**Title: An overview of Design and Reliability of Gallium Nitrite HEMT Power Devices**

**Abstract:** Gallium Nitride Based Power electronic devices are projected to cross $1B mark by 2022 and $5B mark by 2025 with a market dominance in medium voltage segment. However the question is would GaN enjoy a similar development roadmap that Si power devices have enjoyed and can it leverage learning / know-how developed from Si power device technology. If not, what is required to be addressed at this stage of technology development. This talk is divided into three parts. In first part I will give a brief review of techno-commercial aspects of GaN HEMT technology and design aspects of the same. Second part will focus on comprehensive TCAD methodology and TCAD based design approch for GaN HEMT technology, in a tone similar to what Si has enjoyed in the past. In the last part, I will stress on how critical reliability aware design is for GaN HEMT technology, while hilighing some new learnings we have aquired both in terms of long term reliability of commercial GaN devices, as well as SOA like short time device reliability of in-house developed GaN devices.

**Bio:** Prof. Mayank Shrivastava received his PhD degree from Indian Institute of Technology Bombay. He has over 70 international publications and 35 patents. Prof. Shrivastava’s current research deals with experimentation, design and modeling of beyond CMOS devices using Graphene and TMDCs, wide bandgap material based power semiconductor devices and ESD reliability in advanced and beyond CMOS nodes. He had held positions in Inﬁneon Technologies, Munich, Germany; Inﬁneon Technologies, East Fishkill, NY, USA; IBM Microelectronics, Burlington, VT, USA; Intel Mobile Communications, Hopewell Junction, NY, USA; and Intel Corp., Mobile and Communications Group, Munich, Germany between 2010 and 2013. He joined Indian Institute of Science Bangalore as a faculty member in September 2013. He is among the first recipient of Indian section of American TR35 award (2010). He is also the first Indian to receive IEEE EDS Early Career Award (2015). In addition to this he is an IEEE Senior Member and has received several other awards and honors including few best research paper awards; excellence in research award for his PhD thesis in 2010 and industrial impact award from IIT Bombay in 2008. More details related to his group or work can be found at:<http://mayank.dese.iisc.ac.in/>