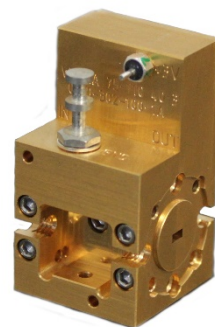


# RPG LNA – Low Noise Amplifier

## Specifications



**Radiometer Physics**  
A Rohde & Schwarz Company

## Definitions

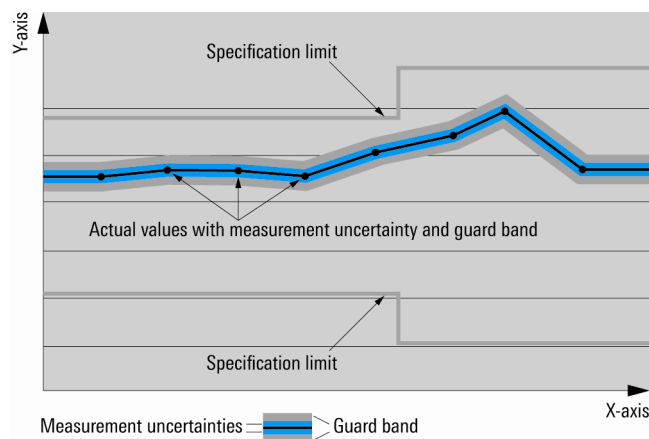
### General

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 Low Noise Amplifiers (LNA) are available for the frequency bands:

- 50 GHz to 75 GHz (V-LNA)
- 60 GHz to 90 GHz (E-LNA)
- 75 GHz to 110 GHz (W-LNA)
- 110 GHz to 170 GHz (D-LNA)
- 140 GHz to 220 GHz (G-LNA)
- 210 GHz to 260 GHz (LNA 210-260 20 7)
- 250 GHz to 350 GHz (H-LNA)

# Specifications

## Test Port

Frequency range [GHz]	V-LNA 50-75 20 5	50 - 75
	V-LNA 50-75 40 5	50 - 75
	E-LNA 60-90 14 5	60 - 90
	E-LNA 60-90 25 5	60 - 90
	W-LNA 75-110 20 3	75 - 110
	W-LNA 75-110 40 3	75 - 110
	D-LNA 110-170 15 6	110 - 170
	D-LNA 110-170 30 6	110 - 170
	G-LNA 140-220 20 6	140 - 220
	G-LNA 140-210 20 5	140 - 210
	LNA 210-260 20 6	210 - 260
	H-LNA 250-330 22 12	250 - 330
	H-LNA 250-350 25 12	250 - 350
	Waveguide designator	V-LNA 50-75 20 5
V-LNA 50-75 40 5		WR-15
E-LNA 60-90 14 5		WR-12
E-LNA 60-90 25 5		WR-12
W-LNA 75-110 20 3		WM-2540 (WR-10)
W-LNA 75-110 40 3		WM-2540 (WR-10)
D-LNA 110-170 15 6		WM-1651 (WR-6.5)
D-LNA 110-170 30 6		WM-1651 (WR-6.5)
G-LNA 140-220 20 6		WM-1295 (WR-5.1)
G-LNA 140-210 20 5		WM-1295 (WR-5.1)
LNA 210-260 20 6		WM-1092 (WR-4.3)
H-LNA 250-330 22 12		WM-864 (WR-3.4)
H-LNA 250-350 25 12		WM-710 (WR-2.8)
Connector type (anti cocking flange)		V-LNA 50-75 20 5
	V-LNA 50-75 40 5	
	E-LNA 60-90 14 5	
	E-LNA 60-90 25 5	
	W-LNA 75-110 20 3	
	W-LNA 75-110 40 3	
	D-LNA 110-170 15 6	
	D-LNA 110-170 30 6	
	G-LNA 140-220 20 6	
	G-LNA 140-210 20 5	
	LNA 210-260 20 7	
	H-LNA 250-330 22 12	RPG precision waveguide flange (compatible with UG-387/U-M and IEEE1785.2)
	H-LNA 250-350 25 12	
	Noise Figure [dB]	V-LNA 50-75 20 5
V-LNA 50-75 40 5		typ. 5
E-LNA 60-90 14 5		typ. 5
E-LNA 60-90 25 5		typ. 5
W-LNA 75-110 20 3		typ. 3
W-LNA 75-110 40 3		typ. 3
D-LNA 110-170 15 6		typ. 6
D-LNA 110-170 30 6		typ. 6
G-LNA 140-220 20 6		typ. 6
G-LNA 140-210 20 5		typ. 5
LNA 210-260 20 7		typ. 7
H-LNA 250-330 22 12		typ. 12
H-LNA 250-350 25 12		typ. 12
Gain [dB]		V-LNA 50-75 20 5
	V-LNA 50-75 40 5	typ. 40
	E-LNA 60-90 14 5	typ. 14
	E-LNA 60-90 25 5	typ. 25
	W-LNA 75-110 20 3	typ. 19
	W-LNA 75-110 40 3	typ. 40
	D-LNA 110-170 15 6	typ. 15
	D-LNA 110-170 30 6	typ. 30
	G-LNA 140-220 20 6	typ. 20
	G-LNA 140-210 20 5	typ. 20
	LNA 210-260 20 7	typ. 20
	H-LNA 250-330 22 12	typ. 22
	H-LNA 250-350 25 12	typ. 25

P1dB [dBm]	V-LNA 50-75 20 5	typ. +12
	V-LNA 50-75 40 5	typ. +12
	E-LNA 60-90 14 5	typ. +14
	E-LNA 60-90 25 5	typ. +14
	W-LNA 75-110 20 3	typ. -3
	W-LNA 75-110 40 3	typ. -3
	D-LNA 110-170 15 6	typ. -3
	D-LNA 110-170 30 6	typ. -3
	G-LNA 140-220 20 6	typ. -3
	G-LNA 140-210 20 5	typ. -3
	LNA 210-260 20 6	typ. -3
	H-LNA 250-330 22 12	typ. -5
	H-LNA 250-350 25 12	typ. -5

## Power Requirements

Input Voltage [V]	V-LNA 50-75 20 5	+ 5
	V-LNA 50-75 40 5	
	E-LNA 60-90 14 5	
	E-LNA 60-90 25 5	
	W-LNA 75-110 20 3	
	W-LNA 75-110 40 3	
	D-LNA 110-170 15 6	
	D-LNA 110-170 30 6	
	G-LNA 140-220 20 6	
	G-LNA 140-210 20 5	
	LNA 210-260 20 6	
	H-LNA 250-330 22 12	
	H-LNA 250-350 25 12	
Supply Current [mA]	V-LNA 50-75 20 5	typ. 80
	V-LNA 50-75 40 5	typ. 150
	E-LNA 60-90 14 5	typ. 120
	E-LNA 60-90 25 5	typ. 240
	W-LNA 75-110 20 3	typ. 40
	W-LNA 75-110 40 3	typ. 80
	D-LNA 110-170 15 6	typ. 40
	D-LNA 110-170 30 6	typ. 80
	G-LNA 140-220 20 6	typ. 40
	G-LNA 140-210 20 5	typ. 40
	LNA 210-260 20 6	typ. 40
	H-LNA 250-330 22 12	typ. 40
	H-LNA 250-350 25 12	typ. 60

## Absolut Maximum Ratings

RF Input Power [dBm]	V-LNA 50-75 20 5	-5
	V-LNA 50-75 40 5	-30
	E-LNA 60-90 14 5	15
	E-LNA 60-90 25 5	0
	W-LNA 75-110 20 3	-10
	W-LNA 75-110 40 3	-30
	D-LNA 110-170 15 6	-10
	D-LNA 110-170 30 6	-30
	G-LNA 140-220 20 6	-10
	G-LNA 140-210 20 5	-10
	LNA 210-260 20 6	-10
	H-LNA 250-330 22 12	-10
	H-LNA 250-350 25 12	-10
Input Voltage [V]	V-LNA 50-75 20 5	+ 7
	V-LNA 50-75 40 5	
	E-LNA 60-90 14 5	
	E-LNA 60-90 25 5	
	W-LNA 75-110 20 3	
	W-LNA 75-110 40 3	
	D-LNA 110-170 15 6	
	D-LNA 110-170 30 6	
	G-LNA 140-220 20 6	
	G-LNA 140-210 20 5	
	LNA 210-260 20 6	
	H-LNA 250-330 22 12	
	H-LNA 250-350 25 12	
Case Temperature [°C]	V-LNA 50-75 20 5	+ 45
	V-LNA 50-75 40 5	
	E-LNA 60-90 14 5	
	E-LNA 60-90 25 5	
	W-LNA 75-110 20 3	
	W-LNA 75-110 40 3	
	D-LNA 110-170 15 6	
	D-LNA 110-170 30 6	
	G-LNA 140-220 20 6	
	G-LNA 140-210 20 5	
	LNA 210-260 20 6	
	H-LNA 250-330 22 12	
	H-LNA 250-350 25 12	

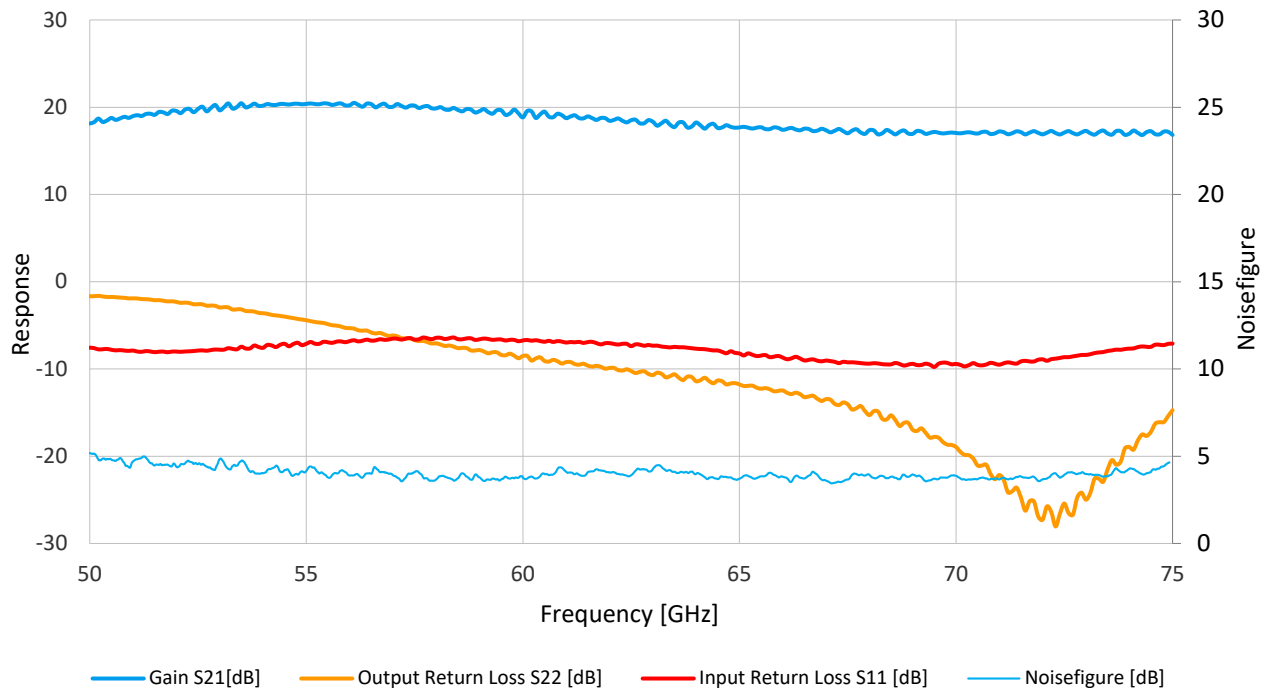


Figure: V-LNA 50-75 20 5

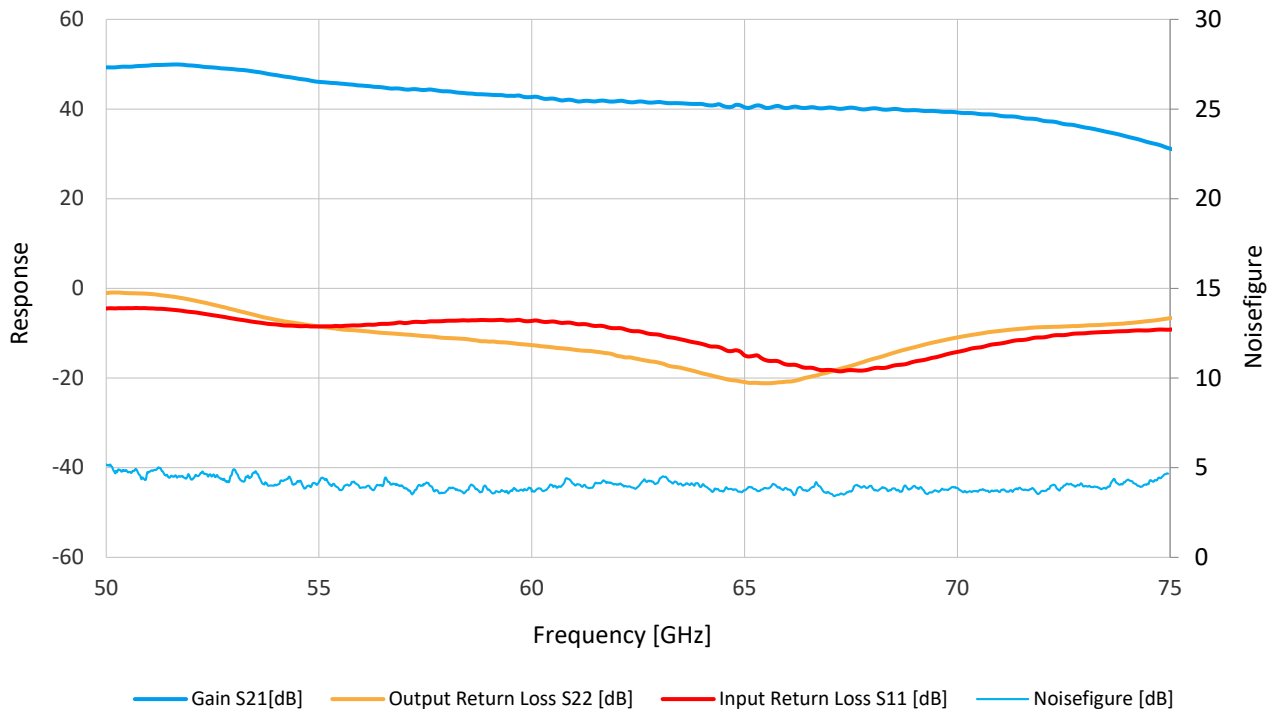


Figure: V-LNA 50-75 40 5

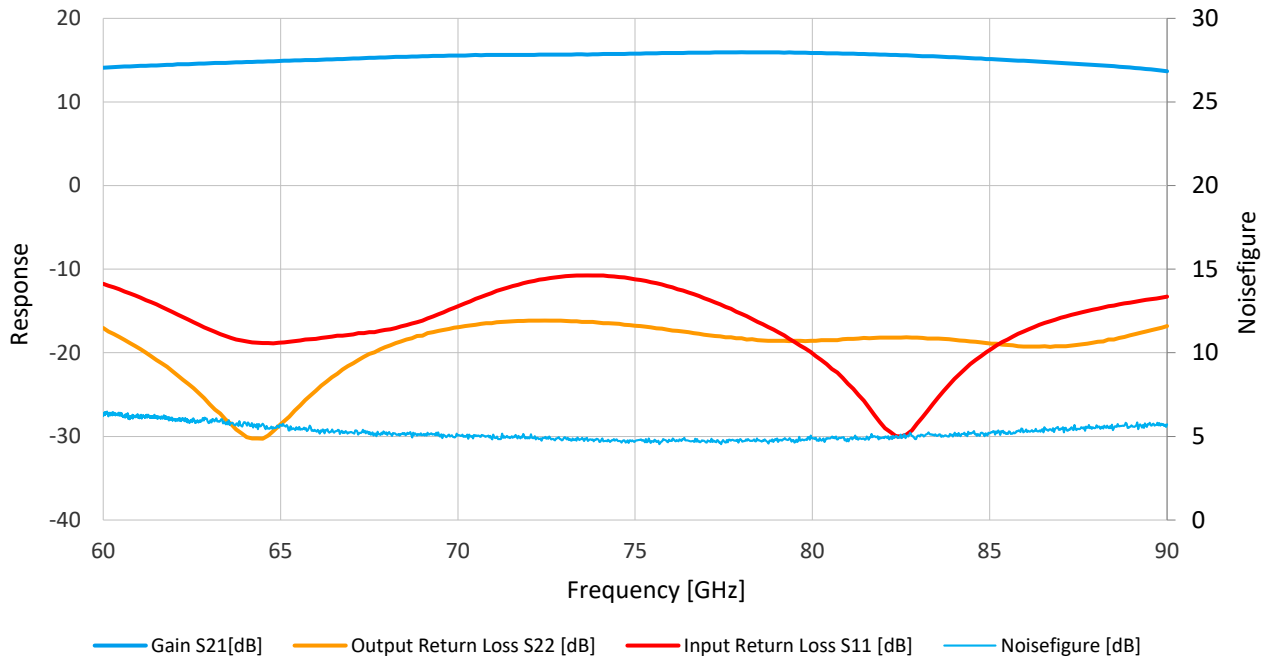


Figure: E-LNA 60-90 14 5

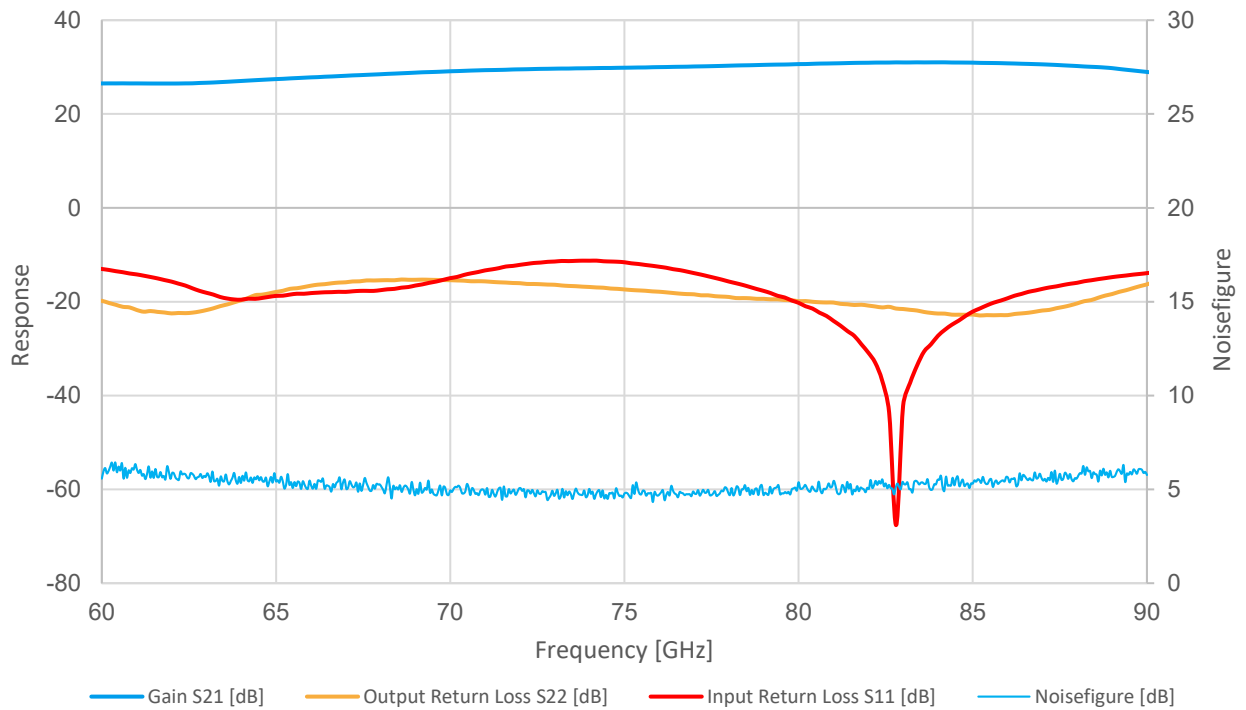


Figure: E-LNA 60-90 25 5



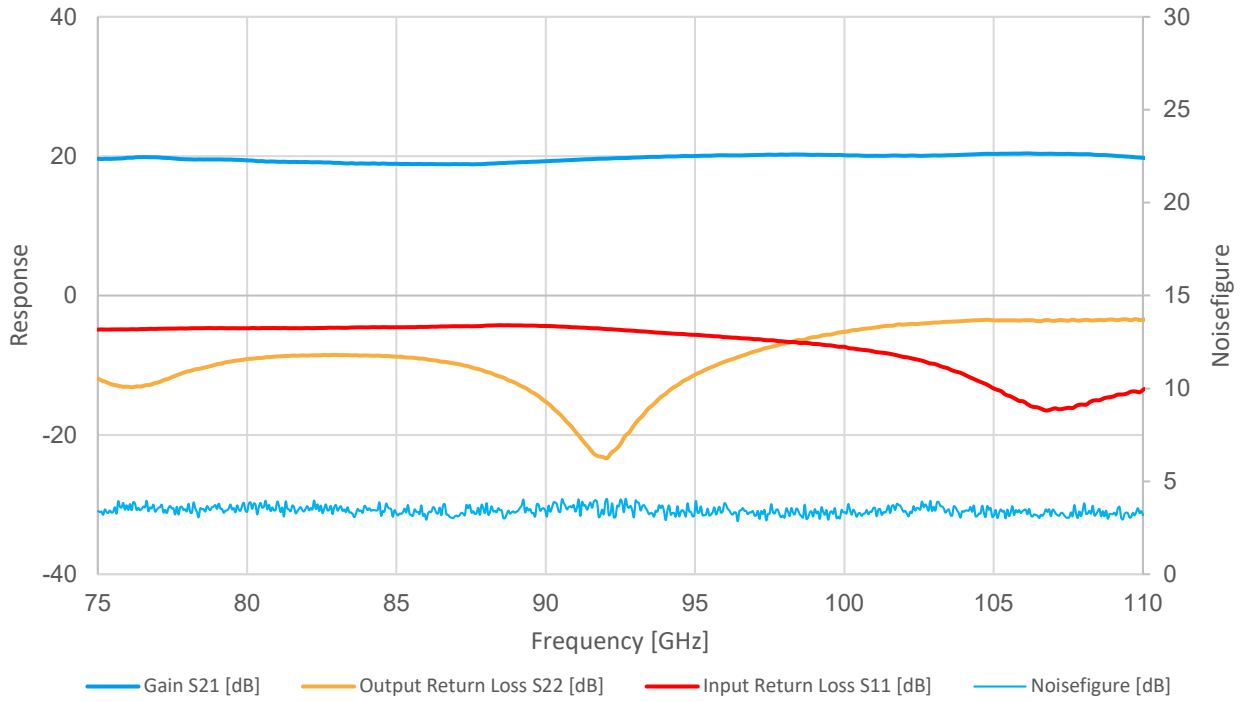


Figure: W-LNA 75-110 20 3

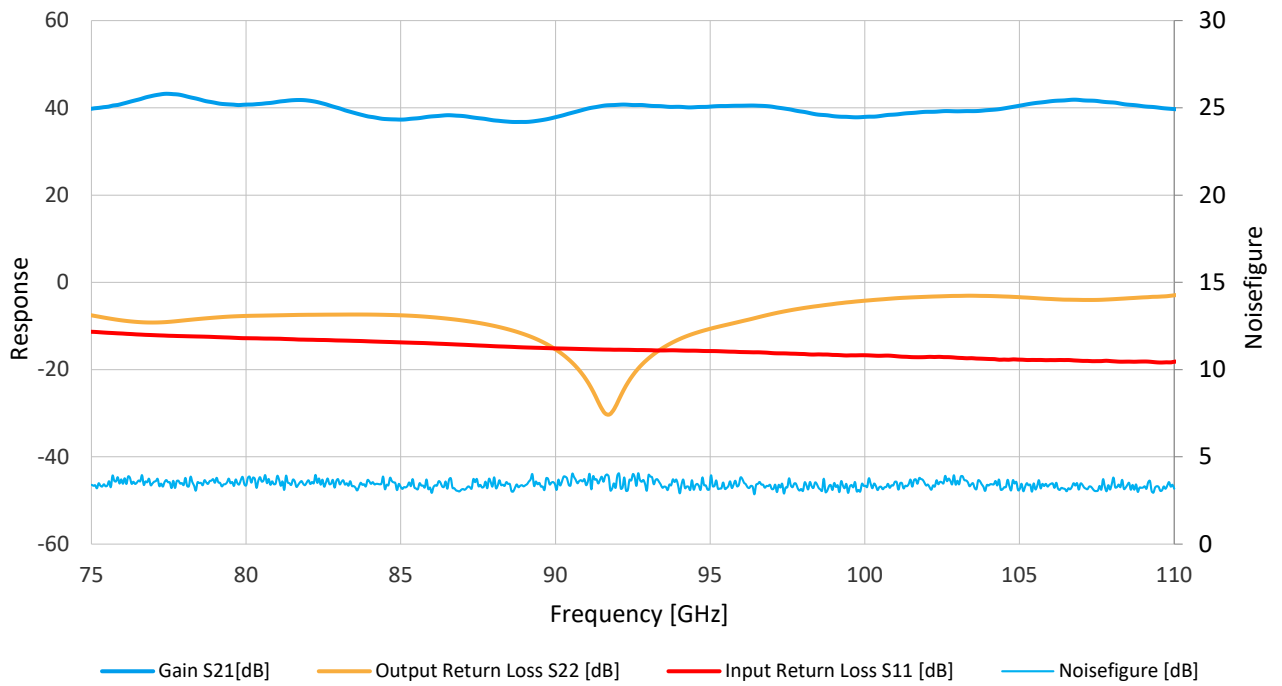


Figure: W-LNA 75-110 40 3

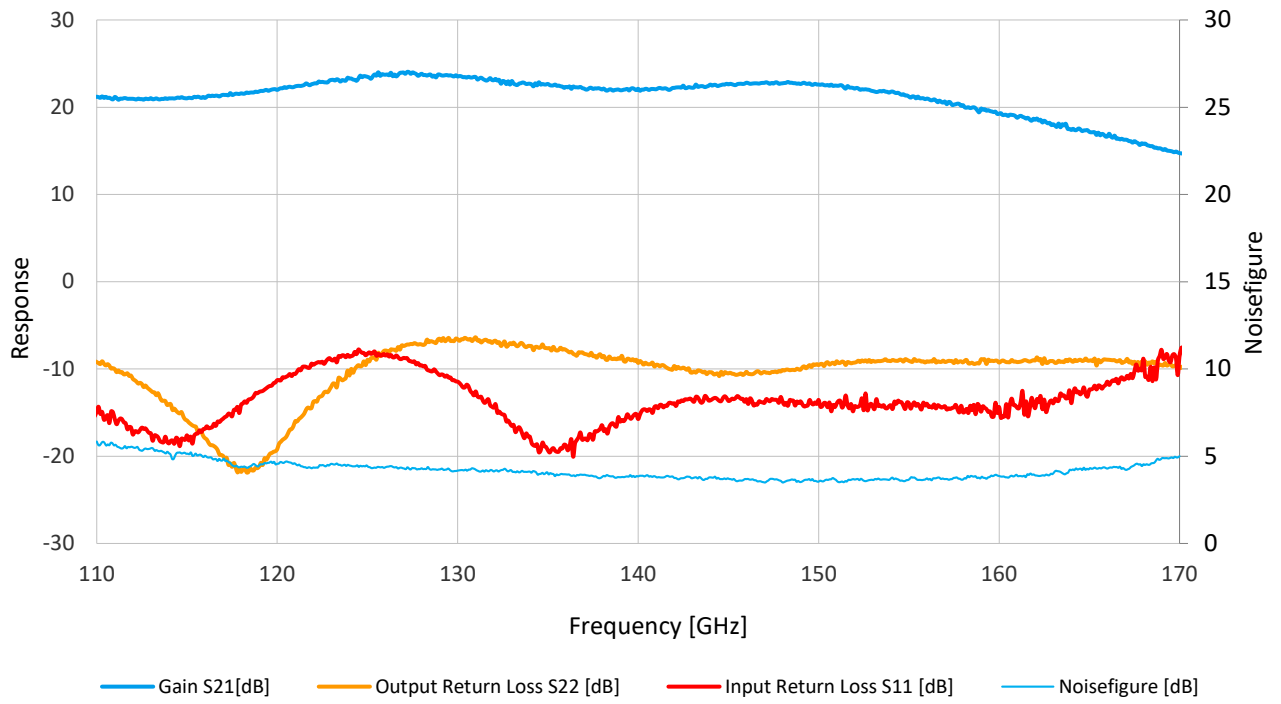


Figure: D-LNA 110-170 15 6

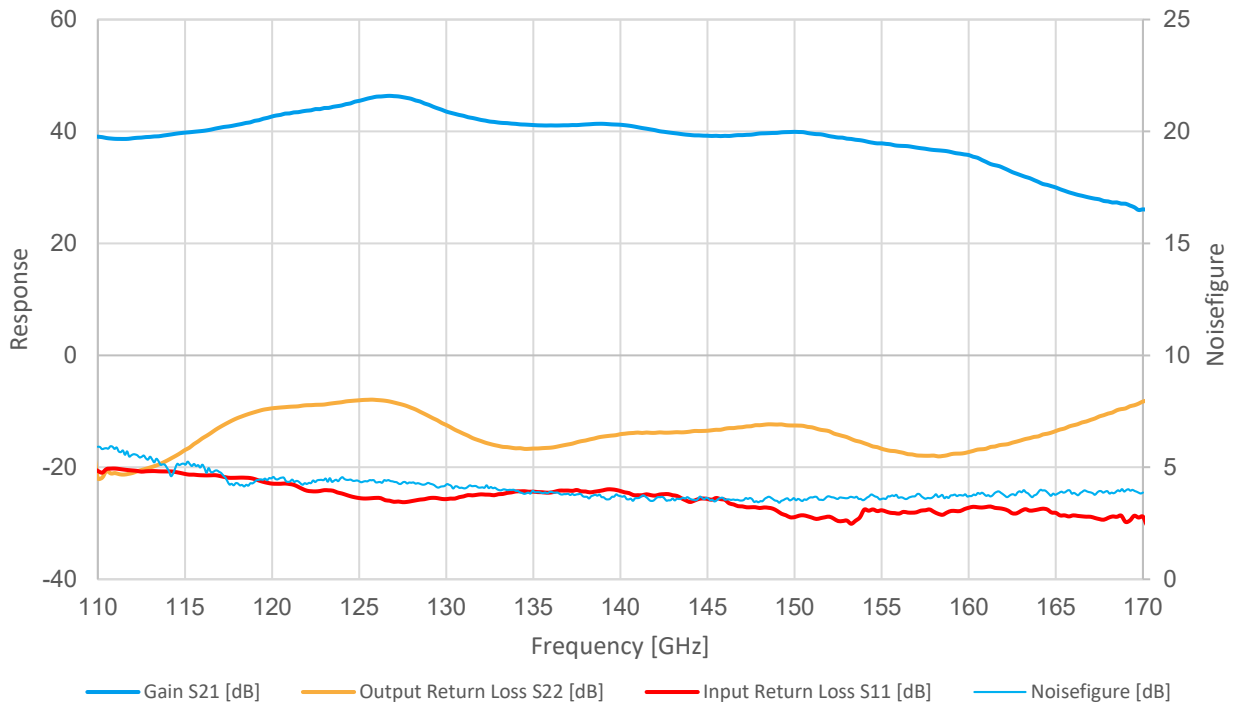


Figure: D-LNA 110-170 30 6

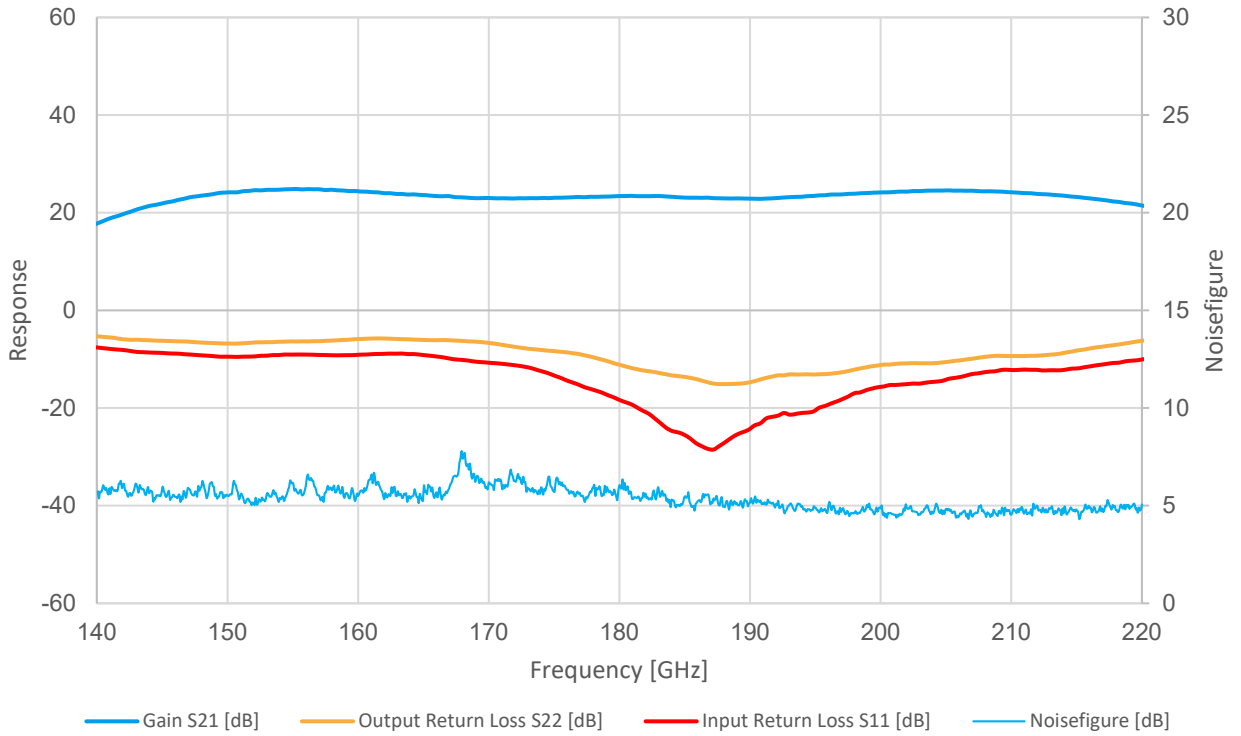


Figure: G-LNA 140-220 20 6

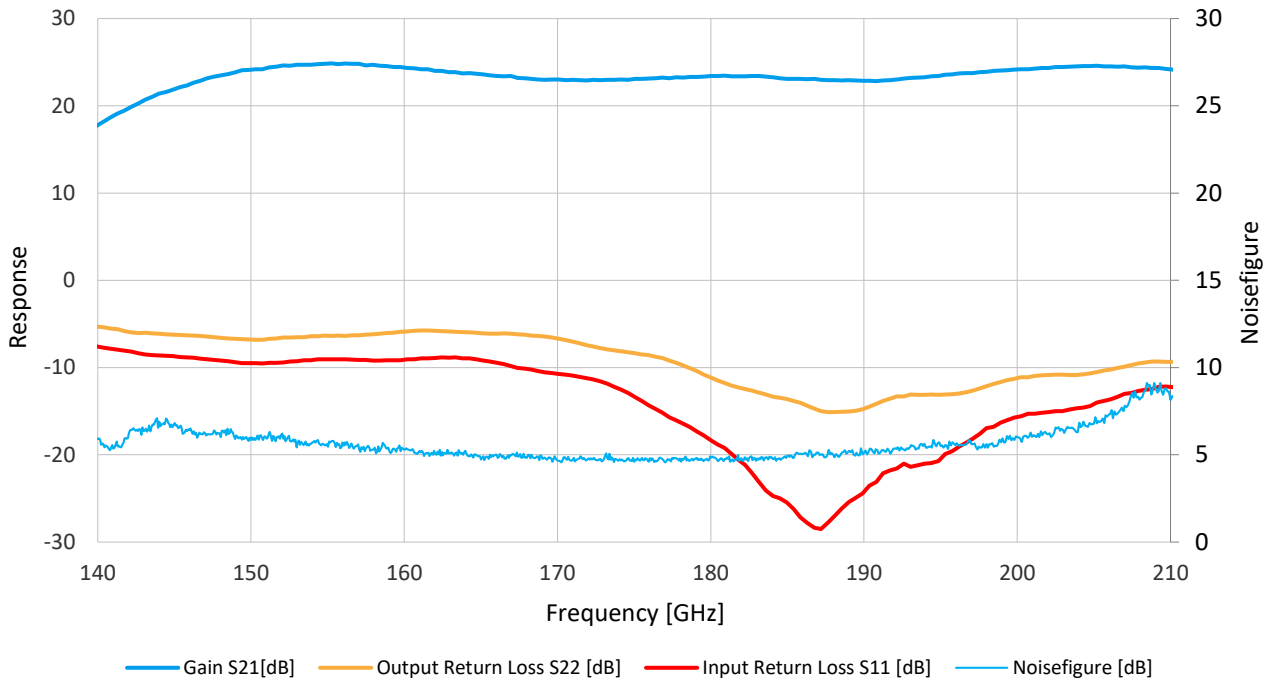


Figure: G-LNA 140-210 20 5

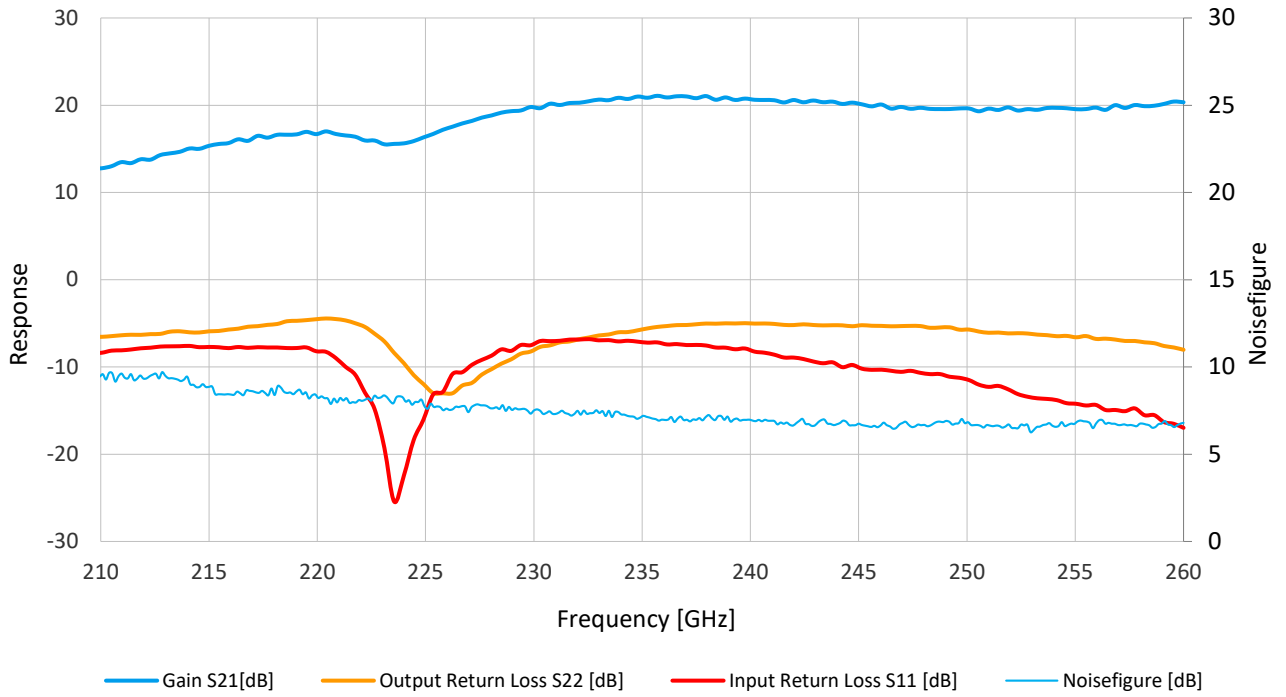


Figure: LNA 210-260 20 7

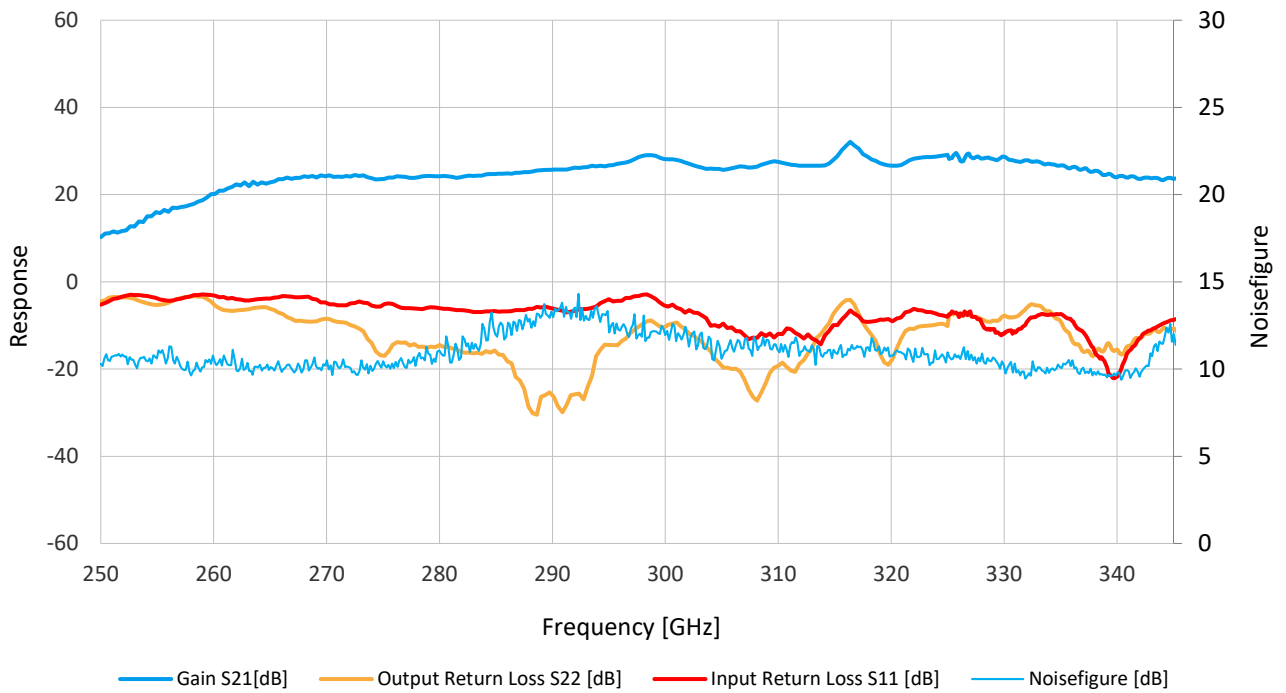


Figure: H-LNA 250-350 25 12

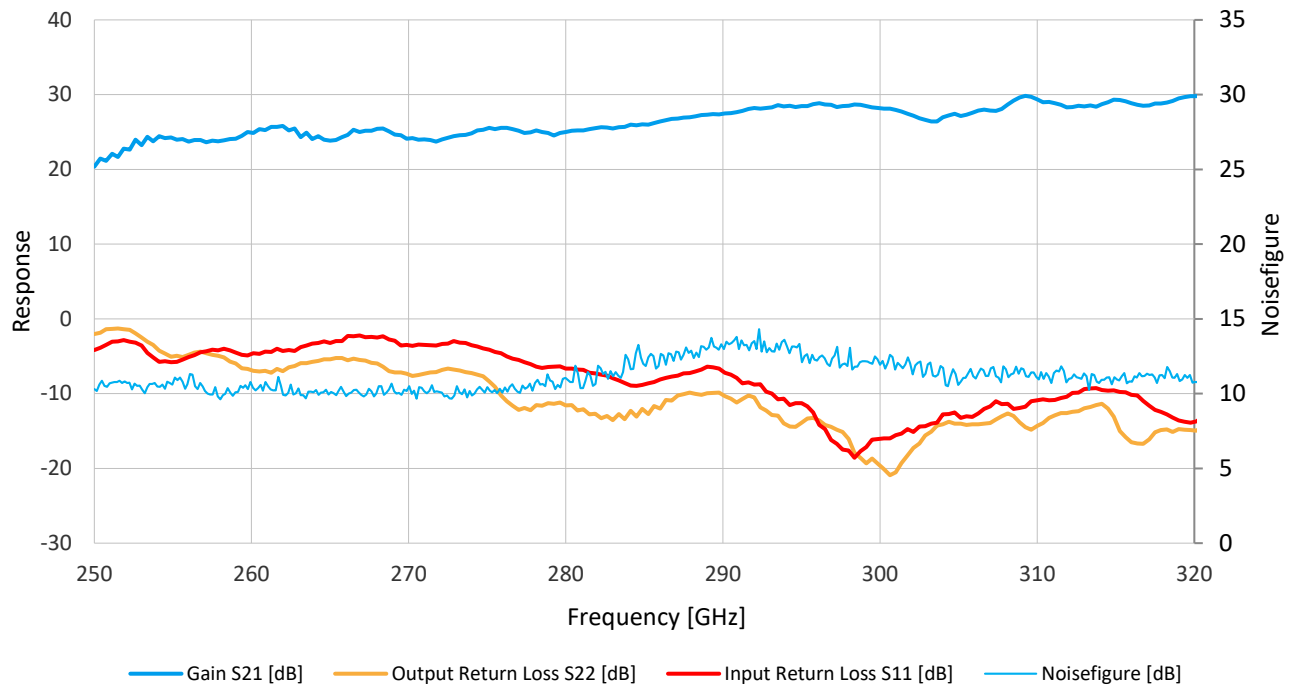
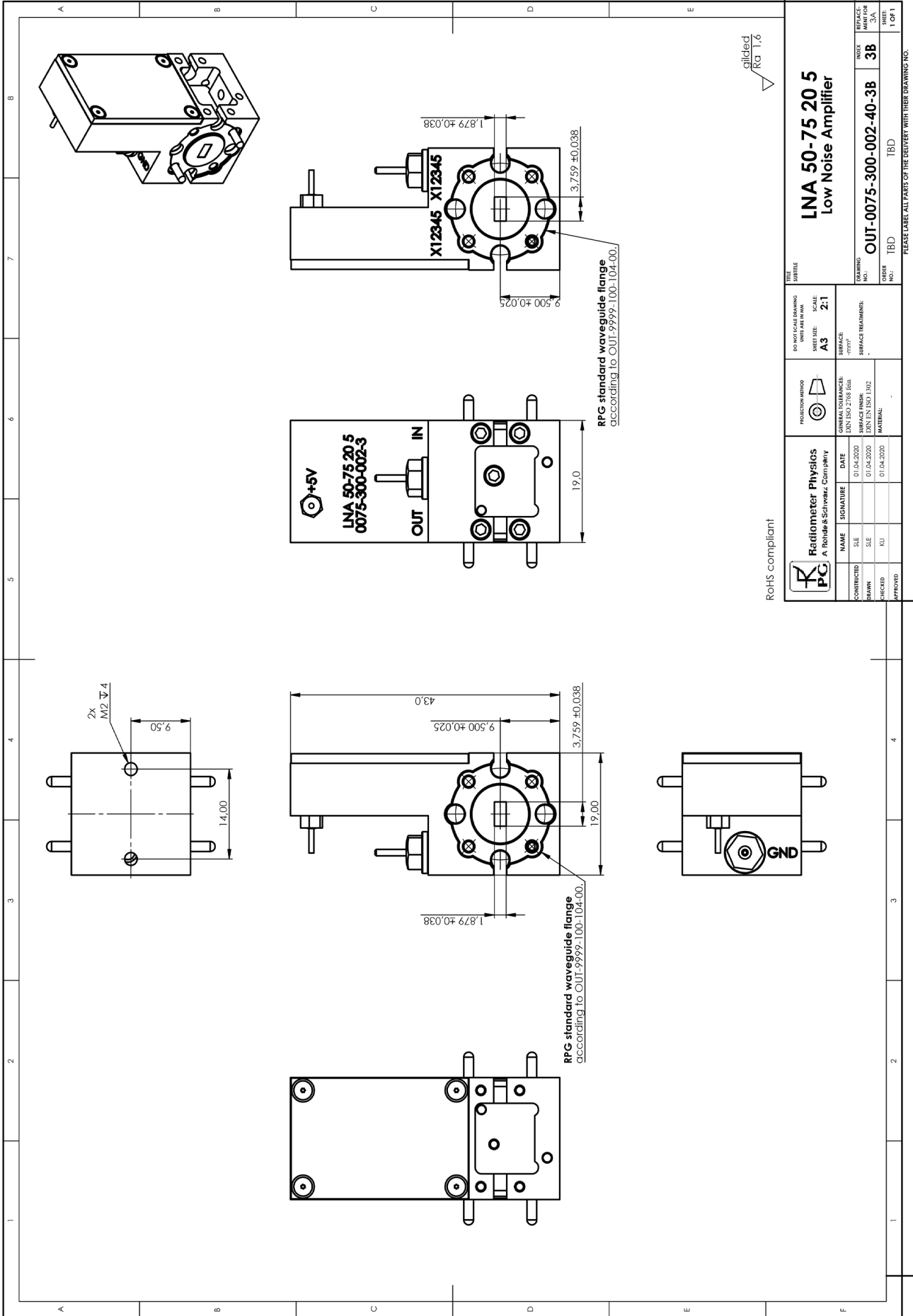


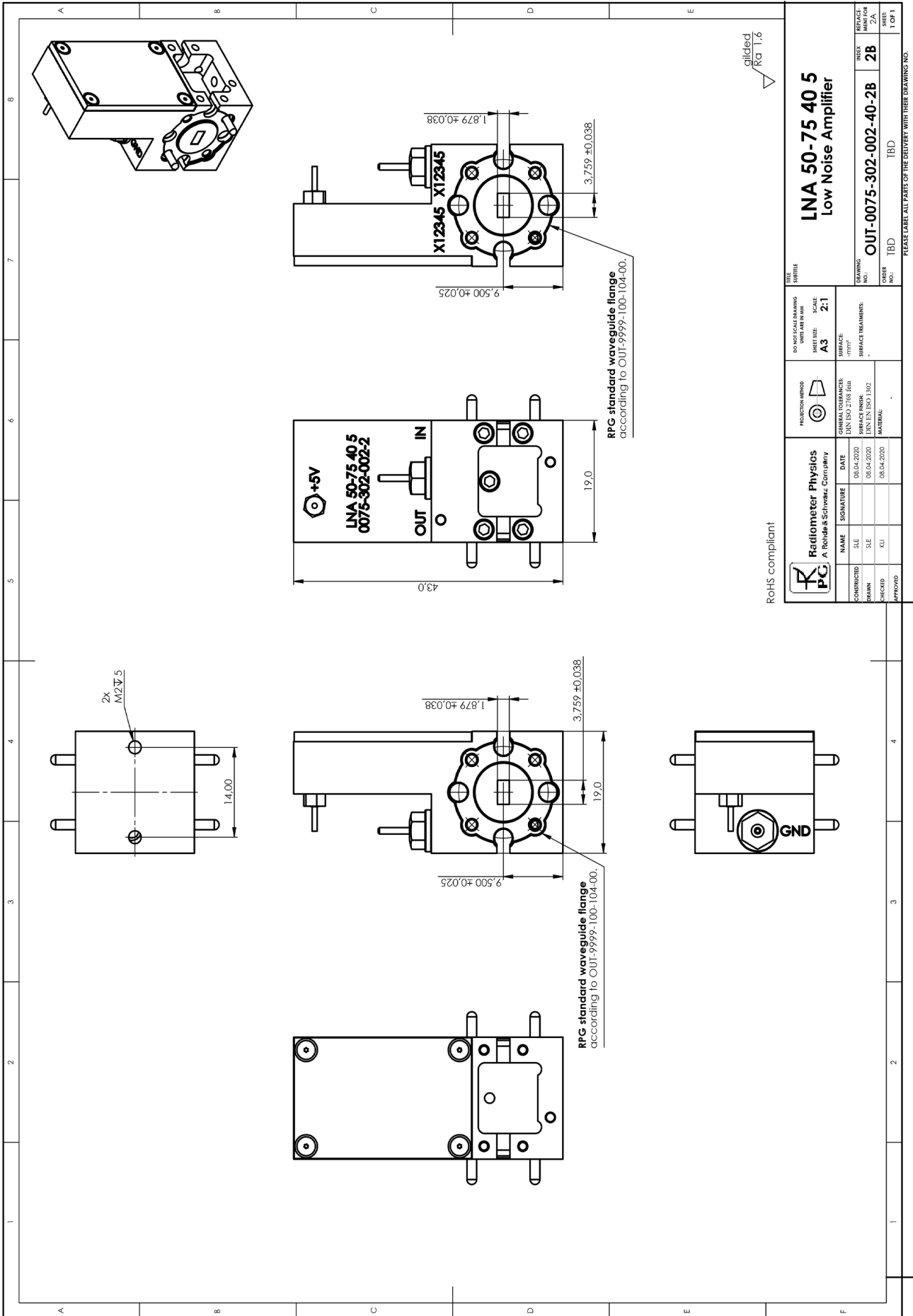
Figure: H-LNA 250-330 22 12

# 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
Damp heat		in line with IEC 60068-2-1 and IEC 60068-2-2
		+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)

Designation	Type	RPG-Order No.
Low Noise Amplifier 50-75 GHz	V-LNA 50-75 20 5	03000023
Low Noise Amplifier 50-75 GHz	V-LNA 50-75 40 5	03000022
Low Noise Amplifier 60-90 GHz	E-LNA 60-90 14 5	03000051
Low Noise Amplifier 60-90 GHz	E-LNA 60-90 25 5	03000059
Low Noise Amplifier 75-110 GHz	W-LNA 75-110 20 3	03000026
Low Noise Amplifier 75-110 GHz	W-LNA 75-110 40 3	03000027
Low Noise Amplifier 110-170 GHz	D-LNA 110-170 15 6	03000024
Low Noise Amplifier 110-170 GHz	D-LNA 110-170 30 6	03000025
Low Noise Amplifier 140-220 GHz	G-LNA 140-220 20 6	03000033
Low Noise Amplifier 140-220 GHz	G-LNA 140-210 20 5	03000031
Low Noise Amplifier 210-260 GHz	LNA 210-260 20 6	03000056
Low Noise Amplifier 250-330 GHz	H-LNA 250-330 22 12	03000017
Low Noise Amplifier 250-350 GHz	H-LNA 250-350 25 12	03000038





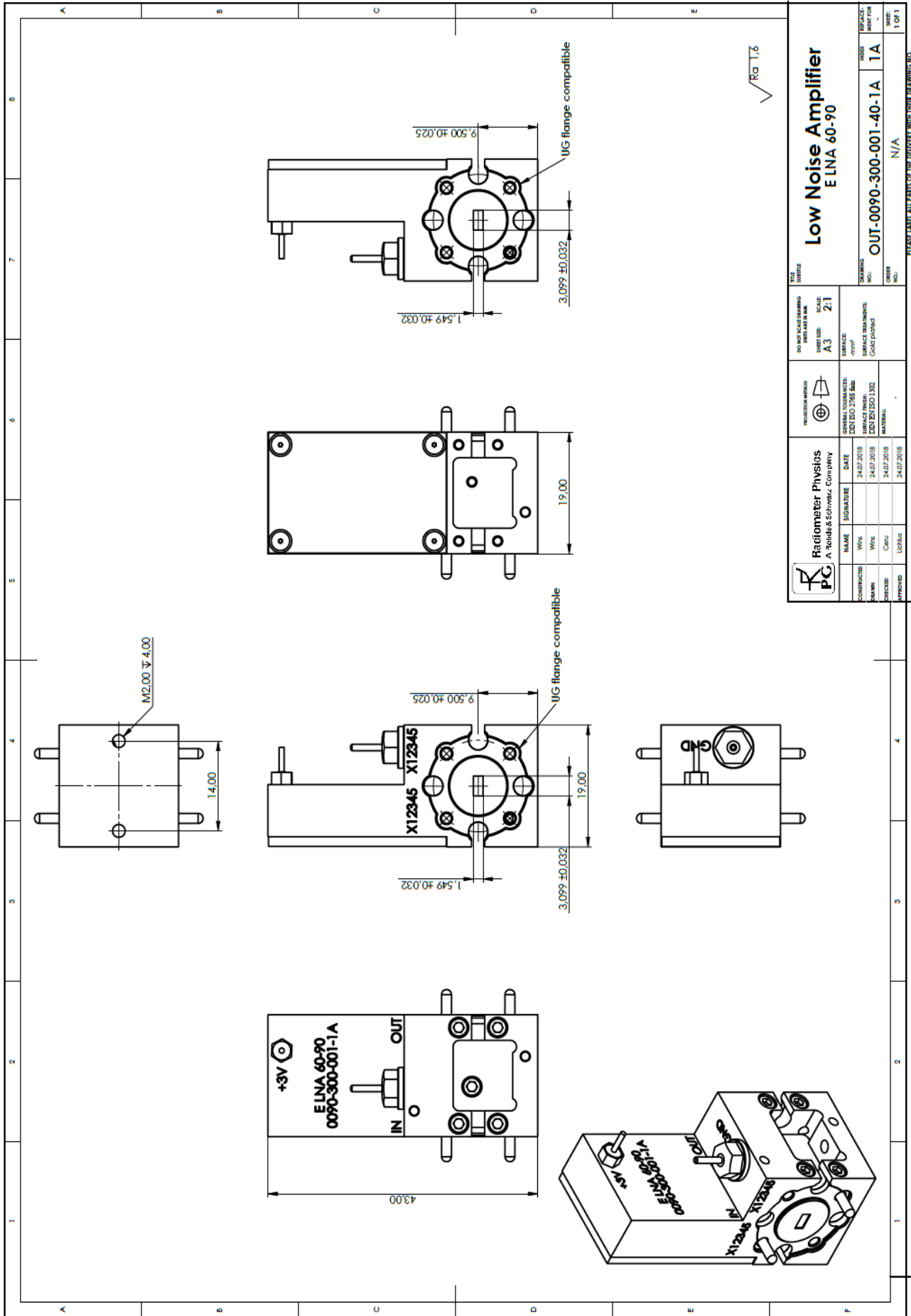
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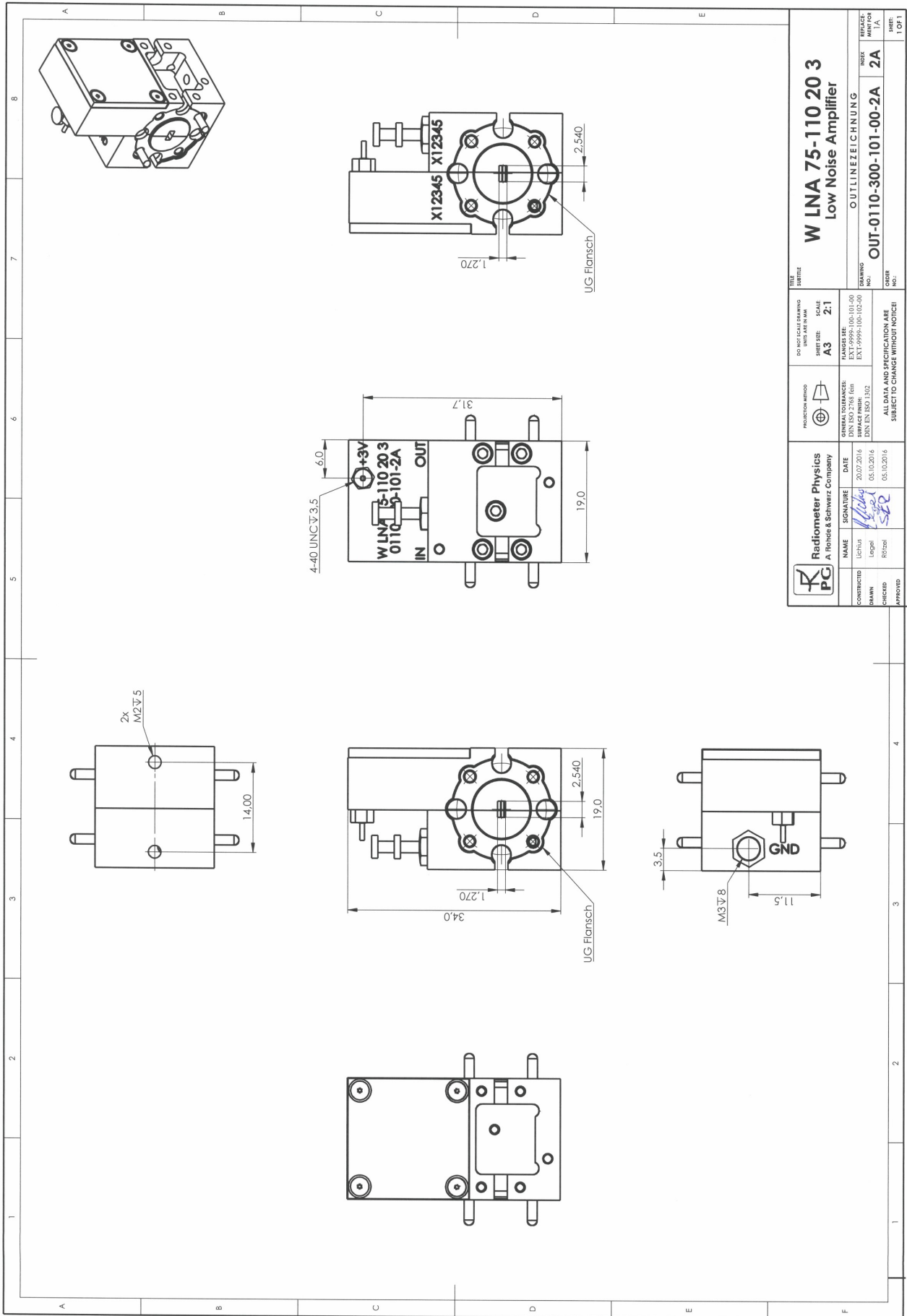
RoHS compliant

		<b>Radiometer Physics</b> A Rohde & Schwarz Company		PRODUCTION NUMBER DIN ISO 2196 (S1)		DRAWING NO. OUT-0075-302-002-40-2B		INDEX 2B	
NAME SLE		DATE 08.04.2020		GENERAL STANDARDS DIN ISO 2196 (S1)		SCALE 2:1		DRAWING NO. OUT-0075-302-002-40-2B	
SIGNATURE SLE		DATE 08.04.2020		SURFACE FINISH DIN EN ISO 1312		SURFACE TREATMENT -		INDEX 2B	
CHECKED KU		DATE 08.04.2020		MATERIAL -		ORDER NO. TBD		INDEX 2B	
APPROVED		DATE		MATERIAL		ORDER NO. TBD		INDEX 2B	

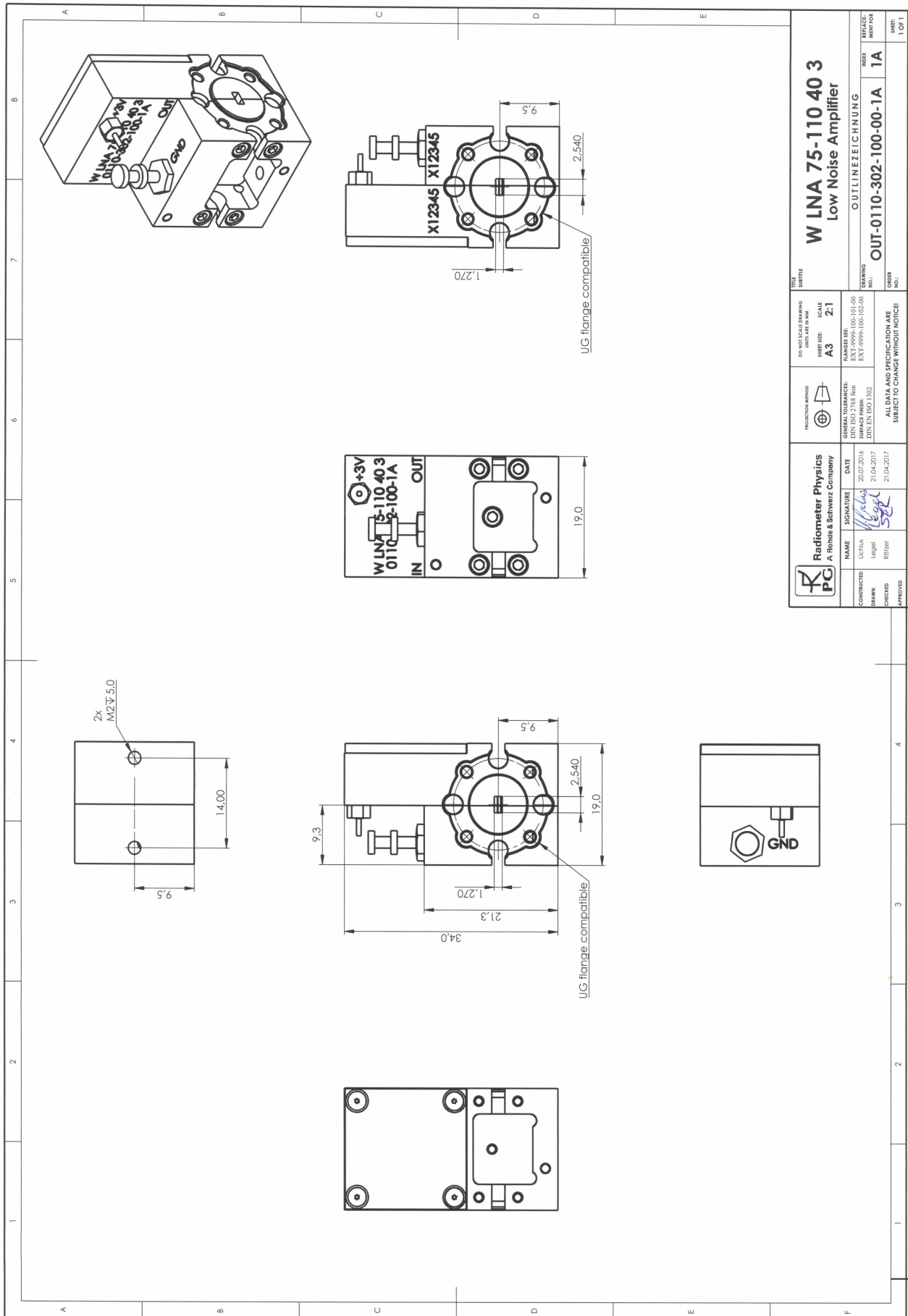
PLEASE LABEL ALL PARTS OF THE DELIVERY WITH THEIR DRAWING NO.

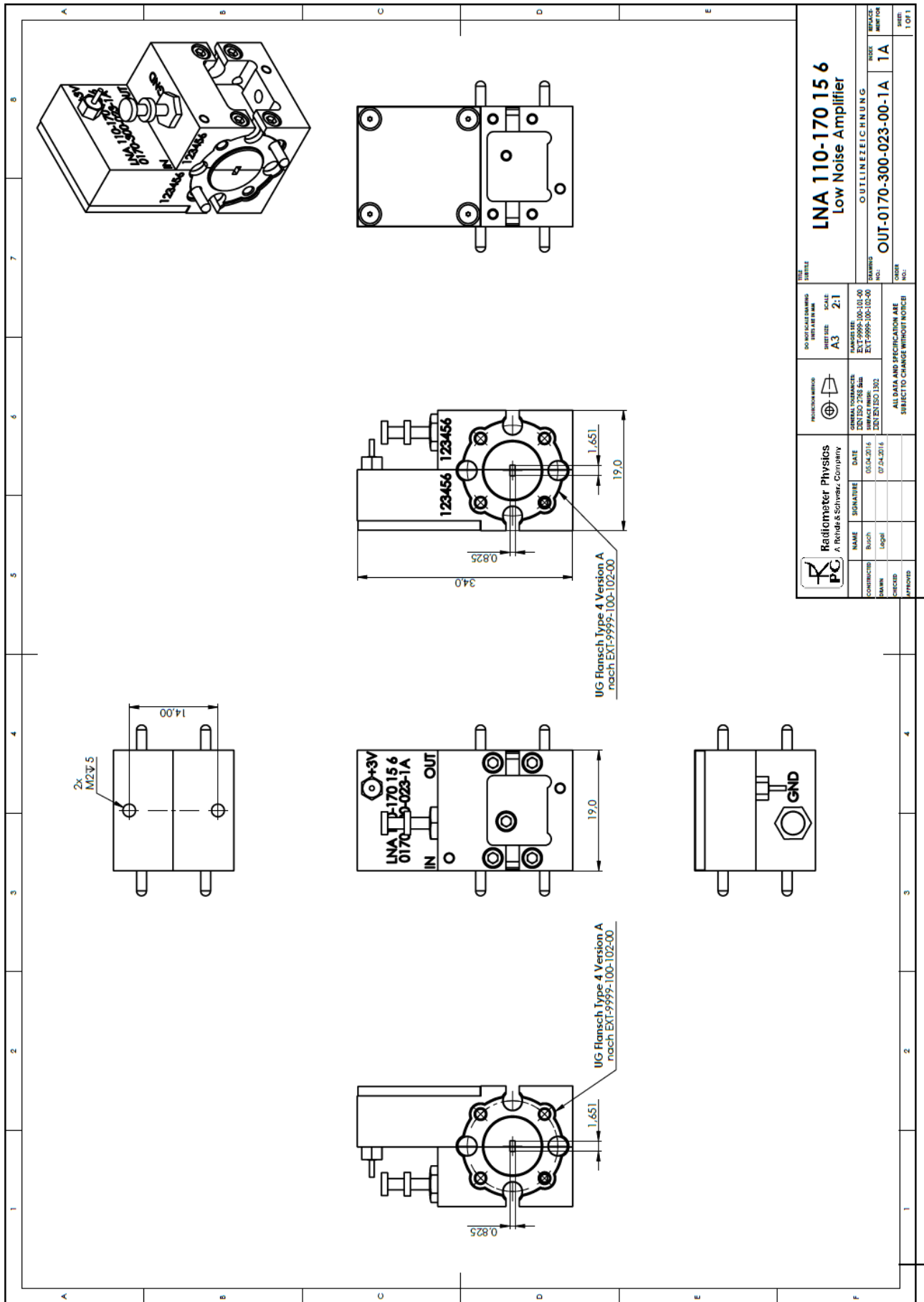




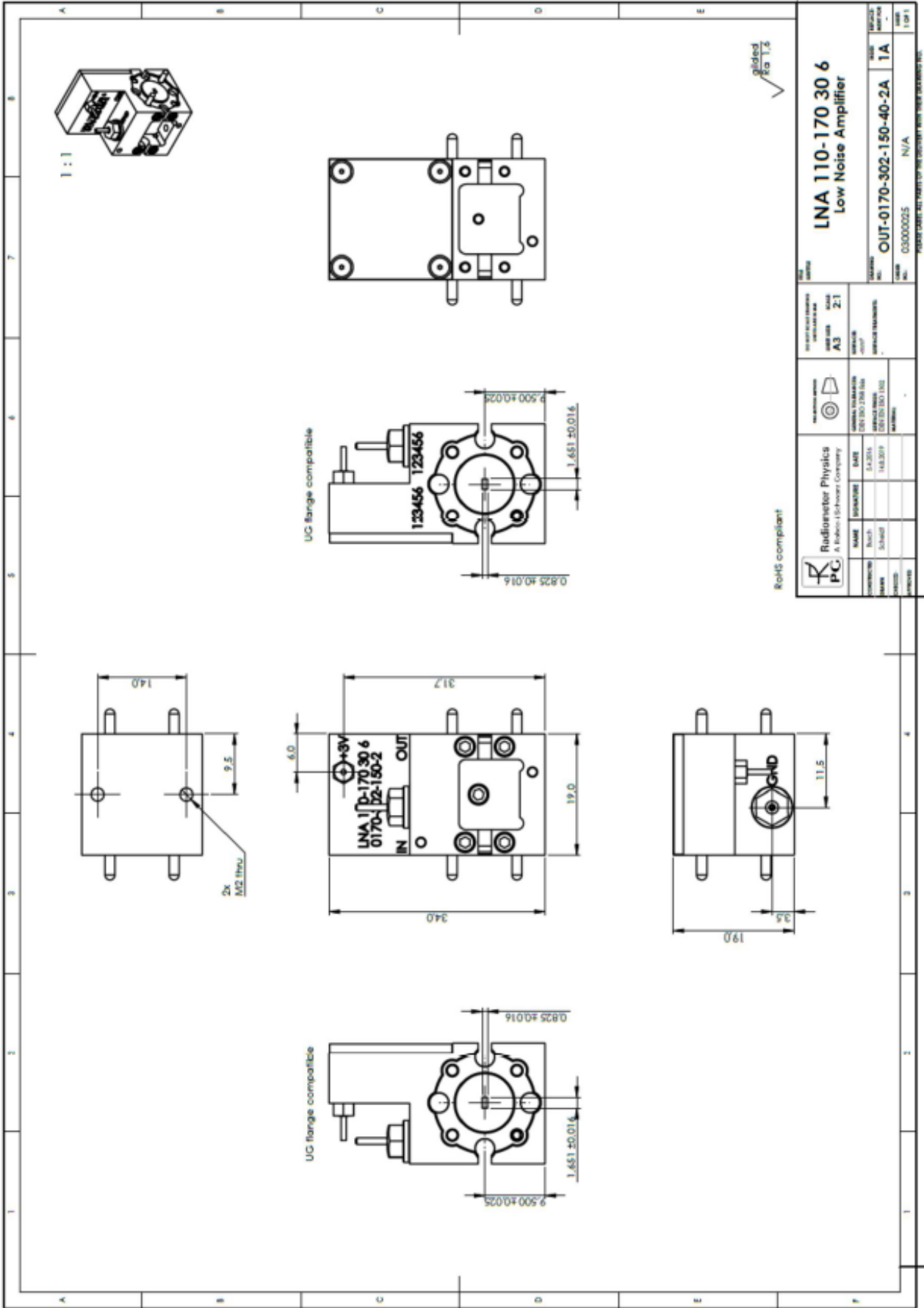


<b>PG</b>		<b>Radiometer Physics</b>		<b>PRODUCTION METHOD</b>		<b>FOR THIS SCALE DRAWING</b>		<b>TITLE</b>	
A Rohde & Schwarz Company		DATE		DIN ISO 2768 (m)		UNITS AND SCALE		W LNA 75-110 20 3	
NAME		SIGNATURE		DIN EN ISO 1302		SHEET SIZE		Low Noise Amplifier	
CONSTRUCTED		20.07.2016		DIN EN ISO 1302		A3		OUTLINEZEICHNUNG	
DRAWN		Legal		DIN EN ISO 1302		2:1		INDEX	
CHECKED		05.10.2016		DIN EN ISO 1302		EXT-9999-100-100-00		OUT-0110-300-101-00-2A	
APPROVED		05.10.2016		DIN EN ISO 1302		EXT-9999-100-100-00		2A	
		SPECIAL INSTRUCTIONS		DIN EN ISO 1302		EXT-9999-100-100-00		SCALE	
		SUBJECT TO CHANGE WITHOUT NOTICE		DIN EN ISO 1302		EXT-9999-100-100-00		DRAWING NO.	
				DIN EN ISO 1302		EXT-9999-100-100-00		ORDER NO.	
				DIN EN ISO 1302		EXT-9999-100-100-00		1 0/1	

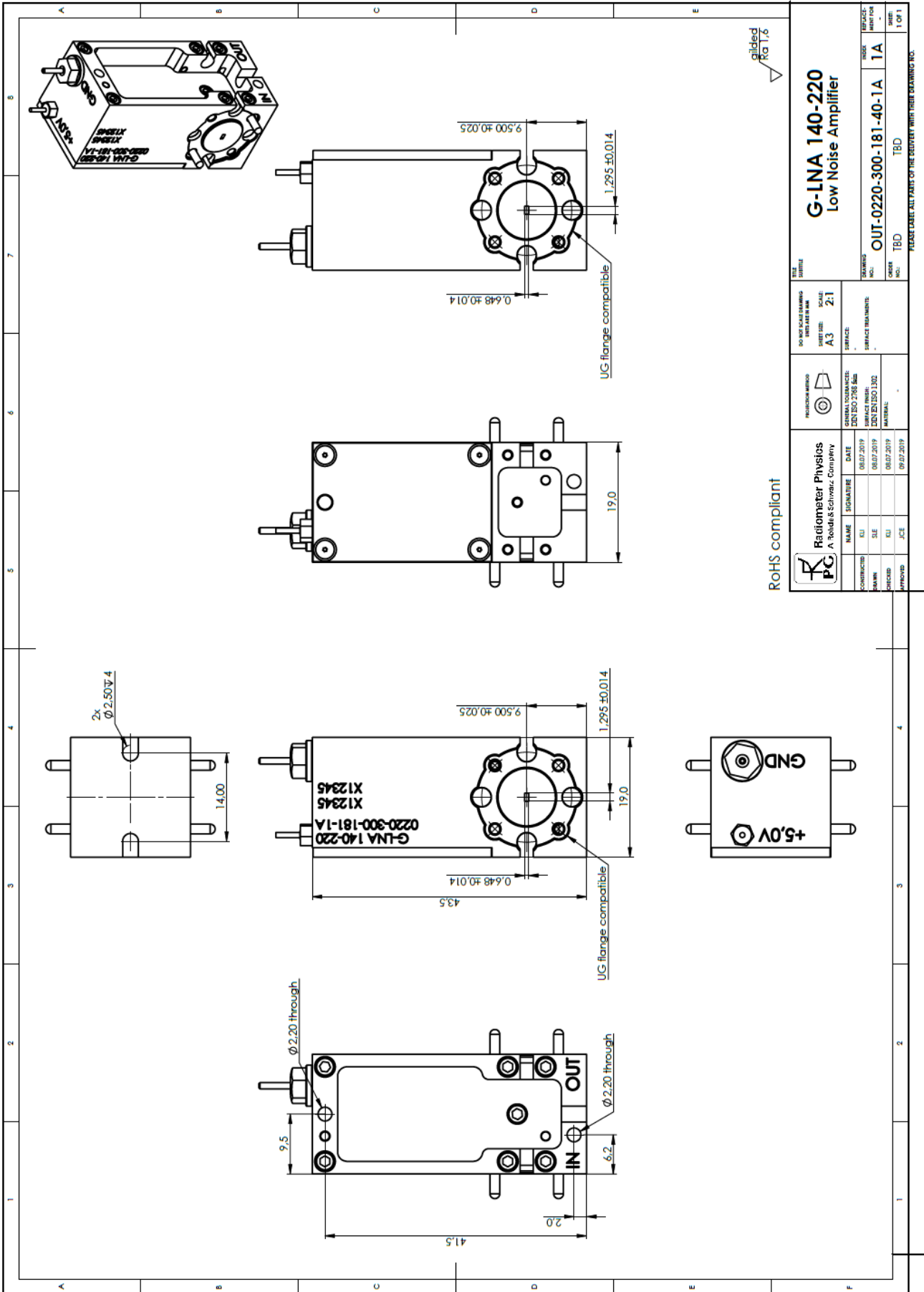




		<b>LNA 110-170 15 6</b> Low Noise Amplifier	
NAME: Radiometer Physics DATE: 05.04.2016 SIGNATURE: [Signature]		TITLE: VERTEIL SCALE: 2:1 SHEET SIZE: A3	
PROJECT: EXT-9999-100-102-00 DRAWING NO.: EXT-9999-100-102-00		OUTLINEZEICHNUNG DRAWING NO.: OUT-0170-300-023-00-1A	
CONSTRUCTED: [Blank] DRAWN: [Blank]		CHECKED: [Blank] APPROVED: [Blank]	
SPECIFICATION: [Blank]		ALL DATA AND SPECIFICATION ARE SUBJECT TO CHANGE WITHOUT NOTICE!	



		<b>RoHS compliant</b>	
		<b>Radiometer Physics</b> A Tektronix Company	
PART NUMBER <b>AS</b>	PART NUMBER <b>Z1</b>	PART NUMBER <b>123456</b>	PART NUMBER <b>123456</b>
NAME <b>AS</b>	NAME <b>AS</b>	NAME <b>AS</b>	NAME <b>AS</b>
DATE <b>01/2016</b>	DATE <b>01/2016</b>	DATE <b>01/2016</b>	DATE <b>01/2016</b>
REVISION <b>01</b>	REVISION <b>01</b>	REVISION <b>01</b>	REVISION <b>01</b>
PART NUMBER <b>OUT-0170-302-150-40-2A</b>	PART NUMBER <b>OUT-0170-302-150-40-2A</b>	PART NUMBER <b>OUT-0170-302-150-40-2A</b>	PART NUMBER <b>OUT-0170-302-150-40-2A</b>
PART NUMBER <b>030000025</b>	PART NUMBER <b>030000025</b>	PART NUMBER <b>030000025</b>	PART NUMBER <b>030000025</b>
PART NUMBER <b>1A</b>	PART NUMBER <b>1A</b>	PART NUMBER <b>1A</b>	PART NUMBER <b>1A</b>



RoHS compliant

		<b>Radimeter Physics</b> A Rohde & Schwarz Company	
NAME: JCE SIGNED: JCE DATE: 09.07.2019	SIGNATURE: [Signature] DATE: 09.07.2019	PROJECTION METHOD: 1st Angle FIRST ANGLE EN ISO 1302 SURFACE TREATMENT:	SIZE: A3 SCALE: 2:1 SURFACE:
CONSTRUCTED: [Blank] DRAWN: [Blank] CHECKED: [Blank] APPROVED: [Blank]	DATE: 08.07.2019 DATE: 08.07.2019 DATE: 08.07.2019 DATE: 09.07.2019	EN ISO 1302 EN ISO 1302 MATERIAL:	TITLE: <b>G-LNA 140-220</b> Low Noise Amplifier NO.: OUT-0220-300-181-40-1A DRAWING NO.: TBD REVISION NO.: 1A SHEET NO.: 1 OF 1

PLEASE CONTACT PARTS OF THE CUSTOMER WITH THESE DRAWINGS NO.

