

R&S® ZN-Z2xx | R&S® ZV-Z2xx CALIBRATION KITS

Specifications



Specifications
Version 08.00

ROHDE & SCHWARZ

Make ideas real



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Definitions

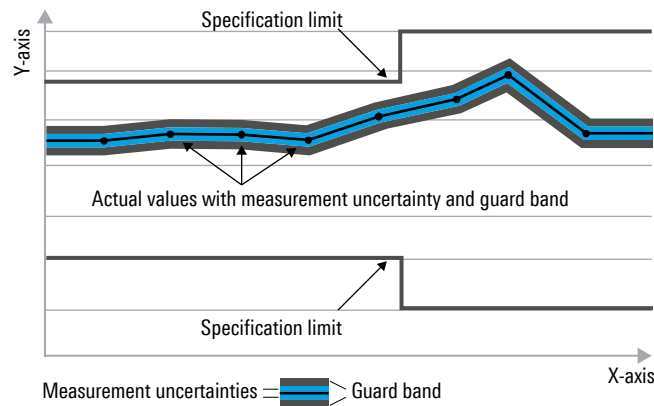
General

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 $<$, \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.



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
Frequency range	R&S®ZV-Z270	0 Hz to 18 GHz
	R&S®ZN-Z235	0 Hz to 26.5 GHz
	R&S®ZV-Z235E	0 Hz to 33 GHz
	R&S®ZN-Z229	0 Hz to 43.5 GHz
	R&S®ZN-Z224	0 Hz to 50 GHz
	R&S®ZN-Z218	0 Hz to 67 GHz
	R&S®ZN-Z210 ¹	0 Hz to 110 GHz
Connectors	R&S®ZV-Z270	type N, female and male
	R&S®ZN-Z235	3.5 mm, female and male
	R&S®ZV-Z235E	3.5 mm, female and male
	R&S®ZN-Z229	2.92 mm, female and male
	R&S®ZN-Z224	2.4 mm, female and male
	R&S®ZN-Z218	1.85 mm, female and male
	R&S®ZN-Z210	1.0 mm, female and male

Effective system data

The specified effective system data are established after performing a suitable system error calibration, e.g. TOSM, at an R&S®ZNA, R&S®ZVA, R&S®ZNB or R&S®ZVT vector network analyzer, using the characteristic data of the calibration kit, which are stored on a provided USB flash drive. This data is valid between +18 °C and +28 °C, at a measurement bandwidth of 10 Hz and a nominal power of 0 dBm at the calibration ports. The calibration kit is fully functional down to 0 Hz, with effective system data as specified below, although the data is only verified for the calibration frequencies: DC; from 50 MHz to the highest frequency in the frequency range of the calibration kit.

R&S®ZV-Z270 calibration kit

	0 Hz to 10 GHz		10 GHz to 18 GHz	
	spec.	typ.	spec.	typ.
Directivity in dB	≥ 46	48	≥ 44	45
Source match in dB	≥ 43	44	≥ 40	43
Load match in dB	≥ 45	47	≥ 43	44
Reflection tracking in dB	≤ 0.06	0.05	≤ 0.07	0.06
Transmission tracking in dB	≤ 0.02	0.01	≤ 0.03	0.02

R&S®ZN-Z235 calibration kit

	0 Hz to 10 GHz		10 GHz to 20 GHz		20 GHz to 26.5 GHz	
	spec.	typ.	spec.	typ.	spec.	typ.
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®ZV-Z235E calibration kit

	0 Hz to 700 MHz		700 MHz to 24 GHz		24 GHz to 33 GHz	
	spec.	typ.	spec.	typ.	spec.	typ.
Directivity in dB	≥ 36	46	≥ 40	46	≥ 36	40
Source match in dB	≥ 30	43	≥ 36	43	≥ 30	36
Load match in dB	≥ 36	46	≥ 40	46	≥ 36	40
Reflection tracking in dB	≤ 0.2	0.04	≤ 0.1	0.02	≤ 0.2	0.04
Transmission tracking in dB	≤ 0.2	0.04	≤ 0.1	0.02	≤ 0.2	0.04

¹ For using the R&S®ZN-Z210 above 67 GHz with an R&S®ZNA or R&S®ZVA vector network analyzer, additionally an R&S®ZVA-Z110, R&S®ZVA-Z110E or R&S®ZC110 converter is required.

R&S®ZN-Z229 calibration kit

	0 Hz to 10 GHz		10 GHz to 26.5 GHz		26.5 GHz to 40 GHz		40 GHz to 43.5 GHz	
	spec.	typ.	spec.	typ.	spec.	typ.	spec.	typ.
Directivity in dB	≥ 45	48	≥ 42	45	≥ 38	41	≥ 38	41
Source match in dB	≥ 41	44	≥ 40	43	≥ 36	39	≥ 36	39
Load match in dB	≥ 44	47	≥ 41	44	≥ 37	40	≥ 37	40
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	0.05

R&S®ZN-Z224 calibration kit

	0 Hz to 10 GHz		10 GHz to 20 GHz		20 GHz to 40 GHz		40 GHz to 50 GHz	
	spec.	typ.	spec.	typ.	spec.	typ.	spec.	typ.
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	≤ 0.06	0.05

R&S®ZN-Z218 calibration kit

	0 Hz to 10 GHz		10 GHz to 20 GHz		20 GHz to 40 GHz		40 GHz to 50 GHz		50 GHz to 67 GHz	
	spec.	typ.	spec.	typ.	spec.	typ.	spec.	typ.	spec.	typ.
Directivity in dB	≥ 46	49	≥ 44	47	≥ 42	45	≥ 39	42	≥ 37	40
Source match in dB	≥ 43	46	≥ 40	43	≥ 38	41	≥ 36	39	≥ 34	37
Load match in dB	≥ 45	48	≥ 43	46	≥ 41	44	≥ 39	42	≥ 37	40
Reflection tracking in dB	≤ 0.03	0.02	≤ 0.04	0.03	≤ 0.04	0.03	≤ 0.06	0.05	≤ 0.07	0.06
Transmission tracking in dB	≤ 0.02	0.01	≤ 0.03	0.02	≤ 0.04	0.03	≤ 0.06	0.05	≤ 0.06	0.05

R&S®ZN-Z210 calibration kit ¹

	0 Hz to 10 GHz		10 GHz to 20 GHz		20 GHz to 40 GHz		40 GHz to 50 GHz		50 GHz to 67 GHz	
	spec.	typ.	spec.	typ.	spec.	typ.	spec.	typ.	spec.	typ.
Directivity in dB	≥ 43	46	≥ 41	44	≥ 38	41	≥ 36	39	≥ 35	38
Source match in dB	≥ 40	43	≥ 38	41	≥ 35	38	≥ 33	36	≥ 32	35
Load match in dB	≥ 42	45	≥ 39	42	≥ 36	39	≥ 35	38	≥ 34	37
Reflection tracking in dB	≤ 0.03	0.02	≤ 0.04	0.03	≤ 0.04	0.03	≤ 0.06	0.05	≤ 0.07	0.06
Transmission tracking in dB	≤ 0.04	0.03	≤ 0.05	0.04	≤ 0.06	0.05	≤ 0.07	0.06	≤ 0.08	0.07

	67 GHz to 90 GHz		90 GHz to 110 GHz	
	spec.	typ.	spec.	typ.
Directivity in dB	≥ 34	37	≥ 32	35
Source match in dB	≥ 30	33	≥ 28	31
Load match in dB	≥ 32	35	≥ 30	33
Reflection tracking in dB	≤ 0.08	0.07	≤ 0.09	0.08
Transmission tracking in dB	≤ 0.09	0.08	≤ 0.12	0.11

General data

Temperature loading	operating temperature range	+18 °C to +28 °C
	permissible temperature range	0 °C to +50 °C
	storage temperature range	-40 °C to +70 °C, in line with IEC 60068-2-1 and IEC 60068-2-2
Calibration interval		1 year
Dimensions	W x H x D	400 mm x 70 mm x 260 mm (15.8 in x 2.8 in x 10.2 in)
Weight	R&S®ZV-Z270	1.8 kg (4 lb)
	R&S®ZN-Z235	1.4 kg (3 lb)
	R&S®ZV-Z235E	1.4 kg (3 lb)
	R&S®ZN-Z229	1.4 kg (3 lb)
	R&S®ZN-Z224	1.4 kg (3 lb)
	R&S®ZN-Z218	1.4 kg (3 lb)
	R&S®ZN-Z210	1.4 kg (3 lb)
	shipping weight (all models)	4 kg (9 lb)

Ordering information

Designation	Type	Order No.
Calibration kit, type N, 0 Hz to 18 GHz	R&S®ZV-Z270	5011.6536.02
Calibration kit, 3.5 mm, 0 Hz to 26.5 GHz	R&S®ZN-Z235	1336.8500.02
Calibration kit, 3.5 mm, 0 Hz to 33 GHz	R&S®ZV-Z235E	5011.6707.02
Calibration kit, 2.92 mm, 0 Hz to 43.5 GHz	R&S®ZN-Z229	1336.7004.02
Calibration kit, 2.4 mm, 0 Hz to 50 GHz	R&S®ZN-Z224	1339.5002.02
Calibration kit, 1.85 mm, 0 Hz to 67 GHz	R&S®ZN-Z218	1337.3502.02
Calibration kit, 1.0 mm, 0 Hz to 110 GHz	R&S®ZN-Z210	1354.3407.02

Warranty and service

Warranty		
Base unit		1 year
All other items		1 year
Service options		
	Service plans	On demand
Calibration	up to five years ²	pay per calibration
Warranty and repair	up to five years ²	standard price repair
Contact your Rohde & Schwarz sales office for further details.		

² For extended periods, contact your Rohde & Schwarz sales office.

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ISO 9001

Certified Environmental Management

ISO 14001

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