

Antenna Report

Report Number:

F250250E5

Equipment under Test (EUT):

Internal antenna of

UHF Reader

TN-UHF-Q150-NA-EN

Applicant:

TURCK GmbH

Manufacturer:

Werner Turck GmbH & Co. KG



References

[1] None (According customer requirements)

Tested and
written by

A blue ink signature of Daniel BRUSCHINSKI.

Daniel BRUSCHINSKI
16.06.2026

Signature

Reviewed and
approved by:

A blue ink signature of Manuel BASTERT.

Manuel BASTERT
16.06.2026

Signature

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1 Identification

1.1 Applicant

Name:	TURCK GmbH
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eMail address:	matthias.linde@turck.com
Applicant represented during the test by the following person:	-

1.2 Manufacturer

Name:	Werner Turck GmbH & Co. KG
Address:	Goethestr. 7, 58553 Halver
Country:	Germany
Name for contact purposes:	Mr. Markus TEUBNER
Phone:	+49 2353 709 6124
eMail address:	markus.teubner@turck.com
Manufacturer represented during the test by the following person:	-

1.3 Test Laboratory

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

1.4 EUT (Equipment under Test)

Test object: *	UHF Reader
Model name: *	TN-UHF-Q150-NA-EN
Model number: *	100018055
Order number: *	100018055
FCC ID: *	YQ7-TN-UHF-Q150
IC certification number: *	8821A-TNUHFQ150
PMN: *	TN-UHF-Q150-NA-EN
HVIN: *	2.0
FVIN: *	1.0.0.0

* Declared by the applicant

		EUT number	
		1	2
Serial number: *		0002480132	-
PCB identifier: *	PCB 1:	3692/2	-
	PCB 2:	7901/5	-
	PCB 3:	12927143	-
Hardware version: *		2.0	-
Software version: *		1.0.0.0	-

* Declared by the applicant

One 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 EUT data			
Power supply EUT: *	DC		
Supply voltage EUT: *	$U_{nom} = 24.0 \text{ V}_{DC}$	$U_{min} = 12.0 \text{ V}_{DC}$	$U_{max} = 30.0 \text{ V}_{DC}$
Temperature range: *	-30 °C to +50 °C		
Lowest / highest internal frequency:	12 MHz * / 927.250 MHz		

* Declared by the applicant

Ports / Connectors				
Identification	Connector		Length during test	Shielding (Yes / No)
	EUT	Ancillary		
DC power	5 pole M12 plug	4 mm laboratory plug	< 3 m	No
Ethernet 1 / PoE	4 pole M12 plug	RJ45	< 3 m	Yes
Ethernet 2	4 pole M12 plug	Left open	-	-
External antenna	RP-TNC male	50 Ω termination	-	-

Radio frequencies	
Channel 00	902.750 MHz
...	...
Channel 24	914.750 MHz
...	...
Channel 49	927.250 MHz

Radio mode		
Antenna type: * ¹	Internal antenna	
Antenna name: * ¹	TN-UHF-Q150-ANT-RHCP-LHCP	
Antenna gain: * ²	@ 902.750 MHz:	2.9 dBi
	@ 914.750 MHz:	2.6 dBi
	@ 927.250 MHz:	1.0 dBi
Antenna connector: * ¹	RP-TNC male	
Type of modulation: * ¹	FHSS (GFSK)	
Adaptive frequency agility: * ¹	No	
Number of channels: * ¹	50	

*¹ Declared by the applicant

*² Calculated in clause 5.1 of this antenna report

1.5.1 Ancillary Equipment / Equipment used for testing

Equipment used for testing	
Test laptop *	Fujitsu Lifebook U759
Test laptop *	Fujitsu Lifebook U7510

* Provided by the laboratory

1.6 Dates

Date of receipt of test sample:	11.11.2025
Start of test:	14.01.2026
End of test:	28.04.2026

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 clause 5.1 of this report.

3 Additional Information

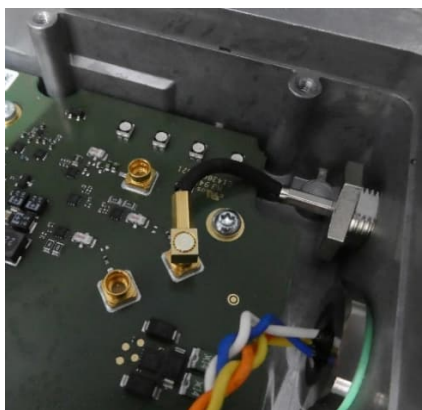
The EUT was used with its internal patch antenna.

Conducted measurements were done with the sample provided by the applicant.

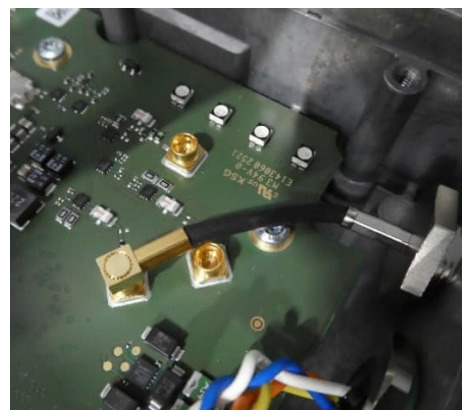
For the conducted measurements, the antenna connector for external antennas was removed and connected to the antenna ports for the internal antenna as shown below.



Original state



Measurement at LHCP antenna



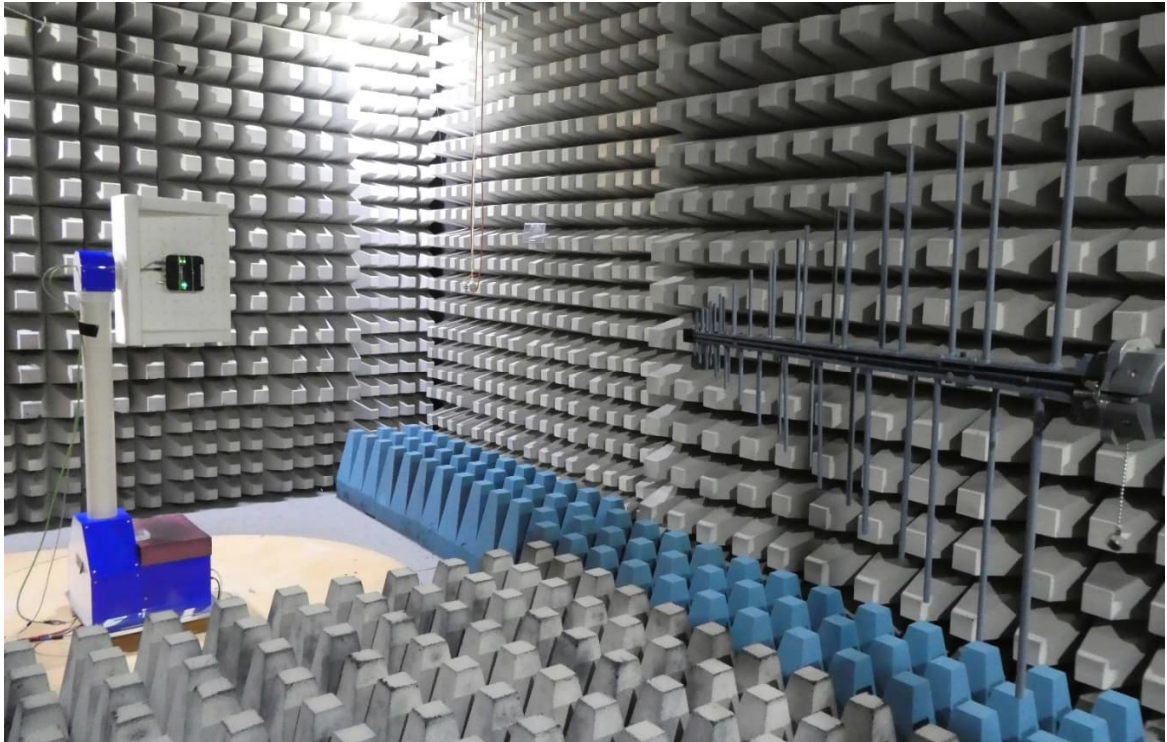
Measurement at RHCP antenna

4 Test setup photos



EUT

4.1 Radiated test setup



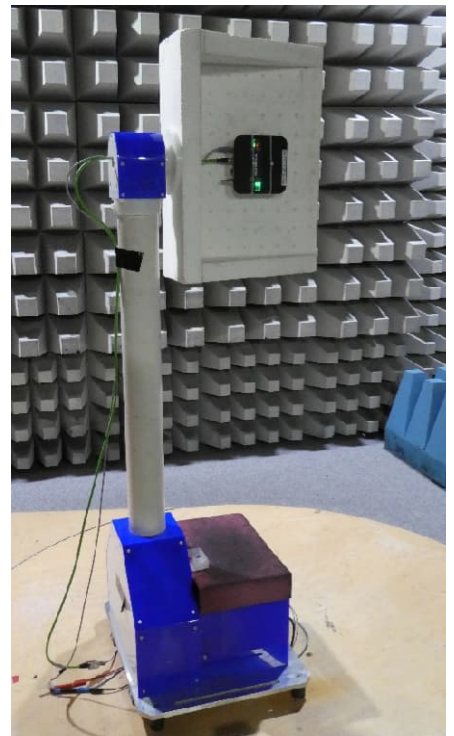
Test setup



EUT position 1

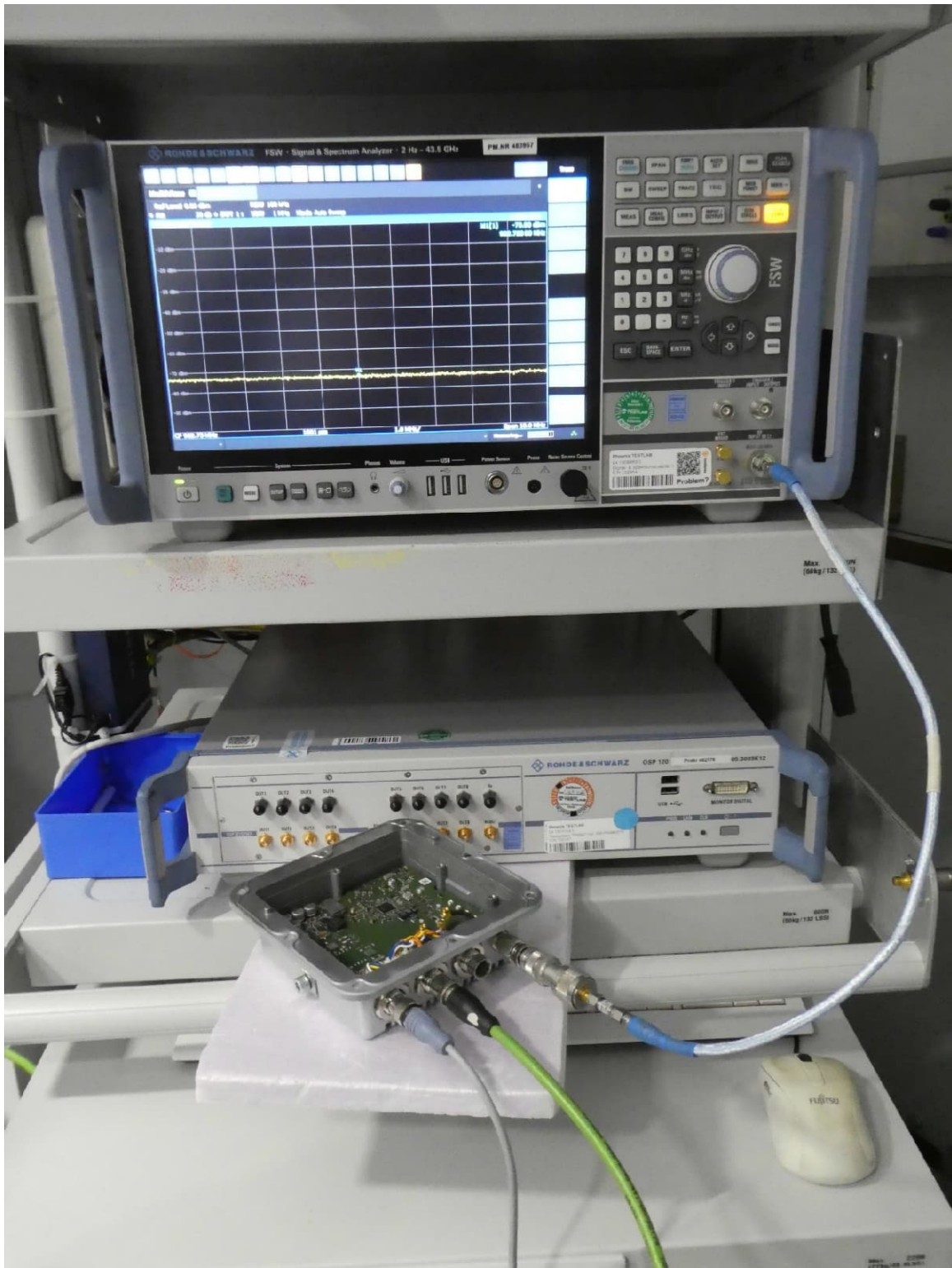


EUT position 2



EUT position 3

4.2 Conducted test setup



5 Results

5.1 Calculation of maximum antenna gain

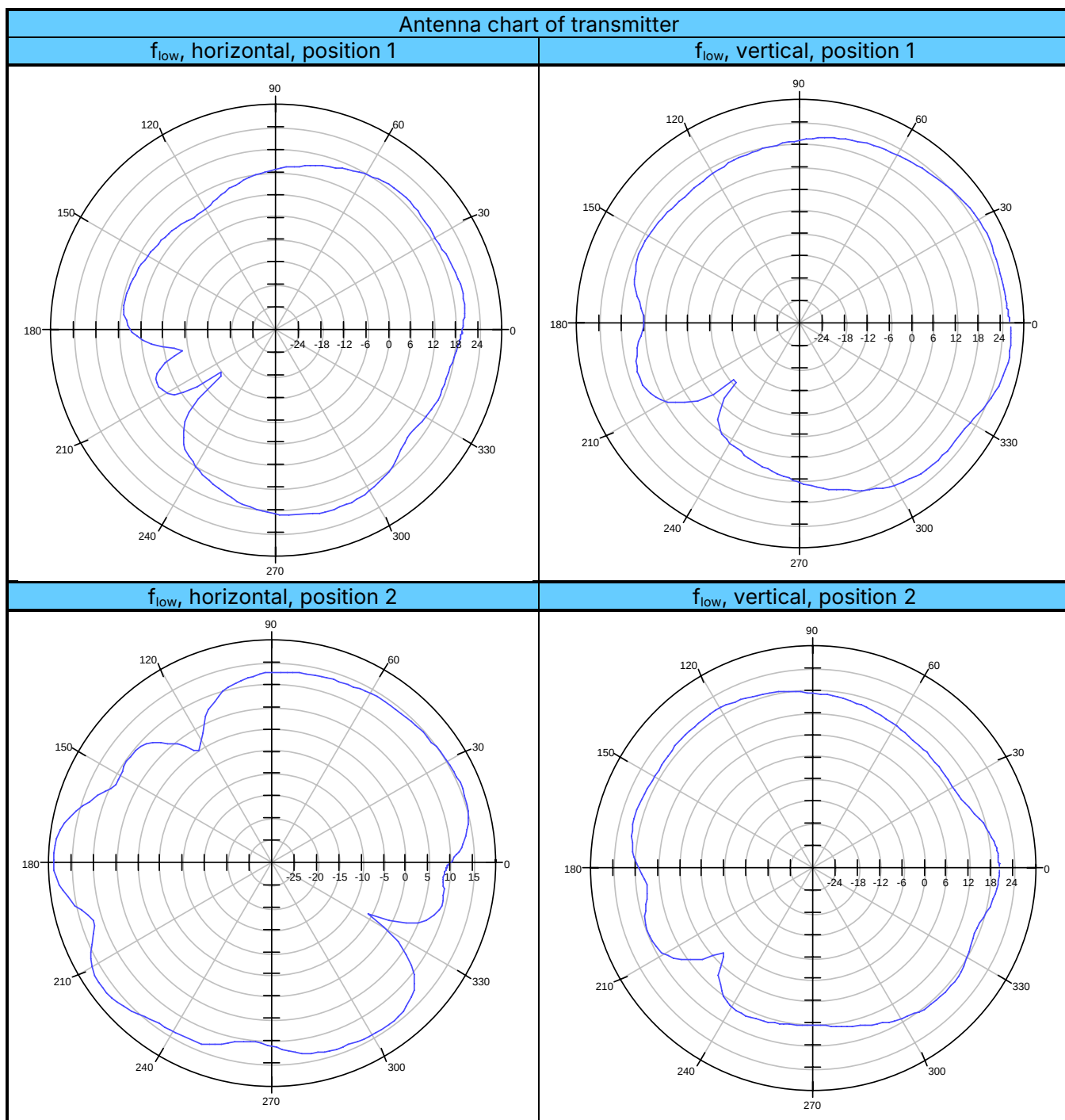
Antenna gain calculation										
		f _{low} : 902.750 MHz			f _{mid} : 914.75 MHz			f _{high} : 927.250 MHz		
		26.35			26.47			26.52		
Conducted output power *1 [dBm]										
Radiated ERP [dBm ERP]		27.10	20.43	23.98	26.92	20.43	24.24	25.37	21.07	24.41
Antenna gain [dBd]		0.75	-5.92	-2.37	0.45	-6.04	-2.23	-1.15	-5.45	-2.11
Antenna gain *2 [dBi]		2.90	-3.77	-0.22	2.60	-3.89	-0.08	1.00	-3.30	0.04
Position		1	2	3	1	2	3	1	2	3
Position of maximum gain	Azimuth	353	359	13	351	357	15	351	357	12
	Polarisation	V	V	H	V	V	H	V	V	H

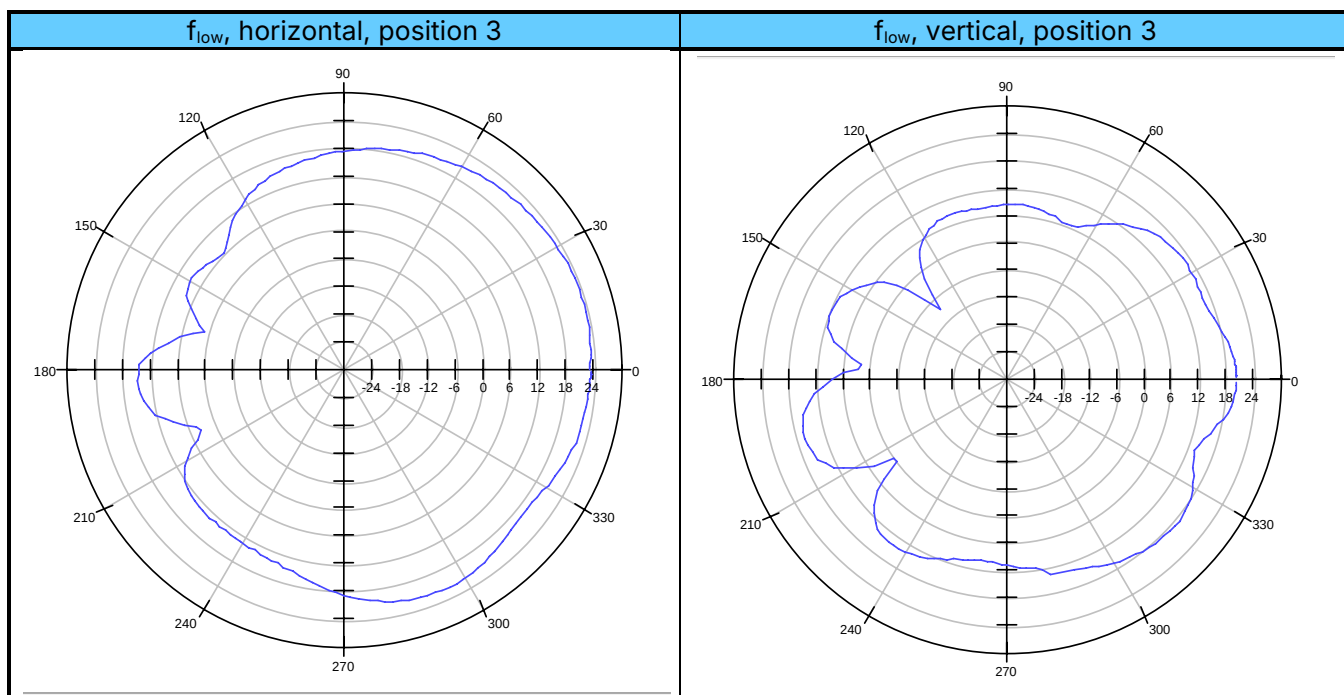
*¹ The worst-case conducted output power of measurements at LHCP antenna port and RHCP antenna port was documented

*² Antenna gain [dBi] = antenna gain [dBd] + 2.15 dB according to ANSI C63.10-2020 (G.4)

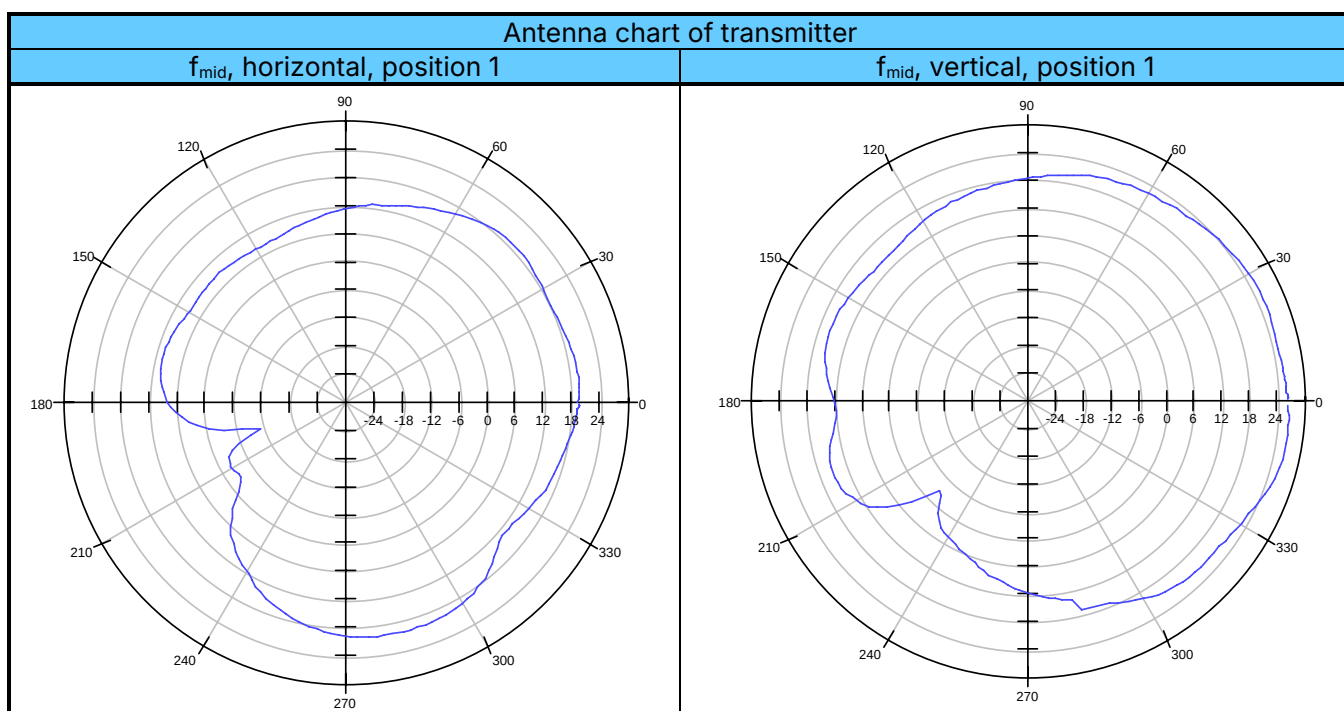
5.2 Antenna charts

5.2.1 Azimuth charts @ 902.750 MHz

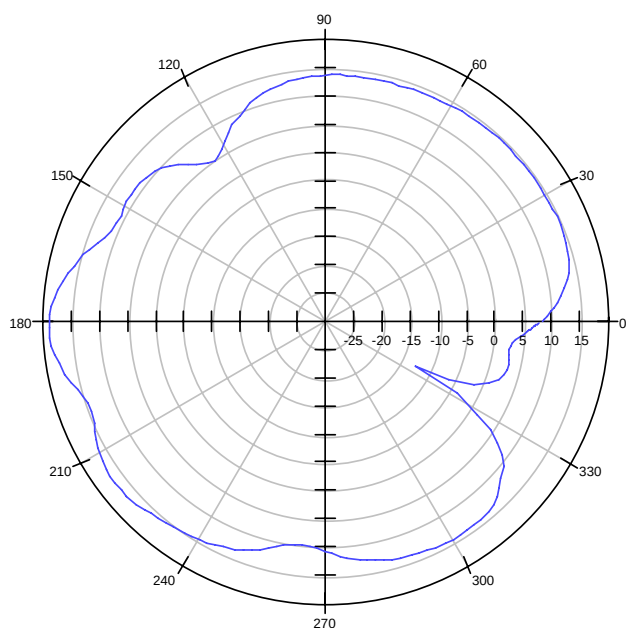




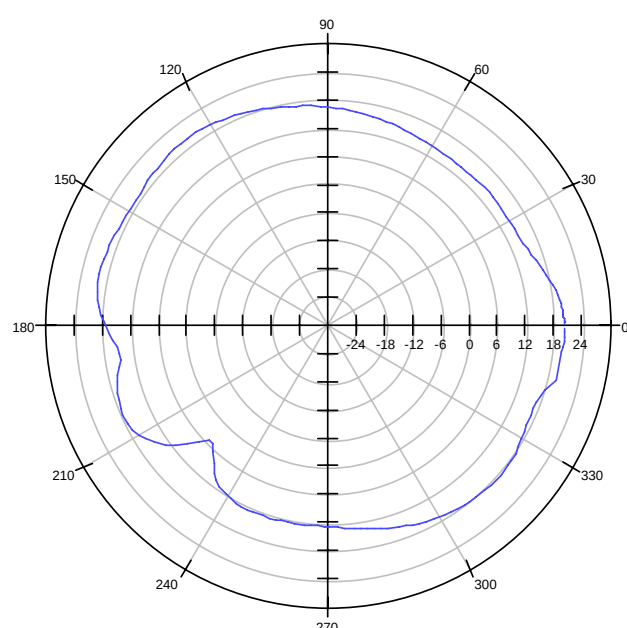
5.2.2 Azimuth charts @ 914.750 MHz



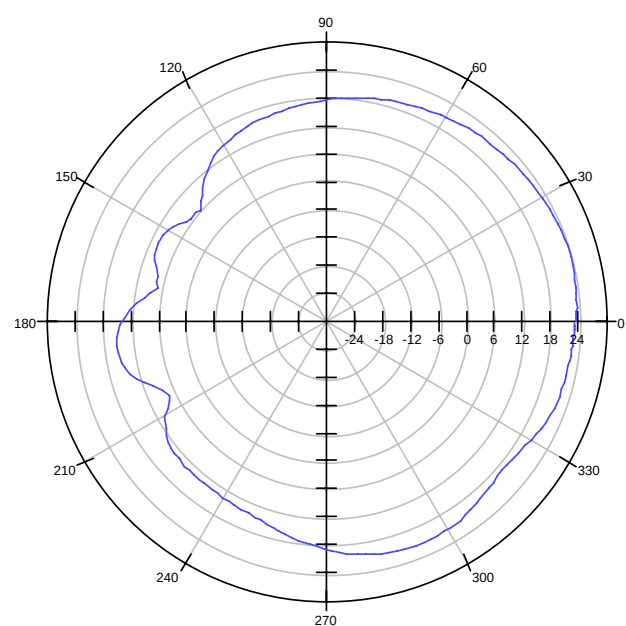
f_{mid} , horizontal, position 2



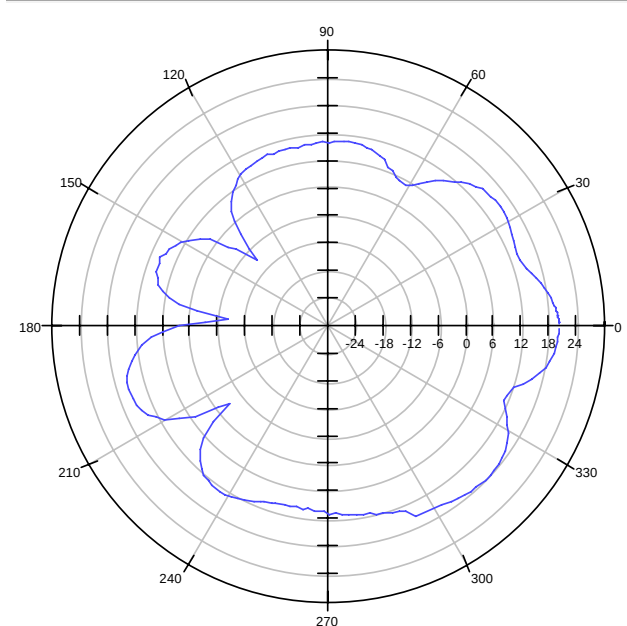
f_{mid} , vertical, position 2



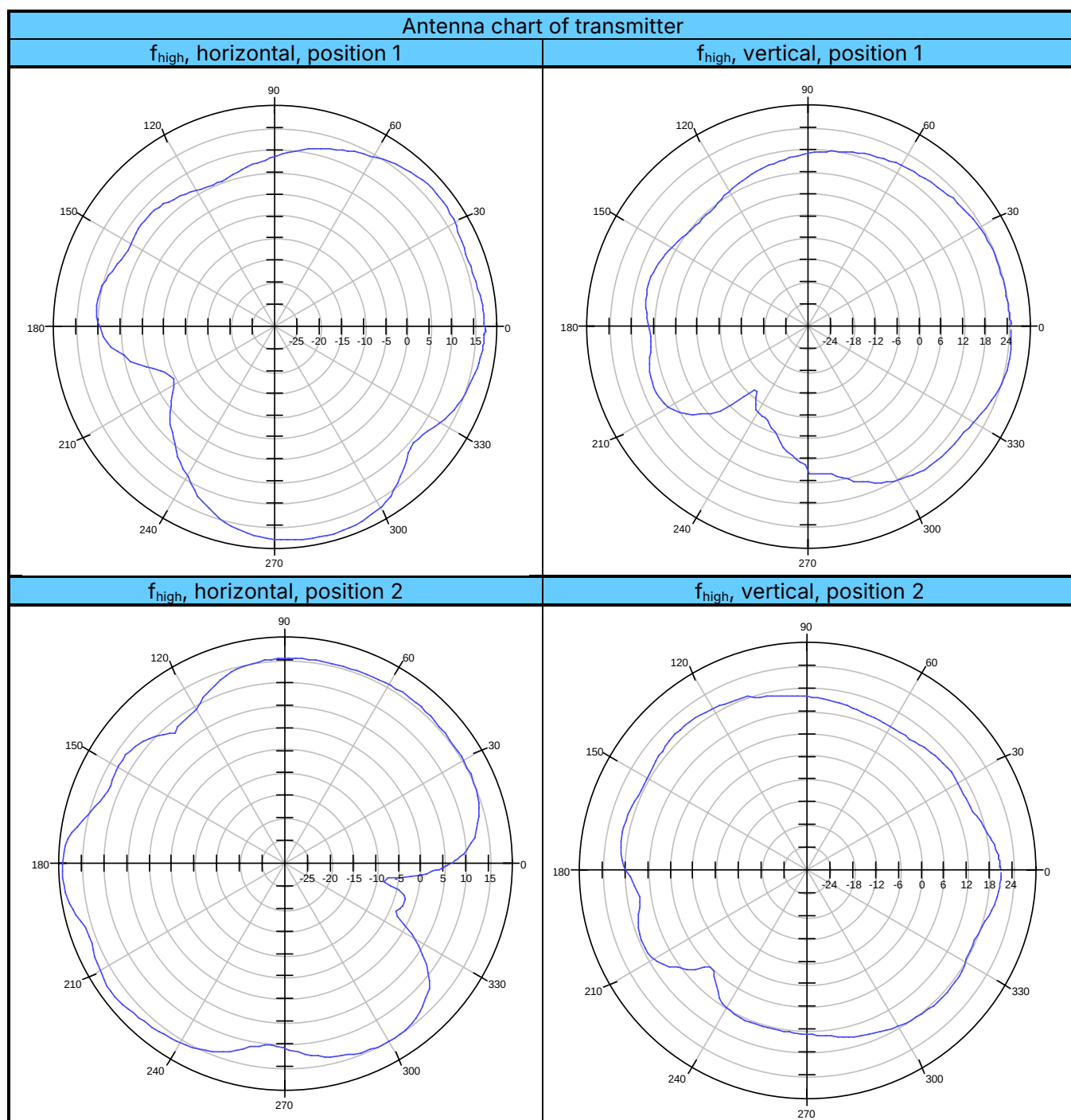
f_{mid} , horizontal, position 3

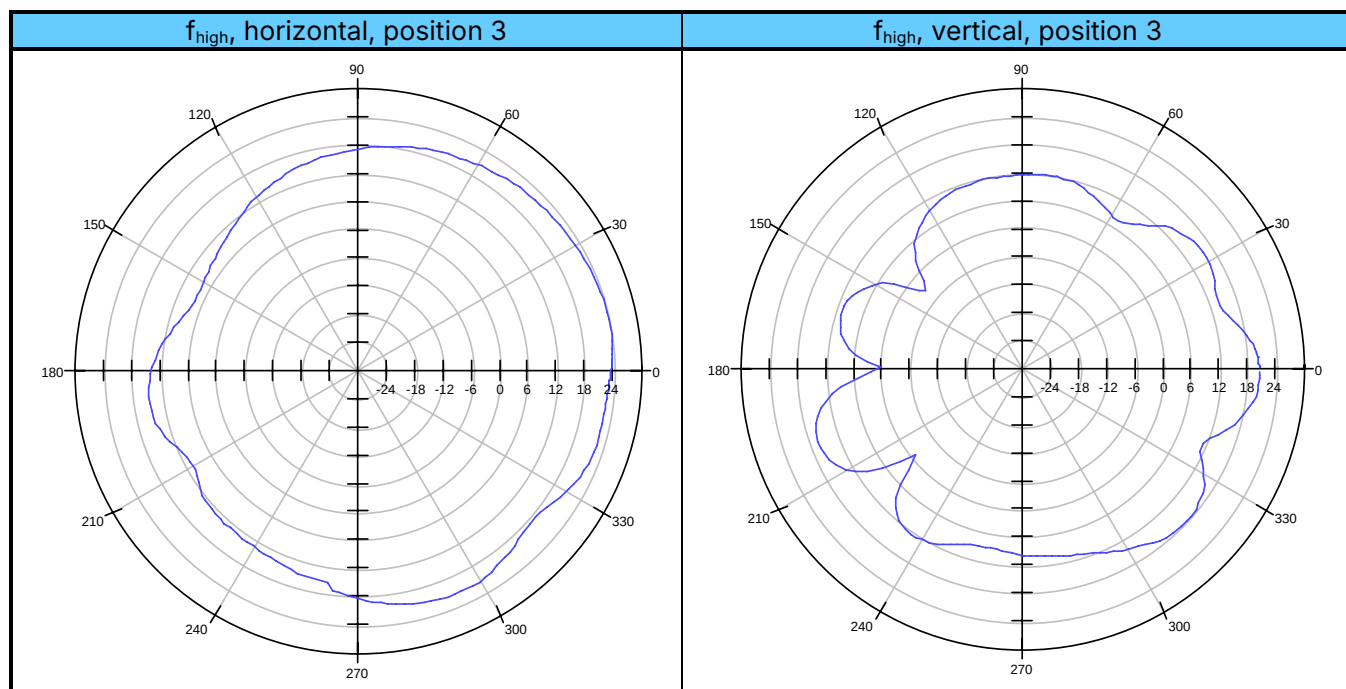


f_{mid} , vertical, position 3



5.2.3 Azimuth charts @ 927.250 MHz





6 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal Due
1	Antenna (Log.-Per.)	HL223	Rohde & Schwarz	835556/014	480123	Calibration not necessary	
2	Software	EMC32 V10.60.20	Rohde & Schwarz	-	483261	Calibration not necessary	
3	RF cable	SF106B/11N/11N/ 7000.0	Huber & Suhner	500219/6B	482416	Calibration not necessary	
4	Antenna support	AS620P	Deisel	620/375	480325	Calibration not necessary	
5	Fully anechoic chamber M20	B83117-E2439-T232	Albatross Projects	103	480303	Calibration not necessary	
6	Turntable	DS420 HE	Deisel	420/620/00	480315	Calibration not necessary	
7	Multiple Control Unit	MCU	Maturo	MCU/043/97110 7	480832	Calibration not necessary	
8	EMI receiver / Spectrum analyser	ESW44	Rohde & Schwarz	101635	482467	29.10.2025	02.2028
9	Positioner	TDF 1.5- 10Kg	Maturo	15920215	482034	Calibration not necessary	
10	Signal & spectrum analyser	FSW43	Rohde & Schwarz	102954	483957	10.07.2024	07.2026

7 Report History

Report Number	Date	Comment
F250250E5	16.06.2026	Initial antenna report
-	-	-
-	-	-

--- end of antenna report ---