

Applied Radio Design

From system architecture to PCB implementation

Wireless technology penetrates more and more applications in the industry, the home and the office. The semiconductor industry offers a wide range of IC devices for wireless transmitters and receivers. It is the charter of the RF circuit designer to implement these ICs on a PCB according to the system architecture.

The 5 day course “Wireless circuit design” enables engineers to estimate the system requirements of a given application and to design a wireless transmission system using integrated circuit solutions.

Particular attention is paid on the tuition of immediately applicable knowledge. The tools most frequently used in RF engineering are introduced avoiding off-putting extensive mathematics, their application is exercised on practical examples. The course will conclude with an exercise starting with the requirements of a simple practical design task, ending up with the schematics of a realization using ICs.

The Course Schedule:

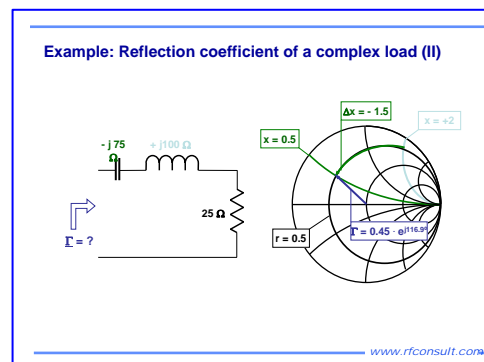
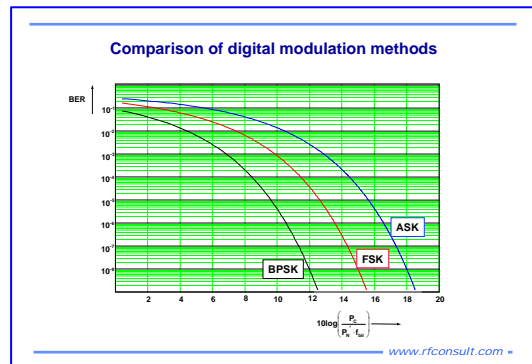
Day one

Wireless data transmission on the system level

- Analog modulation formats
- Digital modulation formats
- BER vs. signal to noise ratio
- Multiple access techniques
- Typical architectures

RF basics I

- Basic definitions
- Complex numbers and logarithmic scales
- The impact of parasitics



Day two

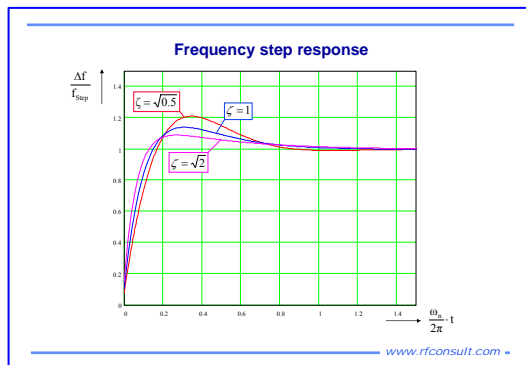
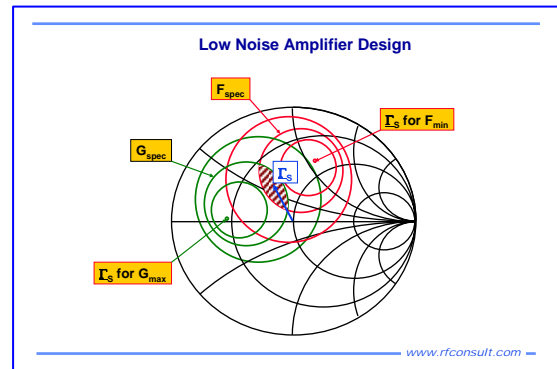
RF basics II

- Resonant circuits
- Reflection and matching
- The Smith Chart and its application
- S-Parameters
- Transmission lines
- Nonlinear distortions and noise

Day three

Building blocks of wireless transmitters and receivers

- Amplifier design
- Stability of amplifiers
- Available gain / operating gain concepts
- LNA design example
- Power amplifiers
- Oscillators
- Mixers



Day four

Phase locked loop synthesizers

- Open loop and closed loop transfer functions
- Stability considerations
- Describing and simulating phase noise
- Phase noise in a wireless system
- The PLL loop filter
- Loop filter dimensioning from lock time requirements
- Phase and frequency modulation in a PLL

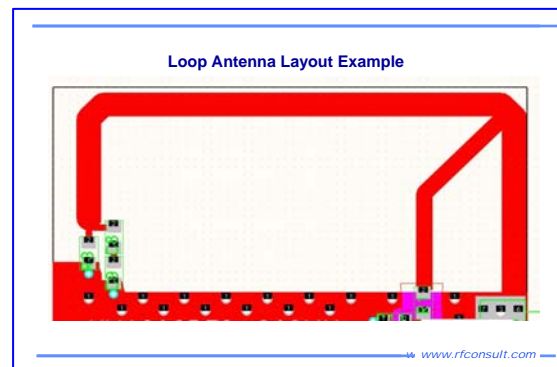
Day five

Antennas and propagation

- Antenna parameters
- Electrical and magnetical antennas
- Measurement of antenna parameters
- Pathloss prediction in free space and inside buildings
- Multipath effects and multipath mitigation, diversity techniques

Application example

- Analysing the requirements of a design task
- System definition and choosing components
- Implementation on a PCB



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

For more information please contact:

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