopher Maxey, Sanjay Raman)