R&S®RSC
Step Attenuator
Specifications

ROHDE&SCHWARZ
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Data Sheet | Version 05.00

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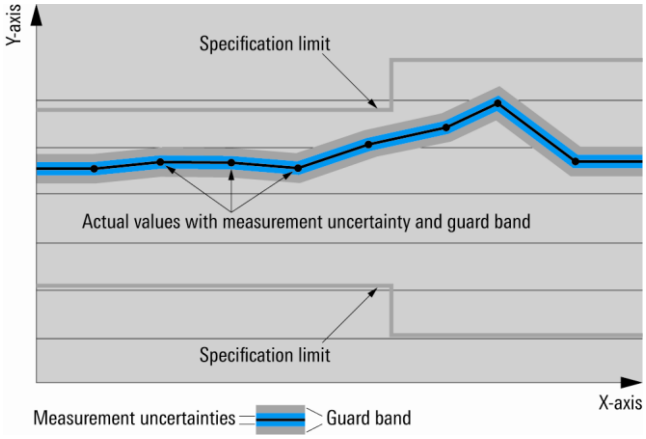
Definitions

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 <, ≤, >, ≥, ±, 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.

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Specifications

Step attenuator, 139 dB, 1 dB steps, DC to 6 GHz (models .03 and .13)

Impedance		50 Ω
RF connector		N female
Frequency range		DC to 6 GHz
Attenuation range		0 dB to 139 dB
Attenuation steps		1 dB
Return loss	DC to 1 GHz	> 20 dB
	1 GHz to 3 GHz	> 15 dB
	3 GHz to 6 GHz	> 10 dB
Attenuation in 0 dB position	DC to 1 GHz	< 1 dB
	1 GHz to 4 GHz	< 1.5 dB
	4 GHz to 6 GHz	< 2 dB
Attenuation uncertainty (relative to 0 dB position)	DC to 1 GHz	< 0.2 dB + 1 % of attenuation value
	1 GHz to 3 GHz	< 0.4 dB + 1 % of attenuation value
	3 GHz to 6 GHz	< 0.6 dB + 1.3 % of attenuation value
Repeatability		0.02 dB (typ.)
Correction data frequency spacing		50 MHz
Maximum power-handling capability	continuous wave	1 W
	pulse < 10 µs	200 W
Maximum voltage	pulse < 10 µs	150 V
Life		> 10×10^6 switching cycles
Switching time		< 25 ms

Step attenuator, 139.9 dB, 0.1 dB steps, DC to 6 GHz (models .04 and .14)

Impedance		50 Ω
RF connector		N female
Frequency range		DC to 6 GHz
Attenuation range		0 dB to 139.9 dB
Attenuation steps	1 dB to 139.9 dB	0.1 dB
Return loss	DC to 1 GHz	> 20 dB
	1 GHz to 3 GHz	> 12 dB
	3 GHz to 6 GHz	> 10 dB
Attenuation in 0 dB position	DC to 1 GHz	< 1 dB
	1 GHz to 3 GHz	< 1.5 dB
	3 GHz to 6 GHz	< 2.2 dB
Attenuation uncertainty without correction (relative to 0 dB position)	DC to 1 GHz	< 0.2 dB + 1 % of attenuation value
	1 GHz to 2 GHz	< 0.4 dB + 1 % of attenuation value
	2 GHz to 6 GHz	< 0.6 dB + 1.3 % of attenuation value
Attenuation uncertainty with correction (relative to 0 dB position, typ.)	DC to 1 GHz	< 0.07 dB + 0.5 % of attenuation value
	1 GHz to 2 GHz	< 0.12 dB + 0.5 % of attenuation value
	2 GHz to 6 GHz	< 0.17 dB + 1 % of attenuation value
Repeatability		0.02 dB (typ.)
Correction data frequency spacing		50 MHz
Maximum power-handling capability	continuous wave	1 W
	pulse < 10 µs	200 W
Maximum voltage	pulse < 10 µs	150 V
Life		> 10×10^6 switching cycles
Switching time		< 25 ms

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Step attenuator, 115 dB, 5 dB steps, DC to 18 GHz (models .05 and .15)

Impedance		50 Ω
RF connector		N female
Frequency range		DC to 18 GHz
Attenuation range		0 dB to 115 dB
Attenuation steps		5 dB
Return loss	DC to 2 GHz	> 20 dB
	2 GHz to 18 GHz	> 15 dB
Attenuation in 0 dB position	DC to 5 GHz	< 2.0 dB
	5 GHz to 10 GHz	< 2.5 dB
	10 GHz to 18 GHz	< 3.5 dB
Attenuation uncertainty (relative to 0 dB position)	DC to 5 GHz	< 0.6 dB + 1 % of attenuation value
	5 GHz to 10 GHz	< 1.0 dB + 1 % of attenuation value
	10 GHz to 18 GHz	< 1.0 dB + 1.3 % of attenuation value
Repeatability		0.02 dB (typ.)
Correction data frequency spacing		100 MHz
Maximum power-handling capability	continuous wave	1 W
	pulse < 10 µs	200 W
Maximum voltage	pulse < 10 µs	150 V
Life		> 1×10^6 switching cycles
Switching time		< 30 ms

External step attenuator, 75 dB, 5 dB steps, DC to 40 GHz (R&S®RSC-Z405)

Impedance		50 Ω
RF connector		2.92 mm female
Frequency range		DC to 40 GHz
Attenuation range		0 dB to 75 dB
Attenuation steps		5 dB
Return loss	DC to 5 GHz	> 20 dB
	5 GHz to 20 GHz	> 15 dB
	20 GHz to 40 GHz	> 12 dB
Attenuation in 0 dB position	DC to 5 GHz	< 1.5 dB
	5 GHz to 20 GHz	< 2.5 dB
	20 GHz to 40 GHz	< 3.5 dB
Attenuation uncertainty from 5 dB to 35 dB (relative to 0 dB position)	DC to 10 GHz	< 0.5 dB
	10 GHz to 20 GHz	< 0.8 dB
	20 GHz to 40 GHz	< 1.5 dB
Attenuation uncertainty from 40 dB to 75 dB (relative to 0 dB position)	DC to 10 GHz	< 1.0 dB
	10 GHz to 20 GHz	< 2.0 dB
	20 GHz to 40 GHz	< 4.0 dB
Repeatability		0.02 dB (typ.)
Correction data frequency spacing		100 MHz
Maximum power-handling capability	continuous wave	1 W
	pulse < 10 µs	200 W
Maximum voltage	pulse < 10 µs	150 V
Life		> 1×10^6 switching cycles
Switching time		< 30 ms

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External step attenuator, 75 dB, 5 dB steps, DC to 67 GHz (R&S®RSC-Z675)

Impedance		50 Ω
RF connector		1.85 mm female
Frequency range		DC to 67 GHz
Attenuation range		0 dB to 75 dB
Attenuation steps		5 dB
Return loss	DC to 5 GHz	> 20 dB
	5 GHz to 20 GHz	> 15 dB
	20 GHz to 40 GHz	> 12 dB
	40 GHz to 60 GHz	> 8 dB
	60 GHz to 67 GHz	> 6 dB
Attenuation in 0 dB position	DC to 5 GHz	< 1.5 dB
	5 GHz to 20 GHz	< 2.5 dB
	20 GHz to 40 GHz	< 3.5 dB
	40 GHz to 60 GHz	< 4.5 dB
	60 GHz to 67 GHz	< 5.0 dB
Attenuation uncertainty from 5 dB to 35 dB (relative to 0 dB position)	DC to 10 GHz	< 0.5 dB
	10 GHz to 20 GHz	< 0.8 dB
	20 GHz to 40 GHz	< 1.5 dB
	40 GHz to 60 GHz	< 2.0 dB
	60 GHz to 67 GHz	< 3.0 dB
Attenuation uncertainty from 40 dB to 75 dB (relative to 0 dB position)	DC to 10 GHz	< 1.0 dB
	10 GHz to 20 GHz	< 2.0 dB
	20 GHz to 40 GHz	< 4.0 dB
	40 GHz to 60 GHz	< 5.0 dB
	60 GHz to 67 GHz	< 6.0 dB
Repeatability		0.02 dB (typ.)
Correction data frequency spacing		100 MHz
Maximum power-handling capability	continuous wave	1 W
	pulse < 10 µs	200 W
Maximum voltage	pulse < 10 µs	150 V
Life		> 1×10^6 switching cycles
Switching time		< 30 ms

Control function

Control of external attenuators	interface	USB with 12 V supply voltage
	connector	round connector 5 pins
	number of controllable step attenuators	4
	max. power at control output	8 W
Remote control	command set	SCIPI 1997.0
	IEC/IEEE bus	in line with IEC 625-1/IEEE 488
	LAN	10/100BaseT, RJ-45
	USB	USB type B

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General data

Temperature loading	in line with IEC 60068-2-1 and IEC 60068-2-2	
	operating temperature range	0 °C to +55 °C
	permissible temperature range	0 °C to +55 °C
	storage temperature range	–40 °C to +70 °C
Damp heat		+40 °C at 80 % rel. humidity, in line with IEC 60068-2-30
Mechanical resistance	vibration, sinusoidal	IEC 60068-2-6
	vibration, random	IEC 60068-2-64
	shock	40 g shock spectrum, in line with MIL-STD-810E, method no. 516.4 procedure I
Recommended calibration interval		2 years
EMC		EMC Directive 2004/108/EC including: • IEC/EN 61326 class B (emission) • IEC/EN 61326 Table A.1 (immunity, industrial)
Safety		in line with IEC 61010-1, EN 61010-1 and UL 3111-1
Power supply		100 V to 240 V 50 Hz to 60 Hz, 75 VA
Power consumption	no switching operation	10 W
	with 4 attenuators switching	max. 40 W
Test mark		VDE, CSA, CSA-NRTL/C, CE conformity mark
Dimensions (W × H × D)	R&S®RSC	250 mm × 117 mm × 395 mm (9.84 in × 4.6 in × 15.55 in)
Weight	model .02	3.4 kg (7.5 lb)
	models .03, .13, .05 and .15	3.9 kg (8.6 lb)
	models .04 and .14	4.4 kg (9.7 lb)

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Ordering information

Designation	Type	Order No.
Step Attenuator, control of external step attenuators (without integrated attenuator)	R&S®RSC	1313.8004.02
Step Attenuator, 0 dB to 139 dB, 1 dB steps, DC to 6 GHz, control of external step attenuators, N(f) connectors at front panel	R&S®RSC	1313.8004.03
Step Attenuator, 0 dB to 139 dB, 1 dB steps, DC to 6 GHz, control of external step attenuators, N(f) connectors at rear panel	R&S®RSC	1313.8004.13
Step Attenuator, 0 dB to 139.9 dB, 0.1 dB steps, DC to 6 GHz, control of external step attenuators, N(f) connectors at front panel	R&S®RSC	1313.8004.04
Step Attenuator, 0 dB to 139.9 dB, 0.1 dB steps, DC to 6 GHz, control of external step attenuators, N(f) connectors at rear panel	R&S®RSC	1313.8004.14
Step Attenuator, 0 dB to 115 dB, 5 dB steps, DC to 18 GHz, control of external step attenuators, N(f) connectors at front panel	R&S®RSC	1313.8004.05
Step Attenuator, 0 dB to 115 dB, 5 dB steps, DC to 18 GHz, control of external step attenuators, N(f) connectors at rear panel	R&S®RSC	1313.8004.15
External step attenuator, 0 dB to 75 dB, 5 dB steps, DC to 40 GHz, controllable by R&S®RSC [1]	R&S®RSC-Z405	1313.9952.02
External step attenuator, 0 dB to 75 dB, 5 dB steps, DC to 67 GHz, controllable by R&S®RSC [1]	R&S®RSC-Z675	1314.0065.02
Control Cable, for connecting an external step attenuator to the R&S®RSC	R&S®RSC-Z41	1314.0136.02
Control Cable, for connecting an external step attenuator to a PC	R&S®RSC-Z42	1314.0142.02

[1] Does not include the R&S®RSC-Z41 or R&S®RSC-Z42 control cable.

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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 [2]. 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 [2] 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 [2] and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

For product brochure, see PD 5214.4413.12 and www.rohde-schwarz.com

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

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- Uncompromising quality
- Long-term dependability

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