



## SEMINAR

Room 1037 ETB

October 6, 2015 3:55-5:10 P.M.

### **Enabling High-Performance High-Voltage Integrated Power Conversion Circuits for Energy-Efficient Systems**

by

**Hoi Lee**

Department of Electrical Engineering, University of Texas at Dallas

**Abstract:** In recent years, high-voltage (HV) power conversion circuits have attracted growing interests for applications in automotive vehicles and renewable energy systems. Innovation in the HV power converter design through miniaturization is important as it can lead to significant reduction in the system cost. However, existing HV power converters typically require the use of bulky passive components due to low frequency operation for better power efficiency consideration. The success experience of the past 2 decades in low-voltage power converter design may not provide sufficient insights to realize high-performance high-input-voltage integrated power converters and we are starting to hit a number of “walls” that are likely to limit our progress. In this talk, we will present our recent research on monolithic HV gate driver developments for enabling reliable high-frequency operation in HV power converters. As an application example, the design considerations of the first soft-switched HV DC-DC based LED driver with the advanced gate driver will also be discussed.

---

**Dr. Hoi Lee** received the Ph.D. degree in Electrical and Electronic Engineering at the Hong Kong University of Science and Technology in Aug. 2004. In Jan. 2005, he joined the Department of Electrical Engineering, University of Texas at Dallas, Richardson, TX, where he is currently an Associate Professor. His research interests include power management integrated circuits; power converter topologies and control methodologies; and low-power analog circuits.

Dr. Lee is an Associate Editor of the IEEE Transactions on Circuits and Systems II and the Chair of Power Management Technical Committee in the IEEE Custom Integrated Circuits Conference. He is also in the Technical Program Committee of many other IEEE conferences including IEEE International Symposium on Circuits and Systems; IEEE Midwest Symposium on Circuits and Systems; IEEE International Symposium on Power Semiconductor Devices and ICs; etc. Dr. Lee is a senior member of IEEE. He received 2011 National Science Foundation CAREER Award and the Best Student Paper Award in the 2002 IEEE Custom Integrated Circuits Conference. He is also a co-recipient of the Best in Session Award in the 2013 SRC TECHCON conference.