

TEST REPORT

Applicant: Fab-Chain Service Co., Ltd.
Address: 5th Floor, Building A, ChuangJian industrial Park,
Yingrenshi, ShiYan BaoAn, Shenzhen, Guangdong,
P.R. China
Equipment Type: PCB Antenna
Model Name: Fuji
Brand Name: Aspirer
Test Standard: IEEE Std 149-2021
Sample Arrival Date: Jul. 09, 2025
Test Date: Jul. 09, 2025
Date of Issue: Aug. 04, 2025

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Mai Jintian

Checked by: Xia Long

Approved by: Sunny Zou
(Technical Director)

Mai Jintian

Xia Long

Sunny Zou

Revision History		
Version	Issue Date	Revisions
<u>Rev. 01</u>	<u>Aug. 04, 2025</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	<input checked="" type="checkbox"/> Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	<input type="checkbox"/> 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	Fab-Chain Service Co., Ltd.
Address	5th Floor, Building A, ChuangJian industrial Park, Yingrenshi, ShiYan BaoAn, Shenzhen, GuangDong, P.R. China
Contact Person	Yang Lin
Telephone Number	18617003076

2.2 Manufacturer Information

Manufacturer	N/A
Address	N/A

2.3 General Description for Equipment under Test (EUT)

EUT Name	PCB Antenna
Model Name Under Test	Fuji
Antenna Type	PCB Antenna
Dimensions	10.5*4 mm

2.4 Ancillary Equipment

Note: Not applicable.

2.5 Technical Information

Frequency Range	2400MHz ~ 2500MHz
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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 A.3	Return Loss	--
ANNEX A.4	Input impedance	--
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

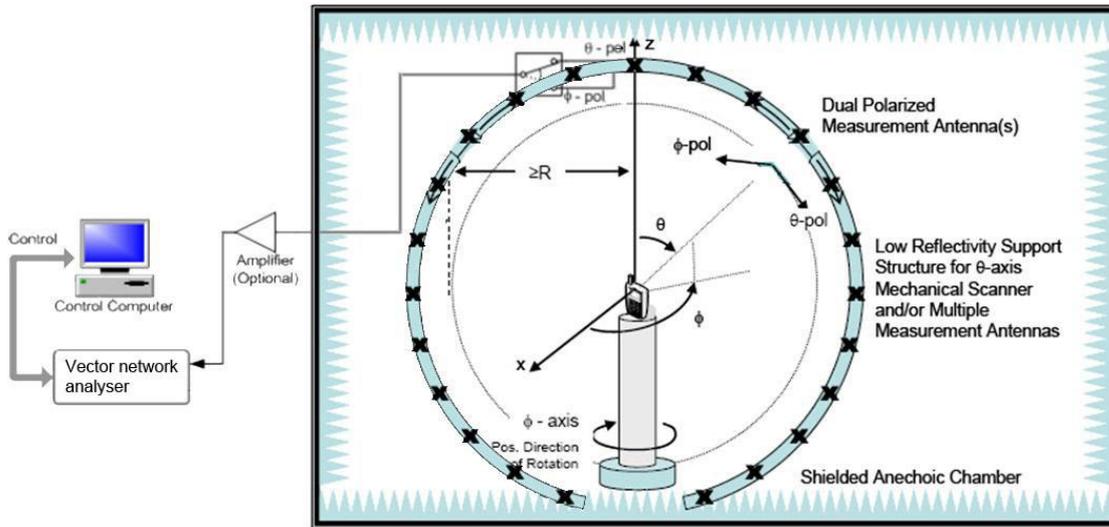
Environment Parameter	Selected Values During Tests			
	Ambient Pressure(KPa)	Temperature(°C)	Voltage	Relative Humidity (%)
Normal Temperature, Normal Voltage (NTNV)	100 to 102	21.8	N/A	47

4.2 Test Equipment List

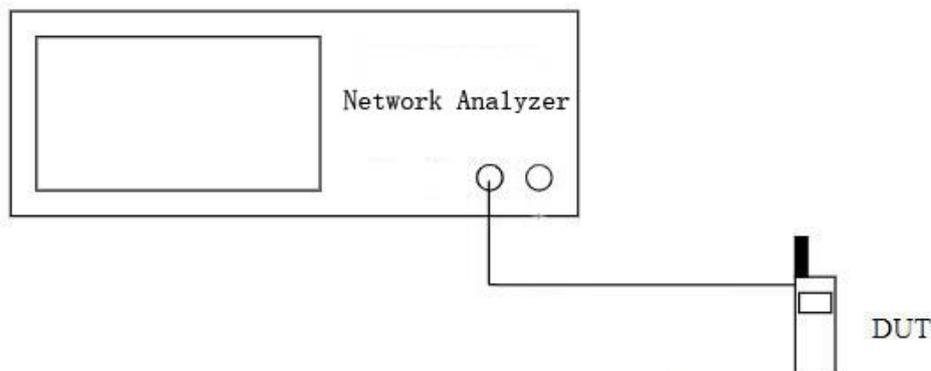
Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
SG24 Multi-probe Antenna Measurement System	SATIMO	SG24-L	1101855-0001	2024/11/11	2027/11/10
Vector Network Analyzer	Agilent	E5071B	MY42404001	2025/1/23	2026/1/22
Description	Manufacturer	Name		Version	
Test Software	MVG	SPM		V 1.8	

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

Test Frequencies	2400MHz, 2410MHz, 2420MHz, 2430MHz, 2440MHz, 2450MHz, 2460MHz, 2470MHz, 2480MHz, 2490MHz, 2500MHz
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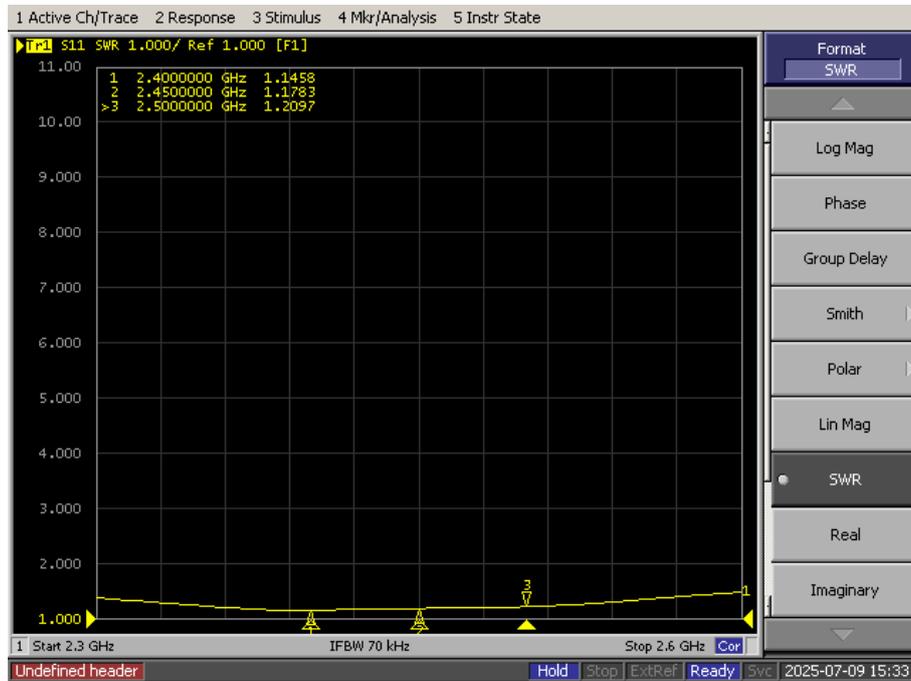
ANNEX A TEST RESULTS

A.1 Gain and Efficiency

Frequency	Gain (dBi)	Efficiency (%)
2400MHz	4.46	53
2410MHz	4.66	54
2420MHz	4.95	57
2430MHz	5.09	60
2440MHz	5.01	61
2450MHz	5.18	61
2460MHz	5.43	64
2470MHz	5.47	65
2480MHz	5.62	67
2490MHz	5.66	67
2500MHz	5.53	68

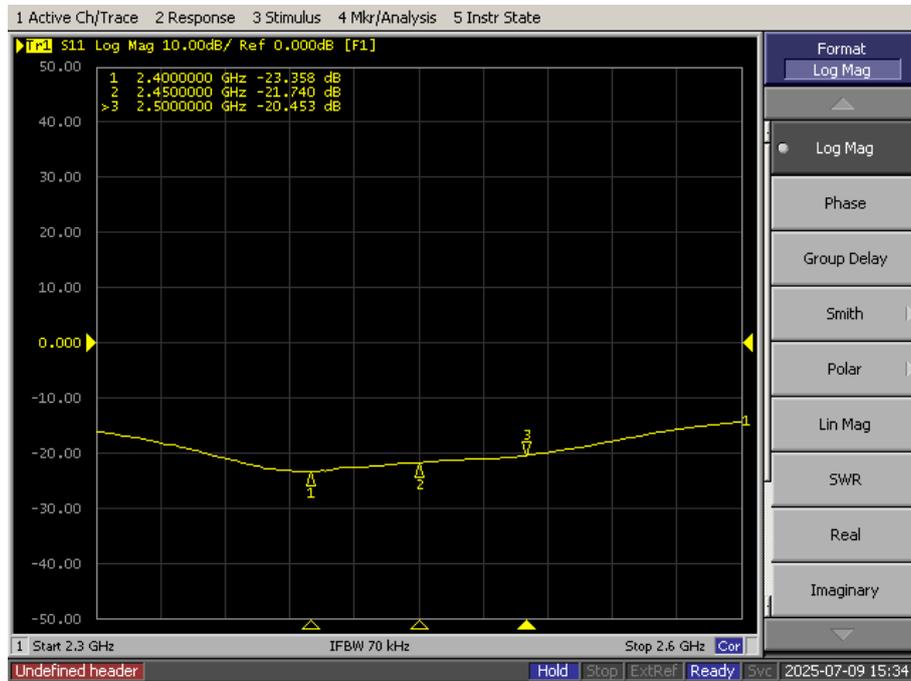
A.2 VSWR

Frequency	VSWR
2400MHz	1.15
2450MHz	1.18
2500MHz	1.21



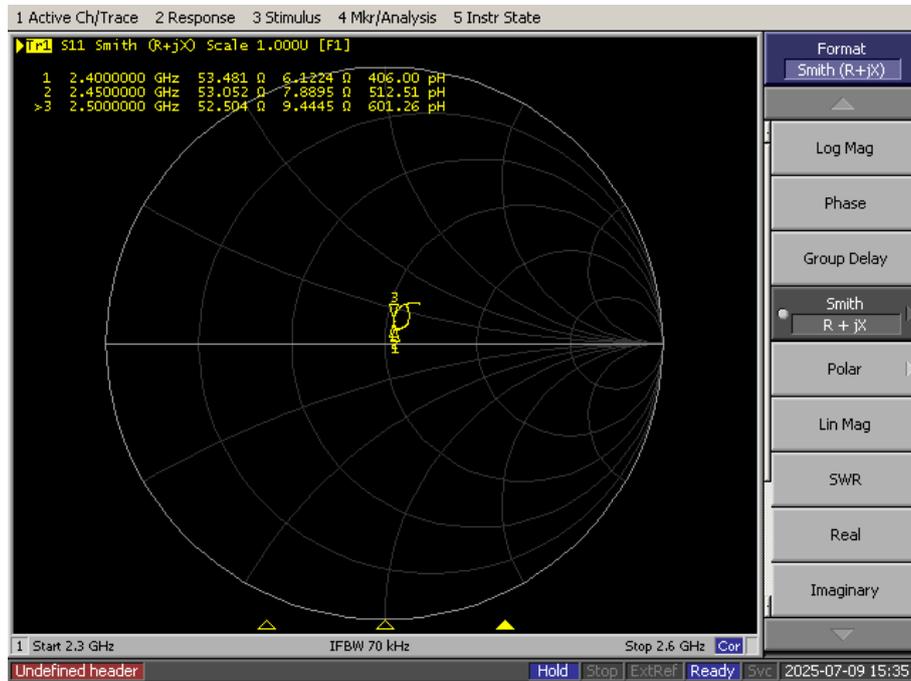
A.3 Return Loss

Frequency	Return Loss(dB)
2400MHz	-23.36
2450MHz	-21.74
2500MHz	-20.45



A.4 Input Impedance

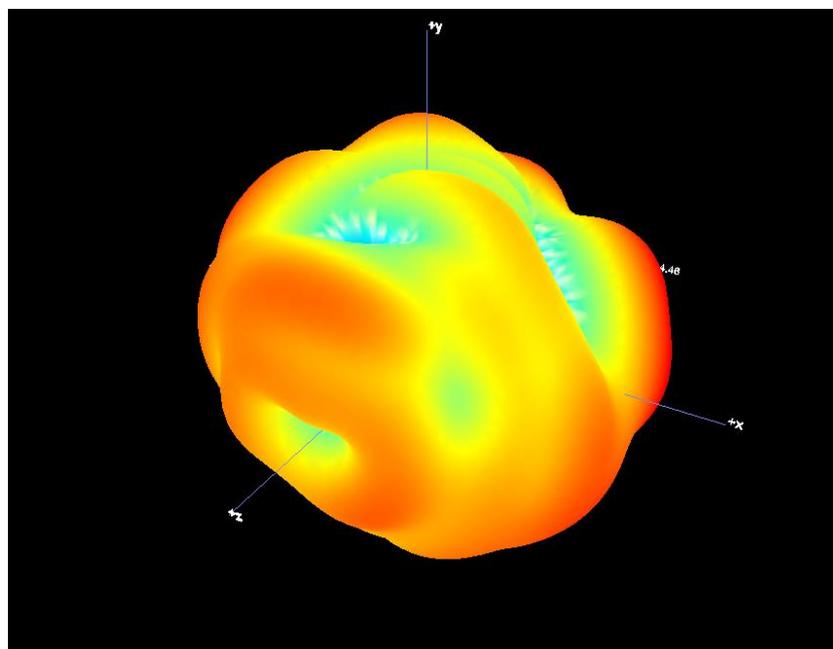
Frequency	Input impedance (Ω)
2400MHz	53.48
2450MHz	53.05
2500MHz	52.50



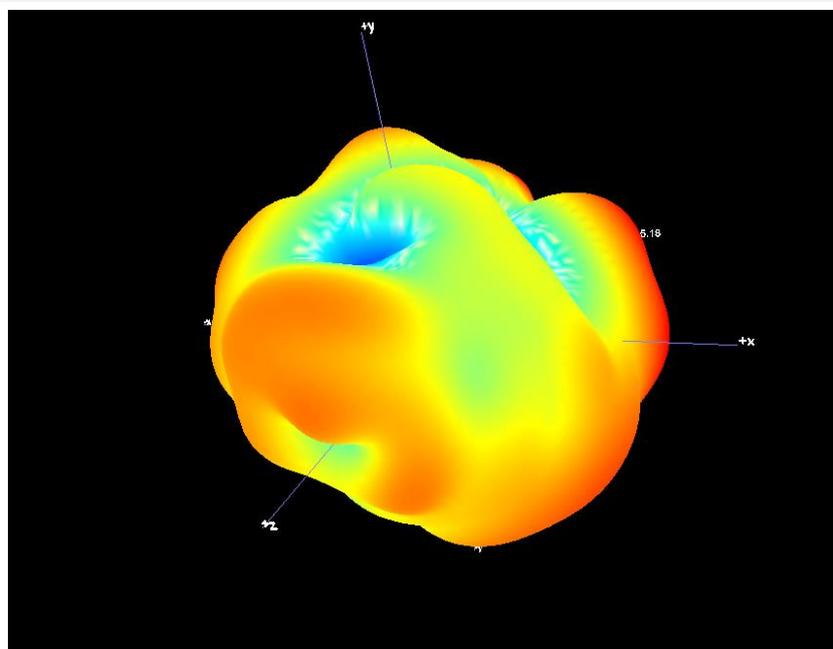
ANNEX B RADIATION PATTERN

B.1 3D Pattern

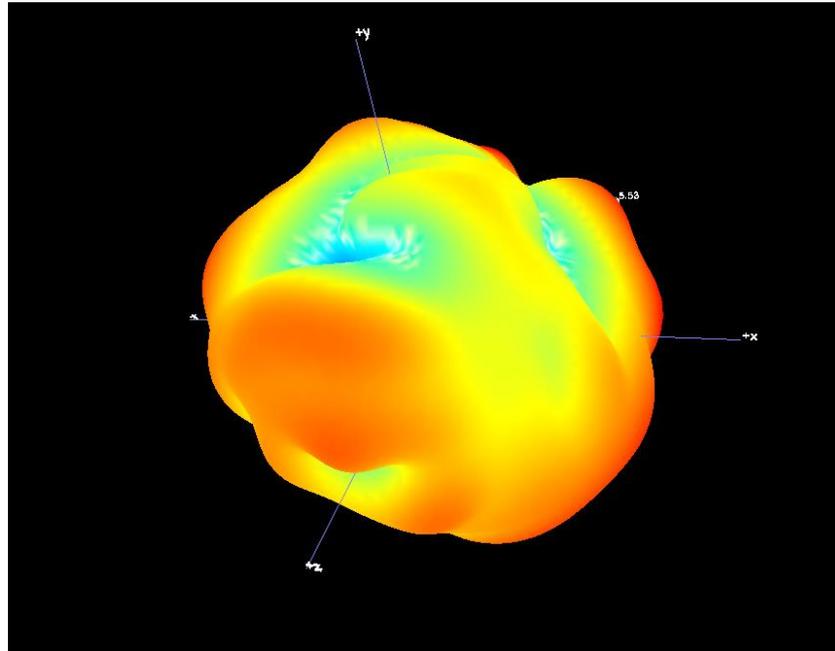
B1.1 3D Pattern for 2400MHz



B1.2 3D Pattern for 2450MHz

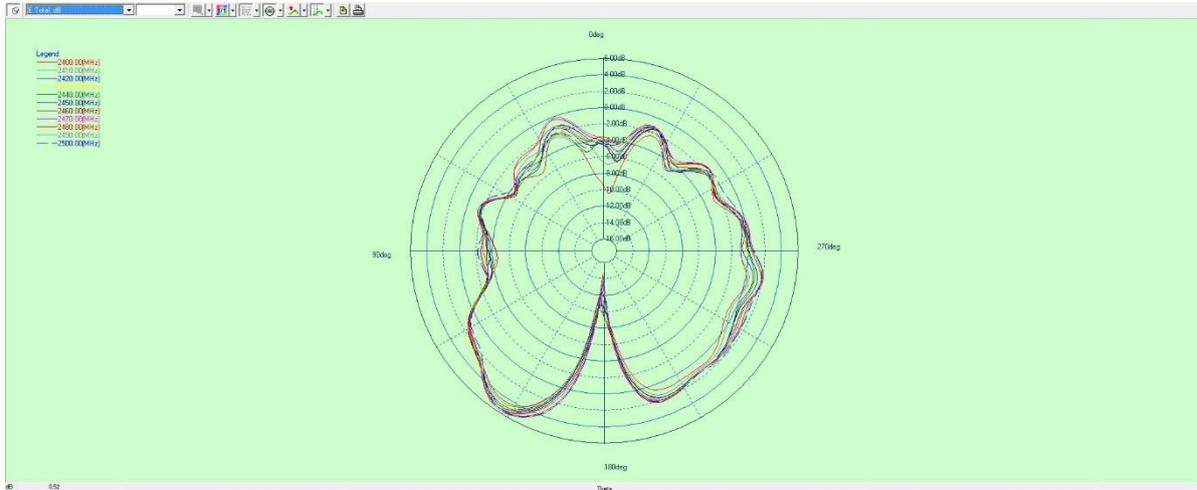


B1.3 3D Pattern for 2500MHz

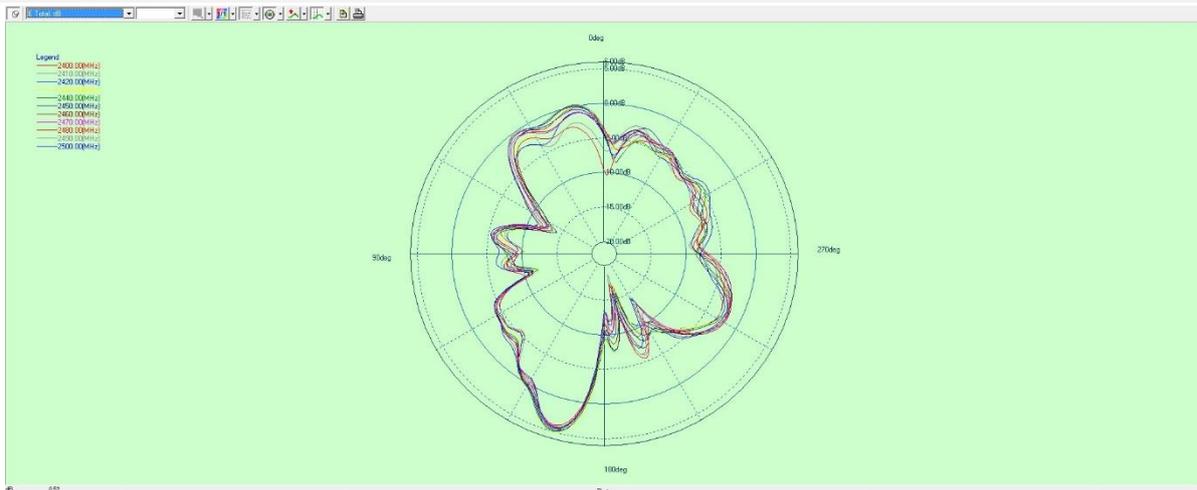


B.2 1D Radiation Pattern

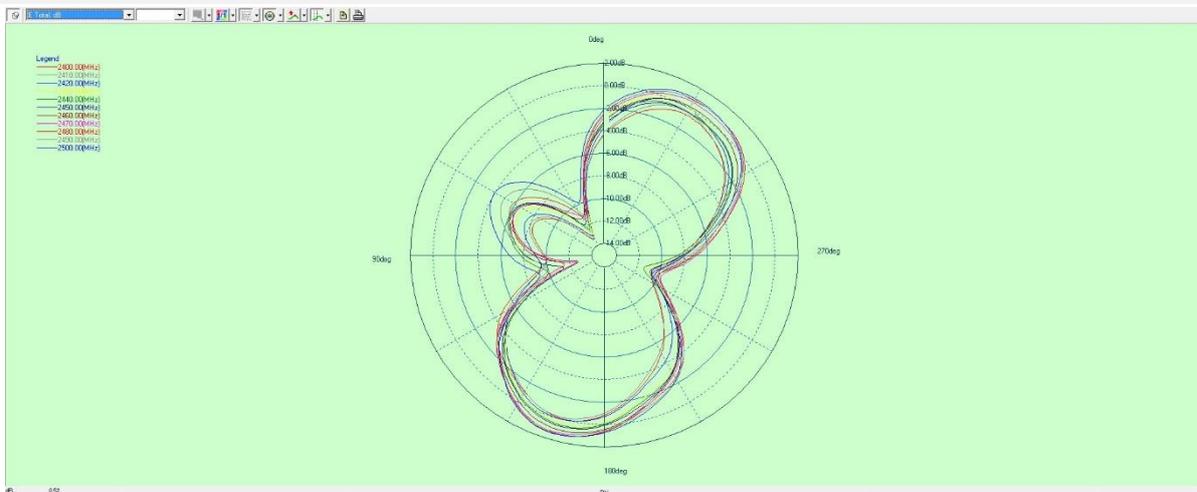
B.2.1 PHI=0



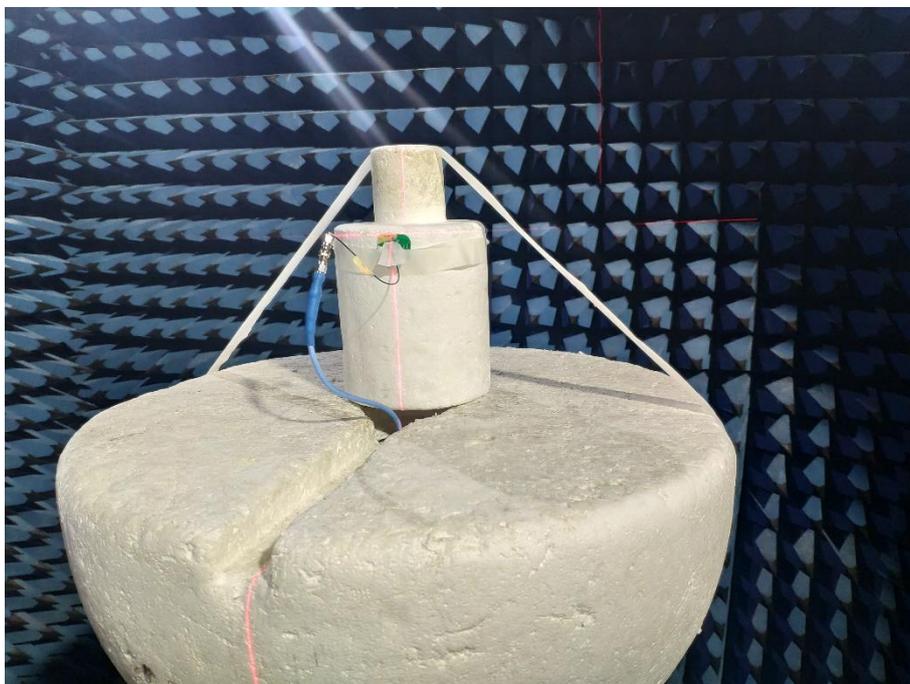
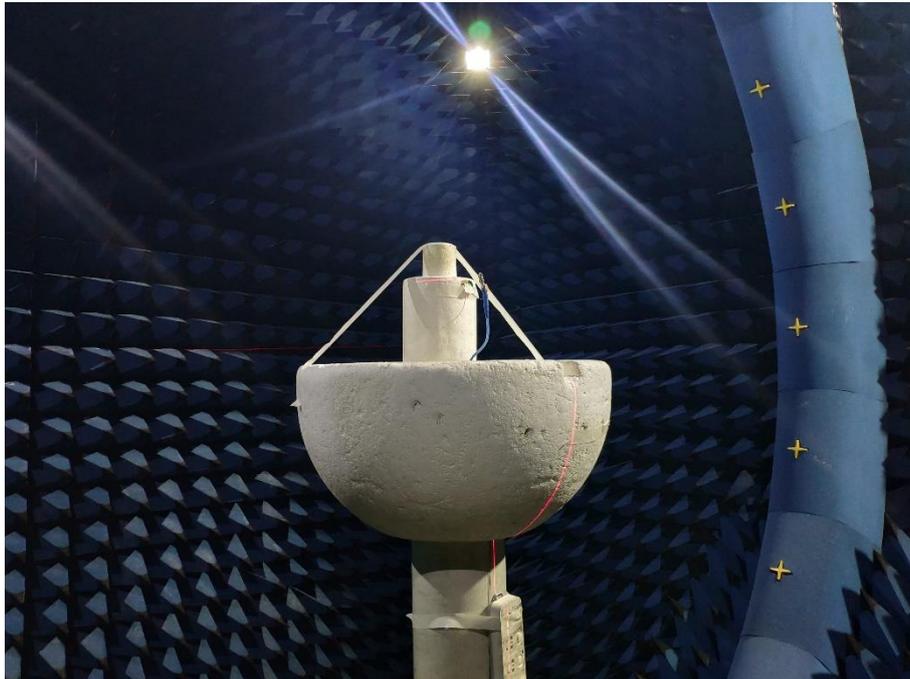
B.2.2 PHI=90



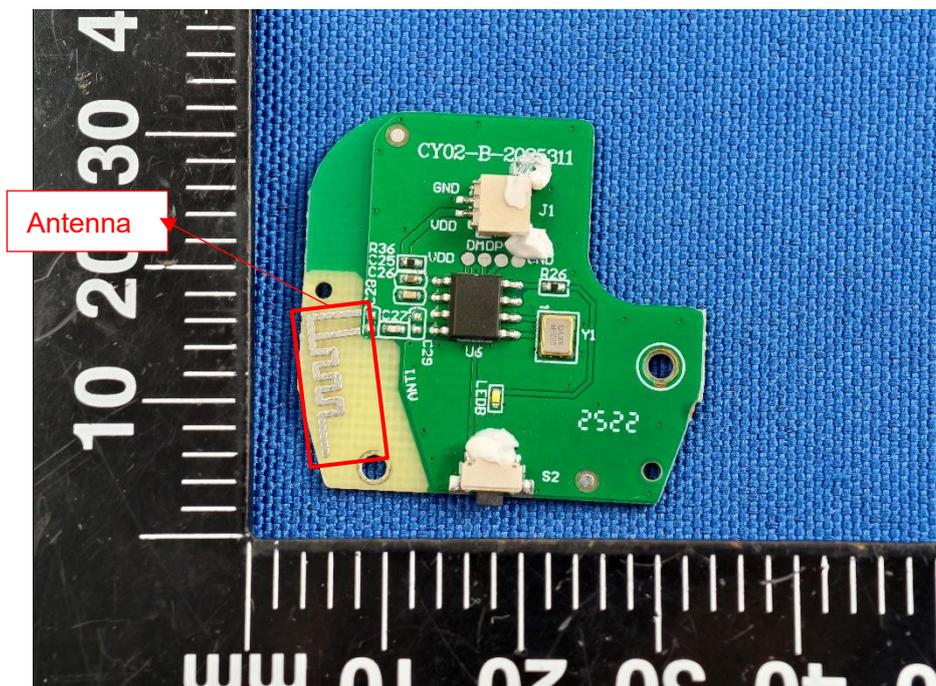
B.2.3 THETA=90



ANNEX C TEST SETUP PHOTO



ANNEX D EUT PHOTO



Statement

1. The laboratory guarantees the scientificity, accuracy and impartiality of the test, and is responsible for all the information in the report, except the information provided by the customer. The customer is responsible for the impact of the information provided on the validity of the results.
2. The report without China inspection body and laboratory Mandatory Approval (CMA) mark has no effect of proving to the society.
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4. This report is invalid if it is altered, without the signature of the testing and approval personnel, or without the "inspection and testing dedicated stamp" or test report stamp.
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7. Any objection shall be raised to the laboratory within 30 days after receiving the report.

--END OF REPORT--