SUNDAY 08:30 – 17:50

SS01
EuMIC

Fundamentals of Microwave PA Design

Chair: Paolo Colantonio[1]
Co-Chair: Rocco Giofrè[1]
[1]University of Roma Tor Vergata

Room: Expedition

Semiconductor Power Amplifiers are key components in radio frequency and microwave transmitter systems. They have received a great deal of attention and development effort over the last decades and are still a hot topic in research area. This short course aims to provide a comprehensive overview of all aspects of fundamental semiconductor microwave power amplifier design. It is an introductory course, aimed at graduate engineers who have moved into the field of RF design, as well as to microwave designers who aim to deeply understand the power amplifier basic concepts. This short course features a range of presentations and will provide a comprehensive overview and basic understanding on recent important progress and novel state-of-the-art achievements in semiconductor power amplifiers. Very recent advances in semiconductor amplifiers and their applications will also be covered.

Starting from the fundamental concepts on semiconductor devices, the core of a power amplifier design, the theoretical foundations of a power amplifier design are discussed. It will include fundamental concepts and state-of-the-art results on actual designs of a range of semiconductor power amplifiers using existing foundries. The load pull technique is also addressed and focused on the designer perspective.

The presentations will also cover a variety of advanced topics, and will provide the attendees with a clear overview of the main streams of current and important research trends worldwide in this field, as the Doherty architecture and the more recent load modulation power amplifier design concepts.

The short course will also focus on the major challenges, such as stability (small and large signal) and how to address these in amplifier design. Finally, accounting for the linearity issue, a basic overview on linearization techniques and their adoption to properly mitigate the amplifier distortion effects will conclude the short course.

PROGRAMME

Semiconductor devices for PAs
Iltcho Angelov [1]
[1]Chalmers University

PA theoretical foundation
Paolo Colantonio[1]
[1]University of Roma Tor Vergata

Design and model-oriented Load Pull techniques: from basic CW to wideband and double pulsed Load Pull systems
Marco Pirola[1], Gustavo Avolio[2]
[1]Politecnico di Torino (Italy), [2]Maury Microwave, Eindhoven, The Netherlands

The Doherty Power Amplifier
Rocco Giofrè[1]
[1]University of Roma Tor Vergata

Balanced PAs: an old trick revival
Roberto Quaglia[1], Aleksander Bogusz[2]
[1]Cardiff Univeristy (UK), [2]Cardiff University

X-parameters high-power PAs modeling for System Level Analysis
Alessandro Cidronali[1]
[1]University of Florence (Italy)

Linear and Nonlinear Stability Analysis of Power Amplifiers
Giorgio Leuzzi[1]
[1]University of L'Aquila (Italy)

Linearization techniques overview
Pere L. Gilabert[1]
[1]Universitat Politècnica de Catalunya (UPC-Barcelona Tech.), Spain

A practical guide to first-time-right integrated microwave PA design
Gijs van der Bent[1]
[1]TNO Radar Technology Department