

ROHDE & SCHWARZ

Make ideas real



WHERE HISTORY MEETS TOMORROW

Vector Network Analyzer



APPLICATIONS

Antenna arrays

Measuring antenna arrays at high frequencies is often a challenge. The R&S®ZNB is a high-performance VNA with up to 24 fully integrated test ports. The R&S®ZNB supports frequencies up to 40 GHz, covering the most important 5G frequencies. The intuitive interface allows the user to set up measurements conveniently.

Measurements in the mmWave range

Extending the R&S®ZNA, the R&S®ZCxxx mmWave converter family covers frequencies up to 1.1 THz. Measurement tasks for mmWave applications are versatile, ranging from the characterization of high-blocking filters to material measurements. Their high dynamic range, high power output and support of third-party probes and software enable the user to perform on-wafer testing in demanding fields such as satellite communications and defense.

Signal integrity

Rohde & Schwarz offers a wide range of solutions for signal integrity measurements for different standards (IEEE802.3 Ethernet, PCIe, USB-C, DisplayPort, HDMI, Automotive Ethernet, etc.). Time-domain analysis options for high-speed signal testing are available with the R&S®ZNx series Vector Network Analyzer. These instruments can be combined with the R&S®ZN-Z8x Switch Matrix and R&S®OSP Open Switch and Control Platform to support challenging multipoint applications. Additionally, the SNP assistant support multipoint DUT topology editing and enables high-dimensional S-parameter Touchstone file export. For compliance cable testing, the R&S®ZNRUN automation test suite is utilized, enhancing the overall testing capabilities of the ZNx series VNAs.

General purpose and field installation

Measurement equipment for general purposes and education has to be versatile. On-site applications, such as installing antenna systems in the field, require high flexibility. The Rohde & Schwarz economy and handheld VNAs are ideally suited to meet these requirements.

Spurious & Spectrum Analysis

The R&S®ZNL provides a distinct advantage by seamlessly integrating vector network analysis with spectrum analysis in one versatile instrument. Equipped with the B1 option, the ZNL facilitates spectrum analysis for frequencies up to 26.5 GHz. Both vector network and spectrum analysis functionalities are accessible and can be simultaneously viewed through a fully integrated user interface, enhancing usability and efficiency.

In a world where precision can define success, every measurement is a piece of a larger puzzle. Rohde & Schwarz brings simplicity to complexity.

Frequency	5 kHz	9 kHz	30 kHz	100 kHz	300 kHz
Economy and handheld					
R&S®ZNH4					
R&S®ZNH8					
R&S®ZNH18					
R&S®ZNH26					
R&S®ZNL3					B100
R&S®ZNL4					B100
R&S®ZNL6					B100 z
R&S®ZNL14					B100
R&S®ZNL18					B100
R&S®ZNL3					
R&S®ZNL4					
R&S®ZNL6					
R&S®ZNL14					
R&S®ZNL20					
Midrange					
R&S®ZNB18					
R&S®ZNB20					
R&S®ZNB26					
R&S®ZNB40					
R&S®ZNB3004					
R&S®ZNB3020					
R&S®ZNB3032					
R&S®ZNB3044					
High end					
R&S®ZNA26					
R&S®ZNA43					
R&S®ZNA50					
R&S®ZNA67					
R&S®ZNA67EXT					

VECTOR NETWORK ANALYZER PORTFOLIO



Instrument		R&S® ZNH	R&S® ZNLE	R&S® ZNL
Main characteristics				
Frequency range	min.	30 kHz	100 kHz (with B100) 1 MHz	5 kHz
	max.	4/8/18/26.5 GHz	3/4.5/6/14/18 GHz (overrange to 20 GHz)	3/4.5/6/14/20 GHz (spectrum analysis up to 26.5 GHz)
Number of ports		2	2	2
Number of sources		1	1	1
RF performance				
Dynamic range* (typ.)		Up to 100 dB	Up to 120 dB	Up to 130 dB
Max. output power* (typ.)		Up to 0 dBm meas.	Up to +2 dBm	Up to +3 dBm
Power range * (spec.)	min.	-5 dBm norm.	-10 dBm	-10 dBm -40 dBm (with B22)
	max.	-25 dBm norm.	0 dBm	-3 dBm 0 dBm (with B22)
Measurement speed (Best speed at 201 points, correction off)		153 ms [IF BW: 100 kHz]	4.9 ms (ZNLE4/6) 11.8 ms (ZNLE14/18) [IF BW: 100 kHz]	4.9 ms (ZNL4/6) 11.8 ms (ZNL14/20) [IF BW: 100 kHz]
Number of points		3 to 16,001	1 to 5,001	1 to 100,001
IFBW		10 Hz to 100 kHz	1 Hz to 500 kHz	1 Hz to 500 kHz
Display and OS				
Size and type		7" WVGA 800 × 480 pixel	10.1" WXGA 1280 × 800 pixel	10.1" WXGA 1280 × 800 pixel
Operating system		Windows CE	Windows 10	Windows 10
General data				
Size (W × H × D)		202 × 294 × 76 mm	408 × 186 × 235 mm	408 × 186 × 235 mm
Weight		3.1 kg	6 kg	6 kg (without HW option) 7.3 kg (with battery)
Key features				
Measurement excellence that drives innovation	<ul style="list-style-type: none"> ▶ Battery operation time of 4 hours ▶ High in precision ▶ Simple to operate, configure and add-value 	<ul style="list-style-type: none"> ▶ Easy to use ▶ Economical instrument with solid performance ▶ Ideal instrument for basic S-parameter measurements 	<ul style="list-style-type: none"> ▶ Optionally battery powered ▶ Modern instrument platform ▶ 3-in-1 instrument: vector network analysis, spectrum analysis, power meter measurements 	

More than 70 years of experience in the field of vector network analysis pay off: With the versatile product portfolio Rohde&Schwarz continuously sets new benchmarks for vector network analyzers. From basic S-parameter to fast multiport-measurements and complex high-end applications, Rohde&Schwarz offers a variety of solutions for a wide range of applications.

No matter if a vector network analyzer is needed in R&D, production or in the classroom: benefit from the high-quality instruments and excellent development expertise that Rohde&Schwarz offers.



R&S® ZNB3000	R&S® ZNBT	R&S® ZNA
9 kHz	9 kHz (ZNBT8) 100 kHz (ZNBT20/26/40)	10 MHz
54 GHz (ZNB3020, ZNB3-B262/ZNB-B264)	8.5/20/26.5/40 GHz	26.5/43.5/50/67 GHz
2, 4	4 (ZNBT8 only) 8, 12, 16, 20, 24 available for all models	2, 4
1 (2 ports unit) 1 or 2 (4 ports unit)	1 or 2 (with more than 8 ports)	1 or 2 (2 ports unit) 2 or 4 (4 ports unit)
Up to 140 dB (ZNB3004) Up to 150 dB (with ZNB3-B52/B54) Up to 155 dB (ZNB3020)	Up to 145 dB (ZNBT8-B5xx) Up to 140 dB (ZNBT8/20) Up to 130 dB (ZNBT26/40)	Up to 139 dB Up to 147 dB (with B3n)
Up to 15 dBm (ZNB3004) Up to 16 dBm (with ZNB3020)	Up to +15 dBm (ZNBT8/20) Up to +11 dBm (ZNBT26/40)	Up to +20 dBm
-55 dBm (ZNB3004) -85 dBm (ZNB3004 with B2x) -30 dBm (ZNB3020) -60 dBm (ZNB3020 with B2x)	-55 dBm (ZNBT8) -85 dBm (ZNBT8 w B2x) -30dBm (ZNBT20/26/40) -60 dBm (ZNBT20/26/40 w B2x)	-80 dBm
+15 dBm (ZNB3004) +16 dBm (ZNB3020)	+13 dBm (ZNBT8) +12 dBm (ZNBT20) +8 dBm (ZNBT26/40)	+17 dBm (ZNA26/43) +16 dBm (ZNA50/67)
1.3 ms (ZNB3004, ZNB3-B082/B084) 1.9 ms (ZNB3020, ZNB3-B262/B264) [IF BW: 500 kHz]	3 ms (ZNB4/8) 2.5 ms (ZNB20) 2.4 ms (ZNB26) 2.6 ms (ZNB43) [IF BW: 500 kHz]	5.1 ms [IF BW: 500 kHz]
1 to 100,001	2 to 100,001	1 to 100,001
1 Hz to 1 MHz 1 Hz to 10 MHz (with K17)	1 Hz to 1 MHz 1 Hz to 10 MHz (with K17)	1 Hz to 1.5 MHz 1 Hz to 30 MHz (with K17)
12.1" WXGA 1280 x 800 pixel	N.A.	12.1" WXGA 1280 x 800 pixel
Windows 11	Windows 10	Windows 10
462.5 mm x 239.6 mm x 361.5 mm (18.2 in x 9.4 in x 14.2 in)	463 x 240 x 612 mm	462 285 x 462 mm
14 kg (2 ports model) 16 kg (4 ports model)	22 kg to 45 kg	24 kg (2-ports) 29 kg (4-ports)
<ul style="list-style-type: none"> ▶ Speed: Ultra fast measurement cycles ▶ Scalability: Flexible upgrades ▶ Stability: Negligible thermal drift 	<ul style="list-style-type: none"> ▶ Parallel measurements up to 24 ports ▶ High output power ▶ True multiport vector network analyzer for high-speed measurements 	<ul style="list-style-type: none"> ▶ High stability, low trace noise, excellent raw data ▶ Up to: four internal sources, two internal LOs (phase-coherent), four internal pulse modulators ▶ mm-wave extensions up to 1.1 THz

MULTIPOINT SOLUTION



Instrument		R&S® ZNBT	R&S® ZN-Z84
Multiport type		True multiport VNA	Switch Matrix (Supported with ZND/ZNB/ZNBT/ZNA)
Frequency range	min.	9 kHz (ZNBT8) 100 kHz (ZNBT20/26/40)	10 MHz
	max.	8.5 / 20 / 26.5 / 40 GHz	8.5 GHz
Test ports options		4 (ZNBT8 base) 8 (ZNBT20/26/40 base, ZNBT8 + B108) 12/16/20/24 (options)	6(base) / 12 / 18 / 24
Max. number of ports		24	48
Test port connector type		ZNBT8 - N (f) ZNBT20 - 3.5 mm (m) ZNBT26/40 - 2.92 mm (m)	SMA (f)
Standard Software Tool			ZN-Z8X Toolbox
Trigger function	Software	Yes	No
	Hardware	Yes (via BNC)	Yes (via direct control)
Touchscreen		No	No
Weight (depend on options installed)		22 kg to 45 kg	5 kg to 7 kg
Dimension		463 × 240 × 612 mm 4HU 19"	445 × 88 × 300 mm 2HU 19"
Rack mount kit option		ZZA-KN5	ZZA-KN2



R&S®ZN-Z86	R&S®ZN-Z86X	R&S®OSP
Switch Matrix (Supported with ZNB/ZNBT/ZNA) 300 kHz	Switch Matrix (Supported with ZNB/ZNBT/ZNA) 300 kHz	Open switch & control platform (Supported with ZNB/ZNA) DC
26.5 GHz	26.5 GHz	Up to 67 GHz
6(base) / 12 / 18 / 24	12 / 24	Configurable
48	12/24	Configurable
2.92 mm (f)	2.92 mm (f)	Frequency dependent
ZN-Z8X Toolbox	ZN-Z8X Toolbox	OSP Web GUI
Yes (with ZN-Z8X Toolbox)	Yes (with ZN-Z8X Toolbox)	Yes (with OSP-K100)
Yes (via BNC and direct control1)	Yes (via BNC and direct control1)	Yes (via BNC, prerequisite OSP-K100)
No	No	OSP220 – No OSP230 – Yes OSP320 – Yes (option OSP-B300M)
4 kg to 6 kg	5 kg to 7 kg	OSP220 - 6.85 kg OSP230 - 6.95 kg OSP320 – 7.95 kg (without module)
460 x 105 352 mm 2HU 19"	460 x 149 x 352 mm 3HU 19"	445 x 108 x 472 mm 2HU 19" (OSP220/230) 445 x 152 x 472 mm 3HU 19" (OSP320)
ZZA-KNP21	ZZA-KNP31	ZZA-KN21 (OSP220, OSP230) ZZA-KN31 (OSP320)

OPTIONS

In combination with the vector network analyzers, Rohde & Schwarz provides a versatile range of hardware and software options covering a wide range of applications.

Tailored to different requirements

With their wide range of options, Rohde & Schwarz vector network analyzers provide excellent solutions to many T&M challenges, such as characterizing complex test devices or maximizing test throughput. Various software and hardware options for advanced applications ease of operation, speed and efficiency. With the R&S®ZRun automated test software, Rohde & Schwarz offers a versatile control application for automated measurements.

Options supporting basic measurements							
Instrument	Spectrum analysis	Extended power range	Step attenuators	Distance-to-fault	Time domain measurements	Differential measurements	Multipoint support
R&S®ZNH			Built-in Rx step attenuator	Standard	K68	K47 - Mixed mode	
R&S®ZNL	B1	B22	B31 (Rx, port 1) B32 (Rx, port 2)	K3	K2		
R&S®ZNB3000		B2X	B3X	K3	K2 K20 Extended time domain analysis	Virtual differential	<ul style="list-style-type: none"> ▶ With R&S®ZN-Z84 / Z86 / Z86X / R&S®OSP ▶ Supported by ZNB3000 Firmware
R&S®ZNB		B2X	B36X (Rx)	K3	K2 K20 Extended time domain analysis	Virtual differential	<ul style="list-style-type: none"> ▶ via R&S®ZRun ▶ with R&S®ZN-Z84 / Z85 / Z86 / Z86X / R&S®OSP
R&S®ZNA		Standard	B2N (Source, port N) B3N (Rx, port N)		K2 K20 Extended time domain analysis	Virtual differential True differential	<ul style="list-style-type: none"> ▶ via R&S®ZRun ▶ with R&S®ZN-Z85 / Z86 / Z86X / R&S®OSP
		Standard Var .05/.06/.07 – High output power	B2N (Source, port N) B3N (Rx, port N)		K2 K20 Extended time domain analysis	Virtual differential True differential	via R&S®ZRun

Options supporting advanced measurements						
Instrument	Frequency conversion measurements	Intermodulation measurements	Vector corrected mixer measurements	Measurement of group delay on frequency converters without LO access	Noise figure measurements	Pulse measurements
R&S®ZNH	K69 (requires external power sensor)					K29 (with power sensor)
R&S®ZNL					FPL1-K30 (requires B1 and FPL1-B5)	
R&S®ZNB3000	K4	K14 (requires K4)			K30	
R&S®ZNB	K4	K14 (requires K4)				
R&S®ZNA	K4	K4	K5 (requires K4)	K9	K30	B4x (Pulse modulator, Port x)
R&S®ZNA67EXT	K4		K5 (requires K4)			B4x (Pulse modulator, Port x)

*A complete list of options is available for each instrument on its datasheet.

CONVERTER



		R&S® ZC75	R&S® ZC90	R&S® ZC90E	R&S® ZC110
Frequency range	min.	50 GHz	60 GHz	60 GHz	75 GHz
	max.	75 GHz	90 GHz	90 GHz	110 GHz
Test port (Waveguide designator)		WR15	WR12	WR12	WM-2540 (WR10)
Output power (typ.)		+12 dBm	+10 dBm	+6 dBm	+15 dBm
Dynamic range (typ.)		110 dB	120 dB	118 dB	120 dB

		R&S® ZC140	R&S® ZC170	R&S® ZC220	R&S® ZC260
Frequency range	min.	90 GHz	100 GHz	140 GHz	170 GHz
	max.	140 GHz	170 GHz	220 GHz	260 GHz
Test port (Waveguide designator)		WM-2032 (WR8)	WM-1651 (WR6.5)	WM-1295 (WR5.1)	WM-1092 (WR4.3)
Output power (typ.)		Up to +9 dBm	+9 dBm	+1 dBm	-2 dBm
Dynamic range (typ.)		120 dB	105 dB	115 dB	110 dB

		R&S® ZC330	R&S® ZC400	R&S® ZC500	R&S® ZC750	R&S® ZC1100
Frequency range	min.	220 GHz	260 GHz	330 GHz	500 GHz	750 GHz
	max.	330 GHz	400 GHz	500 GHz	750 GHz	1100 GHz
Test port (Waveguide designator)		WM-864 (WR3.4)	WM-710	WM-570	WM-380	WM-250
Output power (typ.)		-7 dBm	-12 dBm	-11 dBm	-18 dBm	Up to -25 dBm
Dynamic range (typ.9)		115 dB	95 dB	105 dB	90 dB	75 dB

CALIBRATION KITS AND UNITS

Manual calibration kits

Type	Frequency range	Description	Remarks
R&S®ZN-Z170	DC to 18 GHz	N (f) or N (m)	Economy
R&S®ZN-Z135	DC to 26.5 GHz	3.5mm (f) or 3.5mm (m)	Economy
R&S®ZN-Z129	DC to 40 GHz	2.92mm (f) or 2.92mm (m)	Economy
R&S®ZN-Z129E	DC to 43.5 GHz	2.92mm (f) or 2.92mm (m)	Economy
R&S®ZCAN	0 Hz to 3 GHz	N (f) and N (m), 50Ω or 75Ω	Economy
R&S®ZV-Z270	0 Hz to 18 GHz	N (f) and N (m)	Premium
R&S®ZN-Z235	0 Hz to 26.5 GHz	3.5mm (f) and 3.5mm (m)	Premium
R&S®ZV-Z235E	0 Hz to 33 GHz	3.5mm (f) and 3.5mm (m)	Premium
R&S®ZN-Z229	0 Hz to 43.5 GHz	2.92mm (f) and 2.92mm (m)	Premium
R&S®ZN-Z224	0 Hz to 50 GHz	2.4mm (f) and 2.4mm (m)	Premium
R&S®ZN-Z218	0 Hz to 67 GHz	1.85mm (f) and 1.85mm (m)	Premium
R&S®ZN-Z210	0 Hz to 110 GHz	1.0mm (f) and 1.0mm (m)	Premium

Automatic calibration units

Type	Frequency range	Description	Remarks
R&S®ZN-ZE104	5 kHz to 4.5 GHz	Two ports, N (m/f) or 3.5mm-compatible (m/f)	Economy
R&S®ZN-ZE109	5 kHz to 9 GHz	Two ports, N (m/f) or 3.5mm-compatible (m/f)	Economy
R&S®ZN-ZE118	5 kHz to 18 GHz	Two ports, N (m/f) or 3.5mm-compatible (m/f)	Economy
R&S®ZN-ZE126	5 kHz to 26.5 GHz	Two ports, 3.5mm-compatible (m/f)	Economy
R&S®ZN-Z152	100 kHz to 8.5 GHz	Six ports, SMA (f)	Premium Economy
R&S®ZN-Z153	100 kHz to 8.5 GHz	Four ports, SMA (f)	Premium Economy
R&S®ZN-Z154	100 kHz to 8.5 GHz	Six ports (up to twenty-four ports with options), SMA (f)	Premium Economy
R&S®ZN-Z156	10MHz to 67 GHz	Two ports, 1.85mm (f)	Premium
R&S®ZN-Z50	9 kHz to 9 GHz / 9 kHz to 26.5 GHz	Two ports, 3.5mm (f)	Premium
R&S®ZN-Z51	100 kHz to 8.5 GHz	Four ports, N (f)	Premium
R&S®ZN-Z52	100 kHz to 26.5 GHz	Four ports, 3.5mm (f)	Premium
R&S®ZN-Z54	9 kHz to 40 GHz (characterized up to 43.5 GHz)	Two ports, 2.92mm (f)	Premium
R&S®ZN-Z55	9 kHz to 50 GHz	Two ports, 2.4mm (f)	Premium
R&S®ZV-Z58	300 kHz to 8 GHz	Eight ports, N (f) or 3.5mm (f)	Premium
R&S®ZV-Z59	10 MHz to 20 GHz	Six ports, 3.5mm (f)	Premium



R&S®ZN-Z2xx



R&S®ZN-Z129



R&S®ZN-Z170



R&S®ZN-ZExxx

Automatic inline calibration units

Type	Frequency range	Description
R&S®ZN-Z32	10 MHz to 8.5 GHz	One ports, SMA (m/f)
R&S®ZN-Z33	10 MHz to 40 GHz	One ports, 2.92mm (m/f)

Waveguide calibration kits

Type	Frequency range	Description
R&S®ZV-WR02	325 GHz to 500 GHz	WR02, without sliding match
R&S®ZV-WR03	220 GHz to 325 GHz	WR03, with or without sliding match
R&S®ZV-WR05	140 GHz to 220 GHz	WR05, with or without sliding match
R&S®ZV-WR06	110 GHz to 170 GHz	WR06, with or without sliding match
R&S®ZV-WR08	90 GHz to 140 GHz	WR08, without sliding match
R&S®ZV-WR10	75 GHz to 110 GHz	WR10, with or without sliding match
R&S®ZV-WR12	60 GHz to 90 GHz	WR12, with or without sliding match
R&S®ZV-WR15	50 GHz to 75 GHz	WR15, with or without sliding match
R&S®ZCWM-1092	170 GHz to 260 GHz	WM-1092, without sliding match
R&S®ZCWM-710	260 GHz to 400 GHz	WM-710, without sliding match
R&S®ZCWM-570	330 GHz to 500 GHz	WM-570, without sliding match
R&S®ZCWM-380	500 GHz to 750 GHz	WM-380, without sliding match
R&S®ZCWM-250	750 GHz to 1100 GHz	WM-250, without sliding match



R&S®ZN-Z52



R&S®ZN-Z32



R&S®ZV-WR



R&S®ZCWM

Service at Rohde & Schwarz You're in great hands

- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

Rohde & Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test&measurement, technology systems, and networks&cybersecurity. Founded 90 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

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Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

Rohde & Schwarz training

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