R&S®ZN-Z170
CALIBRATION KIT

Specifications

Data Sheet
Version 01.00

ROHDE&SCHWARZ
Make ideas real

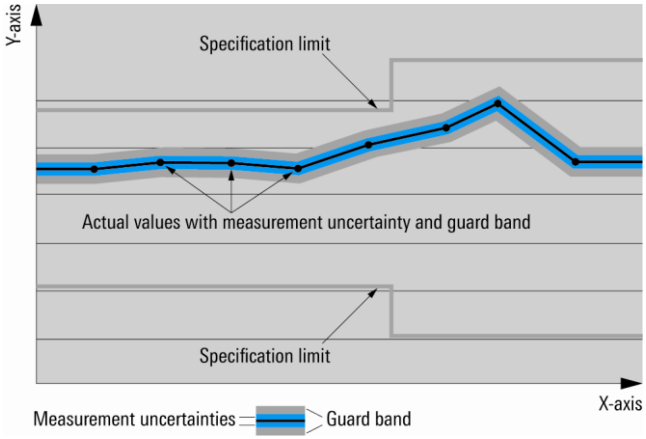
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes 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.



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.

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

Specifications

Mechanical data

Connector type	model .02	type N, 50 Ω, male
	model .03	type N, 50 Ω, female
Gauge	model .02	5.28 mm to 5.32 mm
	model .03	5.22 mm to 5.26 mm
Inner conductor material		Au-plated age-hardened CuBe alloy
Outer conductor material		passivated stainless steel
Body		black anodized aluminum

Electrical data of R&S®ZN-Z170

Model .03 (type N, 50 Ω, female)

Frequency range		DC to 18 GHz
Through standard		
Return loss	DC to 6 GHz	> 40 dB (typ.)
	6 GHz to 9 GHz	> 36 dB (typ.)
	9 GHz to 18 GHz	> 32 dB (typ.)
Insertion loss		$0.0291\ dB \cdot \sqrt{f / GHz}$ (nom.)
Electrical length		45.60 mm (nom.)
Open standard		
Deviation from nominal phase [1]	DC to 6 GHz	< 2.0°
	6 GHz to 9 GHz	< 3.0°
	9 GHz to 18 GHz	< 4.0°
Fringing capacitance	C_0	37.1000 fF (nom.)
	C_1	1.20000 fF/GHz (nom.)
	C_2	–0.03000 fF/GHz^2 (nom.)
	C_3	0.00000 fF/GHz^3 (nom.)
Offset length		12.00 mm (nom.)
Loss		$0.0056\ dB \cdot \sqrt{f / GHz}$ (nom.)
Short standard		
Deviation from nominal phase [2]	DC to 6 GHz	< 1.5°
	6 GHz to 9 GHz	< 2.0°
	9 GHz to 18 GHz	< 2.5°
Inductance	L_0	95.0000 pH (nom.)
	L_1	–9.90000 pH/GHz (nom.)
	L_2	0.98000 pH/GHz^2 (nom.)
	L_3	–0.02900 pH/GHz^3 (nom.)
Offset length		12.00 mm (nom.)
Loss		$0.0056\ dB \cdot \sqrt{f / GHz}$ (nom.)
Match standard		
DC resistance		50.0 Ω ± 0.5 Ω
Return loss	DC to 6 GHz	> 42 dB
	6 GHz to 9 GHz	> 36 dB
	9 GHz to 18 GHz	> 32 dB
Maximum input power		1.0 W

[1] The nominal phase is defined by the offset delay, the offset loss and the fringing capacitance.

[2] The nominal phase is defined by the offset delay, the offset loss and the short inductance.

Model .02 (type N, 50 Ω, male)

Frequency range		DC to 18 GHz
Through standard		
Return loss	DC to 6 GHz	> 40 dB (typ.)
	6 GHz to 9 GHz	> 36 dB (typ.)
	9 GHz to 18 GHz	> 32 dB (typ.)
Insertion loss		0.0407 dB · $\sqrt{f / GHz}$ (nom.)
Electrical length		63.80 mm (nom.)
Open standard		
Deviation from nominal phase [3]	DC to 6 GHz	< 2.0°
	6 GHz to 9 GHz	< 3.0°
	9 GHz to 18 GHz	< 4.0°
Fringing capacitance	C_0	–14.2 fF (nom.)
	C_1	0.4 fF/GHz (nom.)
	C_2	–0.016 fF/GHz^2 (nom.)
	C_3	0.001 fF/GHz^3 (nom.)
Offset length		22.00 mm (nom.)
Loss		0.0102 dB · $\sqrt{f / GHz}$ (nom.)
Short standard		
Deviation from nominal phase [4]	DC to 6 GHz	< 1.5°
	6 GHz to 9 GHz	< 2.0°
	9 GHz to 18 GHz	< 2.5°
Inductance	L_0	–27 pH (nom.)
	L_1	7.2 pH/GHz (nom.)
	L_2	–0.8 pH/GHz^2 (nom.)
	L_3	0.026 pH/GHz^3 (nom.)
Offset length		22.00 mm (nom.)
Loss		0.0102 dB · $\sqrt{f / GHz}$ (nom.)
Match standard		
DC resistance		50.0 Ω ± 0.5 Ω
Return loss	DC to 6 GHz	> 42 dB
	6 GHz to 9 GHz	> 36 dB
	9 GHz to 18 GHz	> 32 dB
Maximum input power		1.0 W

[3] The nominal phase is defined by the offset delay, the offset loss and the fringing capacitance.

[4] The nominal phase is defined by the offset delay, the offset loss and the short inductance.

Effective system data of R&S®ZN-Z170 (type N, female and male)

The specified effective system data is established after performing a UOSM system error calibration on an R&S®ZNA26 vector network analyzer using the calibration kit's characteristic data. This data is valid between +18 °C and +28 °C at a measurement bandwidth of 10 Hz and a nominal power of –10 dBm at the calibration ports. The calibration kit is fully functional down to 0 Hz, with effective system data as specified below.

Directivity	10 MHz to 4 GHz	> 40 dB (meas.)
	4 GHz to 18 GHz	> 32 dB (meas.)
Source match	10 MHz to 4 GHz	> 32 dB (meas.)
	4 GHz to 18 GHz	> 26 dB (meas.)
Reflection tracking	10 MHz to 4 GHz	< 0.04 dB (meas.)
	4 GHz to 18 GHz	< 0.05 dB (meas.)
Load match	10 MHz to 4 GHz	> 39 dB (meas.)
	4 GHz to 18 GHz	> 31 dB (meas.)
Transmission tracking	10 MHz to 4 GHz	< 0.1 dB (meas.)
	4 GHz to 18 GHz	< 0.2 dB (meas.)

General data

Temperature	operating temperature range	+18 °C to +28 °C
	permissible temperature range	+5 °C to +40 °C
	storage temperature range	–40 °C to +70 °C
Standards		in line with IEC 61169-16
Recommended calibration interval		1 year
Dimensions (W × H × D)	model .02	74.7 mm × 18 mm × 111 mm (2.94 in × 0.71 in × 4.37 in)
	model .03	69 mm × 18 mm × 107 mm (2.72 in × 0.71 in × 4.21 in)
Weight	model .02	263 g (0.58 lb)
	model .03	235 g (0.52 lb)
Shipping weight		1 kg (2.2 lb)

Ordering information

Designation	Type	Order No.
Calibration kit, type N, 50 Ω, male	R&S®ZN-Z170	1328.8163.02
Calibration kit, type N, 50 Ω, female	R&S®ZN-Z170	1328.8163.03

Service 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, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with calibration coverage, three years	R&S®CW3	
Extended warranty with calibration coverage, four years	R&S®CW4	
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 accredited calibration coverage, three years	R&S®AW3	
Extended warranty with accredited calibration coverage, four years	R&S®AW4	

Extended warranty with a term of one to four years (WE1 to WE4)
Repairs carried out during the contract term are free of charge [5]. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration (CW1 to CW4)
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 [5] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

Extended warranty with accredited calibration (AW1 to AW4)
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 [5] and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

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

Service that adds value

- Worldwide
- Local und personalized
- Customized and flexibel
- Uncompromising quality
- Long-term dependability

Rohde&Schwarz

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Sustainable product design

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

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

Rohde&Schwarz training

www.training.rohde-schwarz.com

Regional contact

- Europe, Africa, Middle East | +49 89 4129 12345
  customersupport@rohde-schwarz.com
- North America | 1 888 TEST RSA (1 888 837 87 72)
  customer.support@rsa.rohde-schwarz.com
- Latin America | +1 410 910 79 88
  customersupport.la@rohde-schwarz.com
- Asia Pacific | +65 65 13 04 88
  customersupport.asia@rohde-schwarz.com
- China | +86 800 810 82 28 | +86 400 650 58 96
  customersupport.china@rohde-schwarz.com

PD 3609.4784.22 | Version 01.00 | October 2019 (jr)
R&S®ZN-Z170 Calibration Kit
Data without tolerance limits is not binding | Subject to change

3609478422
3609.4784.22 01.00 PDP 1 en