



IEEE SSCS/CASS Atlanta Joint Chapter Seminar

Title: High-Efficiency Silicon RF Power Amplifier Design - Current Status and Future Outlook

Speaker: Dr. Donald Lie, Keh-Shew Lu Regents Chair Professor

Affiliation: Department of Electrical and Computer Engineering, Texas Tech University

Abstract: The majority of the world's high-performance radio-frequency (RF) power amplifiers (PA) products are still designed in III-V semiconductor devices today. However, silicon-based RF PAs designed in advanced CMOS and SiGe technologies have become more and more prevalent in various RF front end modules (FEM) products for broadband wireless applications. Even though the III-V based RF PAs can still offer better frequency performance, considerably higher output power POUT with larger breakdown voltages, and often also with faster time-to-market, the silicon-based RF PAs do have advantages in higher monolithic integration with added functionalities (e.g., on-chip filtering, flexibility on multi-standard modulations and easier correction of nonlinearity with digital predistortion (DPD), etc.), which may translate to lower overall cost and smaller sizes attractive for future broadband multi-mode multi-band transmitters. Therefore, I will present an up-to-date survey on recent design trends of silicon-based PAs, with the focus on high-efficient broadband wireless 5G PA design.



Speaker Biography: Dr. Donald Y.C. Lie received his B.S.E.E. degree from the National Taiwan University in 1987, and the M.S. and Ph.D. degrees in electrical engineering (minor in applied physics) from Caltech, Pasadena, in 1990 and 1995, respectively. He has held technical and managerial positions at companies such as Rockwell International, Silicon-Wave (now Qualcomm), IBM, Microtune Inc., SYS Technologies, and Dynamic Research Corporation (DRC). He is currently the Keh-Shew Lu Regents Chair Professor in the Department of Electrical and Computer Engineering, Texas Tech University, Lubbock, Texas, and also an Adjunct Professor in the Department of Surgery, Texas Tech University Health Sciences Center (TTUHSC). He is instrumental in bringing in multi-million dollars research funding and also designed real-world commercial communication products sold internationally. He was a Visiting Lecturer to the ECE Department, University of California, San Diego (UCSD) during 2002-2007 where he taught upper-division and graduate-level classes and affiliated with UCSD's Center of Wireless Communications (CWC) and co-supervised Ph.D. students. Dr. Lie is currently serving as the General Chair of IEEE VLSI-DAT 2016, the TPC Subcommittee Chair for IEEE RFIC Symp. 2016, and also serving on the Executive/Steering Committees of the IEEE BCTM, SiRF, MWSCAS, VLSI-DAT, and TSWMCS (Texas Wireless Symp.) Dr. Lie has been awarded with the US NAVY SPAWAR SSC San Diego "Center Team Achievement Award", Spring 2007. He and his students have won several Best Graduate Student Paper Awards and Best Paper Awards in international conferences for 1994, 1995, 2006, 2008 (twice), 2010 (thrice), 2011, 2012, 2013, 2014 and 2015. Dr. Lie has been serving as an Associate Editor of IEEE Microwave and Wireless Components Letters (MWCL) since 2010, the Associate Editor-in-Chief for the Open Journal of Applied Biosensor, a Guest Editor of IEEE Journal of Solid-State Circuits (JSSC) in 2009, the Special Topic Editor for IEEE MWCL in 2012. Dr. Lie has authored/coauthored about 190 peer-reviewed technical papers and book chapters and holds seven U.S. patents. His research interests are: (1) power-efficient RF/Analog IC and System-on-a-Chip (SoC) design and test, especially on radio-frequency silicon power amplifier (PA) design; and (2) interdisciplinary and clinical research on medical electronics, biosensors, and biosignal processing.

Seminar Time: 3:00PM-4:00PM on March 30th 2016 **Seminar Location:** TSRB 530, Georgia Tech.

Organizer: Dr. Hua Wang, IEEE SSCS/CASS Atlanta Joint Chapter Chair, Assistant Professor, School of ECE, Georgia Technology. Email: hua.wang@ece.gatech.edu. Phone: (404) 385-6003