

# RPG FS-Z75, FS-Z90, FS-Z110

## Harmonic Mixer

### Specifications



**Radiometer Physics**  
A Rohde & Schwarz Company

# Definitions

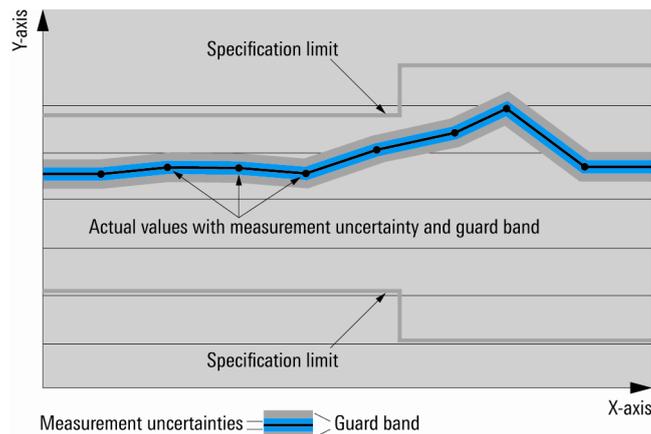
## General

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.

# Specifications

RF frequency range	RPG FS-Z 75	50 GHz to 75 GHz
	RPG FS-Z 90	60 GHz to 90 GHz
	RPG FS-Z 110	75 GHz to 110 GHz
Maximum CW RF input level	RPG FS-Z 75	+10 dBm
	RPG FS-Z 90	+10 dBm
	RPG FS-Z 110	+10 dBm
1 dB compression <sup>1</sup>	RPG FS-Z 75	-5 dBm (nom.)
	RPG FS-Z 90	-6 dBm (nom.)
	RPG FS-Z 110	-6 dBm (nom.)
Conversion loss with the R&S®FSU/FSV/FSVR/FSUP/FSQ/FSW (LO level between +14 dBm and +17 dBm at the LO input port)	RPG FS-Z 75	
	6 <sup>th</sup> LO harmonic selected, 50 GHz ≤ f <sub>RF</sub> ≤ 65 GHz	≤ 24 dB, 20 dB (typ.)
	6 <sup>th</sup> LO harmonic selected, 65 GHz < f <sub>RF</sub> ≤ 75 GHz	≤ 26 dB, 21 dB (typ.)
	RPG FS-Z 90	
	6 <sup>th</sup> LO harmonic selected, 60 GHz ≤ f <sub>RF</sub> ≤ 78 GHz	≤ 22 dB, 16 dB (typ.)
	6 <sup>th</sup> LO harmonic selected, 78 GHz < f <sub>RF</sub> ≤ 90 GHz	≤ 28 dB, 21 dB (typ.)
	RPG FS-Z 110	
8 <sup>th</sup> LO harmonic selected, 75 GHz ≤ f <sub>RF</sub> ≤ 110 GHz	≤ 30 dB, 23 dB (typ.)	
Level uncertainty with the R&S®FSU/FSV/FSVR/FSUP/FSQ/FSW at calibrated frequency points	95 % confidence level, LO level between +14 dBm and +17 dBm at the LO input port	
	+25 °C	< 3.0 dB
	+5 °C to +40 °C	< 4.5 dB
Frequency response	within any 1 GHz band, LO level between +14 dBm and +17 dBm at the LO input port, conversion loss equalized using the supplied conversion loss table	< 6.0 dB
Temperature drift	0 °C to +55 °C	< 1 dB (typ.)
<b>RF input</b>		
Waveguide designator	RPG FS-Z75	WM-3759 (WR15)
	RPG FS-Z90	WM-3099 (WR12)
	RPG FS-Z110	WM-2540 (WR10)
Connector type (anti cocking flange)	RPG FS-Zxxx	precision waveguide flange compatible with flange types UG-387/U-M and IEEE 1785.2a
VSWR	RPG FS-Z 75	1.4 : 1 (typ.)
	RPG FS-Z 90	1.4 : 1 (typ.)
	RPG FS-Z 110	1.4 : 1 (typ.)
<b>Local oscillator input (LO IN)</b>		
Connector		SMA connector (female)
LO frequency range	RPG FS-Z 75	8.0 GHz to 12.84 GHz
	RPG FS-Z 90	7.44 GHz to 15.34 GHz
	RPG FS-Z 110	7.75 GHz to 13.99 GHz
Maximum rated LO level (RF input level < max. permissible CW RF input level)	RPG FS-Z 75	+18.0 dBm
	RPG FS-Z 90	+18.0 dBm
	RPG FS-Z 110	+18.0 dBm
<b>(IF OUT)</b>		
Connector		SMA connector (female)
Frequency range		5 MHz to 6.0 GHz <sup>2</sup>

<sup>1</sup> The specified value represents the 1 dB compression point of the mixer itself. The 1 dB compression point in combination with a Rohde & Schwarz spectrum analyzer with B21 option can be lower, if the RF input level minus conversion loss exceeds the full scale level of the B21 option.

<sup>2</sup> The actual IF frequency depends on the type of spectrum analyzer. Conversion loss tables are supplied with the separately provided USB stick.

## General data

Operating temperature range		0 °C to +55 °C
Permissible temperature range		0 °C to +55 °C
Storage temperature range		-40 °C to +70 °C
Climatic loading		+40 °C at 95 % relative humidity (non condensing) (DIN EN 60068-2-30: 2000-02)
Dimensions	FS-Z 75 (W × H × D)  FS-Z 90 (W × H × D)  FS-Z 110 (W × H × D)	27.0 mm × 22.0 mm × 102.0 mm (1.06 in × 0.87 in × 4.02 in) 27.0 mm × 22.0 mm × 98 mm (1.06 in × 0.87 in × 3.86 in) 27.0 mm × 22.0 mm × 96 mm (1.06 in × 0.87 in × 3,78 in)
Weight		190 g (nom.) 0.45 lb (nom.)

## Ordering information

Designation	Type	R&S Order No.
Harmonic Mixer, 50 GHz to 75 GHz	RPG FS-Z 75	3638.2240.02
Harmonic Mixer, 60 GHz to 90 GHz	RPG FS-Z 90	3638.2270.02
Harmonic Mixer, 75 GHz to 110 GHz	RPG FS-Z 110	3638.2292.02
<b>Accessories supplied</b>	CD with user manual, USB stick with calibrated conversion loss data, carrying case	
Compatible with spectrum analyzers from Rohde & Schwarz; LO/IF ports (-B21 option) required		

