



2015 Power Amplifier Symposium

Monday, September 21

7:30 *Registration and Continental Breakfast*

Welcome Session

8:15 “Introduction to the Power Amplifier Symposium”
Paul Draxler, Peter Zampardi, Peter Asbeck

Session 1: Plenary

8:30 “5G Systems” (*Invited*),
Ed Tiedemann,
Qualcomm, San Diego, CA

9:00 “Envelope Modulator & X-band MMICs ”(*Invited*),
Donald F. Kimball
MaXentric, La Jolla, CA

9:30 “Highly Reliable 600V GaN Power Switches”(Invited),
Toshihide Kikkawa
Transphorm, Santa Barbara, CA

10:00 *Coffee break*

Session 2: Advanced Architectures

10:30 “Capacitively Coupled Quadrature Switched Capacitor PAs”,
Wen Yuan and Jeffrey S. Walling
University of Utah

10:50 “A Hybrid Technique for PA Back-Off Efficiency Enhancement - A Broadband Mixed-Signal Class-G Doherty PA in CMOS”,
Song Hu and Hua Wang
Georgia Institute of Technology, Atlanta, GA

11:10 "Linearization Algorithm for Open-Loop Multi-Switcher Envelope Modulators for Envelope Tracking Power Amplifiers",
Toshifumi Nakatani^{1,2}, Paul T. Theilmann¹, Tuan Do¹, Peter M. Asbeck², and Donald F. Kimball^{1,2}
¹*MaXentric Technologies, La Jolla, CA 92037*, ²*University of California, San Diego, La Jolla, CA 92093*

- 11:30 "High Efficiency Envelope Tracking Power Amplifier Using Dual-Path Digital Predistortion",
Youjiang Liu¹, Chan-Sei Yoo², John Fairbanks¹, Jonmei Yan³, Donald Kimball^{1,3}
and Peter Asbeck¹
¹*University of California, San Diego, La Jolla, USA*
²*Korea Electronics Technology Institute, Gyeonggi-do, Korea*
³*MaXentric Technologies, LLC, La Jolla, USA*

11:50 *LUNCH*

Session 3: Load-Pull Techniques for PA Design

- 1:30 "Designing High-Power Amplifiers With Enhanced Load-Pull Measurements",
Chris Bean,
AWR Group, NI
- 1:50 "The Bias Smith Tube for Simultaneous Optimization of Power Amplifier Bias Voltage and Load Impedance",
Matthew Fellows¹, Sarvin Rezayat¹, Jennifer Barlow¹, Joseph Barkate¹, Alexander Tsatsoulas¹, Charles Baylis¹, Lawrence Cohen², and Robert J. Marks II¹
¹*Baylor University, Waco, TX*
²*U.S. Naval Research Laboratory, Washington, DC*
- 2:10 "Multidimensional Smith Tubes for Multi-Objective, Multi-Parameter Power Amplifier Design Optimization",
Alexander Tsatsoulas¹, Matthew Fellows¹, Joseph Barkate¹, Charles Baylis¹, Lawrence Cohen² and Robert J. Marks II¹
¹*Baylor University, Waco, TX*
²*U.S. Naval Research Laboratory, Washington, DC*
- 2:30 "Momentum-Aided Search in the Power Smith Tube for Simultaneous Optimization of Power Amplifier Input Power and Load Impedance",
Joseph Barkate¹, Alexander Tsatsoulas¹, Matthew Fellows¹, Matthew Flachsbart¹, Charles Baylis¹, Lawrence Cohen², and Robert J. Marks II¹
¹*Baylor University, Waco, TX*
²*U.S. Naval Research Laboratory, Washington, DC*

2:50 *Coffee Break*

Session 4: Matching Networks and 50th Anniversary Presentation

- 3:20 "Bondwire Magnetics for High-Power Amplifiers, Including its Application in Class-E Outphasing Amplifiers"*(Invited)*,
David A. Calvillo-Cortes¹ & Leo C. N. de Vreede²
¹*Qualcomm Technologies, Inc.*, ²*Delft University of Technology*

- 3:50 "Lumped-Element Transforms for Power Amplifier Loading Networks ",
Ramon Beltran
Skyworks Solutions Inc, Newbury Park, CA
- 4:10 "A Novel Pseudo-Fully-Depleted-Silicon-On-Insulator (PFD-SOI) MOS Device
Architecture Optimal for the High-Power Radio-Frequency Applications",
A.H. Tarakji
Institute of Electrical and Electronics Engineers, San Diego, CA
- 4:30 "Electrical and Computer Engineering at UCSD: 50 Years of Accomplishment",
Peter M. Asbeck and Truong Nguyen
ECE Department, UCSD, La Jolla, CA
- 5:00 *Reception*
- 6:30 *Banquet*

Tuesday, September 22

7:30-8:30 *Registration and continental breakfast*

Session 5: CMOS Power Amplifiers

- 8:30 "Monolithic Watt-level Linear CMOS Power Amplifier" (*Invited*),
Ali Afsahi¹ and Lawrence E. Larson²
¹*Broadcomm and* ²*Brown University*
- 9:00 "CMOS Digitally-Controlled Power Amplifiers for Handset Applications",
Varish Diddi, Hamed Gheidi, Youjiang Liu, James Buckwalter, and Peter M. Asbeck
ECE Department, University of California at San Diego, La Jolla, 92093
- 9:20 "A Wideband Fully Digital Phase Modulator in 45nm CMOS SOI",
Hamed Gheidi¹, Toshifumi Nakatani², Vincent Leung³, Voravit Vorapipat¹, James
Buckwalter^{4,1} and Peter M. Asbeck¹
¹*ECE Department, University of California San Diego, La Jolla, CA*
²*MaXentric Technologies Corp., La Jolla, CA*
³*QualcommTechnologies Inc., San Diego, CA*
⁴*ECE Department, University of California Santa Barbara, Santa Barbara, CA*
- 9:40 "Impedance Inverter-Less Doherty Amplifier",
Voravit Vorapipat, Cooper Levy and Peter Asbeck
ECE Department, University of California San Diego, La Jolla, CA
- 10:00 "Co-design of Full-duplex RFIC and Resource Allocation Algorithms",
Jin Zhou, Jelena Marasevic, Gil Zussman, and Harish Krishnaswamy
Department of Electrical Engineering, Columbia University, New York, NY
- 10:20 *Coffee break*

Session 6: High Frequency Amplifiers

- 10:50 "W-Band (90-100 GHz) Power Amplifiers Based on AlInN/GaN-on-Silicon HEMTs",
D. Marti¹, S. Tirelli¹, L. Lugani², M. Malinverni², J.-F. Carlin², N. Grandjean², and C.
R. Bolognesi¹
¹Millimeter-Wave Electronics Group, ETH-Zürich, 8092 Zürich, Switzerland
²ICMP, École Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland
- 11:10 "Large-signal nonlinear HBT compact modeling and verification for mm-wave
applications" (*Invited*),
M. Schroter^{1,2}, A. Pawlak¹, P. Sakalas¹
¹Technical University Dresden, Mommsenstrasse 13, Dresden 01062, Germany
²ECE Dept. UC San Diego, La Jolla, CA, USA
- 11:40 "Digital Predistortion and Quantization Noise Filtering in RF Power DAC Transmitters"
(*Invited*),
Ritesh Bhat and Harish Krishnaswamy
Department of Electrical Engineering, Columbia University, New York, NY
- 12:10 *Conclusion of Symposium*