

ROHDE & SCHWARZ

ZNB20

The Rohde & Schwarz ZNB20 is a high-performance vector network analyzer (VNA) covering a frequency range from 100 kHz to 20 GHz. Designed for demanding measurements on active and passive RF components, it features a wide dynamic range, fast sweep times, and a large multi-touch display. Available in 2-port or 4-port configurations, the ZNB20 offers outstanding measurement speed, high precision, and an intuitive user interface for RF component characterization, making it ideal for both production and R&D environments.

SPECIFICATIONS

General

Interfaces	LAN (10/100/1000Base-T), USB 2.0 (4 front, 4 rear), GPIB (optional R&S ZNB-B10), External Monitor (DVI-D, DisplayPort), USB Device (Type B), Handler I/O (optional), External Trigger Input/Output, Reference Input/Output
Display	12.1-inch TFT color touchscreen, WXGA (1280 x 800 pixels)

Physical

Power Supply	100 V to 240 V AC (±10%), 50 Hz to 60 Hz, max. 350 W (2-port) / 450 W (4-port)
Operating Temperature	5 to 40 °C °C
Dimensions (W×H×D)	461 mm × 240 mm × 351 mm mm
Weight	13.9 kg (2-port base configuration) kg

RF & Measurement Performance

Minimum Frequency	100 kHz
Maximum Frequency	20 GHz
Frequency Resolution	1 Hz
Frequency Stability	±1 ppm
Measurement Points	1 to 100,001
Measurement Bandwidth Range	1 Hz to 10 MHz
Maximum Test Ports	4 (2-port and 4-port models available)
Test Port Connector Type	3.5 mm (male), ruggedized
Test Port Impedance	50 Ω
Dynamic Range	Up to 135 dB (typical at 10 Hz IFBW)
Maximum Output Power	+10 dBm (typical +13 dBm)
Minimum Output Power	-85 dBm (typical, without extended range)
Output Power Resolution	0.01 dB
Trace Noise Magnitude	< 0.004 dB (RMS, at 10 kHz IFBW)
Trace Noise Phase	< 0.05° (RMS, at 10 kHz IFBW)
Maximum Port Damage Level	+27 dBm
Maximum DC Input Voltage	30 V
Measurement Speed per Point	< 3.5 μs (at 10 MHz IFBW)
Port-to-Port Isolation	> 125 dB (typical, at 20 GHz)

Measurement Functions & Software

Supported S-Parameters	S11, S12, S21, S22 (2-port); up to S44 (4-port)
Sweep Types	Linear Frequency, Logarithmic Frequency, Segmented, Power, Time, CW
Calibration Methods	TOSM, TRM, TRL, TNA, TOM, UOSM, One-Path Two-Port, Reflection/Transmission Normalization
Automatic Calibration Support	Yes (via R&S ZN-Zxx calibration units)
Display Formats	dB Magnitude, Phase, Group Delay, Smith Chart, Polar, SWR, Real, Imaginary, Unwrapped Phase, Linear Magnitude
Limit Line Testing	Yes (upper, lower, circle, segmented, offset)
Number of Channels	Up to 100
Number of Traces per Channel	Up to 100
Time Domain Analysis Option	Yes (R&S ZNB-K2)
Frequency Conversion Option	Yes (R&S ZNB-K4)
Intermodulation Measurements Option	Yes (R&S ZNB-K14)
Mixed-Mode S-Parameters	Yes
Distance-to-Fault Option	Yes (R&S ZNB-K3)

System Interfaces & Connectivity

Display Size	12.1 inch
Display Resolution	1280 × 800 pixels
Touch Screen Capability	Yes (capacitive multi-touch)
LAN Port	2× RJ-45 (10/100/1000Base-T)
GPIB Interface Option	Yes (R&S ZNB-B10)
Front USB Ports	4× USB 2.0
Rear USB Ports	4× USB 2.0
USB Device Port	1× USB 2.0 Type B
External Monitor Output	1× DVI-D, 1× DisplayPort
Reference Input Frequency	10 MHz
Reference Output Frequency	10 MHz
Trigger Input Port	1× BNC (rear panel)
Trigger Output Port	1× BNC (rear panel)
Direct Generator/Receiver Access Option	Yes (R&S ZNB-B16)
Handler I/O Port Option	Yes (R&S ZNB-B21)

Power & Environmental

AC Input Voltage Range	100 V to 240 V AC
AC Line Frequency	50 Hz to 60 Hz
Power Consumption (2-Port)	Max. 350 W
Power Consumption (4-Port)	Max. 450 W
Operating Temperature Range	+5 °C to +40 °C
Storage Temperature Range	-40 °C to +70 °C
Operating Humidity	Up to 80% non-condensing

Physical Characteristics

Instrument Height	240 mm (with feet)
Weight (2-port)	13.9 kg
Weight (4-port)	15.9 kg
Rackmount Kit Option	Yes (R&S ZZA-KN5)

Reference Frequency

Standard Reference Frequency Accuracy	$\pm 1 \times 10^{-6}$
Standard Reference Frequency Aging	$\pm 1 \times 10^{-6}$ per year
Precision Reference Frequency Oven Option (ZNB-B4) Aging	$\pm 1 \times 10^{-7}$ per year
Precision Reference Frequency Oven Option (ZNB-B4) Temperature Drift	$\pm 1 \times 10^{-8}$ (0 °C to +50 °C)

Receiver Performance

Receiver 0.1 dB Compression Point	+13 dBm (typical at test port input)
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Source Performance

Harmonics	<-30 dBc (typical at 0 dBm output power, > 10 MHz)
Non-Harmonic Spurious	<-45 dBc (typical at 0 dBm output power, > 10 MHz)

System Configuration

Operating System	Windows 10 / Windows Embedded Standard 7 (hardware-version dependent)
Command Emulation Modes	HP 8753, HP 8720, HP 8510, Keysight E5071C, Keysight E5072A, Keysight E5080A
LXI Compliance	Version 1.4 Core Device

Connectivity

User Port	25-pin D-Sub connector for analog and digital control
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Options

Internal Bias Tees Option	Available via Option R&S ZNB-B1
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Environmental and Compliance

Sinusoidal Vibration (Operating)	5 Hz to 55 Hz, 0.15 mm amplitude (compliant with EN 60068-2-6)
Random Vibration (Operating)	10 Hz to 300 Hz, 1.2 g RMS (compliant with EN 60068-2-64)
Mechanical Shock	40 g shock spectrum (compliant with MIL-STD-810F, EN 60068-2-27)
EMC Compliance	Directive 2014/30/EU, EN 61326-1 (Class A), EN 61326-2-1, EN 55011 (Class A)
Electrical Safety Compliance	Directive 2014/35/EU, EN 61010-1

Maintenance

Recommended Calibration Interval	1 year
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Environmental

IP Protection Rating	IP20
Maximum Operating Altitude	3000 m
Maximum Storage Altitude	4500 m

Performance

Generator Step Attenuator Option Range	0 dB to 70 dB in 10 dB steps (with options ZNB-B21 to ZNB-B24)
Receiver Step Attenuator Option Range	0 dB to 35 dB in 5 dB steps (with options ZNB-B31 to ZNB-B34)

Inputs & Outputs

Internal Bias Tee Option Max Voltage	30 V (with option ZNB-B1)
Internal Bias Tee Option Max Current	250 mA (with option ZNB-B1)

Interfaces

LAN Interface Speed	10/100/1000 Mbps
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Software Options

Time Domain Analysis Option Model	R&S®ZNB-K2
Distance-to-Fault Option Model	R&S®ZNB-K3
Frequency Conversion Option Model	R&S®ZNB-K4
Intermodulation Measurements Option Model	R&S®ZNB-K14
Easy De-embedding Option Model	R&S®ZNB-K20

Hardware Options

Precision Reference Frequency Oven Option Model	R&S®ZNB-B4
GPIO Interface Option Model	R&S®ZNB-B10
Handler I/O Port Option Model	R&S®ZN-B14
Additional Removable Hard Disk Option Model	R&S®ZNB-B19

TECHNOLOGY

Vector Network Analysis

APPLICATIONS

S-parameter measurement, component characterization, active device testing, RF filter tuning

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