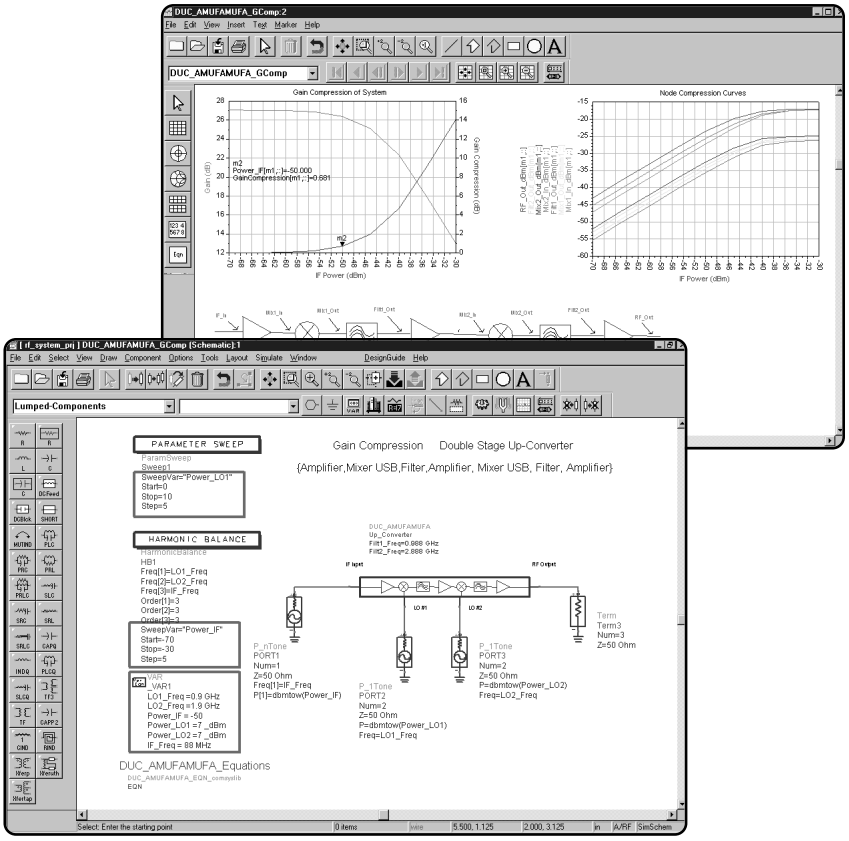
Agilent EEsof EDA
E5617A/AN RF System DesignGuide

Features at a Glance

- **Transmitters and Receivers**
  - Single-Stage and Double-Stage Upconversion
  - Single-Stage and Double-Stage Downconversion
- **Types of Measurements**
  - Noise Figure (table)
  - Carrier to Noise Ratio (table)
  - Carrier to Intermodulation Products (table)
  - Spurious Response with Swept Input Freq (table and graph)
  - Spurious Response with Swept LO Freq (table and graph)
  - System Large Signal S-parameters (graph)
  - Gain Compression (graph)
  - Carrier to Intermodulation products (graph)
- **Source Modulation**
  - PI/4 DQPSK
  - QPSK
  - 16, 64, 256 QAM
  - IS-95 Forward and Reverse Link
  - cdma2000-Compliant Forward and Reverse Link
- **Example RF Systems**
  - Data over Cable Network
  - 16 QAM System
  - GSM System
  - Bluetooth Receiver
  - GSM Receiver
  - OFDM Receiver

Product Overview



The RF System DesignGuide from Agilent EEsof EDA works with Advanced Design System to configure transmitter and receiver chains using behavioral system models.

The inherent capabilities of ADS allow you to replace any or all of the behavioral models with transistor-level models as those portions of the circuit are defined. The RF System DesignGuide also facilitates design of a transmitter or receiver by incorporating schematics and data displays that have been preconfigured to create, simulate, and measure the performance of a system.

As a result, with the RF System DesignGuide, the general design flow for a transmitter or receiver consists of a three-step process:

1. Creation of the converter topology
2. Measurement of the system to ensure that the specifications can be met. The system tests usually involve Carrier-to-Noise Ratio, Carrier-to-Intermodulation, Noise Figure, Spurious Response, and others. This initiates an iterative process between the choice of system architecture and the system measurements.
3. Measurements of the system using the required signal modulation.

These tests may involve Adjacent Channel Power Ratio, Error Vector Magnitude, Peak to Average Ratio, and others.

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Ultimately you would like to integrate the analog system with the DSP portion of the communication system. For this integration, a more accurate representation of the modulation format can be accomplished using Ptolemy co-simulation. Examples of simulation features that are part of the RF System DesignGuide include communication formats such as data over cable network, 16 QAM System, GSM System, Bluetooth Receiver, GSM Receiver, and OFDM Receiver.

Example transmitters and receivers include the following:

- Single-stage upconversion (LSB or USB)
- Double-stage upconversion (LSB/LSB, LSB/USB, USB/LSB, USB/USB)
- Single-stage downconversion (LSB)
- Double-stage downconversion (LSB/LSB)

System Requirements

- Advanced Design System 1.3 or later version installed
- Agilent E8900A/AN Design Environment
- Agilent E8901A/AN Data Display
- Agilent E8881A/AN Linear Simulator
- Agilent E8882A/AN Harmonic Balance Simulator
- Agilent E8883A/AN Circuit Envelope Simulator
- Agilent E8854A/AN RF System Models
- Agilent E8823A/AN Ptolemy Simulator
  (for some examples only)

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