

Agilent N4256A Amplifier Distortion Test Set

Product Overview

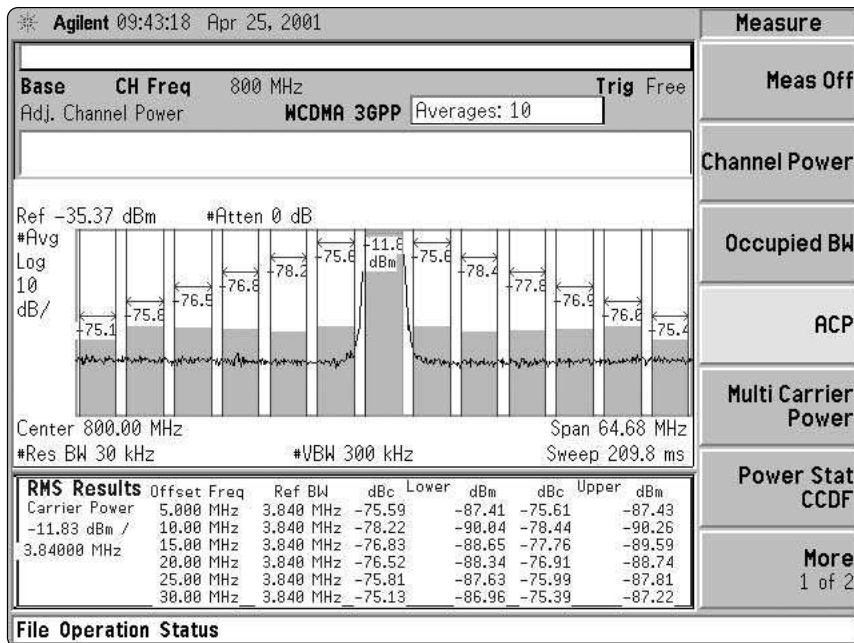


Figure 1. Use the N4256A with other Agilent test equipment, such as a PSA series spectrum analyzer and ESG-D series signal sources, to measure and display the demanding adjacent-channel power ratio (ACPR) and intermodulation distortion (IMD) measurements required by 3G specifications.

Accurately characterize the adjacent-channel power ratio (ACPR) of your multi-carrier power amplifier (MCPA) using the Agilent N4256A amplifier distortion test set. The N4256A boosts the dynamic range of your existing spectrum analyzer based test system by as much as 25 dB so it can measure the distortion of MCPAs used in 3G wireless base stations.

The multi-carrier amplifiers that power W-CDMA and EDGE base stations must achieve spurious rejection greater than -80 dB, which is beyond the capability of most test systems designed to characterize amplifiers used in previous wireless generations.

Designed to work with the Agilent PSA-, ESA- and VSA- series of spectrum/signal analyzers and the Agilent ESG-DP series of signal generators, the N4256A provides a quick solution for "3G equipping" your existing test systems, which were originally designed to characterize amplifiers used in previous wireless generations.



The N4256A amplifier distortion test set relies on spectrum analyzers and signal sources, and has power meter outputs that allow the test device input and output power to be monitored during set-up. A front panel display simplifies test set tuning and a GPIB interface enables remote mode switching and coarse adjustments. Creation and installation of a delay cable to compensate for the equivalent electrical length of your MCPA is also required.

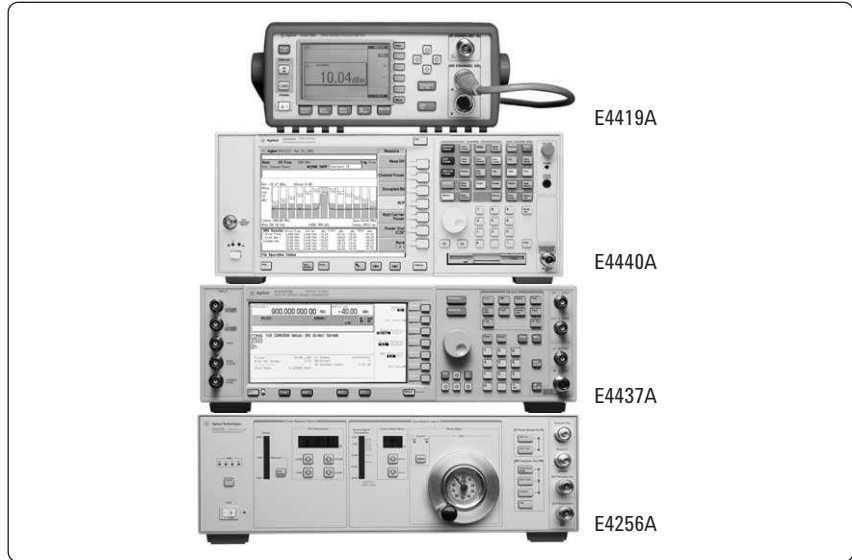


Figure 2. Build a complete measurement system with an Agilent spectrum/signal analyzer (PSA-, ESA-, or VSA-series), ESG-DP series digital RF signal generator and an E4419A EPM-P series dual-channel.

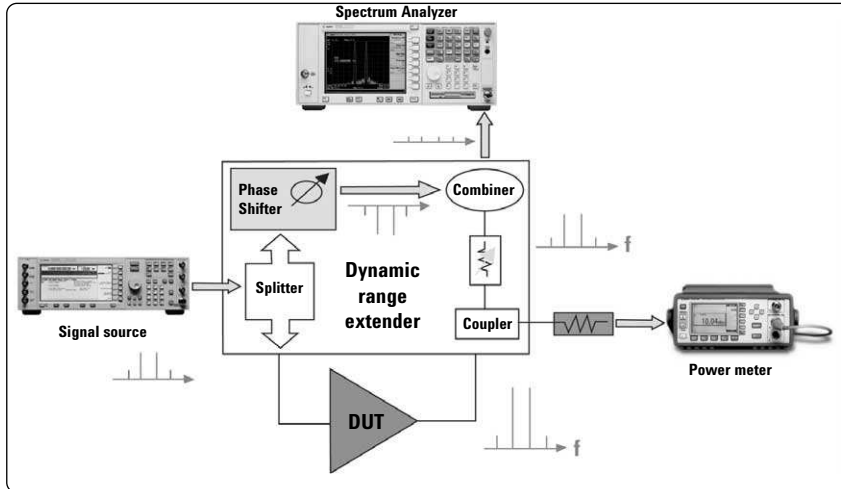


Figure 3. The test set supports a measurement technique that cancels source spurious and extends analyzer dynamic range.

The N4256A amplifier distortion test set is based on the principle that the stimulating source as well as the spectrum analyzer negatively impacts achievable dynamic range of the test system. The N4256A uses a cancellation technique to reduce the distortion coming from the source and reduce the level of the carrier experienced by the spectrum analyzer. It employs an auxiliary signal path where the electrical length is adjusted using an external delay cable. The combination of the delay cable and the internal delay

adjustment are tuned such that the carrier, adjacent, and alternate channels are inverted 180 degrees in phase. This "cancellation" signal is then coupled into the signal path at the output of the amplifier, effectively removing the signal source distortion products and reducing the carrier level going to the spectrum analyzer.

The measurement is conducted in two steps. First, the cancellation path is disabled allowing the spectrum analyzer to measure the carrier reference power.

Second, the cancellation signal is applied allowing the spectrum analyzer to measure the distortion in the adjacent and alternate channels. The Agilent E4440A PSA series spectrum analyzer has a measurement routine that simplifies this process.

When properly installed and adjusted, the N4256A amplifier distortion test set enhances total measurement system performance by up to 25 dB over 100 MHz, achieving unprecedented levels of dynamic range.

Supplemental Specifications

Refer to the appropriate Agilent spectrum analyzer's data sheet for base instrument specifications. The following table provides performance characteristics of the N4256A amplifier distortion test set.

Frequency range	500 MHz to 4 GHz
Minimum cancellation*	
Center frequency	900 MHz
 Cancellation bandwidth (25 MHz)	26 dB
 Cancellation bandwidth (100 MHz)	17 dB
Center frequency	1800 MHz
 Cancellation bandwidth (25 MHz)	25 dB
 Cancellation bandwidth (100 MHz)	22 dB
Maximum device stimulus power	+30 dBm
Maximum device response power	+50 dBm

* Cancellation is specified using a 50 ohm cable connected between the device stimulus and device response ports.

** Maximum response power is +50 dBm with a customer supplied 100W attenuator with attenuation greater or equal than 20 dB connected within the DUT ACCESS loop on the rear panel.

Recommended Ordering Configuration

N4256A amplifier distortion test set
E4440A PSA series spectrum analyzer
E4437B ESG-DP series digital RF signal generator, 4 GHz
E4419A EPM-P series dual-channel power meter
8482B (25 W) and 8582H (3W) power sensors

For more information please visit our Web site:

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Select Base Station Multi-Carrier Power Amplifier (MCPA) Challenges

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Printed in USA July 16, 2001
5988-2925EN**



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