

Agilent Technologies Workshops

- Free to attend -

For more information, program details and registration:
www.agilent.com/find/eumw2009

Location: Upper level Hall 9, as signposted

Tuesday 29 September, 09:30 - 10:45

Looking Towards 4G: IMT-Advanced

The proposals for a true 4G system will require wide bandwidth, high performance, and advanced transmission techniques. One of the proposals is LTE-Advanced requiring further enhancements to the current standards being defined. This presentation discusses the requirements of 4G, the challenge of increased average performance and the proposals for LTE-Advanced to meet these challenges such as Femto cells and in-channel relays.

Tuesday 29 September, 11:00 - 12:30

LTE RF Design and Measurement Challenges

This presentation will discuss some typical LTE signal problems, both single channel and MIMO, along with the measurement approaches to understand them. The presentation will also describe a method for performing FDD and TDD base station and user equipment transmitter and receiver tests according to 3GPP conformance specifications.

Tuesday 29 September, 14:00 - 15:30

MIMO Channel Modeling and Emulation Test Challenges

Modern radio designers have always looked for ways to improve spectral efficiency to transmit more bits per Hz without sacrificing signal quality. This paper covers how antenna technologies have evolved in recent years, including spatial diversity, spatial multiplexing and beam forming, to improve signal quality and throughput. We will review common wireless propagation channel characteristics before focusing on the added complexity in MIMO channel emulation like calculating correlation matrices to simulate various channel conditions.



Agilent Technologies

Tuesday 29 September, 15:45 - 16:45

MIMO Antenna Design on a Small Budget

Multi-Input/Multi-Output (MIMO) antenna systems are becoming more and more popular with advent of 3G/4G wireless standards as they offer increased spectral efficiency. This presentation will walk through patch antenna design basics then delve into MIMO design steps using Agilent Genesys cost-effective EDA solution. If you are involved or would like to learn about designing MIMO antennas for 3G/4G devices such as 802.11n, WiMAX, or LTE on a small budget; this presentation is for you.

Wednesday 30 September, 09:30 - 12:30

Advanced Nonlinear Device Characterization Utilizing Nonlinear Vector Network Analyzer and X-Parameters with Arbitrary Load and Multi-Tone Dependence

This presentation will focus on Agilent's Nonlinear Vector Network Analyzer (NVNA) measurement capability as well as the application of X-parameters for the design and analysis of active components. A simple measurement configuration, calibration process and new phase calibration module provide vector corrected nonlinear measurements from 10 MHz to 26.5 GHz. The NVNA, based on a standard PNA-X, enables active device designers to accurately measure and model nonlinear device characteristics providing measurements such as calibrated amplitude and cross-frequency phase of frequency spectrum, vector corrected time domain waveforms, X-parameters, and pulse multi-envelope domain for analysis of long term memory effects. Details on the applications of measured X-parameters in design and validation of active components including the simulation/ optimization of complex stimulus/response behavior in ADS will be discussed. New load dependent and large-signal two-tone measurement based X-parameters will be introduced and used in the simulator providing an efficient and correct method for the designer to maximize linearity with a nonlinear model that is valid over a wide range of load impedances as well as full two-tone large signal drive at the device input.

Wednesday 30 September, 14:00 - 15:45

New Ultra-Fast Noise Parameter System. Opening A New Realm-of-Possibilities in Noise Characterization (co-presented by Maury Microwave Corporation)

Characterization of noise within a device or circuit is critical for many RF design engineers. The most commonly-used measurement is noise figure, but this parameter is not always sufficient. Noise Parameters are required to fully- understand and optimize devices, circuits and system designs. In the past, noise parameter measurements were often avoided because they took too long -- often days -- to complete. Now, using a PNA-X network analyzer and a noise tuner, complete noise parameter characterization is practical, fast and as easy as measuring S-parameters. This new method is >100x faster and dramatically more accurate. Compromise is no longer essential, as noise parameter measurements are now a practical option for all RF designers & test engineers.

Wednesday 30 September, 16:00 - 17:30
(presented by Cascade Microtech)

Complete and focused solutions for engineering and production test applications addressing 60 GHz through 80 GHz RF millimeter wave components

Explore a complete and focused solution for both engineering and production test applications addressing 60 GHz through 80 GHz for RF millimeter-wave. See how integration software and complete calibration capability ensures that users can perform complete characterization and performance tests to enable production of Known-Good-Die (KGD) for automotive radar and wireless HDTV applications. In addition, review calibration methods for 2 port/4port and learn how to achieve a probing-tolerant 4-port calibration using advanced 4-port hybrid LRRM-SOLR calibrations. New higher-end applications for imaging and video transmission are emerging and create a strong demand for test and measurement equipment in the millimeter-wave range. In addition, discover the latest probe measurement techniques and see how multi-port measurements can be implemented.



Thursday 1 October, 09:30 - 10:30

LTE MIMO System-Level Design

System-level design simulations will be examined for LTE 2x2 MIMO transmitter and receiver design case studies. RF/baseband design trade-offs will be discussed. A transmitter case study will investigate simulated transmitter design impairments and their effects on system-level metrics such as EVM. A receiver case study will investigate MIMO BER simulations with MIMO channel modeling and receiver design impairments. R&D SISO coded BER hardware measurements will be shown, using simulation to perform baseband coding/decoding functionality.

Thursday 1 October, 10:45 - 12:30

Conquering noise for high dynamic range and accurate low-level signal measurements

Noise is the ever-present foe of good RF/Microwave measurements, limiting dynamic range and the accuracy of low-level measurements. This presentation will cover measurement techniques and signal analyzer features, both old and new, which can dramatically reduce the effects of noise and improve both accuracy and speed.

Thursday 1 October, 14:00 - 16:15

Methods and applications of Signal Phase Coherence and Stability

Diversity antenna systems, phased array antennas, direction finding equipment and MIMO systems continue to grow in popularity. These coherent multi-channel systems offer capabilities that are simply unmatched by other technologies. This paper provides an overview on how these systems operate, their unique properties and the test challenges they present. Attendees will learn about some of the different ways to combine antenna apertures, the common problems encountered and the latest in advanced test equipment solutions for the coherent multi-channel system.

Rohde & Schwarz Workshops

- Free to attend -

For more information, details and registration:
<http://www.eumw.rohde-schwarz.com/>

Location: Ottavia, Hall 10

Tuesday 29 September, 10:00 - 11:30

Basics of Modern Signal Generators

The following topics will be covered by the workshop:

- Fundamental structures of signal generators
- Challenges in low phase noise and high output power
- High-performance analog and pulse modulations
- Practical demonstrations for typical applications

Tuesday 29 September, 12:00 - 13:00

Generation of Microwave Vector Signals Using External Mixers

The following topics will be covered by the workshop:

- Mixer fundamentals
- I/Q mixer principles
- I/Q versus conventional mixers
- Practical demonstrations

Tuesday 29 September, 14:00 - 15:00

Power Analysis Using a Microwave Signal Generator

The following topics will be covered by the workshop:

- Power versus frequency (frequency response) measurements
- Power versus power (gain, compression point) measurements
- Power versus time measurements
- Automatic pulse measurements
- Practical demonstrations

Tuesday 29 September, 15:30 - 16:30

Sophisticated Pulsed Signal Generation

The following topics will be covered by the workshop:

- Overview of pulse scenarios
- Generating pulsed signals using analog signal generators
- Generating pulsed signals using vector signal generators
- Advantages and disadvantages of analog and vector signal generators for pulsed signal generation



ROHDE & SCHWARZ

Wednesday 30 September, 10:00 - 12:15
(with 15 min break)

Fast Nonlinear Characterisation and PA Design Using VNAs

In cooperation with NMDG N.V. & Focus Microwaves Inc.

Abstract:

The capabilities of network analyzers are evolving rapidly. The ZVxPlus combines a Rohde & Schwarz network analyzer with hardware and software from NMDG N.V. to perform thorough nonlinear analysis of high-frequency components. Previously, it was only possible to guess why certain nonlinear specifications were achieved. Now, the causes of nonlinearities are visualized and identified in a matter of seconds. Due to the accurate calibration techniques and the large dynamic range of the network analyzer, the large-signal measurements enable model verification and tuning.

Combining the ZVxPlus with the unique fundamental and harmonic tuning technology of Focus Microwaves Inc. adds a new dimension to large-signal characterization. In addition to source- and load-pull contours, ZVxPlus allows the waveforms to be observed while changing the impedances on different harmonics, adapting the bias point and controlling the RF power. It is a practical application of waveform engineering. This combination becomes an indispensable extension to the Rohde & Schwarz network analyzers when switching amplifiers are to be designed and tested.

This practical workshop will demonstrate the use of the R&S@ZVA/ZVxPlus in combination with Focus Microwaves tuners to characterize transistors, to perform model verification and to design power amplifiers using waveform engineering.

Summary:

This practical workshop will demonstrate how customers benefit from extended network analyzers in combination with multiharmonic tuners to characterize the nonlinear behavior of components. It will show the following:

- How a transistor can be characterized in a non-50 Ohm environment on different harmonics
- How model verification and tuning uniquely benefit from this capability
- How amplifier designers benefit from an extension to their network analyzers

The workshop also gives room for practical discussions.

Wednesday 30 September, 13:00 - 14:00

Group Delay Measurements on Converters with Embedded LO

The following topics will be covered by the workshop:

- Basics of a new group delay measurement technique
- Network analyzer architectures for this type of measurement
- Considerations regarding measurement accuracy
- Presentation of measurement results

Wednesday 30 September, 14:30 - 15:30

A Perfect Duo - Network Analysis beyond the Basics

The following topics will be covered by the workshop:

- Measurements up to +43 dBm
- Improved signal purity and dynamic range
- Fast and accurate intermodulation distortion measurements
- New pulse measurement capabilities

Thursday 1 October, 10:00 - 11:00

Modern Techniques for Phase Noise Measurements

The following topics will be covered by the workshop:

- Theory of phase noise testing
- Increased sensitivity through cross-correlation up to 50 GHz
- Residual phase noise
- AM noise

Thursday 1 October, 11:30 - 12:30

Noise Figure Measurement at 60 GHz

The following topics will be covered by the workshop:

- Theory of noise figure measurement with spectrum analyzer
- Description of test setup and components
- Calibration of measurement
- Discussion of the results: Y factor, NF, gain, etc.

Ansoft Seminars

- Free to attend -

To get more information and to register
(seats are limited) contact tdechance@ansoft.com

Location: Upper level Hall 7, as signposted

You wish to see for yourself what our software can achieve?

Ansoft offers you the opportunity to discover our software:
HFSS: 3D Full-wave Electromagnetic Field Simulation tool
Ansoft Designer: High-performance RF/mW Design &
Analog/RFIC Verification software
Nexxim: The Next State of the Art in Circuit Simulation

Here is your chance to learn more about our EDA software.
Register now!

Presentations and demos within the seminars will show you real-life cases using our latest software features. Each session will be limited to 20 attendees to ensure a good interaction and provide appropriate follow up of questions.

Make antenna design easy **Tuesday 29 or Wednesday 30 September** **- Choose your date! 9:30 - 12:30**

This seminar presents:

- Introduction
- HFSS and Ansoft Designer - Advanced features for Antenna Analysis
- HFSS Antenna Wizard
- Electrically-large Antenna System Design
- Planar Antenna Design
- Questions & Answers

Take the power of combining circuit simulation and 3D Electromagnetic Model **Tuesday 29 or Wednesday 30 September** **- Choose your date! 14:00 - 17:00**

This seminar presents:

- Introduction
- Build 3D EM parametric model Library in Ansoft Designer
 - Build circuit library using HFSS project
 - Simulate and optimize circuit design with 3D EM model
 - High-Speed channel design using multi-level model
- Phased Array Antenna System Design using Ansoft Designer and HFSS
 - System Overview
 - Antenna Design
 - PA Design
 - Full system simulation
- Questions & Answers

