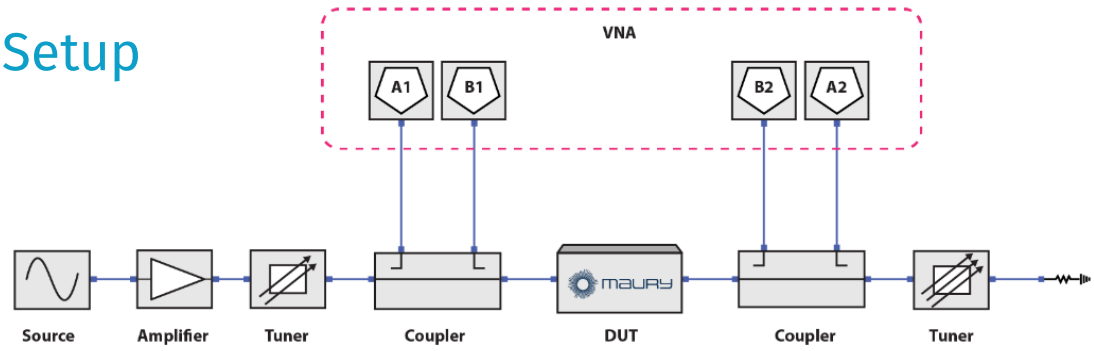
From Device Characterization to PA Optimization: InsightPro for Advanced Load Pull

Achieving accurate large-signal characterization at high frequencies requires precise control over harmonic terminations and visibility into nonlinear device behavior. Traditional scalar load-pull techniques measure only fundamental power and cannot capture the magnitude and phase of harmonic signals at the device reference plane. Without this vector information, engineers have limited insight into harmonic interactions that can impact device efficiency and linearity.

This demonstration features a vector-receiver harmonic load-pull system, with couplers placed at the DUT input and output to capture a- and b-waves at both fundamental and harmonic frequencies. The NT-8G-65G-1C source tuner controls impedance conditions at the DUT input, while the NT-8G-67G-3C load tuner provides fundamental and harmonic impedance control at the DUT output. With this configuration, users can conduct advanced load-pull characterization under controlled source and load impedance conditions.

The system measures critical parameters including power gain, output power, PAE, and input/output impedances, providing greater insight into device performance. Maury InsightPro™ device characterization software drives the measurement workflow, tuner control, and analysis, providing a unified environment for collecting, visualizing, and analyzing measurement data.

Demo Setup



Target Users

Target users include modeling, test and verification, reliability and quality, and R&D engineers focused on reliability testing, design/model verification, and high-frequency system development.

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Product Overview

Nano Series Automated Impedance Tuners

The Nano™ Series (NT-series) automated impedance tuners enable high-gamma load- or source-pull characterization across a wide spectrum. The tuners' compact size simplifies on-wafer probe station integration with a direct probe connection, effectively maximizing VSWR at the DUT reference plane and minimizing phase skew for modulated signals. Patented closed loop feedback motor control enhances measurement accuracy and repeatability.

KEY SPECIFICATIONS AND FEATURES:

- Compact, lightweight design optimized for seamless integration with on-wafer probe station
- Direct connection to probe maximizes tuning range and reduces phase skew
- Eliminates the need for external probe mounts, cables, and couplers
- Minimizes transmission line lengths by bringing turning element closer to the DUT
- Models are available with integrated low-loss, high-directivity coupler

InsightPro Measurement & Modeling DC Software

InsightPro is the industry's premier unified software suite, designed to accelerate the component and sub-system measurement and model extraction workflow for R&D, design verification, and small-scale production testing. Built with a measurement-first approach, InsightPro serves as the primary software interface for instrument-agnostic small-signal and large-signal characterization in both 50Ω and non-50Ω environments. By streamlining data collection, management, and analysis, it enables engineers and researchers to make informed decisions with confidence.

KEY SPECIFICATIONS AND FEATURES:

- Flexible bench configuration for easy instrument/DUT setup to match any workflow
- Automated, multi-instrument calibration workflows empower users to achieve high accuracy results across diverse setups with minimal user intervention
- Built-in system calibration verification for accuracy before data collection begins
- Comprehensive small-signal, large-signal, and pulsed testing captures real-world device behavior for reliable design and modeling
- Powerful visualization and analytics suite empowers users to quickly interpret results, extract models, and drive faster design decisions

More Resources

Visit maurymw.com/info/eumw-2026 to learn more about Maury solutions.

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