

Title of the talk: Semiconductor Devices for 5G Communication Technology

Abstract: The continuous growth of wireless communication, the data traffic was projected to increase in the year 2020 by 1000-fold and further exploded the data traffic exponentially by the year 2030. Increasing spectral efficiency throughput using Long Term Evolution (LTE) system and acquiring additional frequency spectrum could not able to solve the problem and hence need new disruptive thinking like replacement of Si CMOS technology to GaN HEMT technology to use in 5G Communication Technology, particularly at 28GHz. Thus, devices plays major role on communication, be it be in 2G or 5G. The advanced countries are thinking for 60GHz and above frequency for operation. Utilizing the use of new frequency band in milli-meter wave frequencies are expected to solve such kind of problem. This must have to look into design from devices levels first. In such cases, devices like IMPATTs may play major role. The traditional CMOS, BJT and currently HBT and HEMT are playing the major role for operation from 2G to 5G. Therefore, the aim of the talk is to discuss how devices (particularly two terminal and three terminal Semiconductor devices) are playing the role in communication. These devices must put in Integrated circuits for the operation. Hence, the talk will cover as a case study to design an integrated transceiver (LNA, PA and Switch/Circulator/Diode in a single IC) using GaN HEMT technology suitable for millimetre-wave 5G applications.