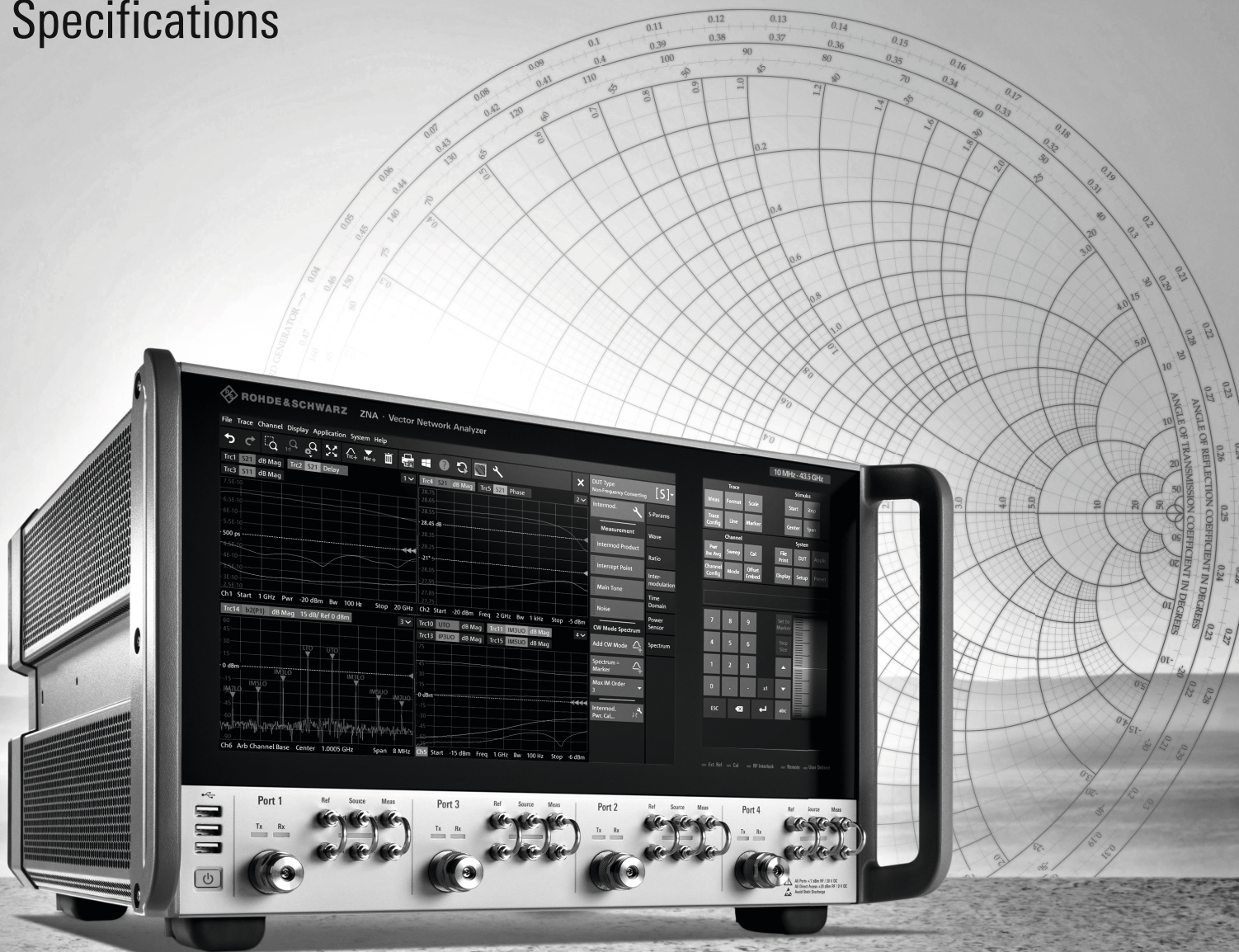


R&S® ZNA VECTOR NETWORK ANALYZER

Specifications



Data Sheet
Version 06.00

ROHDE & SCHWARZ

Make ideas real



CONTENTS

Definitions	3
Measurement range	4
Dynamic range	5
Measurement speed	7
Measurement accuracy of the R&S®ZNA26	9
Measurement accuracy of the R&S®ZNA43, 2.92 mm interface	10
Measurement accuracy of the R&S®ZNA43, 2.4 mm interface	11
Reflection measurement accuracy of the R&S®ZNA26 and R&S®ZNA43	12
Transmission measurement accuracy of the R&S®ZNA26 and R&S®ZNA43	12
Effective system data	13
Uncorrected system data	14
Test port output	16
Test port input	17
Display	19
Internal PC	19
Front panel connectors	19
Rear panel connectors	19
Options	21
R&S®ZNA-B7 memory extension for data streaming.....	21
R&S®ZNA-B8 mmWave converter LO.....	21
R&S®ZNA-B26 direct IF access	21
R&S®ZNA-B91 trigger and control I/O board.....	22
R&S®ZNA26-B16 and R&S®ZNA43-B16 direct source and receiver access.....	22
R&S®ZNA26-B21/-B22/-B23/-B24 and R&S®ZNA43-B21/-B22/-B23/-B24 source step attenuators.....	22
R&S®ZNA26-B31/-B32/-B33/-B34 and R&S®ZNA43-B31/-B32/-B33/-B34 receiver step attenuators.....	23
R&S®ZNA26-B41/-B42/-B43/-B44 and R&S®ZNA43-B41/-B42/-B43/-B44 internal pulse modulators	23
R&S®ZNA26-B161/R&S®ZNA43-B161 source monitor access port 1 and R&S®ZNA26-B163/R&S®ZNA43-B163 source monitor access port 1 and port 3	23
R&S®ZNA26-B213, R&S®ZNA43-B213 internal combiner, port 1 and port 3	23
R&S®ZNA-K1 spectrum analyzer mode (based on fast Fourier transform).....	24
General data	25
Dimensions (in mm).....	26
Ordering information	28

Definitions

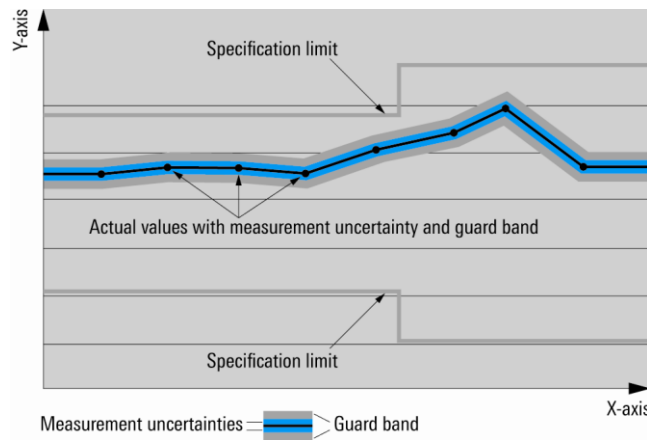
General

Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 60 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable
- Unless stated otherwise, specifications apply to test ports and a nominal source power of -10 dBm

Specifications with limits

Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as $<$, \leq , $>$, \geq , \pm , or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Specifications without limits

Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)

Characterizes product performance by means of representative information for the given parameter. When marked with $<$, $>$ or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)

Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)

Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties

Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are indicated as follows: "parameter: value".

Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

Measurement range

Impedance		50 Ω
Test port connector	R&S®ZNA26	3.5 mm, male, ruggedized
	R&S®ZNA43, 2.4 mm interface	2.4 mm, male, ruggedized
	R&S®ZNA43, 2.92 mm interface	2.92 mm, male, ruggedized
Number of test ports	R&S®ZNA26	2 or 4
	R&S®ZNA43	2 or 4
Frequency range ¹	R&S®ZNA26	10 MHz to 26.5 GHz
	R&S®ZNA43	10 MHz to 43.5 GHz
DC block	R&S®ZNA26 and R&S®ZNA43	standard

Static frequency accuracy	The static frequency accuracy is determined with the formula <i>(time since last adjustment in years x aging per year) + temperature drift + achievable initial calibration accuracy</i> using the values specified below. Depending on whether or not the R&S®ZNA-B4 precision frequency reference option is installed, the standard or the improved value have to be taken into account.	
Aging per year	standard	$\pm 1 \times 10^{-6}$
	with R&S®ZNA-B4 precision frequency reference option	$\pm 1 \times 10^{-7}$
Temperature drift (+5 °C to +40 °C)	standard	$\pm 1 \times 10^{-6}$
	with R&S®ZNA-B4 precision frequency reference option	$\pm 1 \times 10^{-8}$
Achievable initial calibration accuracy	standard	$\pm 5 \times 10^{-7}$
	with R&S®ZNA-B4 precision frequency reference option	$\pm 5 \times 10^{-8}$

Frequency resolution		1 Hz
Number of measurement points	per trace	1 to 100001
Measurement bandwidth	1/1.5/2/3/5/7 steps	
	base unit	1 Hz to 1.5 MHz
	with R&S®ZNA-K17 increased IF bandwidth (30 MHz) option	1 Hz to 30 MHz
Analog frontend bandwidth	10 MHz to 5 GHz	50 MHz (nom.)
	5 GHz to 43.5 GHz	2 GHz (nom.)

¹ Specified and typical data given in this data sheet apply to the R&S®ZNA26 and R&S®ZNA43; please note their respective frequency ranges.

Dynamic range

The receiver noise floor referred to in the following is defined as the RMS value of the data trace of the transmission magnitude, which is produced by noise and crosstalk with the test ports short-circuited. The specification applies at 10 Hz measurement bandwidth, without user correction applied. The dynamic range can be increased by using a measurement bandwidth of 1 Hz. Crosstalk does not limit the dynamic range. Dynamic range performance is specified between port 1 and port 2 as well as between port 3 and port 4 (4-port model). Otherwise, dynamic range performance is typical.

		Base unit			Base unit + R&S®ZNA-B3n ^{2, 3}		
		Specifica- tion	Typical	Measured	Specifica- tion	Typical	Measured
System dynamic range Difference between maximum output power and receiver noise floor (for data with additional step attenuator(s) or direct source and receiver access, refer to "Options")	R&S®ZNA26 and R&S®ZNA43						
	10 MHz to 30 MHz	> 86 dB	96 dB		> 86 dB	96 dB	
	30 MHz to 100 MHz	> 103 dB	113 dB		> 103 dB	113 dB	
	100 MHz to 500 MHz	> 117 dB	127 dB		> 117 dB	127 dB	
	500 MHz to 1 GHz	> 126 dB	136 dB		> 131 dB	141 dB	
	1 GHz to 16 GHz	> 129 dB	139 dB		> 137 dB	147 dB	
	16 GHz to 20 GHz	> 127 dB	137 dB		> 135 dB	145 dB	
	20 GHz to 30 GHz	> 123 dB	133 dB		> 131 dB	141 dB	
	30 GHz to 40 GHz	> 117 dB	127 dB		> 124 dB	134 dB	
	R&S®ZNA43, 2.4 mm interface						
40 GHz to 43.5 GHz	> 106 dB	116 dB		> 112 dB	122 dB		
R&S®ZNA43, 2.92 mm interface							
40 GHz to 43.5 GHz			116 dB			122 dB	

		Base unit + R&S®ZNAxx-B16 ⁴			Base unit + R&S®ZNAxx-B16 + R&S®ZNAxx-B2n + R&S®ZNAxx-B3n ²		
		Specifica- tion	Typical	Measured	Specifica- tion	Typical	Measured
System dynamic range Difference between maximum output power and receiver noise floor (for data with additional step attenuator(s) or direct source and receiver access, refer to "Options")	R&S®ZNA26 and R&S®ZNA43						
	10 MHz to 30 MHz	> 86 dB	96 dB		> 85 dB	95 dB	
	30 MHz to 100 MHz	> 103 dB	113 dB		> 102 dB	112 dB	
	100 MHz to 500 MHz	> 117 dB	127 dB		> 116 dB	126 dB	
	500 MHz to 1 GHz	> 126 dB	136 dB		> 130 dB	140 dB	
	1 GHz to 16 GHz	> 127 dB	137 dB		> 134 dB	144 dB	
	16 GHz to 20 GHz	> 125 dB	135 dB		> 131 dB	141 dB	
	20 GHz to 30 GHz	> 121 dB	131 dB		> 127 dB	137 dB	
	30 GHz to 40 GHz	> 115 dB	125 dB		> 119 dB	129 dB	
	R&S®ZNA43, 2.4 mm interface						
40 GHz to 43.5 GHz	> 103 dB	113 dB		> 105 dB	115 dB		
R&S®ZNA43, 2.92 mm interface							
40 GHz to 43.5 GHz			113 dB			115 dB	

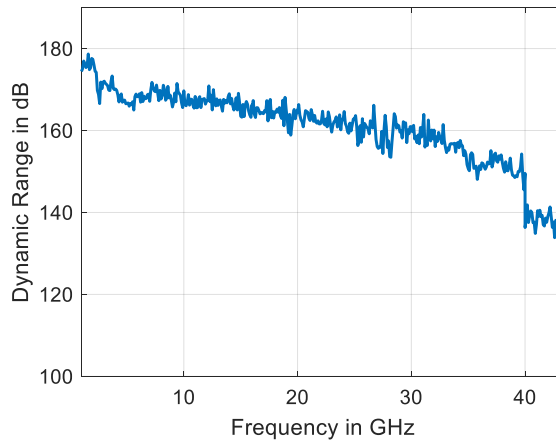
² Receiver step attenuator in 0 dB position.

³ n designates the port number (1/2/3/4).

⁴ xx designates the R&S®ZNA model (R&S®ZNA26/R&S®ZNA43).

	Base unit + R&S®ZNAxx-B16			Base unit + R&S®ZNAxx-B16 + R&S®ZNAxx-B2n + R&S®ZNAxx-B3n ⁵		
	Specifica-tion	Typical	Measured	Specifica-tion	Typical	Measured
Extended dynamic range at direct source and receiver access input Difference between maximum output power and receiver noise floor using the direct receiver access	R&S®ZNA26 and R&S®ZNA43					
	10 MHz to 30 MHz	> 90 dB	100 dB		> 100 dB	105 dB
	30 MHz to 100 MHz	> 105 dB	115 dB		> 115 dB	120 dB
	100 MHz to 500 MHz	> 120 dB	130 dB		> 130 dB	135 dB
	500 MHz to 16 GHz	> 128 dB	136 dB		> 138 dB	146 dB
	16 GHz to 20 GHz	> 124 dB	132 dB		> 132 dB	140 dB
	20 GHz to 26.5 GHz	> 122 dB	130 dB		> 130 dB	135 dB
	26.5 GHz to 30 GHz	> 121 dB	128 dB		> 129 dB	136 dB
	30 GHz to 40 GHz	> 115 dB	120 dB		> 122 dB	127 dB
	R&S®ZNA43, 2.4 mm interface					
	40 GHz to 43.5 GHz	> 101 dB	110 dB		> 107 dB	116 dB
	R&S®ZNA43, 2.92 mm interface					
	40 GHz to 43.5 GHz			110 dB		116 dB

Exemplary measured dynamic range for R&S®ZNA43 in reversed coupler configuration (-B16) at maximum output power, receiver step attenuator set to 0 dB at 1 Hz resolution bandwidth.



⁵ Receiver step attenuator in 0 dB position.

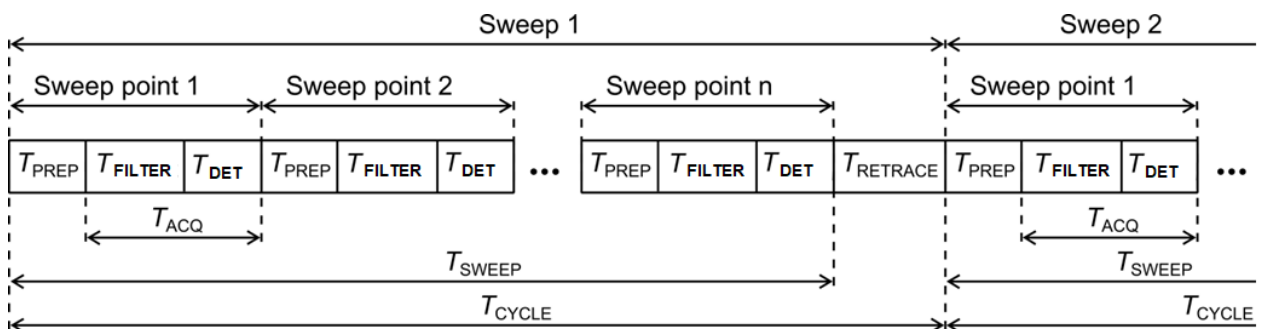
Measurement speed

Measured with firmware version 1.80 and Windows 10 (64 bit).

Measurement time	for 201 measurements points, 10 GHz center frequency, 200 MHz span	
Time per sweep (T_{SWEEP})	1 MHz measurement bandwidth, IF filter (analog) normal	< 2.5 ms
Sweep cycle time (T_{CYCLE})	1 MHz measurement bandwidth, IF filter (analog) normal	< 3.5 ms
Time per sweep point (T_{POINT})	1 MHz measurement bandwidth, IF filter (analog) normal, CW mode	2.5 μs
	1 MHz measurement bandwidth, IF filter (analog) wideband, CW mode	1.4 μs
	2 MHz measurement bandwidth, IF filter (analog) wideband, CW mode	0.9 μs
Acquisition time per point (T_{ACQ})	1 MHz measurement bandwidth, IF filter (analog) wideband	1 μs
	30 MHz measurement bandwidth	32 ns

		IEC/ IEEE	VXI11 over 1 Gbit/s LAN	RSIB	USB 2.0
Time for measurement and data transfer (typical)	for 201 measurements points, 800 MHz start frequency, 1 GHz stop frequency, 1 MHz measurement bandwidth ⁶	14 ms	13 ms	13 ms	14 ms
Data transfer time (typical)	for 201 measurements points (magnitude)	1.7 ms	0.9 ms	0.6 ms	0.7 ms

Switching time between channels	with a maximum of 2001 points	< 2 ms
Switching time between two preloaded instrument settings	with a maximum of 2001 points	< 2 ms



Measurement sequence

T_{PREP}	Preparation time required to set up the internal hardware components
T_{FILTER}	Filter settling time (settling time of the digital filters)
T_{DET}	Detector time (additional time for averaging of detector sample, normally 0)
T_{ACQ}	Data acquisition time ($T_{\text{ACQ}} = T_{\text{FILTER}} + T_{\text{DET}}$)
T_{POINT}	Total time for one sweep point
T_{SWEEP}	Time required for one sweep
T_{RETRACE}	Time between two sweeps
T_{CYCLE}	Sweep cycle time ($T_{\text{CYCLE}} = T_{\text{SWEEP}} + T_{\text{RETRACE}}$)

⁶ In continuous mode, no additional time for data transfer is needed, as data transfer takes place simultaneously with the measurement.

Nominal sweep times in ms versus number of measurement points ⁷					
Number of measurement points	51	201	401	1601	5001
9 GHz start frequency, 10 GHz stop frequency, 500 kHz measurement bandwidth					
With correction switched off	2.2	5.1	8.9	13.7	27.4
With 2-port TOSM calibration	4.1	9.9	17.3	27.2	54.1
With 4-port TOSM calibration	7.6	19.5	34.6	54.2	107
9 GHz start frequency, 10 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	3.7	7.7	12.8	26.2	63.5
With 2-port TOSM calibration	6.7	14.4	24.9	51.4	126
With 4-port TOSM calibration	12.6	28.4	49.1	103	252
9 GHz start frequency, 10 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	57.7	220	437	1724	5356
With 2-port TOSM calibration	115	440	873	3449	10716
With 4-port TOSM calibration	228	879	1746	6904	21433
10 MHz start frequency, 26.5 GHz stop frequency, 500 kHz measurement bandwidth					
With correction switched off	8.7	14.5	19.5	43.6	108
With 2-port TOSM calibration	16.9	28.8	39	87.4	216
With 4-port TOSM calibration	33.2	57.3	78.1	175	434
10 MHz start frequency, 26.5 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	16.8	26.3	33.2	66.1	157
With 2-port TOSM calibration	31.9	51.2	65	131	312
With 4-port TOSM calibration	62	101	129	262	625
10 MHz start frequency, 26.5 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	70.8	239	457	1758	5442
With 2-port TOSM calibration	140	476	913	3517	10889
With 4-port TOSM calibration	278	951	1826	7039	21780
10 MHz start frequency, 43.5 GHz stop frequency, 500 kHz measurement bandwidth					
With correction switched off	10.4	18.3	23.4	47.7	113
With 2-port TOSM calibration	20.4	35.8	46.7	95.5	227
With 4-port TOSM calibration	40.2	71	93.4	191	454
10 MHz start frequency, 43.5 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	19.7	30.6	38.8	72.2	162
With 2-port TOSM calibration	37.7	59.9	76.2	143	324
With 4-port TOSM calibration	73.6	118	151	286	648
10 MHz start frequency, 43.5 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	73.7	243	463	1764	5449
With 2-port TOSM calibration	146	485	924	3529	10902
With 4-port TOSM calibration	289	969	1848	7064	21806

⁷ Sweep time is understood to be the cycle time; static frequency accuracy of the instrument applies; measured with firmware version 1.80, Windows 10 (64 bit).

Measurement accuracy of the R&S®ZNA26

The data below is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 °C after calibration. Validity of the data is conditional on using an R&S®ZN-Z235 calibration kit in order to achieve the effective system data specified below. Frequency points, measurement bandwidth and sweep time have to be identical for measurement and calibration (no interpolation of the calibration). Specifications are based on a matched DUT for transmission measurements and on an isolated DUT for reflection measurements. In both cases, a measurement bandwidth of 10 Hz and a nominal source power of 0 dBm apply for the base unit without options.

Accuracy of transmission measurements		Magnitude	Phase
10 MHz to 40 MHz	0 dB to –20 dB	0.04 dB	0.5°
	< –20 dB to –30 dB	0.23 dB	1.0°
	< –30 dB to –40 dB	0.60 dB	3.0°
	< –40 dB to –50 dB	1.50 dB	5.0°
	< –50 dB to –60 dB	4.50 dB	25°
> 40 MHz to 200 MHz	0 dB to –30 dB	0.04 dB	0.5°
	< –30 dB to –40 dB	0.05 dB	0.6°
	< –40 dB to –50 dB	0.15 dB	0.7°
	< –50 dB to –60 dB	0.45 dB	3.0°
	> 200 MHz to 10 GHz	0 dB to –30 dB	0.04 dB
> 10 GHz to 26.5 GHz	< –30 dB to –40 dB	0.05 dB	0.8°
	< –40 dB to –50 dB	0.05 dB	0.8°
	< –50 dB to –60 dB	0.09 dB	1.0°
	< –50 dB to –60 dB	0.13 dB	1.5°

Accuracy of reflection measurements	Logarithmic			Linear	
	Reflection level	Magnitude	Phase	Reflection range	Magnitude (lin)
10 MHz to 10 GHz	0 dB	0.10 dB	0.6°	0 dB to –3 dB	0.011
	–3 dB	0.10 dB	0.6°	< –3 dB to –6 dB	0.008
	–6 dB	0.11 dB	0.7°	< –6 dB to –15 dB	0.006
	–15 dB	0.25 dB	1.7°	< –15 dB to –25 dB	0.005
	–25 dB	0.74 dB	5.1°	< –25 dB to –35 dB	0.005
	–35 dB	2.16 dB	16°	< –35 dB	0.005
> 10 GHz to 20 GHz	0 dB	0.13 dB	0.9°	0 dB to –3 dB	0.015
	–3 dB	0.13 dB	0.8°	< –3 dB to –6 dB	0.010
	–6 dB	0.14 dB	0.9°	< –6 dB to –15 dB	0.008
	–15 dB	0.31 dB	2.1°	< –15 dB to –25 dB	0.007
	–25 dB	0.93 dB	6.5°	< –25 dB to –35 dB	0.006
	–35 dB	2.64 dB	20°	< –35 dB	0.006
> 20 GHz to 26.5 GHz	0 dB	0.14 dB	0.9°	0 dB to –3 dB	0.016
	–3 dB	0.14 dB	1.0°	< –3 dB to –6 dB	0.012
	–6 dB	0.17 dB	1.1°	< –6 dB to –15 dB	0.010
	–15 dB	0.39 dB	2.6°	< –15 dB to –25 dB	0.008
	–25 dB	1.15 dB	8.1°	< –25 dB to –35 dB	0.008
	–35 dB	3.21 dB	26°	< –35 dB	0.008

Measurement accuracy of the R&S®ZNA43, 2.92 mm interface

The data below is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 °C after calibration. Validity of the data is conditional on using an R&S®ZN-Z229 calibration kit in order which to achieve the effective system data specified below. Frequency points, measurement bandwidth and sweep time have to be identical for measurement and calibration (no interpolation of the calibration). Specifications are based on a matched DUT for transmission measurements and on an isolated DUT for reflection measurements. In both cases, a measurement bandwidth of 10 Hz and a nominal source power of 0 dBm apply for the base unit without options.

Accuracy of transmission measurements		Magnitude	Phase
10 MHz to 40 MHz	0 dB to -20 dB	0.04 dB	0.5°
	< -20 dB to -30 dB	0.23 dB	1.0°
	< -30 dB to -40 dB	0.60 dB	3.0°
	< -40 dB to -50 dB	1.50 dB	5.0°
	< -50 dB to -60 dB	4.50 dB	25°
> 40 MHz to 200 MHz	0 dB to -30 dB	0.04 dB	0.5°
	< -30 dB to -40 dB	0.05 dB	0.6°
	< -40 dB to -50 dB	0.15 dB	0.7°
	< -50 dB to -60 dB	0.45 dB	3.0°
> 200 MHz to 10 GHz	0 dB to -30 dB	0.04 dB	0.7°
	< -30 dB to -40 dB	0.05 dB	0.8°
	< -40 dB to -50 dB	0.05 dB	0.8°
	< -50 dB to -60 dB	0.09 dB	1.0°
> 10 GHz to 26.5 GHz	0 dB to -30 dB	0.05 dB	1.3°
	< -30 dB to -40 dB	0.06 dB	1.4°
	< -40 dB to -50 dB	0.06 dB	1.4°
	< -50 dB to -60 dB	0.13 dB	1.5°
> 26.5 GHz to 40 GHz	0 dB to -30 dB	0.06 dB	1.8°
	< -30 dB to -40 dB	0.07 dB	2.0°
	< -40 dB to -50 dB	0.07 dB	2.0°
	< -50 dB to -60 dB	0.19 dB	2.0°
> 40 GHz to 43.5 GHz (meas.)	0 dB to -30 dB	0.07 dB	2.0°
	< -30 dB to -40 dB	0.08 dB	2.2°
	< -40 dB to -50 dB	0.15 dB	2.2°
	< -50 dB to -60 dB	0.47 dB	3.9°

Accuracy of reflection measurements	Logarithmic			Linear	
	Reflection level	Magnitude	Phase	Reflection range	Magnitude (lin)
10 MHz to 10 GHz	0 dB	0.11 dB	0.8°	0 dB to -3 dB	0.013
	-3 dB	0.11 dB	0.7°	< -3 dB to -6 dB	0.009
	-6 dB	0.12 dB	0.8°	< -6 dB to -15 dB	0.007
	-15 dB	0.28 dB	1.9°	< -15 dB to -25 dB	0.006
	-25 dB	0.83 dB	5.7°	< -25 dB to -35 dB	0.006
	-35 dB	2.39 dB	18°	< -35 dB	0.006
> 10 GHz to 26.5 GHz	0 dB	0.14 dB	0.9°	0 dB to -3 dB	0.016
	-3 dB	0.14 dB	1.0°	< -3 dB to -6 dB	0.012
	-6 dB	0.17 dB	1.1°	< -6 dB to -15 dB	0.010
	-15 dB	0.39 dB	2.6°	< -15 dB to -25 dB	0.008
	-25 dB	1.15 dB	8.1°	< -25 dB to -35 dB	0.008
	-35 dB	3.21 dB	26°	< -35 dB	0.008
> 26.5 GHz to 40 GHz	0 dB	0.22 dB	1.4°	0 dB to -3 dB	0.025
	-3 dB	0.22 dB	1.5°	< -3 dB to -6 dB	0.018
	-6 dB	0.26 dB	1.7°	< -6 dB to -15 dB	0.015
	-15 dB	0.61 dB	4.1°	< -15 dB to -25 dB	0.013
	-25 dB	1.76 dB	13°	< -25 dB to -35 dB	0.013
	-35 dB	4.65 dB	41°	< -35 dB	0.013
> 40 GHz to 43.5 GHz (meas.)	0 dB	0.22 dB	1.5°	0 dB to -3 dB	0.026
	-3 dB	0.23 dB	1.5°	< -3 dB to -6 dB	0.019
	-6 dB	0.26 dB	1.8°	< -6 dB to -15 dB	0.015
	-15 dB	0.61 dB	4.2°	< -15 dB to -25 dB	0.013
	-25 dB	1.76 dB	13°	< -25 dB to -35 dB	0.013
	-35 dB	4.65 dB	41°	< -35 dB	0.013

Measurement accuracy of the R&S®ZNA43, 2.4 mm interface

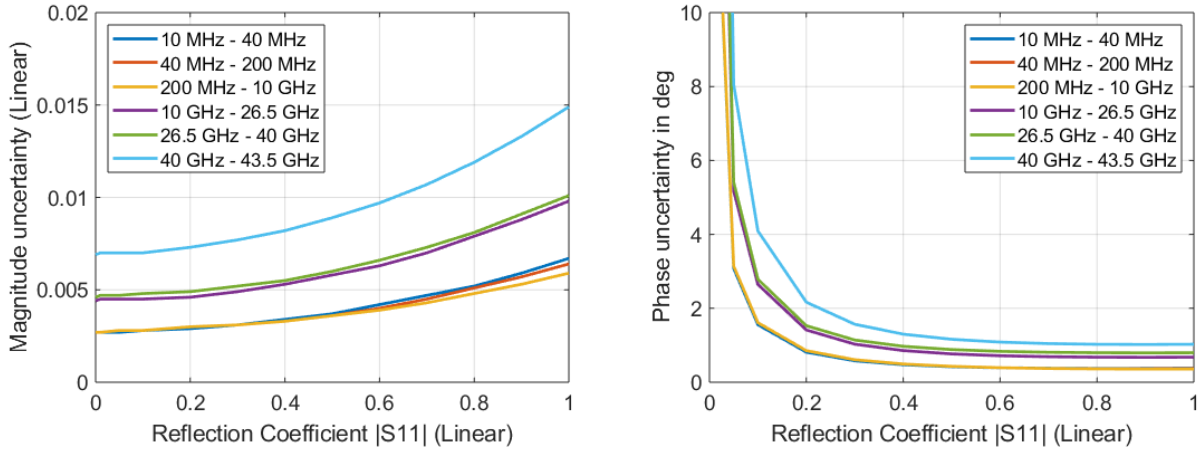
The data below is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 °C after calibration. Validity of the data is conditional on using an R&S®ZV-Z224 calibration kit with accredited calibration in order which to achieve the effective system data specified below. Frequency points, measurement bandwidth and sweep time have to be identical for measurement and calibration (no interpolation of the calibration). Specifications are based on a matched DUT for transmission measurements and on an isolated DUT for reflection measurements. In both cases, a measurement bandwidth of 10 Hz and a nominal source power of 0 dBm apply for the base unit without options.

Accuracy of transmission measurements		Magnitude	Phase
10 MHz to 40 MHz	0 dB to -20 dB	0.04 dB	0.5°
	< -20 dB to -30 dB	0.23 dB	1.0°
	< -30 dB to -40 dB	0.60 dB	3.0°
	< -40 dB to -50 dB	1.50 dB	5.0°
	< -50 dB to -60 dB	4.50 dB	25°
> 40 MHz to 200 MHz	0 dB to -30 dB	0.04 dB	0.5°
	< -30 dB to -40 dB	0.05 dB	0.6°
	< -40 dB to -50 dB	0.15 dB	0.7°
	< -50 dB to -60 dB	0.45 dB	3.0°
> 200 MHz to 10 GHz	0 dB to -30 dB	0.04 dB	0.7°
	< -30 dB to -40 dB	0.05 dB	0.8°
	< -40 dB to -50 dB	0.05 dB	0.8°
	< -50 dB to -60 dB	0.09 dB	1.0°
> 10 GHz to 20 GHz	0 dB to -30 dB	0.05 dB	1.3°
	< -30 dB to -40 dB	0.06 dB	1.4°
	< -40 dB to -50 dB	0.06 dB	1.4°
	< -50 dB to -60 dB	0.13 dB	1.5°
> 20 GHz to 40 GHz	0 dB to -30 dB	0.06 dB	1.8°
	< -30 dB to -40 dB	0.07 dB	2.0°
	< -40 dB to -50 dB	0.07 dB	2.0°
	< -50 dB to -60 dB	0.19 dB	2.0°
> 40 GHz to 43.5 GHz	0 dB to -30 dB	0.07 dB	2.0°
	< -30 dB to -40 dB	0.08 dB	2.2°
	< -40 dB to -50 dB	0.15 dB	2.2°
	< -50 dB to -60 dB	0.47 dB	3.9°

Accuracy of reflection measurements	Logarithmic			Linear	
	Reflection level	Magnitude	Phase	Reflection range	Magnitude (lin)
10 MHz to 10 GHz	0 dB	0.10 dB	0.6°	0 dB to -3 dB	0.011
	-3 dB	0.10 dB	0.6°	< -3 dB to -6 dB	0.008
	-6 dB	0.11 dB	0.7°	< -6 dB to -15 dB	0.006
	-15 dB	0.25 dB	1.7°	< -15 dB to -25 dB	0.005
	-25 dB	0.74 dB	5.1°	< -25 dB to -35 dB	0.005
	-35 dB	2.16 dB	16°	< -35 dB	0.005
> 10 GHz to 20 GHz	0 dB	0.13 dB	0.9°	0 dB to -3 dB	0.015
	-3 dB	0.13 dB	0.8°	< -3 dB to -6 dB	0.010
	-6 dB	0.14 dB	0.9°	< -6 dB to -15 dB	0.008
	-15 dB	0.31 dB	2.1°	< -15 dB to -25 dB	0.007
	-25 dB	0.93 dB	6.5°	< -25 dB to -35 dB	0.006
	-35 dB	2.64 dB	20°	< -35 dB	0.006
> 20 GHz to 40 GHz	0 dB	0.16 dB	1.1°	0 dB to -3 dB	0.019
	-3 dB	0.16 dB	1.0°	< -3 dB to -6 dB	0.013
	-6 dB	0.17 dB	1.2°	< -6 dB to -15 dB	0.010
	-15 dB	0.39 dB	2.6°	< -15 dB to -25 dB	0.008
	-25 dB	1.15 dB	8.1°	< -25 dB to -35 dB	0.008
	-35 dB	3.21 dB	26°	< -35 dB	0.008
> 40 GHz to 43.5 GHz	0 dB	0.20 dB	1.4°	0 dB to -3 dB	0.024
	-3 dB	0.20 dB	1.3°	< -3 dB to -6 dB	0.016
	-6 dB	0.22 dB	1.5°	< -6 dB to -15 dB	0.013
	-15 dB	0.49 dB	3.3°	< -15 dB to -25 dB	0.010
	-25 dB	1.43 dB	10°	< -25 dB to -35 dB	0.010
	-35 dB	3.88 dB	32°	< -35 dB	0.010

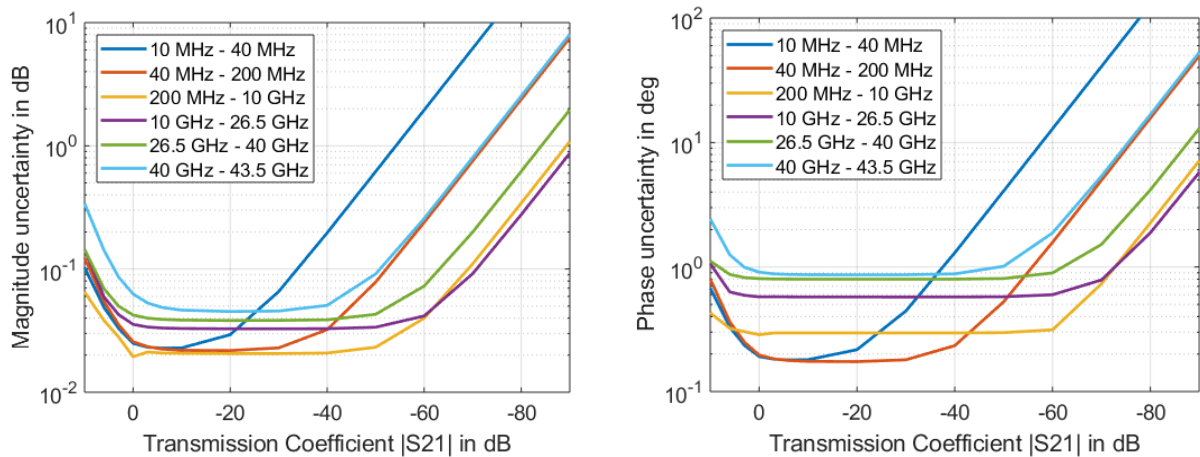
Reflection measurement accuracy of the R&S®ZNA26 and R&S®ZNA43

The diagrams below show the typical accuracy of the reflection magnitude and reflection phase measurements for the R&S®ZNA26 in the frequency range from 10 MHz to 26.5 GHz and for the R&S®ZNA43 in the frequency range from 10 MHz to 43.5 GHz. Analysis conditions: $S_{12} = S_{21} = 0$, calibration power 0 dBm, measurement power 0 dBm. Drift effects were not considered.



Transmission measurement accuracy of the R&S®ZNA26 and R&S®ZNA43

The diagrams below show the typical accuracy of the transmission magnitude and transmission phase measurements for the R&S®ZNA26 in the frequency range from 10 MHz to 26.5 GHz and for the R&S®ZNA43 in the frequency range from 10 MHz to 43.5 GHz. Analysis conditions: $S_{11} = S_{22} = 0$, calibration power 0 dBm, measurement power 0 dBm, high-quality semi-rigid cable. Drift effects were not considered.



Effective system data

The data below is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 °C after calibration. Frequency points, measurement bandwidth and sweep time have to be identical for measurement and calibration (no interpolation of the calibration). The data is based on a measurement bandwidth of 10 Hz.

R&S®ZNA26 calibrated with R&S®ZN-Z235 calibration kit	10 MHz to 10 GHz		10 GHz to 20 GHz		20 GHz to 26.5 GHz	
	Specifi- cation	Typical	Specifi- cation	Typical	Specifi- cation	Typical
Directivity in dB	46	49	44	47	42	45
Source match in dB	43	46	40	43	40	43
Load match in dB	45	48	43	46	41	44
Reflection tracking in dB	0.03	0.02	0.04	0.03	0.04	0.03
Transmission tracking in dB	0.02	0.01	0.03	0.02	0.03	0.02

R&S®ZNA43, 2.92 mm interface calibrated with R&S®ZN-Z229 calibration kit	10 MHz to 10 GHz		10 GHz to 26.5 GHz		26.5 GHz to 40 GHz	40 GHz to 43.5 GHz
	Specifi- cation	Typical	Specifi- cation	Typical	Specifi- cation	Typical Measured
Directivity in dB	45	48	42	45	38	41 38
Source match in dB	41	44	40	43	36	39 36
Load match in dB	44	47	41	44	37	40 37
Reflection tracking in dB	0.03	0.02	0.04	0.03	0.04	0.03 0.06
Transmission tracking in dB	0.02	0.01	0.03	0.02	0.04	0.03 0.05

R&S®ZNA43, 2.4 mm interface calibrated with R&S®ZN-Z224 calibration kit	10 MHz to 10 GHz		10 GHz to 20 GHz		20 GHz to 40 GHz		40 GHz to 43.5 GHz	
	Specifi- cation	Typical	Specifi- cation	Typical	Specifi- cation	Typical	Specifi- cation	Typical
Directivity in dB	46	49	44	47	42	45	40	43
Source match in dB	43	46	40	43	38	41	36	39
Load match in dB	45	48	43	46	41	44	39	42
Reflection tracking in dB	0.03	0.02	0.04	0.03	0.04	0.03	0.06	0.05
Transmission tracking in dB	0.02	0.01	0.03	0.02	0.04	0.03	0.05	0.04

Uncorrected system data

The data below is valid between +18 °C and +28 °C. It is based on a source power of –10 dBm and a measurement bandwidth of 1 kHz.

		Specification	Typical	Measured
Directivity in dB	R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 20 MHz	> 8 dB	12 dB	
	20 MHz to 20 GHz	> 10 dB	18 dB	
	20 GHz to 35 GHz	> 8 dB	15 dB	
	35 GHz to 40 GHz	> 6 dB	10 dB	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	> 6 dB	10 dB	
	R&S®ZNA43, 2.92 mm interface			
	40 GHz to 43.5 GHz			10 dB
Source match in dB	R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 20 MHz	> 8 dB	12 dB	
	20 MHz to 20 GHz	> 10 dB	18 dB	
	20 GHz to 35 GHz	> 8 dB	15 dB	
	35 GHz to 40 GHz	> 6 dB	10 dB	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	> 6 dB	10 dB	
	R&S®ZNA43, 2.92 mm interface			
	40 GHz to 43.5 GHz			10 dB
Reflection tracking in dB	R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 10 GHz	< 1.5 dB	0.5 dB	
	10 GHz to 26.5 GHz	< 2 dB	0.5 dB	
	26.5 GHz to 40 GHz	< 2.5 dB	0.5 dB	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	< 3 dB	1 dB	
	R&S®ZNA43, 2.92 mm interface			
		40 GHz to 43.5 GHz		
Transmission tracking in dB	R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 10 GHz	< 1.5 dB	0.5 dB	
	10 GHz to 26.5 GHz	< 2 dB	0.5 dB	
	26.5 GHz to 40 GHz	< 2.5 dB	0.5 dB	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	< 3 dB	1 dB	
	R&S®ZNA43, 2.92 mm interface			
		40 GHz to 43.5 GHz		
Load match in dB	R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 20 GHz	> 10 dB	18 dB	
	20 GHz to 40 GHz	> 8 dB	15 dB	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	> 6 dB	10 dB	
	R&S®ZNA43, 2.92 mm interface			
	40 GHz to 43.5 GHz			10 dB

Trace stability		1 kHz IF bandwidth	100 kHz IF bandwidth			
		Measured	Specification	Typical	Measured	
Trace noise magnitude (RMS) at 0 dBm source power, 0 dB reflection	R&S®ZNA26 and R&S®ZNA43					
	10 MHz to 20 MHz	0.010 dB	< 0.500 dB	0.100 dB		
	20 MHz to 50 MHz	0.005 dB	< 0.200 dB	0.050 dB		
	50 MHz to 150 MHz	0.001 dB	< 0.050 dB	0.010 dB		
	150 MHz to 500 MHz	0.001 dB	< 0.020 dB	0.002 dB		
	500 MHz to 20 GHz	0.001 dB	< 0.005 dB	0.002 dB		
	20 GHz to 40 GHz	0.001 dB	< 0.008 dB	0.003 dB		
	R&S®ZNA43, 2.4 mm interface					
	40 GHz to 43.5 GHz	0.001 dB	< 0.030 dB	0.007 dB		
	R&S®ZNA43, 2.92 mm interface					
	40 GHz to 43.5 GHz	0.001 dB			0.007 dB	
	Trace noise phase (RMS) at 0 dBm source power, 0 dB reflection	R&S®ZNA26 and R&S®ZNA43				
		10 MHz to 20 MHz	0.05°	< 3.00°	0.5°	
20 MHz to 50 MHz		0.020°	< 1.00°	0.20°		
50 MHz to 150 MHz		0.005°	< 0.30°	0.05°		
150 MHz to 500 MHz		0.002°	< 0.10°	0.02°		
500 MHz to 20 GHz		0.001°	< 0.04°	0.01°		
20 GHz to 40 GHz		0.002°	< 0.06°	0.02°		
R&S®ZNA43, 2.4 mm interface						
40 GHz to 43.5 GHz		0.006°	< 0.20°	0.06°		
R&S®ZNA43, 2.92 mm interface						
40 GHz to 43.5 GHz					0.06°	
Temperature dependence		10 MHz to 5 GHz			0.01 dB/K, 0.1°/K	
		5 GHz to 40 GHz			0.02 dB/K, 0.4°/K	
	40 GHz to 43.5 GHz			0.03 dB/K, 0.6°/K		

Test port output

The data below is valid from +18 °C to +28 °C.

		Specification	Typical	Measured
Power range without optional source step attenuator (for data with additional source step attenuator(s) refer to "Options")	R&S®ZNA26			
	10 MHz to 4 GHz	-80 dBm to +17 dBm	up to +20 dBm	
	4 GHz to 20 GHz	-80 dBm to +13 dBm	up to +18 dBm	
	20 GHz to 25 GHz	-80 dBm to +11 dBm	up to +15 dBm	
	25 GHz to 26.5 GHz	-80 dBm to +8 dBm	up to +11 dBm	
	R&S®ZNA43			
	10 MHz to 4 GHz	-80 dBm to +17 dBm	up to +20 dBm	
	4 GHz to 20 GHz	-80 dBm to +13 dBm	up to +16 dBm	
	20 GHz to 25 GHz	-80 dBm to +12 dBm	up to +15 dBm	
	25 GHz to 30 GHz	-80 dBm to +9 dBm	up to +12 dBm	
	30 GHz to 40 GHz	-80 dBm to +6 dBm	up to +9 dBm	
R&S®ZNA43, 2.4 mm interface				
40 GHz to 43.5 GHz	-60 dBm to +4 dBm	up to +8 dBm		
R&S®ZNA43, 2.92 mm interface				
40 GHz to 43.5 GHz			+8 dBm	
Minimum power level using optional source step attenuator (see "Options")	R&S®ZNA26 and R&S®ZNA43	-120 dBm		
Power accuracy, source power -10 dBm	R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 26.5 GHz	< 2.0 dB	0.5 dB	
	R&S®ZNA43			
	26.5 GHz to 40 GHz	< 3.0 dB	0.5 dB	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	< 3.0 dB	0.5 dB	
R&S®ZNA43, 2.92 mm interface				
40 GHz to 43.5 GHz			0.5 dB	
Power linearity referenced to -10 dBm, no power calibration	source power -40 dBm to +10 dBm ⁸ , R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 20 GHz	< 1.5 dB	0.2 dB	
	20 GHz to 40 GHz	< 2 dB	0.2 dB	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	< 2 dB	0.2 dB	
	R&S®ZNA43, 2.92 mm interface			
	40 GHz to 43.5 GHz			0.2 dB
	source power < -40 dBm, R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 20 GHz	< 2 dB	0.2 dB	
	20 GHz to 40 GHz	< 3 dB	0.2 dB	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	< 3 dB	0.2 dB	
	R&S®ZNA43, 2.92 mm interface			
	40 GHz to 43.5 GHz			0.2 dB
Power resolution		0.01 dB		

		Specification	Typical	Measured	Nominal
Second harmonics at -10 dBm	R&S®ZNA26 and R&S®ZNA43				
	10 MHz to 20 MHz	< -23 dBc	-30 dBc		
	20 MHz to 16 GHz	< -25 dBc	-40 dBc		
Third harmonics at -10 dBm	16 GHz to 43.5 GHz			-40 dBc	
	R&S®ZNA26 and R&S®ZNA43				
	10 MHz to 20 MHz	< -23 dBc	-30 dBc		
	20 MHz to 50 MHz	< -25 dBc	-50 dBc		
	50 MHz to 13 GHz	< -40 dBc	-60 dBc		
Nonharmonic spurious (nom.), low phase noise mode	13 GHz to 30 GHz			-60 dBc	
	30 GHz to 43.5 GHz				-60 dBc

⁸ Maximum power level is limited to +10 dBm or the maximum specified output power, whichever is smaller.

	Offset	10 kHz	100 kHz	200 kHz	1 MHz	5 MHz
Phase noise (nom.) in dBc (1 Hz)	R&S®ZNA26 and R&S®ZNA43					
	10 MHz to 100 MHz	-117	-117	-123	-128	-128
	100 MHz to 1.25 GHz	-108	-108	-108	-120	-125
	1.25 GHz to 2.5 GHz	-102	-102	-102	-112	-125
	2.5 GHz to 5 GHz	-95	-95	-100	-105	-120
	5 GHz to 10 GHz	-87	-87	-90	-100	-120
	10 GHz to 20 GHz	-80	-80	-85	-95	-120
	20 GHz to 26.5 GHz	-79	-79	-80	-90	-112
	26.5 GHz to 40 GHz	-72	-72	-77	-90	-110

Test port input

		Specification	Typical	Measured	Nominal
Match without system error correction, equivalent to raw test port match	R&S®ZNA26 and R&S®ZNA43				
	10 MHz to 20 GHz	> 10 dB			
	20 GHz to 40 GHz	> 8 dB			
	R&S®ZNA43, 2.4 mm interface				
	40 GHz to 43.5 GHz	> 6 dB			
	R&S®ZNA43, 2.92 mm interface				
	40 GHz to 43.5 GHz			6 dB	
Maximum nominal input level					+15 dBm
Power measurement accuracy at -10 dBm with power calibration using SMARTerCAL (UOSM)	R&S®ZNA26 and R&S®ZNA43				
	10 MHz to 26.5 GHz	< 0.1 dB			
	26.5 GHz to 40 GHz	< 0.2 dB			
	R&S®ZNA43, 2.4 mm interface				
	40 GHz to 43.5 GHz	< 0.2 dB			
	R&S®ZNA43, 2.92 mm interface				
	40 GHz to 43.5 GHz		0.2 dB		
Power measurement accuracy at -10 dBm without power calibration from +18 °C to +28 °C	R&S®ZNA26 and R&S®ZNA43				
	10 MHz to 30 GHz	< 1.5 dB	0.5 dB		
	30 GHz to 40 GHz	< 2.0 dB	0.5 dB		
	R&S®ZNA43, 2.4 mm interface				
	40 GHz to 43.5 GHz	< 2.5 dB	0.5 dB		
	R&S®ZNA43, 2.92 mm interface				
	40 GHz to 43.5 GHz			0.5 dB	

		Specification	Typical	Measured
Compression at test port input referenced to -10 dBm	R&S®ZNA26 and R&S®ZNA43			
	for 0 dBm to +10 dBm			
	10 MHz to 25 GHz	< 0.2 dB	-0.1 dB	
	for 0 dBm to +8 dBm			
	25 GHz to 40 GHz	< 0.2 dB	-0.1 dB	
	for -50 dBm to 0 dBm			
	10 MHz to 40 GHz	< 0.05 dB		
	R&S®ZNA43, 2.4 mm interface			
	for 0 dBm to +8 dBm			
	40 GHz to 43.5 GHz	< 0.2 dB	-0.1 dB	
	for -50 dBm to 0 dBm			
	40 GHz to 43.5 GHz	< 0.05 dB		
	R&S®ZNA43, 2.92 mm interface			
	for 0 dBm to +8 dBm			
40 GHz to 43.5 GHz			-0.1 dB	
for -50 dBm to 0 dBm				
	40 GHz to 43.5 GHz			0.05 dB
Damage level		+27 dBm		
Damage DC voltage		30 V		

Standard configuration		Base unit			Base unit + R&S®ZNAxx-B16 + R&S®ZNAxx-B3n ⁹		
		Specifica- tion	Typical	Measured	Specifica- tion	Typical	Measured
Noise level ¹⁰ at 1 kHz measurement bandwidth, normalized to 1 Hz	R&S®ZNA26 and R&S®ZNA43						
	10 MHz to 30 MHz	< -75 dBm	-100 dBm		< -85 dBm	-110 dBm	
	30 MHz to 100 MHz	< -92 dBm	-110 dBm		< -102 dBm	-120 dBm	
	100 MHz to 500 MHz	< -107 dBm	-125 dBm		< -117 dBm	-130 dBm	
	500 MHz to 30 GHz	< -120 dBm	-132 dBm		< -130 dBm	-142 dBm	
	30 GHz to 40 GHz	< -115 dBm	-130 dBm		< -122 dBm	-139 dBm	
	R&S®ZNA43, 2.4 mm interface						
	40 GHz to 43.5 GHz	< -105 dBm	-120 dBm		< -111 dBm	-126 dBm	
R&S®ZNA43, 2.92 mm interface							
	40 GHz to 43.5 GHz			-120 dBm			-126 dBm

Reversed coupler configuration ¹¹		Base unit + R&S®ZNAxx-B16			Base unit + R&S®ZNAxx-B16 + R&S®ZNAxx-B3n ⁹		
		Specifica- tion	Typical	Measured	Specifica- tion	Typical	Measured
Noise level at 1 kHz measurement bandwidth, normalized to 1 Hz	R&S®ZNA26 and R&S®ZNA43						
	10 MHz to 30 MHz	< -105 dBm	-122 dBm		< -115 dBm	-132 dBm	
	30 MHz to 100 MHz	< -117 dBm	-139 dBm		< -127 dBm	-149 dBm	
	100 MHz to 500 MHz	< -127 dBm	-141 dBm		< -137 dBm	-151 dBm	
	500 MHz to 30 GHz	< -127 dBm	-141 dBm		< -137 dBm	-151 dBm	
	30 GHz to 40 GHz	< -122 dBm	-137 dBm		< -129 dBm	-145 dBm	
	R&S®ZNA43, 2.4 mm interface						
	40 GHz to 43.5 GHz	< -112 dBm	-132 dBm		< -118 dBm	-138 dBm	
R&S®ZNA43, 2.92 mm interface							
	40 GHz to 43.5 GHz			-132 dBm			-138 dBm

Direct source and receiver access ¹²		Base unit + R&S®ZNAxx-B16		
		Specifica- tion	Typical	Measured
Noise level at 1 kHz measurement bandwidth, normalized to 1 Hz	R&S®ZNA26 and R&S®ZNA43			
	10 MHz to 30 MHz	< -115 dBm	-132 dBm	
	30 MHz to 100 MHz	< -127 dBm	-149 dBm	
	100 MHz to 500 MHz	< -137 dBm	-151 dBm	
	500 MHz to 30 GHz	< -137 dBm	-151 dBm	
	30 GHz to 40 GHz	< -129 dBm	-145 dBm	
	R&S®ZNA43, 2.4 mm interface			
	40 GHz to 43.5 GHz	< -118 dBm	-138 dBm	
R&S®ZNA43, 2.92 mm interface				
	40 GHz to 43.5 GHz			-138 dBm

⁹ Receiver step attenuator in 0 dB position.

¹⁰ The noise level is defined as the RMS value of the specified noise floor.

¹¹ With R&S®ZNAxx-B16 option installed, the jumpers of the direct source and receiver access connectors "Source" and "Meas" are swapped to horizontal position to enable the reverse coupler operation.

¹² Using the direct source and receiver access connectors "Meas In" and "Ref In" (jumpers removed) and no receiver attenuator installed or in 0 dB position.

Display

Main screen		touchscreen, 30.7 cm (12.1") diagonal, WXGA, 18-bit color LCD
Main screen resolution		1280 × 800 pixel, 125 dpi
Pixel failure rate		$\leq 1 \times 10^{-5}$
Auxiliary screen		touchscreen, 17.8 cm (7") diagonal, WVGA, 18-bit color LCD
Auxiliary screen resolution		480 × 800 pixel, 125 dpi
Pixel failure rate		$\leq 1.5 \times 10^{-5}$

Internal PC

Removable PC ¹³	IPC 11/4	
	CPU	Intel Core i7, x64
	clock rate	2.3 GHz
	RAM	16 Gbyte DDR3
	operating system	Windows 10 IoT Enterprise LTSC 2016
	solid state drive	≥ 128 Gbyte

Front panel connectors

USB	2.0 device connector (type A)	3
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Rear panel connectors

GPIO interface	remote control interface in line with IEEE 488, IEC 60625; 24-pin	
External handler I/O	connector for R&S®ZNB-T-Z14 handler I/O option (external) for R&S®ZNA	
LAN	local area network connector, 8-pin, RJ-45, 1 Gbit/s	
USB	2.0 device connector (type A)	4
USB device	2.0 slave connector (type B)	1
External monitor	DVI-D digital-only connector	1
	DisplayPort	1

REF IN	input for external reference frequency signal	
Connector type		
BNC, female	input frequency range	1 MHz to 50 MHz
	step size	1 Hz
	input impedance	100 Ω
SMA, female	input frequency range	100 MHz or 1 GHz
	step size	fixed frequency
	input impedance	50 Ω
Maximum permissible deviation		1 kHz
Input power		-10 dBm to +15 dBm

REF OUT	output for external reference frequency signal	
Connector type		
BNC, female	output impedance	50 Ω
	output frequency	10 MHz
	output frequency accuracy	1 Hz
	output power	+9 dBm \pm 4 dB

¹³ Internal PC is subject to change without notice.

USER CONTROL	diverse control and trigger signals, 25-pin D-Sub, 3.3 V TTL, for controlling external generators, for limit checks, sweep signals, etc.	
CHANNEL BIT 0 to CHANNEL BIT 3	pin 8 to pin 11 (outputs)	channel-specific, user-configurable bits
CHANNEL BIT 4 to CHANNEL BIT 7	pin 16 to pin 19 (outputs)	channel-specific, user-configurable bits
DRIVE PORT 1 to DRIVE PORT 4	pin 16 to pin 19 (outputs)	indicates drive ports (can alternatively be used for channel bits 4 to 7)
PASS 1 and PASS 2	pin 13 and pin 14 (outputs)	pass/fail results of limit checks
BUSY	pin 4 (output)	measurements running
READY FOR TRIGGER	pin 6 (output)	ready for trigger
EXT GEN TRIGGER	pin 21 (output)	control signal for external generator
EXT GEN BLANK	pin 22 (input)	handshake signal from external generator
EXTERNAL TRIGGER	pin 2 (input)	first trigger input for analyzer, 5 V tolerant
EXTERNAL TRIGGER 2	pin 25 (input)	second trigger input for analyzer, 5 V tolerant

Trigger In A	trigger input for analyzer	
Connector type		BNC, female
TTL signal (edge-triggered or level-triggered)		3 V, 5 V tolerant
Polarity	selectable	positive or negative
Minimum pulse width		1 μ s
Input impedance		5 k Ω (nom.)

Options

R&S®ZNA-B7 memory extension for data streaming

Timing resolution	≥ 20 MHz resolution bandwidth	8 ns
	≥ 10 MHz resolution bandwidth	16 ns
Number of wave quantities capturable	≥ 20 MHz resolution bandwidth	4
	≥ 10 MHz resolution bandwidth	8

R&S®ZNA-B8 mmWave converter LO

The data is valid in the temperatur range from +18 °C to +28 °C.

Power range	30 MHz to 26.5 GHz	
	specified	-10 dBm to +20 dBm
	typical	+25 dBm
Power accuracy, source power -10 dBm	30 MHz to 26.5 GHz	
	specified	< 2.0 dB
	typical	0.5 dB
Power linearity referenced to 0 dBm, no power calibration	30 MHz to 26.5 GHz, -10 dBm to +20 dBm	
	specified	< 2 dB
	typical	0.2 dB
Power resolution	specified	0.01 dB
Second harmonics at 0 dBm	1 GHz to 20 GHz	
	specified	< -15 dBc
	typical	-20 dBc
Third harmonics at 0 dBm	1 GHz to 13 GHz	
	specified	< -25 dBc
	typical	-30 dBc

R&S®ZNA-B26 direct IF access

Connector type		SMA, female
Impedance		50 Ω (nom.)
Frequency range	input (ADC clock 125 MHz)	100 kHz to 1 GHz (nom.)
	output, RF ≤ 5 GHz	100 kHz to 60 MHz (nom.)
	output, RF > 5 GHz	100 kHz to 2 GHz (nom.)
Interfaces		
IF Reference 1	input/output	
IF Meas 1	input/output	
IF Reference 2	input/output	
IF Meas 2	input/output	
IF Reference 3 (4-port model)	input/output	
IF Meas 3 (4-port model)	input/output	
IF Reference 4 (4-port model)	input/output	
IF Meas 4 (4-port model)	input/output	

R&S®ZNA-B91 trigger and control I/O board

Connector type		BNC, female
Interfaces		
Trigger In B	input	3 V, 5 V tolerant, impedance: 10 k Ω (nom.)
Trigger In C		
Trigger In D		
Trigger Out A	output	logic high: typ. 5 V, impedance: 50 Ω (nom.)
Trigger Out B		
Trigger Out C		
Trigger Out D		
PuMo In/Out A	input/output	input: 3 V, 5 V tolerant, impedance: 10 k Ω (nom.)
PuMo In/Out B		
PuMo In/Out C		output: logic high: typ. 5 V, impedance: 50 Ω (nom.)
PuMo In/Out D		
Ready for Trigger	output	logic high: typ. 5 V, impedance: 50 Ω (nom.)
Busy	output	logic high: typ. 5 V, impedance: 50 Ω (nom.)
RF Off Control	input	pull up resistor 4.7 k Ω on 3.3V

R&S®ZNA26-B16 and R&S®ZNA43-B16 direct source and receiver access

Frequency range	R&S®ZNA26-B16	
	specified	10 MHz to 26.5 GHz
	nominal	100 kHz to 26.5 GHz
	R&S®ZNA43-B16, 2.4 mm interface	
	specified	10 MHz to 43.5 GHz
	nominal	100 kHz to 43.5 GHz
	R&S®ZNA43-B16, 2.92 mm interface	
	specified	10 MHz to 40 GHz
	measured	40 GHz to 43.5 GHz
nominal	100 kHz to 43.5 GHz	
Damage level	+20 dBm, 0 V DC	
Dynamic range is reduced by	10 MHz to 1 GHz	0 dB
	1 GHz to 40 GHz	2 dB
	40 GHz to 43.5 GHz	3 dB

R&S®ZNA26-B21/-B22/-B23/-B24 and R&S®ZNA43-B21/-B22/-B23/-B24 source step attenuators

Frequency range	R&S®ZNA26-B21/-B22/-B23/-B24	10 MHz to 26.5 GHz
	R&S®ZNA43-B21/-B22/-B23/-B24	10 MHz to 43.5 GHz
Attenuation (nominal)	0 dB to 70 dB in 10 dB steps	
Minimum output power is reduced to	-120 dBm	
Maximum output power and dynamic range are reduced by	10 MHz to 16 GHz	1 dB
	16 GHz to 30 GHz	2 dB
	30 GHz to 40 GHz	3 dB
	40 GHz to 43.5 GHz	4 dB

R&S®ZNA26-B31/-B32/-B33/-B34 and R&S®ZNA43-B31/-B32/-B33/-B34 receiver step attenuators

Frequency range	R&S®ZNA26-B31/-B32/-B33/-B34	10 MHz to 26.5 GHz
	R&S®ZNA43-B31/-B32/-B33/-B34	10 MHz to 43.5 GHz
Attenuation	preset setting 10 dB	0 dB to 35 dB in 5 dB steps
Step attenuator accuracy; attenuation > 0 dB, referenced to attenuation = 10 dB	10 MHz to 20 GHz	≤ 1 dB
	20 GHz to 40 GHz	≤ 1.5 dB
	40 GHz to 43.5 GHz	≤ 2 dB
Dynamic range is increased by	10 MHz to 500 MHz	0 dB
	500 MHz to 1 GHz	5 dB
	1 GHz to 30 GHz	8 dB
	30 GHz to 40 GHz	7 dB
	40 GHz to 43.5 GHz	6 dB
Noise floor is reduced by	10 MHz to 30 GHz	10 dB
	30 GHz to 40 GHz	7 dB
	40 GHz to 43.5 GHz	6 dB

R&S®ZNA26-B41/-B42/-B43/-B44 and R&S®ZNA43-B41/-B42/-B43/-B44 internal pulse modulators

Frequency range	R&S®ZNA26-B41/-B42/-B43/-B44	10 MHz to 26.5 GHz
	R&S®ZNA43-B41/-B42/-B43/-B44	10 MHz to 43.5 GHz
Pulse generator	pulse period	200 ns to 30 s in 8 ns steps (nom.)
	pulse width	8 ns to 15 s in 4 ns steps (nom.)
Pulse modulator	minimum pulse width	40 ns (nom.)
On/off ratio	10 MHz to 18 GHz	80 dB (nom.)
	18 GHz to 43.5 GHz	100 dB (nom.)
Rise/fall time		20 ns (nom.)
Dynamic range		no impact

R&S®ZNA26-B161/R&S®ZNA43-B161 source monitor access port 1 and R&S®ZNA26-B163/R&S®ZNA43-B163 source monitor access port 1 and port 3

Frequency range	R&S®ZNA26-B161/-B163	10 MHz to 26.5 GHz
	R&S®ZNA43-B161/-B163	10 MHz to 43.5 GHz
Maximum output power and dynamic range are reduced by	10 MHz to 30 GHz	2 dB
	30 GHz to 40 GHz	3 dB
	40 GHz to 43.5 GHz	4 dB

R&S®ZNA26-B213, R&S®ZNA43-B213 internal combiner, port 1 and port 3

Frequency range	R&S®ZNA26-B213	10 MHz to 26.5 GHz
	R&S®ZNA43-B213	10 MHz to 43.5 GHz
Maximum output power and dynamic range are reduced by	10 MHz to 30 GHz	1 dB
	30 GHz to 40 GHz	2 dB
	40 GHz to 43.5 GHz	3 dB
Maximum output power and dynamic range in combined state for port 1 and 3 are reduced by	10 MHz to 30 MHz	10 dB
	30 MHz to 100 MHz	7 dB
	100 MHz to 1 GHz	6 dB
	1 GHz to 16 GHz	7 dB
	16 GHz to 30 GHz	8 dB
	30 GHz to 43.5 GHz	9 dB
Power range		no impact
Power accuracy		no impact

R&S®ZNA-K1 spectrum analyzer mode (based on fast Fourier transform)

Impedance		50 Ω
Test port connector	R&S®ZNA26	3.5 mm, male, ruggedized
	R&S®ZNA43, 2.92 mm interface	2.92 mm, male, ruggedized
	R&S®ZNA43, 2.4 mm interface	2.4 mm, male, ruggedized
Frequency range	R&S®ZNA26	10 MHz to 26.5 GHz
	R&S®ZNA43	10 MHz to 43.5 GHz
Test port		selectable
DC block		standard
Number of points		2 to 100001
Resolution bandwidth (–3 dB)	1/1.5/2/3/5/7 steps	1 Hz to 1.5 MHz

Standard configuration	Base unit		Base unit + R&S®ZNAxx-B16 + R&S®ZNAxx-B2n	
		Nominal		Nominal
	R&S®ZNA26 or R&S®ZNA43			
Noise level ¹⁴ at 1 kHz measurement bandwidth, normalized to 1 Hz, IF gain 10 dB	10 MHz to 30 MHz	–100 dBm		–110 dBm
	30 MHz to 100 MHz	–110 dBm		–120 dBm
	100 MHz to 500 MHz	–125 dBm		–130 dBm
	500 MHz to 30 GHz	–132 dBm		–142 dBm
	30 GHz to 40 GHz	–130 dBm		–139 dBm
	40 GHz to 43.5 GHz	–120 dBm		–126 dBm

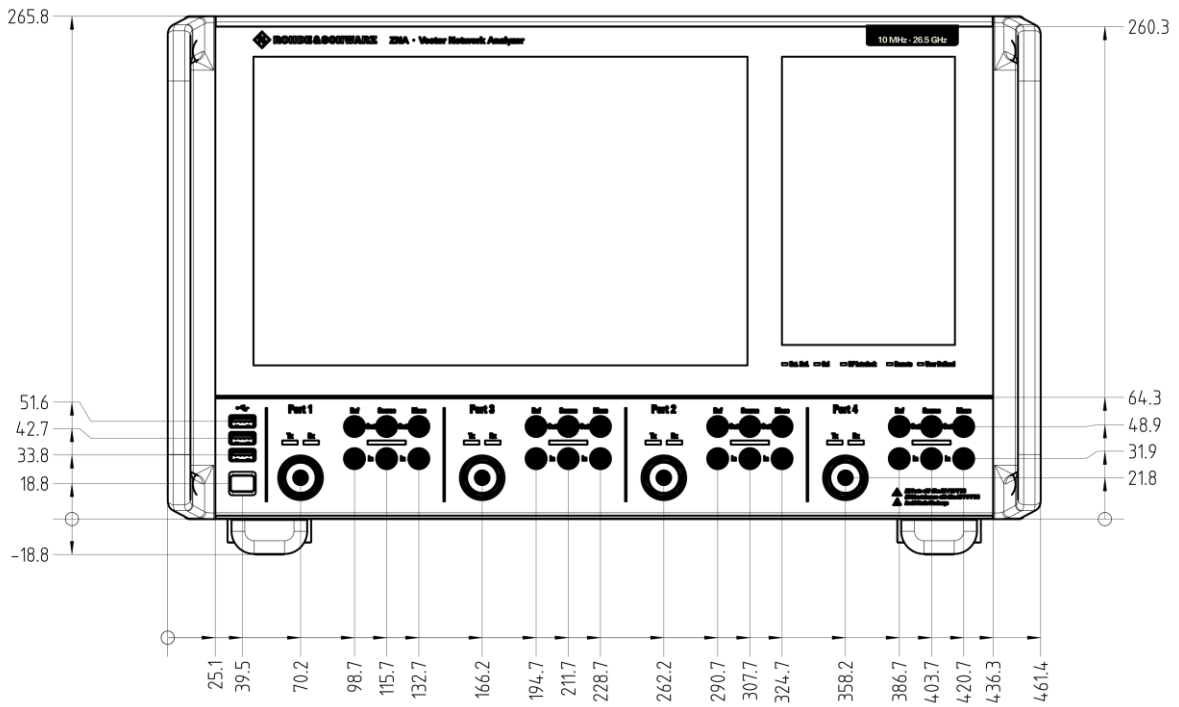
¹⁴ The noise level is defined as the RMS value of the specified noise floor.

General data

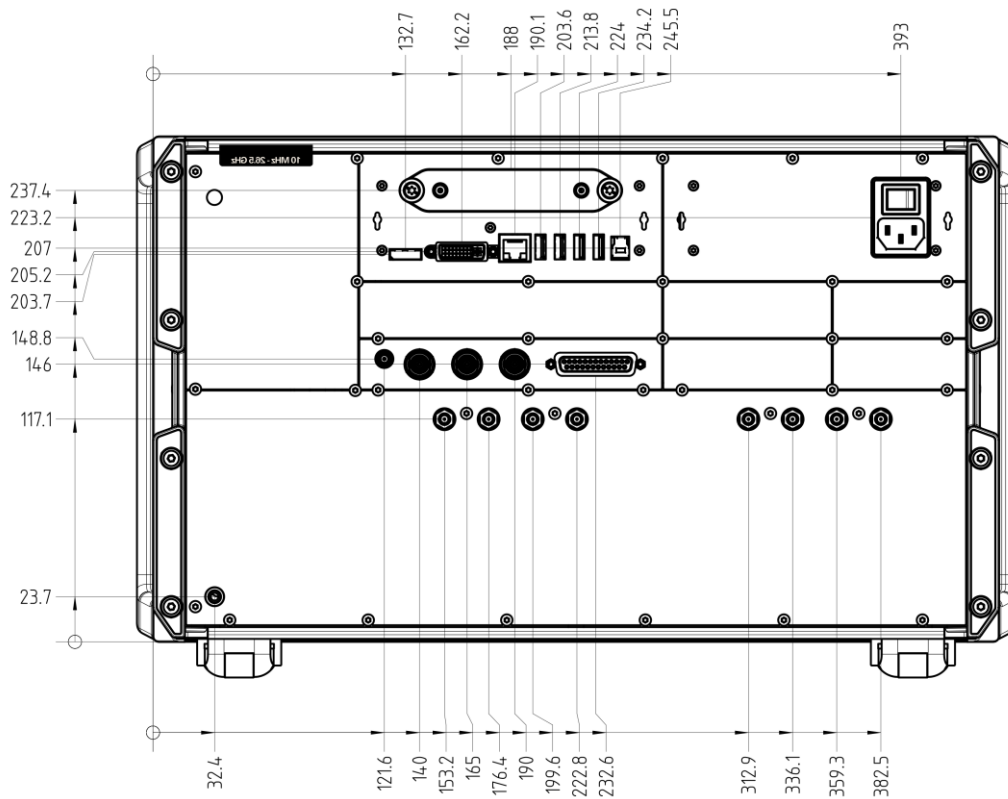
Temperature loading		in line with IEC 60068-2-1 and IEC 60068-2-2
	operating temperature range	+5 °C to +40 °C
	storage temperature range	-20 °C to +60 °C
Damp heat		+40 °C at 85 % rel. humidity, in line with IEC 60068-2-30
Max. operating altitude	above sea level	4600 m (approx. 15100 feet)
Mechanical resistance	vibration, sinusoidal	5 Hz to 55 Hz, 0.15 mm constant amplitude, 55 Hz to 150 Hz, 0.5 g constant, in line with IEC 60068-2-6
	vibration, random	10 Hz to 300 Hz, acceleration 1.2 g (RMS), in line with IEC 60068-2-64
	shock	40 g shock spectrum, in line with MIL-STD-810E method no. 516.4 procedure I
Calibration interval		1 year
EMC	RF emission	in line with CISPR 11/EN 55011 group 1 class A (for a shielded test setup); instrument complies with the emission requirements stipulated by EN 55011 and EN 61326-1 class A; this means that the instrument is suitable for use in industrial environments
	immunity	in line with EMC Directive 2004/108/EC including: IEC/EN 61326-1 (immunity test requirements for industrial environments, EN 61326 table 2), IEC/EN 61326-2-1, IEC/EN 61000-3-2, IEC/EN 61000-3-3
Safety		in line with IEC 61010-1, EN 61010-1 and UL 61010-1, CSA C22.2 61010-1
Power supply		100 V to 240 V at 50 Hz to 60 Hz and 400 Hz, max. 7.3 A to 4.6 A (respectively)
Power consumption	2-port model	≤ 450 W (specification), 300 W (typical)
	4-port model	≤ 550 W (specification), 350 W (typical)
Conformity marking		VDE, GS, cCSA _{US} , CE, KCC conformity mark
Dimensions (W × H × D)		EIA RU1 = 6 ¹⁵ , 461.4 mm × 284.6 mm × 462.1 mm (18.2 in × 11.2 in × 18.2 in)
Weight	2-port model	24 kg (52.9 lb)
	4-port model	29 kg (63.9 lb)
Shipping weight	2-port model	30 kg (66.2 lb)
	4-port model	35 kg (77.2 lb)

¹⁵ Electronics Industry Association rack units. 1 RU = 1.75 in.

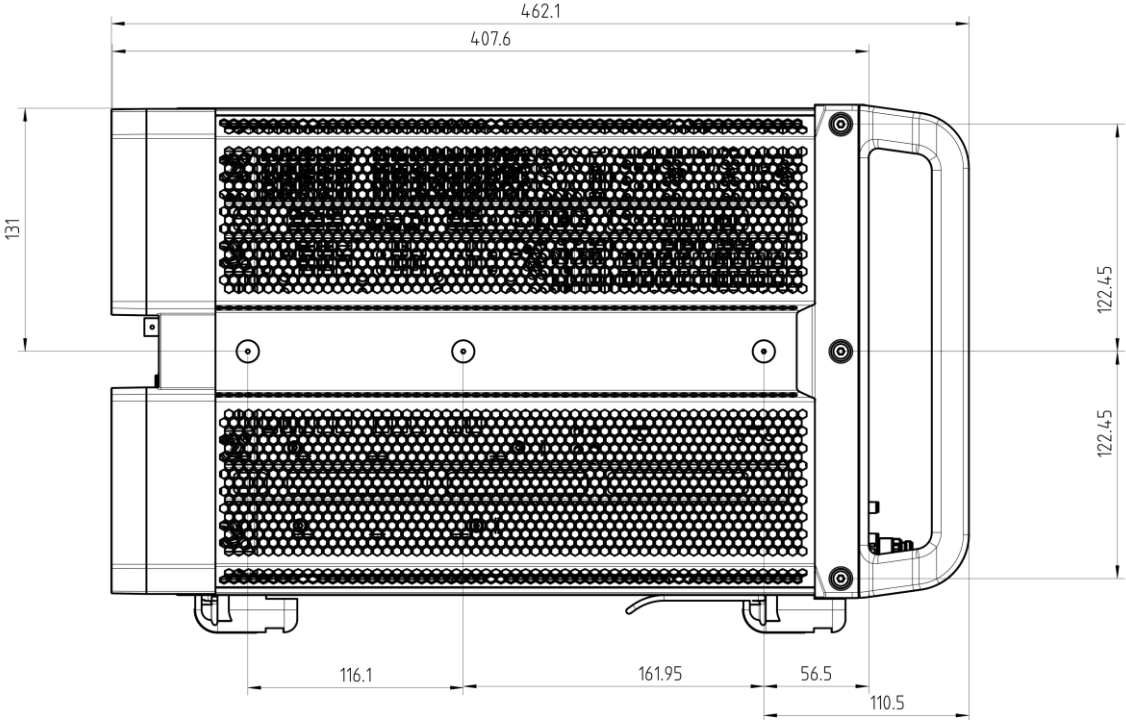
Dimensions (in mm)



Front view of the R&S®ZNA



Rear view of the R&S®ZNA



Side view of the R&S[®]ZNA

Ordering information

Designation	Type	Requires	Service center upgrade ¹⁶	On-site upgrade ¹⁷	Order No.
Base unit					
Vector network analyzer, 2 ports, 26.5 GHz, 3.5 mm connectors	R&S®ZNA26				1332.4500K22
Vector network analyzer, 4 ports, 26.5 GHz, 3.5 mm connectors	R&S®ZNA26				1332.4500K24
Vector network analyzer, 2 ports, 43.5 GHz, 2.92 mm connectors	R&S®ZNA43				1332.4500K42
Vector network analyzer, 4 ports, 43.5 GHz, 2.92 mm connectors	R&S®ZNA43				1332.4500K44
Vector network analyzer, 2 ports, 43.5 GHz, 2.4 mm connectors	R&S®ZNA43				1332.4500K43
Vector network analyzer, 4 ports, 43.5 GHz, 2.4 mm connectors	R&S®ZNA43				1332.4500K45
Options					
Precision frequency reference (OCXO)	R&S®ZNA-B4		yes		1332.4530.02
2nd internal LO source	R&S®ZNA-B5	4-port model	yes		1332.4675.02
Memory streaming extension	R&S®ZNA-B7		yes		1332.4546.02
mmWave converter LO	R&S®ZNA-B8		yes		1332.4652.02
Additional removable hard disk (includes image and HDD module)	R&S®ZNA-B19		yes	yes	1332.4600.02
Direct IF access	R&S®ZNA-B26		yes		1332.4598.02
Trigger and control I/O board	R&S®ZNA-B91		yes		1332.4800.02
3rd and 4th internal source for R&S®ZNA26	R&S®ZNA26-B3	4-port model	yes		1332.4523.02
3rd and 4th internal source for R&S®ZNA43	R&S®ZNA43-B3	4-port model	yes		1332.4617.02
Direct source and receiver access for R&S®ZNA26	R&S®ZNA26-B16	2-port model	yes (U)		1332.4581.22
	R&S®ZNA26-B16	4-port model	yes (U)		1332.4581.24
Direct source and receiver access for R&S®ZNA43	R&S®ZNA43-B16	2-port model	yes (U)		1332.4581.42
	R&S®ZNA43-B16	4-port model	yes (U)		1332.4581.44
Source step attenuator for R&S®ZNA26					
Port 1	R&S®ZNA26-B21		yes (U)		1332.4630.21
Port 2	R&S®ZNA26-B22		yes (U)		1332.4630.22
Port 3	R&S®ZNA26-B23		yes (U)		1332.4630.23
Port 4	R&S®ZNA26-B24		yes (U)		1332.4630.24
Source step attenuator for R&S®ZNA43					
Port 1	R&S®ZNA43-B21		yes (U)		1332.4646.21
Port 2	R&S®ZNA43-B22		yes (U)		1332.4646.22
Port 3	R&S®ZNA43-B23		yes (U)		1332.4646.23
Port 4	R&S®ZNA43-B24		yes (U)		1332.4646.24
Receiver step attenuator for R&S®ZNA26					
Port 1	R&S®ZNA26-B31		yes (U)		1332.4700.31
Port 2	R&S®ZNA26-B32		yes (U)		1332.4700.32
Port 3	R&S®ZNA26-B33		yes (U)		1332.4700.33
Port 4	R&S®ZNA26-B34		yes (U)		1332.4700.34
Receiver step attenuator for R&S®ZNA43					
Port 1	R&S®ZNA43-B31		yes (U)		1332.4717.31
Port 2	R&S®ZNA43-B32		yes (U)		1332.4717.32
Port 3	R&S®ZNA43-B33		yes (U)		1332.4717.33
Port 4	R&S®ZNA43-B34		yes (U)		1332.4717.34

¹⁶ Option may also be ordered at a later date; upgrade by Rohde & Schwarz service center. For upgrades, please order the designated U option instead of the B option.

¹⁷ Option may be installed by the user on site.

Designation	Type	Requires	Service center upgrade ¹⁶	On-site upgrade ¹⁷	Order No.
Internal pulse modulator for R&S®ZNA26					
Port 1	R&S®ZNA26-B41		yes		1332.4775.41
Port 2	R&S®ZNA26-B42		yes		1332.4775.42
Port 3	R&S®ZNA26-B43		yes		1332.4775.43
Port 4	R&S®ZNA26-B44		yes		1332.4775.44
Internal pulse modulator for R&S®ZNA43					
Port 1	R&S®ZNA43-B41		yes		1332.4781.41
Port 2	R&S®ZNA43-B42		yes		1332.4781.42
Port 3	R&S®ZNA43-B43		yes		1332.4781.43
Port 4	R&S®ZNA43-B44		yes		1332.4781.44
Source monitor access port 1 for R&S®ZNA26	R&S®ZNA26-B161		yes (U)		1332.4823.51
Source monitor access port 1 for R&S®ZNA43	R&S®ZNA43-B161		yes (U)		1332.4830.51
Source monitor access port 1 and port 3 for R&S®ZNA26	R&S®ZNA26-B163	4-port model	yes (U)		1332.4823.53
Source monitor access port 1 and port 3 for R&S®ZNA43	R&S®ZNA43-B163	4-port model	yes (U)		1332.4830.53
Internal combiner port 1 and port 3 for R&S®ZNA26	R&S®ZNA26-B213	4-port model	yes		1332.4846.13
Internal combiner port 1 and port 3 for R&S®ZNA43	R&S®ZNA43-B213	4-port model	yes		1332.4869.13
Spectrum analyzer mode	R&S®ZNA-K1		yes		1332.5320.02
Time domain analysis (TDR)	R&S®ZNA-K2		yes	yes	1332.5336.02
Extended time domain analysis (incl. eye diagram)	R&S®ZNA-K20	R&S®ZNA-K2	yes	yes	1332.4746.02
Scalar mixer and arbitrary frequency-converting measurements	R&S®ZNA-K4		yes	yes	1332.5342.02
Vector corrected converter measurements (without reference mixer and phase reference)	R&S®ZNA-K5	R&S®ZNA-K4	yes	yes	1332.5359.02
Measurements on pulsed signals	R&S®ZNA-K7	R&S®ZNA-K17 together with pulse modulator ¹⁸	yes	yes	1332.5371.02
Group delay measurements on frequency converters without LO access	R&S®ZNA-K9	R&S®ZNA-K4	yes	yes	1332.5394.02
Increased IF bandwidth 30 MHz	R&S®ZNA-K17		yes	yes	1332.5459.02
1 mHz frequency resolution	R&S®ZNA-K19		yes	yes	1332.5513.02

Designation	Type	Order No.
Recommended calibration and verification accessories		
Calibration kits (manual calibration)		
Calibration kit, 0 Hz to 26.5 GHz, 3.5 mm	R&S®ZN-Z235	1336.8500.02
Calibration kit, 0 Hz to 43.5 GHz, 2.92 mm	R&S®ZN-Z229	1336.7004.02
Calibration kit, 0 Hz to 50.0 GHz, 2.4 mm	R&S®ZN-Z224	1339.5002.02
Calibration kit, 0 Hz to 67.0 GHz, 1.85 mm	R&S®ZN-Z218	1337.3502.02
Calibration units (automatic calibration)		
Calibration unit, 100 kHz to 8.5 GHz, 2 ports, 3.5 mm (f)	R&S®ZN-Z51	1319.5507.32
Calibration unit, 100 kHz to 8.5 GHz, 4 ports, 3.5 mm (f)	R&S®ZN-Z51	1319.5507.34
Calibration unit, 100 kHz to 26.5 GHz, 2 ports, 3.5 mm (f)	R&S®ZN-Z53	1335.7046.32
Calibration unit, 9 kHz to 40 GHz, 2 ports, 2.92 mm (f)	R&S®ZN-Z54	1335.7117.92
Calibration unit, 9 kHz to 50 GHz, 2 ports, 2.4 mm (f)	R&S®ZN-Z55	1335.7181.42
Calibration unit, 5 GHz to 67 GHz, 2 ports, 1.85 mm (f)	R&S®ZN-Z156	1332.7239.02

¹⁸ R&S®ZNAxx-B41/-B42/-B43/-B44, and/or R&S®ZNA-B91(control of external pulse modulator).

Designation	Type	Order No.
Verification kits		
T-check verification device, 45 MHz to 26.5 GHz, 3.5 mm (f to m)	R&S®ZV-Z335	1319.1018.02
T-check verification device, 45 MHz to 40 GHz, 2.92 mm (f to m)	R&S®ZV-Z329	1319.1024.02
T-check verification device, 45 MHz to 50 GHz, 2.4 mm (f to m)	R&S®ZV-Z324	1319.1030.02
Verification kit, 45 MHz to 26.5 GHz, 3.5 mm	R&S®ZV-Z435	1319.1060.02
Verification kit, 45 MHz to 40.0 GHz, 2.92 mm	R&S®ZV-Z429	1319.1076.02
Verification kit, 45 MHz to 50.0 GHz, 2.4 mm	R&S®ZV-Z424	1319.1082.02
Hardware add-ons		
19" rack adapter	R&S®ZZA-KN6	1332.4498.02
Cable set for R&S®ZNA-K9 (3.5 mm for R&S®ZNA26)	R&S®ZNA26-Z9	1332.4730.26
Cable set for R&S®ZNA-K9 (2.92 mm for R&S®ZNA43)	R&S®ZNA43-Z9	1332.4730.43
Cable set for R&S®ZNA-K9 (2.4 mm for R&S®ZNA43)	R&S®ZNA43-Z9	1332.4730.44
Torque wrench for 3.5/2.92/2.4/1.85 mm connector, 8 mm width, 0.9 Nm torque	R&S®ZTW	1328.8534.35
Torque wrench for R&S®ZNA test port connector, 19 mm width, 0.9 Nm torque	R&S®ZTW	1328.8534.19

Warranty		
Base unit		3 years
All other items ¹⁹		1 year
Options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	

Extended warranty with a term of one and two years (WE1 and WE2)

Repairs carried out during the contract term are free of charge ²⁰. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration coverage (CW1 and CW2)

Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs ²⁰ and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

Extended warranty with accredited calibration (AW1 and AW2)

Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated under accreditation, inspected and maintained during the term of the contract. It includes all repairs ²⁰ and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

¹⁹ For options that are installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

²⁰ Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

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