

R&S® HA-Z24E

External Preamplifier, 1 GHz to 85 GHz

Specifications



Definitions

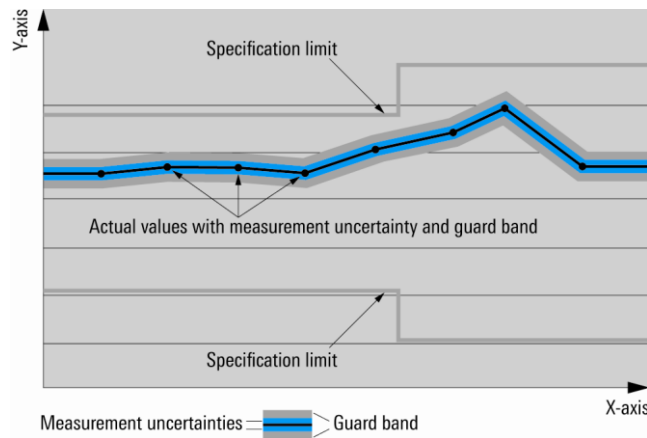
General

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.

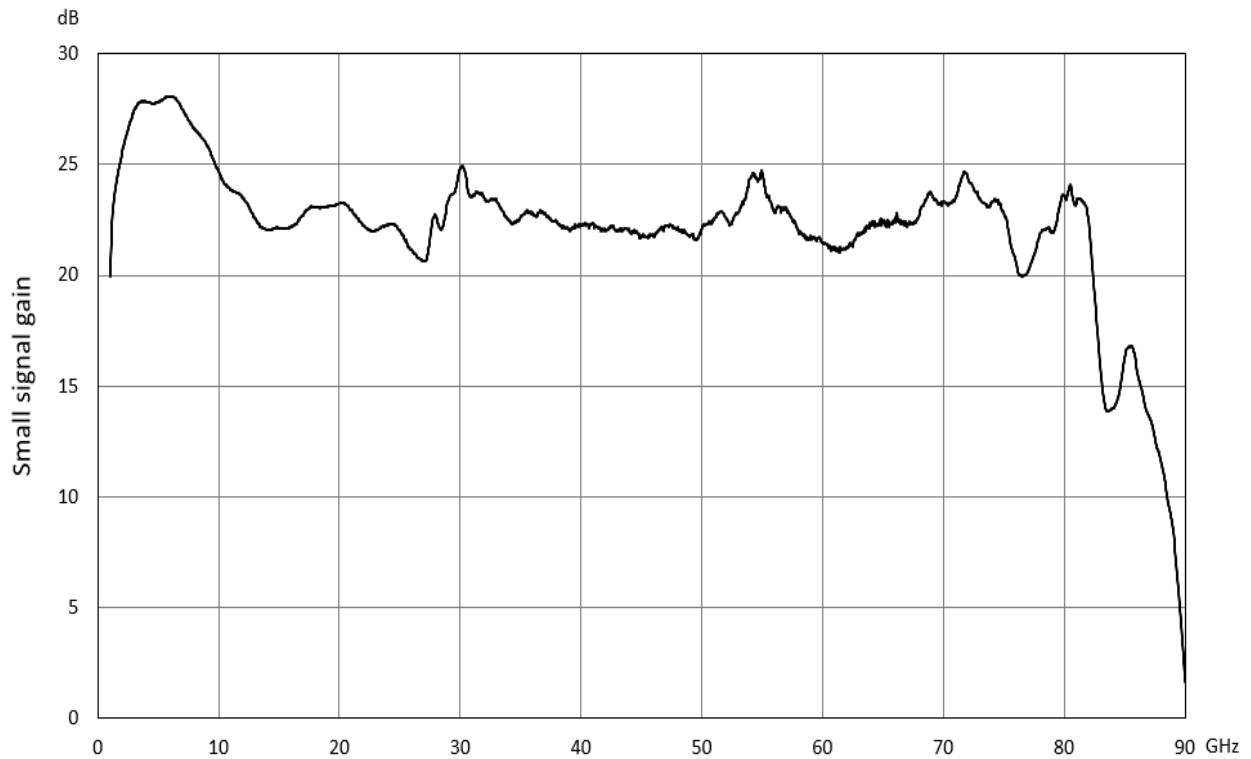
Device settings and GUI parameters are indicated as follows: "parameter: value".

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

In line with the 3GPP/3GPP2 standard, chip rates are specified in Mcps (million chips per second), whereas bit rates and symbol rates are specified in Gbps (billion bits per second), Mbps (million bits per second), kbps (thousand bits per second), Msps (million symbols per second) or ksps (thousand symbols per second), and sample rates are specified in Msample/s (million samples per second). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

Specifications

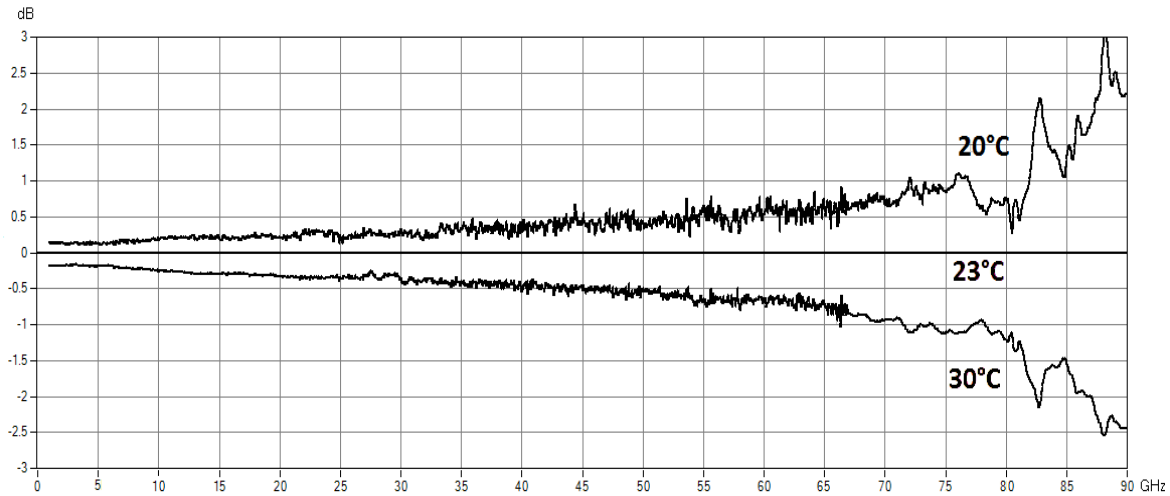
RF frequency range		1 GHz to 85 GHz ¹
Maximum input level	CW RF power	-10 dBm
	DC voltage	25 V
1 dB compression point		-8 dBm (nom.)
Small signal gain	at room temperature ²	
	1 GHz ≤ f < 2 GHz	≥ +17 dB, typ. 20 dB
	2 GHz ≤ f < 24 GHz	≥ +20 dB, typ. 23 dB
	24 GHz ≤ f < 73 GHz	≥ +18 dB, typ. 22 dB
	73 GHz ≤ f < 80 GHz	≥ +16 dB, typ. 20 dB
	80 GHz ≤ f < 82 GHz	≥ +10 dB, typ. 14 dB
	82 GHz ≤ f ≤ 85 GHz	≥ +7 dB, typ. 12 dB
Small signal gain uncertainty	at room temperature ²	
	1 GHz ≤ f ≤ 20 GHz	± 0.6 dB
	20 GHz < f ≤ 40 GHz	± 0.7 dB
	40 GHz < f ≤ 67 GHz	± 0.9 dB
	67 GHz < f ≤ 80 GHz	± 1.1 dB
	80 GHz < f ≤ 85 GHz	± 1.3 dB
Temperature coefficient of gain	referenced to small signal gain at room temperature ² , +20 °C to +30 °C	
	1 GHz ≤ f ≤ 20 GHz	-0.03 dB/K (meas.)
	20 GHz < f ≤ 40 GHz	-0.05 dB/K (meas.)
	40 GHz < f ≤ 67 GHz	-0.11 dB/K (meas.)
	67 GHz < f ≤ 80 GHz	-0.12 dB/K (meas.)
	80 GHz < f ≤ 85 GHz	-0.22 dB/K (meas.)
Noise figure at room temperature ²	3 GHz ≤ f < 25 GHz	≤ 7 dB (meas.)
	25 GHz ≤ f < 40 GHz	≤ 9 dB (meas.)
	40 GHz ≤ f < 67 GHz	≤ 14 dB (meas.)



Typical small signal gain of the R&S®HA-Z24E at room temperature.

¹ The useable frequency range is from 10 MHz to 90 GHz. For this frequency range, correction values are stored in the preamplifier EEPROM.

² Room temperature = +23 °C.



Typical small signal gain variation of the R&S®HA-Z24E at different temperatures.

Inputs and outputs

RF input		
Connector		1 mm (f)
Impedance		50 Ω
Maximum input level	CW RF power	-10 dBm
	DC voltage	25 V
Return loss	2 GHz ≤ f < 3 GHz	≤ -4 dB
	3 GHz ≤ f < 25 GHz	≤ -8 dB
	25 GHz ≤ f < 65 GHz	≤ -7 dB
	65 GHz ≤ f < 80 GHz	≤ -6 dB
	80 GHz ≤ f ≤ 85 GHz	≤ -5 dB (meas.)

RF output		
Connector		1 mm (f)
Impedance		50 Ω
Maximum reverse DC voltage		25 V
Return loss		≤ -5 dB (meas.)

Power supply/control interface		
Connector	for power supply and control interface	5-pin LEMOSA female
DC supply voltage		+5 V
Max. input current		600 mA (nom.)
Control interface		supports high speed and full speed modes according to USB version 2.0

General data

Temperature		
Operating temperature range		+5 °C to +40 °C
Storage temperature range		-40 °C to +70 °C
Climatic loading		+40 °C at 90 % relative humidity, in line with EN 60068-2-30, without condensation

Dimensions and weight		
Dimensions	W × H × D	96.0 mm × 46.0 mm × 67.0 mm (3.76 in × 1.55 in × 2.18 in)
Weight		nom. 280 g (0.45 lb)

Warranty		1 year
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Recommended calibration interval		1 year
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Ordering information

Designation	Type	Order No.
External preamplifier, 1 GHz to 85 GHz	R&S®HA-Z24E	1331.6539.85
Accessories supplied		
RF cable 1 mm (f) to 1 mm (m), DC to 110 GHz, flexible, phase stable, length: 150 mm, USB interface cable, getting started user manual, carrying case		

Recommended extras

Designation	Type	Order No.
Coaxial adapter 1 mm (m) – 1 mm (m)		1314.9256.00
Spare RF cable, 50 Ω, 1 mm (f) – 1 mm (m), DC to 110 GHz, flexible, phase stable, length: 150 mm	R&S®ZV-Z198	1306.4565.06
Torque wrench for 1.0 mm connectors, 0.45 Nm coupling torque (for R&S®FSW85)	R&S®ZN-ZTW	1328.8534.10

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