R&S®ZNLE
VECTOR NETWORK ANALYZER

Specifications

Specifications
Version 07.00

ROHDE&SCHWARZ
Make ideas real

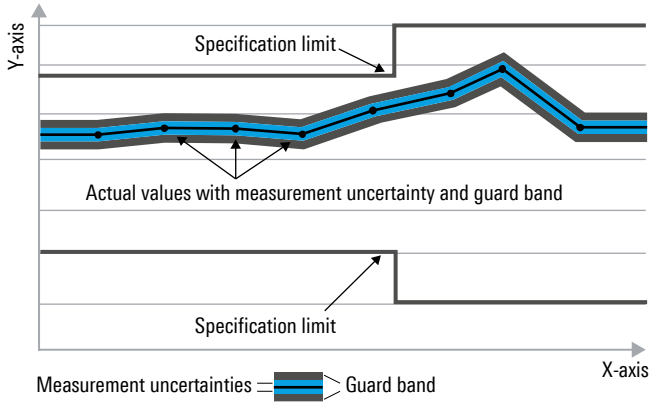
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours of storage at ambient temperature followed by 30 minutes of warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

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 <, ≤, >, ≥, ± 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.



Non-traceable specifications with limits (n. trc.)
Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

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 designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

Specifications

Measurement range

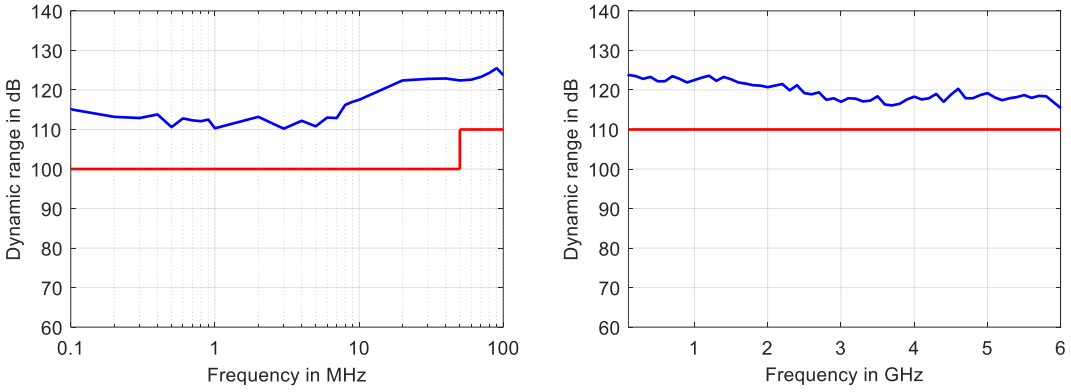
Impedance		50 Ω
Test port connector		N, female
Number of test ports		2
Frequency range [1]	without R&S®ZNLE-B100 low frequency extension option	
	R&S®ZNLE3	1 MHz to 3 GHz
	R&S®ZNLE4	1 MHz to 4.5 GHz
	R&S®ZNLE6	1 MHz to 6 GHz
	R&S®ZNLE14	1 MHz to 14 GHz
	R&S®ZNLE18	1 MHz to 18 GHz (overrange to 20 GHz)
	with R&S®ZNLE-B100 low frequency extension option	
	R&S®ZNLE3	100 kHz to 3 GHz
	R&S®ZNLE4	100 kHz to 4.5 GHz
	R&S®ZNLE6	100 kHz to 6 GHz
	R&S®ZNLE14	100 kHz to 14 GHz
	R&S®ZNLE18	100 kHz to 18 GHz (overrange to 20 GHz)

Static frequency accuracy		(time since last adjustment × aging rate) + temperature drift + calibration accuracy
Aging per year		$\pm 1 \times 10^{-6}$
Temperature drift (+5 °C to +40 °C)		$\pm 1 \times 10^{-6}$
Achievable initial calibration accuracy		$\pm 5 \times 10^{-7}$

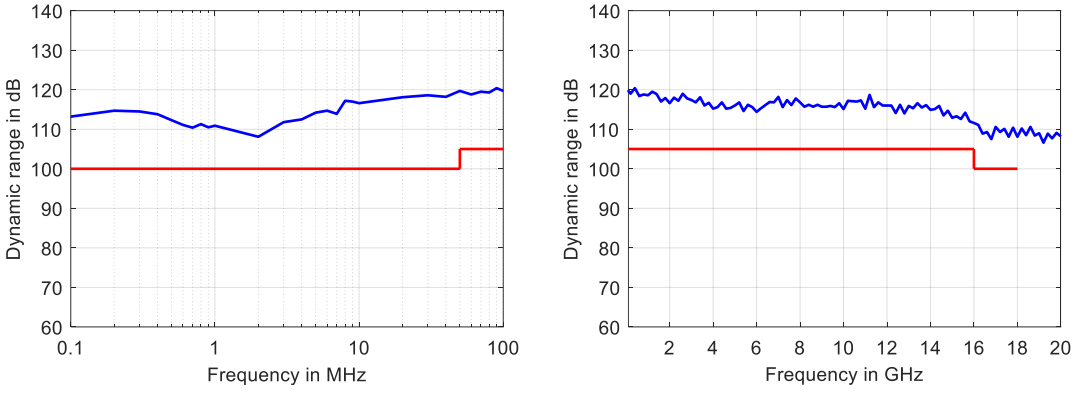
Frequency resolution		1 Hz
Number of measurement points	per trace	1 to 5001
Measurement bandwidth	1/1.5/2/3/5/7 steps	1 Hz to 500 kHz

[1] Specified and typical data given in this specifications document apply to the R&S®ZNLE3, R&S®ZNLE4, R&S®ZNLE6, R&S®ZNLE14 and R&S®ZNLE18; note their respective frequency ranges.

		Specification	Typical
Dynamic range [2]	R&S®ZNLE3, R&S®ZNLE4 and R&S®ZNLE6		
	100 kHz to 50 MHz	> 100 dB	110 dB
	50 MHz to 6 GHz	> 110 dB	120 dB
	R&S®ZNLE14 and R&S®ZNLE18		
	100 kHz to 50 MHz	> 100 dB	110 dB
	50 MHz to 16 GHz	> 105 dB	120 dB
	16 GHz to 18 GHz	> 100 dB	110 dB
	18 GHz to 20 GHz		110 dB



Measured dynamic range in dB versus frequency for the R&S®ZNLE3, R&S®ZNLE4 and R&S®ZNLE6



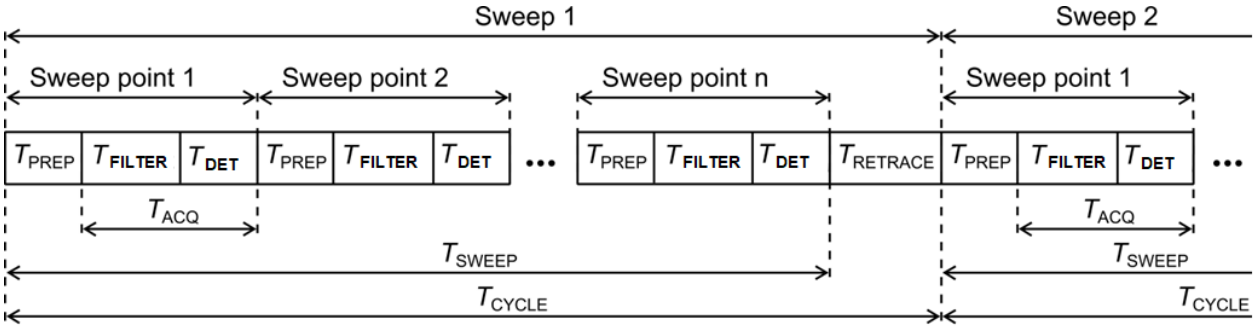
Measured dynamic range in dB versus frequency for the R&S®ZNLE14 and R&S®ZNLE18

[2] The dynamic range is defined as the difference between 0 dBm source power and 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 system error correction. The dynamic range can be increased by using a measurement bandwidth of 1 Hz.

Measurement speed

Measurement time	sweep type: CW, center frequency: 1 GHz, meas.: S_{11}, bandwidth: selectivity normal, number of points: 201	
Time per sweep (T_{SWEEP})	bandwidth 500 kHz	920 µs
	bandwidth 100 kHz	2.65 ms
Sweep cycle time (T_{CYCLE})	bandwidth 500 kHz	1.6 ms (meas.)
	bandwidth 100 kHz	3.6 ms (meas.)
Preparation time per sweep point (T_{PREP})		0.6 µs [3]
Acquisition time per point (T_{ACQ})	bandwidth 500 kHz	4.0 µs
	bandwidth 100 kHz	12.7 µs
Total time per point (T_{POINT})	bandwidth 500 kHz	4.6 µs
	bandwidth 100 kHz	13.2 µs

Data transfer time	sweep type: CW, center frequency: 1 GHz, meas.: S_{11}, bandwidth: 500 kHz selectivity normal			
		IEC/IEEE	VXI11	HiSLIP
			over 1 GBit/s LAN	
Time for measurement and data transfer (magnitude, REAL32) [4], includes all necessary remote commands	for 201 measurements points	10 ms (meas.)	8 ms (meas.)	8 ms (meas.)
	for 5001 measurements points	46 ms (meas.)	31 ms (meas.)	31 ms (meas.)
Data transfer time (magnitude, REAL32), includes all necessary remote commands	for 201 measurements points	4 ms (meas.)	2.5 ms (meas.)	2.5 ms (meas.)
	for 5001 measurements points	18 ms (meas.)	3.5 ms (meas.)	3.5 ms (meas.)



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 ($T_{ACQ} = T_{FILTER} + T_{DET}$)
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 ($T_{CYCLE} = T_{SWEEP} + T_{RETRACE}$)

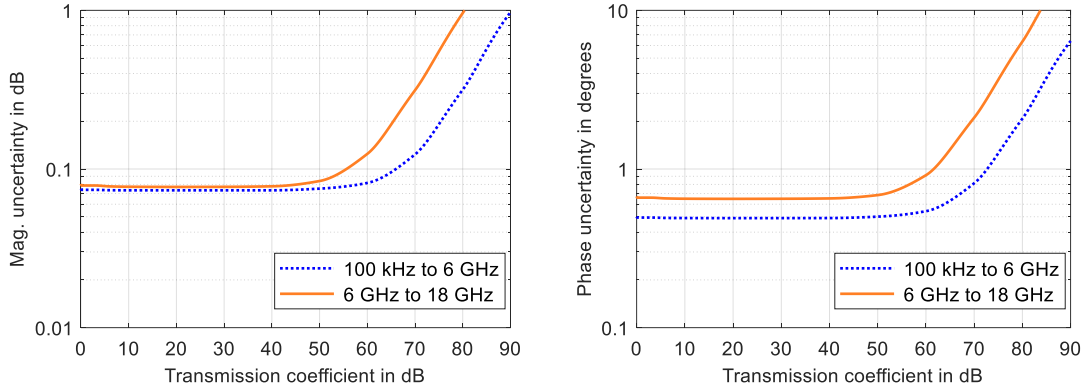
[3] Only sweep type “CW”. When sweep type “Lin Freq” or “Log Freq” preparation time increases.
[4] In continuous mode, no additional time for data transfer is needed, as data transfer takes place simultaneously with the measurement.

Nominal sweep times in ms versus number of measurement					
Number of measurement points	**51**	**201**	**401**	**1601**	**5001**
R&S®ZNLE3, R&S®ZNLE4 and R&S®ZNLE6					
800 MHz start frequency, 1 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	2.4	4.9	8.7	31.2	94
With 2-port TOSM calibration	3.9	9.6	16.7	61.7	189
800 MHz start frequency, 1 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	66	258	515	2055	6400
With 2-port TOSM calibration	132	515	1028	4100	12780
100 MHz start frequency, 3 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	3.9	9.1	14.5	36.7	102
With 2-port TOSM calibration	7.3	17.7	28.8	73.3	206
100 MHz start frequency, 3 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	68	262	519	2055	6390
With 2-port TOSM calibration	136	524	1040	4110	12800
100 MHz start frequency, 6 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	3.9	9.5	15.4	47	104
With 2-port TOSM calibration	7.3	18.8	30.5	95	209
100 MHz start frequency, 6 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	68	263	521	2070	6400
With 2-port TOSM calibration	136	525	1042	4120	12800
R&S®ZNLE14 and R&S®ZNLE18					
9 GHz start frequency, 10 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	5.3	11.8	18.8	59	174
With 2-port TOSM calibration	9.9	22.7	36.5	117	347
9 GHz start frequency, 10 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	69.4	265	524	2077	6491
With 2-port TOSM calibration	138	529	1047	4159	13524
100 MHz start frequency, 14 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	12.7	31.1	52.4	140	287
With 2-port TOSM calibration	24.7	61.4	104	281	577
100 MHz start frequency, 14 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	76.9	284	558	2160	6614
With 2-port TOSM calibration	153	568	1115	4326	13800
100 MHz start frequency, 20 GHz stop frequency, 100 kHz measurement bandwidth					
With correction switched off	12.7	31.4	51.4	134	294
With 2-port TOSM calibration	24.8	62.2	102	269	589
100 MHz start frequency, 20 GHz stop frequency, 1 kHz measurement bandwidth					
With correction switched off	76.9	285	556	2154	6622
With 2-port TOSM calibration	153	569	1113	4314	13819

Measurement accuracy

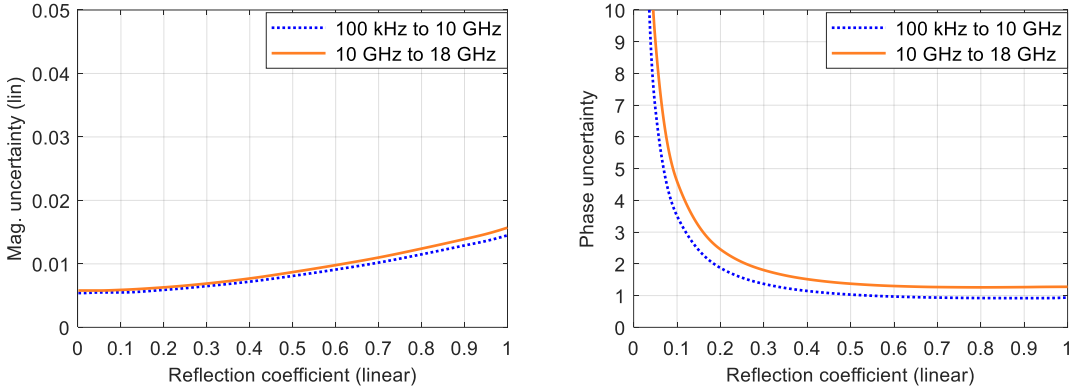
This data is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 °C since calibration. Validity of the data is conditional on the use of an R&S®ZV-Z270 calibration kit and TOSM/SOLT calibration. This calibration kit is used to achieve the effective system data specified below. Frequency points, measurement bandwidth and sweep time have to be identical for measurement and calibration (no interpolation allowed).

Uncertainty of transmission measurements		**Magnitude**	**Phase**
100 kHz to 6 GHz	0 dB to –20 dB	0.08 dB	0.5°
	–20 dB to –30 dB	0.08 dB	0.5°
	–30 dB to –40 dB	0.08 dB	0.5°
	–40 dB to –50 dB	0.09 dB	0.6°
	–50 dB to –60 dB	0.19 dB	1.2°
6 GHz to 18 GHz	0 dB to –20 dB	0.08 dB	0.7°
	–20 dB to –30 dB	0.08 dB	0.7°
	–30 dB to –40 dB	0.09 dB	0.7°
	–40 dB to –50 dB	0.12 dB	0.9°
	–50 dB to –60 dB	0.31 dB	2.1°
Specifications are based on a matched DUT, a measurement bandwidth of 10 Hz and a nominal source power of –10 dBm.			



Measured uncertainty of transmission magnitude and transmission phase measurements for the R&S®ZNLE [1]; analysis conditions: S_{11} = S_{22} = 0, calibrated power: –10 dBm, measured power: –10 dBm

Uncertainty of reflection measurements	Logarithmic			Linear	
	Reflection level	Magnitude	Phase	Reflection range	Magnitude
100 kHz to 10 GHz	0 dB	0.14 dB	0.9°	0 dB to –3 dB	0.016
	–3 dB	0.14 dB	0.9°	–3 dB to –6 dB	0.011
	–6 dB	0.15 dB	1.0°	–6 dB to –15 dB	0.009
	–15 dB	0.31 dB	1.9°	–15 dB to –25 dB	0.006
	–25 dB	0.89 dB	6.9°	–25 dB to –35 dB	0.006
	–35 dB	2.53 dB	34.3°	–35 dB	0.006
10 GHz to 18 GHz	0 dB	0.18 dB	1.3°	0 dB to –3 dB	0.021
	–3 dB	0.18 dB	1.3°	–3 dB to –6 dB	0.015
	–6 dB	0.20 dB	1.4°	–6 dB to –15 dB	0.012
	–15 dB	0.41 dB	2.5°	–15 dB to –25 dB	0.009
	–25 dB	1.14 dB	9.0°	–25 dB to –35 dB	0.008
	–35 dB	3.19 dB	45.0°	–35 dB	0.008
Specifications are based on an isolating DUT, a measurement bandwidth of 10 Hz and a nominal source power of –10 dBm.					



Measured uncertainty of reflection magnitude and reflection phase measurements for the R&S®ZNLE [1]; analysis conditions: $S_{12} = S_{21} = 0$, calibrated power: –10 dBm, measured power: –10 dBm

Effective system data

This data is valid between +18 °C and +28 °C, provided the temperature has not varied by more than 1 °C since calibration. Validity of the data is conditional on the use of an R&S®ZV-Z270 calibration kit and TOSM/SOLT calibration. This calibration kit is used 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 allowed).

	100 kHz to 10 GHz	**10 GHz to 18 GHz**
Directivity	≥ 46 dB	≥ 42 dB
Source match	≥ 40 dB	≥ 37 dB
Load match	≥ 42 dB	≥ 38 dB
Reflection tracking	≤ 0.07 dB	≤ 0.09 dB
Transmission tracking	≤ 0.06 dB	≤ 0.06 dB

Factory-calibrated system data

This data 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**
Directivity	100 kHz to 18 GHz	≥ 20 dB	30 dB
Source match	100 kHz to 18 GHz	≥ 20 dB	30 dB
Reflection tracking	100 kHz to 6 GHz	≤ 1.5 dB	0.5 dB
	6 GHz to 18 GHz	≤ 2 dB	0.5 dB
Transmission tracking	100 kHz to 6 GHz	≤ 1.5 dB	0.5 dB
	6 GHz to 18 GHz	≤ 2 dB	0.5 dB
Load match (raw test port match)	R&S®ZNLE3, R&S®ZNLE4 and R&S®ZNLE6		
	100 kHz to 3 GHz	≥ 14 dB	18 dB
	3 GHz to 6 GHz	≥ 12 dB	16 dB
	R&S®ZNLE14 and R&S®ZNLE18		
	100 kHz to 1 GHz	≥ 17 dB	24 dB
	1 GHz to 3 GHz	≥ 13 dB	20 dB
	3 GHz to 10 GHz	≥ 10 dB	16 dB
	10 GHz to 18 GHz	≥ 7 dB	15 dB

Trace stability

		Specification	**Typical**
Trace noise magnitude (RMS) [5]	source power: 0 dBm, reflection: 0 dB, bandwidth: 10 kHz		
	100 kHz to 10 GHz	< 0.005 dB	0.0010 dB
	10 GHz to 18 GHz	< 0.005 dB	0.0025 dB
	18 GHz to 20 GHz		0.0025 dB
Trace noise phase (RMS) [5]	source power: 0 dBm, reflection: 0 dB, bandwidth: 10 kHz		
	100 kHz to 10 MHz	< 0.1°	
	10 MHz to 10 GHz	< 0.05°	0.01°
	10 GHz to 18 GHz	< 0.05°	0.02°
	18 GHz to 20 GHz		0.02°

		Magnitude	**Phase**
Measured temperature stability	source power: –10 dBm, transmission or reflection: 0 dB		
	R&S®ZNLE3, R&S®ZNLE4 and R&S®ZNLE6		
	100 kHz to 6 GHz	0.05 dB/K	0.8°/K
	R&S®ZNLE14 and R&S®ZNLE18		
	100 kHz to 10 GHz	0.02 dB/K	0.15°/GHz/K
	10 GHz to 20 GHz	0.03 dB/K	0.15°/GHz/K

[5] The RMS value describes trace noise, which is produced by noise.

Test port output

This data is valid from +18 °C to +28 °C.

		Specification	Typical
Power range	100 kHz to 18 GHz	–10 dBm to 0 dBm	up to +2 dBm
	18 GHz to 20 GHz		up to +2 dBm
Power accuracy	source power: –10 dBm		
	100 kHz to 18 GHz	≤ 2 dB	0.5 dB
	18 GHz to 20 GHz		0.5 dB
Power linearity	referenced to –10 dBm		
	100 kHz to 6 GHz	≤ 1.5 dB	0.2 dB
	6 GHz to 18 GHz	≤ 2.0 dB	0.3 dB
	18 GHz to 20 GHz		0.3 dB
Power resolution		0.01 dB	
Harmonics	source power –10 dBm		
	R&S®ZNLE3, R&S®ZNLE4 and R&S®ZNLE6		
	100 kHz to 6 GHz		–30 dBc
	R&S®ZNLE14 and R&S®ZNLE18		
	10 MHz to 9 GHz		–30 dBc

Test port input

		Specification	Typical
Maximum nominal input level		0 dBm	
Power measurement accuracy	at –10 dBm without power calibration		
	100 kHz to 18 GHz	< 2 dB	0.3 dB
	18 GHz to 20 GHz		0.3 dB
Receiver linearity	referenced to –10 dBm		
	+10 dB to +5 dB	< 0.3 dB	0.2 dB
	+5 dB to –40 dB	< 0.2 dB	0.1 dB
Damage level		+27 dBm	
Damage DC voltage		30 V	
Noise level [6]	measurement bandwidth 1 kHz, normalized to 1 Hz		
	100 kHz to 50 MHz	< –110 dBm (1 Hz)	–130 dBm (1 Hz)
	50 MHz to 6 GHz	< –120 dBm (1 Hz)	–130 dBm (1 Hz)
	6 GHz to 16 GHz	< –118 dBm (1 Hz)	–125 dBm (1 Hz)
	16 GHz to 18 GHz	< –115 dBm (1 Hz)	–115 dBm (1 Hz)
	18 GHz to 20 GHz		–115 dBm (1 Hz)

[6] The noise level is defined as the RMS value of the specified noise floor.

Display

Screen	26.4 cm (10.1") diagonal WXGA color LCD with touchscreen
Resolution	1280 × 800 × 262144 (high color, 125 dpi)
Pixel failure rate	$< 1 \times 10^{-5}$

Front panel connectors

USB	two universal serial bus connectors for connecting USB devices (USB 2.0)

Rear panel connectors

LAN	local area network connector, 10/100/1000BASE-T, 8-pin, RJ-45

USB	two universal serial bus connectors for connecting USB devices (USB 3.0)

MONITOR	DVI-D connector (for external monitor)

REF IN	input for external frequency reference signal	
Connector type		BNC, female
Input frequency		10 MHz
Maximum permissible deviation		1 kHz
Input power		–10 dBm to +15 dBm at 50 Ω
Input impedance		> 10 kΩ

REF OUT	output for external frequency reference signal	
Connector type		BNC, female
Output frequency		10 MHz
Output frequency accuracy		80 Hz
Output power		+6 dBm ± 4 dB at 50 Ω

EXT TRIG IN	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 µs
Input impedance		> 10 kΩ

Option

For the subsequently activated option, all specifications parameters are typical values until a calibration is performed.

R&S®FPL1-B10 GPIP interface

GPIB interface	remote control interface, in line with IEEE 488, IEC 60625; 24-pin

General data

Data storage		
Internal	standard	solid-state drive, 32 Gbyte (nom.)
External		supports USB 2.0 compatible memory devices

Environmental conditions		
Temperature	operating temperature range	+5 °C to +40 °C
	storage temperature range	–20 °C to +70 °C
Climatic loading	without condensation	+40 °C at 85 % rel. humidity, in line with EN 60068-2-30

Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, 0.15 mm constant amplitude (1.8 g at 55 Hz), in line with EN 60068-2-6
		55 Hz to 150 Hz, acceleration: 0.5 g constant, in line with EN 60068-2-6
	random	8 Hz to 500 Hz, acceleration 1.2 g (RMS), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810E, method no. 516.4, procedure I, MIL-PRF-28800F

EMC		
		in line with EMC Directive 2014/30/EU including IEC/EN 61326-1 [7, 8], IEC/EN 61326-2-1, CISPR 11/EN 55011 [7], IEC/EN 61000-3-2, IEC/EN 61000-3-3

EU legislation	for details, see user documentation	EU: in line with Data Act – Regulation (EU) 2023/2854

Recommended calibration interval		1 year

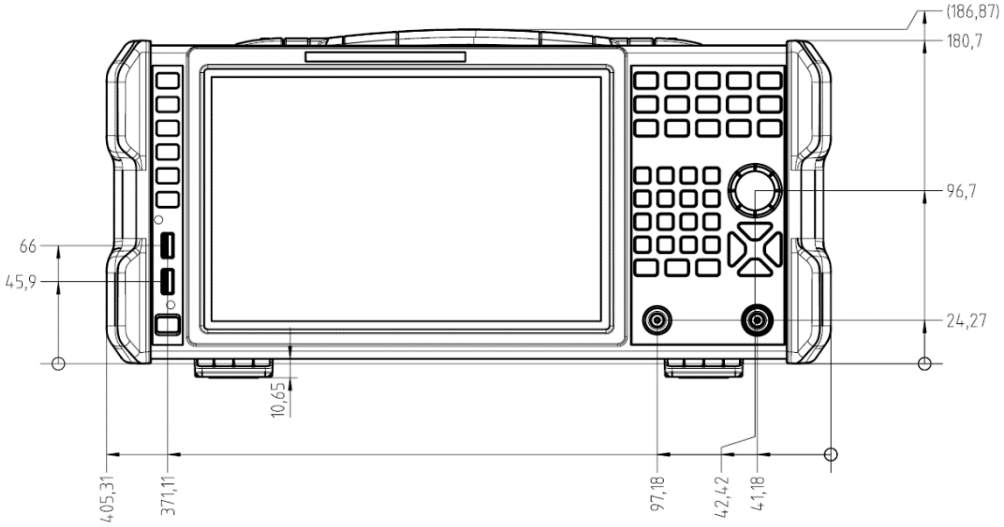
Power supply		
AC supply		100 V to 240 V ± 10 %, 50 Hz to 60 Hz ± 5 %, 400 Hz ± 5 % class of protection I, in line with VDE 411
Current consumption		1.7 A to 0.8 A
Power consumption		max. 170 W, 80 W (typ.)
Safety		in line with EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Test marks		CE, $_{C}$CSA$_{US}$, KCC

Dimensions and weight		
Dimensions	W × H × D	408 mm × 186 mm × 235 mm (16.06 in × 7.32 in × 9.25 in)
Net weight, nominal		6 kg (13.22 lb)

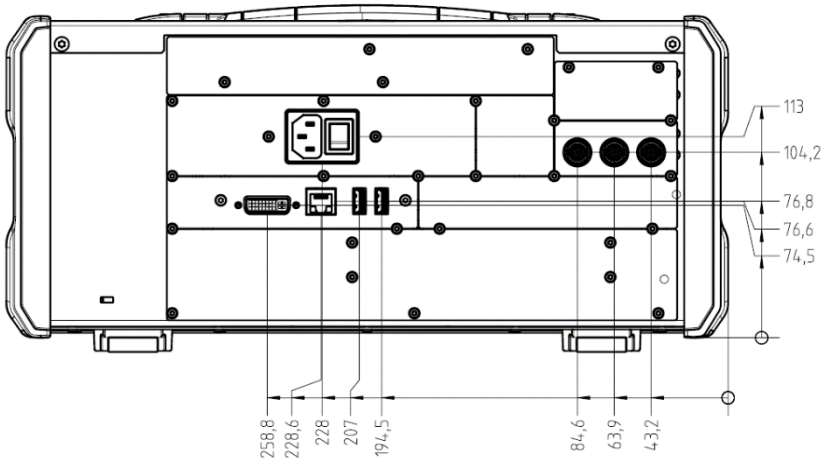
[7] Emission limits for class A equipment.

[8] Immunity test requirement for industrial environment (EN 61326 table 2).

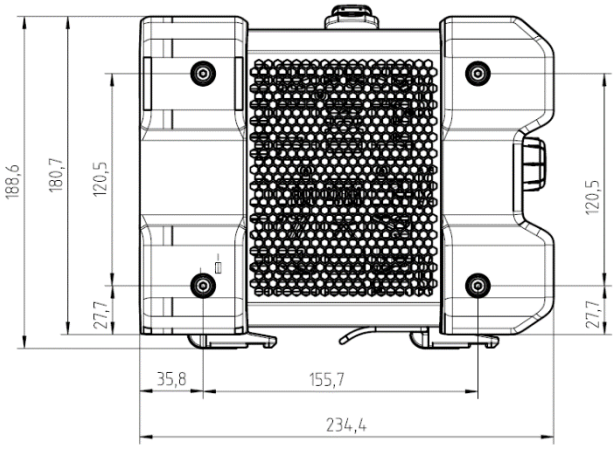
Dimensions (in mm)



Front view of the R&S®ZNLE



Rear view of the R&S®ZNLE



Side view of the R&S®ZNLE

Ordering information

Designation	Type	Retrofit [9]	On site [10]	Order No.
Base units				
Vector network analyzer, 3 GHz, N connectors	R&S®ZNLE3			1323.0012.53
Vector network analyzer, 4.5 GHz, N connectors	R&S®ZNLE4			1323.0012.54
Vector network analyzer, 6 GHz, N connectors	R&S®ZNLE6			1323.0012.56
Vector network analyzer, 14 GHz, N connectors	R&S®ZNLE14			1323.0012.64
Vector network analyzer, 18 GHz (20 GHz), N connectors	R&S®ZNLE18			1323.0012.70
Options				
Low frequency extension	R&S®ZNLE-B100	•	–	1303.9272.02
GPIB interface	R&S®FPL1-B10	•	•	1323.1890.02
Firmware/software				
Time domain analysis	R&S®ZNL-K2	•	•	1323.1819.02
Distance-to-fault measurement	R&S®ZNL-K3	•	•	1323.1825.02

Recommended extras

Designation	Type	Order No.
Protective hard cover	R&S®FPL1-Z1	1323.1960.02
Soft carrying bag, for transport and outdoor operation	R&S®FPL1-Z2	1323.1977.02
Carrying vest holster (requires R&S®FPL1-Z2)	R&S®FPL1-Z3	1323.1683.02
19" rackmount kit (RAL 5000) [11]	R&S®FPL1-Z6B	1323.1954.03
19" rackmount kit (RAL 5014) [11]	R&S®FPL1-Z6	1323.1954.02
Broadband limiter, N (m to f), 50 Ω, 50 MHz to 6 GHz	R&S®ZN-B13	1303.7840.02
Connectors and cables		
N (m) to N (m), 50 Ω, length: 0.6 m, DC to 18 GHz	R&S®ZV-Z191	1306.4507.24
N (m) to N (m), 50 Ω, length: 0.9 m, DC to 18 GHz	R&S®ZV-Z191	1306.4507.36
N (m) to 3.5 mm (m), 50 Ω, length: 0.6 m, DC to 18 GHz	R&S®ZV-Z192	1306.4513.24
N (m) to 3.5 mm (m), 50 Ω, length: 0.9 m, DC to 18 GHz	R&S®ZV-Z192	1306.4513.36
3.5 mm (m) to 3.5 mm (m), 50 Ω, length: 0.6 m, DC to 26.5 GHz	R&S®ZV-Z193	1306.4520.24
3.5 mm (m) to 3.5 mm (m), 50 Ω, length: 0.9 m, DC to 26.5 GHz	R&S®ZV-Z193	1306.4520.36
Calibration kits		
Calibration kit, N (m), 50 Ω, 0 Hz to 18 GHz	R&S®ZN-Z170	1328.8163.02
Calibration kit, N (f), 50 Ω, 0 Hz to 18 GHz	R&S®ZN-Z170	1328.8163.03
Calibration kit, 3.5 mm (m), 50 Ω, 0 Hz to 26.5 GHz	R&S®ZN-Z135	1328.8157.02
Calibration kit, 3.5 (mm) (f), 50 Ω, 0 Hz to 26.5 GHz	R&S®ZN-Z135	1328.8157.03
Calibration units		
Calibration unit, 1 port, N (f), 2 MHz to 4 GHz	R&S®ZN-Z103	1321.1828.02
Calibration unit, 1 port, N (f), 1 MHz to 6 GHz	R&S®ZN-Z103	1321.1828.12
Calibration unit, 2 configurable ports, 5 kHz to 4.5 GHz	R&S®ZN-ZE104	1350.8040.04
Calibration unit, 2 configurable ports, 5 kHz to 9 GHz	R&S®ZN-ZE109	1350.8040.09
Calibration unit, 2 configurable ports, 5 kHz to 18 GHz	R&S®ZN-ZE118	1350.8040.18
Calibration unit, 2 configurable ports, 5 kHz to 26.5 GHz	R&S®ZN-ZE126	1350.8040.26

Warranty and service

Warranty		
Base unit		1 year
All other items		1 year
Service options		
	Service plans	**On demand**
Calibration	up to five years [12]	pay per calibration
Warranty and repair	up to five years [12]	standard price repair
Contact your Rohde & Schwarz sales office for further details.		

[9] Option may also be ordered at a later stage, upgrade in service.

[10] Option may be installed by the user on site.

[11] R&S®FPL1-Z6B is available for instruments in the current corporate design color RAL 5000 (violet blue), while R&S®FPL1-Z6 is available for the legacy color RAL 5014 (pigeon blue).

[12] For extended periods, contact your Rohde & Schwarz sales office.

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