

RPG HM – Harmonic Mixer

Specifications



Radiometer Physics
A Rohde & Schwarz Company

Definitions

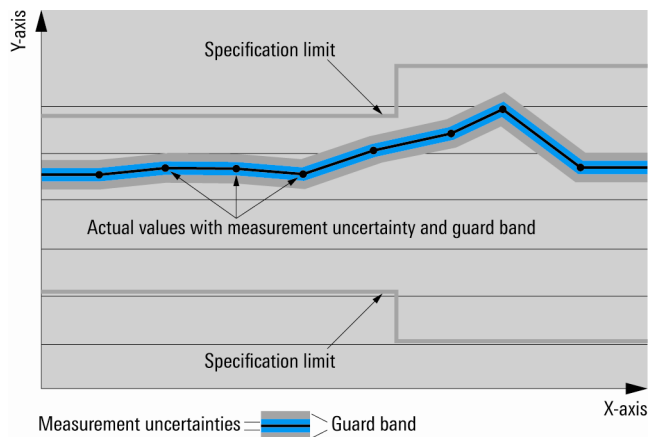
General

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 RPG Harmonic Mixers (HM) are available for the frequency bands:

- 50 GHz to 75 GHz (HM 50-75)
- 60 GHz to 90 GHz (HM 60-90)
- 75 GHz to 110 GHz (HM 75-110)
- 90 GHz to 140 GHz (HM 90-140)
- 110 GHz to 170 GHz (HM 110-170)
- 140 GHz to 220 GHz (HM 140-220)
- 220 GHz to 330 GHz (HM 220-330)

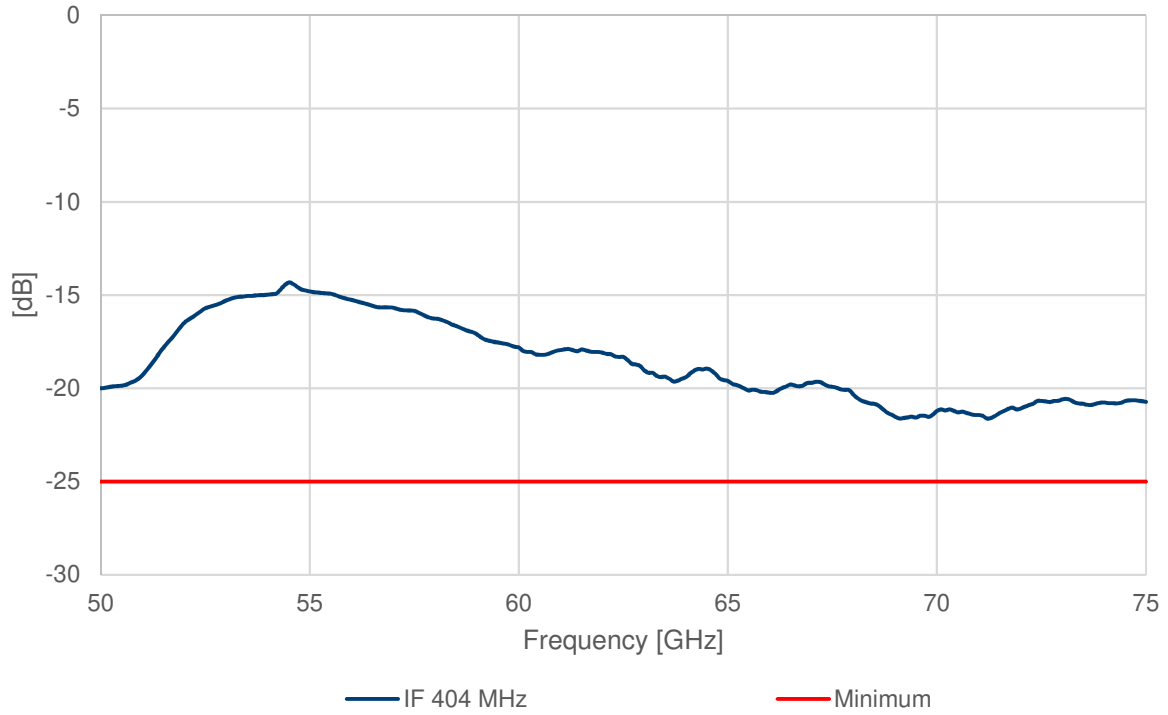
Specifications

Test Port

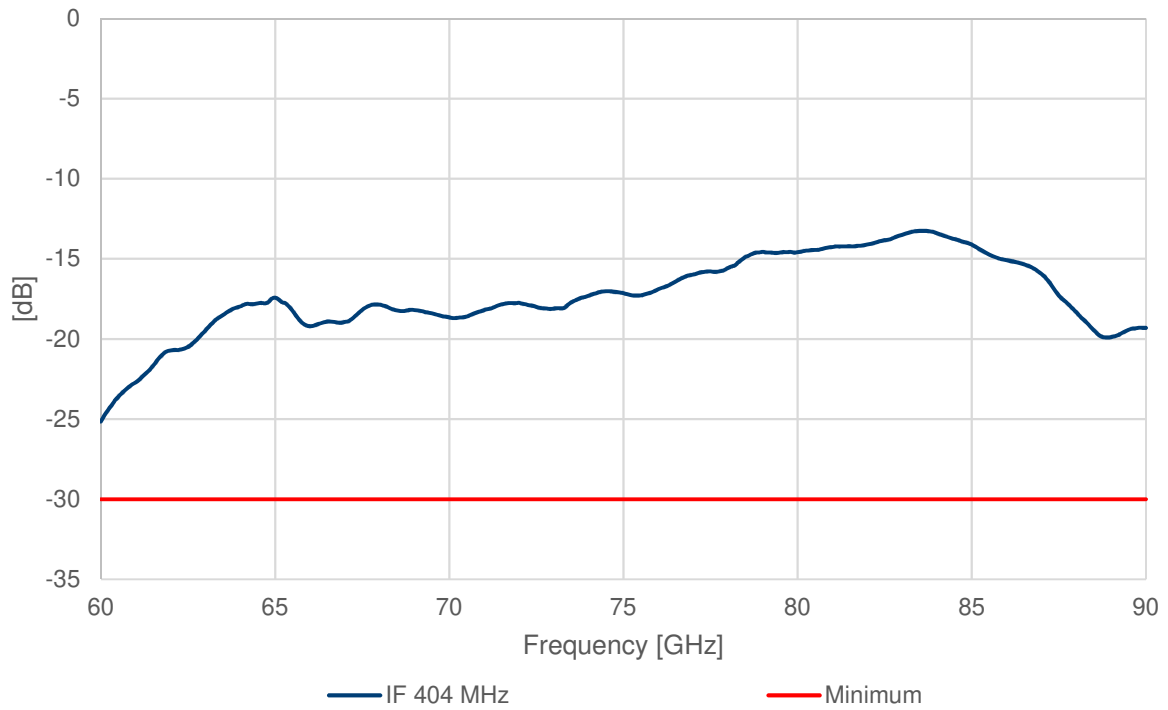
RF-Frequency range [GHz]	HM 50-75	50 - 75
	HM 60-90	60 - 90
	HM 75-110	75 - 110
	HM 90-140	90 - 140
	HM 110-170	110 - 170
	HM 140-220	140 - 220
	HM 220-330	220 - 330
Harmonic number	HM 50-75	# 6
	HM 60-90	# 6
	HM 75-110	# 8
	HM 90-140	# 10
	HM 110-170	# 12
	HM 140-220	# 16
	HM 220-330	# 22
Waveguide designator	HM 50-75	WR-15
	HM 60-90	WR-12
	HM 75-110	WM-2540 (WR-10)
	HM 90-140	WM-2032 (WR-8)
	HM 110-170	WM-1651 (WR-6.5)
	HM 140-220	WM-1295 (WR-5.1)
	HM 220-330	WM-864 (WR-3.4)
Connector type (anti cocking flange)	HM 50-75	RPG standard waveguide flange (compatible with UG-387/U-M)
	HM 60-90	
	HM 75-110	
	HM 90-140	
	HM 110-170	
	HM 140-220	
	HM 220-330	RPG precision waveguide flange (compatible with UG-387/U-M)
VSWR	HM 50-75	typ. 2.5 :1
	HM 60-90	
	HM 75-110	
	HM 90-140	
	HM 110-170	
	HM 140-220	
	HM 220-330	
LO-Frequency range [GHz] (with IF Frequency of 279 MHz)	HM 50-75	8.29 – 12.45
	HM 60-90	9.95 – 14.95
	HM 75-110	9.34 – 13.71
	HM 90-140	8.97 – 13.97
	HM 110-170	9.14 – 14.14
	HM 140-220	8.73 – 13.73
	HM 220-330	9.98 – 14.76
LO-Input power [GHz]	HM 50-75	typ. +14
	HM 60-90	typ. +14
	HM 75-110	typ. +15.5
	HM 90-140	typ. +14
	HM 110-170	typ. +15.5
	HM 140-220	typ. +13
	HM 220-330	typ. +16
P1dB [dBm]	HM 50-75	typ. -5
	HM 60-90	
	HM 75-110	
	HM 90-140	
	HM 110-170	
	HM 140-220	
	HM 220-330	
IF-Frequency range [MHz]	HM 50-75	5 - 3200
	HM 60-90	
	HM 75-110	
	HM 90-140	
	HM 110-170	
	HM 140-220	
	HM 220-330	

Absolut Maximum Ratings

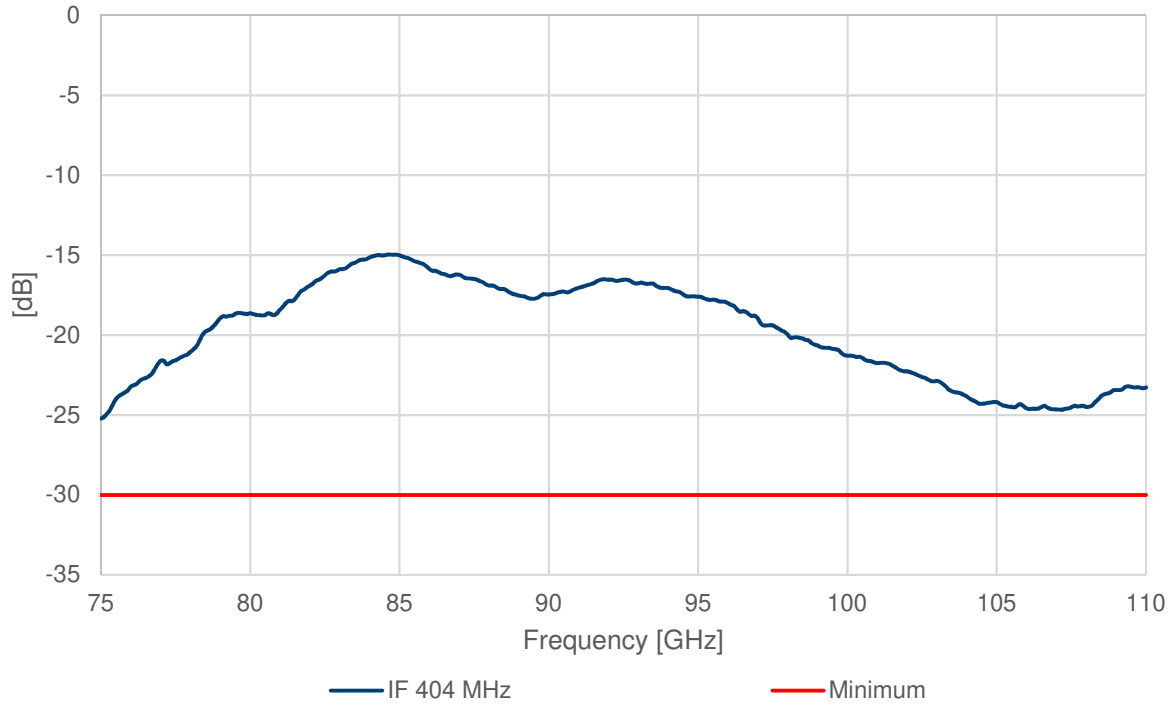
RF-Input power [dBm]	HM 50-75	+ 10
	HM 60-90	
	HM 75-110	
	HM 90-140	
	HM 110-170	
	HM 140-220	
	HM 220-330	
LO-Input power [dBm]	HM 50-75	+ 17
	HM 60-90	
	HM 75-110	
	HM 90-140	
	HM 110-170	
	HM 140-220	
	HM 220-330	
Case temperature [°C]	HM 50-75	+ 45
	HM 60-90	
	HM 75-110	
	HM 90-140	
	HM 110-170	
	HM 140-220	
	HM 220-330	



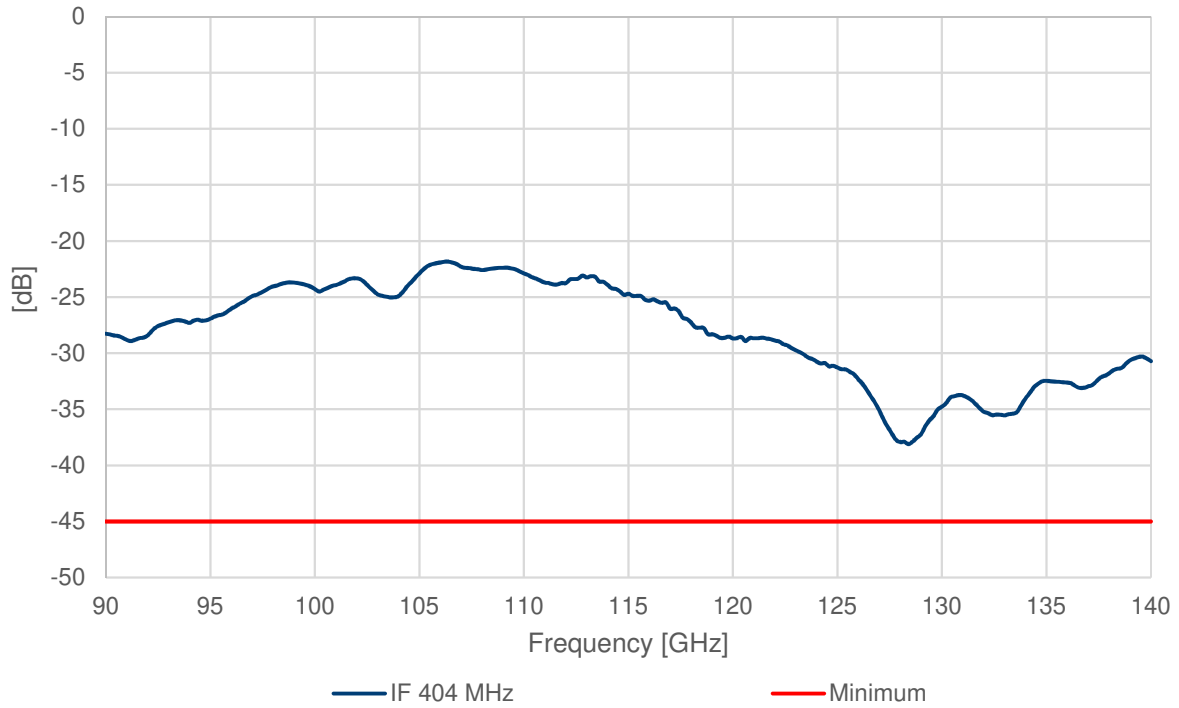
Typ. Figure 1: HM 50-75 Conversion loss (SSB)



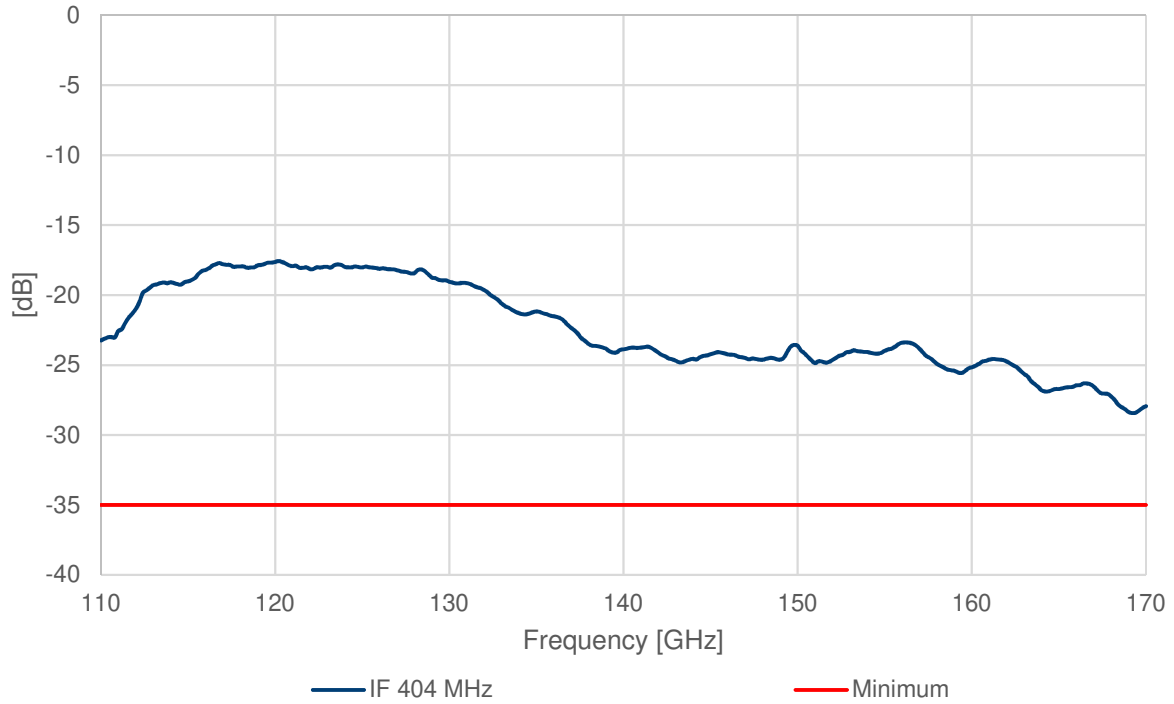
Typ. Figure 2: HM 60-90 Conversion loss (SSB)



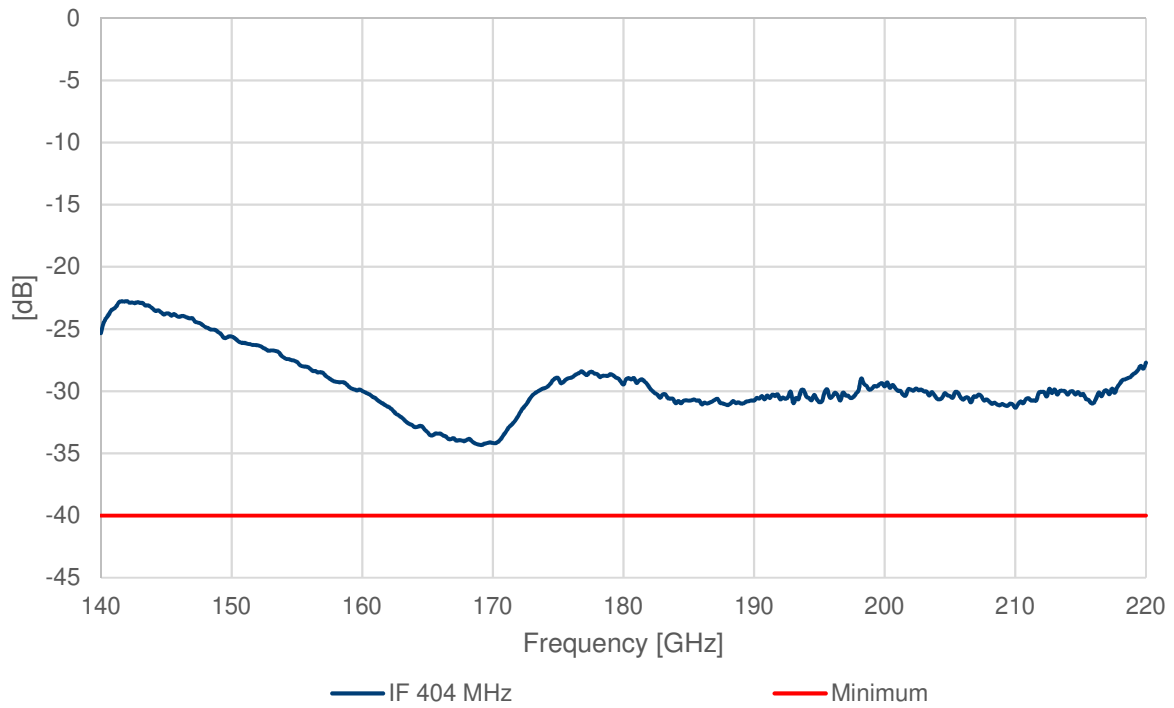
Typ. Figure 3: HM 75-110 Conversion loss (SSB)



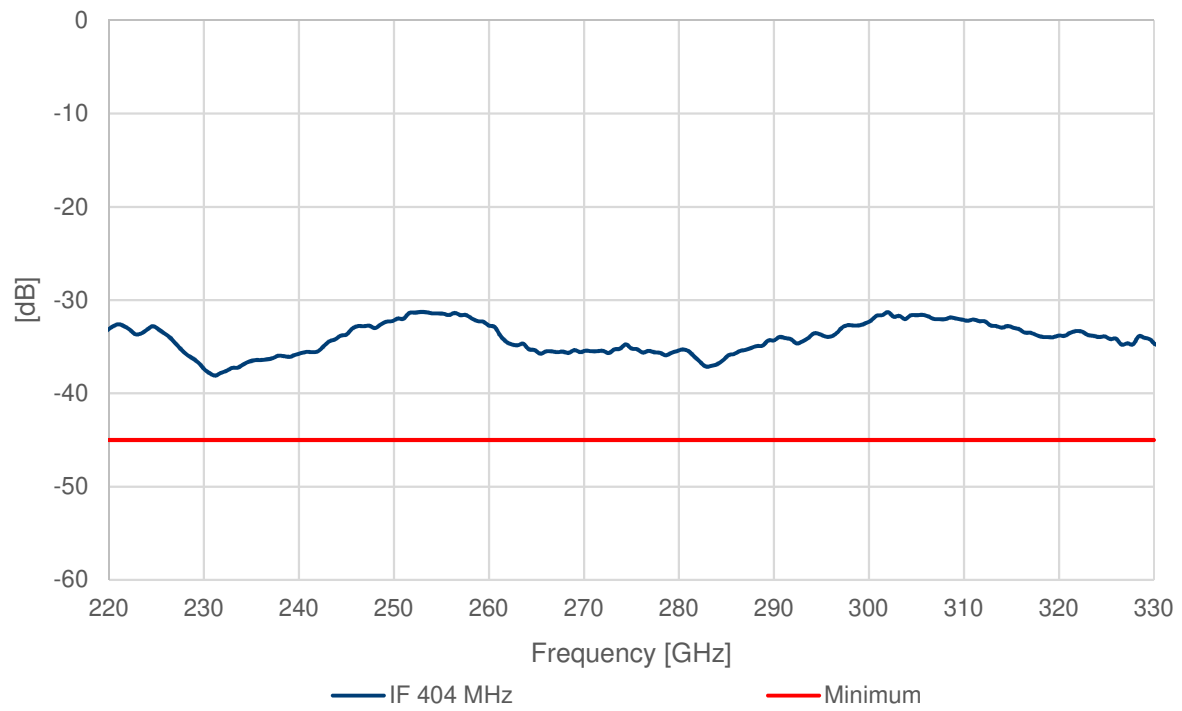
Typ. Figure 4: HM 90-140 Conversion loss (SSB)



Typ. Figure 5: HM 110-170 Conversion loss (SSB)



Typ. Figure 6: HM 140-220 Conversion loss (SSB)



Typ. Figure 7: HM 220-330 Conversion loss (SSB)

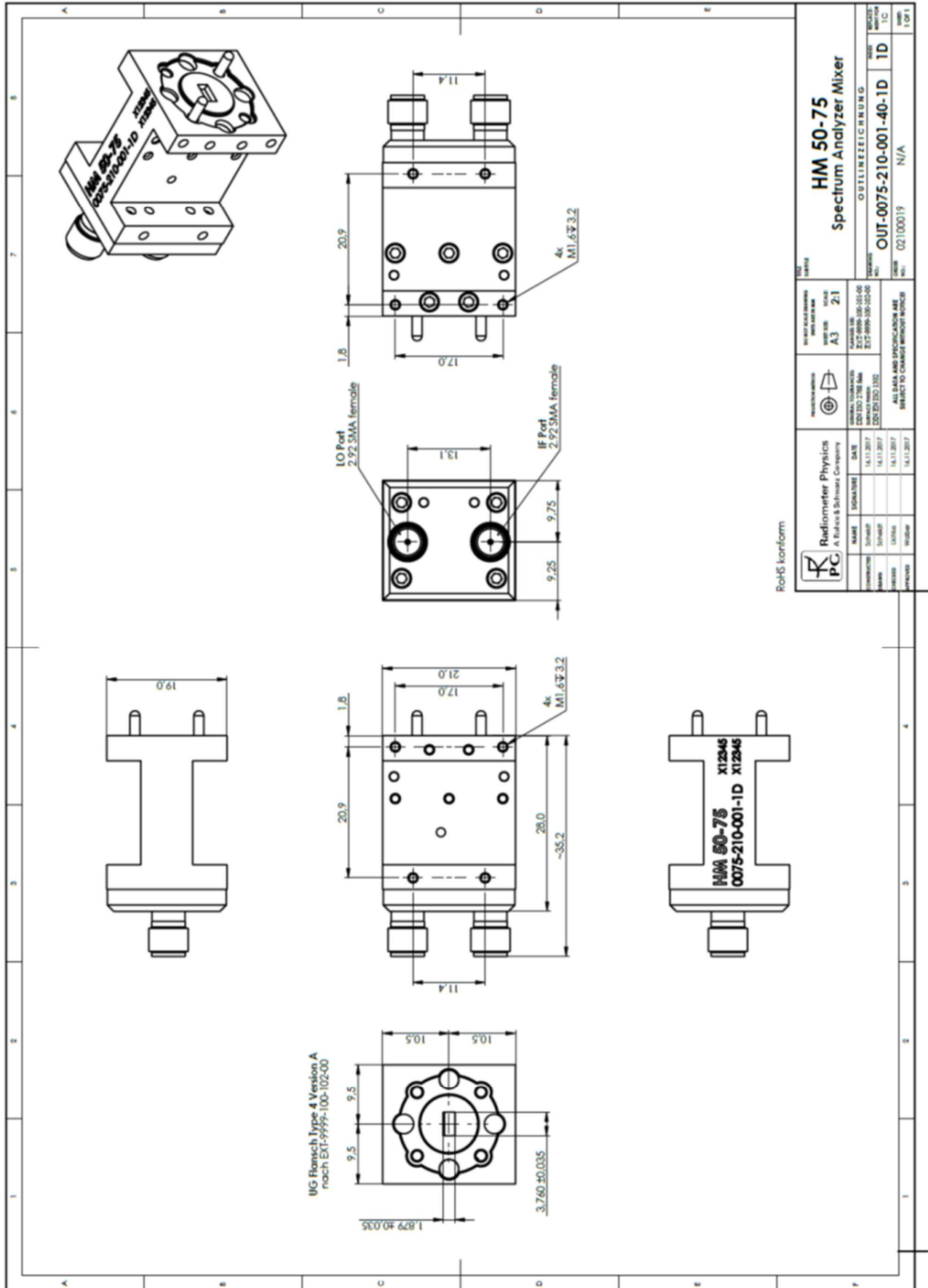
General data

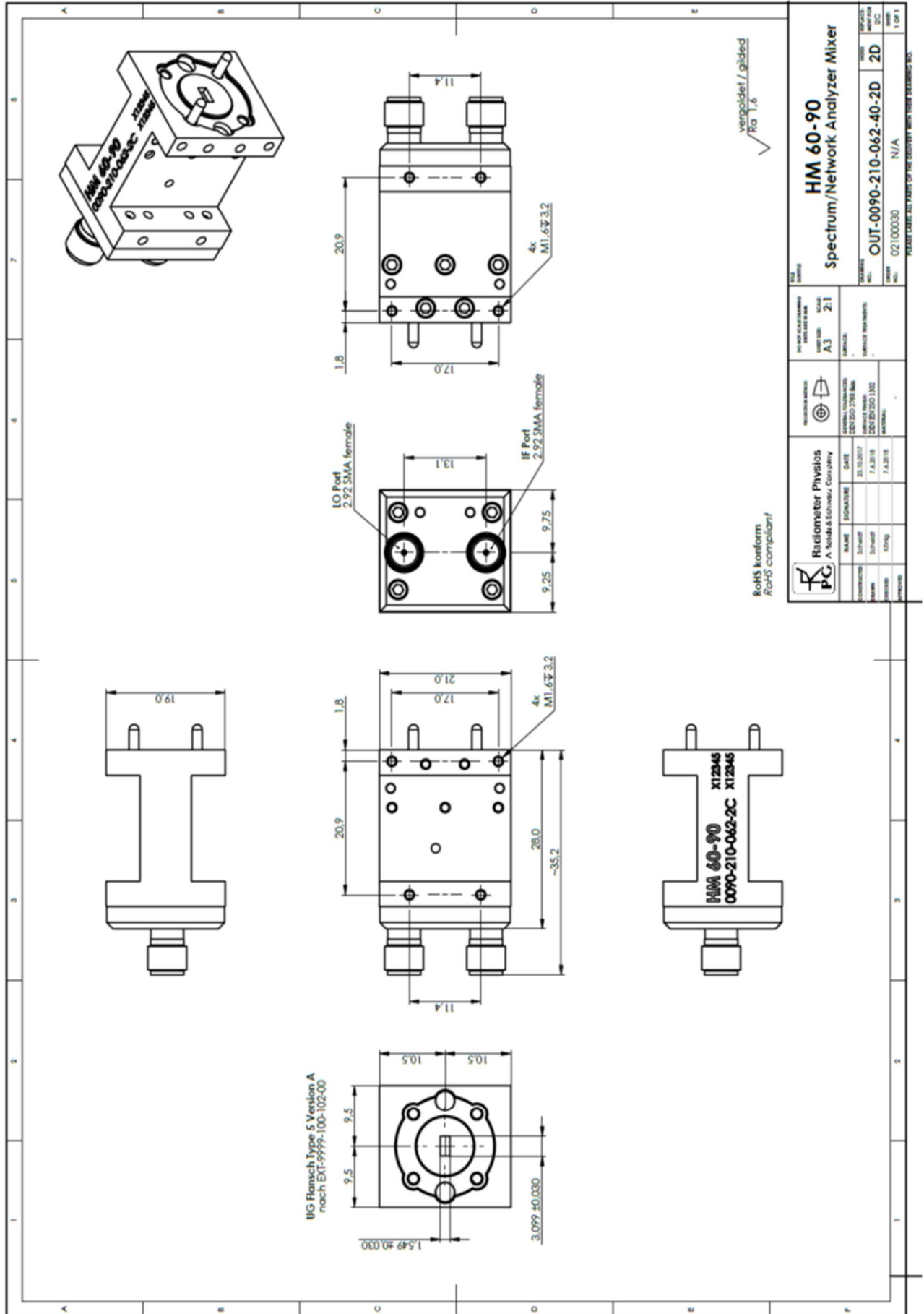
Temperature loading	operating temperature range	+18 °C to +28 °C
	permissible temperature range	+5 °C to +40 °C
	storage temperature range	−40 °C to +70 °C
		in line with IEC 60068-2-1 and IEC 60068-2-2
Damp heat		+40 °C at 80 % rel. humidity, in line with IEC 60068-2-30
Mechanical resistance	vibration, sinusoidal	5 Hz to 150 Hz, in line with IEC 60068-2-6
	vibration, random	10 Hz to 300 Hz, in line with IEC 60068-2-64
	shock	40 g shock spectrum, in line with MIL-STD-810, method 516, procedure I
Operation	permissible altitude	3000 m above sea level
Weight		70 gram (0.15 lb)
Shipping weight		100 gram (0.22 lb)

Ordering information

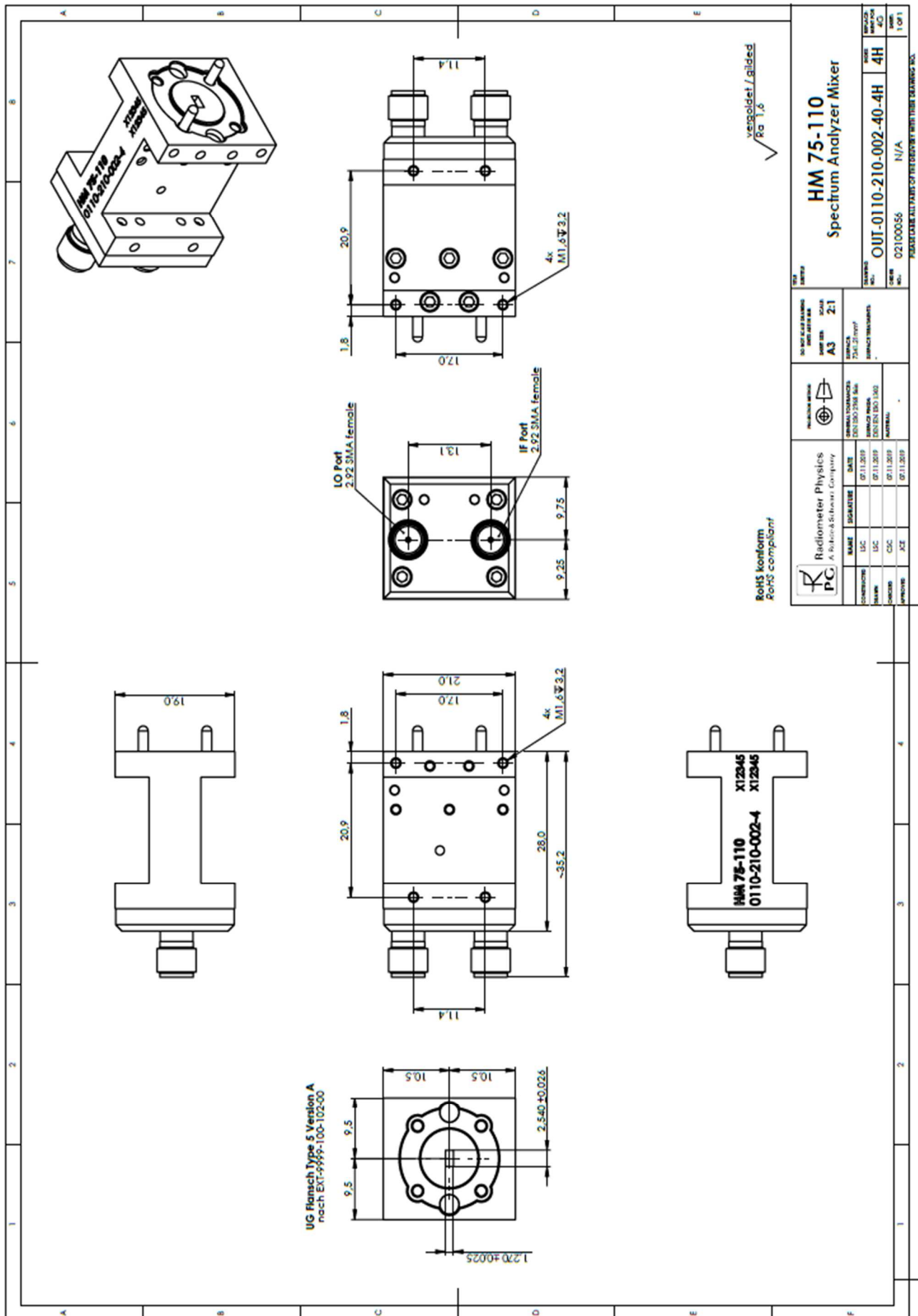
Designation	RPG-Order No.
Harmonic Mixer 50-75 GHz	02100019
Harmonic Mixer 60-90 GHz	02100030
Harmonic Mixer 75-110 GHz	02100014
Harmonic Mixer 90-140 GHz	02100026
Harmonic Mixer 110-170 GHz	02100033
Harmonic Mixer 140-220 GHz	02100034
Harmonic Mixer 220-330 GHz	02100028

Outline Drawing





PC Radometer Physicos A. Radak & Schwaner, Company		HM 60-90 Spectrum/Network Analyzer Mixer	
NAME	SCHWABER	DATE	23.10.2017
SCHWEISS	SCHWABER	IMPACT NUMBER	7.4.2018
BRAND	Köding	DRUCKENDE UNIT	7.4.2018
APPROVED		MATERIAL	
TECHNICAL SPECIFICATIONS DEN 250 2785 50k		GENERAL INFORMATION SCALE 2:1 SURFACE IMPACT TREATMENT	
IDENTIFICATION NUMBER A.3		ORDER NUMBER OUT-0090-210-062-40-2D	
DRAWING NUMBER 02100030		ORDER NUMBER N/A	
PLEASE CHECK ALL PARTS OF THE DRAWING WITH THESE DIMENSIONS!		NUMBER OF SHEETS 2D	
		SHEET NUMBER 1 OF 1	



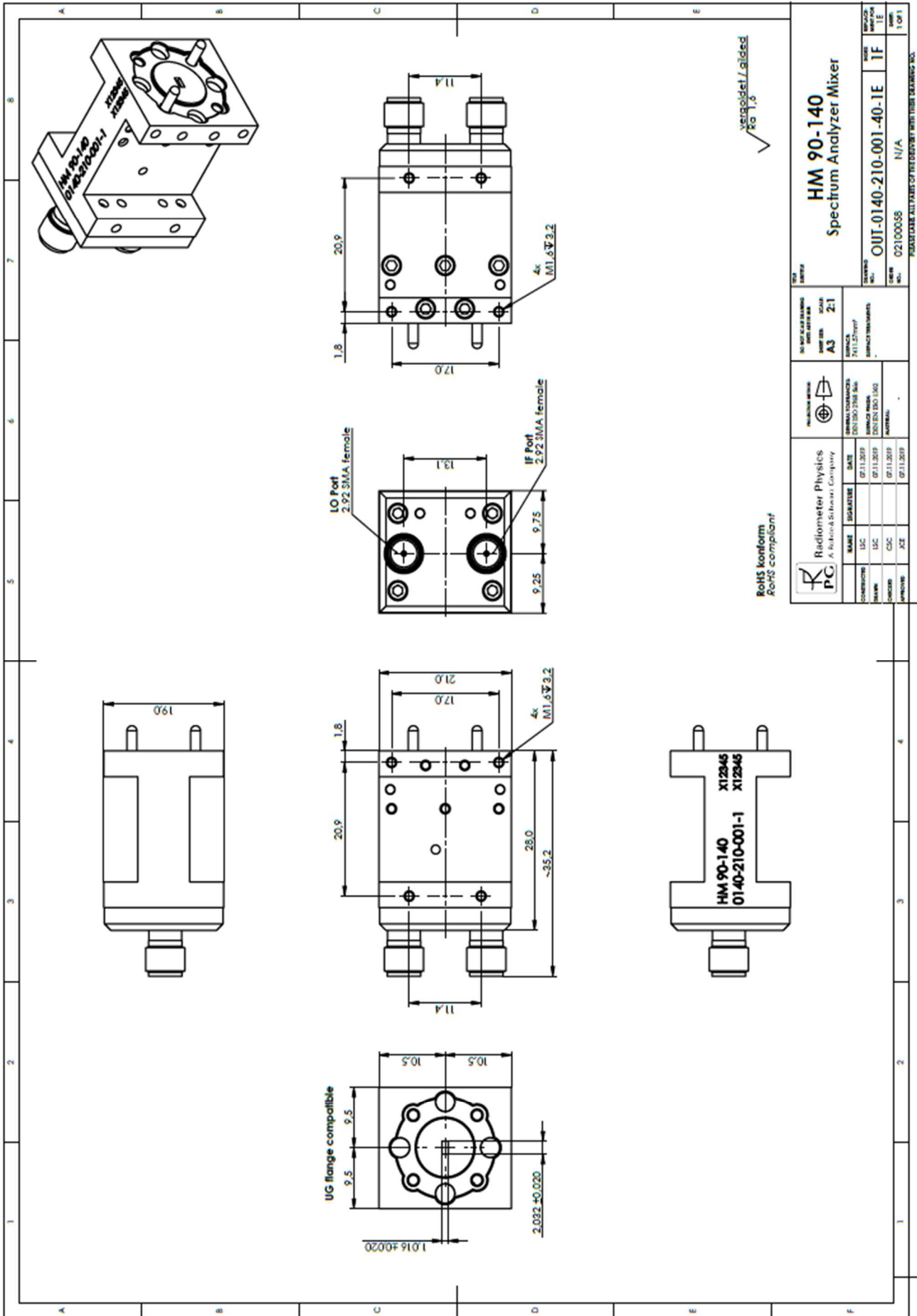
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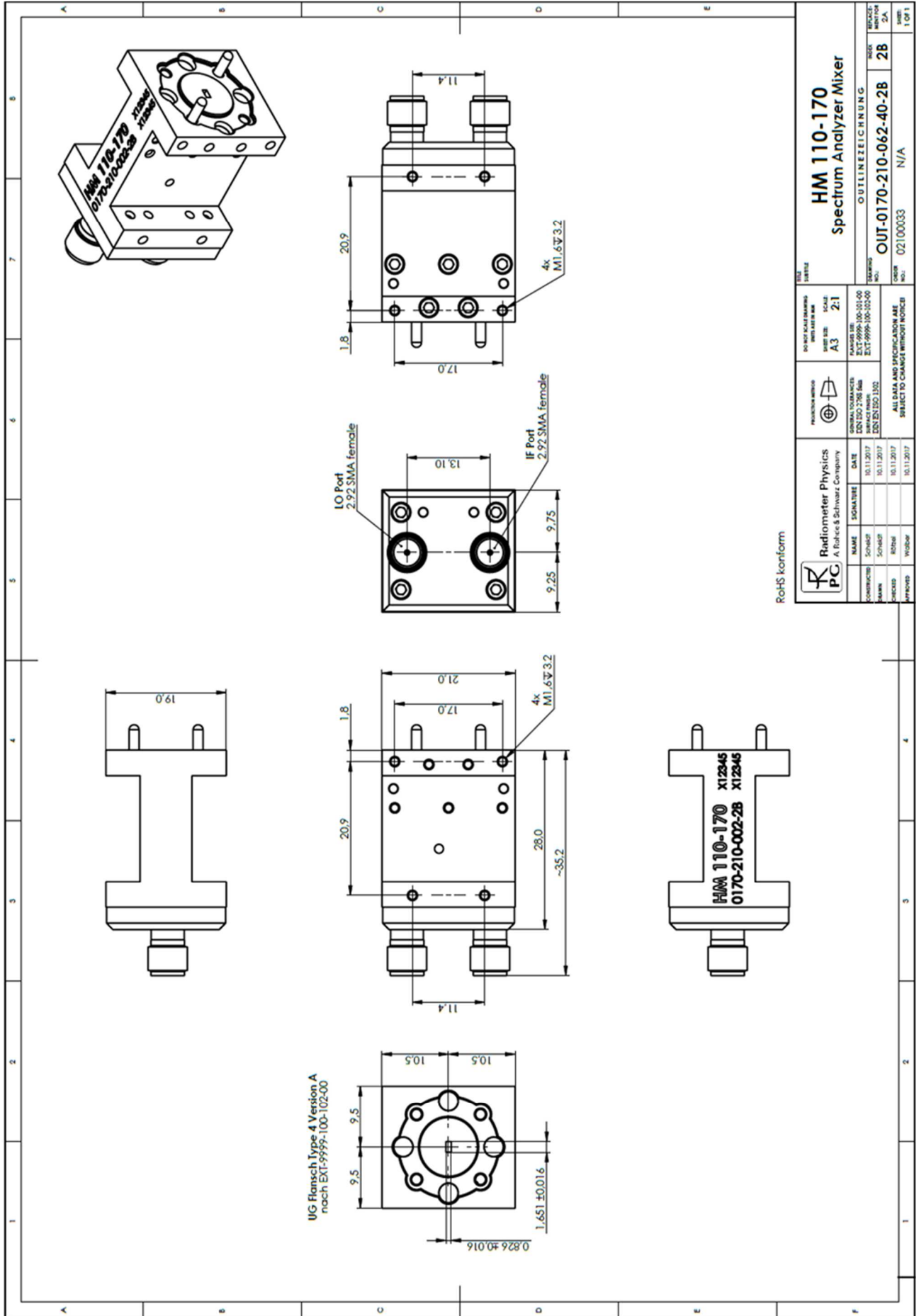
RoHS konform
RoHS compliant

		Radimeter Physics A Radcast Group Company				SOLE SALES NAME: SCALE 2:1 NAME REF: A3		ITEM: HM 75-110 PART NUMBER: 0110-210-002-4	
NAME: SCALE 2:1	DATE: 07.11.2019	GENERAL DIMENSIONS: 100x100x100	SERIAL NUMBER: 0110-210-002-4	PART NUMBER: 0110-210-002-4	DRAWING NUMBER: 0110-210-002-4	MATERIAL: N/A	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056
CONTACT: USC	DATE: 07.11.2019	SERIAL NUMBER: 0110-210-002-4	PART NUMBER: 0110-210-002-4	DRAWING NUMBER: 0110-210-002-4	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056
CONTACT: USC	DATE: 07.11.2019	SERIAL NUMBER: 0110-210-002-4	PART NUMBER: 0110-210-002-4	DRAWING NUMBER: 0110-210-002-4	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056
CONTACT: USC	DATE: 07.11.2019	SERIAL NUMBER: 0110-210-002-4	PART NUMBER: 0110-210-002-4	DRAWING NUMBER: 0110-210-002-4	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056	ORDER NUMBER: 02100056
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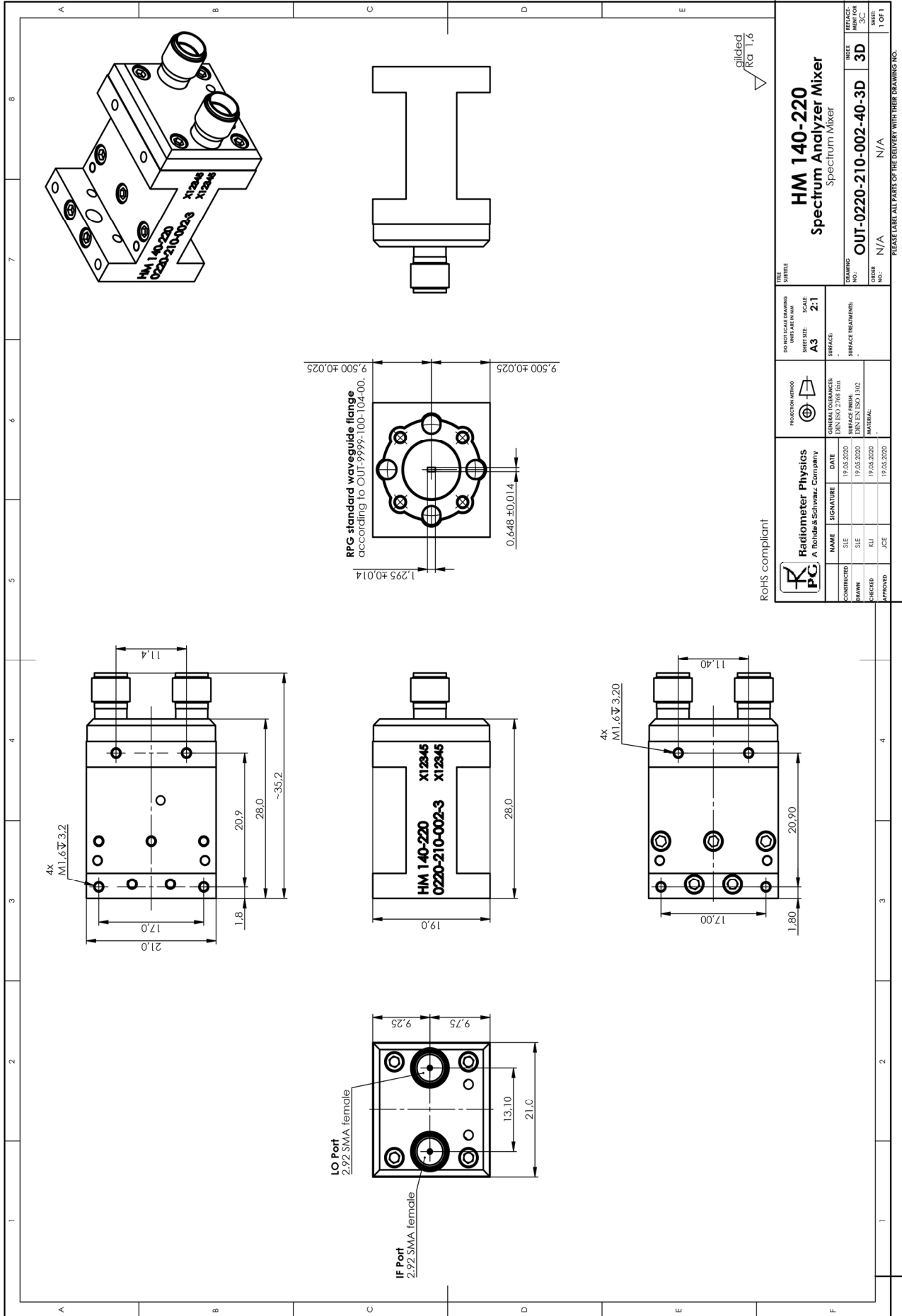
HM 75-110
Spectrum Analyzer Mixer

ORDER NUMBER: 0110-210-002-4	ORDER NUMBER: 0110-210-002-4	ORDER NUMBER: 0110-210-002-4	ORDER NUMBER: 0110-210-002-4
ORDER NUMBER: 0110-210-002-4	ORDER NUMBER: 0110-210-002-4	ORDER NUMBER: 0110-210-002-4	ORDER NUMBER: 0110-210-002-4
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PC Radiometer Physics A. Rohde & Schwarz Company		HM 110-170 Spectrum Analyzer Mixer		
NAME: SCHWAB CONTRACTOR: SCHWAB DRAWN: SCHWAB CHECKED: ROSE APPROVED: HUBER	DATE: 10.11.2017 DATE: 10.11.2017 DATE: 10.11.2017 DATE: 10.11.2017	PROJECT NAME: HM 110-170 SCALE: 2:1 PART NO.: A3 CLASSIFICATION: ZVT-9999-100-101-00 ZVT-9999-100-102-00 GENERAL STANDARDS: IEC 60335-1 IEC 60335-2-1 IEC 60335-2-2 IEC 60335-2-3 IEC 60335-2-4 IEC 60335-2-5 IEC 60335-2-6 IEC 60335-2-7 IEC 60335-2-8 IEC 60335-2-9 IEC 60335-2-10 IEC 60335-2-11 IEC 60335-2-12 IEC 60335-2-13 IEC 60335-2-14 IEC 60335-2-15 IEC 60335-2-16 IEC 60335-2-17 IEC 60335-2-18 IEC 60335-2-19 IEC 60335-2-20 IEC 60335-2-21 IEC 60335-2-22 IEC 60335-2-23 IEC 60335-2-24 IEC 60335-2-25 IEC 60335-2-26 IEC 60335-2-27 IEC 60335-2-28 IEC 60335-2-29 IEC 60335-2-30 IEC 60335-2-31 IEC 60335-2-32 IEC 60335-2-33 IEC 60335-2-34 IEC 60335-2-35 IEC 60335-2-36 IEC 60335-2-37 IEC 60335-2-38 IEC 60335-2-39 IEC 60335-2-40 IEC 60335-2-41 IEC 60335-2-42 IEC 60335-2-43 IEC 60335-2-44 IEC 60335-2-45 IEC 60335-2-46 IEC 60335-2-47 IEC 60335-2-48 IEC 60335-2-49 IEC 60335-2-50 IEC 60335-2-51 IEC 60335-2-52 IEC 60335-2-53 IEC 60335-2-54 IEC 60335-2-55 IEC 60335-2-56 IEC 60335-2-57 IEC 60335-2-58 IEC 60335-2-59 IEC 60335-2-60 IEC 60335-2-61 IEC 60335-2-62 IEC 60335-2-63 IEC 60335-2-64 IEC 60335-2-65 IEC 60335-2-66 IEC 60335-2-67 IEC 60335-2-68 IEC 60335-2-69 IEC 60335-2-70 IEC 60335-2-71 IEC 60335-2-72 IEC 60335-2-73 IEC 60335-2-74 IEC 60335-2-75 IEC 60335-2-76 IEC 60335-2-77 IEC 60335-2-78 IEC 60335-2-79 IEC 60335-2-80 IEC 60335-2-81 IEC 60335-2-82 IEC 60335-2-83 IEC 60335-2-84 IEC 60335-2-85 IEC 60335-2-86 IEC 60335-2-87 IEC 60335-2-88 IEC 60335-2-89 IEC 60335-2-90 IEC 60335-2-91 IEC 60335-2-92 IEC 60335-2-93 IEC 60335-2-94 IEC 60335-2-95 IEC 60335-2-96 IEC 60335-2-97 IEC 60335-2-98 IEC 60335-2-99 IEC 60335-2-100	ORDER NO.: 02100033 N/A	ORDER NO.: 02100033 N/A



RoHS compliant

Radiometer Physics A Rohde & Schwarz Company		DATE 19.05.2020	TITLE HM 140-220 Spectrum Analyzer Mixer
NAME SLE	SIGNATURE	GENERAL STANDARDS DIN ISO 2768 MS	DRAWING NO. OUT-0220-210-002-40-3D
CONTRIBUTOR SLE	DATE 19.05.2020	PROJECTION METHOD 	INDEX 3D
DRAWN SLE	DATE 19.05.2020	SCALE 2:1	ORDER NO. N/A
CHECKED KLI	DATE 19.05.2020	SURFACE TREATMENT -	INDEX 3D
APPROVED JCE	DATE 19.05.2020	MATERIAL -	ORDER NO. N/A
PLEASE LABEL ALL PARTS OF THE DELIVERY WITH THEIR DRAWING NO.			SHEET NO. 1 OF 1

