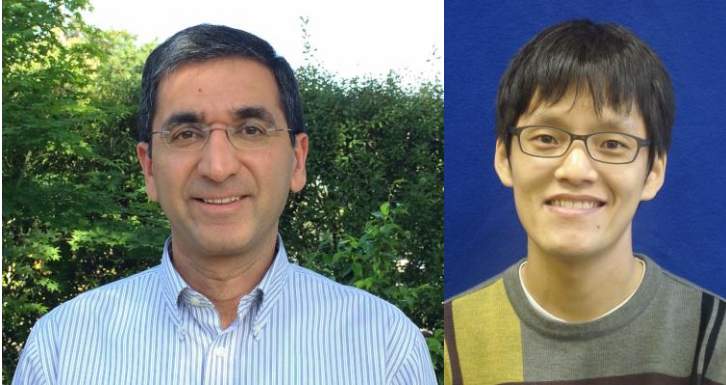


Tutorial #5

GaN Reliability for Power Devices and Applications

Sandeep Bahl and Jungwoo Joh – Texas Instruments



Biography

Sandeep Bahl is the GaN Reliability, Devices & Modeling manager of the High Voltage Power Business Unit of Texas Instruments. He graduated with a PhD in Electrical Engineering from the Massachusetts Institute of Technology. Sandeep has extensive experience with semiconductor technology development. His present focus is to bring reliable GaN products to market, and to develop the methodology to know that they will be reliable under actual-use conditions. He helped kickoff the standardization effort of the GaN industry and is presently participating on the GaNSPEC reliability committee as the switching reliability sub-team lead. He is also chairing the Wide Bandgap Committee of the IEEE International Reliability Physics Symposium (IRPS).

Jungwoo Joh received his S.M. and Ph.D. degrees in Electrical Engineering from MIT. His thesis topic was on reliability physics of GaN HEMTs. He is currently with Texas Instruments, Dallas, TX, where he has been conducting research on GaN device physics and reliability.

Abstract

The talk will provide a tutorial on GaN reliability, both from the device and applications-use perspective. It will go over both device and application-use failure modes, summarizing learnings from the literature. You will learn about device TDDB, charge-trapping and hard-switching. You will also learn about what the traditional JEDEC qualification recipe means and why it does not assure application-relevant reliability. The tutorial will also summarize industry approaches to application reliability.