TEST REPORT

Applicant:	Guangzhou Shirui Electronics Co., Ltd.
Address:	192 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, Guangdong, China
Equipment Type:	PCB Antenna
Model Name:	2.4G PCB Antenna
Brand Name:	N/A
Test Standard:	ANSI/IEEE Std 149-1979
Test Date:	Aug. 30, 2022
Date of Issue:	Sep. 07, 2022

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Mai Jintian **Checked by:** Tolan Tu **Approved by:** Wei Yanquan (Chief Engineer)

Revision History

Version	Issue Date	Revisions
Rev. 01	Sep. 07, 2022	Initial Issue

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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	Guangzhou Shirui Electronics Co., Ltd.
Address	192 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, Guangdong, China
Contact Person	Yi Bing
Telephone Number	13826160417
E-mail Address	yibing@cvte.com

2.2 Manufacturer Information

Manufacturer	N/A
Address	N/A

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	PCB Antenna
Model Name Under Test	2.4G PCB Antenna
Antenna Type	PCB Antenna
Dimensions	1#: 11.0*6.0 mm 2#: 9.5*6.0 mm

Note: This report contains test data for two antennas, in this report, 1#, 2#, are used to represent the corresponding antenna and corresponding test data.

2.5 Ancillary Equipment

Note: Not applicable.

2.6 Technical Information

Frequency Range	2400MHz ~ 2480MHz
Test Frequencies	2400MHz, 2410MHz, 2420MHz, 2430MHz, 2440MHz, 2450MHz, 2460MHz, 2470MHz, 2480MHz

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	ANSI/IEEE Std 149-1979	IEEE Standard Test Procedures for Antennas

3.2 Test Verdict

Report Section	Description	Remark
ANNEX A.1	Gain and Efficiency	--
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	±1.92dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Condition

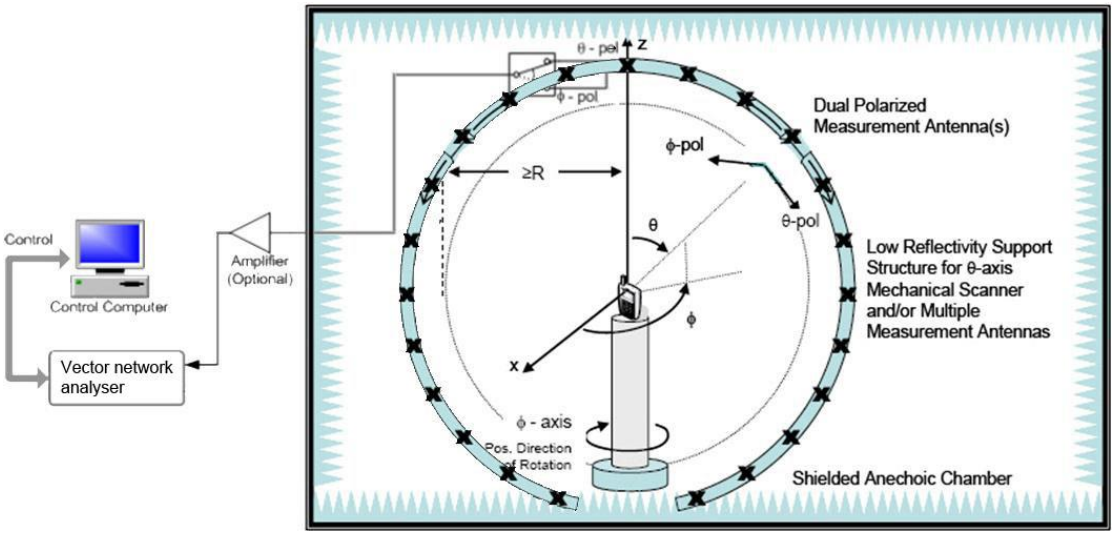
Environment Parameter	Selected Values During Tests			
	Ambient Pressure(KPa)	Temperature(℃)	Voltage	Relative Humidity (%)
Normal Temperature, Normal Voltage (NTNV)	101	25	N/A	50

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Multi-probe Antenna Measurement System	SATIMO	SG24-L	1101855-0001	2021.11.12	2024.11.11
Vector Network Analyzer	Agilent	E5071B	MY42404001	2022.04.02	2023.04.01
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



ANNEX A TEST RESULTS

A.1 Gain and Efficiency

1#

Frequency	Gain (dBi)	Efficiency (%)
2400MHz	**1.72**	**47**
2410MHz	1.51	47
2420MHz	1.13	45
2430MHz	0.85	45
2440MHz	0.88	46
2450MHz	1.18	47
2460MHz	1.03	46
2470MHz	1.03	46
2480MHz	0.83	47

2#

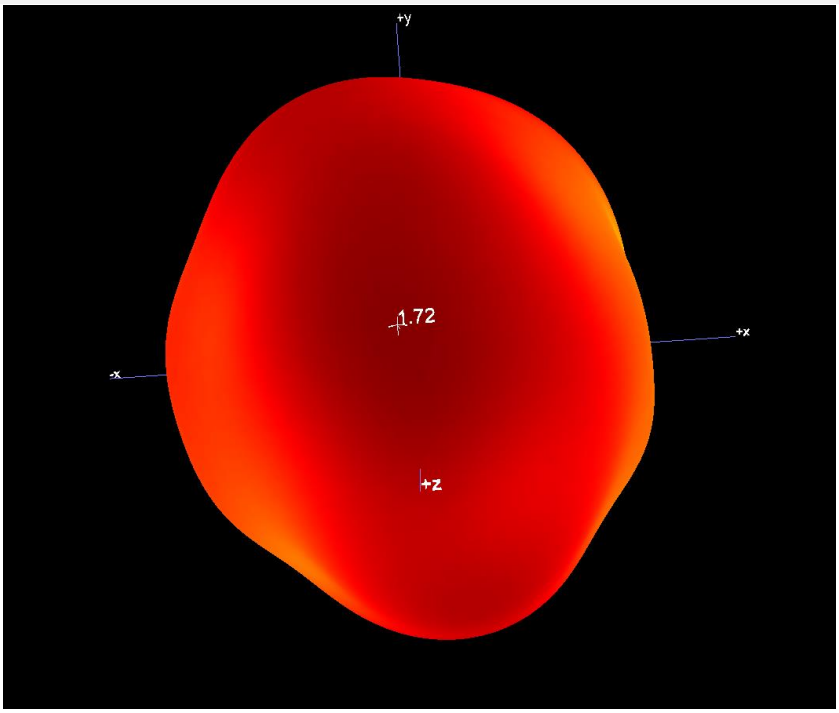
Frequency	Gain (dBi)	Efficiency (%)
2400MHz	-5.34	7
2410MHz	-5.12	7
2420MHz	-4.87	7
2430MHz	**-4.86**	7
2440MHz	-5.13	7
2450MHz	-5.08	7
2460MHz	-5.00	7
2470MHz	-4.88	**8**
2480MHz	-4.92	7

ANNEX B RADIATION PATTERN

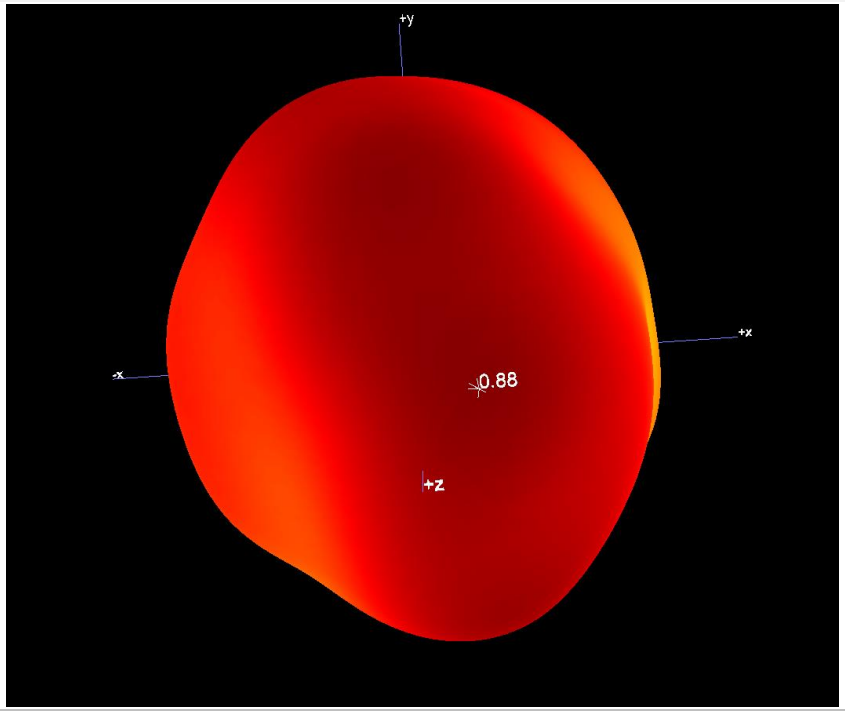
B.1 3D Pattern

1#

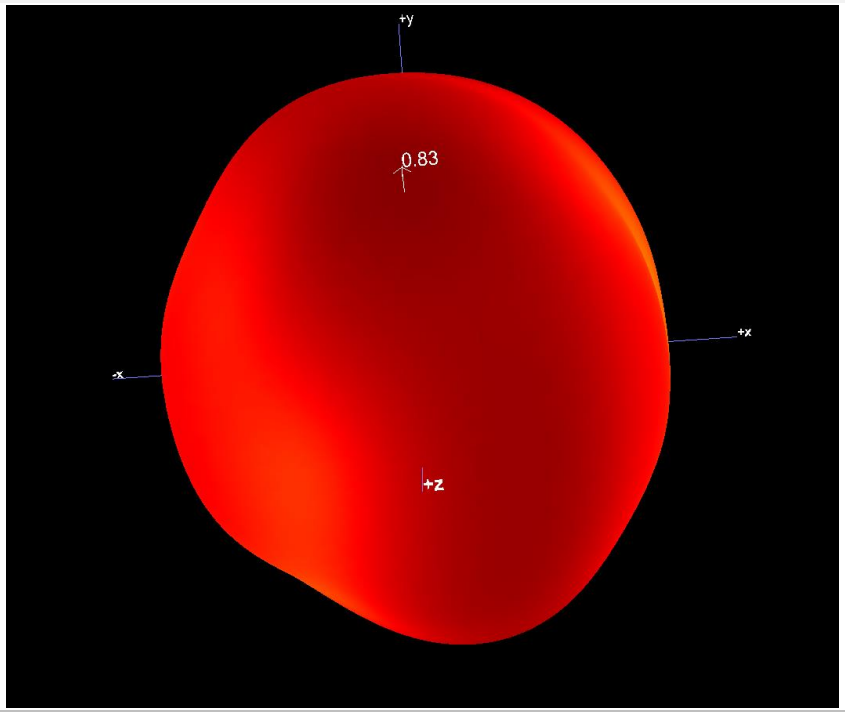
B1.1 3D Pattern for 2400MHz



B1.2 3D Pattern for 2440MHz

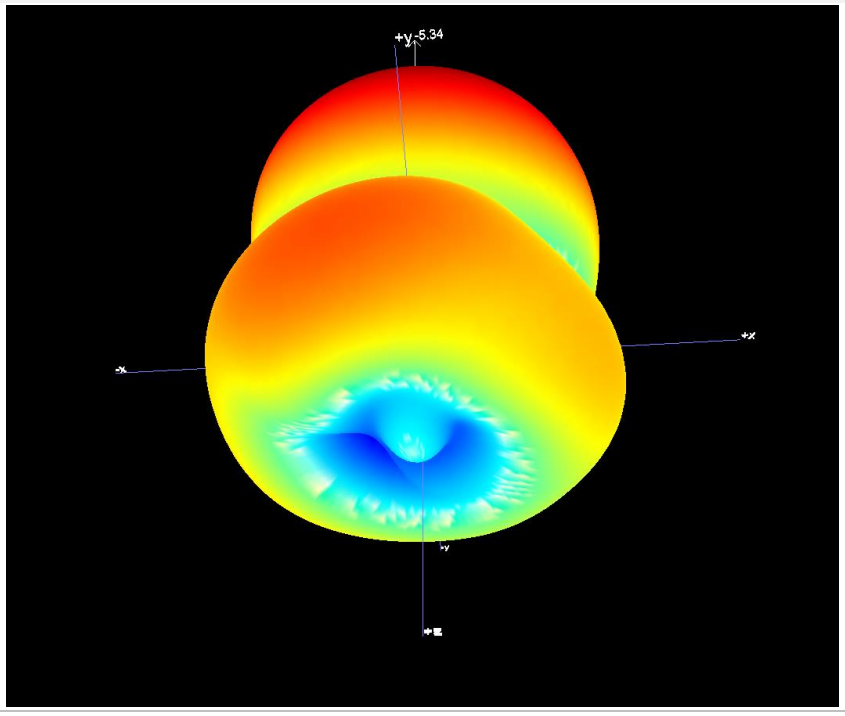


B1.3 3D Pattern for 2480MHz

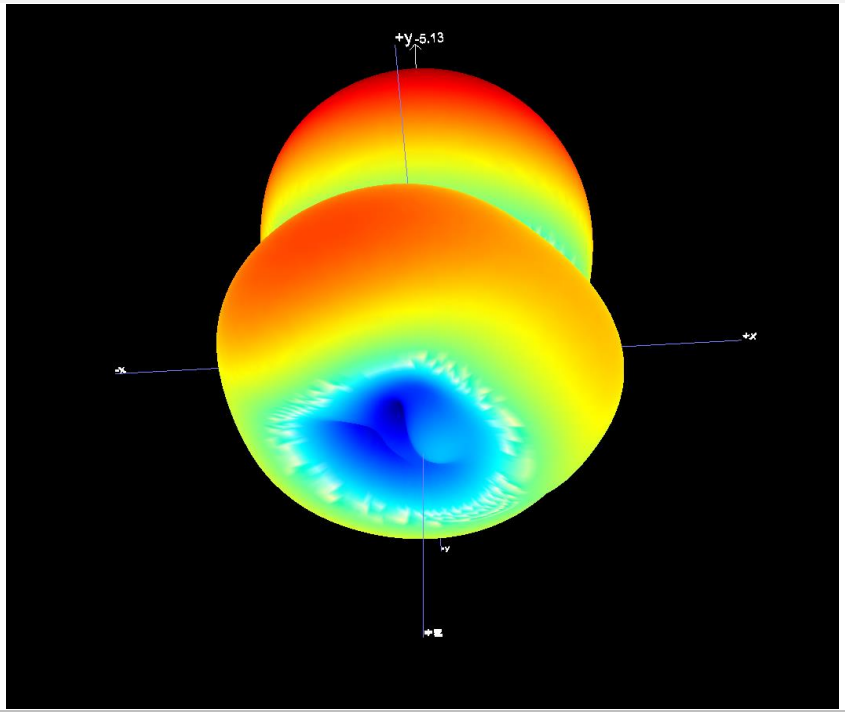


2#

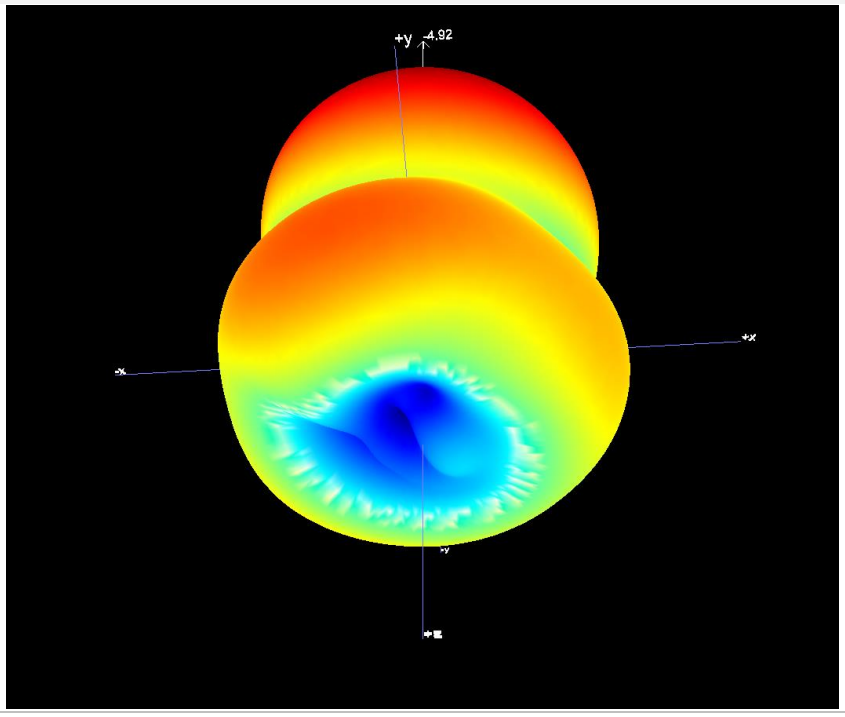
B1.4 3D Pattern for 2400MHz



B1.5 3D Pattern for 2440MHz



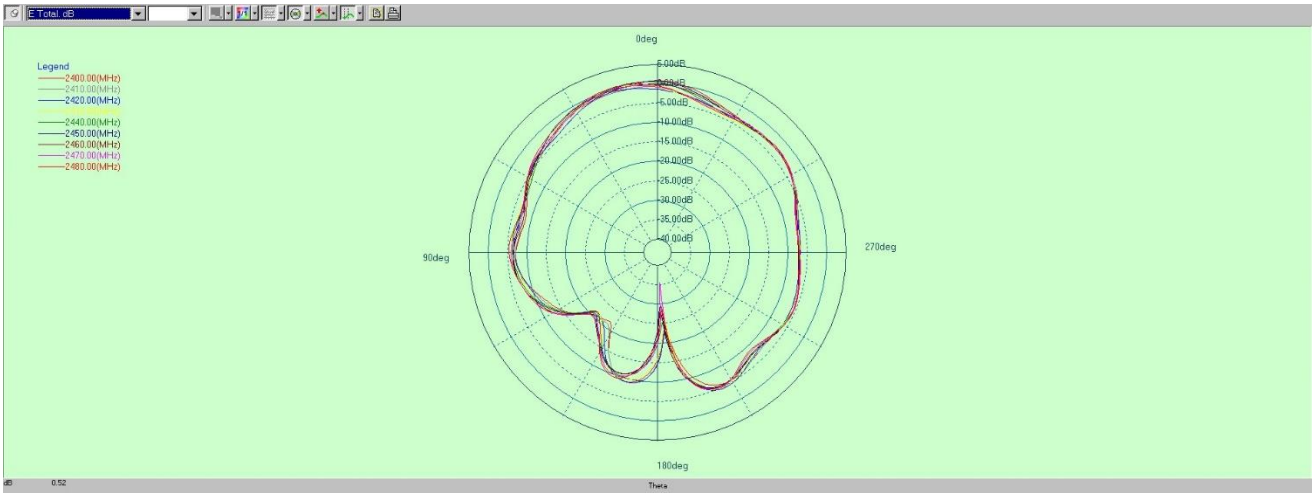
B1.6 3D Pattern for 2480MHz



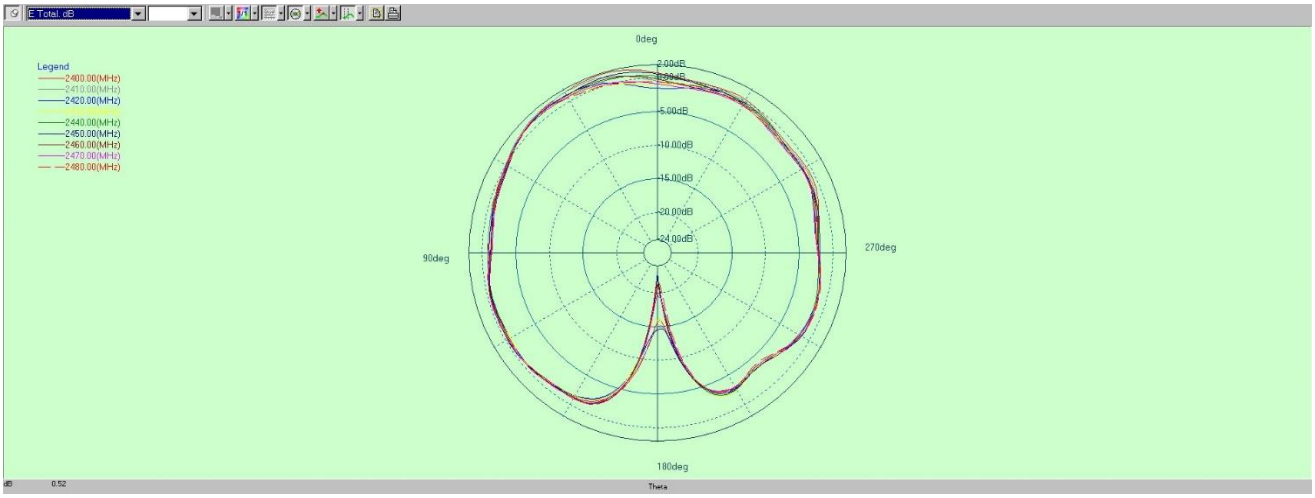
B.2 1D Radiation Pattern

1#

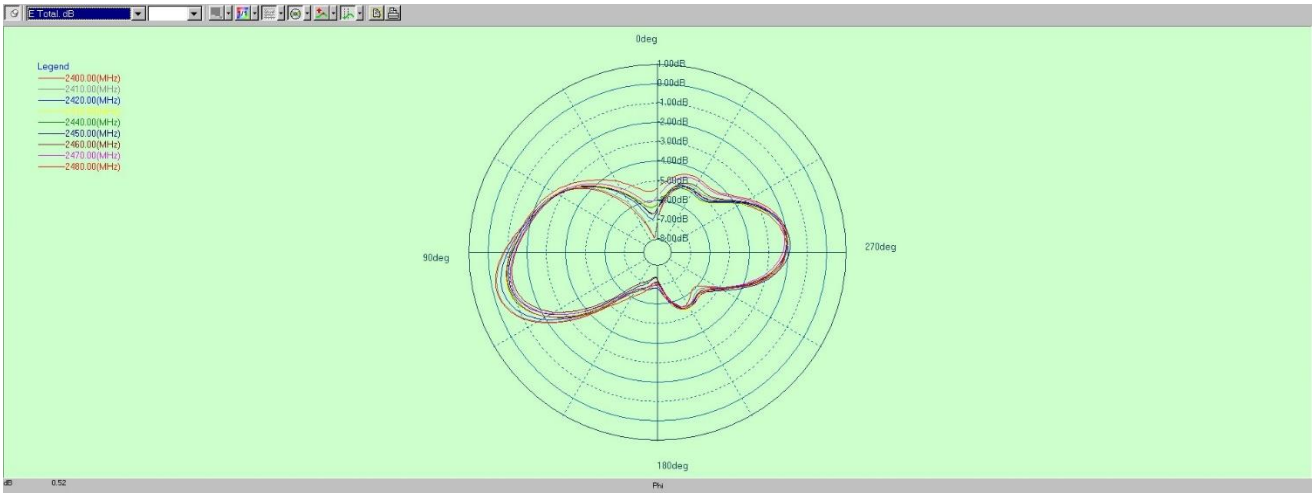
B2.1 PHI=0



B2.2 PHI=90

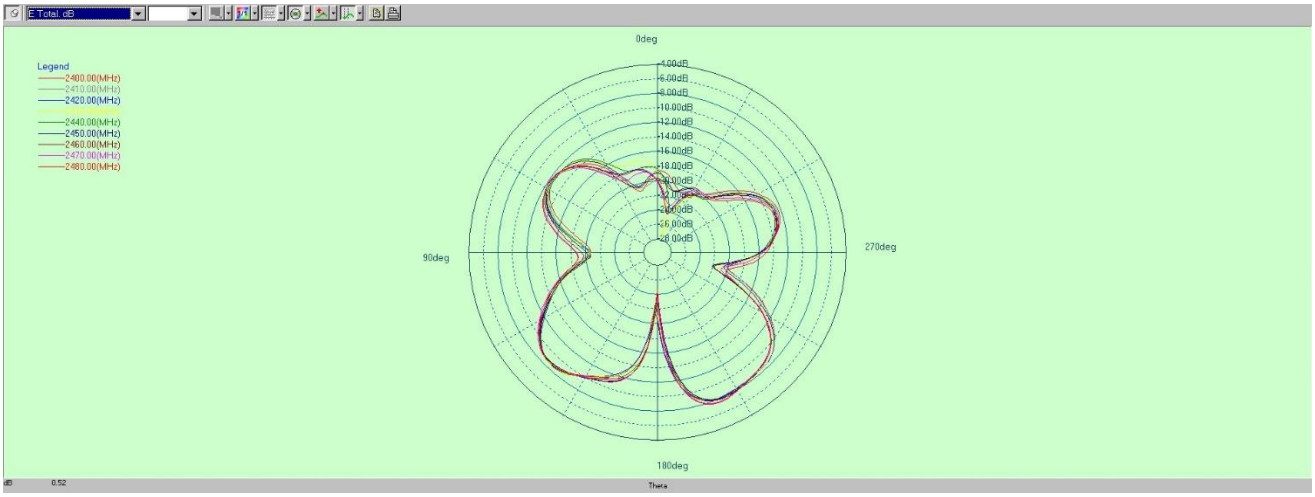


B2.3 THETA=90

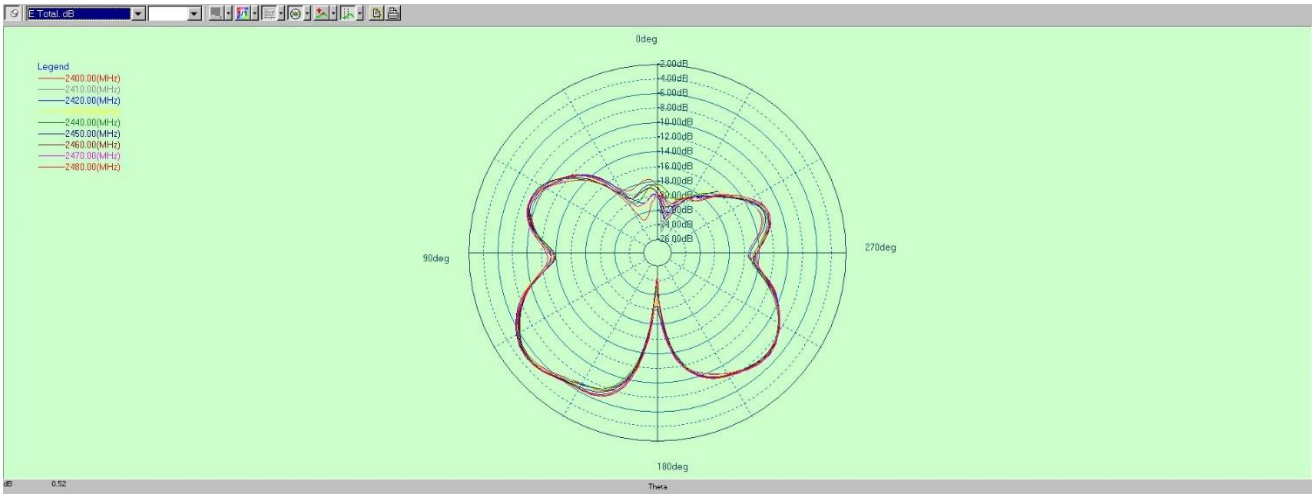


2#

B2.4 PHI=0



B2.5 PHI=90



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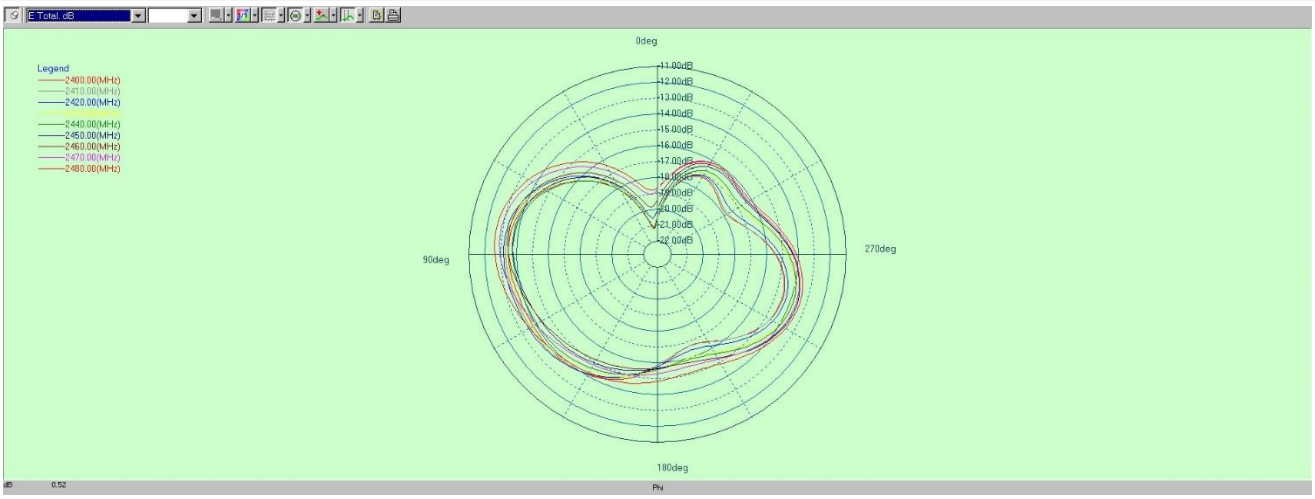
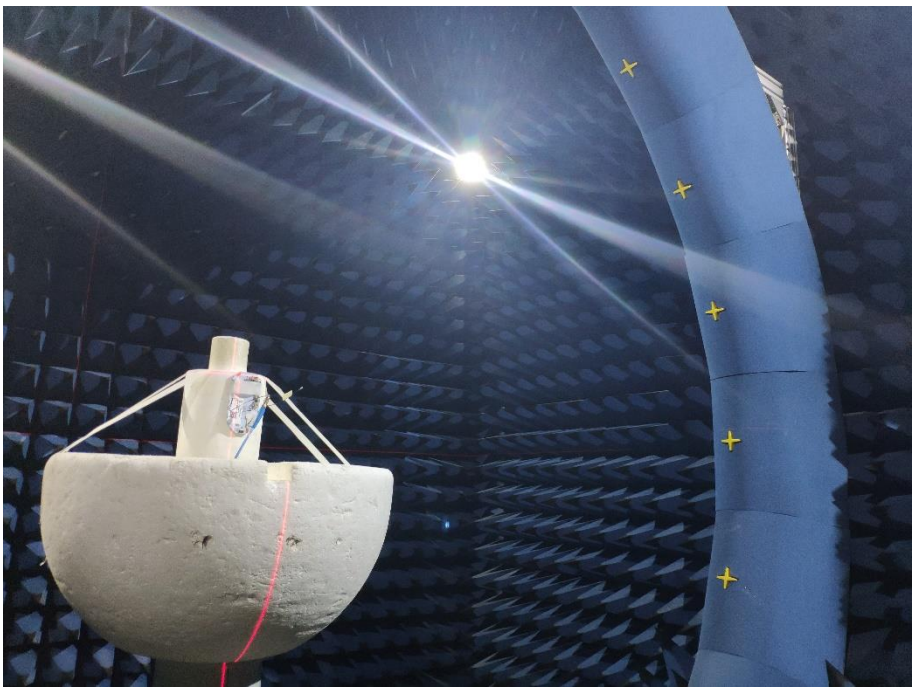
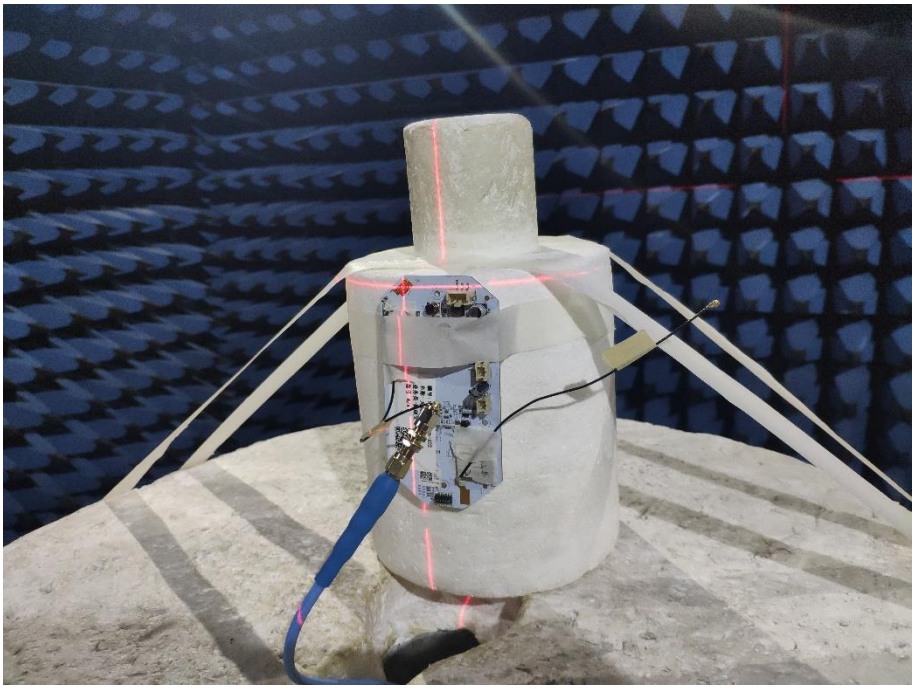


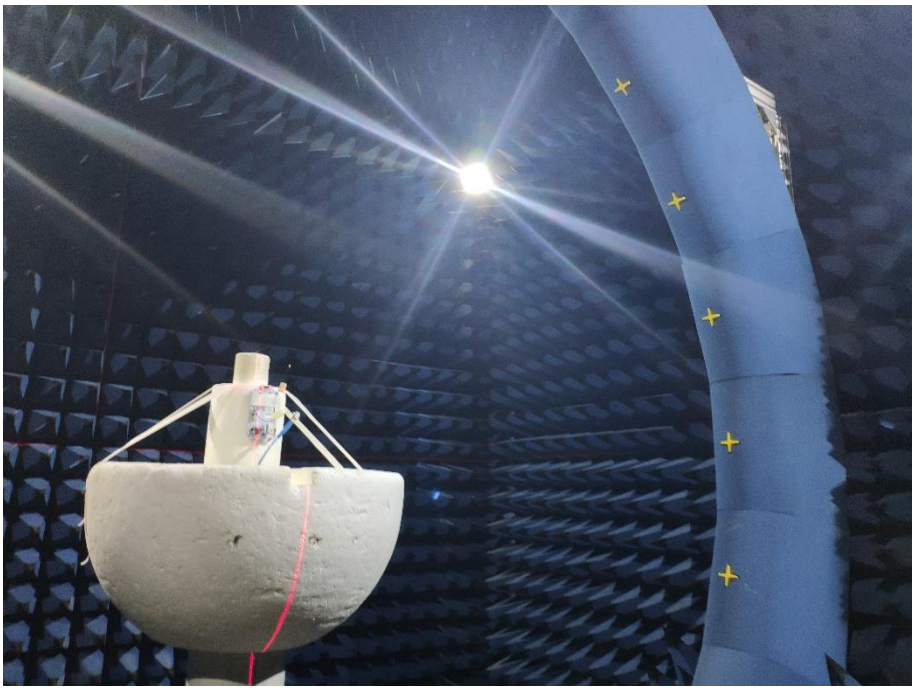
ANNEX C TEST SETUP PHOTO

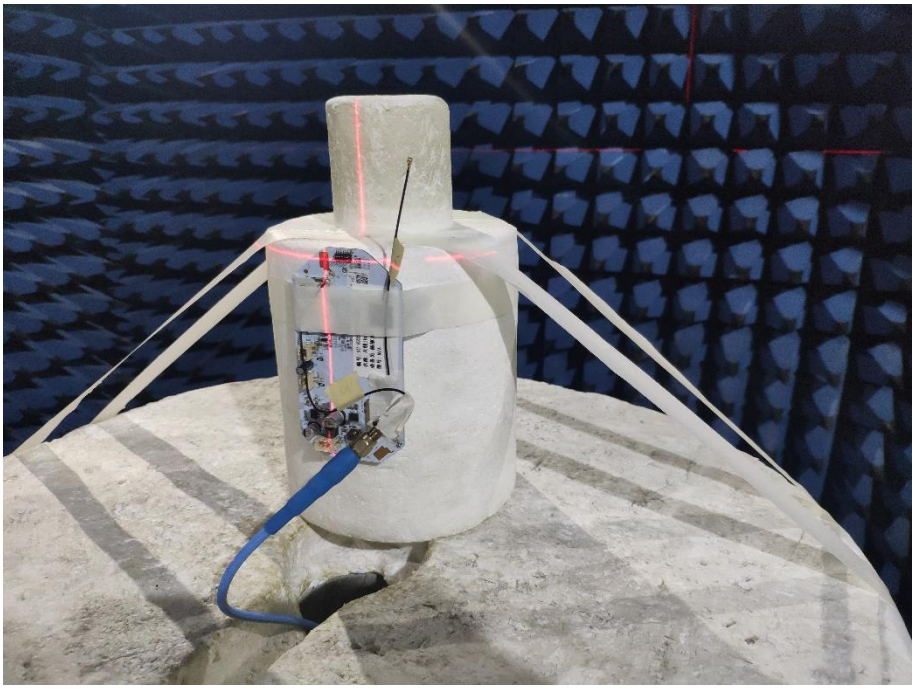
1#





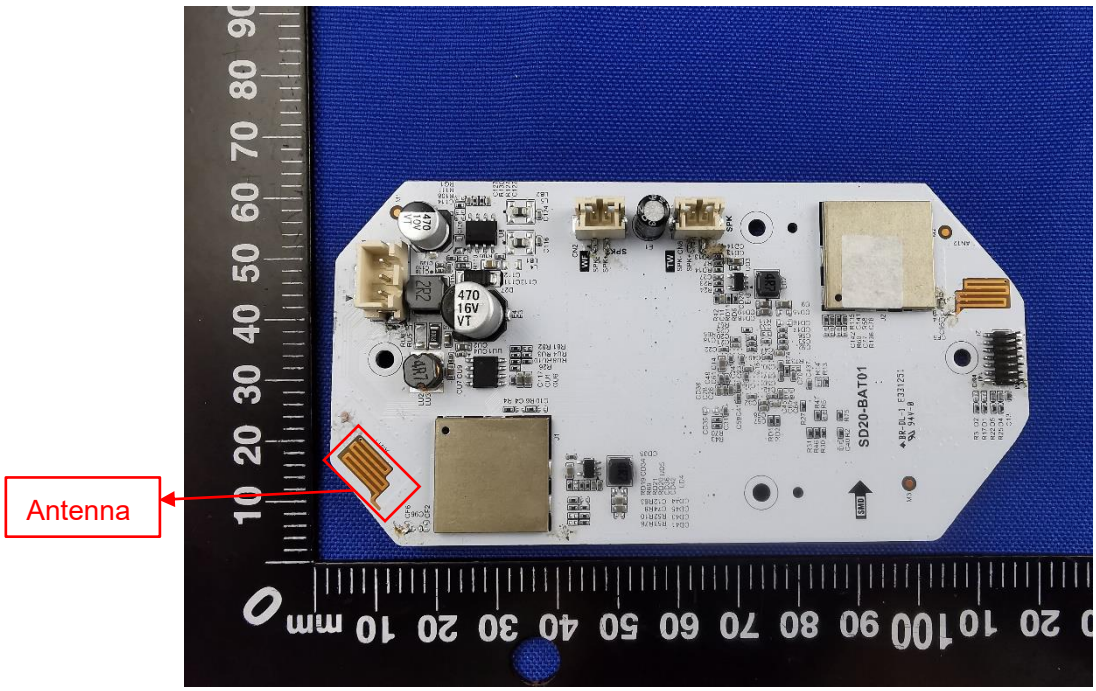
2#





ANNEX D EUT PHOTO

1#



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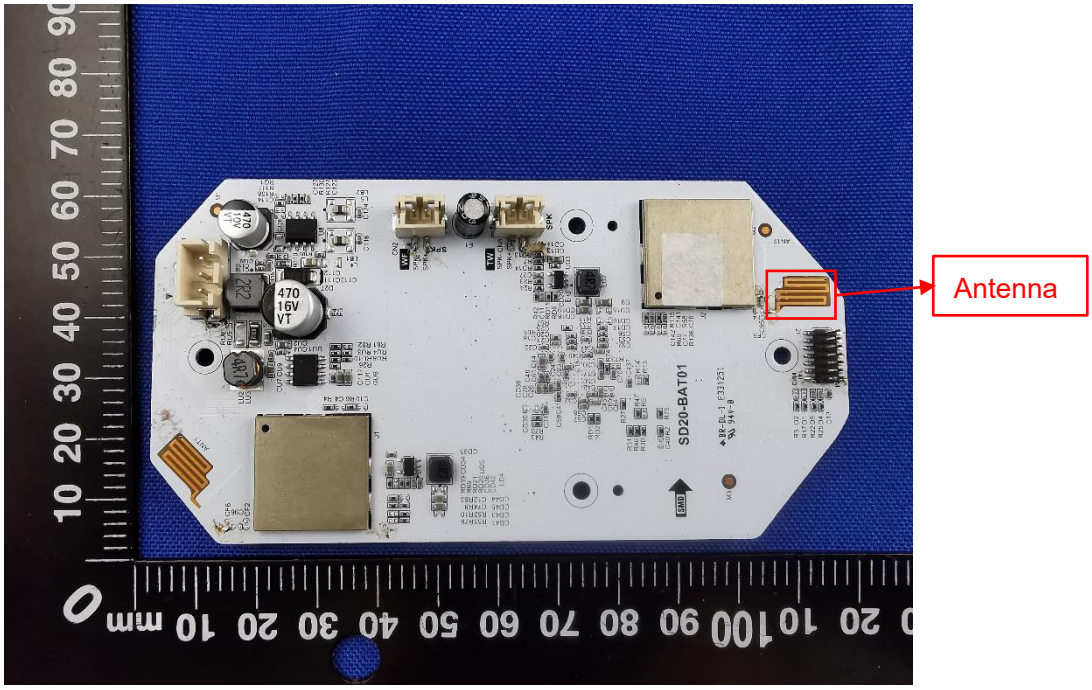

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