

KEYSIGHT TECHNOLOGIES (AGILENT HP)

N5231A

The Keysight N5231A PNA-L microwave vector network analyzer offers high-performance passive and active component characterization from 300 kHz to 13.5 GHz. As a modern successor to the N5230C, the N5231A delivers 133 dB of system dynamic range, +13 dBm of output power, and a large 10.4-inch touchscreen, serving as a versatile and budget-friendly solution for microwave design and manufacturing.

SPECIFICATIONS

General

Interfaces	GPIB, LAN (Gigabit Ethernet), USB (4 front, 4 rear), VGA, External Trigger, 10 MHz Reference Input/Output
Display	10.4-inch XGA (1024 x 768) color LCD with touchscreen

Physical

Power Supply	100 V to 240 V AC, 50/60/400 Hz
Operating Temperature	0 °C to +40 °C °C
Dimensions (W×H×D)	425 mm W × 267 mm H × 502 mm D (2-port), 545 mm D (4-port) mm

Frequency and Sweep Characteristics

Minimum Operating Frequency	300 kHz
Maximum Operating Frequency	13.5 GHz
Number of Test Ports	2 or 4 (option dependent)
Frequency Resolution	1 Hz
Frequency Accuracy	±1 ppm
Frequency Temperature Stability	±0.05 ppm (0 °C to 50 °C)
Frequency Aging Rate	±0.1 ppm/year
Sweep Type Modes	Linear, Log, Power, CW, Segmented
Number of Measurement Points per Trace	1 to 32,001
IF Bandwidth Range	1 Hz to 15 MHz
Measurement Channels	200

Receiver Specifications

System Dynamic Range	133 dB
Receiver Noise Floor	-120 dBm (at 10 Hz IF bandwidth)
Maximum Input Level at Test Port	+10 dBm
Damage Level at Test Port	+27 dBm (RF), 40 VDC

Test Port Output Specifications

Power Level Resolution	0.01 dB
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Measurement Capabilities & Applications

S-Parameter Measurements	Yes
Time Domain Analysis Capability	Optional (Option 010)
Frequency Offset Measurements	Yes
Mixer/Converter Measurements	Optional (Option 082 or 083)
Gain Compression Analysis	Yes

Hardware Configuration & Ports

Test Port Connector Type	3.5 mm ruggedized male
Test Port Impedance	50 Ω

Connectivity & Peripheral Interfaces

GPIB Interface	Yes (24-pin D-sub)
LAN Port Speed	10/100/1000 Base-T (Gigabit Ethernet)
External Video Output Port	VGA (15-pin D-sub)
External Trigger Input / Output	Yes (BNC female)
10 MHz Reference Input / Output	Yes (BNC female)

System, Software & Display

Internal Operating System	Windows
Touchscreen Functionality	Yes

Power & Environmental

Storage Temperature Range	-40 °C to +70 °C
Operating Humidity Range	11% to 90% non-condensing

Physical Characteristics & Certifications

Rack Unit (U) Height	6U
Net Instrument Weight	24 kg (53 lb) for 2-port, 27 kg (59 lb) for 4-port

Performance

Second Harmonic (at max port power, 2 GHz to 13.5 GHz)	<-25 dBc (typical)
Measurement Speed (201 points, 1-port cal, typical)	4 ms (100 kHz IFBW)
Measurement Speed (201 points, 2-port cal, typical)	7 ms (100 kHz IFBW)
Supported Calibration Methods	SOLT, TRL, LRM, SOLR, ECal

RF Output

Power Level Accuracy (50 MHz to 2 GHz)	±1.0 dB
Power Sweep Range (10 MHz to 50 MHz)	42 dB (-30 to +12 dBm)

Display

Display Resolution	1024 × 768 pixels (XGA)
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Inputs & Outputs

USB Ports	4x USB 2.0 (rear), 2x USB 2.0 (front)
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Storage & System

Storage Drive	Solid State Drive (SSD), ≥ 100 GB
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Environmental

Operating Altitude	0 to 3,000 m (9,843 ft)
Storage Altitude	0 to 4,572 m (15,000 ft)
Operating Vibration	0.21 g rms (5 to 500 Hz)
Non-Operating Vibration	2.09 g rms (5 to 500 Hz)
Non-Operating Shock	120 g (half-sine, 2 to 3 ms)
Acoustic Noise (nominal)	52 dBA (at 25 °C)

Power & Electrical

Line Voltage Range	100 to 240 VAC (±10%)
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Receiver & Source Specifications

Source Attenuator Range (with Option 216 or 416)	0 to 60 dB (in 10 dB steps)
Bias Tee Maximum Current	200 mA
Bias Tee Maximum Voltage	40 VDC
Non-Harmonic Spurious (typical)	-50 dBc (at max port power)
Phase Noise (10 kHz offset, typical)	-103 dBc/Hz (to 2 GHz), -97 dBc/Hz (to 8 GHz), -93 dBc/Hz (to 13.5 GHz)
Receiver 0.1 dB Compression Input Level (typical)	+10 dBm (500 MHz to 13.5 GHz)

Hardware Options

Internal Bias Tees	Included with Option 216 or 416
Available Port Configurations	2-port (Option 200/216) or 4-port (Option 400/416)

Interfaces

LXI Compliance	LXI Class C compliant
Test Set I/O Port	Provides control for external test sets

Compliance

Safety Compliance	IEC 61010-1 / EN 61010-1 / CSA C22.2 No. 61010-1
EMC Compliance	IEC 61326-1 / EN 61326-1 / CISPR 11 Class A

TECHNOLOGY

Microwave Vector Network Analyzer

APPLICATIONS

Passive components, amplifiers, and frequency converters characterization, design, and manufacturing test

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