

Antenna Report

Report Number:

F230236E1

Equipment under Test (EUT):

**RFID Antenna
Article No. 3059790003**

Applicant:

Müller Elektronik

Manufacturer:

Müller Elektronik

References

[1] None (According customer requirements)

Disclaimer

Tested by:

Signature

Written by:

Signature

Reviewed and
approved by:

Signature

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1 Identification

1.1 Applicant

Name:	Müller-Elektronik GmbH
Address:	Franz-Kleine-Str. 18 33154 Salzkotten
Country:	Germany
Name for contact purposes:	Norbert BILAU
Phone:	+49 5258 9834 6100
eMail address:	bilau@mueller-elektronik.de
Applicant represented during the test by the following person:	None

1.2 Manufacturer

Name:	Müller-Elektronik GmbH
Address:	Franz-Kleine-Str. 18 33154 Salzkotten
Country:	Germany
Name for contact purposes:	Norbert BILAU
Phone:	+49 5258 9834 6100
eMail address:	bilau@mueller-elektronik.de
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: *	RFID Antenna
Model name: *	RFID Antenna
Article number: *	3059790003
KD-number: *	SMSE015

	EUT number		
	1	2	3
Serial number: *	3059790003E070300	-	-
PCB identifier: *	3759790003.3140	-	-
Hardware version: *	3.0	-	-
Software version: *	n/a	-	-

* 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					
Frequency Range *	840 MHz to 960 MHz				
Supply voltage LED indicator: *	U _{nom} =	n/a	U _{min} =	3.5 VDC	U _{max} = 5.5 VDC
Temperature range: *	-20 °C to + 70°C				

* Declared by the applicant

Ports / Connectors				
Identification	Connector		Length during test	Shielding (Yes / No)
	EUT	Ancillary		
Antenna Port	Fix	SMA (m)	50cm	Yes

Equipment used for testing	
none	

*1 Provided by the applicant

*2 Provided by the laboratory

1.6 Dates

Date of receipt of test sample:	24.02.2023
Start of test:	18.04.2023
End of test:	20.04.2023

2 Operational States

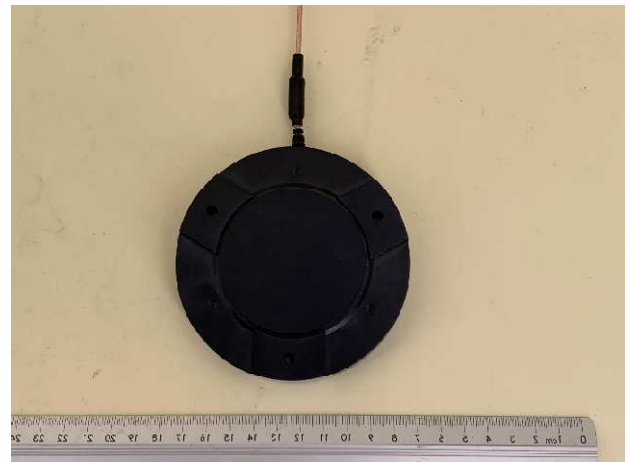
During the antenna chart measurements, the antenna was supplied with a rf-signal with a level of 0 dBm at its antenna connector.

3 Additional Information

The antenna was not supplied with a DC voltage during the measurements.

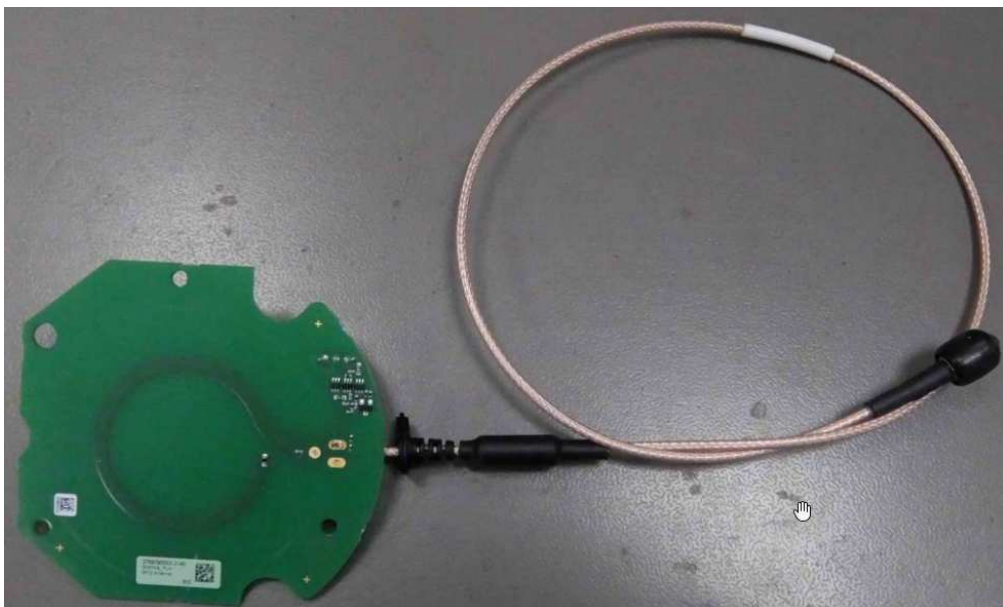
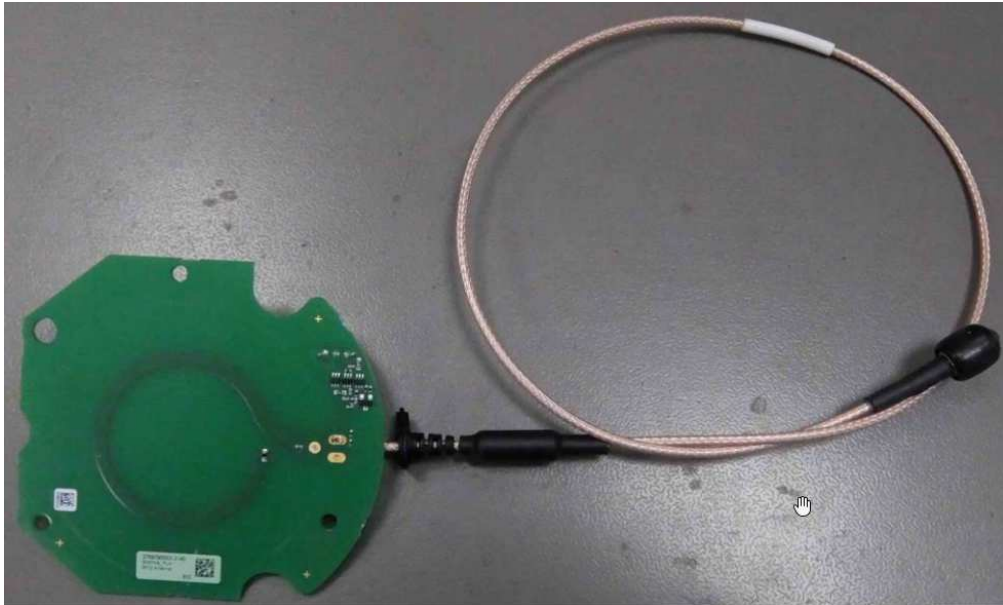
4 Antenna photographs

4.1 External photographs



4.2 internal photographs

Due to the fact that the antenna is sealed these photographs were provided by the applicant.



5 Antenna Charts

5.1 Results (Max. Gain)

Frequency [MHz]	Maximum Antenna gain [dBi]	Turntable Pos [°]	EUT Positioner [°]	EUT Pos.	Antenna Polarization
840	-22.19	79	0	X	H
870	-20.14	84	0	X	H
900	-18.38	84	0	X	H
930	-17.37	90	0	X	H
960	-18.70	96	0	X	H

Test equipment (please refer to chapter 7 for details)

1 - 10

5.2 Antenna Diagrams EUT Position 1 (X-Position)

5.2.1 Test Setup Photos (X-Position)



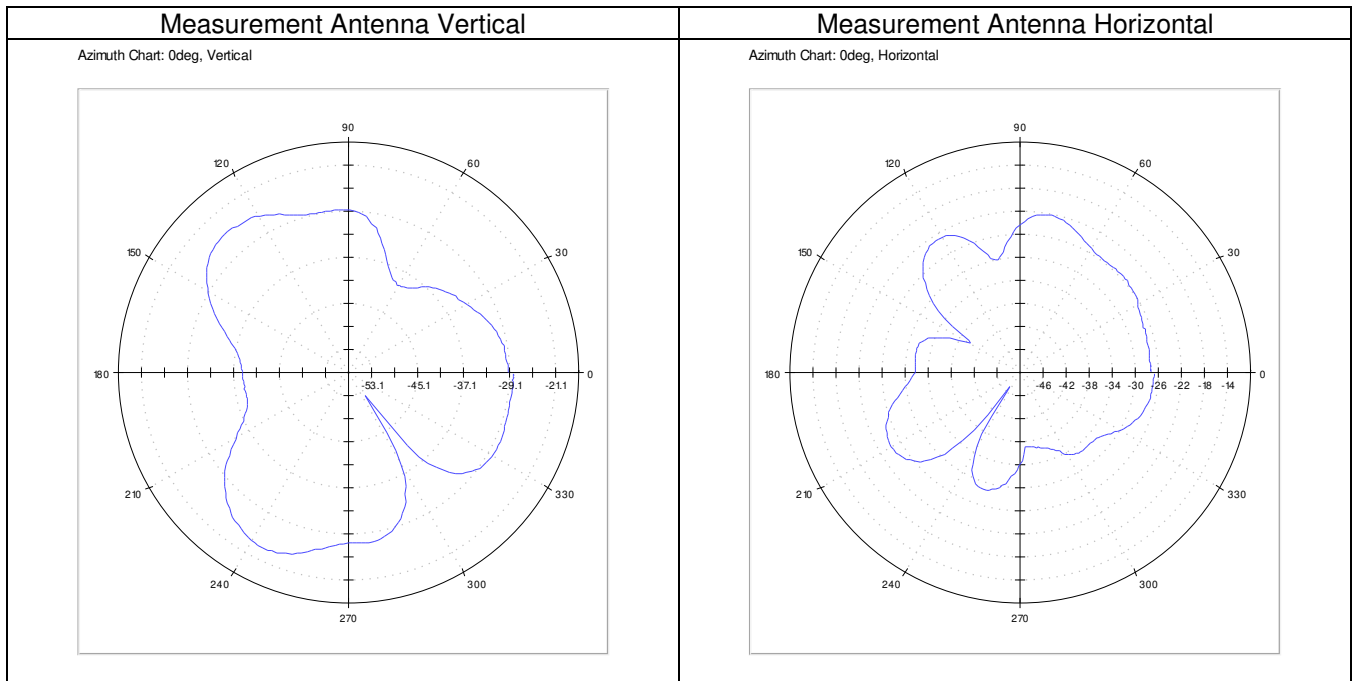
0° Position to measuring antenna



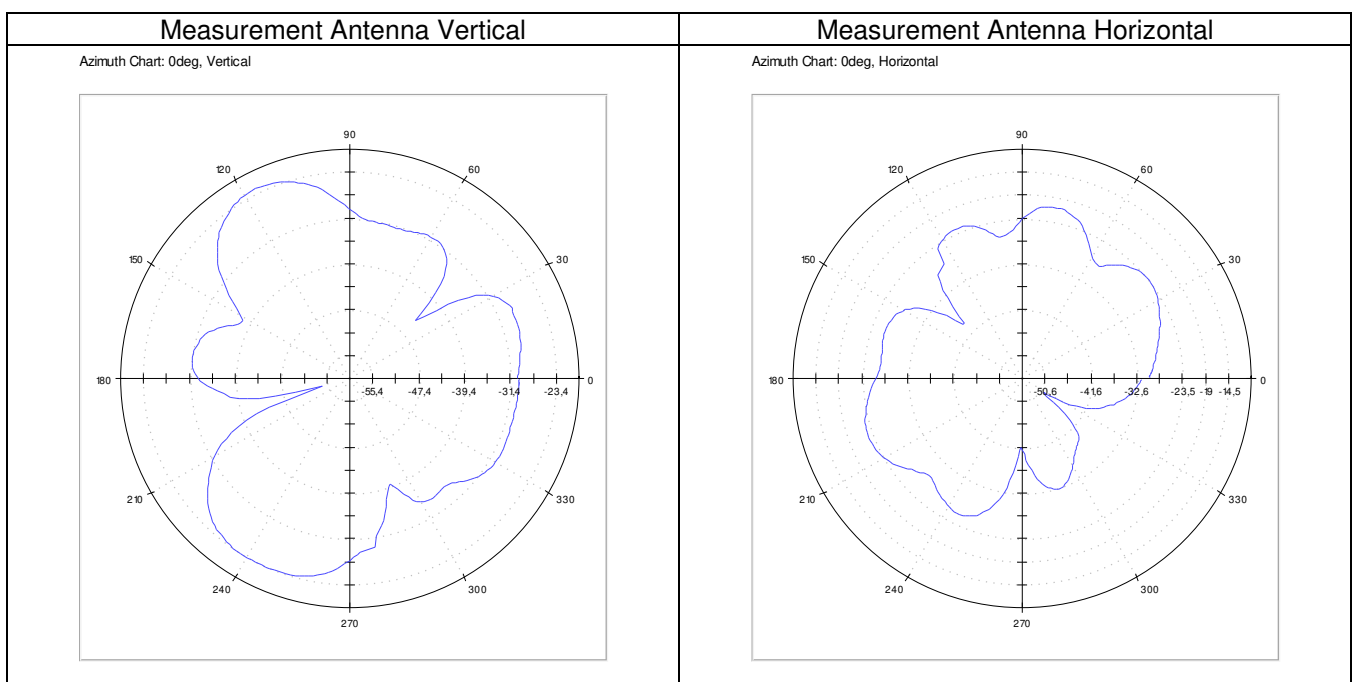
sideview

5.2.2 Antenna Charts X-Position

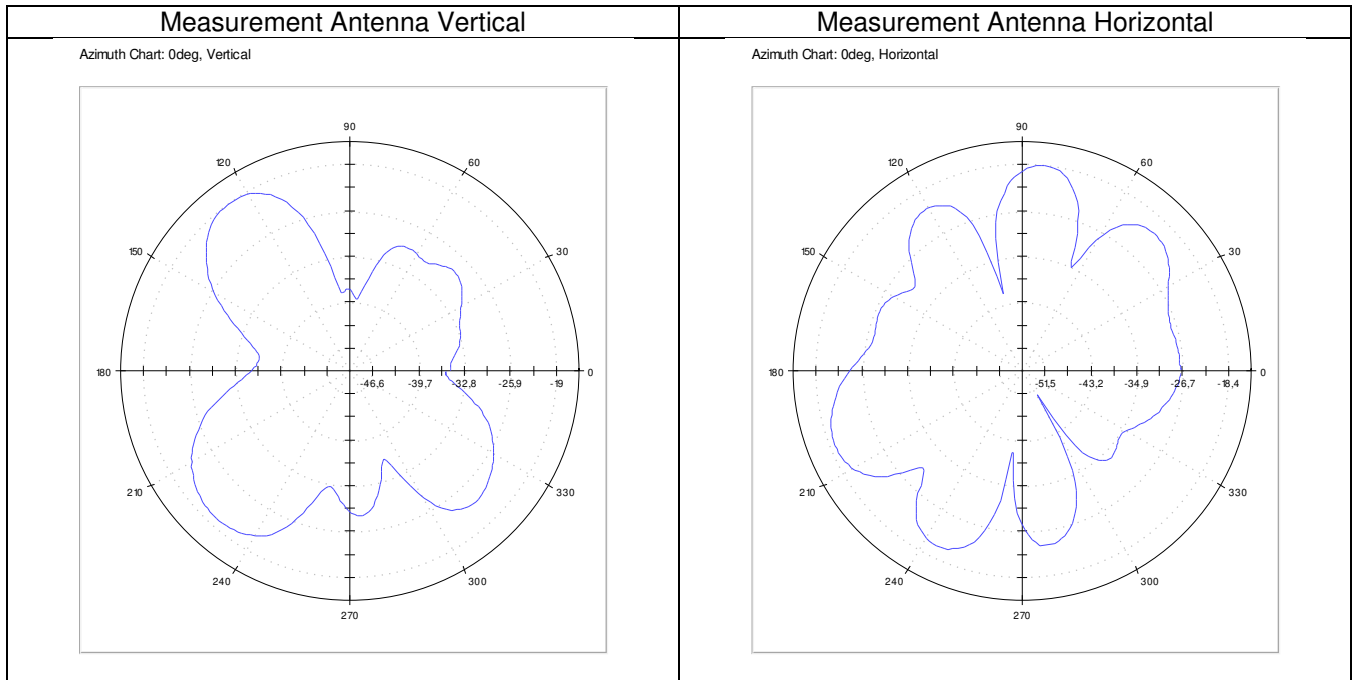
840 MHz



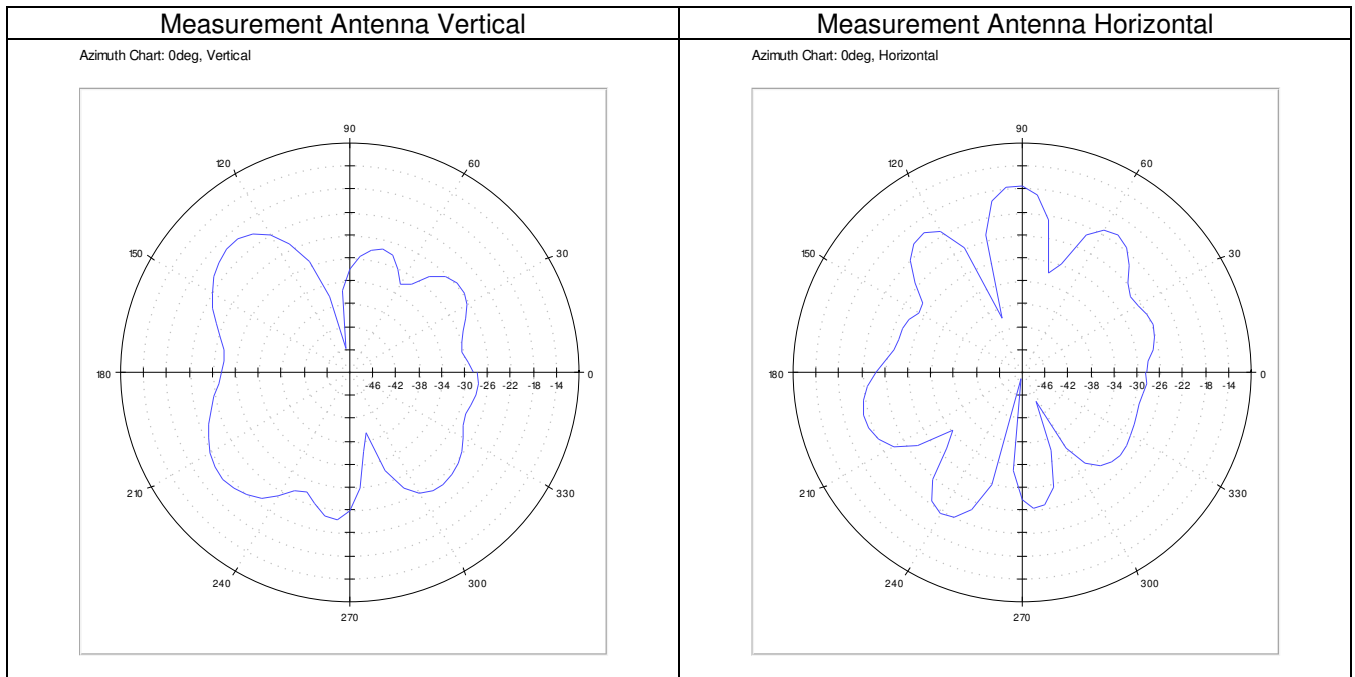
870 MHz



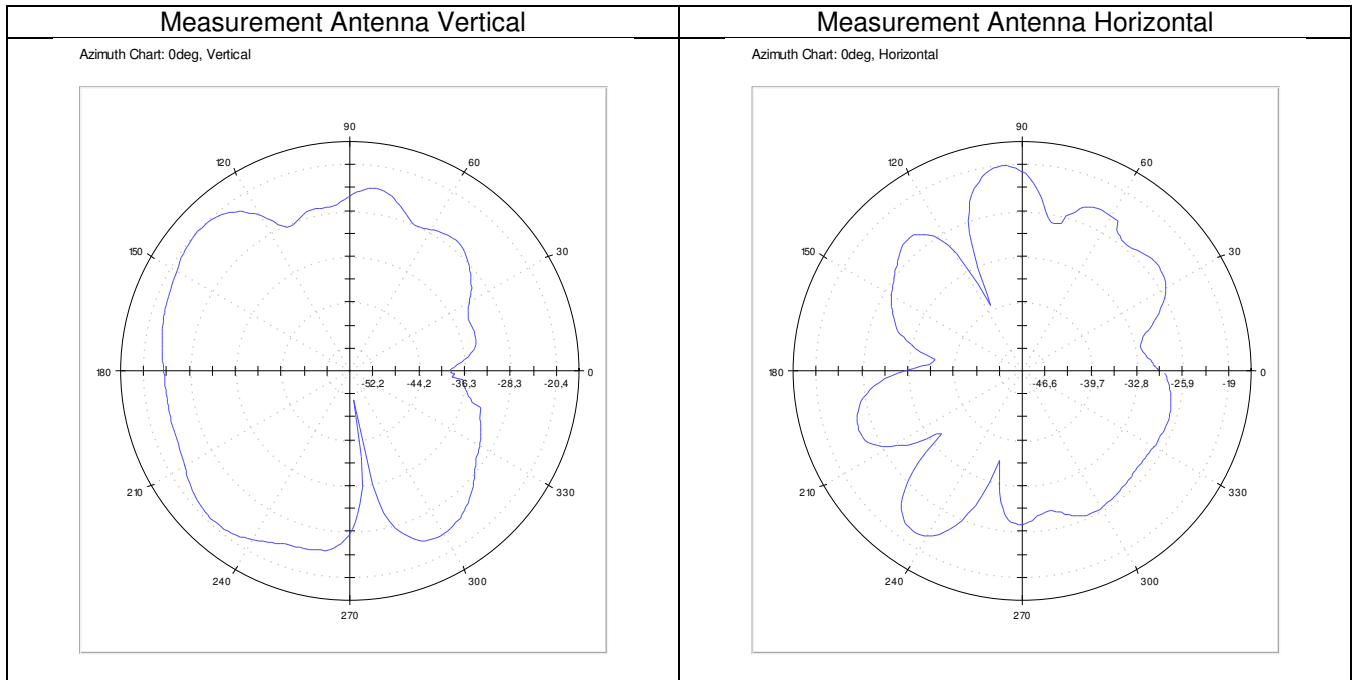
900 MHz



930 MHz



960 MHz



5.3 Antenna Diagrams EUT Position 2 (Y-Position)

5.3.1 Test Setup Photos



0° Position to measuring antenna

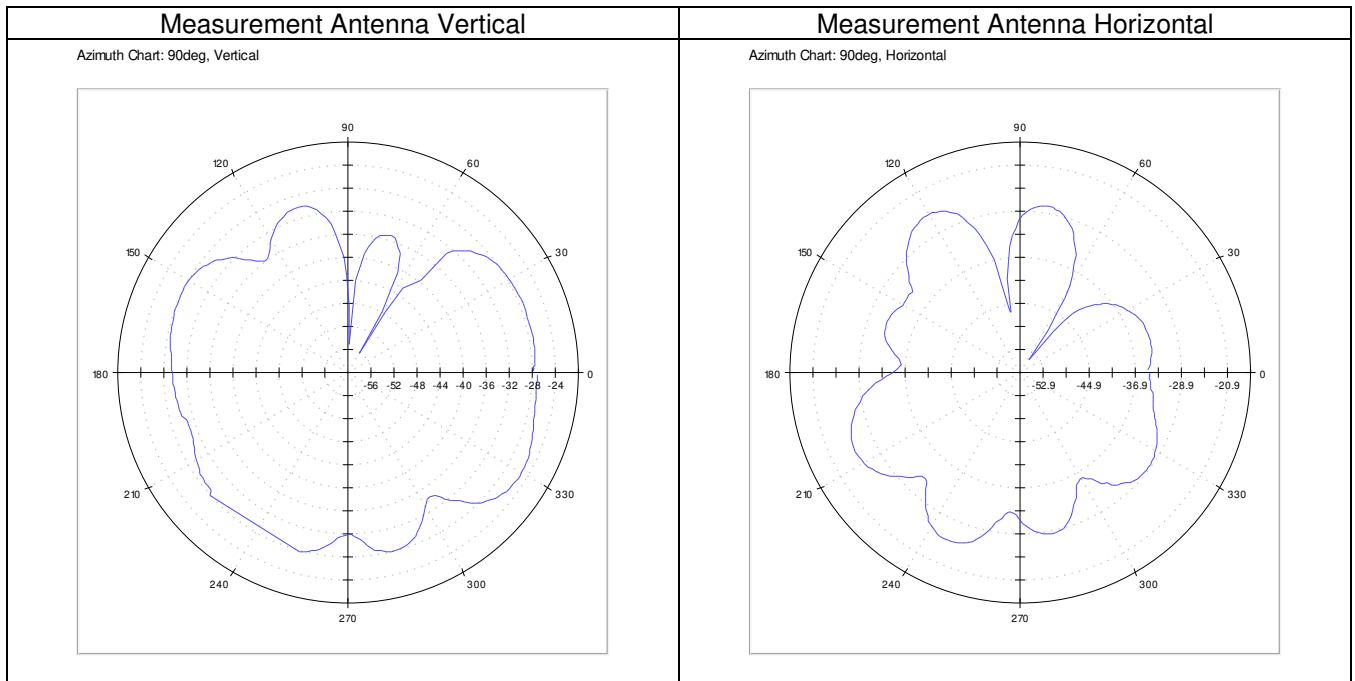


sideview

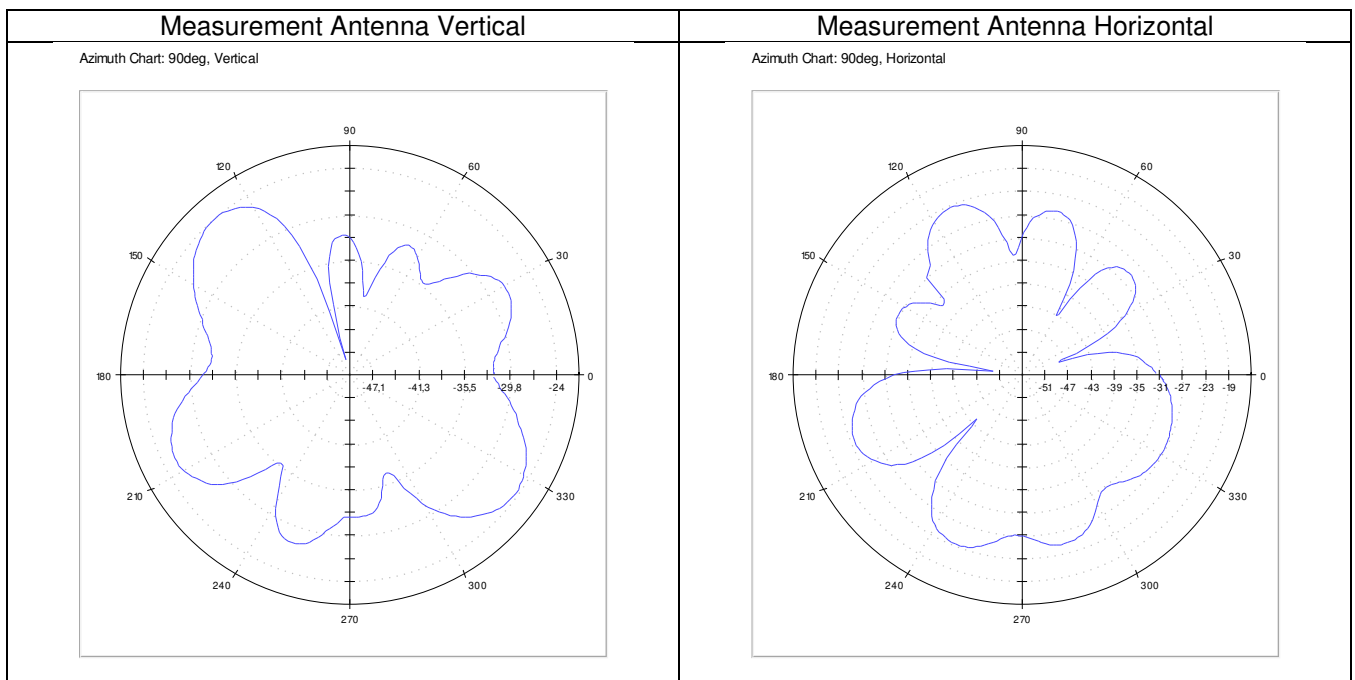


5.3.2 Antenna Charts Y-Position

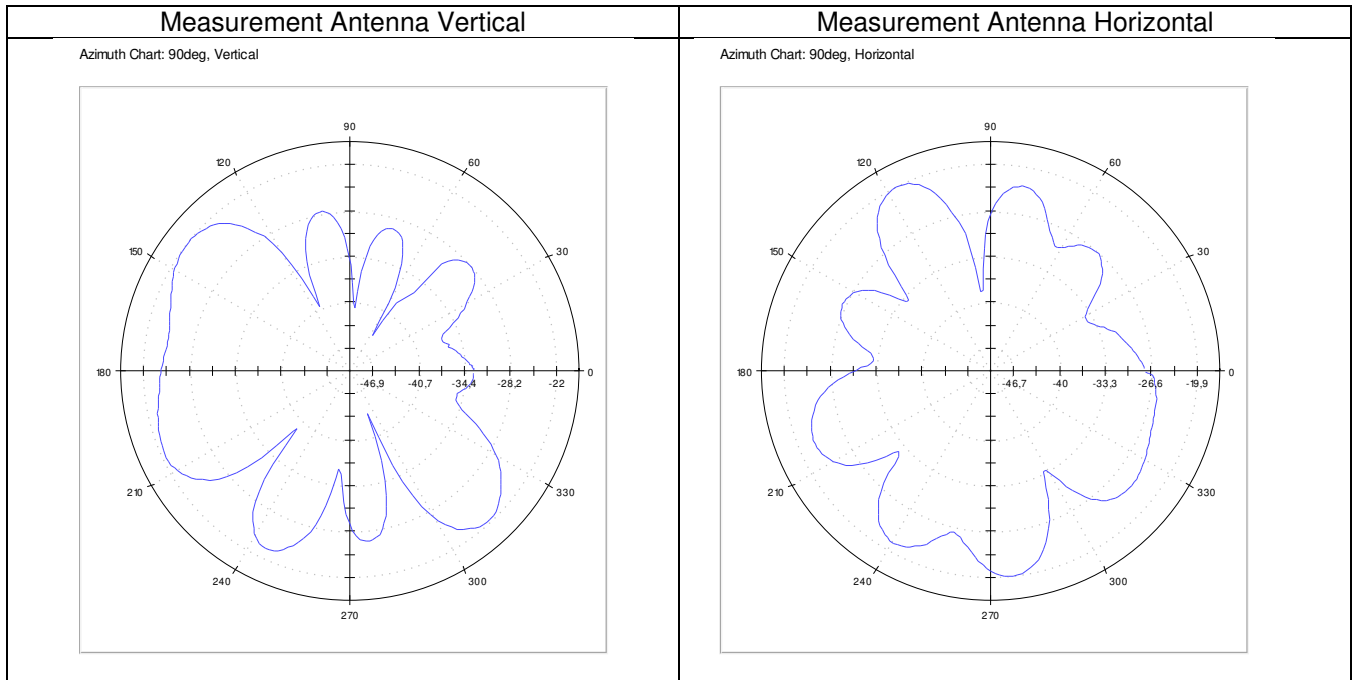
840 MHz



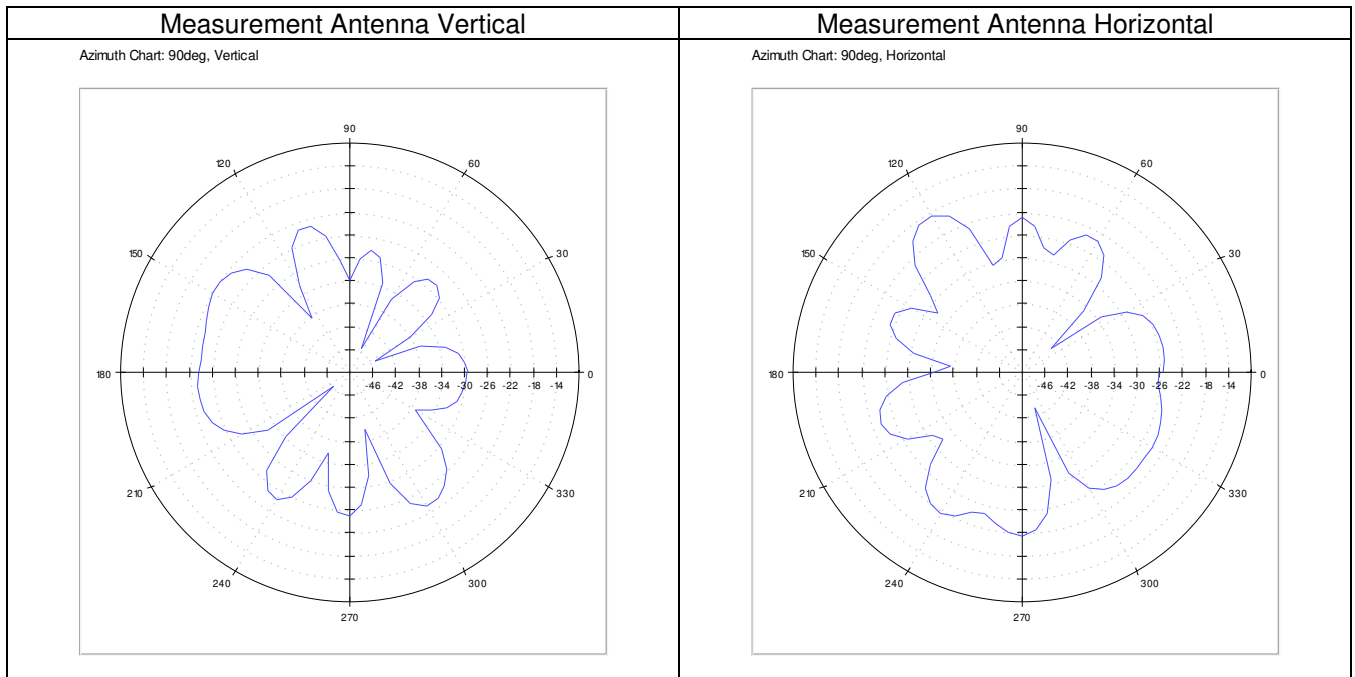
870 MHz



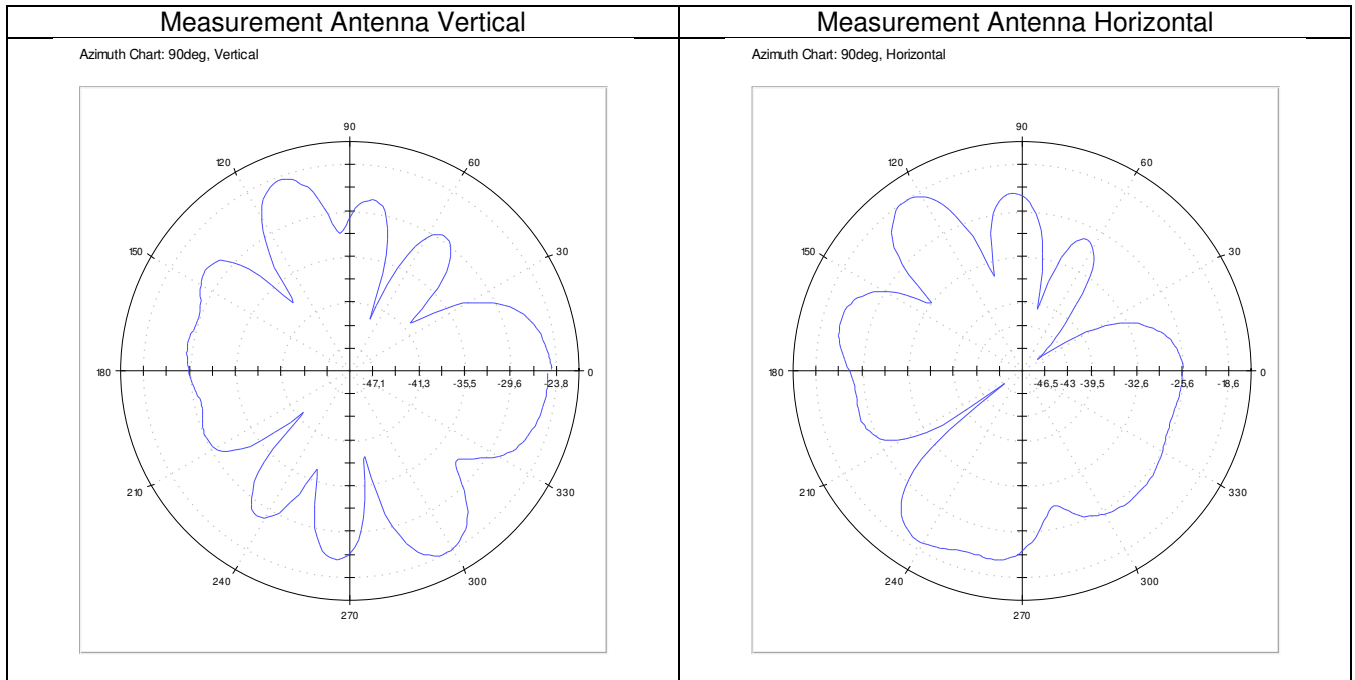
900 MHz



930 MHz



960 MHz



5.4 Antenna Diagrams EUT Position 3 (Z-Position)

5.4.1 Test Setup Photos



0° Position to measuring antenna

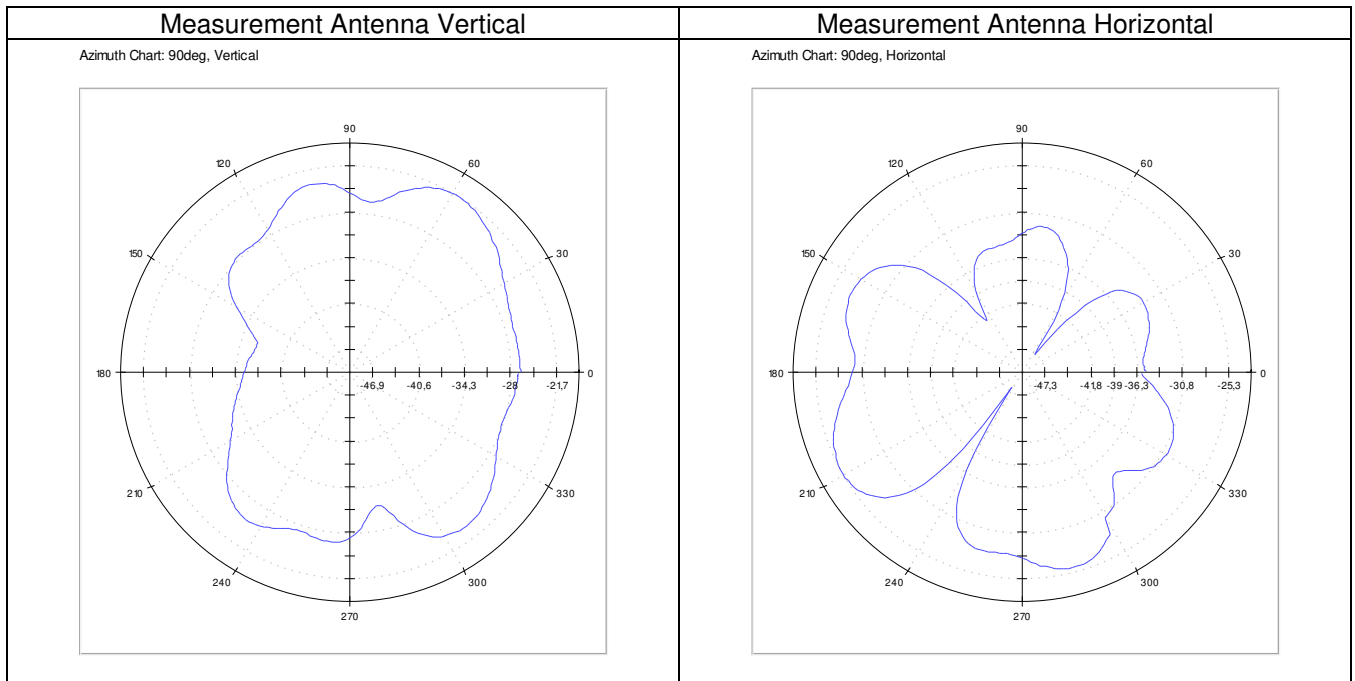


sideview

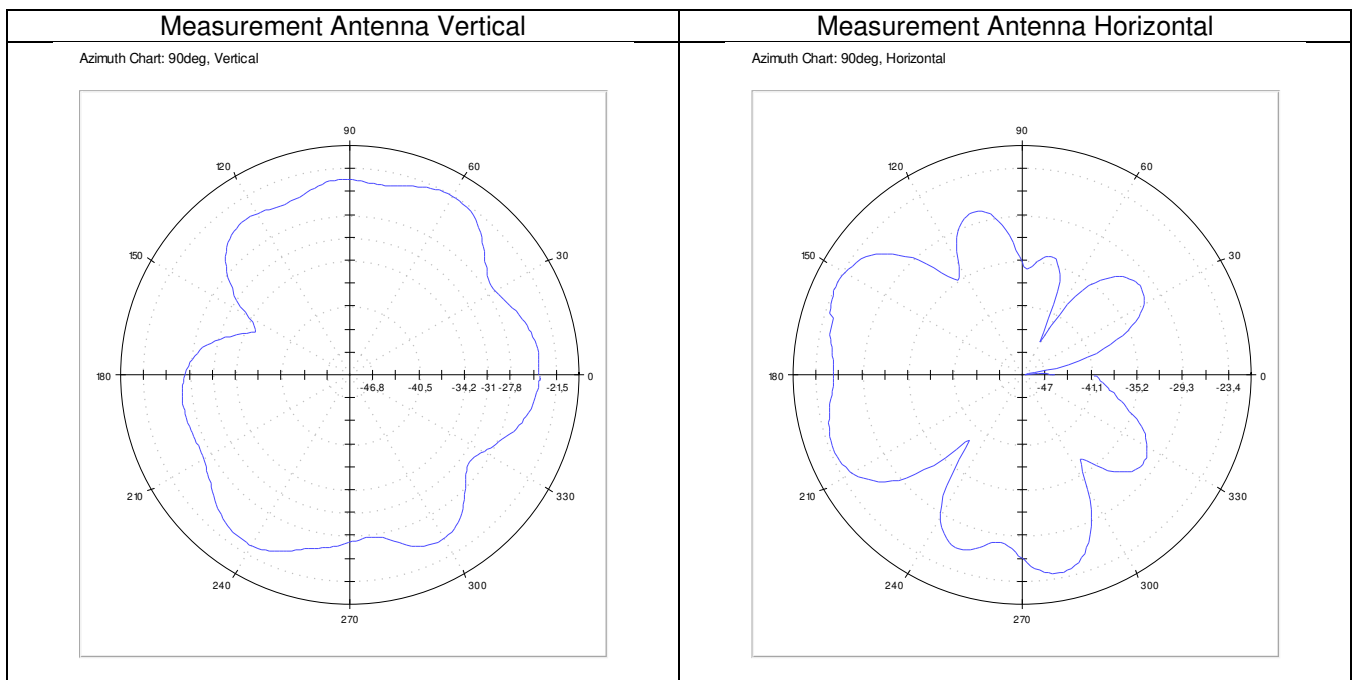


5.4.2 Antenna Charts Z-Position

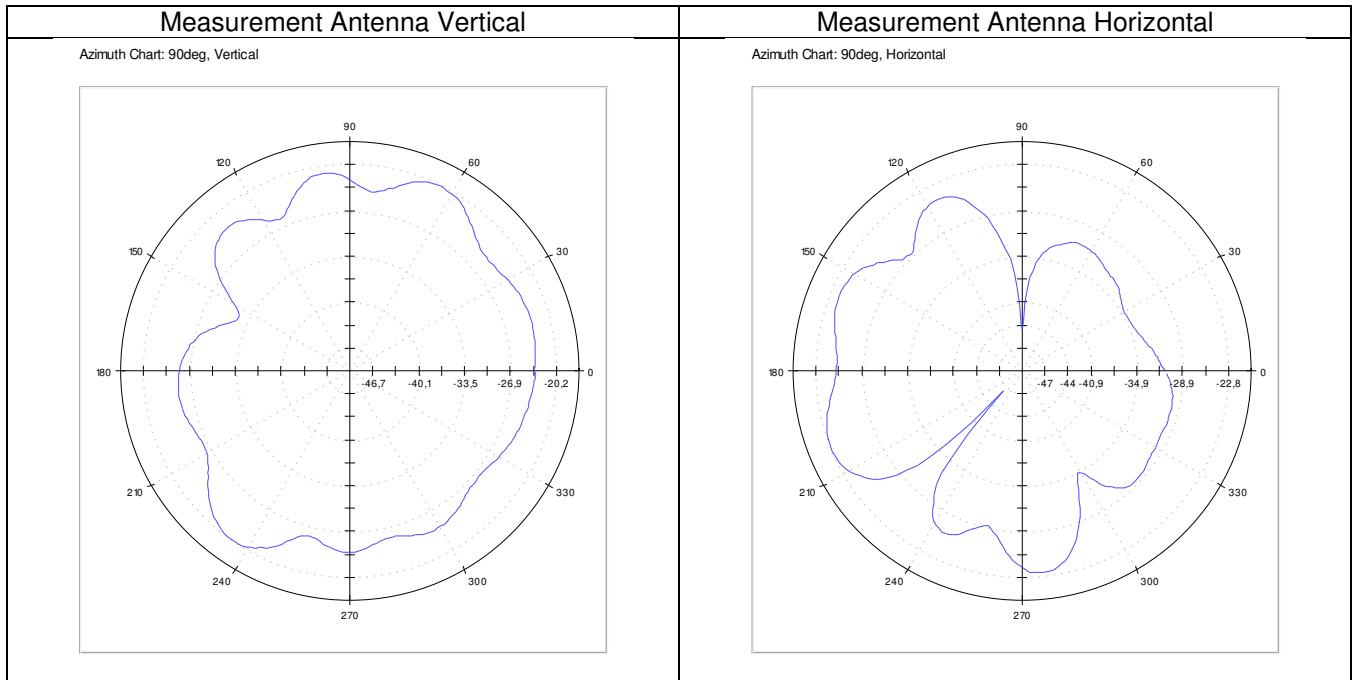
840 MHz



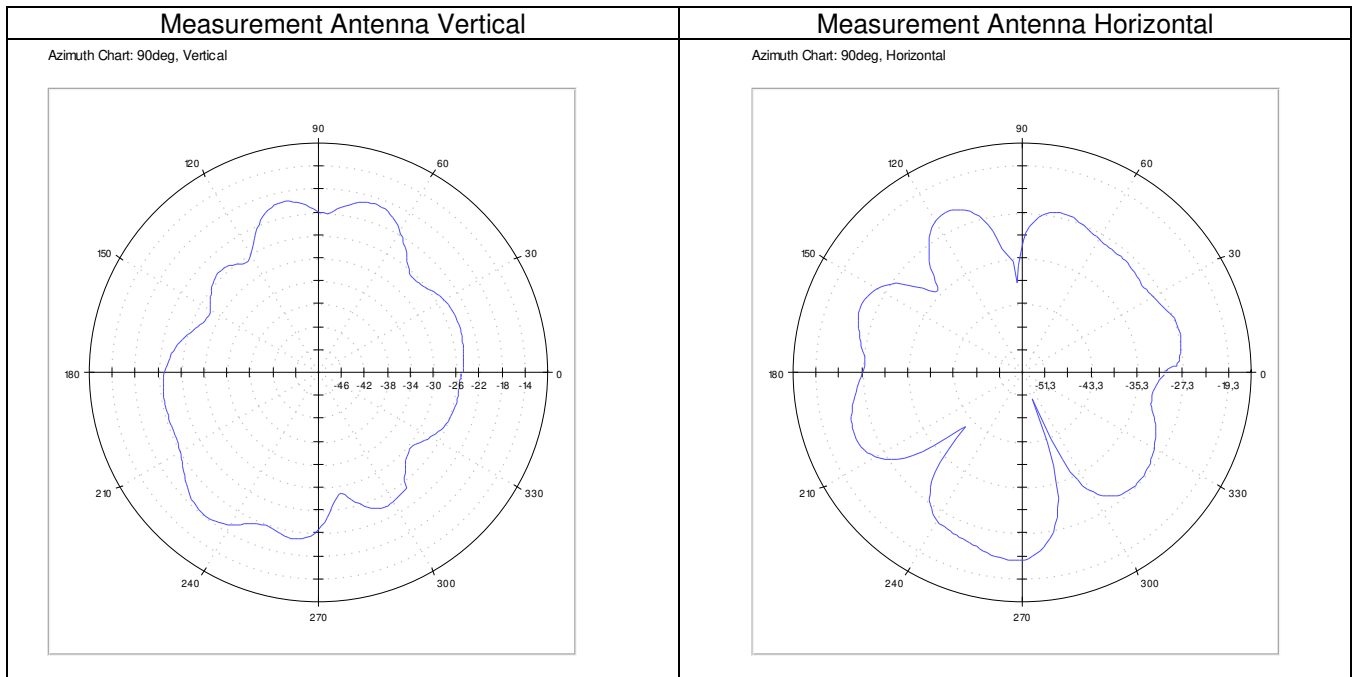
870 MHz



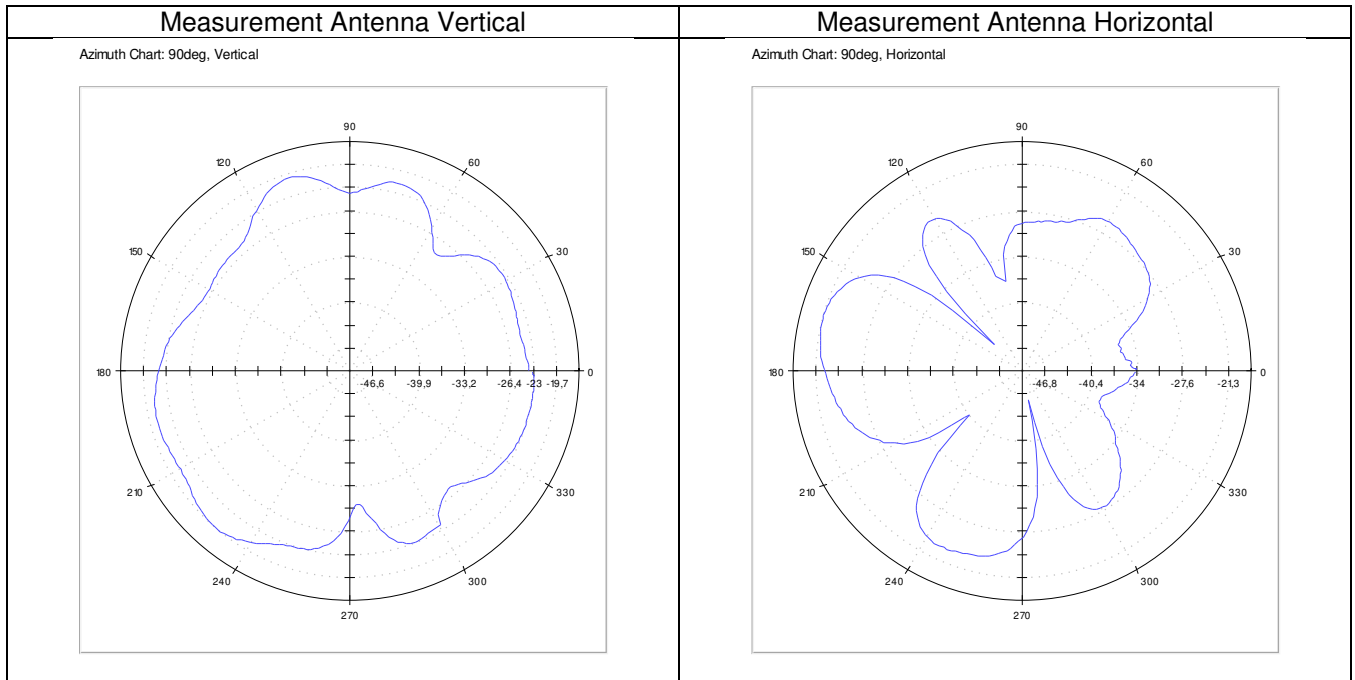
900 MHz



930 MHz

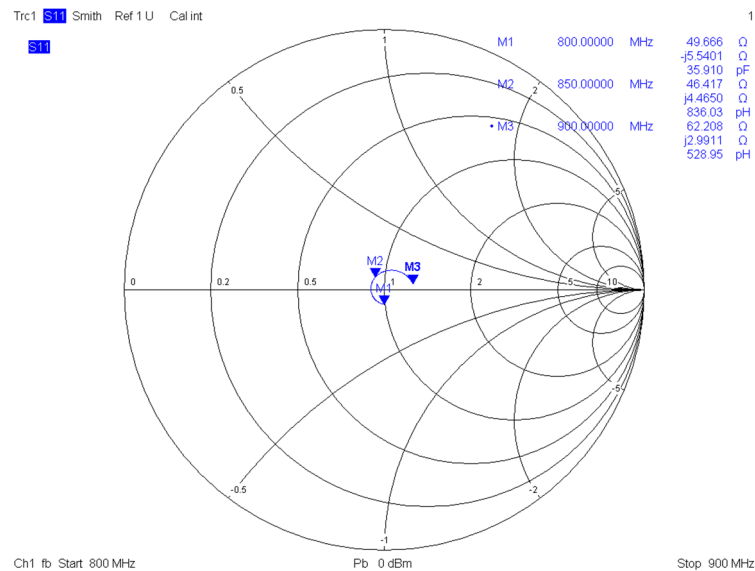


960 MHz

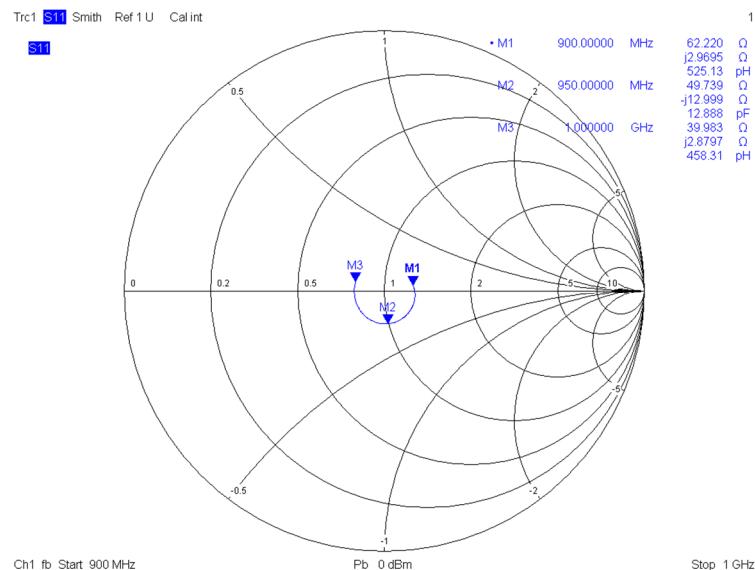


6 VSWR

6.1 Smithchart



S11 Smith Chart 800 MHz – 900 MHz

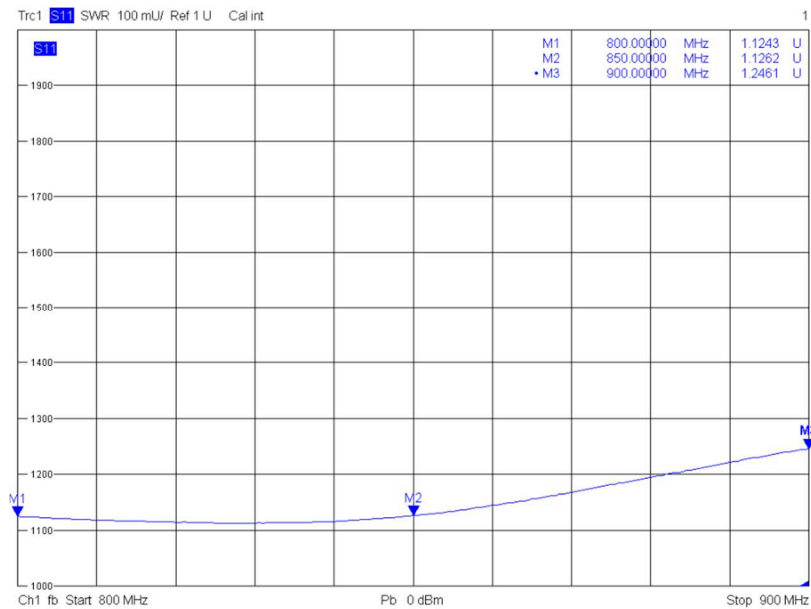


S11 Smith Chart 900 MHz – 1000 MHz

Test equipment (please refer to chapter 7 for details)

11,12

6.2 SWR



S11 SWR 800 MHz – 900 MHz



S11 SWR 900 MHz – 1000 MHz

Test equipment (please refer to chapter 7 for details)
11, 12

7 Test Equipment used for Tests

No.	Test equipment	Type	Manufacturer	Serial No.	PM. No.	Cal. Date	Cal Due
1	EMI Receiver / Spectrum Analyser	ESW44	Rohde & Schwarz	101635	482467	22.02.2022	02.2024
2	Fully anechoic chamber M20	B83117-E2439-T232	Albatross Projects	103	480303	Calibration not necessary	
3	Turntable	DS420 HE	Deisel	420/620/00	480315	Calibration not necessary	
4	Antenna support	AS620P	Deisel	620/375	480325	Calibration not necessary	
5	Positioner	TDF 1.5-10kg	Maturo	15920215	482034	Calibration not necessary	
6	Multiple Control Unit	MCU	Maturo	MCU/043/971107	480832	Calibration not necessary	
7	Antenna Log Per	HL223	Rohde & Schwarz	835556/014	480123	Calibration not necessary	
8	Signal generator	SMB100A	Rohde & Schwarz	101360	482190	16.02.2022	02.2024
9	Software	EMC32 V10.60.20	Rohde & Schwarz		483261	Calibration not necessary	
10	RF-Cable No. 36	Sucoflex 106B	Suhner	500213/6B	482325	Calibration not necessary	
11	Vector Network Analyser	ZVA40	Rohde & Schwarz	100298	481538	17.02.2022	02.2024
12	Calibration Kit	ZV-Z21	Rohde & Schwarz	100149	480385	28.03.2022	03.2024

8 Report History

Report Number	Date	Comment
F230236E1	15.12.2023	Initial Test Report
-	-	-
-	-	-