R&S®FC330SR FREQUENCY CONVERTER, 220 GHz to 330 GHz

Specifications

Specifications
Version 02.00

ROHDE&SCHWARZ
Make ideas real

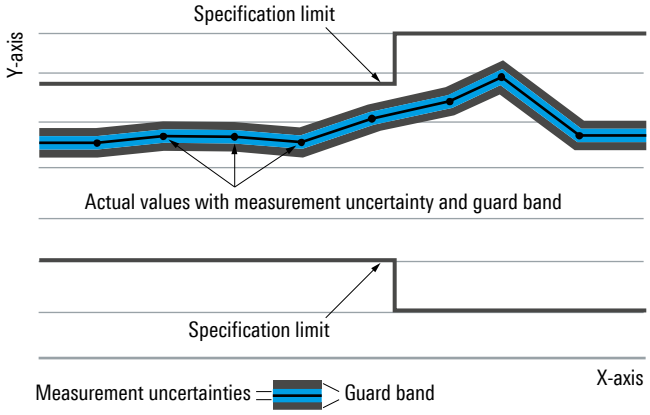
CONTENTS

Definitions

General
Product data applies under the following conditions:

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



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 standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit 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.

Specifications

Unless otherwise noted, all specifications in this section are valid for:

- +12 V power supply (see Accessories supplied)
- Temperature range from +20 °C to +30 °C

Frequency

RF frequency range	at RF waveguide input	220 GHz to 330 GHz
LO frequency range	at LO input connector	27.5 GHz to 41.25 GHz
IF frequency range	at IF output connector	1 GHz to 35 GHz

Level

Maximum safe RF input level	without external amplifier	+5 dBm
	with external amplifier R&S®FC330-Z50	–8 dBm

Input 1dB compression point	without external amplifier	> –5 dBm (meas.)
	with external amplifier R&S®FC330-Z50	–18 dBm (meas.)

Conversion gain	raw mixer conversion gain	approx. –12 dB (meas.)
	R&S®FC330SR including internal IF amplifier, without external amplifier	approx. +4dB (meas.)
	R&S®FC330SR including IF amplifier, with external amplifier R&S®FC330-Z50	approx. +17 dB (meas.)

Sensitivity

Noise figure	without external amplifier	+13 dB (nom.)
	with external amplifier R&S®FC330-Z50	+8 dB (nom.)

Inputs and outputs

RF input		
Connector		WM-864 / WR-3.4 waveguide
Impedance		50 Ω

IF output		
Connector		RPC2.92 female
Impedance		50 Ω (nom.)
Output frequency		1 GHz to 35 GHz

LO input		
Connector		RPC2.92 female
Impedance		50 Ω (nom.)
Input frequency		27.5 GHz to 41.25 GHz
Level	nominal level	+7 dBm
	absolute maximum level	+10 dBm

Power supply		
Connector		barrel connector (5.5 mm × 2.5 mm)
Supply voltage		+12 V DC, max. 2.5 A (nom.)

External modules		
Connector		ix Industrial, type B

USB interface	for service use only	1 port, type B plug, version 2.0

General data

Temperature		
Temperature range	operating	+10 °C to +40 °C
	storage	–40 °C to +70 °C

Altitude		
Maximum operating altitude	above sea level	2000 m (approx. 6500 ft)

Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, displacement: 0.3 mm, constant amplitude (1.8 g at 55 Hz), in line with EN 60068-2-6
		55 Hz to 150 Hz, acceleration: 0.5 g constant, in line with EN 60068-2-6
	random	8 Hz to 500 Hz, acceleration 1.2 g (RMS), in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810G, method 516.6, procedure I

EMC		• IEC/EN 61326-1 [1, 2] • IEC/EN 61326-2-1 • CISPR 11/EN 55011

Recommended calibration interval		2 years

External power supply		
DC output voltage range		+12 V
Maximum output current		5 A
Power consumption		max. 60 W
Safety		in line with IEC/UL/EN 61010-1
Test marks		KC, CE

Dimensions and weight		
Dimensions (nom.)	W × H × D (without adjustable device feet)	90 mm × 60 mm × 180 mm (3.54 in × 2.36 in × 7.09 in)
	W × H × D (with adjustable device feet)	130 mm x 73 mm x 183 mm (5.12 in x 2.87 in x 7.20 in)
Net weight (nom.)		1.23 kg (2,71 lb)

[1] Emission limits for class A equipment applied.

[2] Immunity test requirement for industrial environment (EN 61326 table 2).

Ordering information

Designation	Type	Order No.
Frequency converter, 220 GHz to 330 GHz	R&S®FC330SR	1444.6310.02
Accessories supplied		
+12 V power supply		
USB flash drive with measurement and alignment data		

Recommended extras

Designation	Type	Order No.
Torque wrench, for 3.5/2.92/2.4/1.85 mm connectors, 0.9 Nm coupling torque	R&S®ZN-ZTW	1328.8534.35
Torque wrench, for waveguide flanges, 0.58 Nm	R&S®ZCTW	1175.2014.02
Waveguide filter, 220 GHz to 250 GHz	R&S®FC330-Z01	1444.6327.02
Waveguide filter, 240 GHz to 270 GHz	R&S®FC330-Z02	1444.6333.02
Waveguide filter, 260 GHz to 290 GHz	R&S®FC330-Z03	1444.6340.02
Waveguide filter 280 GHz to 310 GHz	R&S®FC330-Z04	1444.6356.02
Waveguide filter, 300 GHz to 330 GHz	R&S®FC330-Z05	1444.6362.02
WR3.4 waveguide-to-waveguide adapter, 40 mm	R&S®FC330-Z20	1444.6385.02
External amplifier, 220 GHz to 330 GHz	R&S®FC330-Z50	1444.6379.02
Horn antenna, 220 GHz to 330 GHz	R&S®SGH330G25	1538.5875.03
Tunable attenuator, 220 GHz to 325 GHz	R&S®WTA-325	3593.4005.02
Fixed attenuator (0 db to 40 dB, due to customer specification)	WFA 220-330	04710037 (RPG part number)

Recommended LO generator

Designation	Type	Order No.
Signal generator	R&S®SMA100B	1419.8888.02
Frequency option, 8 kHz to 40 GHz	R&S®SMAB-B140	1420.8988.02
Ultra-low phase noise option	R&S®SMAB-B711	1420.8020.02

Service options

Warranty		
Base unit		1 year
All other items		1 year
Service options		
	Service plans	**On demand**
Calibration	up to five years [3]	pay per calibration
Warranty and repair	up to five years [4]	standard price repair
Contact your Rohde & Schwarz sales office for further details.		

[3] For extended periods, contact your Rohde & Schwarz sales office.

[4] For options installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

Service at Rohde&Schwarz
You're in great hands

- ► Worldwide
- ► Local and personalized
- ► Customized and flexible
- ► Uncompromising quality
- ► Long-term dependability

Rohde&Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test&measurement, technology systems and networks&cybersecurity. Founded 90 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and 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

PD 3673.0263.22 | Version 02.00 | October 2024 (st)
R&S®FC330SR Frequency Converter, 220 GHz to 330 GHz
Data without tolerance limits is not binding | Subject to change