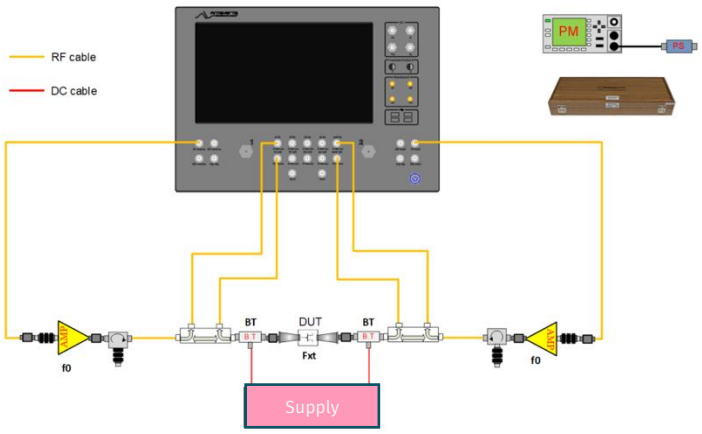
Next-Generation Mixed Signal Active Load Pull Characterization

With the growing importance of wireless applications and increasing use of wideband, modulated signals, optimizing the linearity and efficiency of amplifiers has become crucial. Traditional passive load pull test benches face challenges such as losses and electrical delay from tuners, cables, and probes, which limit the reflection coefficient that can be provided to the DUT. Advanced mixed signal active load pull overcomes these limitations, presenting wide-range, high-accuracy impedances at the DUT reference plane to evaluate device performance under real-world load pull/source pull conditions.

The MT2000-based mixed signal active load pull demonstration showcases an advanced RF device characterization platform engineered to accelerate the design and validation of high-performance devices for next-generation applications. By combining active impedance synthesis with wideband signal generation and analysis, the system demonstrates precise load pull measurements under realistic modulated signal conditions. Leveraging the MT2000 mixed-signal architecture, which offers up to 1000 impedance/power states per minute with no limitation on Smith chart coverage, users can comprehensively evaluate key parameters such as power efficiency, linearity, noise, and dynamic behavior across a broad frequency spectrum. With a clear speed and accuracy advantage over traditional approaches, this setup is critical for power amplifier design in wireless, automotive, and AD applications.

Demo Setup



Target Users

Target users include designers of wireless and microwave systems, antennas, and semiconductor devices engaged in technology development, compact model device extraction and validation, and design activities with specific needs related to advanced, high-speed, wideband communications systems.

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Product Overview

MT2000 Mixed Signal Active Load Pull System

The MT2000 is a turnkey one-box load pull solution that replaces the functions typically performed by passive fundamental and harmonic impedance tuners, VNAs, NVNAs, analog signal generators, vector signal generators, vector signal analyzers, and oscilloscopes. Moreover, the solution adds the capabilities of high-speed load pull measurements and wideband impedance control for modulated signals. By combining multiple bench setups into a single box, offering unrivaled load pull speeds, and maximizing Smith chart coverage, the MT2000 is a powerhouse for device characterization, validation of nonlinear compact models, and extracting nonlinear behavioral models.

KEY SPECIFICATIONS AND FEATURES:

- Performs load pull at high speeds of up to 1000 impedance/power states per minute with limitation-free Smith chart coverage under the following conditions:
    - Single-tone CW and pulsed-CW RF signal
    - DC and pulsed-DC bias
    - Time-domain NVNA voltage and current waveforms and load lines
    - Fundamental and harmonic impedance control on the source and/or load
    - Frequencies between 1 MHz and 67 GHz
- High-speed load pull with high magnitudes of reflection coefficients ideal for:
    - Reducing time-to-market due to faster measurement speeds
    - Minimizing bottlenecks caused by traditional passive mechanical load pull systems without a loss of accuracy
    - Validating nonlinear compact models
    - Extracting nonlinear behavioral models
    - R&D, design validation test, and on-wafer production test
- Wideband impedance control of up to 1000 MHz bandwidth at the fundamental, harmonic, and baseband frequencies and is optimal for:
    - Using ACPR/EVM measurement data in the design of wideband PA circuits
    - Improving PA linearity based on controlled baseband terminations
    - Evaluating the performance of a DUT under realistic antenna load conditions and different matching network topologies

More Resources

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