



Agilent N8300A Wireless Networking Test Set With N630XA Measurement Applications



The Agilent N8300A wireless networking test set is a one-box radio frequency (RF) parametric test set based on an architecture that includes an integrated vector signal analyzer (VSA) and a vector signal generator (VSG).

The Agilent N6301A measurement applications add one-button measurements and modulation analysis capabilities to help with your design, evaluation, and manufacturing test of Fixed WiMAX™ and Mobile WiMAX™ devices and modules.



Agilent Technologies

Definitions and Conditions

Specification

Specifications describe the performance parameters covered by the product warranty and apply over 20 to 30 °C unless otherwise noted. Warranted specifications include measurement uncertainty calculated with a 95 percent confidence. Data represented in this document are specifications unless otherwise noted.

Typical

Represents characteristic performance, which 80 percent of the instruments manufactured will meet. This data, shown in italics, is not warranted, does not include measurement uncertainty, and is valid only at room temperature (approximately 25 °C).

Nominal

The expected mean or average performance, or an attribute whose performance is by design, such as the 50 Ω connector. This data is not warranted and is measured at room temperature (approximately 25 °C).

The test set will meet its specification when:

- The test set is within its calibration cycle
- The test set is within the temperature range 20 to 30 °C
- The test set has been turned on for at least 45 minutes

N8300A Hardware Specifications

VSA performance

Performance

Quantization	14 bits
Sampling frequency	100 MHz digital down-conversion
Sampling resolution	10 ns
Acquisition buffer	5 ms

Frequency specifications

Frequency range	75 MHz to 4.8 GHz (Option 505); also refer to Application Software section
Frequency resolution	Refer to Application Software section
IF bandwidth	Variable to 40 MHz

Amplitude specifications

Maximum safe input level	+25 dBm (CW)
Absolute power measurement accuracy	Refer to Application Software section
Input amplitude range	Refer to Application Software section

VSG performance

Performance

Sample rate	To 125 MSa/s
Bandwidth	100 MHz
Effective DAC resolution	16 bits

Frequency specifications

Frequency range	250 kHz to 6.0 GHz; also refer to Application Software section
Frequency accuracy	\pm aging rate; \pm temperature effects; \pm line voltage effects
Internal time base reference oscillator aging rate	$\leq \pm 5.0$ ppm/10 yrs, $< \pm 1.0$ ppm/yr
Temperature effects	± 1.0 ppm (0 to 50 °C)
Line voltage effects	± 0.1 ppm (nominal), over line voltage range 5 to -10% (nominal)
Frequency resolution	0.01 Hz

Amplitude specifications

Absolute amplitude accuracy	Refer to Application Software section
Output amplitude range	Refer to Application Software section
Amplitude resolution	0.02 dB (nominal)
Spurious (non-harmonics) ¹	250 kHz to 3 GHz: < -62 dBc typical (out-of-band) 3 to 6 GHz: < -56 dBc typical (out-of-band)
Output return loss ¹	1.7:1 typical (≤ 1.4 GHz) 2.3:1 typical (> 1.4 to 4 GHz) 2.4:1 typical (> 4.0 to 5.0 GHz) 2.2:1 typical (> 5.0 to 6.0 GHz)

1. This specification applies to the RF Output port only and not the RF In/Out port.

Power requirements

Power consumption	< 270 W maximum
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Data storage

External	Supports USB 2.0-compatible memory devices
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Size and weight

Dimensions (H x W x L)	177 mm x 425 mm x 495 mm 7.0 in x 16.8 in x 19.5 in
Weight	18.5 kg (net) 24 kg (shipping)

Environmental characteristics

Operating temperature	5 to 50 °C
Storage temperature	–40 to 65 °C
Operating humidity	15 to 95% relative humidity (non-condensing)
EMC	The conformity assessment requirements have been met using the technical construction file route for compliance with the requirements of the EMC Directive 89/336/EEC, amended by 93/68/ECC <ul style="list-style-type: none">• IEC/EN 61326• CISPR Pub 11 Group 1, Class A• AS/NZS CISPR 11.2002• ICES/NMB-001

Safety

Complies with European Low Voltage Directive 73/23/EEC, amended by 93/68/EEC <ul style="list-style-type: none">• IEC/EN 61010-1• Canada: CSA C22.2 No. 61010-1• USA: UL 61010-1

Warranty

This test set is supplied with a one-year warranty.

Calibration cycle

The recommended calibration cycle is one year. Calibration services are available through Agilent service centers.

Inputs and Outputs

Front panel

RF In/Out

Connector	Type-N female, 50 Ω nominal
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RF output

Connector	Type-N female, 50 Ω nominal
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USB ports

Master (2 ports)	
Standard	Compatible with USB 2.0
Connector	USB Type-A female
Output current	0.5 A nominal

Others (not used)

Probe power	
Voltage/Current	+15 Vdc, $\pm 7\%$ at 150 mA max nominal -12.6 Vdc, $\pm 10\%$ at 150 mA max nominal
Headphone jack	

Rear panel

SOURCE REF IN

Accepts a 10 MHz reference signal used to frequency lock the internal timebase	
Connector	BNC female, 50 Ω nominal
Input amplitude range	-3.5 to +20 dBm nominal

SOURCE 10 MHz OUT

Outputs the 10 MHz reference signal used by the internal timebase. Permanently connected to the ANALYZER 10 MHz IN port	
Connector	BNC female, 50 Ω nominal
Output amplitude	+3.9 dBm nominal
Input damage level	+16 dBm

ANALYZER 10 MHz IN

Permanently connected to the SOURCE 10 MHz OUT port	
Connector	BNC female, 50 Ω nominal
Input amplitude range	-5 to +10 dBm nominal
Input frequency	1 to 50 MHz nominal
Frequency range lock	$\pm 5 \times 10^{-6}$ of specified external reference input frequency

ANALYZER 10 MHz OUT

Connector	BNC female, 50 Ω nominal
Output amplitude	≥ 0 dBm nominal
Frequency	10 MHz (± 10 MHz x frequency reference accuracy)

Rear panel (continued)

SOURCE TRIG IN	Accepts TTL and CMOS level signals for triggering point-to-point in sweep mode. Damage levels are ≤ -0.3 V and $\geq +5.3$ V
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SOURCE TRIG OUT	Outputs a TTL- and CMOS-compatible signal level for use with sweep mode. Input damage levels are ≤ -0.3 V and $\geq +5.3$ V
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ANALYZER TRIG IN	
Connector	BNC female
Impedance	> 10 k Ω nominal
Trigger level range	-5 to +5 V

ANALYZER TRIG OUT	
Connector	BNC female
Impedance	50 Ω nominal
Level	5 V TTL nominal

Monitor output	
Connector	VGA compatible, 15-pin mini D-SUB
Format	XGA (60 Hz vertical sync rates, non-interlaced) analog RGB
Resolution	1024 x 768

USB 2.0 ports	
Master (4 ports)	Note: One port is permanently connected; three ports are available for use
Standard	Compatible with USB 2.0
Connector	USB Type-A female
Output current	0.5 A nominal
Slave (1 port)	
Standard	Compatible with USB 2.0
Connector	USB Type-B female
Output current	0.5 A nominal

GPIB interface	
Connector	IEEE-488 bus connector
GPIB codes	SH1, AH1, T6, SR1, PP0, DC1, C1, C2, C3, C28, DT1, L4, C0

LAN TCP/IP interface		<i>Connector located middle of rear panel</i>
Standard	100 Base-T	
Connector	RJ45 Ethertwist	

LAN		<i>Connector located bottom right hand side of rear panel</i>
Standard	100 Base-T	
Connector	RJ45 Ethertwist	

N6301A-1FP 802.16 OFDMA measurement application (Mobile WiMAX)

N6301A-2FP 802.16 OFDM measurement application (Fixed WiMAX)

Available measurements

Transmitter

- Modulation analysis, results include:
 - Spectral flatness
 - Relative constellation error (RCE)
 - Power versus time
 - Channel power
 - IQ offset
 - Frequency error
 - Symbol clock error
- Adjacent channel leakage ratio (ACLR)
- Power statistics CCDF
- Spectrum emissions mask (SEM)
- Waveform
 - Average power
 - Peak power

Receiver¹

- PER
- RSSI

N6301A key specifications

Analyzer performance

Frequency specifications

Frequency range	2.15 to 2.7 GHz; 3.3 to 3.8 GHz
Frequency resolution	250 kHz
Measurement bandwidth	10 MHz, 8.75 MHz, 7 MHz, 5 MHz

Amplitude specifications

Input amplitude range	+23 to -70 dBm (2.15 to 2.7 GHz; 3.3 to 3.8 GHz)
Absolute power measurement accuracy	±0.6 dB (CW) (+23 to -60 dBm) ±0.25 dB (CW) <i>typical (+23 to -70 dBm, 2.15 to 2.7 GHz)</i> ±0.25 dB (CW) <i>typical (+23 to -60 dBm, 3.3 to 3.8 GHz)</i>
Residual EVM	< 1% rms typical
SNR	> 65 dB typical
Input return loss	< 1.6:1 typical (2.15 to 2.7 GHz); < 1.8:1 typical (3.3 to 3.8 GHz)

1. Device under test (DUT) chipset control software is required for receiver measurements.

N6301A key specifications (continued)

Source performance

Frequency specifications

Frequency range	2.15 to 2.7 GHz; 3.3 to 3.8 GHz
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Amplitude specifications

Output amplitude range	+10 to -100 dBm (CW); 0 to -100 dBm (modulated)
Absolute amplitude accuracy	± 0.9 dB (CW) (+7 to -90 dBm) ± 0.5 dB (CW) <i>typical (+7 to -90 dBm)</i>
EVM ¹	<i>< 1% rms typical</i>
Spurious (non-harmonics)	250 kHz to 3 GHz; <i>< -48 dBc typical (in-band)</i> 3 to 6 GHz; <i>< -42 dBc typical (in-band)</i>

1. EVM specifications apply to a 64QAM signal at -7 dBm.

Related Literature

Agilent N8300A Wireless Networking Test Set, brochure, literature number 5989-7063EN

N6301A 802.16 OFDMA Measurement Application, technical overview, literature number 5989-7609EN

Agilent N8300A Wireless Networking Test Set, N7300 Series Chipset Software and N630XA Measurement Applications, configuration guide, literature number 5989-7919EN

Agilent N7300 Series Chipset Software, brochure, literature number 5989-7920EN

Application notes

WiMAX Manufacturing Test with the N8300A: The First Steps Towards Test Automation, application note, literature number 5989-7610EN

IEEE 802.16e WiMAX OFDMA Signal Measurements and Troubleshooting, application note 1578, literature number 5989-2382EN

WiMAX Concepts and RF Measurements, application note, literature number 5989-2027EN

VSA literature

89600 Series Vector Signal Analysis Software 89601A/89601AN/89601N12, datasheet, literature number 5989-1786EN



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