UNIVERSITÀ DI PISA

DIPARTIMENTO DI INGEGNERIA DELL'INFORMAZIONE

Dottorato di Ricerca in Ingegneria dell'Informazione

Corso di Dottorato

"GaN and advanced silicon technology for power electronics"

Dr. Gilberto Curatola

Infineon Technologies Austria

Short Abstract:

In this 16hrs course, Gallium-Nitride and advanced silicon technologies for power applications will be presented and described in details.

Particular emphasis will be given to the disruptive gallium-nitride technology that is currently one of the most promising technologies for future power and RF devices. The main advantages and features of GaN-on-Silicon field effect transistors will be presented during the course. Detailed explanations of the different device concepts and of the main fabrication processes will be given in the first part of the course; furthermore, the main roadblocks for a successful integration of GaN technology on conventional Silicon wafers will be described.

The second part of the course will focus more in details on the different characterization techniques specific to GaN technology and on the Infineon GaN Virtual prototyping approach for the device and system modeling.

Finally, an overview on the main applications for GaN devices will be presented.

The final day of the course will be focused on the overview of advanced silicon technologies for power applications. Both high-voltage and mid-to-low-voltage device concepts and technologies will be presented.

Course Contents in brief:

- GaN Power Technology:
  - GaN Fundamentals
  - Device Concepts: normally-on vs. normally-off
  - GaN-on-Silicon Epitaxial Growth and Device Fabrication
  - GaN power device characterization and modeling
  - GaN applications

- Advanced Silicon Technologies for Power applications:
  - Device Concepts
  - Applications

Total # of hours: # 16

CV of the Teacher

Gilberto Curatola was born May 5, 1975 in Italy. He received his M.Sc. degree in electrical engineering and the Ph.D. degree for a thesis on the subject of quantum effects and transport in nanoscale field effect transistors, from the University of Pisa, Italy in 2000 and 2005, respectively.
From 2005 until 2010 he was with Philips Research-NXP Leuven, working on device simulations for CMOS applications, with special emphasis on FinFET devices, quantum effects and mobility. Since 2010 he has been with Infineon Technology Austria working on GaN technology for power applications.
His research interest include GaN modelling and characterization, new device concepts and interface between technology and applications

Room and Schedule

Room: *Aula Riunioni del Dipartimento di Ingegneria dell'Informazione, Via G. Caruso 16, Pisa – Ground Floor*

Time:

29 giugno ore 9:00-13:00, 15:00 – 17:00, GaN Power Technology (Module I)

30 giugno ore 9:00-13:00, 15:00 – 17:00, GaN Power Technology (Module II)

1 luglio ore 9:00-13:00, Advanced Silicon Power Technologies