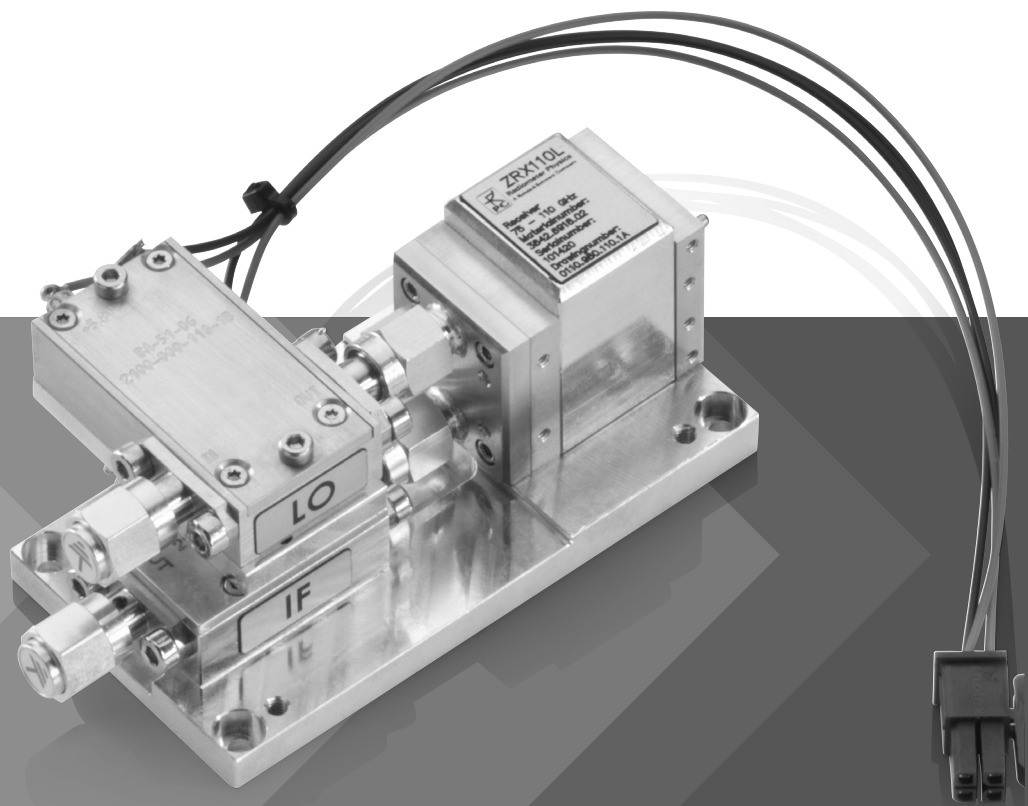


RPG ZRXxxxL MILLIMETERWAVE RECEIVER

Specifications



Data Sheet
Version 05.00

ROHDE & SCHWARZ

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Definitions

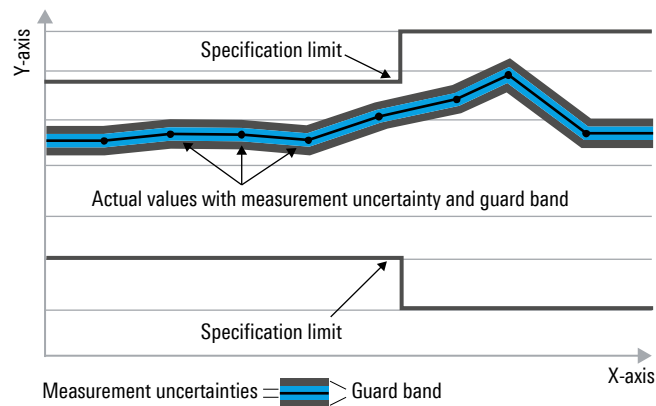
General

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 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.

General information

The RPG ZRXxxxL millimeterwave receivers facilitate measurements in the millimeterwave frequency range with the following vector network analyzers:

- R&S®ZNA26, R&S®ZNA43, R&S®ZNA50 and R&S®ZNA67 with two and four ports
- R&S®ZVA24, R&S®ZVA40, R&S®ZVA50 and R&S®ZVA67 with four ports

The RPG ZRXxxxL millimeterwave receivers are available for the frequency bands from:

- 50 GHz to 75 GHz (RPG ZRX75L)
- 75 GHz to 110 GHz (RPG ZRX110L)
- 110 GHz to 170 GHz (RPG ZRX170L)
- 140 GHz to 220 GHz (RPG ZRX220L)
- 220 GHz to 330 GHz (RPG ZRX330L)
- 330 GHz to 500 GHz (RPG ZRX500L)
- 500 GHz to 750 GHz (RPG ZRX750L)

The R&S®ZNA vector network analyzers must be configured with the R&S®ZNA-K8 option and either the R&S®ZNAxx-B16 or R&S®ZNA-B26 option. Together with the R&S®ZNA-B8 option, each port of the R&S®ZNA can be equipped with a millimeterwave converter or receiver using the dedicated millimeterwave converter LO from the rear panel of the R&S®ZNA.

The R&S®ZVA vector network analyzer must be equipped with the R&S®ZVAxx-B16 and R&S®ZVA-K8 options.

The RPG ZRXxxxL millimeterwave receivers come with the following accessories:

- Hex ball driver
- Two coaxial cables with SMA connectors for the reference and measurement output signals
- Mounting plate
- DC cable
- Waveguide flange screws and dowel pins
- Documentation

The RPG ZRXxxxL millimeterwave receivers must be operated with a separate power supply (not included).

Specifications

Test port (RF IN)

Frequency range	RPG ZRX75L	50 GHz to 75 GHz
	RPG ZRX110L	75 GHz to 110 GHz
	RPG ZRX170L	110 GHz to 170 GHz
	RPG ZRX220L	140 GHz to 220 GHz
	RPG ZRX330L	220 GHz to 330 GHz
	RPG ZRX500L	330 GHz to 500 GHz
	RPG ZRX750L	500 GHz to 750 GHz
Waveguide designator	RPG ZRX75L	WR-15
	RPG ZRX110L	WR-10
	RPG ZRX170L	WR-6.5
	RPG ZRX220L	WR-5.1
	RPG ZRX330L	WR-3.4
	RPG ZRX500L	WR-2.2
	RPG ZRX750L	WM-380
Connector type (anti cocking flange)	RPG ZRX75L	RPG standard waveguide flange (compatible with UG-387/U-M)
	RPG ZRX110L	
	RPG ZRX170L	
	RPG ZRX220L	
	RPG ZRX330L	
	RPG ZRX500L	RPG precision waveguide flange (compatible with UG-387/U-M)
	RPG ZRX750L	
Damage level		+10 dBm

Source input (LO IN)

Connector type		2.92 mm, female	
Frequency range and multiplication factor	RPG ZRX75L	8.333 GHz to 12.500 GHz	× 6
	RPG ZRX110L	9.375 GHz to 13.750 GHz	× 8
	RPG ZRX170L	11.000 GHz to 17.000 GHz	× 10
	RPG ZRX220L	11.667 GHz to 18.333 GHz	× 12
	RPG ZRX330L	9.166 GHz to 13.750 GHz	× 24
	RPG ZRX500L	13.541 GHz to 20.833 GHz	× 24
	RPG ZRX750L	13.889 GHz to 20.833 GHz	× 36
Input power range	RPG ZRX75L	+7 dBm (typ.)	
	RPG ZRX110L	+7 dBm (typ.)	
	RPG ZRX170L	+7 dBm (typ.)	
	RPG ZRX220L	+7 dBm (typ.)	
	RPG ZRX330L	+7 dBm (typ.)	
	RPG ZRX500L	+7 dBm (typ.)	
	RPG ZRX750L	+7 dBm (typ.)	

Measurement output (IF OUT)

Connector type		SMA, female
Frequency range	RPG ZRX75L	5 MHz to 2900 MHz
	RPG ZRX110L	5 MHz to 2900 MHz
	RPG ZRX170L	5 MHz to 2900 MHz
	RPG ZRX220L	5 MHz to 2900 MHz
	RPG ZRX330L	5 MHz to 2900 MHz
	RPG ZRX500L	5 MHz to 2900 MHz
	RPG ZRX750L	5 MHz to 2900 MHz

Power supply input (POWER SUPPLY)

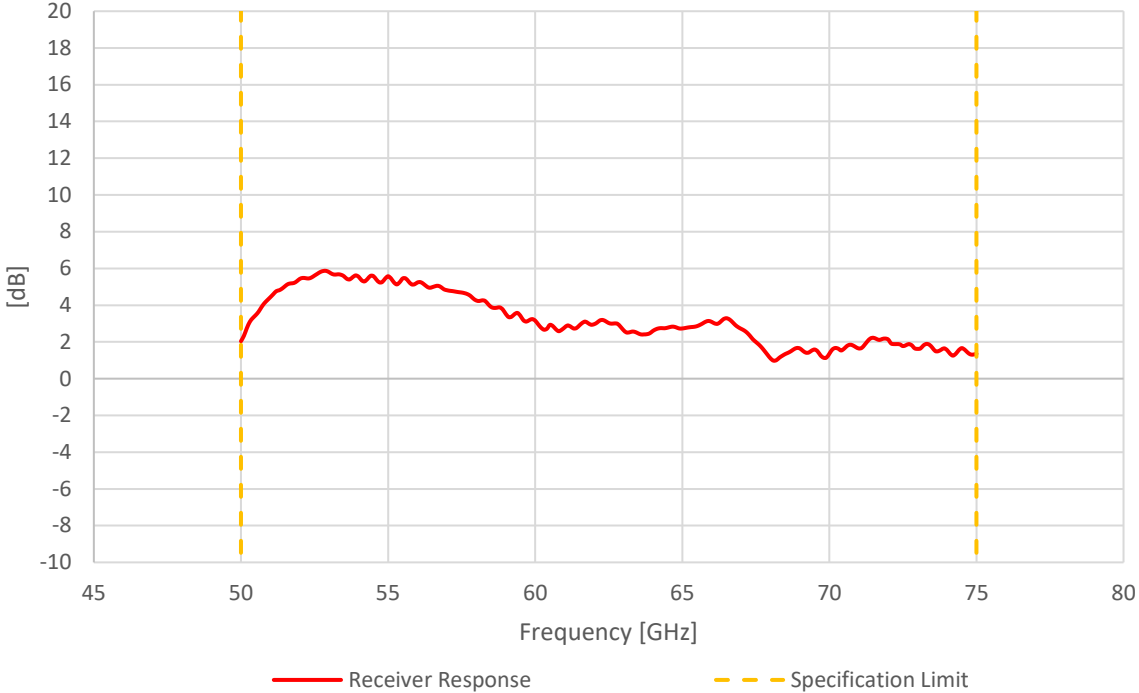
Connector type		DC solder contact
Power consumption	RPG ZRX75L	2 W
	RPG ZRX110L	2 W
	RPG ZRX170L	2 W
	RPG ZRX220L	2 W
	RPG ZRX330L	2 W
	RPG ZRX500L	4 W
	RPG ZRX750L	7 W
IF amplifier	RPG ZRXxxxL ¹	50 mA at +7.0 V DC, max. +9.0 V DC
LO driver amplifier	RPG ZRXxxxL ²	150 mA at +7.0 V DC, max. +12.0 V DC
LO multiplier (active)	RPG ZRX750L	900 mA at +6.0 V DC, max. +12.0 V DC 50 mA at -5.5 V DC, max. -12.0 V DC

System characteristics

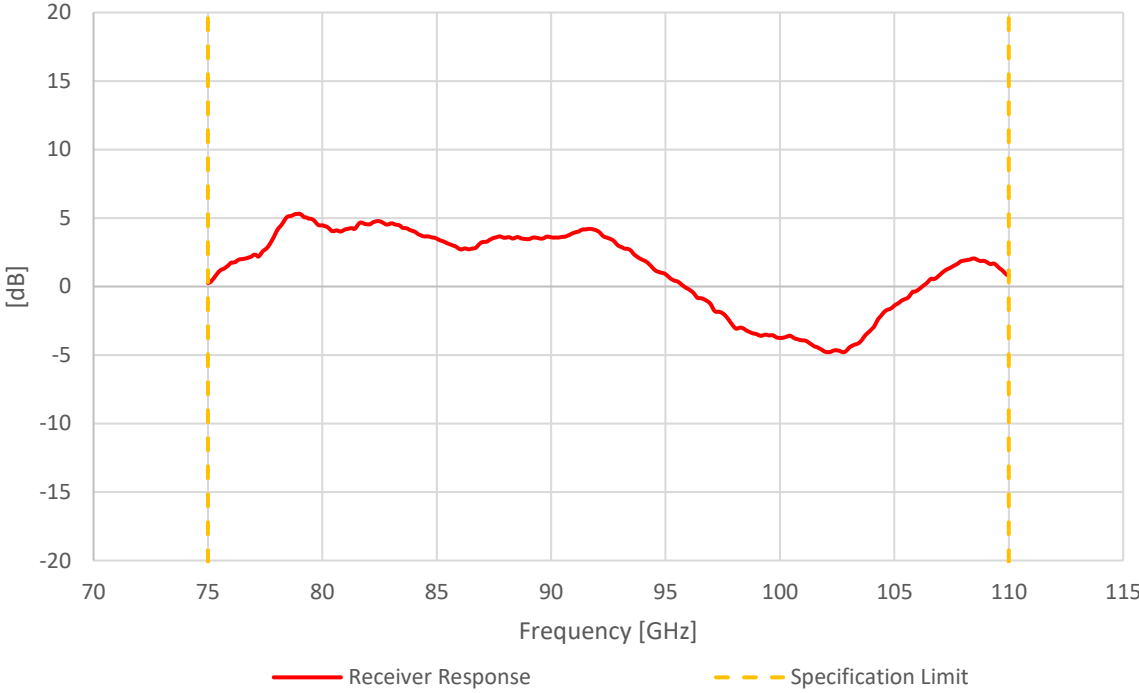
Conversion loss	RPG ZRX75L	17 dB, < 23 dB (typ.)
	RPG ZRX110L	20 dB, < 30 dB (typ.)
	RPG ZRX170L	25 dB, < 35 dB (typ.)
	RPG ZRX220L	30 dB, < 40 dB (typ.)
	RPG ZRX330L	35 dB, < 45 dB (typ.)
	RPG ZRX500L	40 dB, < 55 dB (typ.)
	RPG ZRX750L	45 dB, < 55 dB (typ.)
IF gain	RPG ZRX75L	20 dB
	RPG ZRX110L	20 dB
	RPG ZRX170L	20 dB
	RPG ZRX220L	28 dB
	RPG ZRX330L	40 dB
	RPG ZRX500L	40 dB
	RPG ZRX750L	40 dB

¹ Not assembled for RPG ZRX500L.

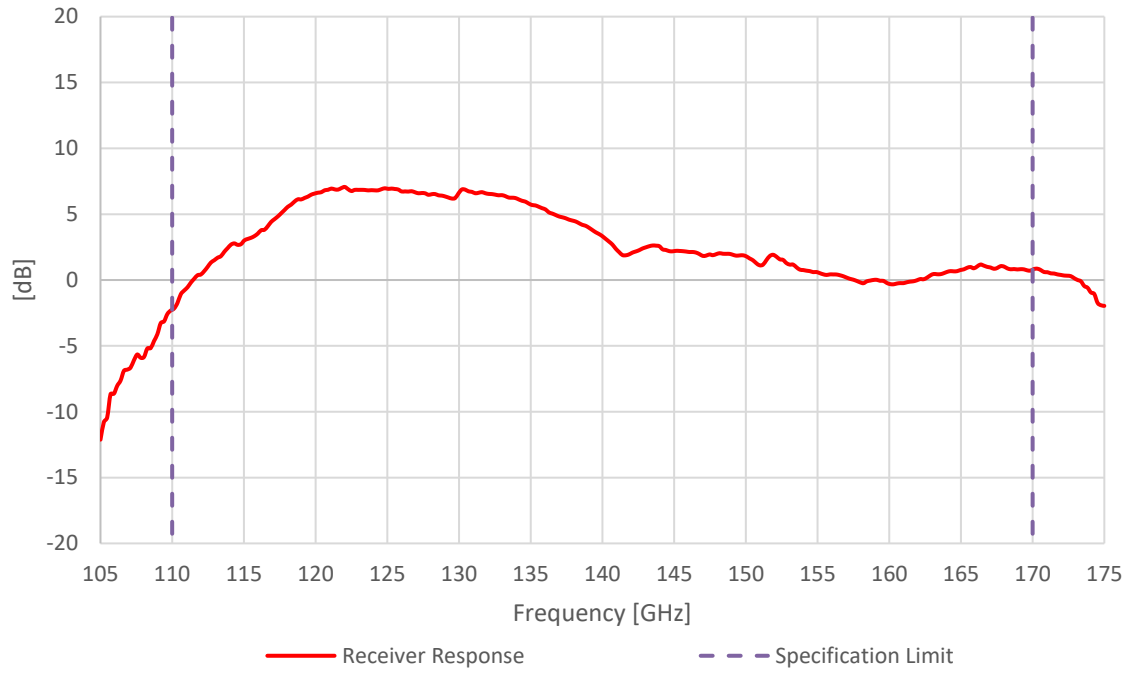
² Not assembled for RPG ZRX750L.



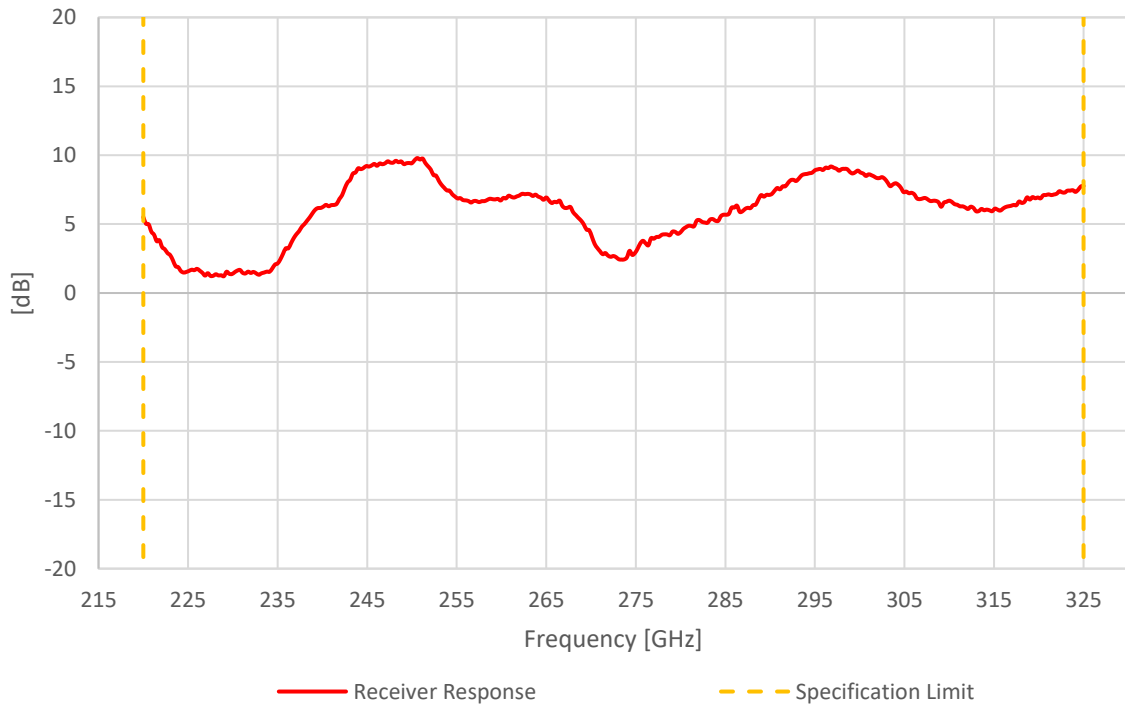
RPG ZRX75L receiver response from 45 GHz to 80 GHz (typ.)



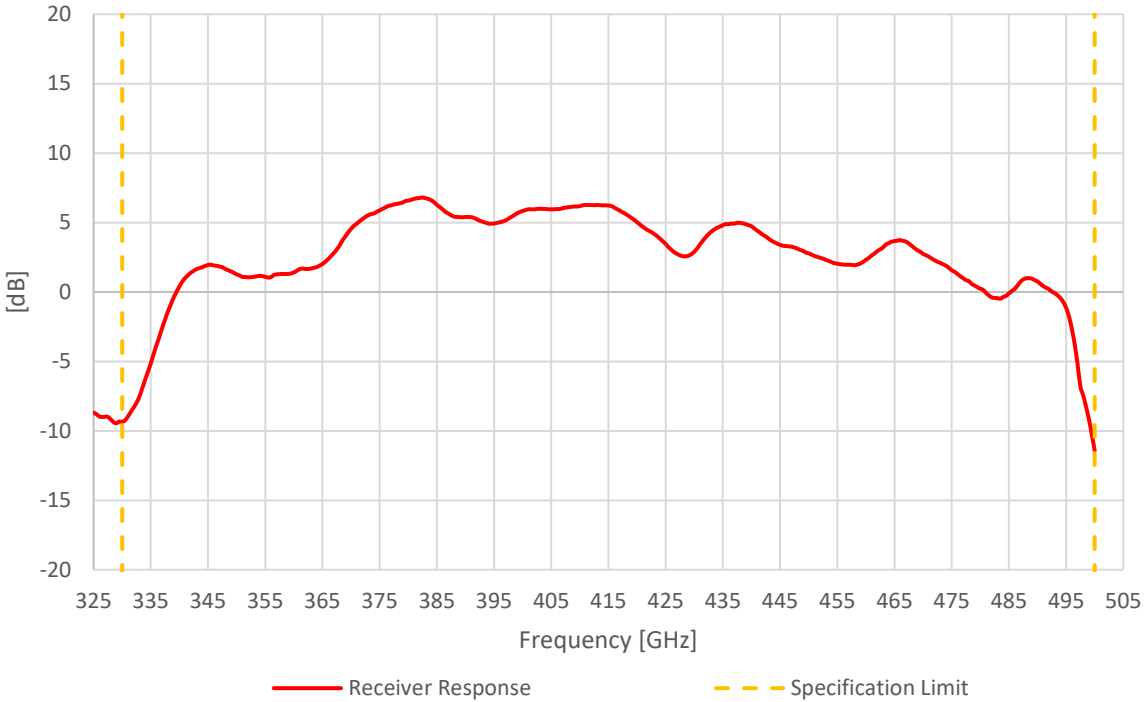
RPG ZRX110L receiver response from 70 GHz to 115 GHz (typ.)



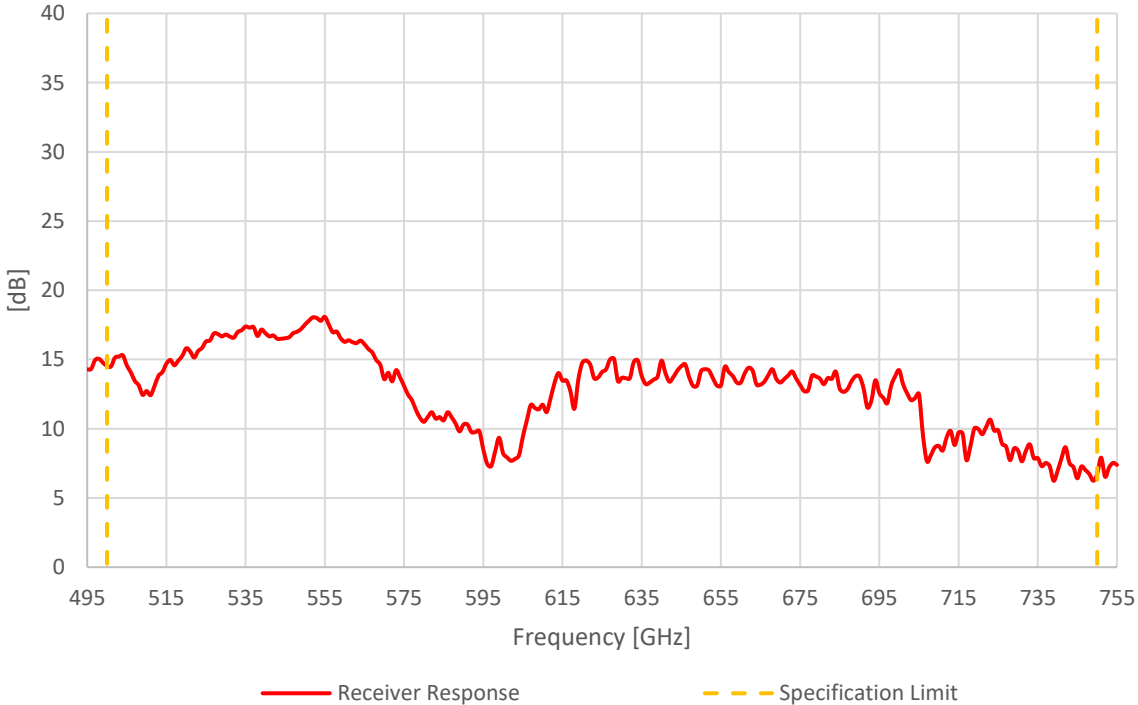
RPG ZRX170L receiver response from 105 GHz to 175 GHz (typ.)



RPG ZRX330L receiver response from 215 GHz to 330 GHz (typ.)



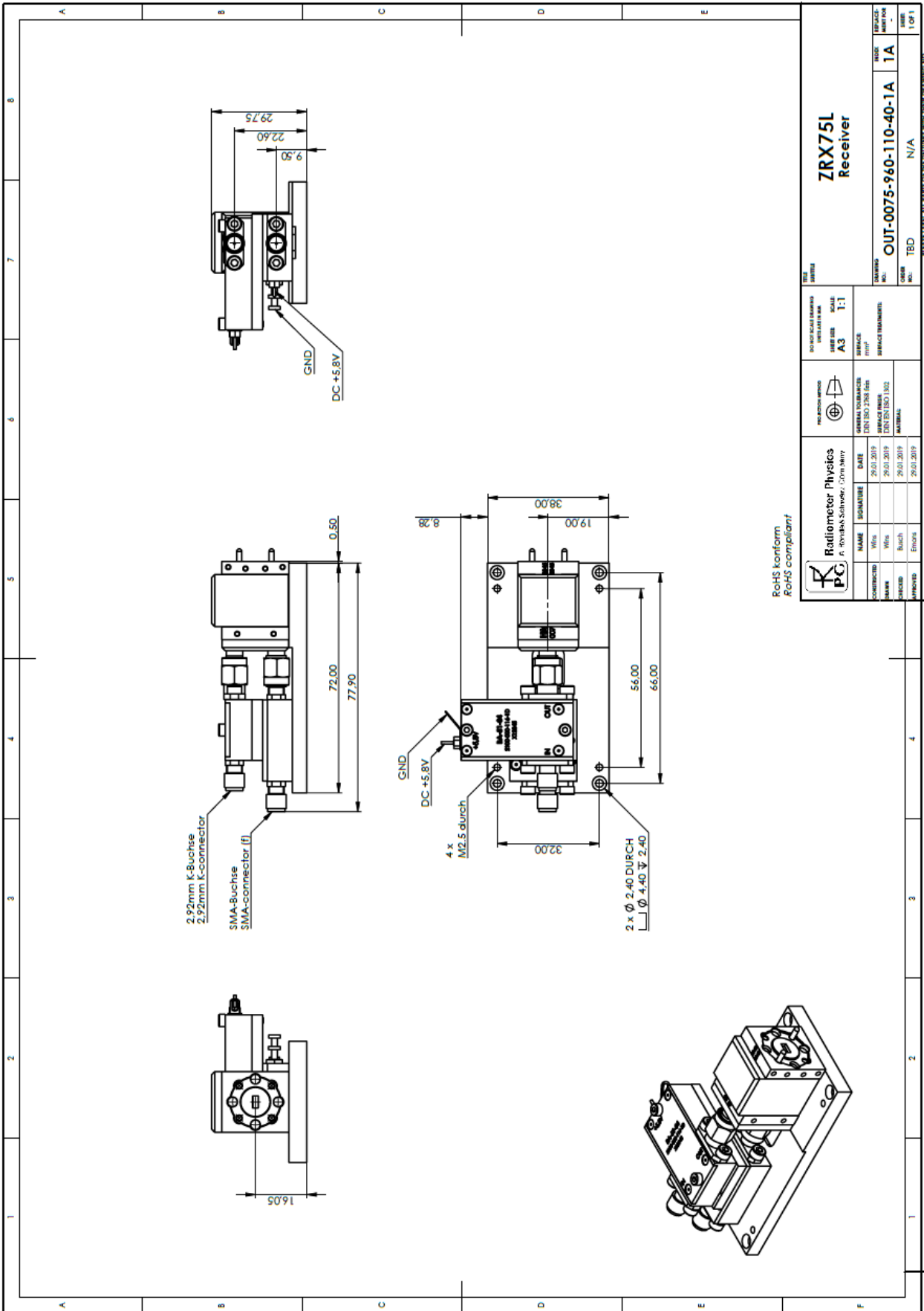
RPG ZRX500L receiver response from 325 GHz to 505 GHz (typ.)

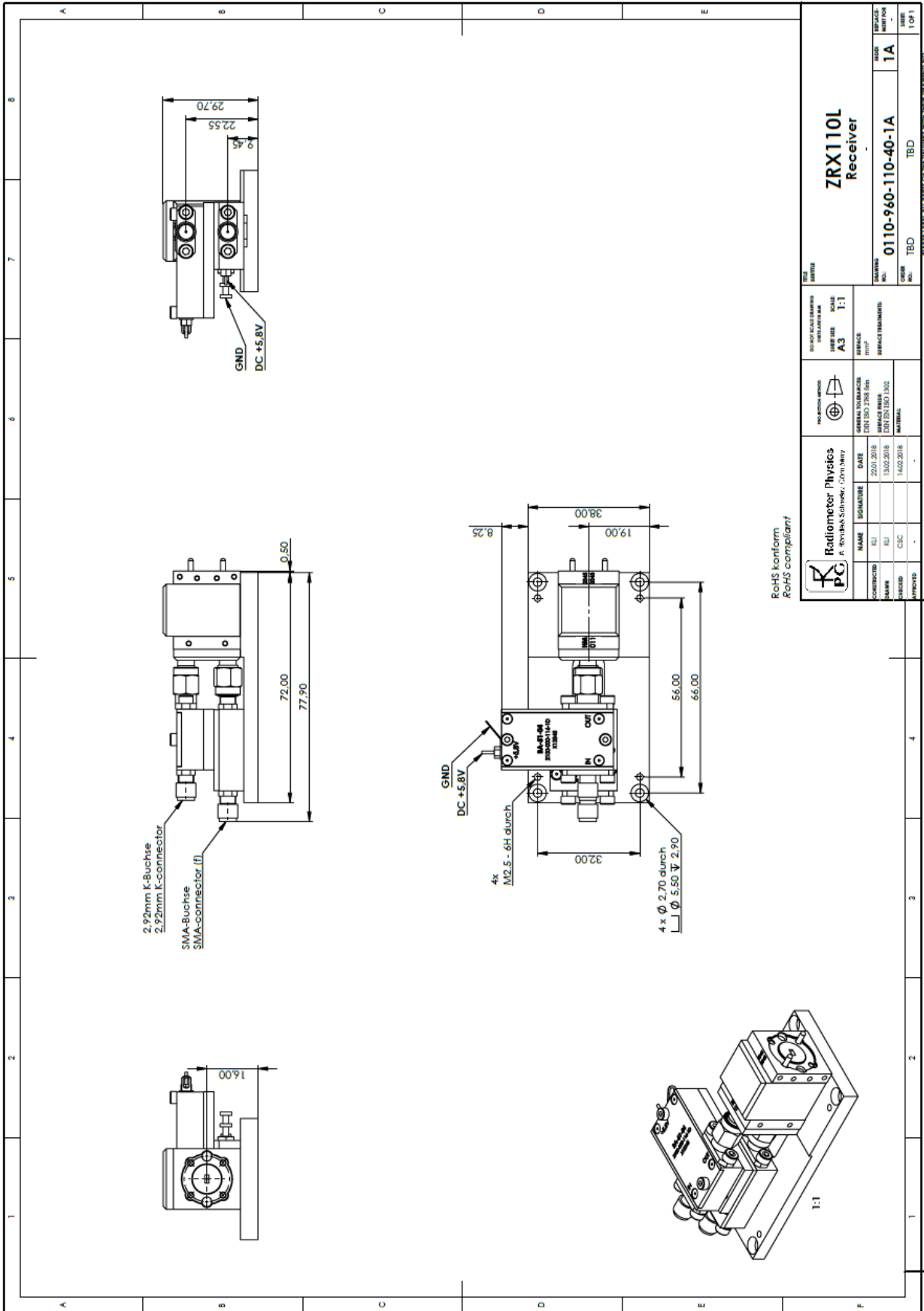


RPG ZRX750L receiver response from 495 GHz to 755 GHz (typ.)

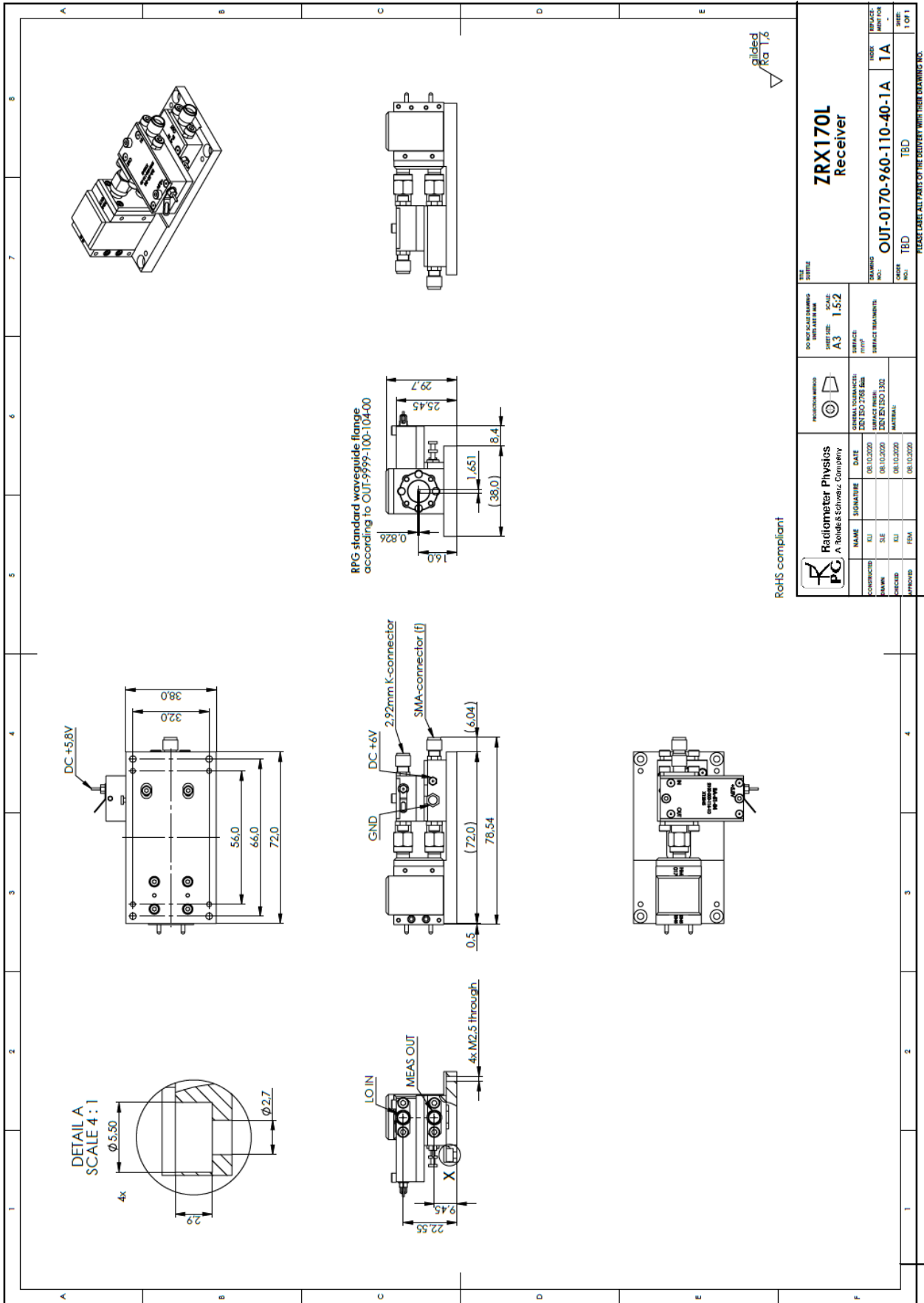
General data

Environmental conditions		
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
Altitude	permissible altitude	3000 m (9843 ft)
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 150 Hz, in line with IEC 60068-2-6
	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
Weight		0.5 kg (1.1 lb)
	shipping weight	1 kg (2.2 lb)





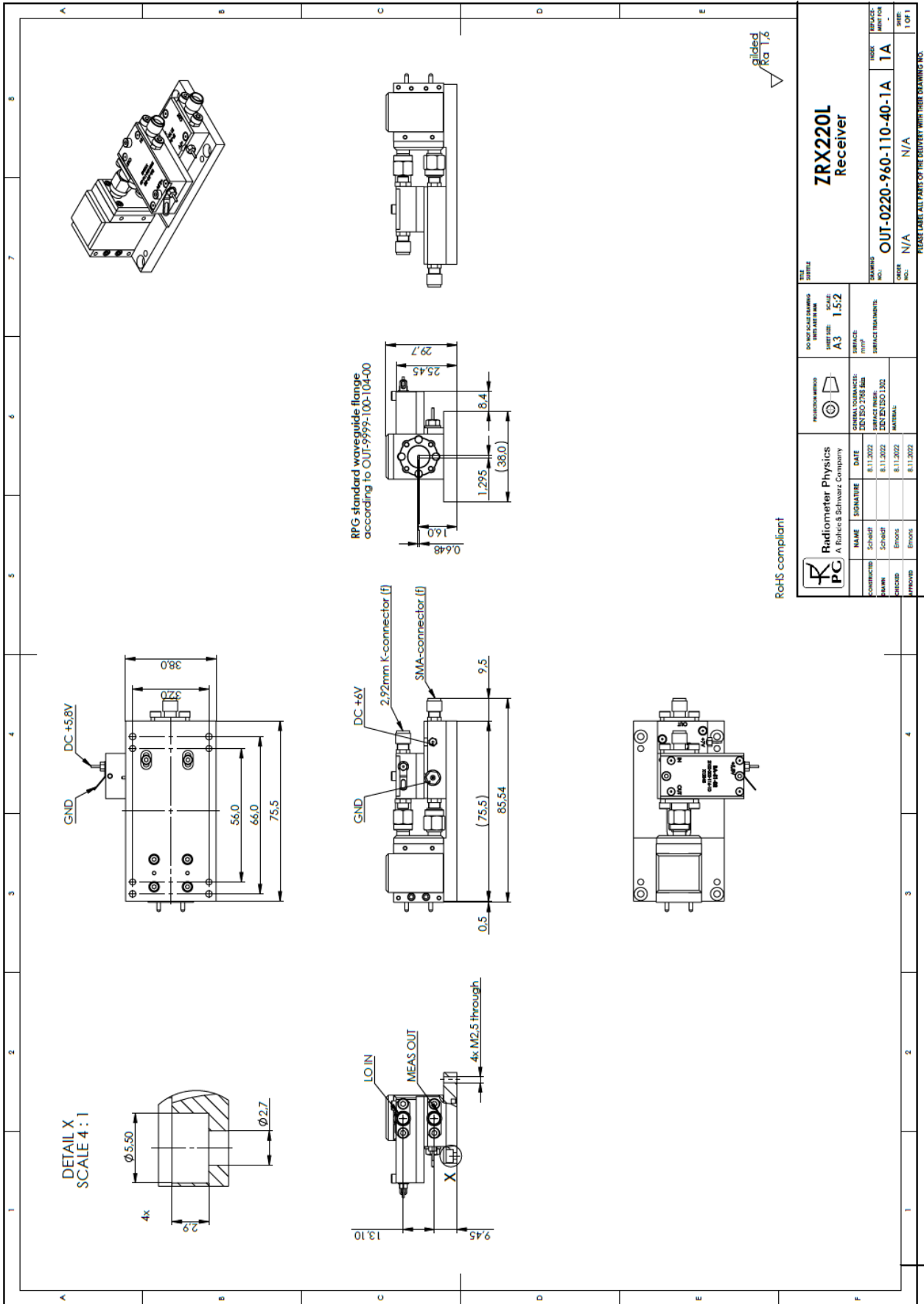
Radiometer Physics P. WYHMAN-SCHWABE, Chem. HWY.		GENERAL STANDARDS DIN ISO 2768 MS SURFACE FINISH DIN EN ISO 1302 MATERIAL	NAME: _____ SIGNATURE: _____ DATE: 22.01.2018 13.02.2018 14.02.2018	DRAWING NO.: 0110-960-110-40-1A ORDER NO.: TBD DATE: 1A 1 OF 1
CONSTRUCTION: RLI DRAWN: RLI CHECKED: CSC APPROVED: _____	SCALE: A3 SIZE: 1:1	PROJECTION METHOD:	SURFACE TREATMENT: _____	TITLE: ZRX110L Receiver



RohS compliant

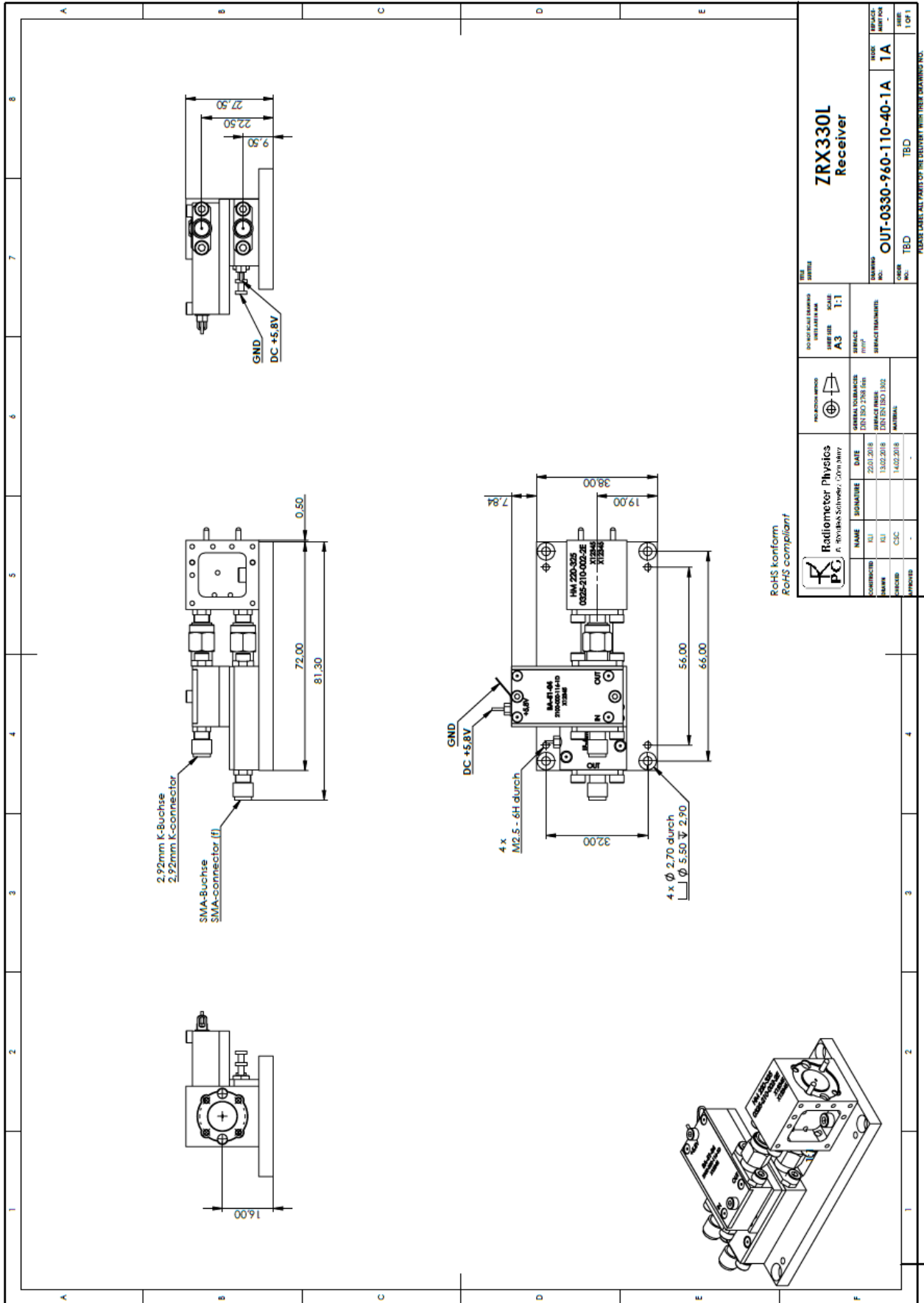
Rohde & Schwarz Radiometer Physics A. Rohde & Schwarz, Company		GENERAL INFO PART NUMBER: ZRX170L DATE: 08.10.2020 GENERAL TOLERANCES: EN ISO 2768 MS SURFACE TREATMENT: EN ISO 1302 MATERIAL:	ORDER NO.: OUT-0170-860-110-40-1A ORDER QTY.: TBD ORDER DATE: TBD	TITLE: ZRX170L Receiver SCALE: 1:1 SHEET NO.: 1A SHEET TOTAL: 1 OF 1
NAME: KL SURNAME: KL DATE: 08.10.2020 CHECKED: KL APPROVED: FM	SIGNATURE: DATE: 08.10.2020 DATE: 08.10.2020 DATE: 08.10.2020	SURFACE: AS SCALE: 1:1 SURFACE TREATMENT:	DO NOT SCALE DRAWING SHEET NUMBER:	CHECKED BY: KL APPROVED BY: FM

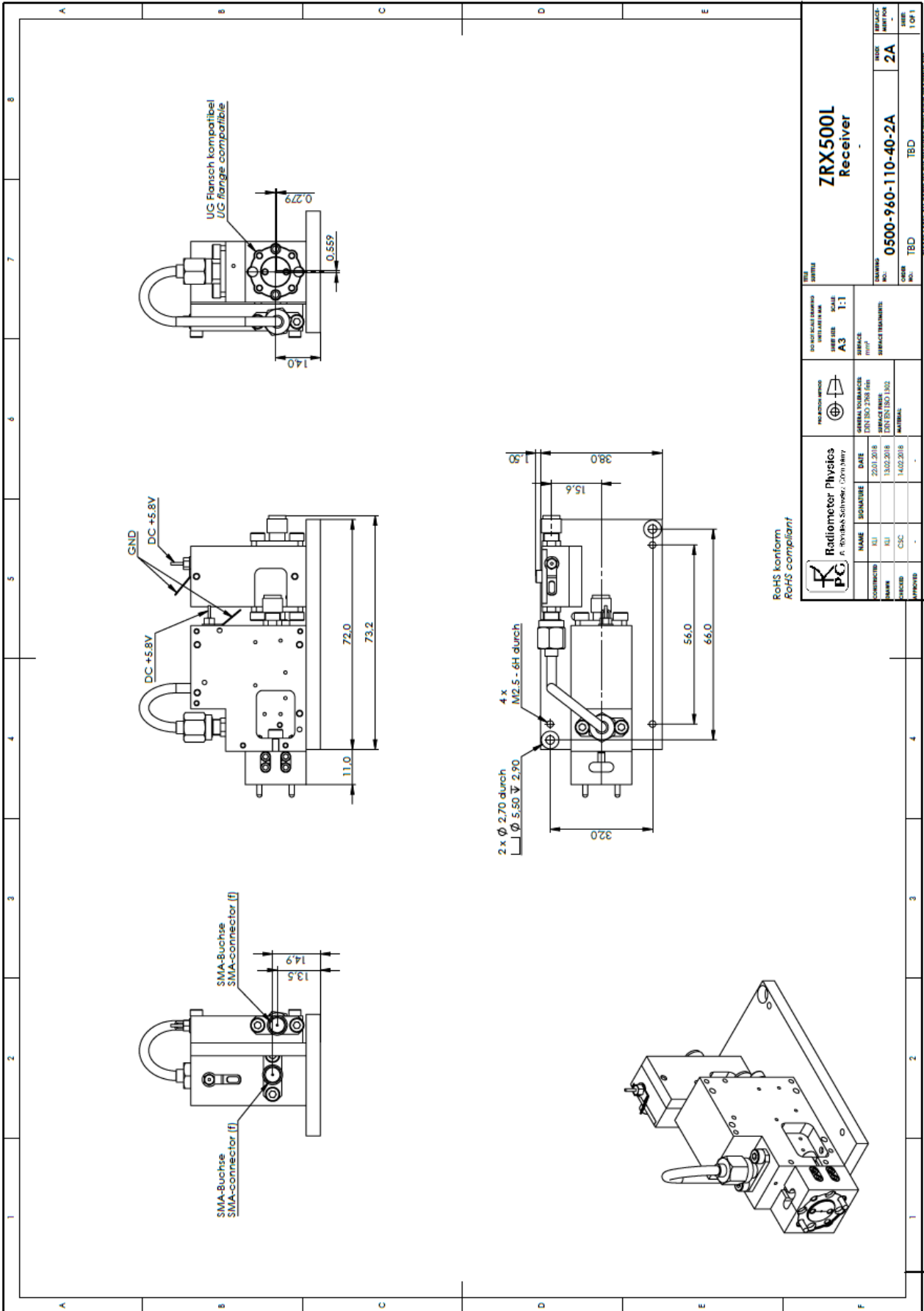
PLEASE CHECK ALL PARTS OF THE DELIVERY WITH THESE DRAWINGS AND



RoHS compliant

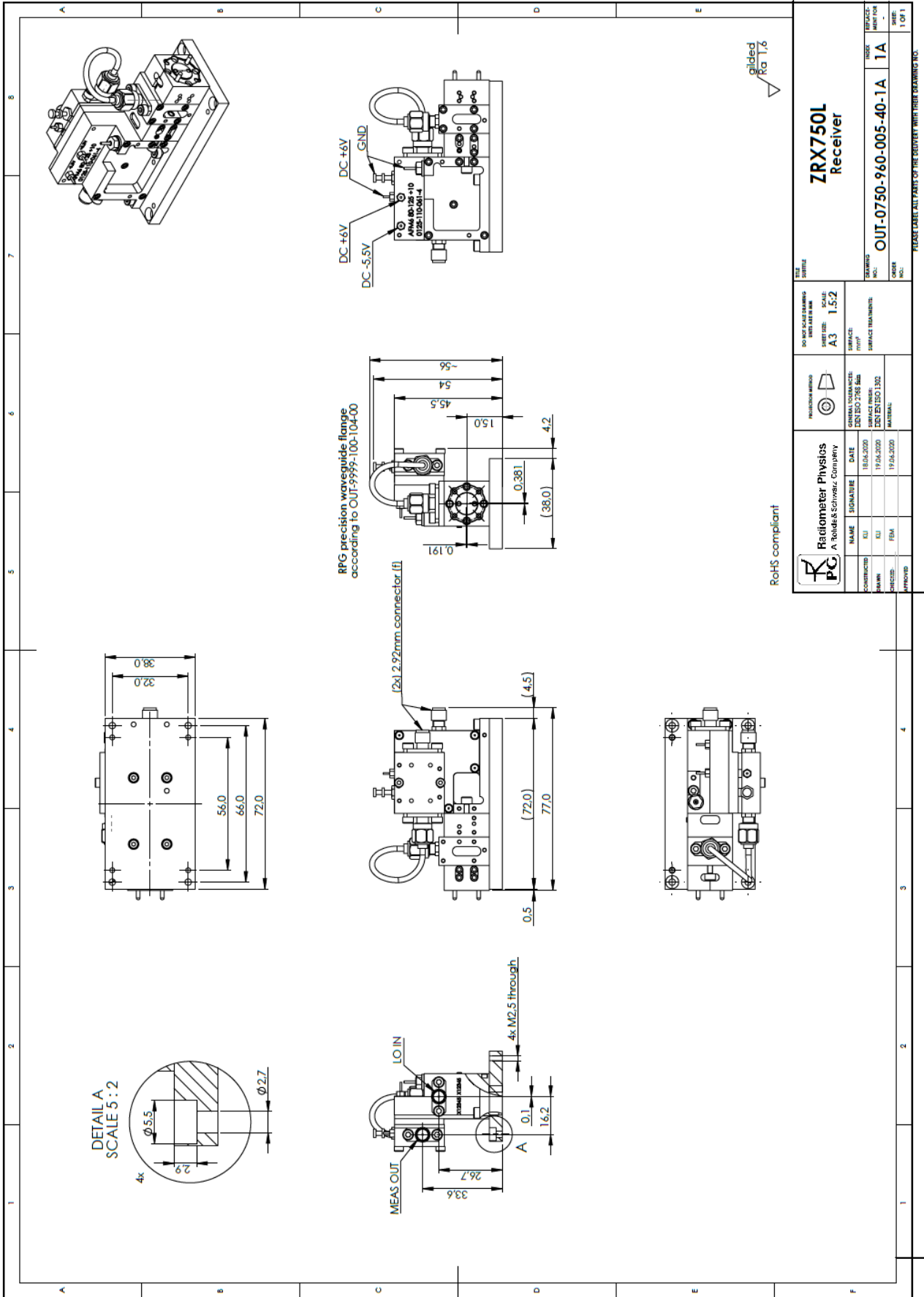
		Radiometer Physics A. Roloff & Schwarz Company		FUNCTION SYMBOL 		DPO NOT SCALE DRAWING DATE: 8.11.2022 SCALE: A3 1:52		NAME: Schaffl SIGNATURE: Schaffl DATE: 8.11.2022		TITLE: ZRX220L Receiver	
NAME: Schaffl SIGNATURE: Schaffl DATE: 8.11.2022		GENERAL TOLERANCES: EN ISO 2768 MS SURFACE TREATMENT: EN ISO 1100 MATERIAL: N/A		ORDER NO.: OUT-0220-960-110-40-1A		ORDER NO.: N/A		INDEX: 1A		SHEET: 1 OF 1	
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RoHS compliant

		Radiometer Physics P. Rohde & Schwarz Company		GENERAL STANDARDS DIN ISO 2266 DIN ISO 2266 DIN EN ISO 1502		PRODUCTION METHOD SMT		PRODUCTION DRAWING SHEET SIZE: A3 SCALE: 1:1 SHEET NO.: TBD		ZRX500L Receiver	
NAME: KSC	SIGNATURE:	DATE: 22.01.2018	DATE: 13.02.2018	REFERENCE:	REFERENCE:	DRAWING NO.: 0500-960-110-40-2A	ORDER NO.: TBD	REVISION: 2A	SHEET NO.: 1 OF 1	DATE:	DRAWN BY:
CHECKED:	CHECKED:	CHECKED:	CHECKED:	CHECKED:	CHECKED:	CHECKED:	CHECKED:	CHECKED:	CHECKED:	CHECKED:	CHECKED:
APPROVED:	APPROVED:	APPROVED:	APPROVED:	APPROVED:	APPROVED:	APPROVED:	APPROVED:	APPROVED:	APPROVED:	APPROVED:	APPROVED:



RoHS compliant

		Rohde & Schwarz Ratiometer Physics A. Rohde & Schwarz Company		PRODUCTION METHOD 		ISO 9001 SCALE DRAWING SHEET NO. A3 SCALE 1:52		TITLE ZRX750L Receiver	
NAME RPH	SIGNATURE [Signature]	DATE 18.04.2020	GENERAL TOLERANCES DIN ISO 2768 Mm	SURFACE FINISH Ra 1.6	SURFACE TREATMENT gilded	DRAWING NO. OUT-0750-960-005-40-1A	ORDER NO.	INDEX TA	SHEET 1 OF 1
CONTRIBUTOR RPH	CHECKED RPH	DATE 19.04.2020	SURFACE FINISH DIN ISO 2768 Mm	MATERIAL [Material]	NATIONAL	ORDER NO.	INDEX TA	SHEET 1 OF 1	PLEASE CONTACT ANY PARTY OF THE COMPANY WITH THESE DRAWINGS.

Ordering information

Designation	Type	Order No.
Millimeterwave receiver, WR-15	RPG ZRX75L	3642.6330.02
Millimeterwave receiver, WR-10	RPG ZRX110L	3642.6918.02
Millimeterwave receiver, WR-6.5	RPG ZRX170L	3688.8113.02
Millimeterwave receiver, WR-5.1	RPG ZRX220L	3688.8107.02
Millimeterwave receiver, WR-3.4	RPG ZRX330L	3642.6924.02
Millimeterwave receiver, WR-2.2	RPG ZRX500L	3642.7108.02
Millimeterwave receiver, WR-1.5	RPG ZRX750L	3665.9265.02
Test cable, 3.5 mm (f) to 3.5 mm (m), length: 910 mm (two cables per converter required)	R&S®ZV-Z193	1306.4520.36
Test cable, 2.92 mm (f) to 2.92 mm (m), length: 910 mm (two cables per converter required)	R&S®ZV-Z195	1306.4536.36
Adapter kit, including a power divider and two right angle SMA (m/m) adapters (required if R&S®ZVA24 model. 28 or R&S®ZVA40 model. 48 (VNAs with four sources) is used)	R&S®ZCAK	1323.7746.24
Adapter kit, including four 1.85 mm (f) to 2.92 mm (m) adapters and four 1.85 mm (m) to 2.92 mm (f) adapters (required if R&S®ZVA50 is used)	R&S®ZCAK	1323.7746.50
Adapter kit, including a power divider, two right angle SMA (m/m) adapters, three 1.85 mm (f) to 2.92 mm (m) adapters and four 1.85 mm (m) to 2.92 mm (f) adapters (required if R&S®ZVA67 is used)	R&S®ZCAK	1323.7746.67
Torque wrench, for waveguide flange screws	R&S®ZV-Z1000	1314.5467.02
Angled wrench, for waveguide flange screws	R&S®ZCAW	1175.1960.00
Angled torque wrench, for waveguide flange screws	R&S®ZCTW	1175.2014.02

Service options		
Extended warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty, three years	R&S®WE3	
Extended warranty, four years	R&S®WE4	

Extended warranty with a term of one to four years (WE1 to WE4)

Repairs carried out during the contract term are free of charge ³. Necessary calibration and adjustments carried out during repairs are also covered.

This product was manufactured for Rohde & Schwarz by:

RPG-Radiometer Physics GmbH, Werner-von-Siemens-Str. 4, 53340 Meckenheim, Germany

³ Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

Service that adds value

- ▶ 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 more than 85 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

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Rohde & Schwarz customer support

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