

RPG FS-Zxxx

Harmonic Mixer

Specifications



Radiometer Physics
A Rohde & Schwarz Company

Definitions

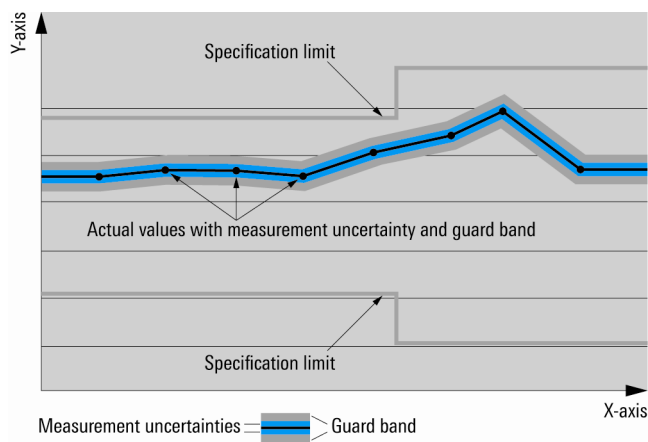
General

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.



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 Radiometer Physics 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 indicated as follows: “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Radiometer Physics.

General information

The Spectrum Analyzer Extenders are available for the frequency bands:

- 40 GHz to 60 GHz (FS-Z 60)
- 50 GHz to 75 GHz (FS-Z 75)
- 60 GHz to 90 GHz (FS-Z 90)
- 75 GHz to 110 GHz (FS-Z 110)
- 90 GHz to 140 GHz (FS-Z 140)
- 110 GHz to 170 GHz (FS-Z 170)
- 140 GHz to 220 GHz (FS-Z 220)
- 220 GHz to 325 GHz (FS-Z 325)
- 325 GHz to 500 GHz (FS-Z 500)

Specifications

Test Port

Frequency Range [GHz]	RPG FS-Z 60	40 – 60
	RPG FS-Z 75	50 – 75
	RPG FS-Z 90	60 – 90
	RPG FS-Z 110	75 – 110
	RPG FS-Z 140	90 – 140
	RPG FS-Z 170	110 – 170
	RPG FS-Z 220	140 – 220
	RPG FS-Z 325	220 – 325
	RPG FS-Z 500	325 – 500
Harmonic number	RPG FS-Z 60	#4
	RPG FS-Z 75	#6
	RPG FS-Z 90	#6
	RPG FS-Z 110	#8
	RPG FS-Z 140	#10
	RPG FS-Z 170	#12
	RPG FS-Z 220	#16
	RPG FS-Z 325	#22
	RPG FS-Z 500	#36
P1dB (typ.) [dBm]	RPG FS-Z 60	+ 0
	RPG FS-Z 75	- 5
	RPG FS-Z 90	- 6
	RPG FS-Z 110	- 6
	RPG FS-Z 140	- 3
	RPG FS-Z 170	- 3
	RPG FS-Z 220	- 3
	RPG FS-Z 325	- 5
	RPG FS-Z 500	- 3
Temperatur drift (typ.) [dB] (0 °C to +55 °C)	RPG FS-Z 60	< 1
	RPG FS-Z 75	
	RPG FS-Z 90	
	RPG FS-Z 110	
	RPG FS-Z 140	
	RPG FS-Z 170	
	RPG FS-Z 220	
	RPG FS-Z 325	
	RPG FS-Z 500	
Conversion loss (typ.) [dB]	RPG FS-Z 60	+ 13
	RPG FS-Z 75	+ 18
	RPG FS-Z 90	+ 18
	RPG FS-Z 110	+ 22
	RPG FS-Z 140	+ 26
	RPG FS-Z 170	+ 26
	RPG FS-Z 220	+ 32
	RPG FS-Z 325	+ 38
	RPG FS-Z 500	+ 50

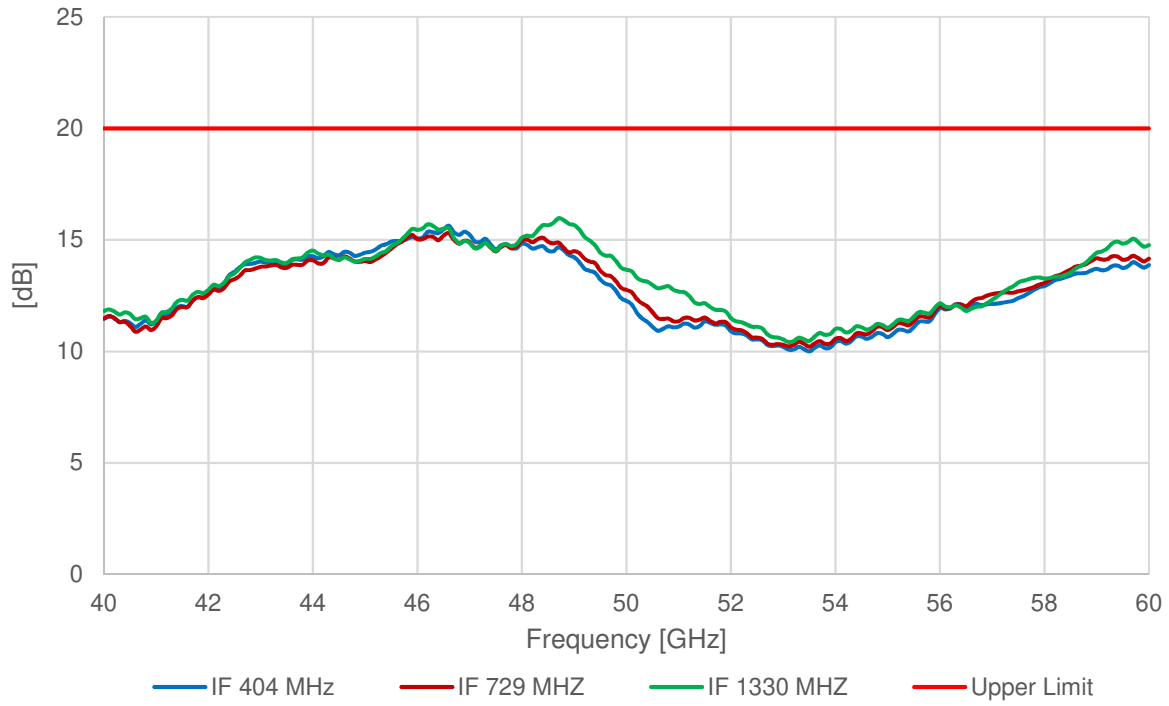
RF INPUT		
Waveguide designator	RPG FS-Z 60	WR-19
	RPG FS-Z 75	WR-15
	RPG FS-Z 90	WR-12
	RPG FS-Z 110	WM-2540 (WR-10)
	RPG FS-Z 140	WM-2032 (WR-8)
	RPG FS-Z 170	WM-1651 (WR-6.5)
	RPG FS-Z 220	WM-1295 (WR-5.1)
	RPG FS-Z 325	WM-864 (WR-3.4)
	RPG FS-Z 500	WM-570 (WR-2.2)
Connector type (anti cocking flange)	RPG FS-Z 60	R&S precision waveguide flange (compatible with UG-383)
	RPG FS-Z 75	R&S precision waveguide flange (compatible with UG-387/U-M and IEEE1785.2)
	RPG FS-Z 90	
	RPG FS-Z 110	
	RPG FS-Z 140	
	RPG FS-Z 170	
	RPG FS-Z 220	
	RPG FS-Z 325	
	RPG FS-Z 500	
VSWR (typ.)	RPG FS-Z 60	1.3 : 1
	RPG FS-Z 75	1.4 : 1
	RPG FS-Z 90	1.4 : 1
	RPG FS-Z 110	1.4 : 1
	RPG FS-Z 140	1.5 : 1
	RPG FS-Z 170	1.6 : 1
	RPG FS-Z 220	1.7 : 1
	RPG FS-Z 325	3 : 1
	RPG FS-Z 500	3 : 1

Local oscillator input (LO IN)		
LO Frequency range [GHz]	RPG FS-Z 60	8.60 – 15.40
	RPG FS-Z 75	8.00 – 12.84
	RPG FS-Z 90	7.44 – 15.34
	RPG FS-Z 110	7.75 – 13.99
	RPG FS-Z 140	9.00 – 14.00
	RPG FS-Z 170	9.13 – 14.13
	RPG FS-Z 220	8.72 – 13.72
	RPG FS-Z 325	10.00 – 14.77
	RPG FS-Z 500	9.02 – 13.88
Connector type	RPG FS-Z 60	SMA Connector (female)
	RPG FS-Z 75	
	RPG FS-Z 90	
	RPG FS-Z 110	
	RPG FS-Z 140	
	RPG FS-Z 170	
	RPG FS-Z 220	
	RPG FS-Z 325	
	RPG FS-Z 500	
LO Input power (typ.) [dBm]	RPG FS-Z 60	+ 13.0
	RPG FS-Z 75	+ 14.0
	RPG FS-Z 90	+ 14.0
	RPG FS-Z 110	+ 15.5
	RPG FS-Z 140	+ 14.0
	RPG FS-Z 170	+ 15.5
	RPG FS-Z 220	+ 13.0
	RPG FS-Z 325	+ 16.0
	RPG FS-Z 500	+ 15.5

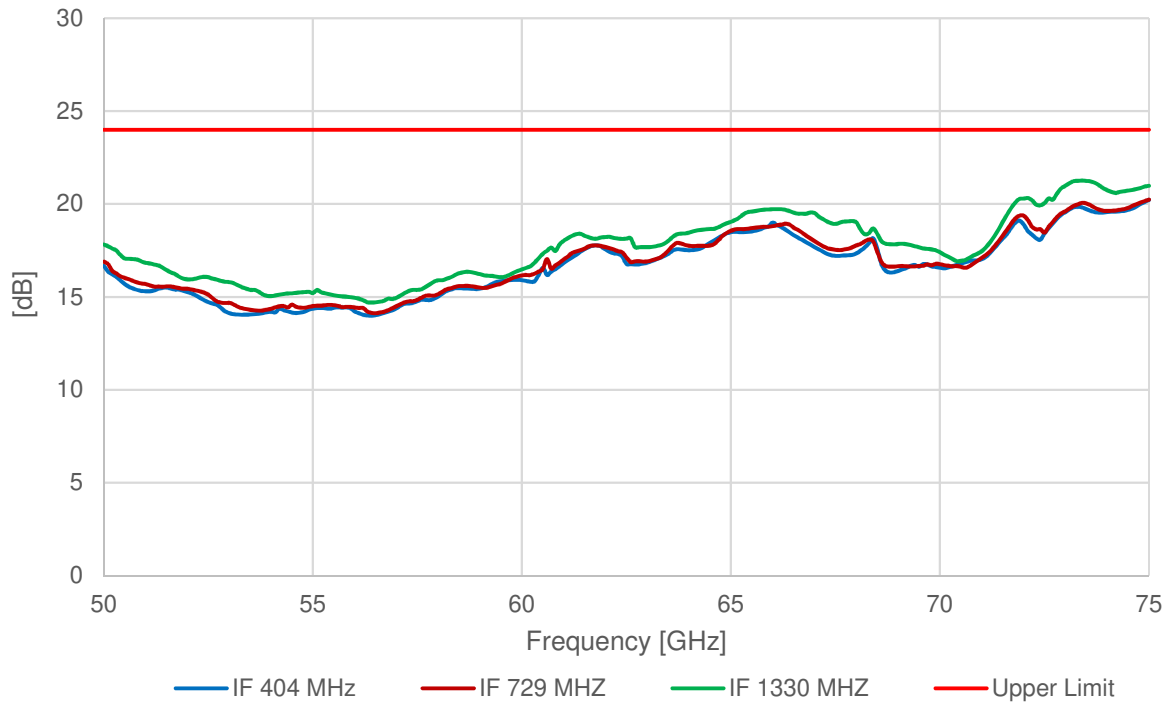
IF OUT		
Connector type	RPG FS-Z 60	SMA Connector (female)
	RPG FS-Z 75	
	RPG FS-Z 90	
	RPG FS-Z 110	
	RPG FS-Z 140	
	RPG FS-Z 170	
	RPG FS-Z 220	
	RPG FS-Z 325	
	RPG FS-Z 500	
Frequency Range [MHz]	RPG FS-Z 60	5 - 2000
	RPG FS-Z 75	
	RPG FS-Z 90	
	RPG FS-Z 110	
	RPG FS-Z 140	
	RPG FS-Z 170	
	RPG FS-Z 220	
	RPG FS-Z 325	
	RPG FS-Z 500	

Absolut Maximum Ratings

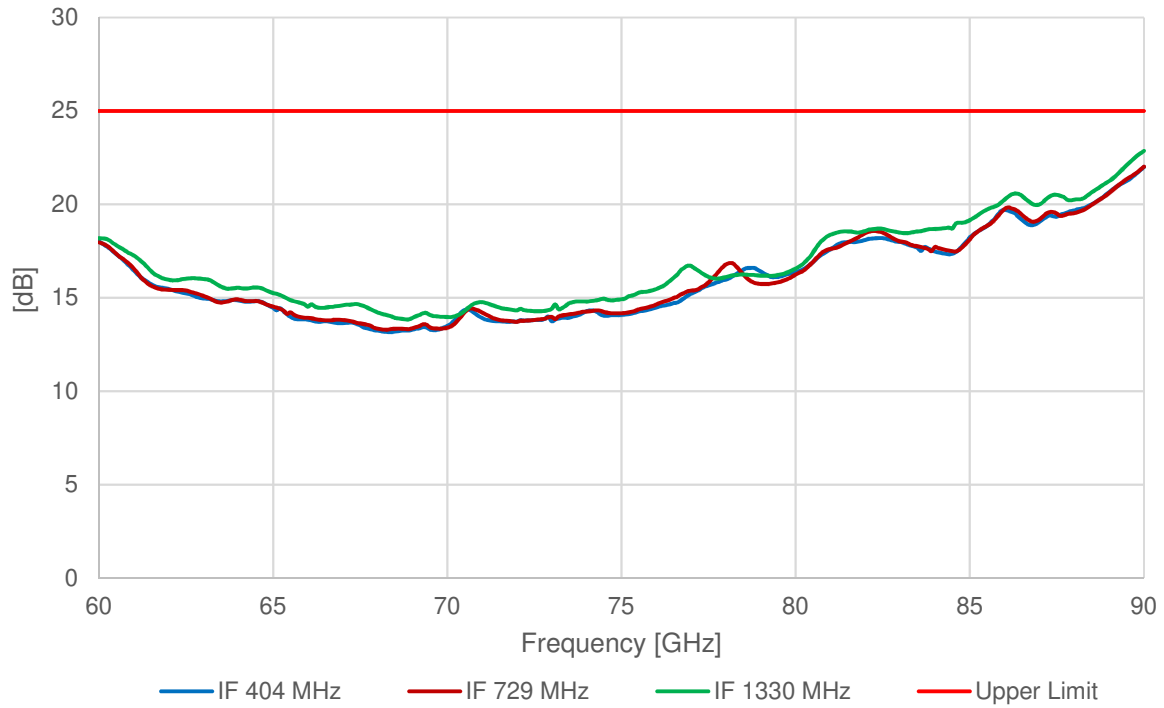
RF Input Power [dBm]	RPG FS-Z 60	+ 23
	RPG FS-Z 75	+ 10
	RPG FS-Z 90	
	RPG FS-Z 110	
	RPG FS-Z 140	
	RPG FS-Z 170	
	RPG FS-Z 220	
	RPG FS-Z 325	
	RPG FS-Z 500	
LO Input Power [dBm]	RPG FS-Z 60	+ 17
	RPG FS-Z 75	
	RPG FS-Z 90	
	RPG FS-Z 110	
	RPG FS-Z 140	
	RPG FS-Z 170	
	RPG FS-Z 220	
	RPG FS-Z 325	
	RPG FS-Z 500	
Case Temperature [°C]	RPG FS-Z 60	+ 45
	RPG FS-Z 75	
	RPG FS-Z 90	
	RPG FS-Z 110	
	RPG FS-Z 140	
	RPG FS-Z 170	
	RPG FS-Z 220	
	RPG FS-Z 325	
	RPG FS-Z 500	



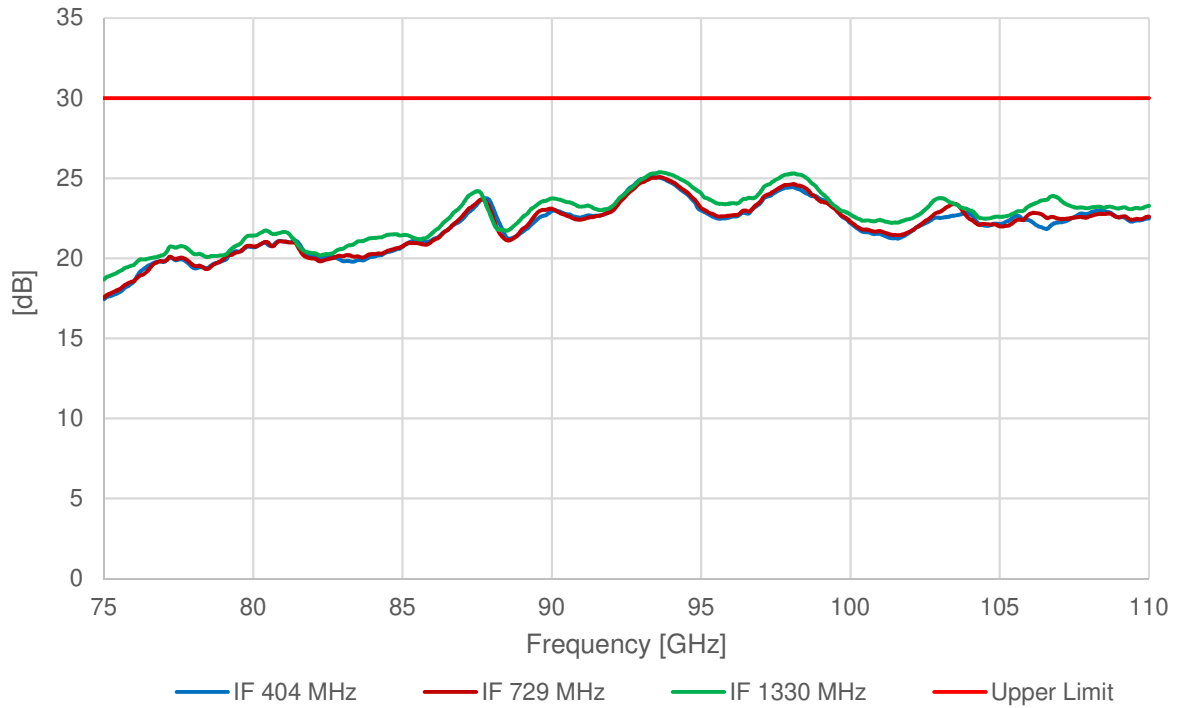
typ. figure: FS-Z60 Conversion Loss



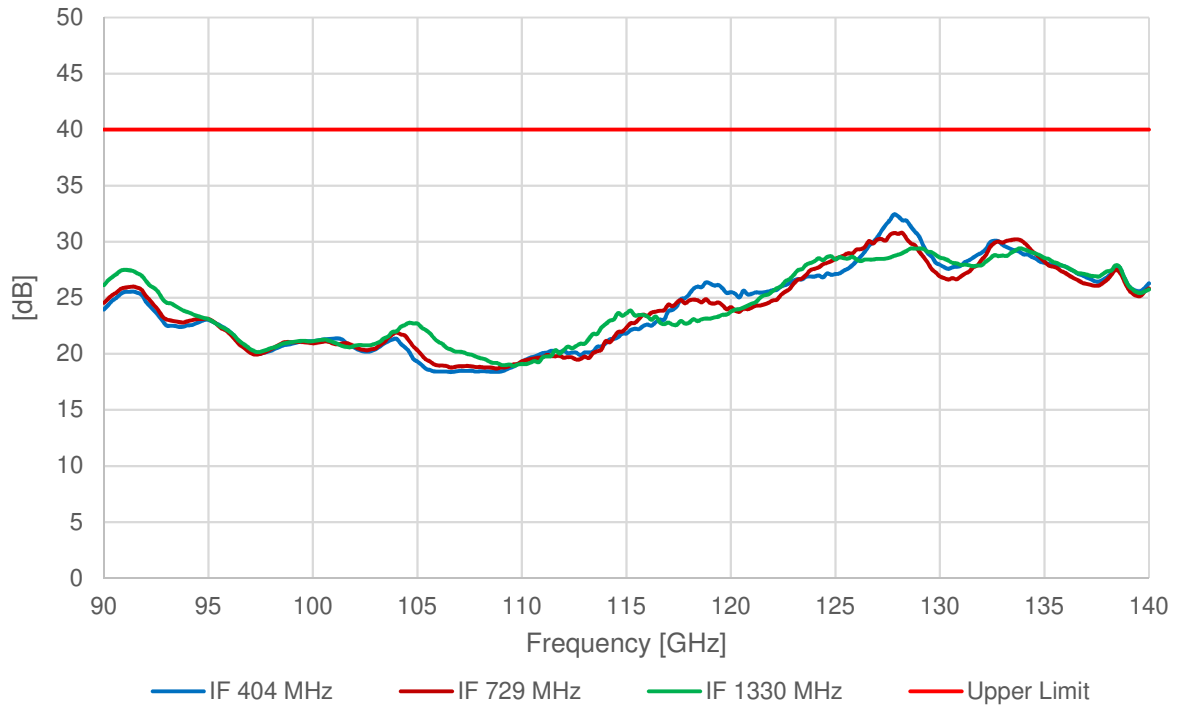
typ. figure: FS-Z75 Conversion Loss



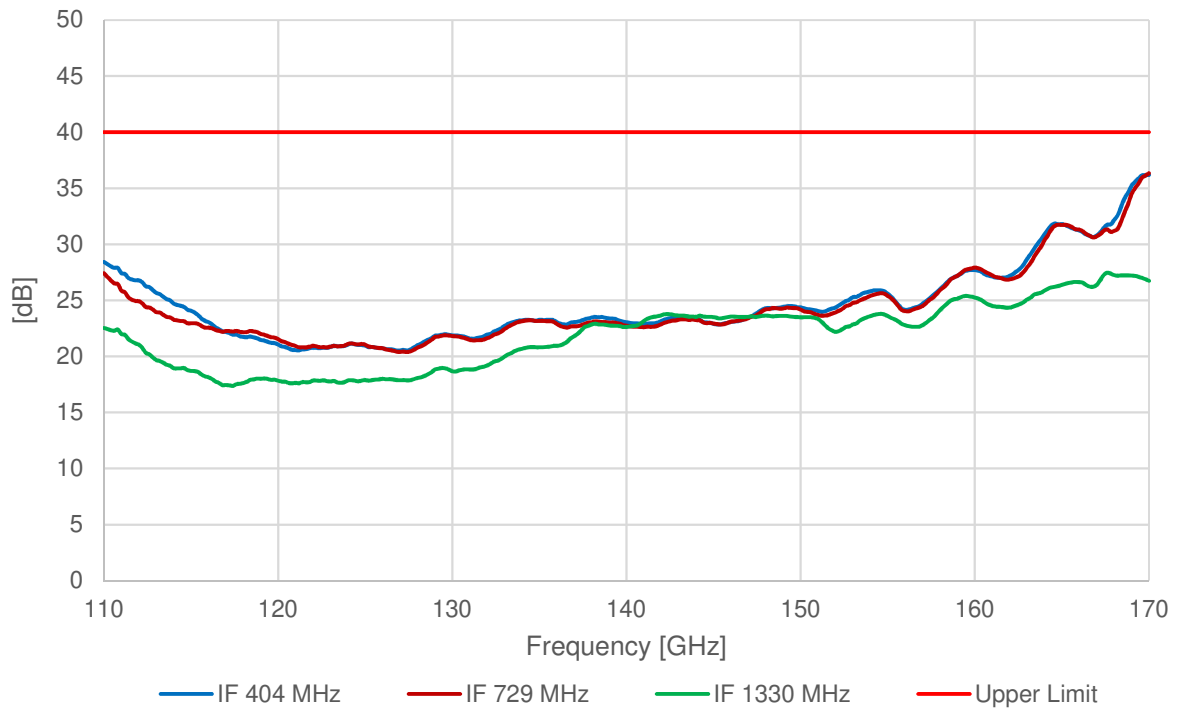
typ. figure: FS-Z90 Conversion Loss



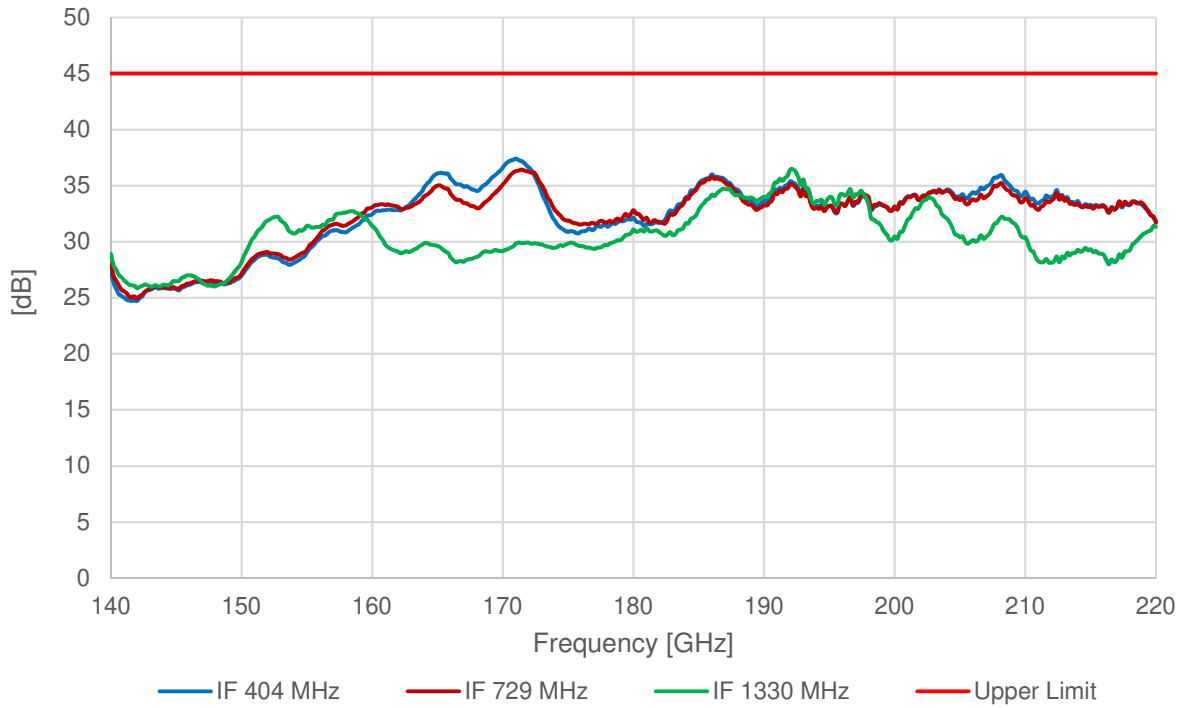
typ. figure: FS-Z110 Conversion Loss



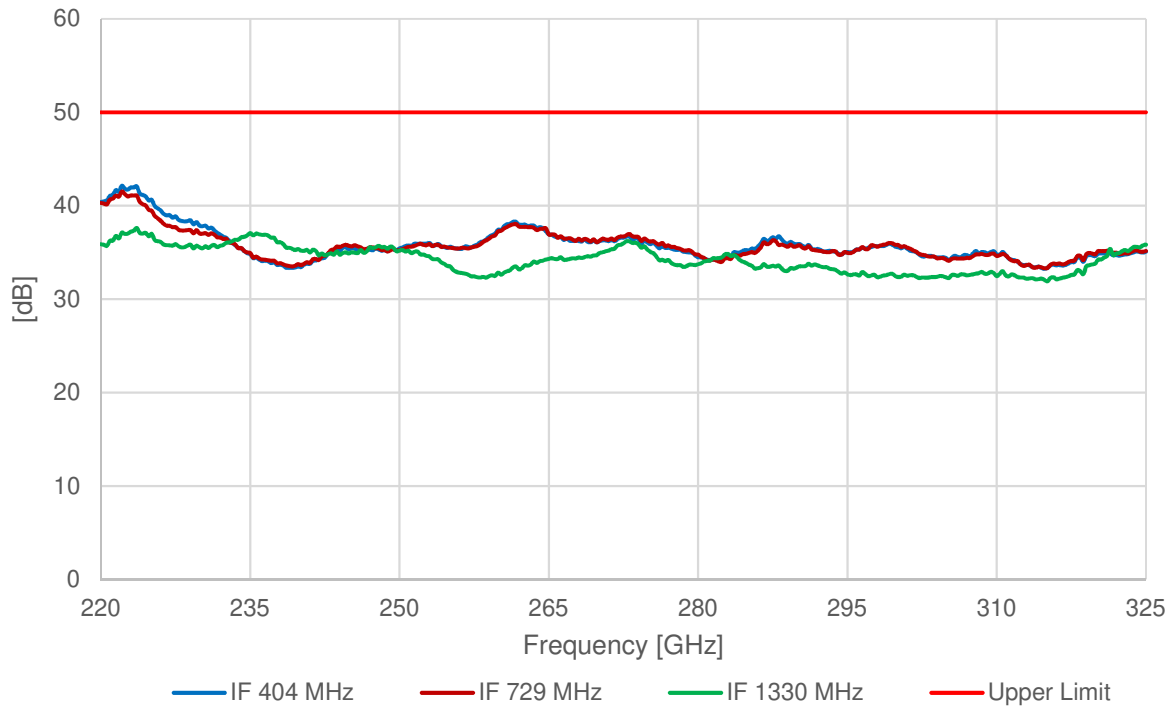
typ. figure: FS-Z140 Conversion Loss



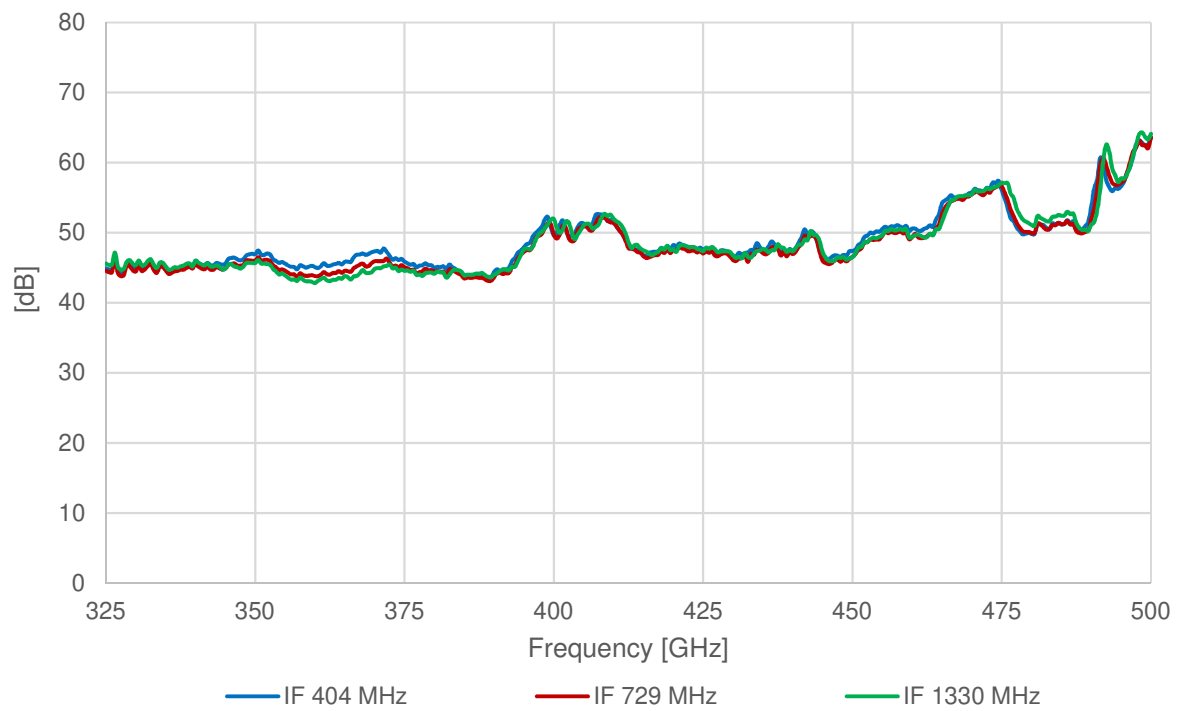
typ. figure: FS-Z170 Conversion Loss



typ. figure: FS-Z220 Conversion Loss



typ. figure: FS-Z325 Conversion Loss



typ. figure: FS-Z500 Conversion Loss

General data

Temperature loading	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		in line with IEC 60068-2-1 and IEC 60068-2-2
Dimensions	FS-Z 60 (W × H × D)	+40 °C at 95 % rel. humidity, in line with IEC 60068-2-30 27.0 mm × 24.15 mm × ~64 mm (1.06 in × 0.95 in × 2.51 in)
	FS-Z 75 (W × H × D)	27.0 mm × 22.0 mm × 102.0 mm (1.06 in × 0.87 in × 4.02 in)
	FS-Z 90 (W × H × D)	27.0 mm × 22.0 mm × 98 mm (1.06 in × 0.87 in × 3.86 in)
	FS-Z 110 (W × H × D)	27.0 mm × 22.0 mm × 96 mm (1.06 in × 0.87 in × 3.78 in)
	FS-Z 140 (W × H × D)	27.0 mm × 24.15 mm × ~94 mm (1.06 in × 0.95 in × 3.70 in)
	FS-Z 170 (W × H × D)	27.0 mm × 24.15 mm × ~85 mm (1.06 in × 0.95 in × 3.34 in)
	FS-Z 220 (W × H × D)	27.0 mm × 24.15 mm × ~84 mm (1.06 in × 0.95 in × 3.30 in)
	FS-Z 325 (W × H × D)	27.0 mm × 24.15 mm × ~73 mm (1.06 in × 0.95 in × 2.87 in)
	FS-Z 500 (W × H × D)	
Weight		(typ.) 190 g (nom.) (typ.) 0.45 lb (nom.)

Ordering information

Designation	R&S-Order No.
RPG FS-Z 60	1048.0171.02
RPG FS-Z 75	3638.2240.02
RPG FS-Z 90	3638.2270.02
RPG FS-Z 110	3638.2292.02
RPG FS-Z 140	3622.0708.02
RPG FS-Z 170	3622.0714.02
RPG FS-Z 220	3593.3250.02
RPG FS-Z 325	3593.3267.02
RPG FS-Z 500	3593.3273.02