

RF Measurement techniques

RF technology is becoming more and more important in industrial, communication, home and office applications. Production testing, design verification and sometimes even the design itself require highly specialized measurement and test techniques. That's why there is a rising need for engineers with sound knowledge in RF laboratory measurement technology.

In the beginning of the course, the participant will be familiarized with the special features of the subjects of measurements. RF components, resonant circuits, transmission lines and the principles of reflection and matching will be introduced. The use of the Smith Chart as a tool to solve matching tasks will be practiced. A discussion of S-parameters, nonlinear distortions and noise completes the first section.

RF laboratory accessories are different from those used at lower frequencies and can substantially influence the dependability and accuracy of measurements. The second section is dedicated to a discussion of cables, attenuators, couplers, filters, mixers and low noise amplifiers used in a RF lab.

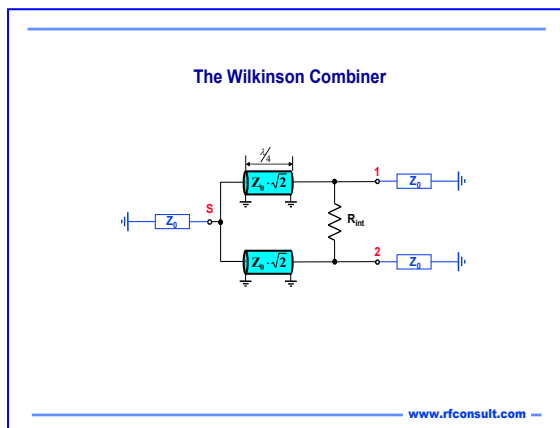
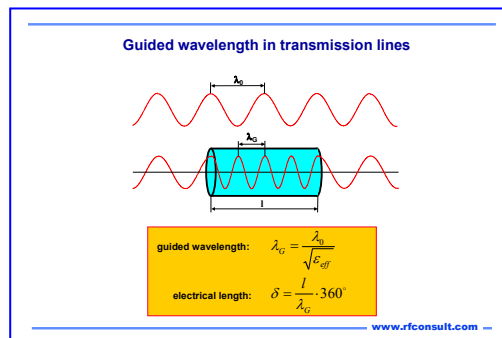
Based on the acquired knowledge, Signal generators, Spectrum analysers, Network analysers and signal analysers will be discussed in great detail. Based on practical examples, the proper use of RF measurement equipment will be demonstrated and exercised.

The Course Schedule:

Day One

RF Basics: What do we measure?

- Basic definitions
- Passive components at RF
- Reflection and matching
- The Smith Chart
- 2-port parameters



Day Two

RF Basics (continued)

- Transmission lines
- Nonlinear distortions and noise

RF Laboratory Accessories

- Cables and connectors
- Attenuators
- Combiners, splitters and directional couplers
- Non-reciprocal components
- RF filters
- Mixers
- Low noise amplifiers

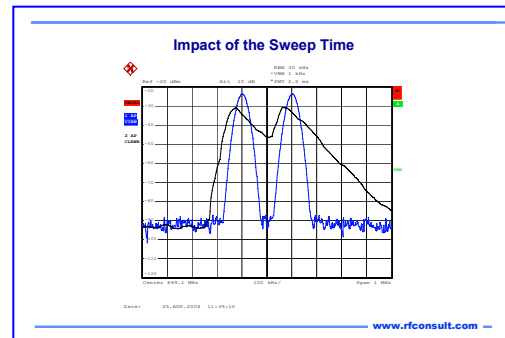
Day Three

RF Signal Generators

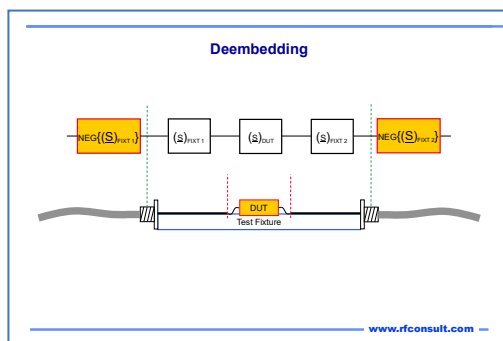
- Frequency synthesisers
- Signal modulation

Spectrum Analysers

- Basic function
- Settings and their impact on the performance
- Nonlinear distortions and noise



Day Four



Vector Signal Analysers

- Basic function
- Frequency domain measurements
- Time domain measurements

Network analysers

- Network analyser architectures
- Calibration of network analysers
- Deembedding and port extension
- Measurements at differential ports

Day Five

Hands-on excercises

- Spectrum analyser measurements
- Network analyser measurements

The participants will be provided with an extensive set of lecture notes.

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