

# Agilent E5612A/AN Agilent EEsof EDA Oscillator DesignGuide

Product Overview

### Features at a Glance Ready-to-use common oscillator components and component characterization

- Biased active components
- Oscillator core
- Resonant circuits
- Buffer amplifier
- Fixed VSWR complex load

## Generic resonator/oscillator circuit and four specific examples

- Crystal (XTO)
- SAW
- VCO
- YIG

## Simulations and data display for common specifications

- Step-by-step introduction to linear design stability analysis
- Spectrum and waveform display for fixed frequency and tunable oscillators
- Phase-noise list of elements that contribute to the noise
- Tuning linearity for a VCO

### **Advanced simulations**

- Frequency pulling/pushing for user-specified VSWR
- Large-signal design dynamic load simulation/Kurokawa plots
- Models nonlinear reverse-biased varactor diode



Whether you are modifying an existing oscillator or assembling a new one, the Oscillator DesignGuide gives you the right set of tools for the job. The Oscillator DesignGuide, one of a family of DesignGuides from the Agilent EEsof EDA product group, provides a quick start for assembling a new oscillator by providing a custom library of resonators and other oscillator components, plus specialized analysis to help characterize the individual building blocks. Linear and non-linear design tools help you quickly determine input/output load mapping, Nyquist stability for varying impedance, and large-signal behavior.

Simulation results help characterize the oscillator performance for things such as single frequency oscillations, phase noise, tuned oscillations, frequency pulling, and frequency pushing.

The Oscillator DesignGuide dramatically shortens design cycle time. More time allows for more testing, giving you greater insight into the circuit behavior and more confidence in your design's success.





## **System Requirements**

- Advanced Design System 1.3 or later version installed
- E8900A Design Environment
- E8901A Data Display
- E8881A Linear Simulator
- E8882A Harmonic Balance Simulator

#### **Simulation Components**

- Biased BJT
- Biased MESFET
- Varactor Diode
- Biased Varactor Diode
- Buffer Amplifier (microwave)
- Buffer Amplifier (1-2 GHz)
- Buffer Amplifier (10-100 MHz)
- YIG Resonator
- RF Oscillator Core
- Fixed VSWR Complex Load
- Parallel Resonator
- Series Resonator
- SAW Resonator
- Crystal Resonator
- Oscillator Core

#### **Component Characterization**

- S-Parameters for 1-port
- S-Parameters for 2-port
- BJT Curve Tracer
- FET Curve Tracer
- S-Parameters for Biased BJT
- S-Parameters for YIG Resonator
- Capacitance and Admittance of Biased Varactor
- S-Parameters for Parallel Resonator
- S-Parameters for Series Resonator
- S-Parameters for Generic Resonator
- S-Parameters for SAW Resonator
- S-Parameters for Crystal Resonator



- Fixed Frequency Oscillator
- Single Frequency Dynamics Display
- Single Frequency Phase Noise
- Frequency Pulling
- Frequency Pushing
- Output Load Mapping
- Input Load Mapping
- Stability via Nyquist Plot
- Large Signal S-Parameters
- Tuning Characteristics

### Crystal and Surface-Acoustic Wave Oscillators

- Fixed Frequency Oscillator
- Single Frequency Dynamics
  Display
- Single Frequency Phase Noise
- Frequency Pulling
- Frequency Pushing
- Output Load Mapping
- Input Load Mapping
- Stability via Nyquist Plot
- Large Signal S-Parameters

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