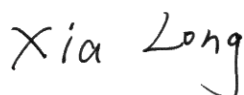


TEST REPORT

Applicant: Dongguan Huachuang Electronic Co., Ltd.
Address: No. 35, Rongfu Road, Shangsha Community,
Chang'an Town, Dongguan, Guangdong Province
Equipment Type: wireless carplay adapte
Model Name: CP10
Brand Name: N/A
Test Standard: IEEE Std 149-2021
Sample Arrival Date: Jul. 02, 2024
Test Date: Jul. 02, 2024
Date of Issue: Jul. 04, 2024

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Mai Jintian**Checked by:** Xia Long**Approved by:** Tolan Tu
(Testing Director)

Revision History

Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Jul. 04, 2024</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☒ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Dongguan Huachuang Electronic Co., Ltd.
Address	No. 35, Rongfu Road, Shangsha Community, Chang'an Town, Dongguan, Guangdong Province
Contact Person	Miss You
Telephone Number	18929176141
E-mail Address	671442677@qq.com

2.2 Manufacturer Information

Manufacturer	N/A
Address	N/A

2.3 General Description for Equipment under Test (EUT)

EUT Name	wireless carplay adapte
Model Name Under Test	CP10
Antenna Type	PCB Antenna
Dimensions	18*6 mm

Note: This sample contains includes test data for both 2.4G and 5G bands, where 1# is 2.4G band data and 2# is 5G band data. In this report, 1# and 2# are used to represent the corresponding frequency band and the corresponding test data.

2.4 Ancillary Equipment

Note: Not applicable.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	IEEE Std 149-2021	IEEE Standard Test Procedures for Antennas

3.2 Test Verdict

Report Section	Description	Remark
ANNEX A.1	Gain and Efficiency	--
ANNEX A.2	VSWR	--
ANNEX B	Radiation Pattern	--

3.3 Test Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Item	Uncertainty
VSWR(S11)	± 0.61
Gain	$\pm 1.92\text{dB}$

4 GENERAL TEST CONFIGURATIONS

4.1 Test Condition

Environment Parameter	Selected Values During Tests			
	Ambient Pressure(KPa)	Temperature(°C)	Voltage	Relative Humidity (%)
Normal Temperature, Normal Voltage (NTNV)	101	21.6	N/A	45

4.2 Test Equipment List

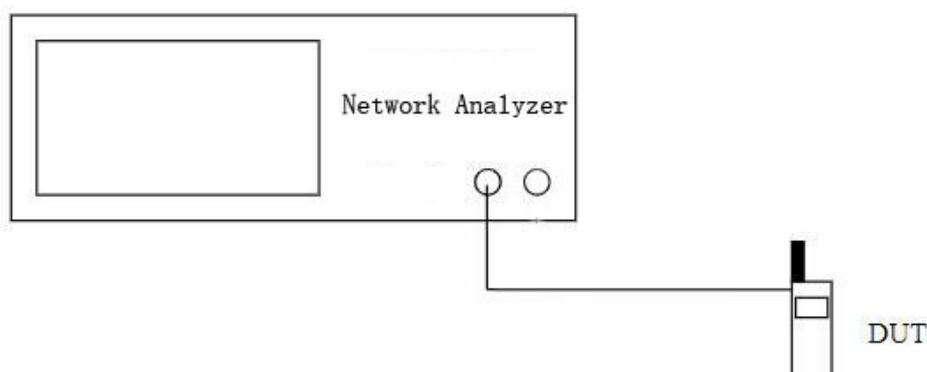
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
SG24 Multi-probe Antenna Measurement System	SATIMO	SG24-L	1101855- 0001	2021.11.12	2024.11.11
Vector Network Analyzer	Agilent	E5071B	MY42404001	2024.01.16	2025.01.15
Description	Manufacturer	Name		Version	
Test Software	MVG	SPM		V 1.8	

4.3 Test Setup

4.3.1 Antenna gain, efficiency and radiation pattern test setup



4.3.2 S11 parameter test setup



4.4 Test Frequencies

1#

Test Frequencies	2400MHz, 2410MHz, 2420MHz, 2430MHz, 2440MHz, 2450MHz, 2460MHz, 2470MHz, 2480MHz, 2490MHz, 2500MHz
------------------	---

2#

Test Frequencies	5150MHz, 5200MHz, 5250MHz, 5300MHz, 5350MHz, 5400MHz, 5450MHz, 5500MHz, 5550MHz, 5600MHz, 5650MHz, 5700MHz, 5750MHz, 5800MHz, 5850MHz
------------------	---

ANNEX A TEST RESULTS

A.1 Gain and Efficiency

1#

Frequency	Gain (dBi)	Efficiency (%)
2400MHz	2.68	22
2410MHz	2.59	22
2420MHz	2.62	23
2430MHz	2.80	24
2440MHz	2.95	25
2450MHz	2.74	25
2460MHz	2.63	25
2470MHz	2.73	27
2480MHz	2.94	28
2490MHz	2.90	28
2500MHz	2.98	28

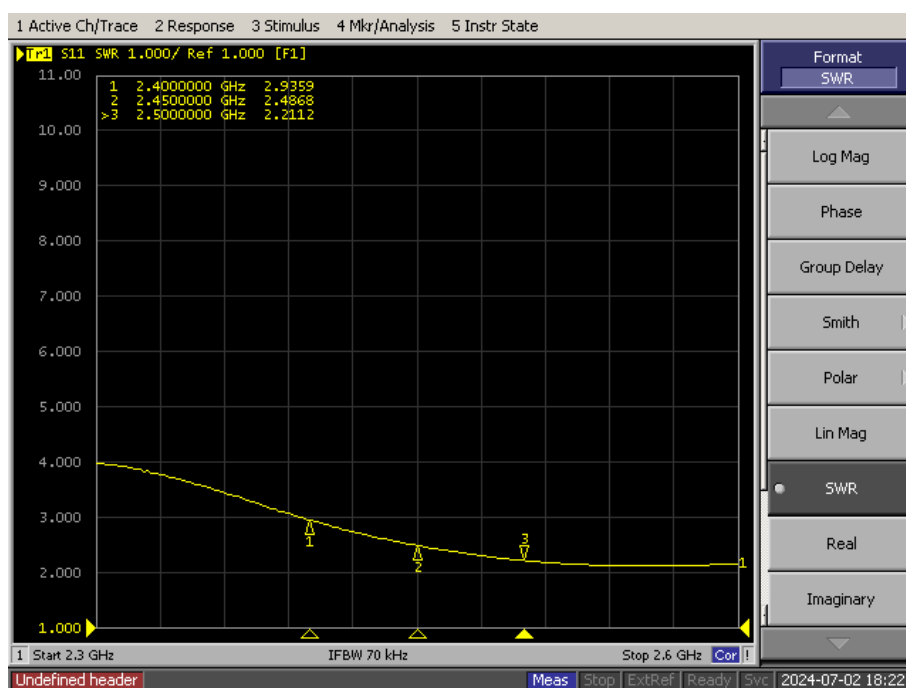
2#

Frequency	Gain (dBi)	Efficiency (%)
5150MHz	-1.97	12
5200MHz	-1.45	13
5250MHz	-0.05	18
5300MHz	1.40	24
5350MHz	2.66	33
5400MHz	3.39	38
5450MHz	4.02	45
5500MHz	4.18	47
5550MHz	3.93	46
5600MHz	3.78	43
5650MHz	3.73	41
5700MHz	3.90	39
5750MHz	3.73	37
5800MHz	3.91	37
5850MHz	4.21	40

A.2 VSWR

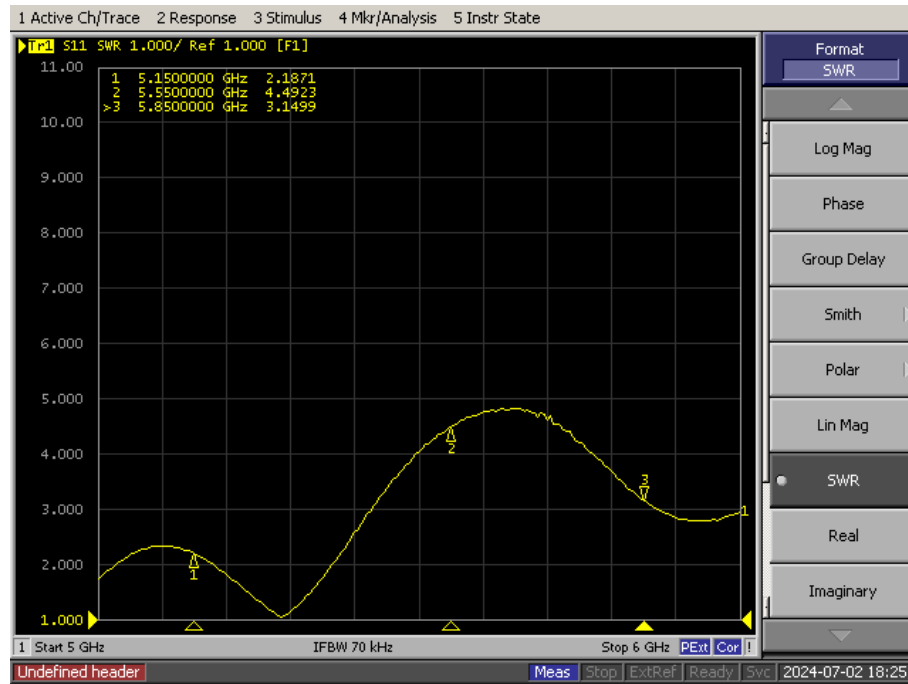
1#

Frequency	VSWR
2400MHz	2.94
2450MHz	2.49
2500MHz	2.21



2#

Frequency	VSWR
5150MHz	2.19
5500MHz	4.49
5850MHz	3.15

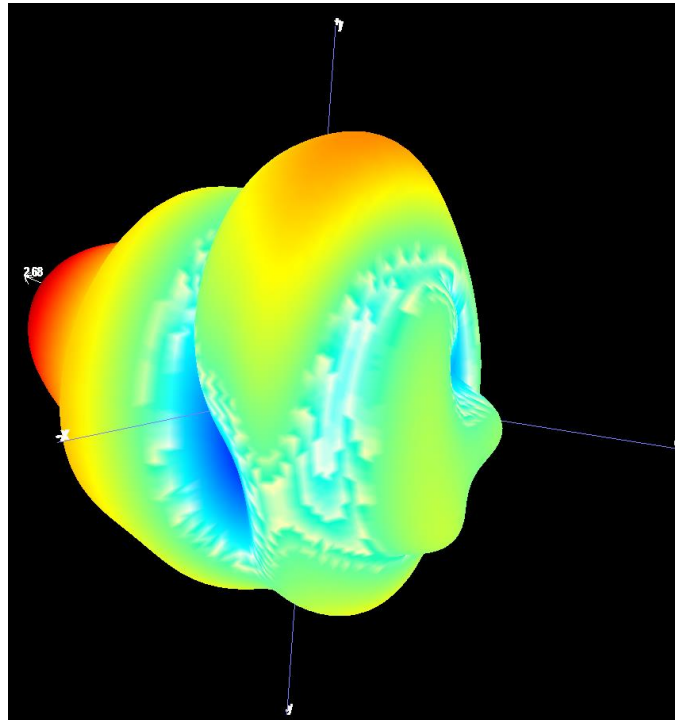


ANNEX B RADIATION PATTERN

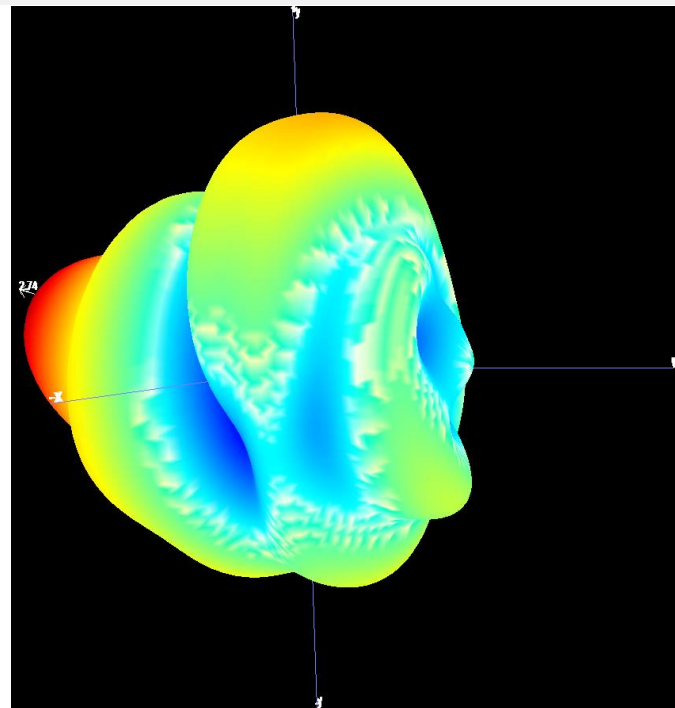
B.1 3D Pattern

1#

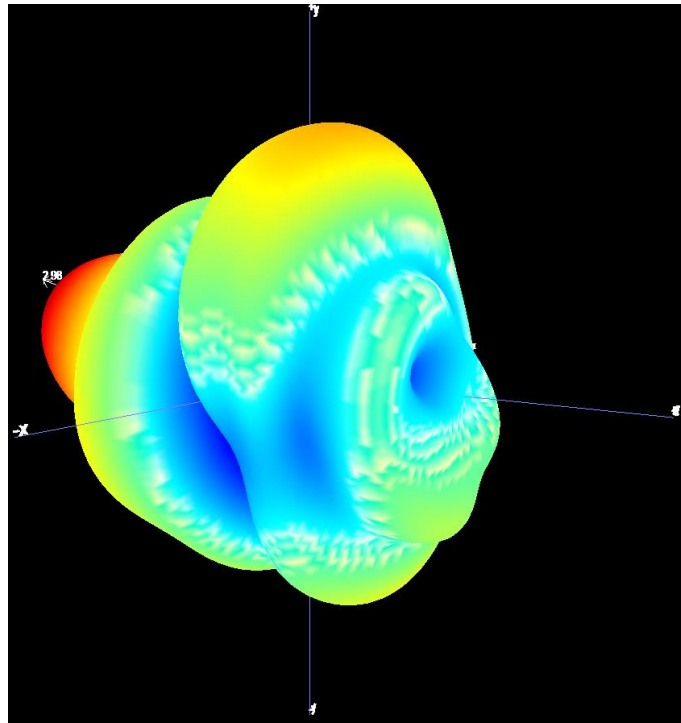
B1.1 3D Pattern for 2400MHz



B1.2 3D Pattern for 2450MHz

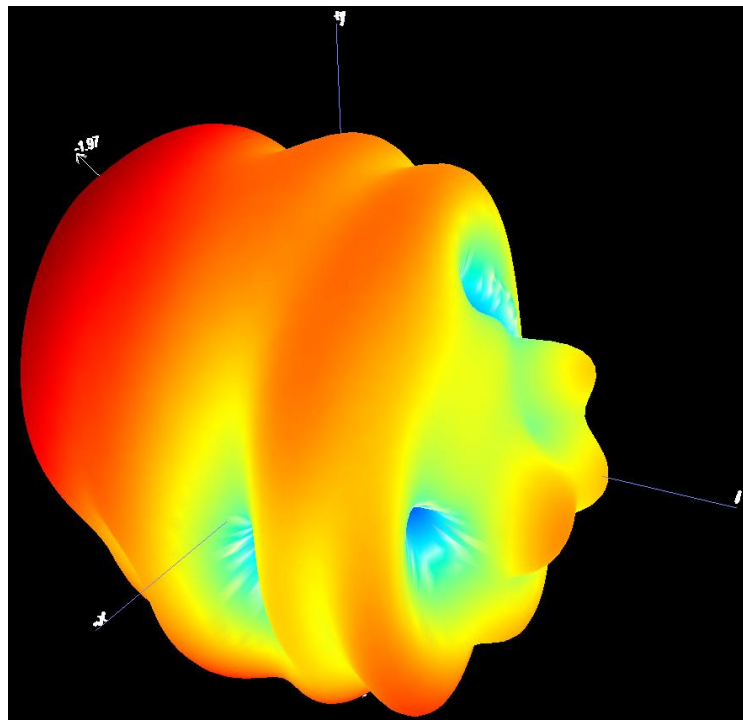


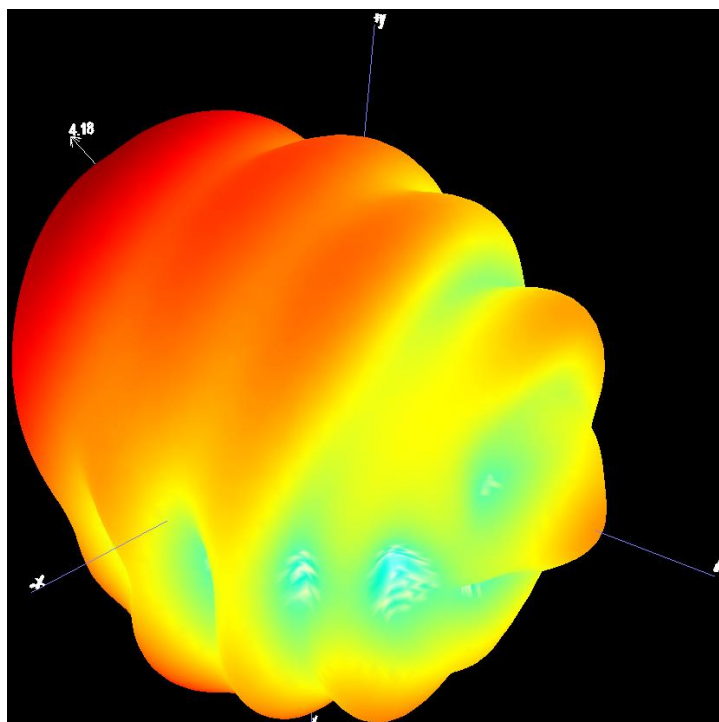
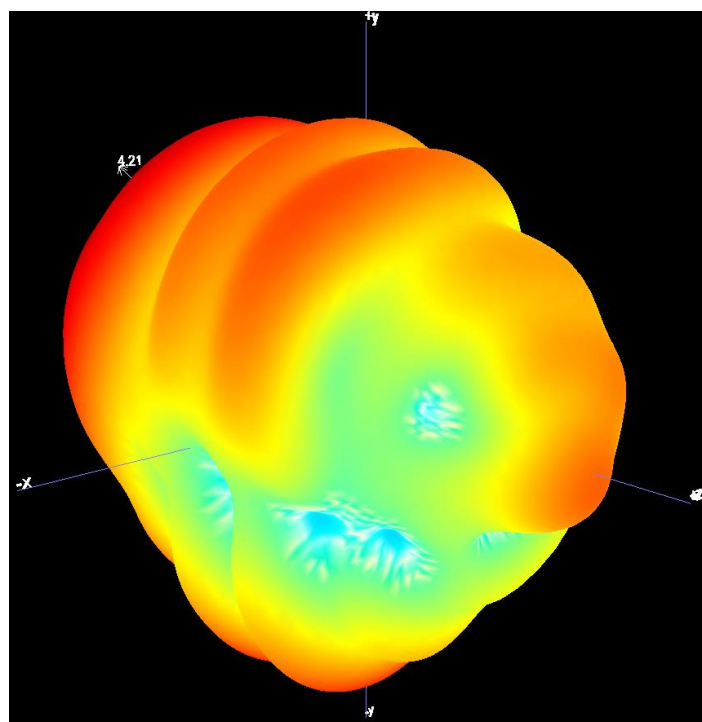
B1.3 3D Pattern for 2500MHz



2#

B1.4 3D Pattern for 5150MHz

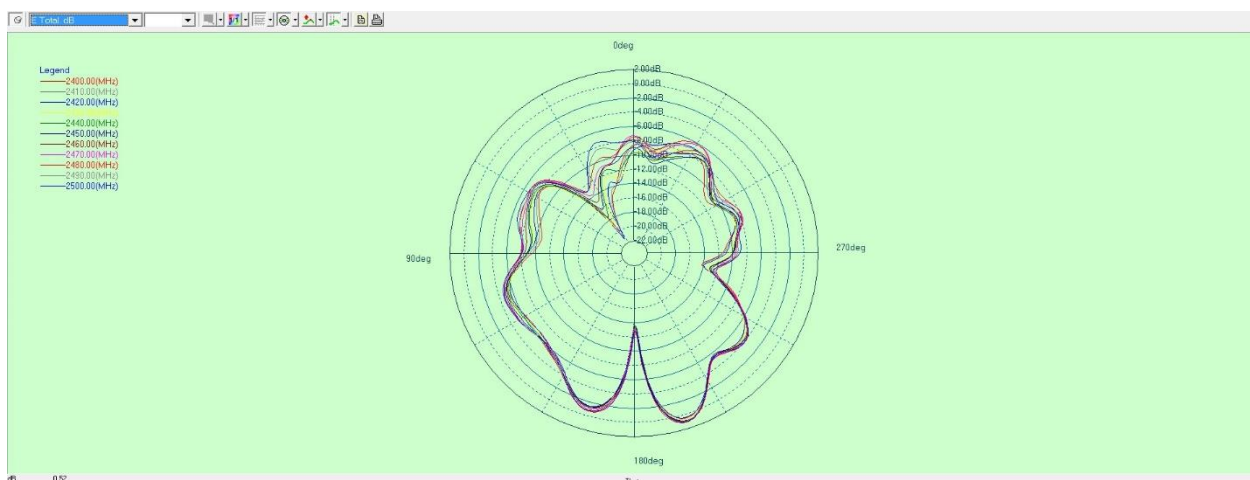


B1.5 3D Pattern for 5500MHz**B1.6** 3D Pattern for 5850MHz

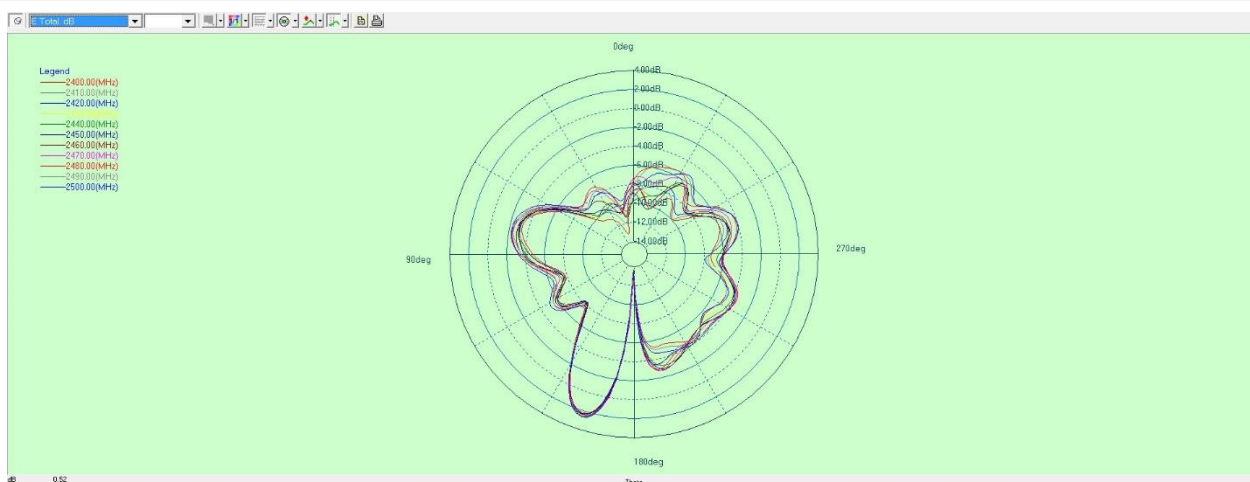
B.2 1D Radiation Pattern

1#

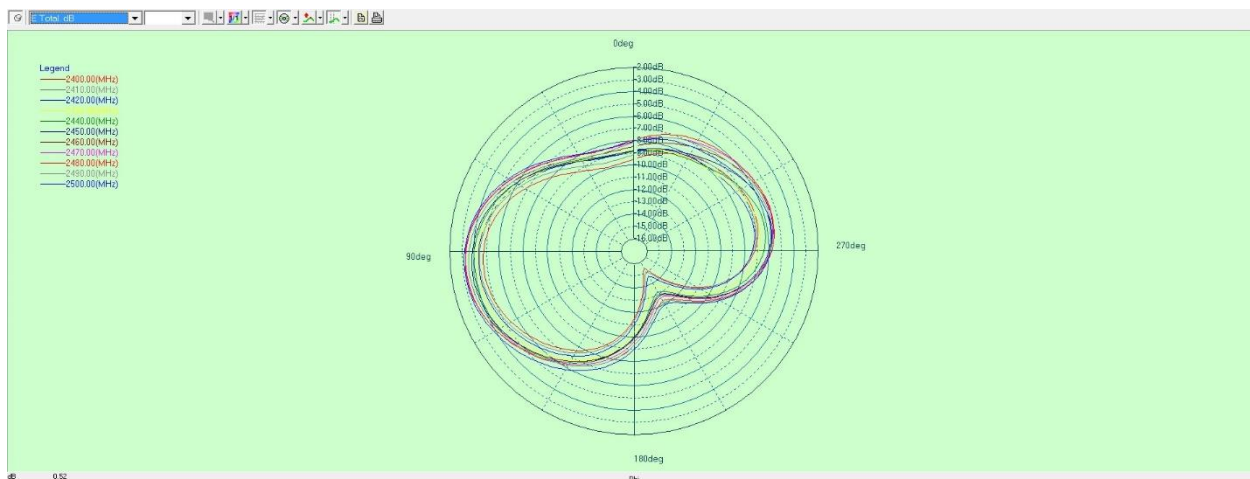
B2.1 PHI=0



B2.2 PHI=90

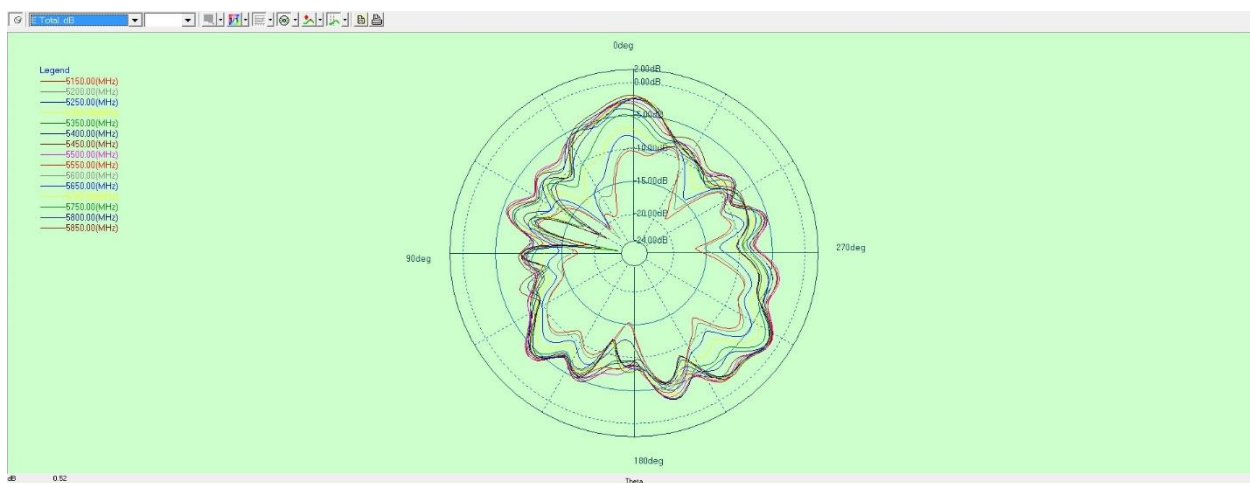


B2.3 THETA=90

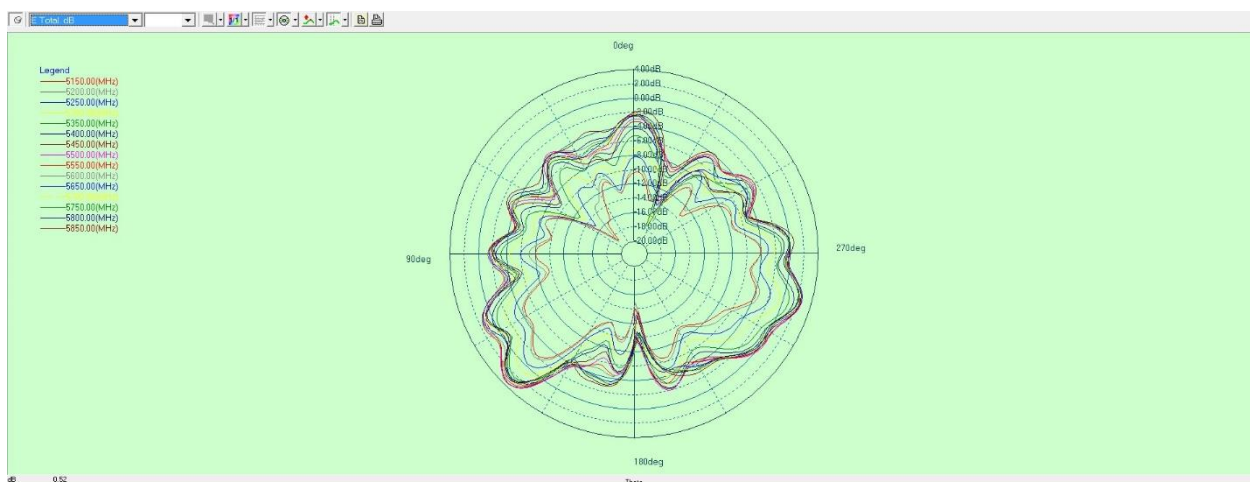


2#

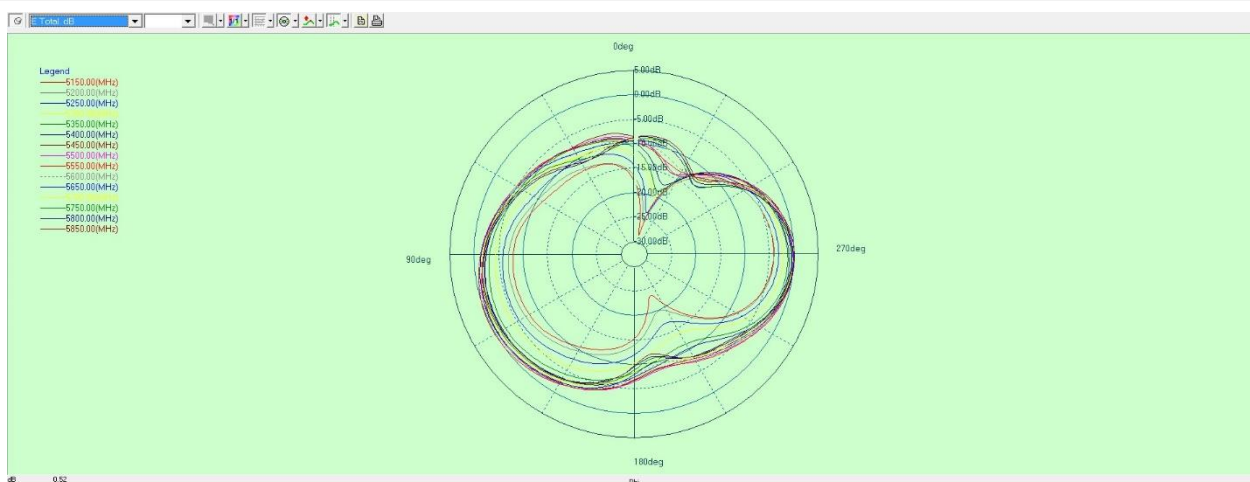
B2.4 PHI=0



B2.5 PHI=90



B2.6 THETA=90



ANNEX C TEST SETUP PHOTOS

Please refer the document “BL-SZ2470167-AO.PDF”.

ANNEX D EUT PHOTO

Please refer the document “BL-SZ2470167-AA.PDF”.

Statement

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--END OF REPORT--