Version 03.20, June 2020

RPG AFM – ACTIVE FREQUENCY MULTIPLIER

Specifications

Radiometer Physics
A Rohde & Schwarz Company

Definitions

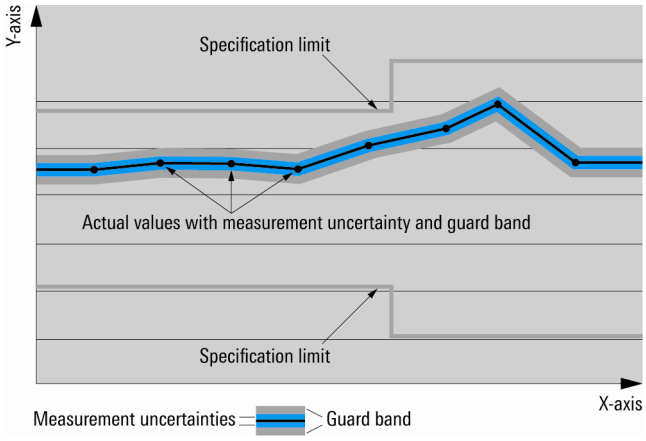
General

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 <, ≤, >, ≥, ±, 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 tea

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 Active Frequency Multipliers are available for the frequency bands:

- 45 GHz to 75 GHz (AFM4 45-75 +12)
- 60 GHz to 90 GHz (AFM6 60-90 +10)
- 75 GHz to 110 GHz (AFM6 75-110 +10)
- 70 GHz to 110 GHz (AFM6 70-110 +14)
- 80 GHz to 125 GHz (AFM6 80-125 +10)
- 80 GHz to 125 GHz (AFM6 80-125 +17)
- 90 GHz to 140 GHz (AFM6 90-140 +10)
- 110 GHz to 170 GHz (AFM12 110-170 +10)

Specifications

Test Port

OUTPUT		
RF-Frequency range [GHz]	AFM4 45-75 +12	45 - 75
	AFM6 60-90 +10	60 - 90
	AFM6 75-110 +10	75 - 110
	AFM6 70-110 +14	70 - 110
	AFM6 80-125 +10	80 - 125
	AFM6 80-125 +17	80 - 125
	AFM6 90-140 +10	90 - 140
	AFM12 110-170 +10	110 - 170
Waveguide designator	AFM4 45-75 +12	WR-15
	AFM6 60-90 +10	WR-12
	AFM6 75-110 +10	WM-2540 (WR-10)
	AFM6 70-110 +14	WM-2540 (WR-10)
	AFM6 80-125 +10	WR-9
	AFM6 80-125 +17	WR-9
	AFM6 90-140 +10	WM-2032 (WR-8)
	AFM12 110-170 +10	WM-1651 (WR-6.5)
Connector type	AFM4 45-75 +12	RPG standard waveguide flange (UG-387/ U-M compatible)
	AFM6 60-90 +10	
	AFM6 75-110 +10	
	AFM6 70-110 +14	
	AFM6 80-125 +10	
	AFM6 80-125 +17	
	AFM6 90-140 +10	
	AFM12 110-170 +10	
RF-power (typ.) [dBm]	AFM4 45-75 +12	+ 12
	AFM6 60-90 +10	+ 10
	AFM6 75-110 +10	+ 10
	AFM6 70-110 +14	+ 14
	AFM6 80-125 +10	+ 10
	AFM6 80-125 +17	+ 17
	AFM6 90-140 +10	+ 10
	AFM12 110-170 +10	+ 10
INPUT		
RF-Frequency range [GHz]	AFM4 45-75 +12	11.25 – 18.75
	AFM6 60-90 +10	10.00 – 15.00
	AFM6 75-110 +10	12.50 – 18.33
	AFM6 70-110 +14	11.67 – 18.33
	AFM6 80-125 +10	13.33 – 20.83
	AFM6 80-125 +17	13.33 – 20.83
	AFM6 90-140 +10	15.00 – 23.33
	AFM12 110-170 +10	09.16 – 14.16

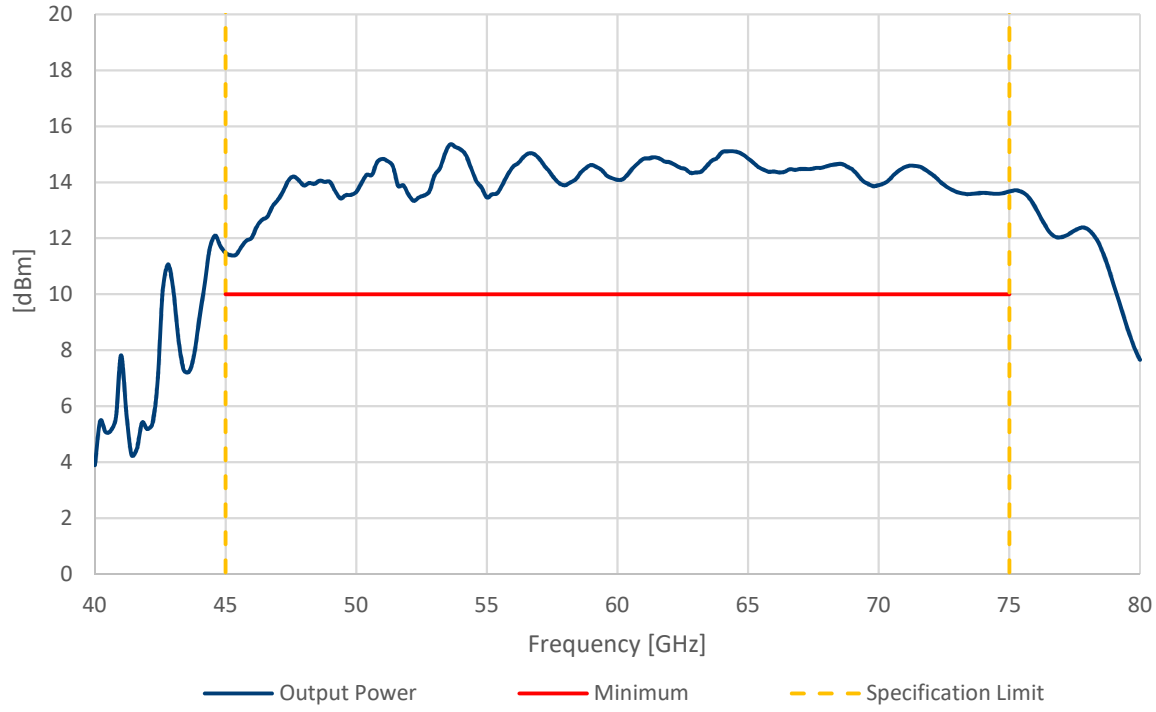
RF-Input power (typ.) [dBm]	AFM4 45-75 +12	+ 7
	AFM6 60-90 +10	
	AFM6 75-110 +10	
	AFM6 70-110 +14	
	AFM6 80-125 +10	
	AFM6 80-125 +17	
	AFM6 90-140 +10	
	AFM12 110-170 +10	
RF-port	AFM4 45-75 +12	2.92 mm (female)
	AFM6 60-90 +10	
	AFM6 75-110 +10	
	AFM6 70-110 +14	
	AFM6 80-125 +10	
	AFM6 80-125 +17	
	AFM6 90-140 +10	
	AFM12 110-170 +10	
RF-Multiplication factor	AFM4 45-75 +12	4
	AFM6 60-90 +10	6
	AFM6 75-110 +10	6
	AFM6 70-110 +14	6
	AFM6 80-125 +10	6
	AFM6 80-125 +17	6
	AFM6 90-140 +10	6
	AFM12 110-170 +10	12

Power Requirements

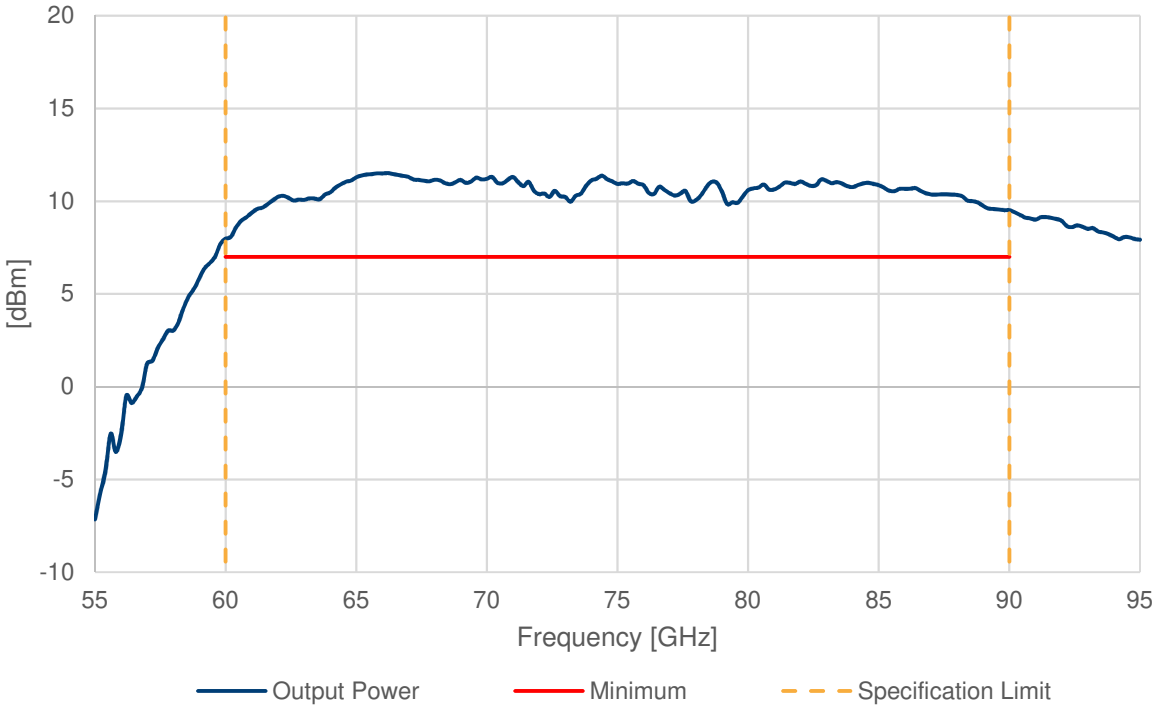
Input voltage [V]	AFM4 45-75 +12	+ 7
	AFM6 60-90 +10	+ 7
	AFM6 75-110 +10	+ 7
	AFM6 70-110 +14	+ 7
	AFM6 80-125 +10	+ 7 / - 5.5
	AFM6 80-125 +17	+ 5.8 / - 5.5
	AFM6 90-140 +10	+ 7
	AFM12 110-170 +10	AFM4 36-56 +15: + 7 / - 5.5 MPA 36-56 17 26: + 12 / - 5.5
Supply current (typ.) [mA]	AFM4 45-75 +12	+ 550
	AFM6 60-90 +10	+ 650
	AFM6 75-110 +10	+ 650
	AFM6 70-110 +14	+ 1300
	AFM6 80-125 +10	+ 800
	AFM6 80-125 +17	+ 2600
	AFM6 90-140 +10	+ 700
	AFM12 110-170 +10	AFM4 36-56 +15: + 250 MPA 36-56 17 26: + 450 / + 50

Absolut Maximum Ratings

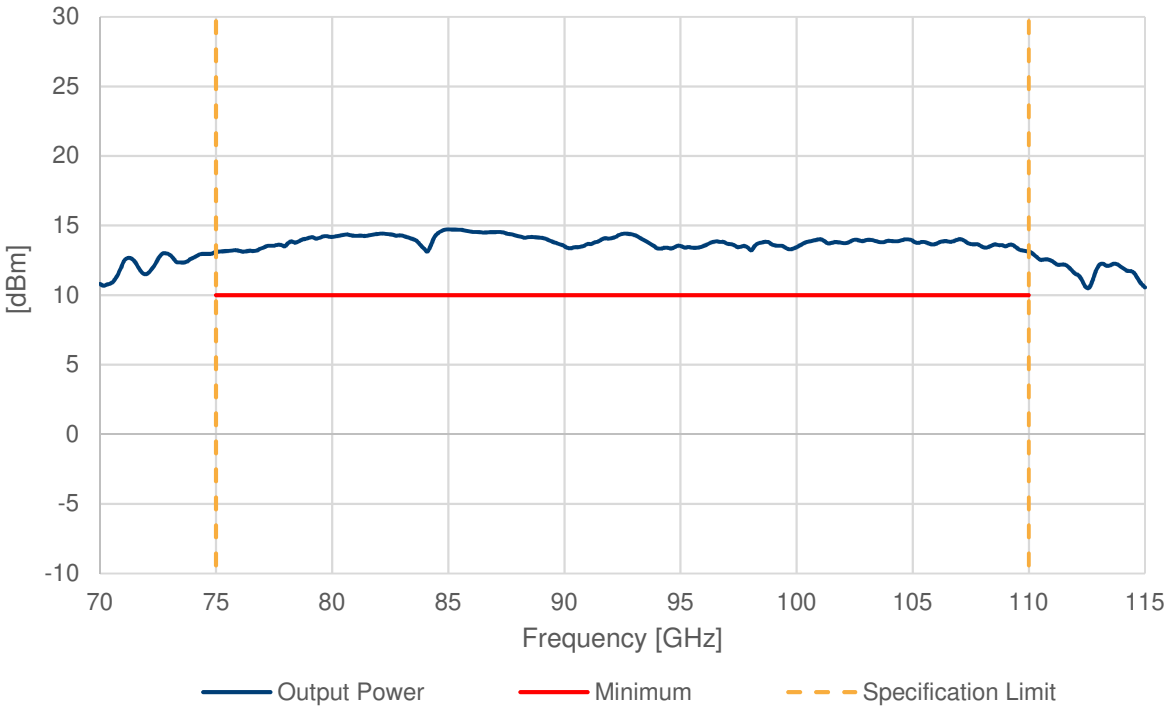
RF-Input power [dBm]	AFM4 45-75 +12	+ 10
	AFM6 60-90 +10	
	AFM6 75-110 +10	
	AFM6 70-110 +14	
	AFM6 80-125 +10	
	AFM6 80-125 +17	
	AFM6 90-140 +10	
	AFM12 110-170 +10	
Input voltage [V]	AFM4 45-75 +12	+ 10
	AFM6 60-90 +10	+ 10
	AFM6 75-110 +10	+ 10
	AFM6 70-110 +14	+ 10
	AFM6 80-125 +10	+ 10 / - 10
	AFM6 80-125 +17	+ 7 / - 10
	AFM6 90-140 +10	+ 10
	AFM12 110-170 +10	AFM4 36-56 +15: + 10 / - 10 MPA 36-56 17 26: + 15 / - 10
Case temperature [°C]	AFM4 45-75 +12	+ 45
	AFM6 60-90 +10	
	AFM6 75-110 +10	
	AFM6 70-110 +14	
	AFM6 80-125 +10	
	AFM6 80-125 +17	
	AFM6 90-140 +10	
	AFM12 110-170 +10	



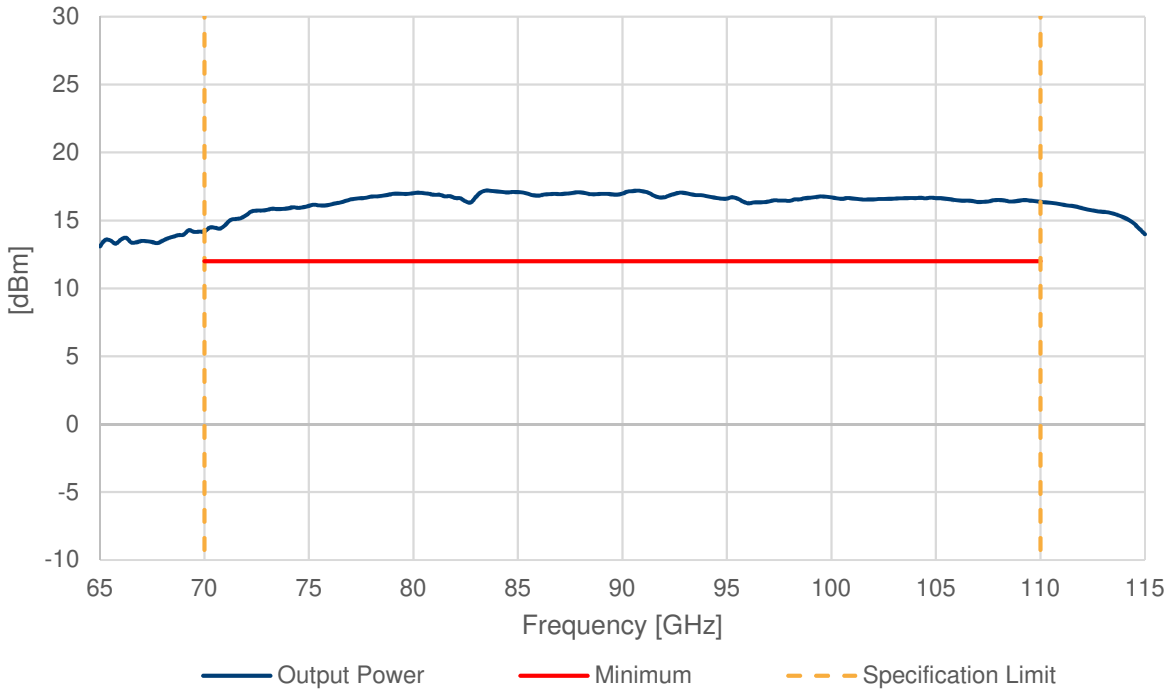
Typ. Figure 1: AFM4 45-75 +12 Output Power between 40 GHz and 80 GHz



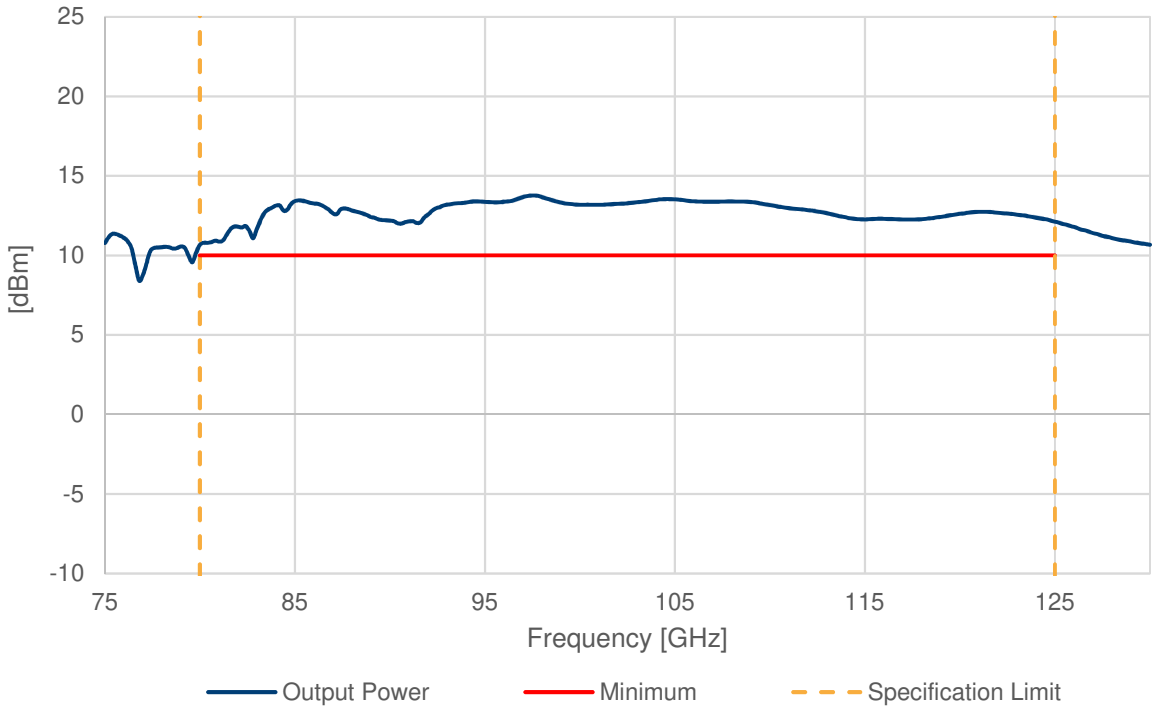
Typ. Figure 2: AFM6 60-90 +10 Output Power between 55 GHz and 95 GHz



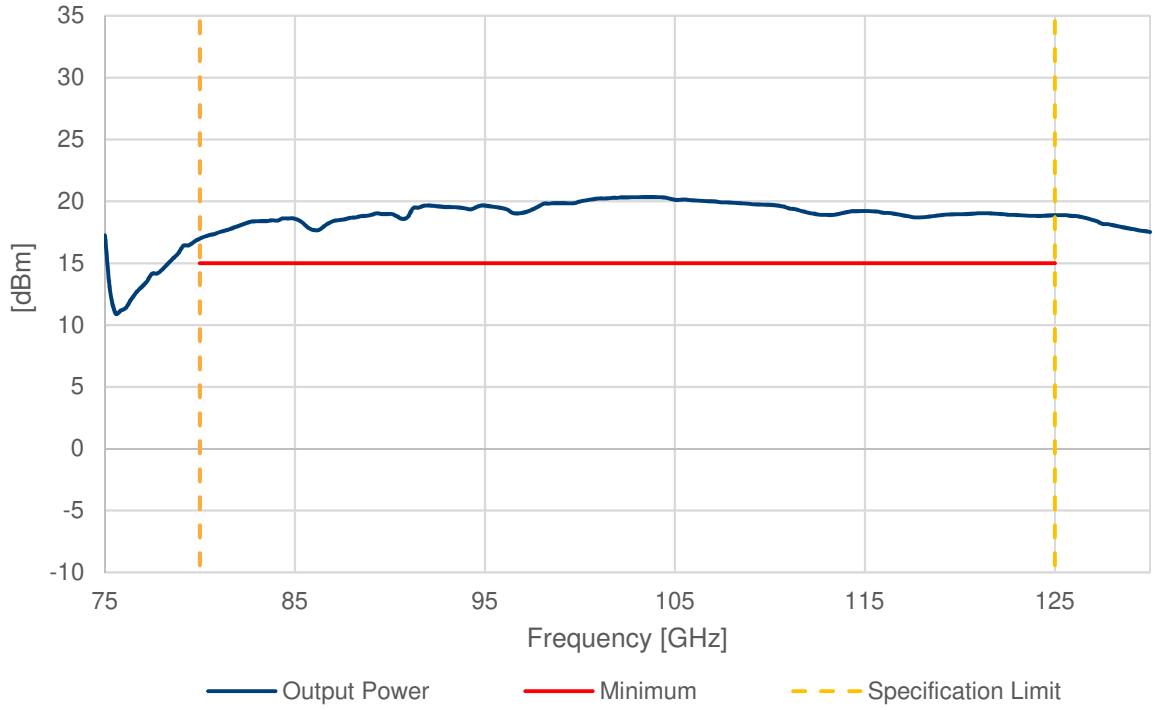
Typ. Figure 3: AFM6 75-110 +10 Output Power between 70 GHz and 115 GHz



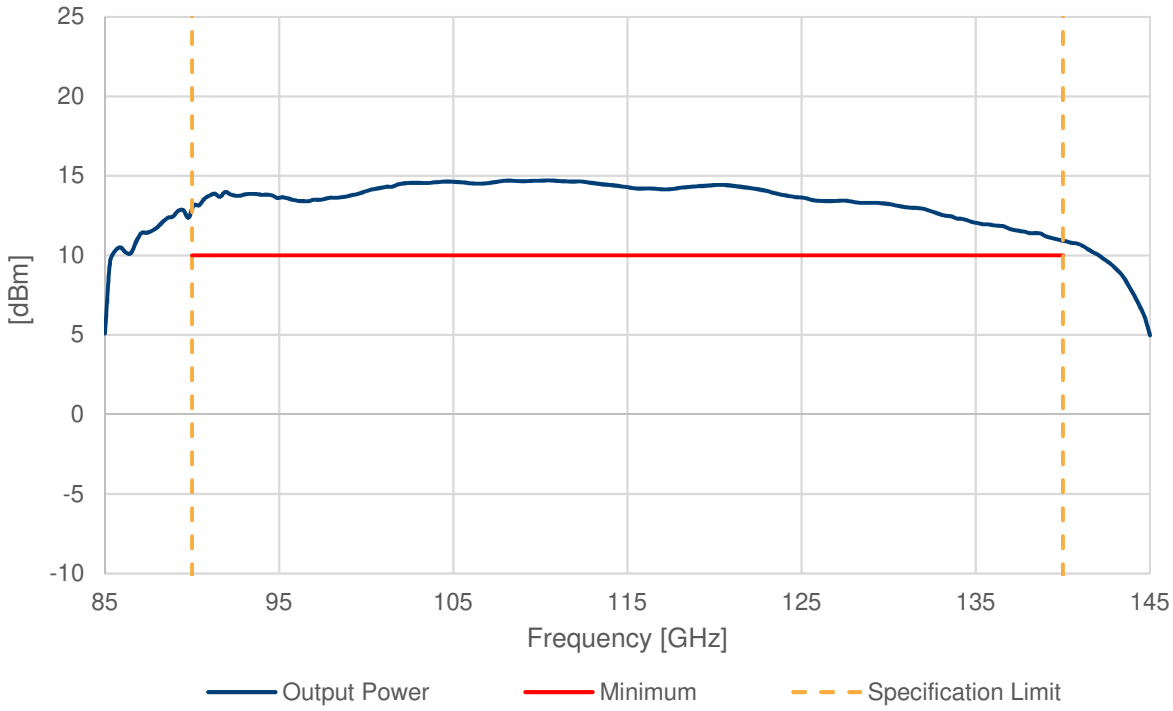
Typ Figure 4: AFM6 70-110 +14 Output Power between 65 GHz and 115 GHz



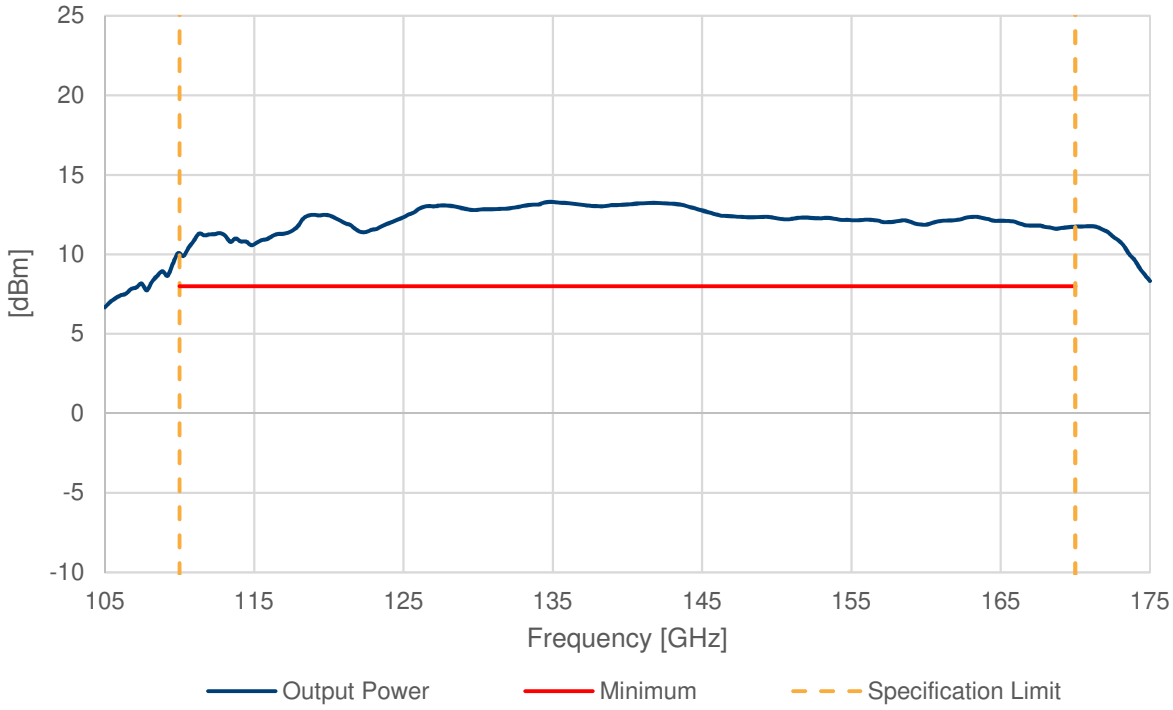
Typ. Figure 5: AFM6 80-125 +10 Output Power between 75 GHz and 130 GHz



Typ. Figure 6: AFM6 80-125 +17 Output Power between 75 GHz and 130 GHz



Typ. Figure 7: AFM6 90-140 +10 Output Power between 85 GHz and 145 GHz



Typ. Figure 8: AFM12 110-170 +10 Output Power between 105 GHz and 175 GHz

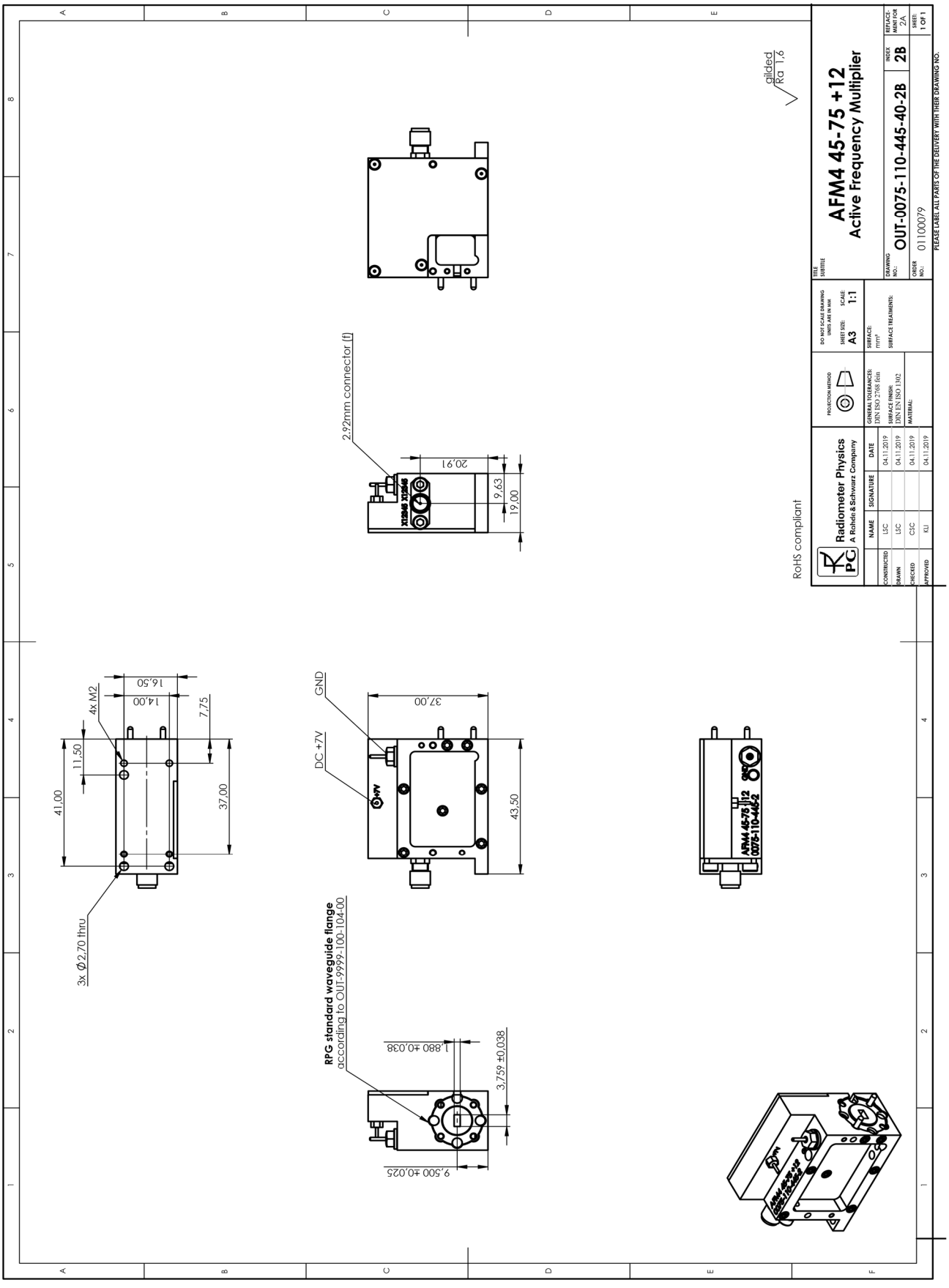
General data

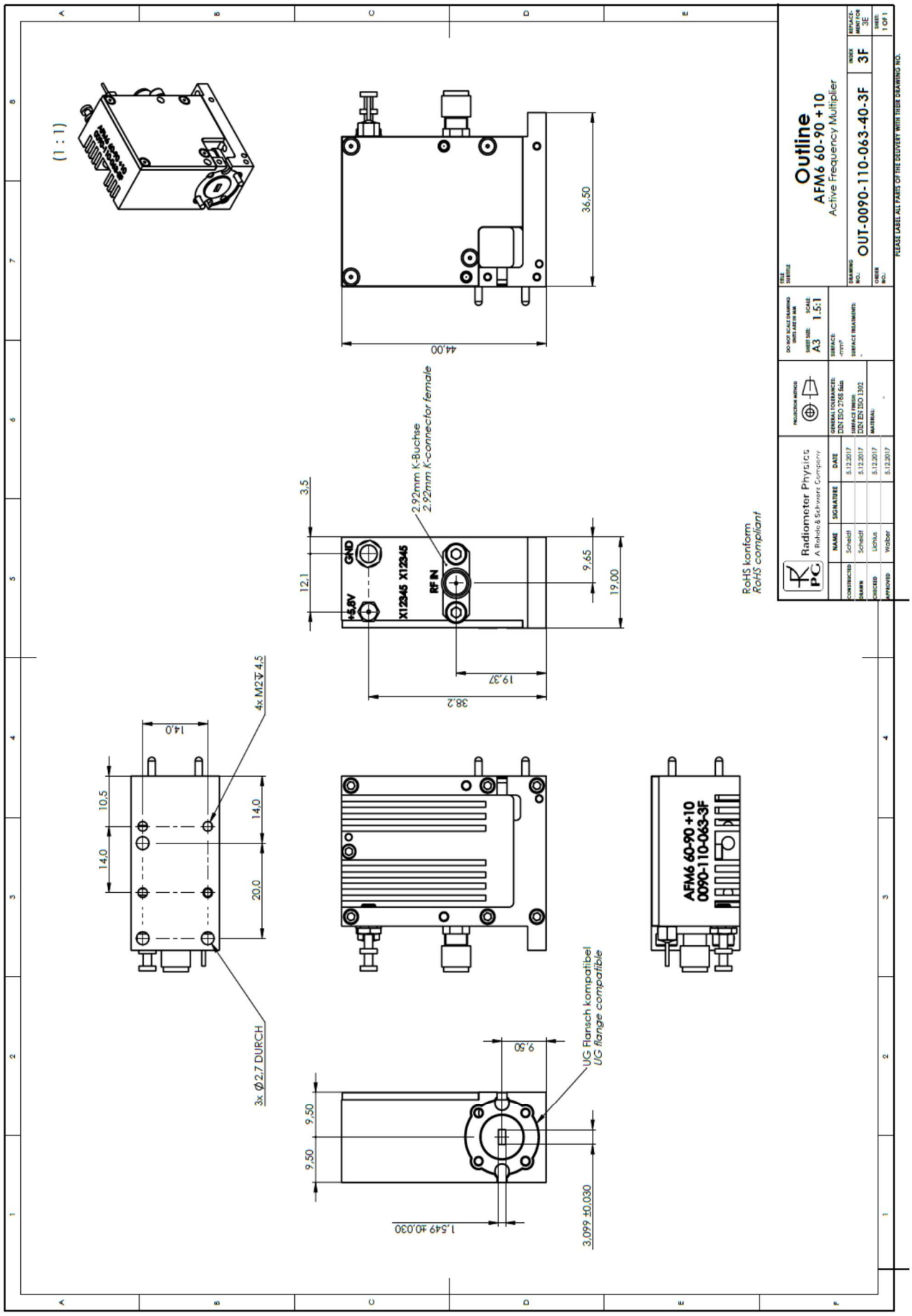
Temperature loading	operating temperature range	+18 °C to +28 °C
	permissible temperature range	+5 °C to +40 °C
	storage temperature range	–40 °C to +70 °C
		in line with IEC 60068-2-1 and IEC 60068-2-2
Damp heat		+40 °C at 80 % rel. humidity, in line with IEC 60068-2-30
Mechanical resistance	vibration, 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		typ. 150 - 215 gram (0.33 lb – 0.47 lb)
Shipping weight		typ. 300 gram (0.66 lb)

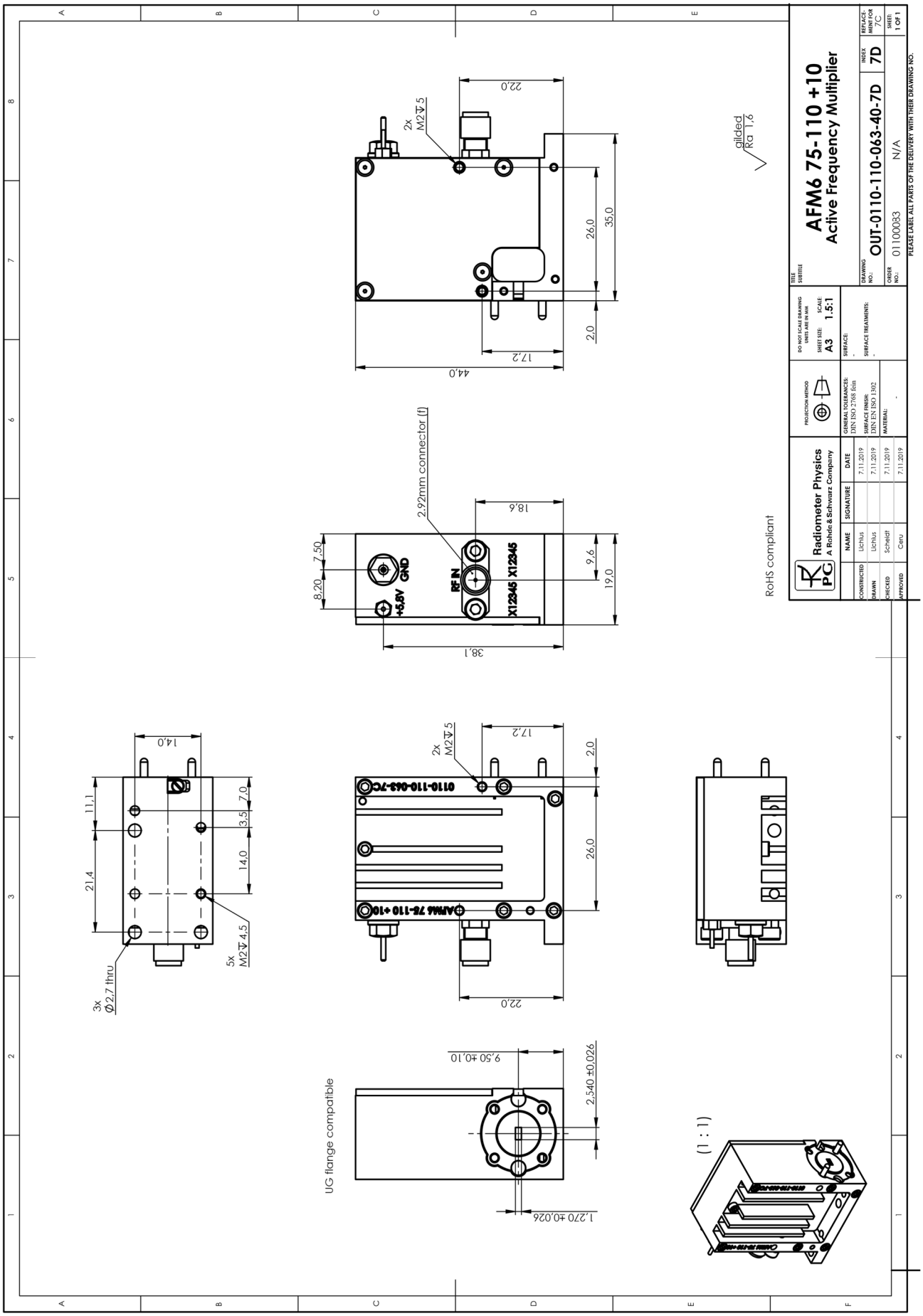
Ordering information

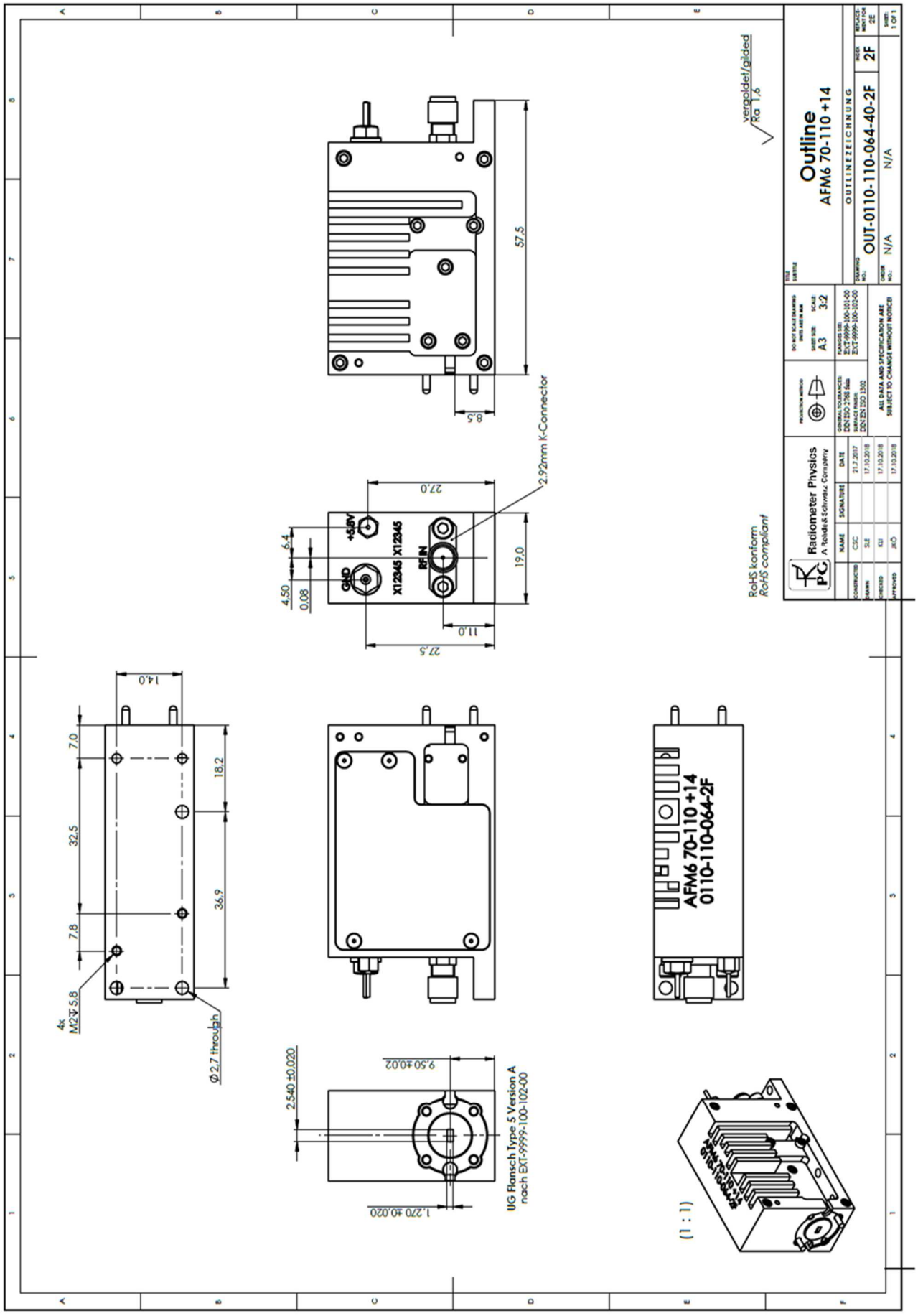
Designation	**RPG-Order No.**
AFM4 45-75 +12	**01100061**
AFM6 60-90 +10	**01100035**
AFM6 75-110 +10	**01100083**
AFM6 70-110 +14	**01100080**
AFM6 80-125 +10	**01100034**
AFM6 80-125 +17	**01100066**
AFM6 90-140 +10	**01100041**
AFM12 110-170 +10	**01100033**

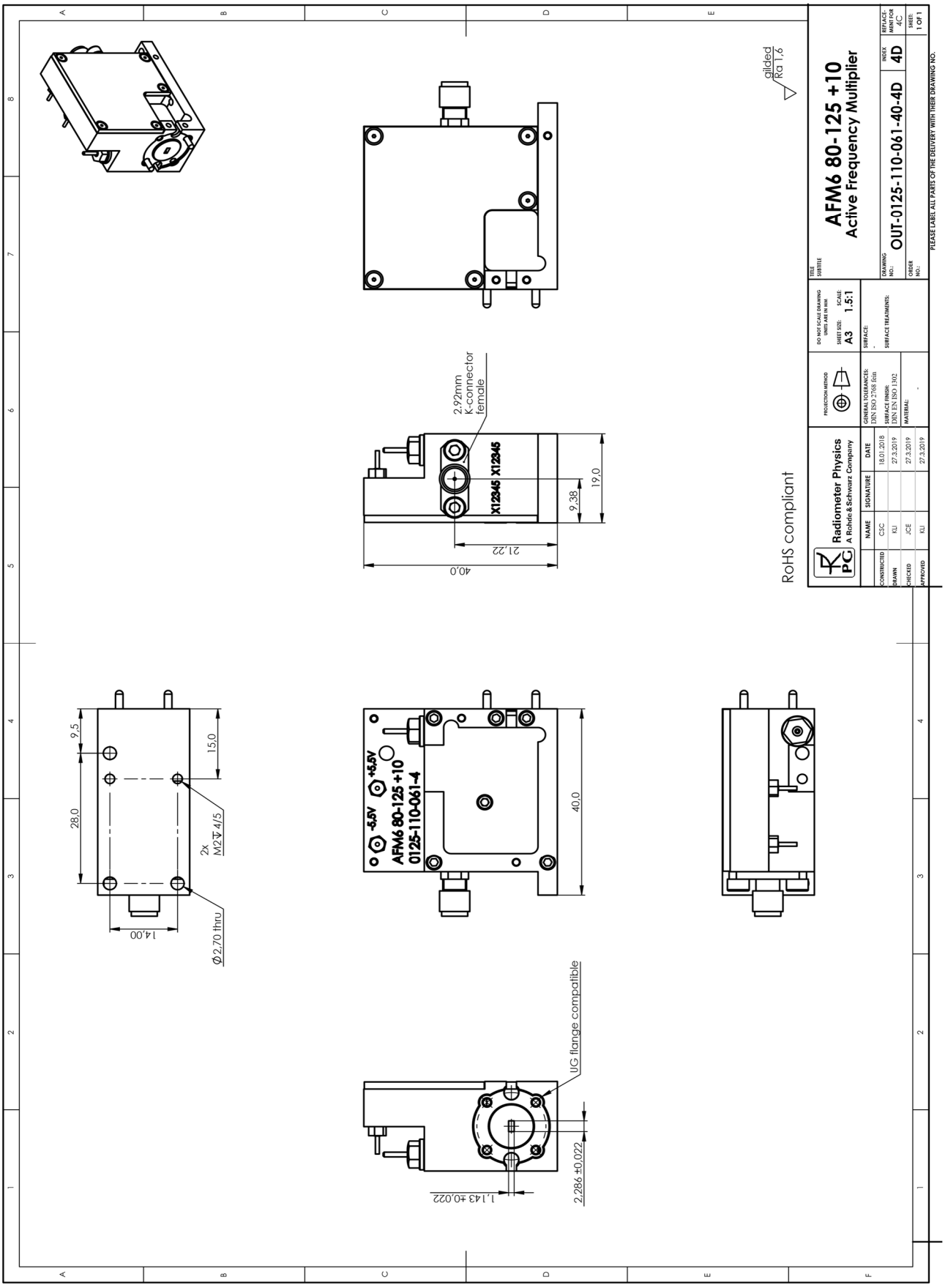
Outline Drawing

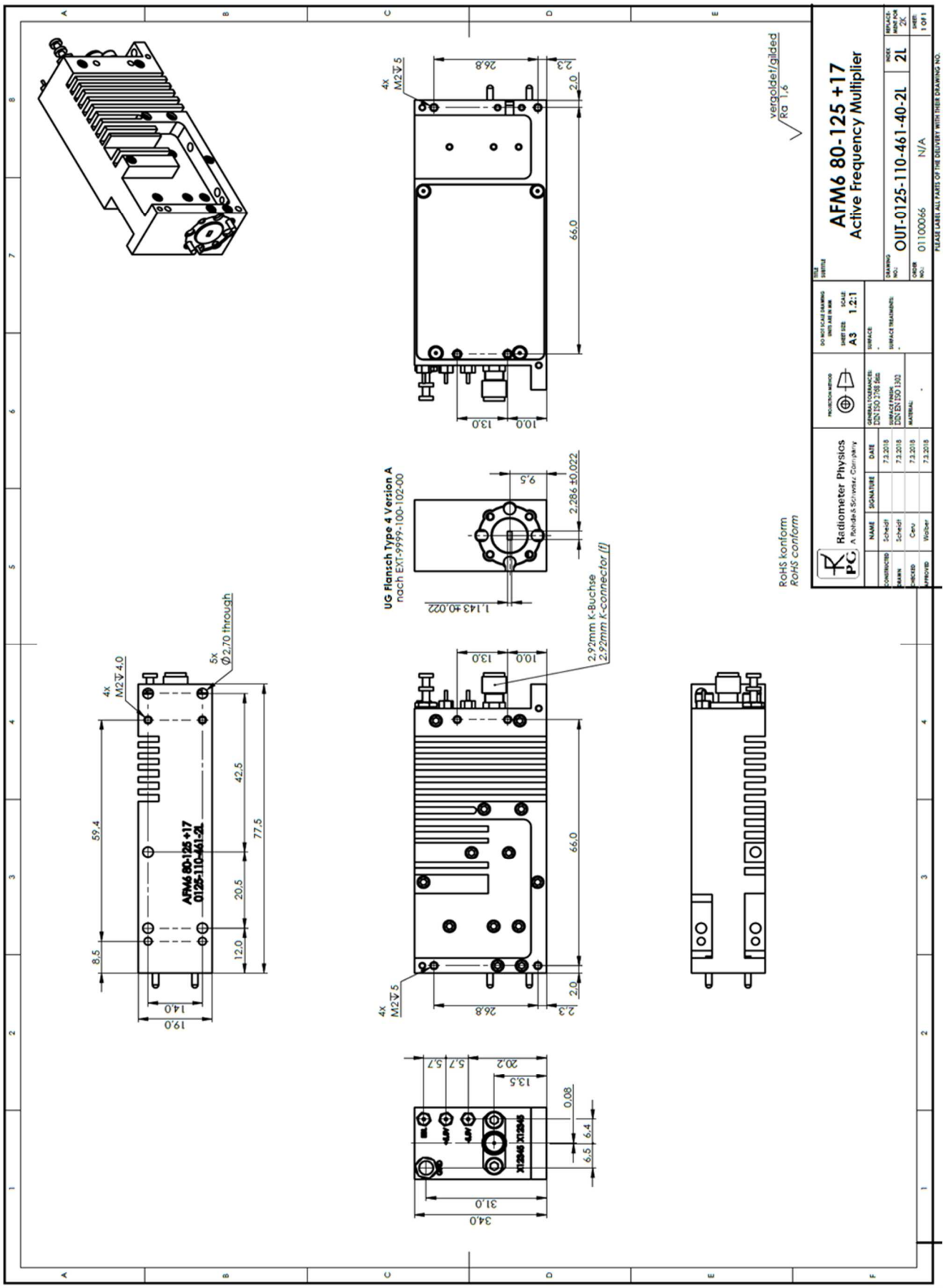


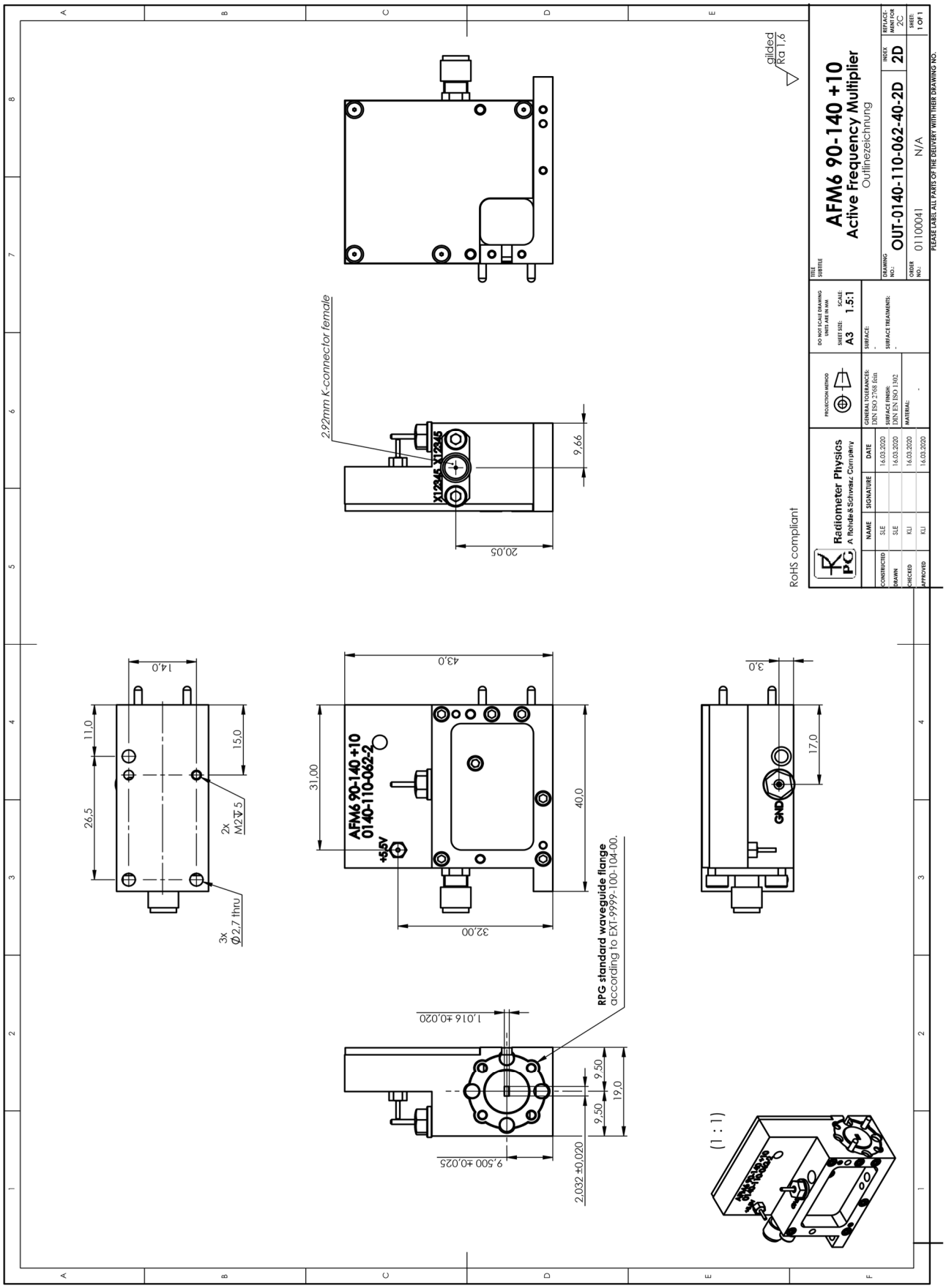

(1 : 1)
36,50
44,00
2.92mm K-Buchse
2.92mm K-connector female
3,5
12,1
GND
+5,5V
X12345 X12345
RF IN
9,65
19,00
19,37
38,2
4x M2↧4,5
14,0
10,5
14,0
14,0
20,0
3x Ø2,7 DURCH
9,50
9,50
UG Flansch kompatibel
UG flange compatible
1,549 ±0,030
3,099 ±0,030
AFM6 60-90 +10
0090-110-063-3F
RoHS konform
RoHS compliant
Radiometer Physics
A Rohde & Schwarz Company
Outline
AFM6 60-90 +10
Active Frequency Multiplier
OUT-0090-110-063-40-3F
3F
A3
1.5:1

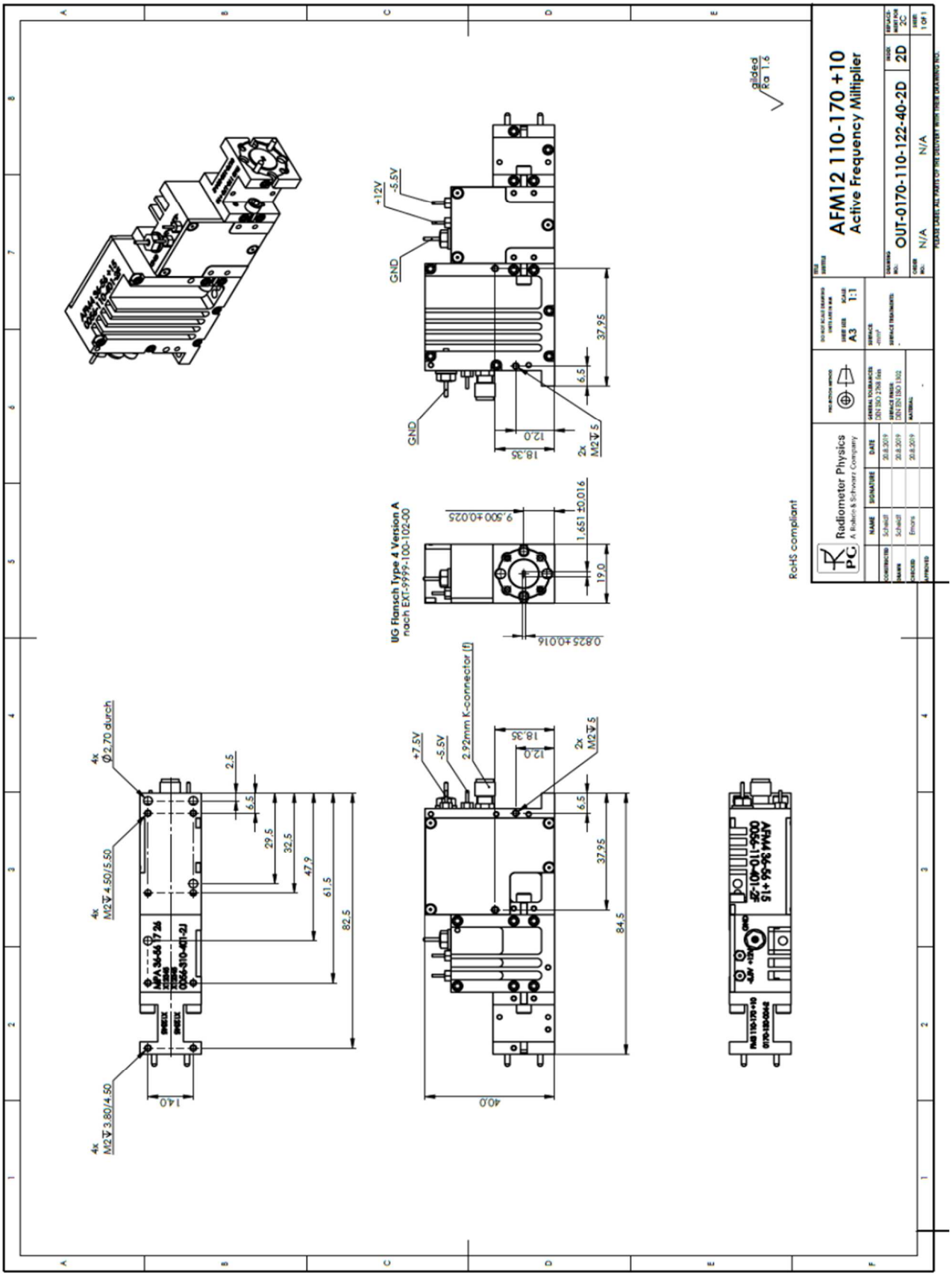

AFM6 75-110 +10
Active Frequency Multiplier
OUT-0110-110-063-40-7D
7D
01100083
N/A
Radiometer Physics
A Rohde&Schwarz Company
RoHS compliant
gilded
Ra 1,6
2x M2 ↧5
22,0
44,0
35,0
26,0
2,0
17,2
2.92mm connector (f)
RF IN
X12345 X12345
GND
+5.6V
18,6
38,1
7,50
8,20
9,6
19,0
14,0
11,1
21,4
3,5
7,0
5x M2 ↧4,5
3x Ø2,7 thru
0110-110-063-7C
AFM6 75-110 +10
UG flange compatible
9,50 ±0,10
2,540 ±0,026
1,270 ±0,026
(1 : 1)


Outline
AFM6 70-110 +14
OUTLINEZEICHNUNG
OUT-0110-110-064-40-2F
2F
N/A
A3
3:2
Radiometer Physics
A. Rohde & Schwarz Company
vergoldet/gilded
Ra 1,6
RoHS konform
RoHS compliant
ALL DATA AND SPECIFICATION ARE SUBJECT TO CHANGE WITHOUT NOTICE!
57,5
8,5
2,92mm K-Connector
27,0
19,0
11,0
27,5
6,4
4,50
0,08
+5,5V
GND
X12345 X12345
RFIN
14,0
7,0
32,5
7,8
18,2
36,9
4x
M2,5 ↧5,8
Ø2,7 through
AFM6 70-110 +14
0110-110-064-2F
2,540 ±0,020
9,50 ±0,02
1,270 ±0,020
UG Flansch Type 5 Version A
nach EXT-9999-100-102-00
(1 : 1)


AFM6 80-125 +10
Active Frequency Multiplier
OUT-0125-110-061-40-4D
4D
Radiometer Physics
A Rohde & Schwarz Company
RoHS compliant
gilded
Ra 1,6
2,92mm
k-connector
female
X1234 X1234
19,0
9,38
21,22
40,0
AFM6 80-125 +10
0125-110-061-4
-5,5V
+5,5V
40,0
9,5
15,0
28,0
2x
M2 ↧4/5
14,00
Ø2,70 thru
UG flange compatible
1,143 ±0,022
2,286 ±0,022


AFM6 80-125 +17
Active Frequency Multiplier
OUT-0125-110-461-40-2L
2L
01100066
N/A
Radiometer Physics
A. Rohde & Schwarz Company
vergoldet/gilded
Ra 1.6
RoHS konform
RoHS conform
UG Flansch Type 4 Version A
nach EXT-9999-100-102-00
2.92mm K-Buchse
2.92mm K-connector (f)
5x Ø2.70 through
4x M2↧4.0
4x M2↧5
AFM6 80-125 +17
0125-110-461-2L
59.4
42.5
77.5
20.5
12.0
8.5
19.0
14.0
66.0
26.8
13.0
10.0
2.3
2.0
9.5
2.286 ±0.022
1.143 ±0.022
20.2
13.5
5.7
0.08
6.4
6.5
31.0
34.0


AFM6 90-140 +10
Active Frequency Multiplier
Outlinezeichnung
OUT-0140-110-062-40-2D
2D
Radiometer Physics
A Rohde&Schwarz Company
RoHS compliant
gilded
Ra 1,6
2.92mm K-connector female
X1245 X12345
9,66
20,05
AFM6 90-140 +10
0140-110-062-2
+5,5V
43,0
31,00
40,0
32,00
14,0
11,0
26,5
15,0
2x
M2▽5
3x
Ø2,7 thru
3,0
17,0
GND
RPG standard waveguide flange
according to EXT-9999-100-104-00.
1,016 ±0,020
9,500 ±0,025
9,50
9,50
19,0
2,032 ±0,020
(1 : 1)


AFM12 110-170 +10
Active Frequency Multiplier
OUT-0170-110-122-40-2D
2D
Radiometer Physics
A Radiometer & Schwarz Company
RoHS compliant
gilded
Ra 1.6
+12V
-5.5V
GND
GND
18.35
12.0
2x M2↧5
6.5
37.95
UG Flansch Type 4 Version A
nach EXT-9999-100-102-00
9.500±0.025
1.651±0.016
19.0
0.825±0.016
4x Ø2.70 durch
4x M2↧4.50/5.50
4x M2↧3.80/4.50
2.5
6.5
29.5
32.5
47.9
61.5
82.5
14.0
+7.5V
-5.5V
2.92mm K-connector (f)
18.35
12.0
2x M2↧5
6.5
37.95
84.5
40.0
AFM4 36-56 +15
0056-110-401-2F