

R&S® ZV-Z135 Calibration Kit Specifications



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Definitions

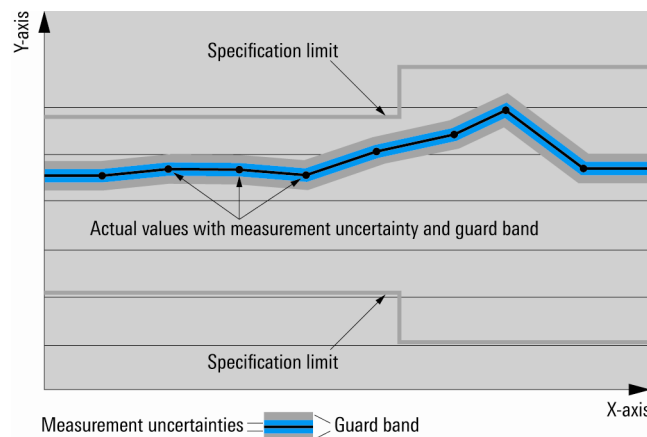
General

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 $<$, \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 designated with the format "parameter: value".

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

Specifications

Mechanical data

Connector type	R&S® ZV-Z135 model.02	3.5 mm, male
	R&S® ZV-Z135 model.03	3.5 mm, female
Gauge	R&S® ZV-Z135 model.02	0 mm to 0.076 mm
	R&S® ZV-Z135 model.03	0 mm to 0.076 mm
Inner conductor material		Au-plated age-hardened CuBe alloy
Outer conductor material		CuSnZn-plated Cu alloy
Body		blue anodized Al

Electrical data of R&S® ZV-Z135 (3.5 mm, female)

Frequency range		0 Hz to 15 GHz
Through standard		
Return loss	0 Hz to 4 GHz	typ. 36 dB
	4 GHz to 8 GHz	typ. 30 dB
	8 GHz to 13 GHz	typ. 27 dB
	13 GHz to 15 GHz	typ. 25 dB
Insertion loss		typ. 0.02 dB · \sqrt{f} /GHz
Electrical length		typ. 38.25 mm
Open standard		
Fringing capacitance	C ₀	-7.425 fF
	C ₁	2.47 fF/GHz
	C ₂	-0.226 fF/GHz ²
	C ₃	0.00618 fF/GHz ³
Offset length		9.24 mm
Loss		typ. 0.01 dB · \sqrt{f} /GHz
Short standard		
Inductance	L ₀	27.98 pH
	L ₁	-5.01 pH/GHz
	L ₂	0.3038 pH/GHz ²
	L ₃	-0.00613 pH/GHz ³
Offset length		9.2 mm
Loss		typ. 0.01 dB · \sqrt{f} /GHz
Match standard		
DC resistance		50.0 Ω ± 0.5 Ω
Return loss	0 Hz to 4 GHz	typ. 42 dB
	4 GHz to 8 GHz	typ. 37 dB
	8 GHz to 13 GHz	typ. 30 dB
	13 GHz to 15 GHz	typ. 24 dB
Maximum input power		0.5 W
Effective system data		
Directivity	0 Hz to 4 GHz	> 41 dB
	4 GHz to 8 GHz	> 38 dB
	8 GHz to 13 GHz	> 29 dB
	13 GHz to 15 GHz	> 23 dB
Source match	0 Hz to 4 GHz	> 36 dB
	4 GHz to 8 GHz	> 31 dB
	8 GHz to 13 GHz	> 26 dB
	13 GHz to 15 GHz	> 20 dB
Reflection tracking	0 Hz to 4 GHz	< 0.025 dB
	4 GHz to 8 GHz	< 0.03 dB
	8 GHz to 13 GHz	< 0.04 dB
	13 GHz to 15 GHz	< 0.05 dB
Load match	0 Hz to 4 GHz	> 39 dB
	4 GHz to 8 GHz	> 35 dB
	8 GHz to 13 GHz	> 27 dB
	13 GHz to 15 GHz	> 21 dB
Transmission tracking	0 Hz to 4 GHz	< 0.05 dB
	4 GHz to 8 GHz	< 0.10 dB
	8 GHz to 13 GHz	< 0.20 dB
	13 GHz to 15 GHz	< 0.40 dB

Electrical data of R&S® ZV-Z135 (3.5 mm, male)

Frequency range		0 Hz to 15 GHz
Through standard		
Return loss	0 Hz to 4 GHz	typ. 36 dB
	4 GHz to 8 GHz	typ. 30 dB
	8 GHz to 13 GHz	typ. 27 dB
	13 GHz to 15 GHz	typ. 25 dB
Insertion loss		typ. $0.02 \text{ dB} \cdot \sqrt{f/\text{GHz}}$
Electrical length		typ. 38.25 mm
Open standard		
Fringing capacitance	C_0	3.434 fF
	C_1	-0.3752 fF/GHz
	C_2	-0.000676 fF/GHz ²
	C_3	0.000725 fF/GHz ³
Offset length		9.24 mm
Loss		0.01 dB $\cdot \sqrt{f/\text{GHz}}$
Short standard		
Inductance	L_0	22.44 pH
	L_1	-4.568 pH/GHz
	L_2	0.2909 pH/GHz ²
	L_3	-0.00516 pH/GHz ³
Offset length		9.217 mm
Loss		0.015 dB $\cdot \sqrt{f/\text{GHz}}$
Match standard		
DC resistance		50.0 $\Omega \pm 0.5 \Omega$
Return loss	0 Hz to 4 GHz	typ. 42 dB
	4 GHz to 8 GHz	typ. 37 dB
	8 GHz to 13 GHz	typ. 30 dB
	13 GHz to 15 GHz	typ. 24 dB
Maximum input power		0.5 W
Effective system data		
Directivity	0 Hz to 4 GHz	> 41 dB
	4 GHz to 8 GHz	> 38 dB
	8 GHz to 13 GHz	> 29 dB
	13 GHz to 15 GHz	> 23 dB
Source match	0 Hz to 4 GHz	> 36 dB
	4 GHz to 8 GHz	> 31 dB
	8 GHz to 13 GHz	> 26 dB
	13 GHz to 15 GHz	> 20 dB
Reflection tracking	0 Hz to 4 GHz	< 0.025 dB
	4 GHz to 8 GHz	< 0.03 dB
	8 GHz to 13 GHz	< 0.04 dB
	13 GHz to 15 GHz	< 0.05 dB
Load match	0 Hz to 4 GHz	> 39 dB
	4 GHz to 8 GHz	> 35 dB
	8 GHz to 13 GHz	> 27 dB
	13 GHz to 15 GHz	> 21 dB
Transmission tracking	0 Hz to 4 GHz	< 0.05 dB
	4 GHz to 8 GHz	< 0.10 dB
	8 GHz to 13 GHz	< 0.20 dB
	13 GHz to 15 GHz	< 0.40 dB

General data

Temperature loading	operating temperature range	+18 °C to +28 °C
	permissible temperature range	+5 °C to +40 °C
	storage temperature range	-40 °C to +70 °C, in line with EN 60068-2-1 and EN 60068-2-2
Standards	R&S® ZV-Z135	IEC 60169-23
Recommended calibration interval		1 year
Dimensions (W × H × D)	R&S® ZV-Z135 model.02	65 mm × 22 mm × 90 mm, (2.6 in × 0.9 in × 3.6 in)
Dimensions (W × H × D)	R&S® ZV-Z135 model.03	74 mm × 22 mm × 95 mm, (2.9 in × 0.9 in × 3.7 in)
Weight	R&S® ZV-Z135	225 g (0.5 lb)
Shipping weight		1 kg (2.2 lb)

Ordering information

Designation	Type	Order No.
Calibration Kit (3.5 mm, male)	R&S® ZV-Z135	1317.7677.02
Calibration Kit (3.5 mm, female)	R&S® ZV-Z135	1317.7677.03

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