



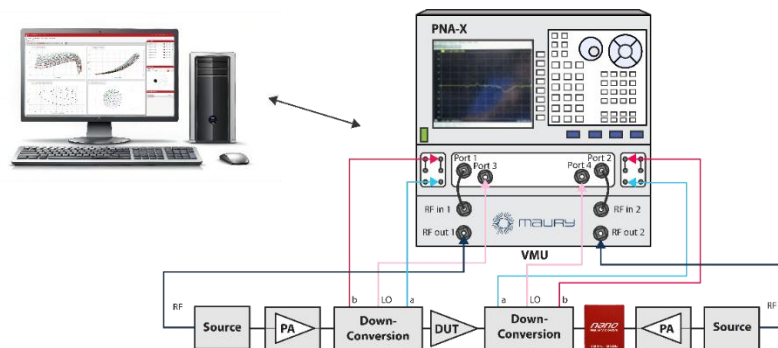
Accelerating D-Band Component Development with VRLP Active Load Pull

Conventional load pull systems often rely on scalar techniques that measure only power levels, without capturing the magnitude and phase of signals at the device under test (DUT) reference plane. These limitations reduce measurement accuracy, introduce de-embedding errors, and restrict the depth of characterization. These challenges become even more critical at higher frequencies such as D-band, which requires extreme precision to maintain reliable and repeatable results.

Vector-receiver load pull (VRLP) addresses these limitations by directly measuring both incident and reflected waveforms (a- and b-waves) at the DUT reference plane. By providing full complex wave information, a VRLP system with the Maury Microwave NT series automated impedance tuner and powerful InsightPro™ software enables real-time impedance verification, more accurate power and efficiency measurements, oscillation detection, and enhanced stability analysis at D-band.

Using the VRLP methodology, this demonstration provides S-parameter measurements and active load pull in the WR6.5 waveguide band (110 GHz – 170 GHz) on a waveguide-connectorized amplifier. After signal conversion, the DUT output is presented to the NT series tuner, which generates wide-ranging impedance states across the Smith chart while maintaining exceptional accuracy and repeatability. By maximizing VSWR at the DUT reference plane and minimizing phase skew, the NT series ensures reliable, high-performance D-band load pull. In this setup, the InsightPro device characterization software streamlines VRLP measurements, optimizes analysis workflows, and delivers advanced data visualizations.

Demo Setup



Target Users

Target users include professors, design engineers, technicians, and researchers who are involved in mmWave/RF analog design, device modeling, and device characterization.

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Product Overview

InsightPro Measurement and Modeling Device Characterization Software

InsightPro is the industry's premier unified software suite, designed to accelerate 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 into a single software suite, 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

NT Series Automated Impedance Tuners

The NT series tuners enable engineers to determine optimized matching conditions to extract noise parameters and maximize output power or power-added efficiency. The tuners' compact and direct probe connection simplifies on-wafer integration, 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 tuning element closer to the DUT
- Models are available with integrated low-loss, high-directivity coupler

More Resources

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

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