Measurement excellence that drives innovation

www.rohde-schwarz.com/networkanalyzer

ROHDE&SCHWARZ

Applications

Antenna arrays
Measuring antenna arrays at high frequencies is often a challenge. The R&S®ZNBT is a high-performance VNA with up to 24 fully integrated test ports. If even more ports are required, the R&S®ZNBT8 in combination with R&S®ZN-Z84 switch matrices provides up to 288 ports. The R&S®ZNBT 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®ZVA or R&S®ZNA, the R&S®ZCxxx mmWave converter family covers frequencies up to 500 GHz. 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 probers 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 (USB-C, automotive Ethernet, BroadR-Reach, etc.). Time-domain analysis options for high-speed signal testing are available with the R&S®ZNB and R&S®ZNBT, both of which can be combined with the R&S®ZN-Z84 to support challenging multiport applications.

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.

The R&S®ZNA forms the powerful core in antenna test systems.

Frequency	5 kHz	9 kHz	100 kHz	300 kHz	1 MHz	10 MHz		3 GHz	4.5 GHz	6 GHz	8 GHz	8.5 GHz	13.5 GHz	20 GHz	24 GHz	26.5 GHz	40 GHz	43.5 GHz	50 GHz	67 GHz	110 GHz		500 GHz
Economy and handheld																							
R&S®ZPH									B4														
R&S®ZNLE3			B100 option																				
R&S®ZNLE6			B100 option																				
R&S®ZVL3-75 (75 Ohm matched model)																							
R&S®ZVL13																							
R&S®ZNL3																							
R&S®ZNL6																							
R&S®ZND									K1														
Midrange																							
R&S®ZNBT8																							
R&S®ZNBT20																							
R&S®ZNBT26																							
R&S®ZNBT40																							
R&S®ZNB4																							
R&S®ZNB8																							
R&S®ZNB20																							
R&S®ZNB40 .82 and .84 models																							
R&S®ZNB40 .72 model (better dyn.rng. than .82 and .84)																							
R&S®ZN-Z84 (switch matrix)																							
R&S®ZN-Z85 (switch matrix)																							
High end																							
R&S®ZVA8																							
R&S®ZVA24																							
R&S®ZVA40																							
R&S®ZVA50																							
R&S®ZVA67																							
R&S®ZVA110																							
R&S®ZNA26				B16 option																			
R&S®ZNA43				B16 option																			

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®ZNrun automated test software, Rohde&Schwarz offers a versatile control application for automated measurements.

Options supporting basic measurements*					
Instrument	**Extended power range**	**Step attenuators**	**Time domain measurements**	**Differential measurements**	**Multiport support**
R&S®ZPH					
R&S®ZNLE					via R&S®ZNrun
R&S®ZVL			K2 for distance-to-fault, K3 for time domain		
R&S®ZNL	R&S®ZNL-B22	B3x (receiver, port 1 or 2)	K2		via R&S®ZNrun
R&S®ZND	K7; B7 also available (high output power)		K2		via R&S®ZNrun
R&S®ZNB	B2x	B3x (receiver, port 1 to 4) only for R&S®ZNB4 and R&S®ZNB8	K2 K20 for advanced time domain		native (ZN-Z84/85 switch matrices) and via R&S®ZNrun
R&S®ZNBT	B2x	B36x (receiver, port 1 to 24)	K2 K20 for advanced time domain	Virtual differential	native (true multiport) and via R&S®ZNrun
R&S®ZVA	Extended with source step attenuators (B2x)	B2x (source, port 1 to 4) B3x (receiver, port 1 to 4)	K2	Virtual differential or K6 for true differential	via R&S®ZNrun
R&S®ZNA	Extended with source step attenuators (B2x)	B2x (source, port 1 to 4) B3x (receiver, port 1 to 4)	K2 K20 for advanced time domain	Virtual differential	via R&S®ZNrun

Options supporting advanced measurements*				
Instrument	**Frequency conversion/ intermodulation measurements**	**Vector corrected mixer measurements**	**Measurement of group delay on frequency converters without LO access**	**Noise figure measurements**
R&S®ZNB	K4, K14 for intermodulation			
R&S®ZNBT	K4, K14 for intermodulation			
R&S®ZVA	K4	K5 (requires B16 and K4)	K5 for mixer with LO access, K9 otherwise	K30 K31 for frequency converting DUTs (requires K4, K30)
R&S®ZNA	K4	K5 (requires K4)	K5 for mixer with LO access, K9 otherwise	

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

Vector Network Analyzer Portfolio

More than 65 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.

Instrument	R&S®ZPH	R&S®ZNLE	R&S®ZNL	R&S®ZND	R&S®ZNB	R&S®ZNBT	R&S®ZVA	R&S®ZNA
Main characteristics								
Frequency range	2 MHz to 3/4 GHz	100 kHz / 1 MHz to 3/6 GHz	5 kHz to 3/6 GHz	100 kHz to 4.5/8.5 GHz	9 kHz to 4.5/8.5 GHz 100 kHz to 20/40 GHz 10 MHz to 40 GHz (higher dynamic)	9 kHz to 8.5 GHz 100 kHz to 20/26.5/40 GHz	300 kHz to 8 GHz 10 MHz to 24/40/50/67 GHz 10 MHz to 110 GHz (2 port unit)	10 MHz to 26.5 GHz 10 MHz to 43.5 GHz
Number of ports	1	2	2	2	2 or 4	R&S®ZNBT8: 4, 8, 12, 16, 20 or 24 R&S®ZNBT20/ZNBT26/ZNBT40: 8, 12, 16, 20, 24	2 or 4 2 for R&S®ZVA110	2 or 4
Number of sources	1	1	1	1	1 (2 port unit) 1 or 2 (4 port unit)	1 (2 with more than 8 ports)	1 (2 port unit) 2 or 4 (4 port unit)	1 (2 port unit) 2 or 4 (4 port unit)
RF performance								
Dynamic range	not spec.	up to 110 dB (spec.) up to 120 dB (typ.)	up to 120 dB (spec.) up to 130 dB (typ.)	up to 120 dB (spec.) up to 130 dB (typ.)	up to 140 dB (spec.) (w/ B5x) up to 150 dB (typ.) (w/ B5x)	up to 130 dB (spec.) up to 140 dB (typ.)	up to 130 dB (spec.) up to 140 dB (typ.)	Up to 128 dB (spec., w/ options) Up to 146 dB (typ., w/ options)
Max. output power	10 dBm (spec.)	0 dBm (spec.) +2 dBm (typ.)	0 dBm (spec.) up to +3 dBm (typ.)	up to +10 dBm (nom.) (w/ B7)	up to +13 dBm (spec.) up to +15 dBm (typ.)	up to +13 dBm (spec.) up to +15 dBm (typ.)	up to +13 dBm (spec.) up to +18 dBm (typ.)	Up to +15 dBm (spec.) Up to + 20 dBm (typ.)
Power range	not spec.	up to 10 dB	up to 40 dB	up to 55 dB (w/ K7)	up to 98 dB (w/ B2x)	up to 98 dB (w/ B2x)	up to 127 dB (w/ B2x)	Up to 100 dB
Measurement speed	0.3 ms per point	4.9 ms for 201 points 100 kHz IFBW, 200 MHz span, correction switched off	4.9 ms for 201 points 100 kHz IFBW, 200 MHz span, correction switched off	5 ms for 201 points, 300 kHz IFBW, 200 MHz span, correction switched off	2.9 ms for 201 points, 500 kHz IFBW, 200 MHz span, correction switched off	4 ms for 201 points, 500 kHz IFBW, 200 MHz span, correction switched off	6.8 ms for 201 points, 100 kHz IFBW, 200 MHz span, correction switched off	5.1 ms for 201 points, 500 kHz IFBW, 1 GHz span, correction switched off
IFBW		1 Hz to 500 kHz	1 Hz to 500 kHz	1 Hz to 300 kHz	1 Hz to 10 MHz (w/ K17)	1 Hz to 10 MHz	1 Hz to 30 MHz	1 Hz to 30 MHz (w/ option)
Display and OS								
Size and type	7.5" touchscreen	10.1" touchscreen	10.1" touchscreen	12.1" touchscreen	12.1" touchscreen	none	10.4"	12.1'' touchscreen and 7'' touchscreen
Operating system	Windows CE	Windows 10	Windows 10	Windows 10	Windows 10	Windows 10	Windows 7	Windows 10
General data								
Size (W x H x D)	202 mm × 294 mm × 76 mm (8.0 in × 11.6 in × 3 in)	408 mm × 186 mm × 235 mm (16.06 in × 7.32 in × 9.25 in)	408 mm × 186 mm × 235 mm (16.06 in × 7.32 in × 9.25 in)	462.5 mm × 239.6 mm × 361.5 mm (18.2 in × 9.4 in × 14.23 in)	461.1 mm × 239.9 mm × 351.0 mm (18.2 in × 9.4 in × 13.9 in)	463 mm × 240 mm × 612 mm (18.2 in × 9.4 in × 24.1 in)	465.1 mm × 286.2 mm × 495.0 mm (18.31 in × 11.27 in × 19.49 in)	461.4 mm × 284.6 mm × 462.1 mm (18.2 in × 11.2 in × 18.2 in)
Weight	2.5 kg	6 kg	From 6 kg to 8 kg	14 kg	from 14 kg to 21 kg	from 22 kg to 45 kg	25 kg	from 24 kg to 29 kg

Instrument	R&S®ZPH	R&S®ZNLE	R&S®ZNL	R&S®ZND	R&S®ZNB	R&S®ZNBT	R&S®ZVA	R&S®ZNA
Key features	▮ Fast and efficient ▮ Ideal for field use ▮ Includes a measurement wizard	▮ Easy to use ▮ Economical instrument with solid performance ▮ Ideal instrument for basic S-parameter measurements	▮ Optionally battery powered ▮ Modern instrument platform ▮ 3-in-1 instrument: vector network analysis, spectrum analysis, power meter measurements	▮ Flexible and future-proof option concept ▮ Clear menu structures and convenient user interface ▮ High output power option	▮ Wide dynamic range ▮ Convenient characterization of active and passive components ▮ Multiport capability with switch matrices	▮ Parallel measurements up to 24 ports ▮ High output power ▮ True multiport vector network analyzer for high-speed measurements	▮ Broad functionality (e.g. direct channel access) for high-end applications ▮ Ideal choice for demanding measurement tasks in labs and production ▮ mm-wave extensions up to 500 GHz	▮ High stability, low trace noise, excellent raw data ▮ Up to: four internal sources, two internal LOs (phase-coherent), four internal pulse modulators ▮ DUT-centric operating concept ▮ mm-wave extensions up to 500 GHz

Accessory portfolio

Accessory	Type	Dynamic range
Manual calibration / verification		
R&S®ZV-Z129	Calibration kit, 2.92 mm: open, short, match, through combination (m or f)	0 Hz to 40 GHz
R&S®ZV-Z135	Calibration kit, 3.5 mm: open, short, match, through combination (m or f)	0 Hz to 15 GHz
R&S®ZV-Z170	Calibration kit, N: open, short, match, through combination (m or f)	0 Hz to 9 GHz
R&S®ZV-Z270	Calibration kit, N: open, short, match, through standards (m and f)	0 Hz to 18 GHz
R&S®ZN-Z235	Calibration kit, 3.5 mm: open, short, match, through standards (m and f)	0 Hz to 26.5 GHz
R&S®ZN-Z229	Calibration kit, 2.92 mm: open, short, match, through standards (m and f)	0 Hz to 40 GHz
R&S®ZV-Z224	Calibration kit, 2.4 mm: open, short, match, through standards (m and f)	0 Hz to 50 GHz
R&S®ZV-Z218	Calibration kit, 1.85 mm: open, short, match, through standards (m and f)	0 Hz to 67 GHz
R&S®ZV-Z210	Calibration kit, 1.0 mm: open, short, match, through standards (m and f)	0 Hz to 110 GHz
R&S®ZV-WR02/03/05/ 06/08/10/12/15	Waveguide calibration kits (with or without sliding match)	up to 500 GHz
Automatic calibration / verification		
R&S®ZN-Z151/152/153/154	Calibration units, up to 24 ports	100 kHz to 8.5 GHz
R&S®ZN-Z150	Calibration unit, two ports, N (f)	5 kHz to 6 GHz
R&S®ZN-Z156	Calibration unit, two ports, 1.85 mm (f)	5 GHz to 67 GHz
R&S®ZN-Z50	Calibration unit, two ports, 3.5 mm (f)	9 kHz to 9 GHz/26.5 GHz
R&S®ZN-Z51	Calibration unit, two or four ports, 3.5 mm (f) or N (f)*	100 kHz to 8.5 GHz
R&S®ZN-Z52	Calibration unit, four ports, 3.5 mm (f)	100 kHz to 26.5 GHz
R&S®ZN-Z53	Calibration unit, two ports, N (f) or 3.5 mm (f)	N (f): 100 kHz to 18 GHz 3.5 mm (f): 100 kHz to 26.5 GHz
R&S®ZN-Z54	Calibration unit, two ports, 2.92 mm (f)	9 kHz to 40 GHz
R&S®ZN-Z55	Calibration unit, two ports, 2.4 mm (f)	9 kHz to 50 GHz
R&S®ZV-Z58	Calibration unit, eight ports, N (f) or 3.5 mm (f)	300 kHz to 8 GHz
R&S®ZV-Z59	Calibration unit, six ports, 3.5 mm (f)	10 MHz to 20 GHz
R&S®ZV-Z424/429/435/470	Verification kit, 2.4 mm / 2.92 mm / 3.5 mm / N	45 MHz up to 50 GHz depending on connector type
R&S®ZV-Z324/329/335/370	T-check verification standard (f to m), 2.4 mm / 2.92 mm / 3.5 mm / N	45 MHz up to 50 GHz depending on connector type
R&S®ZN-Z30 R&S®ZN-Z32/33	Controller and inline calibration modules	10 MHz to 8.5 GHz/40 GHz
Cables		
R&S®ZV-Z9x	Ruggedized test cables, different connectors and lengths	
R&S®ZV-Z19x	High-end test cables, different connectors and lengths	
Automated Test Software		
R&S®ZNrun-KT/K2	Automated test software/multiclient capability	
Others		
R&S®ZN-ZTW	Torque wrenches for different connector types	

* For var. 72/74, ports can be configured individually: N(m), 3.5mm (m,f), 7/16 (m,f), 4.3-10 (f)

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