

R&S® SAM100 SYSTEM AMPLIFIER

Specifications

3
year
warranty



Data Sheet
Version 01.01

ROHDE & SCHWARZ

Make ideas real



CONTENTS

Definitions	3
Frequency band from 2 GHz to 20 GHz.....	4
R&S®SAM100-0220-20, 20 W power class.....	4
Ordering information	6
Base unit	6
Required extras	6
Option.....	6

RoHS Europe, Directive 2011/65/EU: Equipment category 9, fulfilled without any exceptions.

WEEE Europe, Directive 2002/96/EC:

No disposing with unsorted municipal waste; no return with collection of waste electrical and electronic equipment from private households. Separate collection necessary. Ask Rohde & Schwarz representatives about recovery.

Definitions

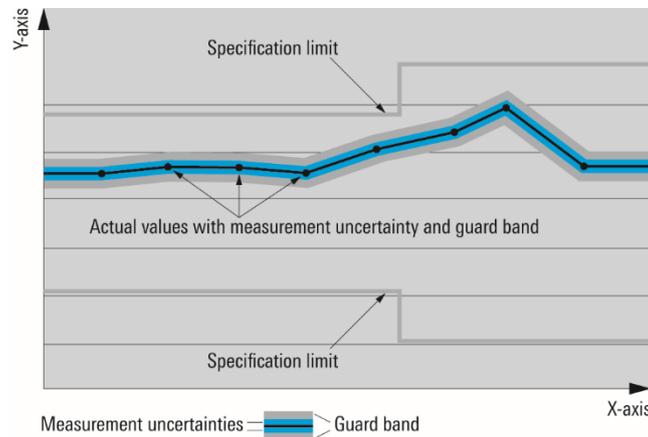
General

Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- All specified parameters are valid for an ambient temperature of + 25 °C, input impedance of 50 Ω and output impedance of 50 Ω
- 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/3GPP2 standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bits per second (Gbps), million bits per second (Mbps), thousand bits 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.

Frequency band from 2 GHz to 20 GHz

R&S®SAM100-0220-20, 20 W power class

RF specifications

Frequency range		2 GHz to 20 GHz, instantaneously
Nominal output power		20 W (43 dBm)
Nominal output load		50 Ω
Output power (P_{sat})	2 GHz to 3 GHz	min. 17 W (42.3 dBm)
	3 GHz to 4.5 GHz	min. 26 W (44.1 dBm)
	4.5 GHz to 8 GHz	min. 20 W (43 dBm)
	8 GHz to 13.5 GHz	min. 15 W (41.8 dBm)
	13.5 GHz to 19.5 GHz	min. 10 W (40.0 dBm)
	19.5 GHz to 20 GHz	min. 9 W (39.5 dBm)
Output power at 1 dB compression point ($P_{1\text{dB}}$)	2 GHz to 3 GHz	min. 7 W (38.5 dBm)
	3 GHz to 4.5 GHz	min. 12 W (40.8 dBm)
	4.5 GHz to 6 GHz	min. 10 W (40.0 dBm)
	6 GHz to 10 GHz	min. 8 W (39.0 dBm)
	10 GHz to 14.6 GHz	min. 6 W (37.8 dBm)
	14.6 GHz to 16.2 GHz	min. 4 W (36.1 dBm)
	16.2 GHz to 19.5 GHz	min. 6 W (37.8 dBm)
	19.5 GHz to 20 GHz	min. 5 W (37.0 dBm)
Gain	at 15 GHz	47 dB (nom.)
Gain flatness		± 4.5 dB
Noise figure		< 8.0 dB (nom.)
Harmonics	at 1 dB compression output power	< -20 dBc
	at 1 dB compression output power – 3 dB	< -25 dBc
Spurious	carrier offset > 100 kHz, depending on AC adapter	-80 dBc (nom.), max. -70 dBc
Nominal forward output power	at VSWR ≤ 2:1	continuous, without foldback
	at VSWR > 2:1	continuous, with gradual foldback of output power, depending on load impedance
Output mismatch protection, VSWR		100 %, without damage
Input		
Nominal input load		50 Ω
Input level	at nominal output power	-4 dBm
Input VSWR	at 50 Ω	max. 2:1
Maximum input level	RF cable	+15 dBm
	DC	0 V
Connectors		
RF input	front panel	2.92 mm/3.5 mm female
RF output	rear panel	2.92 mm/3.5 mm female

Remote control and user interface

Remote control connector		9-pin D-Sub plug (digital I/O)
Local LED display		ready LED, RF LED

Electrical specifications

AC supply voltage		
Nominal operating voltage range	external AC adapter, power cable with low-temperature connector and country- specific plugs	100 V to 240 V AC ± 10 %, single phase, 50 Hz to 60 Hz ± 6 %
Rated current	at 110 V	3.0 A
	at 230 V	1.5 A
Rated power	$RF_{\text{cw}} = 20 \text{ W (RMS)}$, VSWR = 1	330 VA

Environmental conditions

Temperature range	operating temperature range	0 °C to +40 °C
	storage temperature range	-20 °C to +70 °C
Humidity		+25 °C/+40 °C cyclic, 95 % relative humidity, without condensation
Altitude	operating altitude	up to 2000 m
	storage altitude	up to 4600 m

Mechanical specifications

Mechanical load capacity of desktop models	vibration, sinusoidal	5 Hz to 55 Hz, 0.15 mm amplitude, > 55 Hz to 150 Hz, 0.5 g acceleration, in line with EN 60068-2-6
	vibration, random	effective acceleration ≤ 1.2 g, 10 Hz to 300 Hz, 0.003 g ² /Hz acceleration spectral density, in line with EN 60068-2-64
	shock	18 sawtooth shocks, each 40 g in 11 ms, in line with EN 60068-2-27 and MIL-STD-810E method no. 516.4, procedure I

General data

Dimensions (W × H × D)	including fans and corner bumpers, integrable in PXI frame	121 mm × 100 mm × 150 mm (4.8 in × 3.9 in × 5.9 in)
Weight	without external power supply	3 kg (6.6 lb)

Ordering information

Base unit

Designation	Type	Configuration No.
System amplifier, 2 GHz to 20 GHz, 20 W output power (P_{sat})	R&S®SAM100	SAM100-0220-20

Required extras

Adapter 2.92 mm	R&S®SAM-B102	5358.2900.02
Adapter 3.5 mm	R&S®SAM-B103	5358.2900.03
Desktop kit	R&S®ZR-SAM-D	5358.2930.02
Frame mounting kit	R&S®ZR-SAM-R	5358.2923.02

Option

19" frame for up to 3 x R&S®SAM100	R&S®ZR-SAM-F	5358.2917.02
------------------------------------	--------------	--------------

Service that adds value

- ▶ Worldwide
- ▶ Local und personalized
- ▶ Customized and flexible
- ▶ 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

Rohde & Schwarz customer support

www.rohde-schwarz.com/support

