Impedance Matching with Vector-Receiver Load Pull

Agilent Technologies and Maury Microwave

Improve the performance of your amplifier designs with faster and more accurate impedance matching

Load pull is the technique used to determine the ideal matching impedances required to maximize power transfer, output power, gain and efficiency in your amplifier designs. With vector-receiver load pull, the scalar measurement instruments traditionally used are replaced by a vector network analyzer. Vector-receiver load pull allows you to make faster, more accurate assessments of the optimum matching impedances required for your amplifier designs.
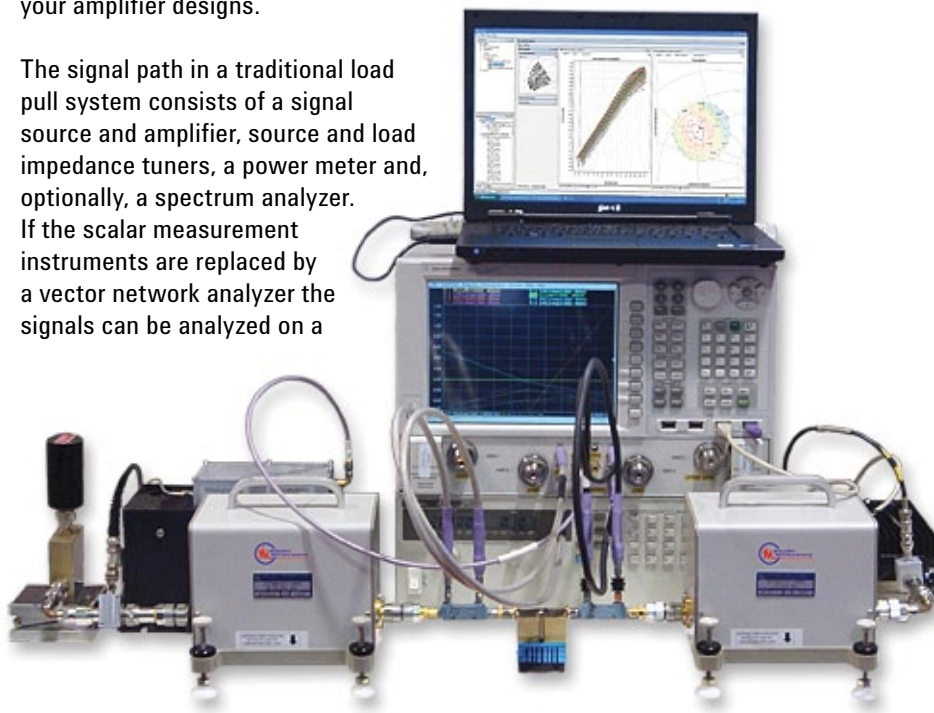
The signal path in a traditional load pull system consists of a signal source and amplifier, source and load impedance tuners, a power meter and, optionally, a spectrum analyzer. If the scalar measurement instruments are replaced by a vector network analyzer the signals can be analyzed on a

per-frequency basis. Each frequency component is accurately separated and can be used to calculate independent fundamental and harmonic powers. Additionally, a network analyzer is inherently a more accurate tool for measuring power than a power meter or spectrum analyzer.

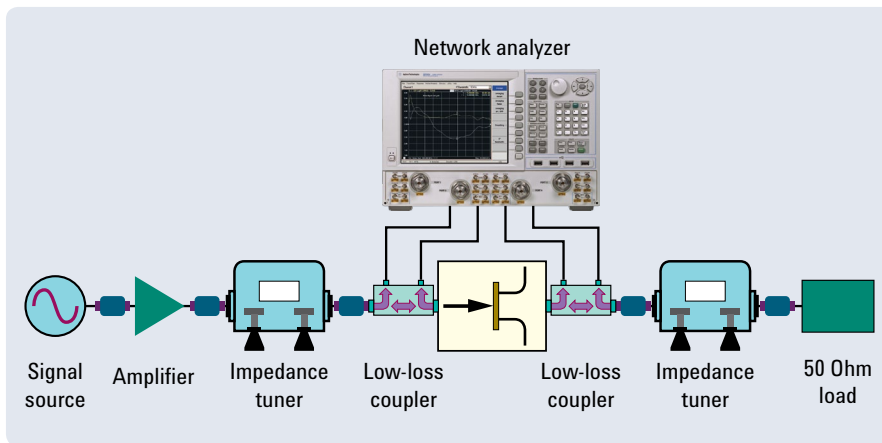In a vector-receiver load pull system measurements are made in real time at the device-under-test (DUT) reference plane. Instead of measuring power parameters, the actual DUT a- and b-waves are measured, allowing a more complete set of parameters to be analyzed. Parameters include large signal input impedance, which is used to determine delivered input power, power gain and power added efficiency, AM-PM, and harmonic measurements.

- *Load pull measurements using vector network analyzer*
- *Provides faster and more accurate impedance matching*
- *Allows measurements on per frequency basis*
- *Measurements made at DUT reference plane*
- *Separates fundamental and harmonic measurements*
- *Eliminates load-pull source-pull iterations*
- *Uses Agilent PNA-X network analyzers*

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Network analyzer

| Signal source | Amplifier | Impedance tuner | Low-loss coupler | | Low-loss coupler | Impedance tuner | 50 Ohm load |

To learn how this solution can address your specific needs please contact Agilent's solutions partner, Maury Microwave

www.agilent.com/find/maurymw

Using a vector-receiver load pull system eliminates the necessity for multiple load-pull source-pull iterations thereby saving time, it reduces errors cause by de-embedding through tuners at higher gammas and it improves the overall accuracy by measuring at the DUT reference plane.

Maury Microwave provides a full range of passive, active, hybrid-active and vector-receiver fundamental and harmonic load pull solutions. All of these solutions are designed around the Agilent Technologies

PNA-X Series of microwave network analyzers. The PNA-X has wide power range, fast and accurate control of source phase, clean harmonics, wide frequency coverage from 10 MHz to 50 GHz and a flexible test set to allow the connection of ancillary components.

With a vector-receiver load pull solution from Maury and Agilent you can reduce the time and improve the accuracy of your load pull measurements allowing you to optimize the performance of your amplifier designs.

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Maury Microwave has been in business for 50+ years and has become the world's leading manufacturer of laboratory devices and system components, with an emphasis on device characterization and automated tuning systems.
www.maurymw.com

For information on Agilent Technologies' products, applications and services, go to **www.agilent.com**

Product specifications and descriptions in this document subject to change without notice.

System Components

Agilent Technologies

N524xA	PNA-X microwave network analyzer

Maury Microwave

MT98x	Automated impedance tuner
MT930A	IVCAD base application
MT930B	IVCAD visualization
MT930C	IVCAD vector-receiver load pull

For a complete list of Agilent/Maury Solution Briefs:
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