

Antenna Report

Report Number:

F240089E7

Equipment under Test (EUT):

**Picomag Insertion
Antenna**

Applicant:

Endress+Hauser Flowtec AG

Manufacturer:

Endress+Hauser Flowtec AG

References

[1] None (According customer requirements)

Tested and
written by

Signature

Reviewed and
approved by:

Signature

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1 Identification

1.1 Applicant

Name:	Endress+Hauser Flowtec AG
Address:	Kägenstr. 7, 4153 Reinach
Country:	Switzerland
Name for contact purposes:	--
Phone:	+41-61-715-6111
eMail address:	--
Applicant represented during the test by the following person:	None

1.2 Manufacturer

Name:	Endress+Hauser Flowtec AG
Address:	Kägenstr. 7, 4153 Reinach
Country:	Switzerland
Name for contact purposes:	--
Phone:	+41-61-715-6111
eMail address:	--
Manufacturer represented during the test by the following person:	None

1.3 Test Laboratory

The tests were carried out by: **PHOENIX TESTLAB GmbH**
Königswinkel 10
32825 Blomberg
Germany

1.4 AUT (Antenna under test)

Test object: *	2.4 GHz antenna on module PCB
Model name: *	---

	AUT number		
	1	2	3
Serial number: *	N/A	-	-
PCB identifier: *	234180013871462120	-	-
Hardware version: *	A	-	-
Software version: *	01.00.00	-	-

* Declared by the applicant

One radiated EUT was used for all tests.

Note: PHOENIX TESTLAB GmbH does not take samples. The samples used for tests are provided exclusively by the applicant.

1.5 Technical Data of Equipment

General	
Frequency Range *	2402 MHz to 2480 MHz

* Declared by the applicant

Ports / Connectors				
Identification	Connector		Length during test	Shielding (Yes / No)
	EUT	Ancillary		
---	---	---	---	---

Equipment used for testing	
Picomag insertion	

1.6 Dates

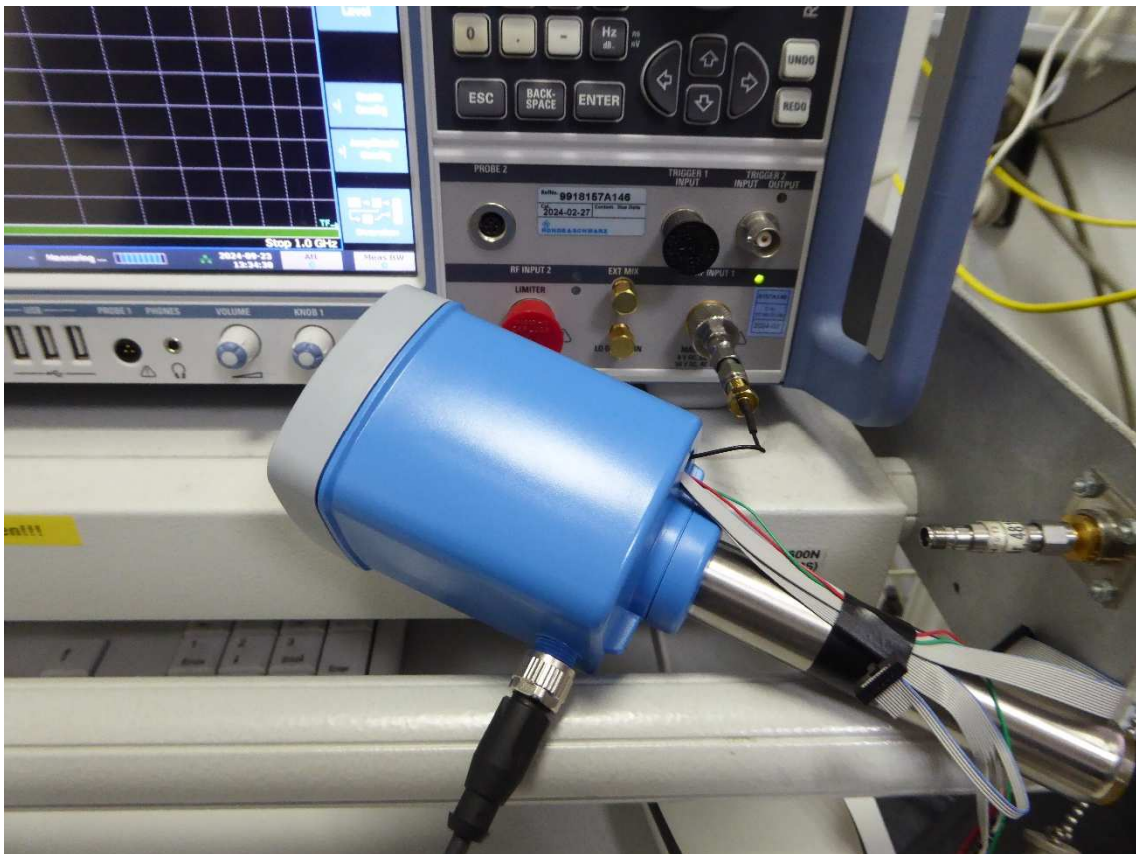
Date of receipt of test sample:	21.08.2024
Start of test:	23.09.2024
End of test:	23.09.2024

2 Operational States

During the antenna chart measurements, the antenna was supplied with a CW rf-signal generated by the EUT with a level as shown in the chapter below its antenna connector.

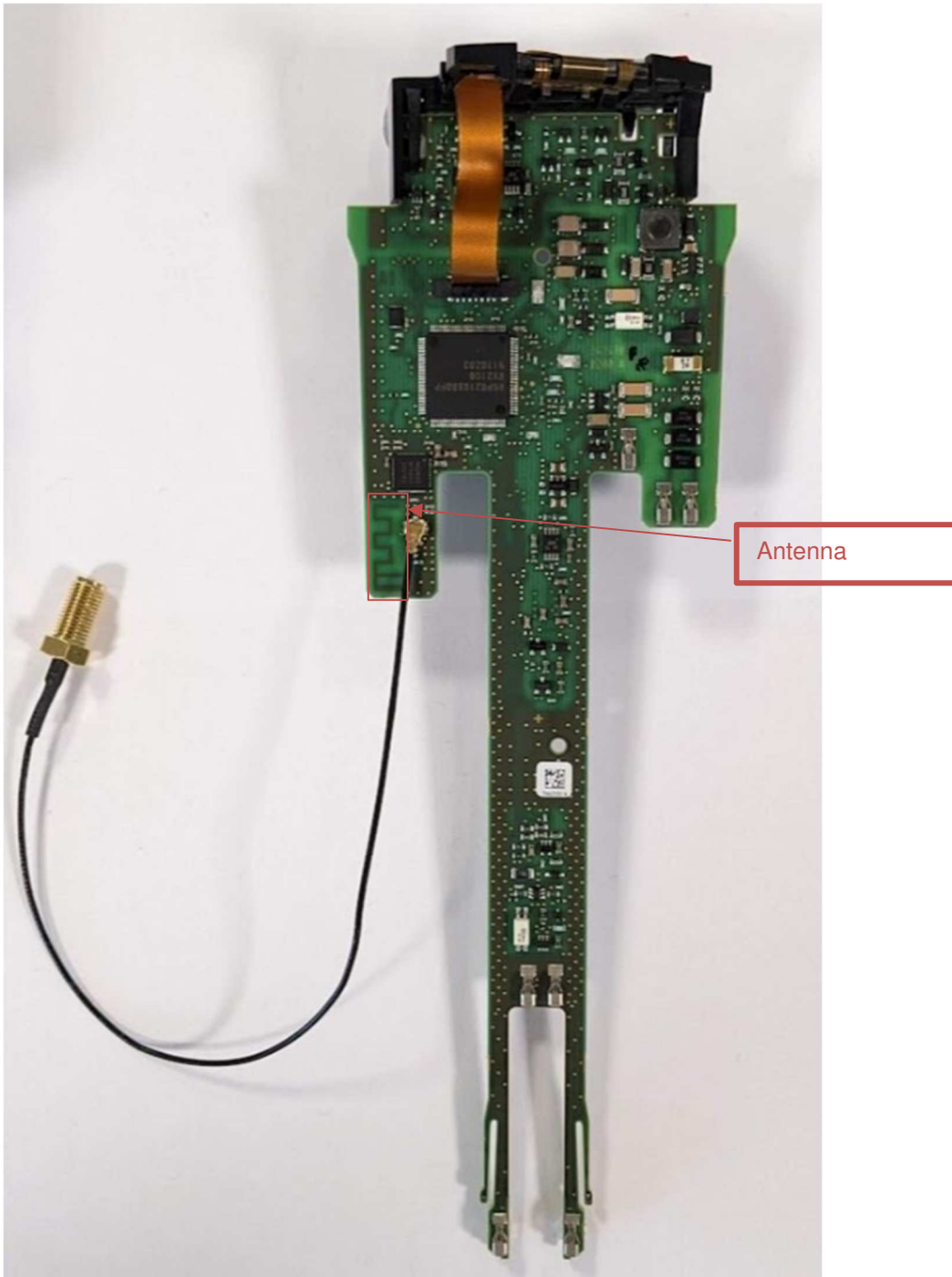
3 Additional Information

Conducted measurements were done with a modified sample as provided by the applicant.



4 Antenna photographs

4.1 Internal photographs



Photos were provided by the applicant

5 Antenna Charts

5.1 Results (Max. Gain)

Antenna gain calculation				
	f_{low}	f_{mid}	f_{high}	
Conducted output power [dBm]	-0.5	-0.7	-0.9	
Radiated EIRP [dBm EIRP]	-11.5	-12.9	-12.1	
Antenna Gain [dBi]	-11.0 dBi	-12.2 dBi	-11.2 dBi	
Position	Pos 3	Pos 1	Pos 1	
Position of maximum gain	Azimuth	166	336	297
	Polarisation	Horizontal	Vertical	Vertical

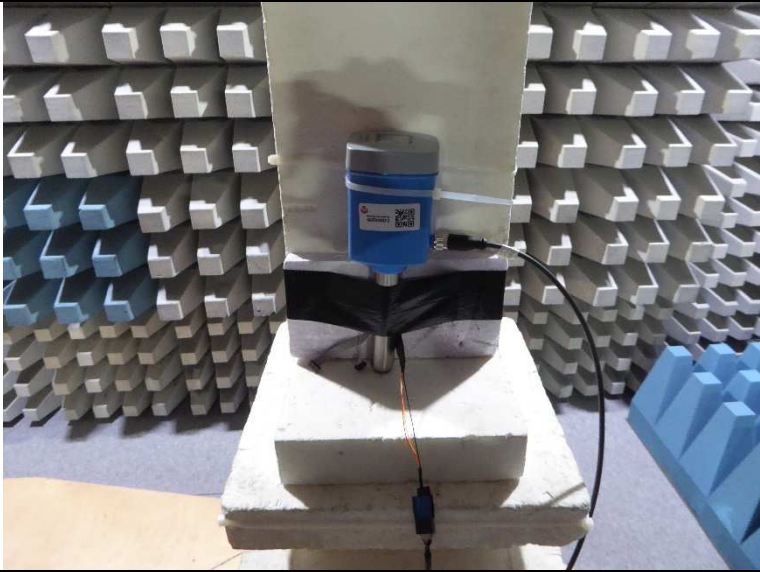
Conducted f_{low}	Meas BW (6dB) 1 MHz Meas Time 10 ms Step TD Scan Automatic Att 20 dB Notch Off Preamp Off Input 1 AC PS On Frequency 2.4020000 GHz 1 Bargraph Max Peak 106.49 dBμV 10 20 30 40 50 60 70 80 90 100 110 Average 106.46 dBμV 10 20 30 40 50 60 70 80 90 100 110 RMS 106.46 dBμV 10 20 30 40 50 60 70 80 90 100 110 106.5 dBμV – 107 = -0.5 dBm
Conducted f_{mid}	Meas BW (6dB) 1 MHz Meas Time 10 ms Step TD Scan Automatic Att 20 dB Notch Off Preamp Off Input 1 AC PS On Frequency 2.4400000 GHz 1 Bargraph Max Peak 106.31 dBμV 10 20 30 40 50 60 70 80 90 100 110 Average 106.27 dBμV 10 20 30 40 50 60 70 80 90 100 110 RMS 106.27 dBμV 10 20 30 40 50 60 70 80 90 100 110 106.3 dBμV – 107 = -0.7 dBm
Conducted f_{high}	Meas BW (6dB) 1 MHz Meas Time 10 ms Step TD Scan Automatic Att 20 dB Notch Off Preamp Off Input 1 AC PS On Frequency 2.4800000 GHz 1 Bargraph Max Peak 106.07 dBμV 10 20 30 40 50 60 70 80 90 100 110 Average 106.04 dBμV 10 20 30 40 50 60 70 80 90 100 110 RMS 106.04 dBμV 10 20 30 40 50 60 70 80 90 100 110 106.1dBμV – 107 = -0.9 dBm

Test equipment (please refer to chapter 7 for details)

1 - 11

5.2 Antenna Diagrams EUT Position

5.2.1 Test Setup Photos

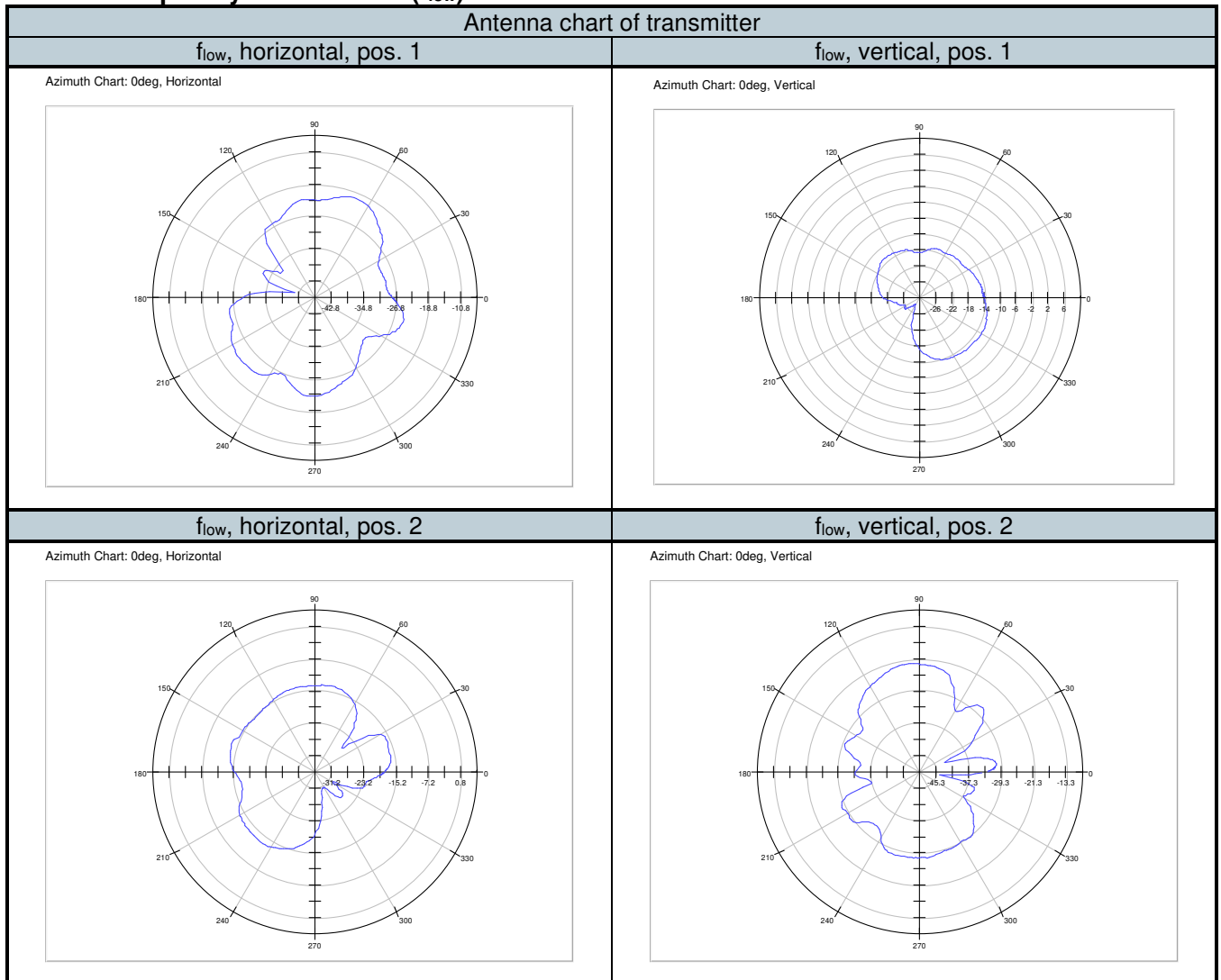
Setup Photos	
Position 1	
Position 2	

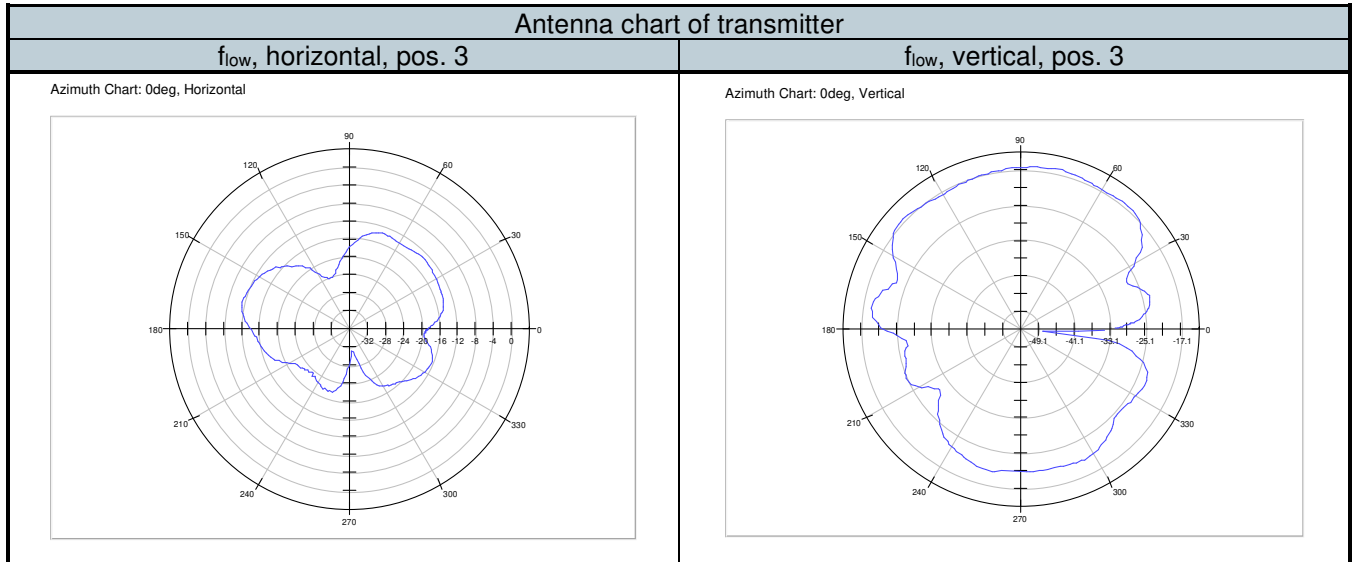
Position 3



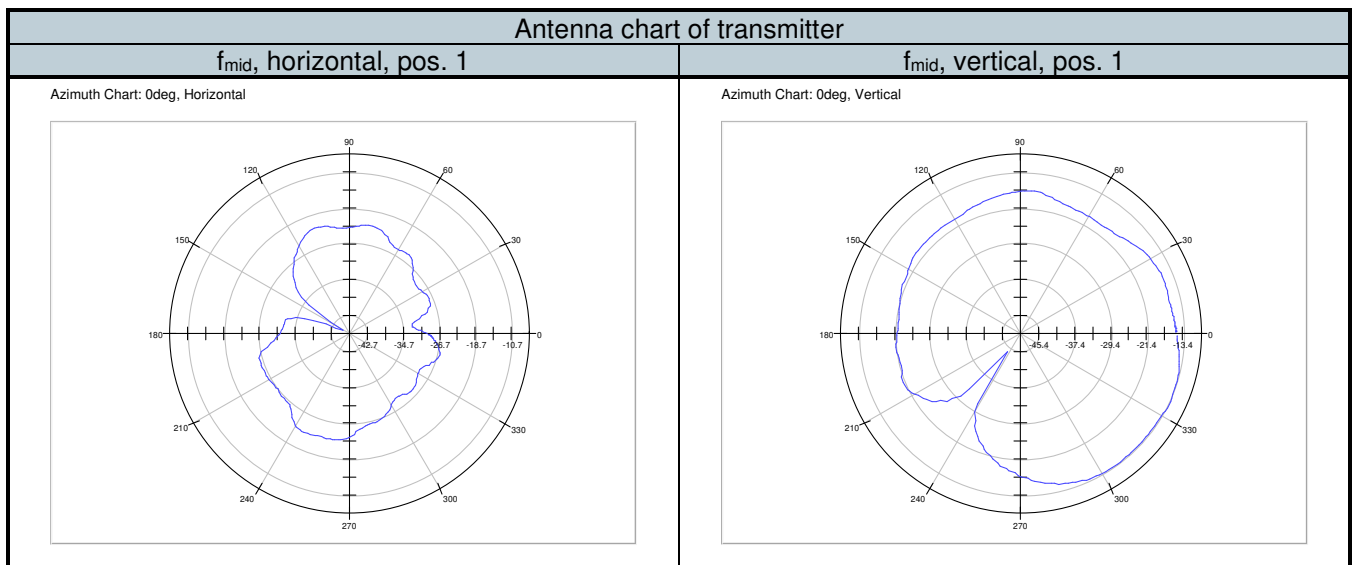
5.2.2 Azimuth charts of transmitter

5.2.2.1 Frequency near bottom (f_{low})





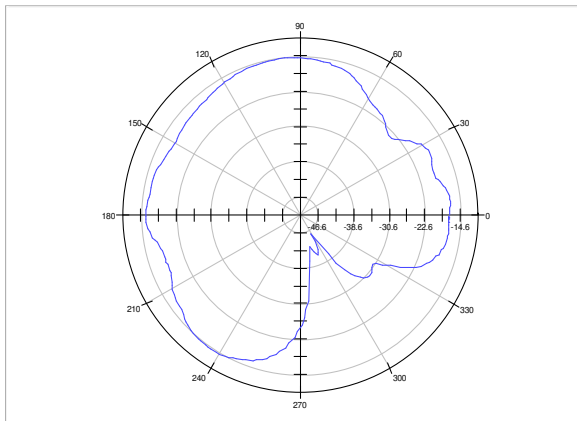
5.2.2.2 Frequency near middle (f_{mid})



Antenna chart of transmitter

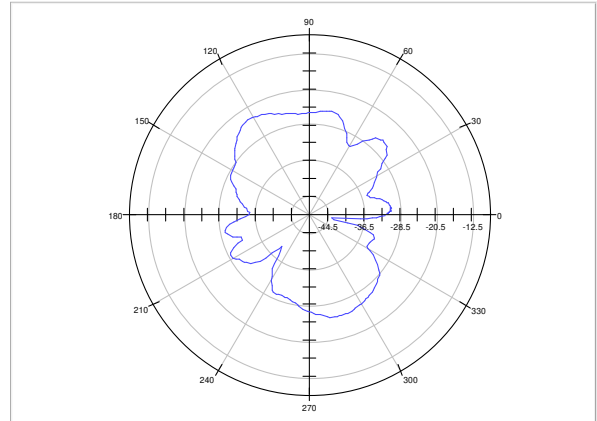
f_{mid} , horizontal, pos. 2

Azimuth Chart: 0deg, Horizontal



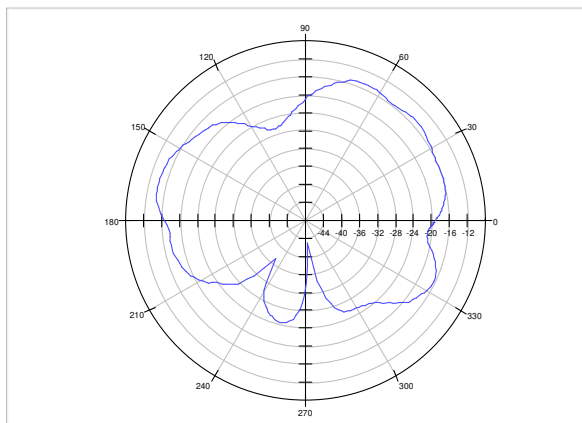
f_{mid} , vertical, pos. 2

Azimuth Chart: 0deg, Vertical



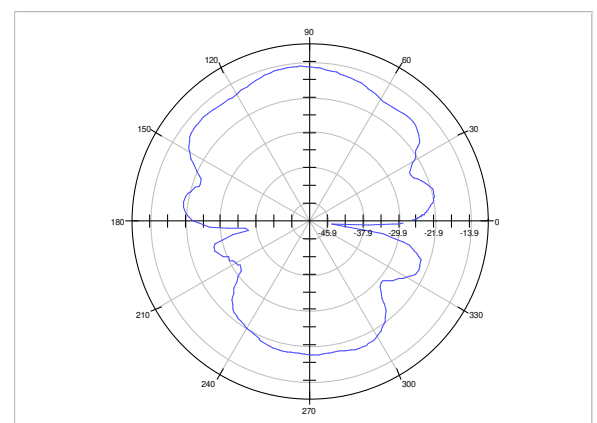
f_{mid} , horizontal, pos. 3

Azimuth Chart: 0deg, Horizontal

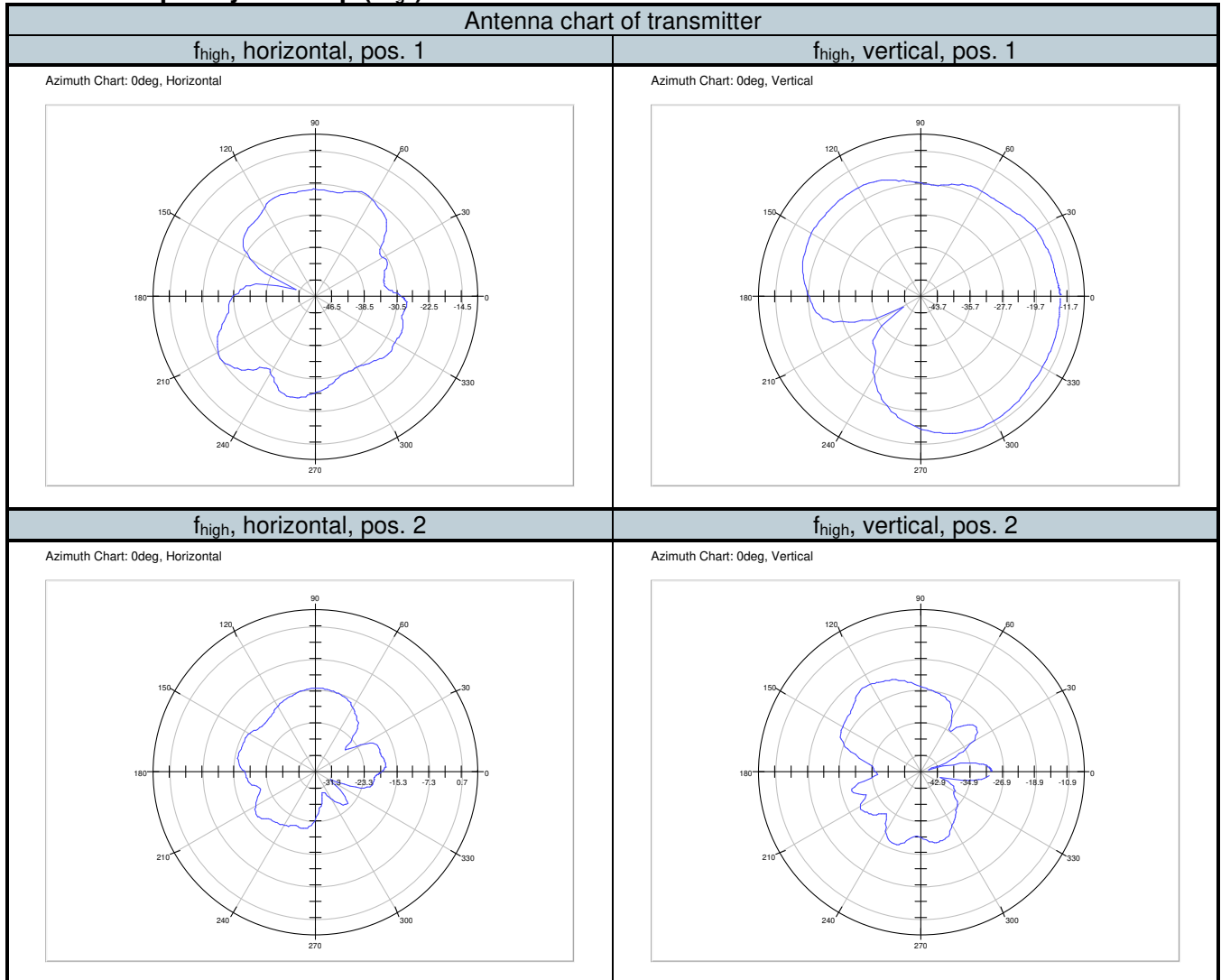


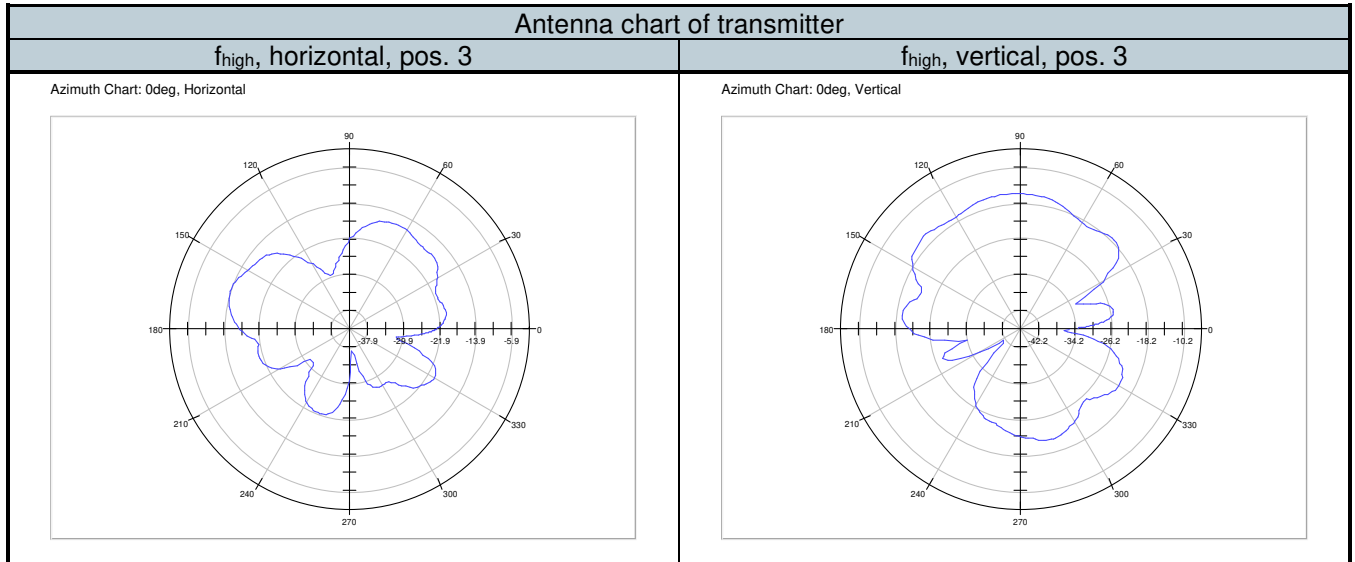
f_{mid} , vertical, pos. 3

Azimuth Chart: 0deg, Vertical



5.2.2.3 Frequency near top (f_{high})





6 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal Due
1	Antenna	3115	EMCO Elektronik GmbH	9609-4918	480183	13.02.2024	02.2027
2	RF cable	SF102/11SK/11S K 500.0	Huber+Suhner	521885/2	483401	Calibration not necessary	
3	Antenna support	AS620P	Deisel	620/375	480325	Calibration not necessary	
4	Fully anechoic chamber M20	B83117-E2439-T232	Albatross Projects	103	480303	Calibration not necessary	
5	Turntable	DS420 HE	Deisel	420/620/00	480315	Calibration not necessary	
6	Multiple Control Unit	MCU	Maturo GmbH	MCU/043/971107	480832	Calibration not necessary	
7	Positioners	TDF 1.5- 10Kg	Maturo	15920215	482034	Calibration not necessary	
8	Antenna	3115	EMCO Elektronik GmbH	9609-4922	480184	14.11.2022	11.2025
9	CW Generator Microwave	83650L	Agilent	3844A00554	480333	27.02.2024	02.2026
10	Software	EMC32 V10.60.20	Rohde & Schwarz	---	483261	Calibration not necessary	
11	EMI Receiver / Spectrum Analyser	ESW44	Rohde & Schwarz	101635	482467	27.02.2024	02.2026

7 Report History

Report Number	Date	Comment
F240089E7	06.02.2025	Initial Test Report
-	-	-
-	-	-

----- end of test report -----