Advanced Design System Fundamentals

Course Overview

Course Numbers:
Agilent Training Center: N3211A
Onsite Training Center: N3211B

Learn through a combination of lecture and hands-on exercises

Course Overview

Agilent Technologies offers a medium-paced, 3-day, detailed introduction to the application of Advanced Design System for communication systems and circuit designs. This course instructs designers on schematic capture, the proper application of a wide variety of simulators, and the display and manipulation of results. After a brief study of ADS basic operation, students design and test amplifier and filter circuits that are placed afterwards in a down-converting receiver system for final simulation. The use of real-world examples are employed so that designers can return to their jobs ready to effectively apply ADS to their design challenges.

What you will learn

- Efficient operation of the ADS user-interface
- Use of ADS built-in design examples and DesignGuides
- Fast and efficient schematic capture
- Simulation using: DC, AC, S-parameter, Transient, Harmonic Balance, Envelope, and Data Flow
- Optimization and Tuning
- Control and display of simulation data and measurement equations
- Use of components such as SDDs, noise controllers, and more
- Use of various sources, including modulated sources such as CDMA and GSM
- Brief use of ADS Momentum from Layout
- Use of behavioral system models
- Use of data access components - DAC
- Simulation of Network Analyzer data
- Sub-circuit and hierarchy creation
- Plus a wide variety of tips and techniques that apply to all RF, Microwave, and RFIC designs, including amplifiers, filters, mixers, and oscillators

Specifications

Course type

User/Application Training

Audience

Technical staff who work in an RF or microwave design environment and want a comprehensive introduction to the application of ADS.

Prerequisites

Familiarity with basic RF and microwave concepts. Windows and PC experience.

Course Length

3 days

Course Format

The course combines lecture presentations with instructor guided, hands-on sessions.

Delivery Method

Scheduled (at Agilent training locations) or Dedicated (at customer site)

To save you time and travel, many Agilent EEsof EDA course can be delivered at your site. Agilent can provide the required equipment.

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Detailed Course Agenda

Day 1
Fundamentals of Circuit Design

This overview of user-interface and design flow includes most used commands, including efficient schematic capture, simulation setup, and data display. In addition, this class segment introduces example files and templates.

Basic System Design

Learn to use system blocks with behavioral models for a receiver/down converter. System testing includes S-parameters, phase noise, and spectral results using both Transient and Harmonic Balance. This system is later revisited when circuits replace the behavioral blocks for final testing with a modulated source.

DC Simulation

Learn how a modeled device becomes the sub-circuit for the amplifier, including package parasitics, simulation of dc curves, bias calculations, final testing.

Day 2
AC Simulation

Learn AC gain, noise, group delay, and phase measurements. Tuning, sweeping parameters, and data manipulation are covered for the biased circuit.

S-parameter Simulation

Learn to setup and analysis of S-parameters for reflection and transmission characteristics of the amplifier. Optimization and tuning are used to create a matching network for the input and output of the amplifier. In addition, using network analyzer data for simulation is covered.

Momentum and Transient Simulations

Focusing on filters, this section teaches the basic use of these tools for filter design. Also, the use of the DAC is included.

Harmonic Balance Simulation

This topic shows more extensive use of the HB simulator for various specifications testing using built-in measurements and sweeps for harmonic distortion, compression, TOI or IP3, and 2-tone testing. Equations operating on the data are also covered in more detail for use in various applications, including multi-dimensional sweeps.

Day 3
Circuit Envelope Simulation

Basics of Envelope simulation using a behavioral amplifier are completed first. Then, the amplifier is tested using modulated sources.

Final Design Test and Data Flow (co-simulation)

The amplifier and filters are inserted into the system design from topic 2. The system is then briefly tested for both small-signal and large signal performance. Finally, a Data Flow simulation is created for real-time testing.

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