ANTENNA TEST REPORT

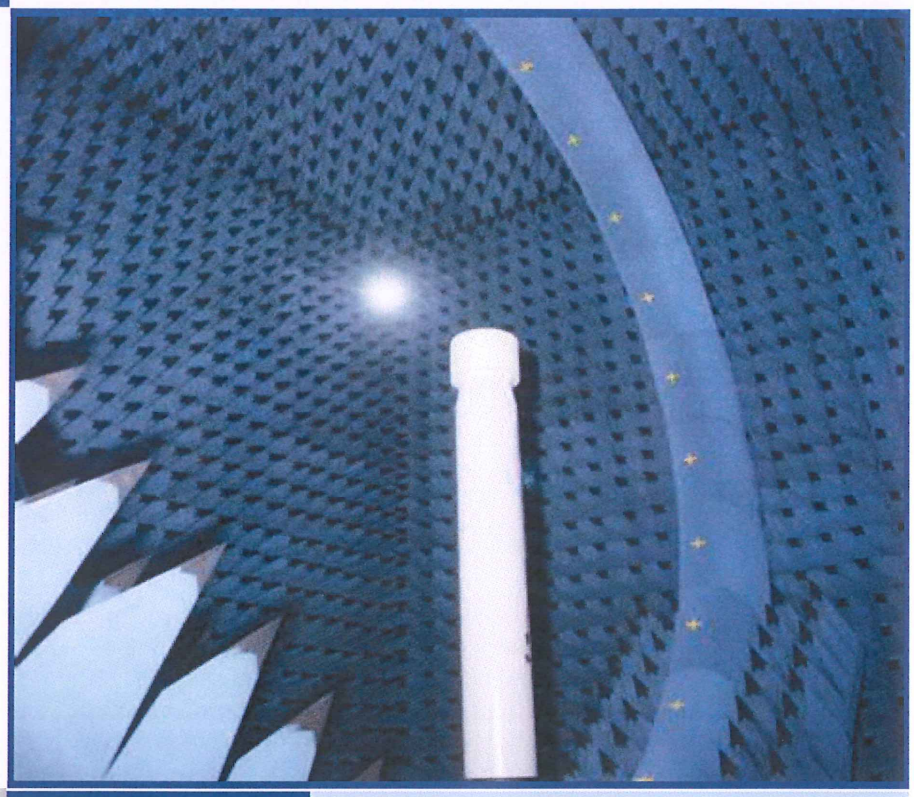
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

mouse module

ISSUED TO
SHENZH BOYCHUANG TECHNOLOGY CO., LTD

Room 407-408, skyworth semiconductor building, no.18, gaoxin south 4th road, nanshan district, shenzhen



Report No:	BL-SZ1998167-901
EUT Name:	mouse module
Model Name:	HS6210
Brand Name:	N/A
Test Standard:	IEEE149-1979
Maximum:	Gain: -4.62 (dBi) Efficiency: 11%
Test Date:	Sep. 20, 2019
Date of Issue:	Sep. 27, 2019

Tested by: Zong Liyao
Zong Liyao
(Engineer)
Date Sep. 27, 2019

Approved by:
Wei Yanquan
(Chief Engineer)
Date Sep. 27. 2019

NOTE: This test report of test results only related to the testing samples, which can be duplicated completely for the legal use with the approval of the applicant; it shall not be reproduced except in full, without the written approval of Shenzhen BALUN Technology Co., Ltd. Any objections should be raised within thirty days from the date of issue. To validate the report, please visit BALUN website.

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Revision History

Version	Issue Date	Revisions
Rev. 01	Sep. 27, 2019	Initial Issue

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1 Administrative Data (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

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

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791. The laboratory is a testing organization accredited by China Metrology Accreditation (CMA). The accreditation certificate number is 2017192290Z.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	19℃ to 25℃
Ambient Relative Humidity	45% to 55%
Ambient Pressure	100 kPa to 102 kPa

1.4 Announce

(1) The test report reference to the report template version v2.2.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	SHENZH BOYCHUANG TECHNOLOGY CO., LTD
Address	Room 407-408, skyworth semiconductor building, no.18, gaoxin south 4th road, nanshan district, shenzhen
Contact Person	QIAN.YI
Telephone Number	13612864217
E-mail Address	qian.yi@huntersun.com.cn

2.2 Manufacturer Information

Manufacturer	SHENZH BOYCHUANG TECHNOLOGY CO., LTD
Address	Room 407-408, skyworth semiconductor building, no.18, gaoxin south 4th road, nanshan district, shenzhen

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	mouse module
Model Name Under Test	HS6210
Antenna Type	PCB Antenna
Dimensions	12mm * 6mm

2.5 Ancillary Equipment

Note: Not applicable.

2.6 Technical Information

Frequency Range	2402MHz ~ 2480MHz
Test Frequencies	2402MHz, 2441MHz, 2480MHz

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	IEEE149-1979	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)	±0.2
Gain	±0.5dB

4 GENERAL TEST CONFIGURATIONS

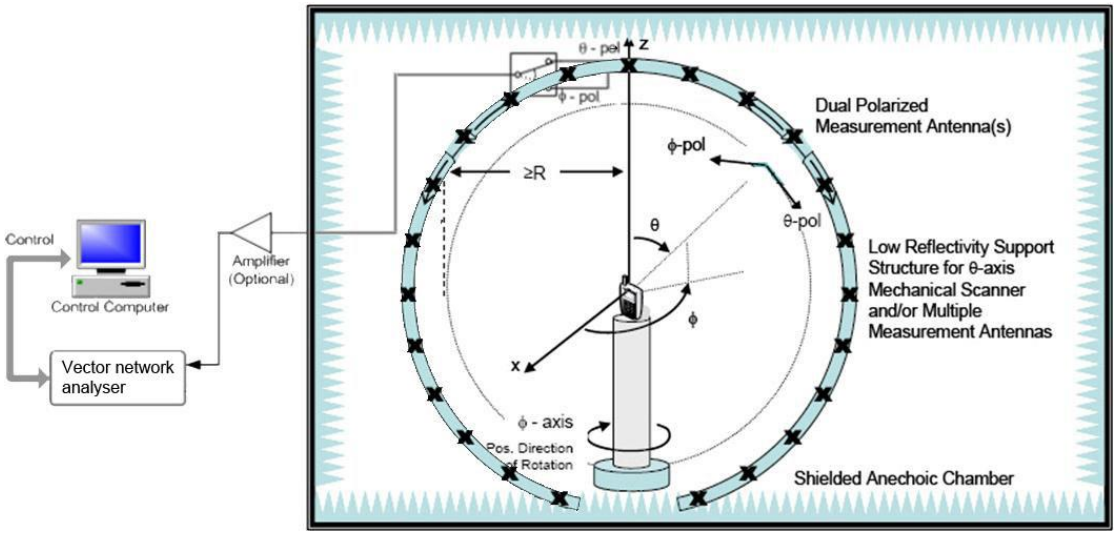
4.1 Test Condition

Environment Parameter	Selected Values During Tests			
	Ambient Pressure(KPa)	Temperature(℃)	Voltage	Relative Humidity (%)
Normal Temperature, Normal Voltage (NTNV)	100 to 102	19 to 25	N/A	45 to 55

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
Vector Network Analyzer	Agilent	E5071C	MY46103472	2019.02.28	2020.02.27
SG24 Multi-probe Antenna Measurement System	SATIMO	SG24-L	1101855-0001	2018.06.22	2020.06.21

4.3 Test Setup



ANNEX A TEST RESULTS

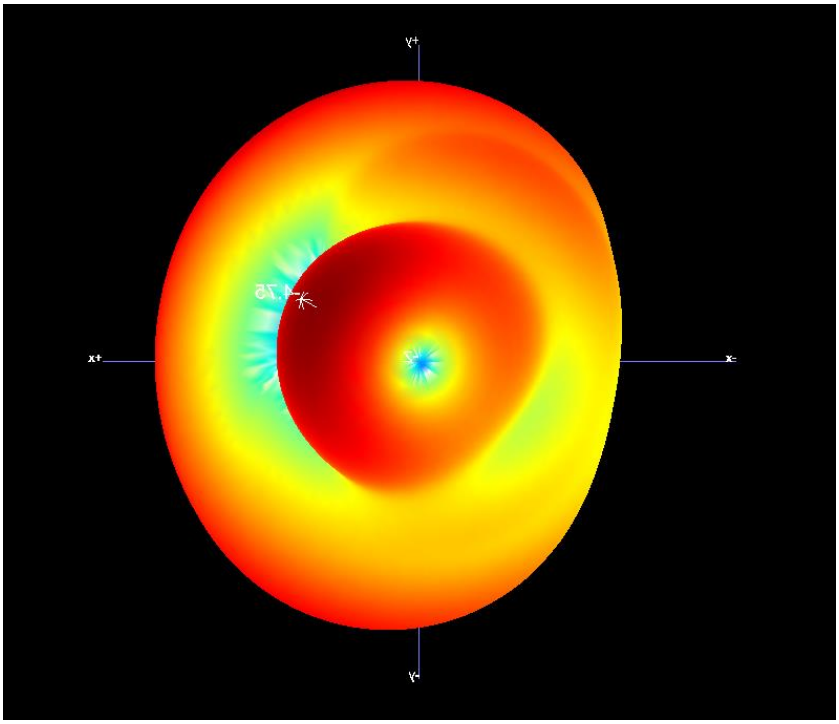
A.1 Gain and Efficiency

Frequency	Gain (dBi)	Efficiency (%)
2402MHz	-4.75	11
2441MHz	-5.51	11
2480MHz	-4.62	10

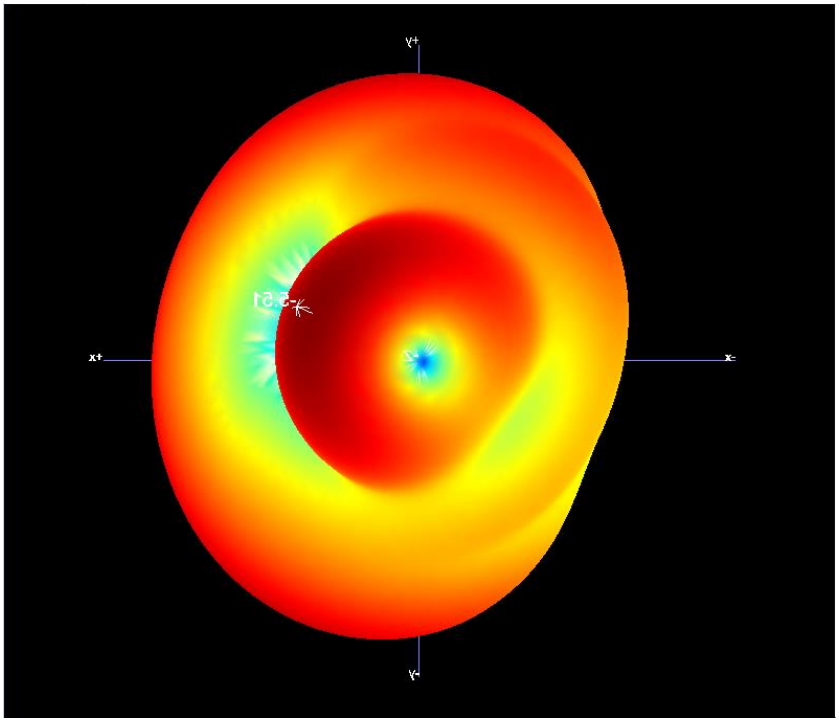
ANNEX B RADIATION PATTERN

B.1 3D Pattern

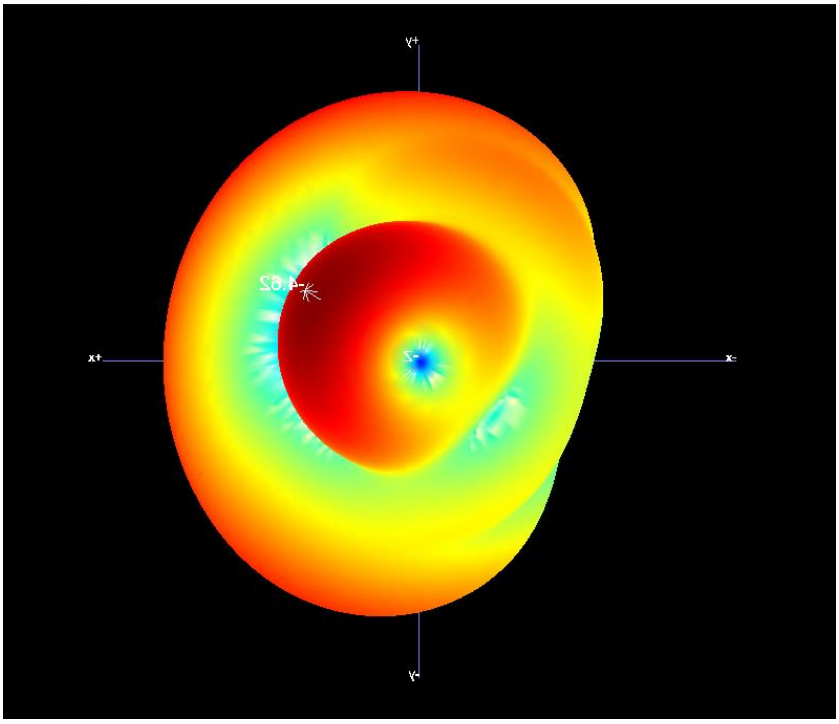
B1.1 3D Pattern for 2402MHz



B1.2 3D Pattern for 2441MHz

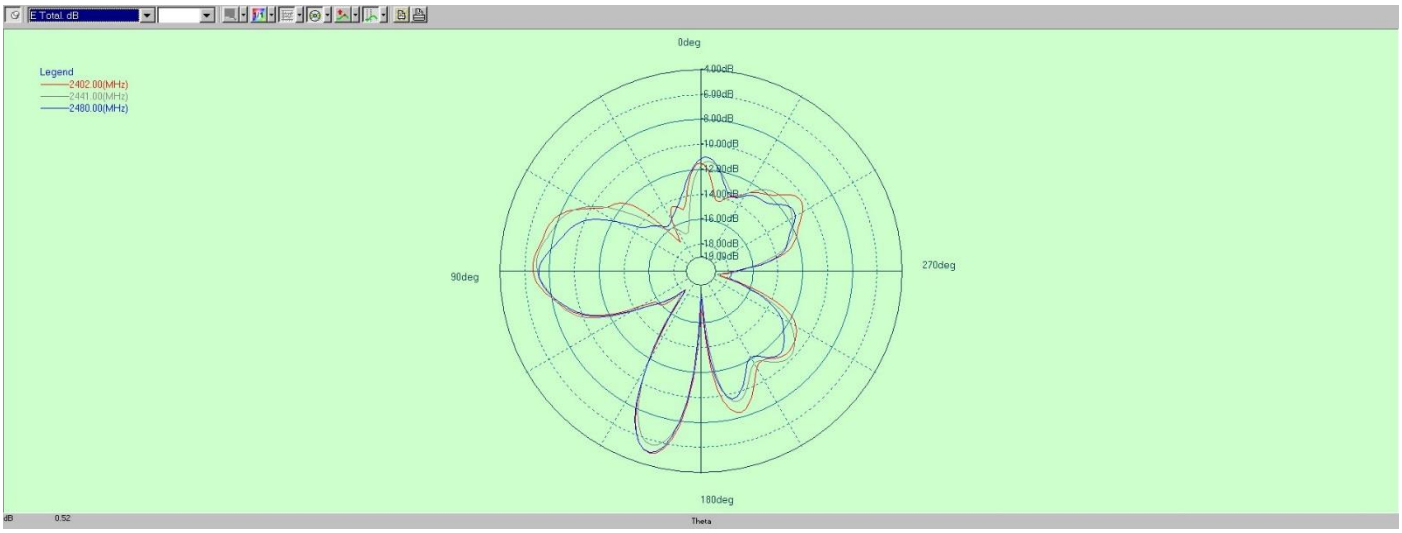


B1.3 3D Pattern for 2480MHz



B.2 1D Radiation Pattern

B2.1 PHI=0



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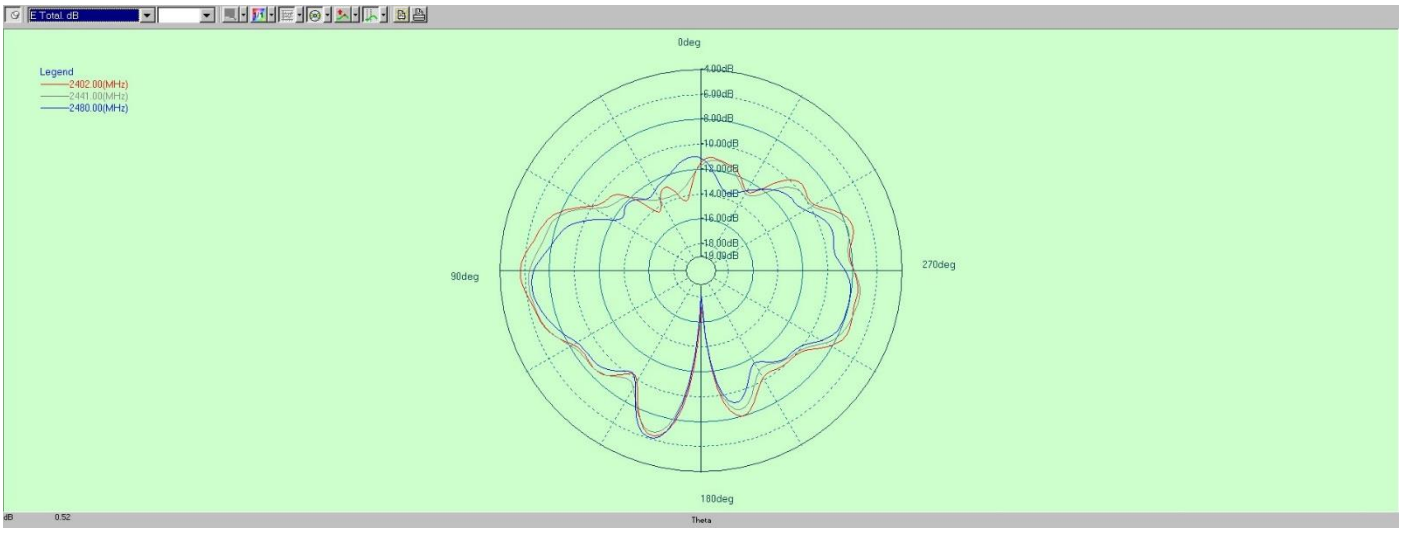
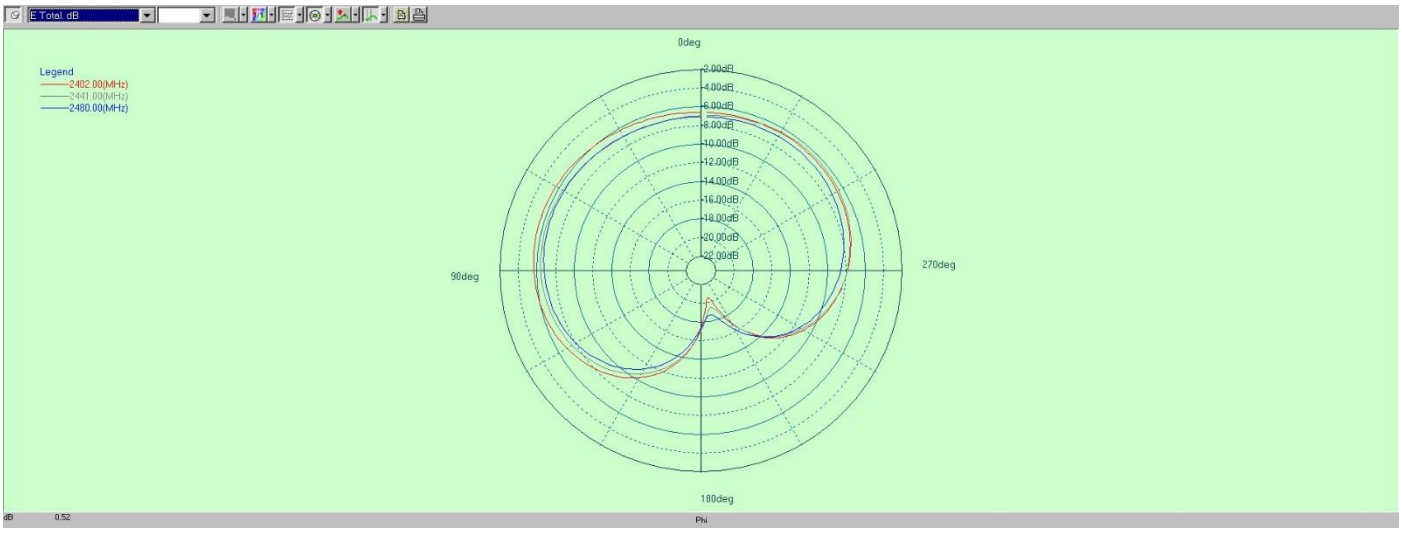
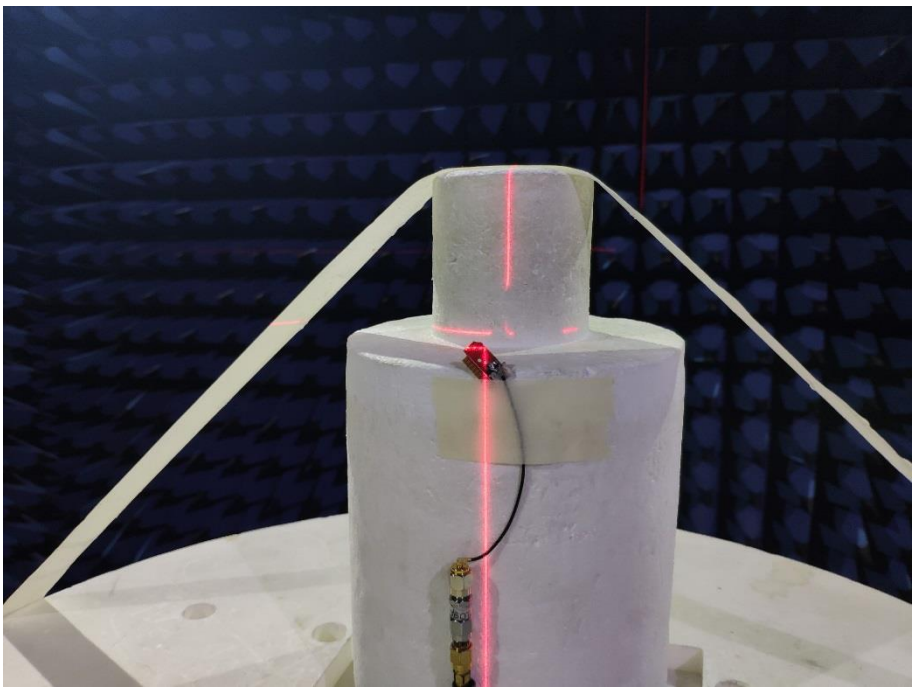
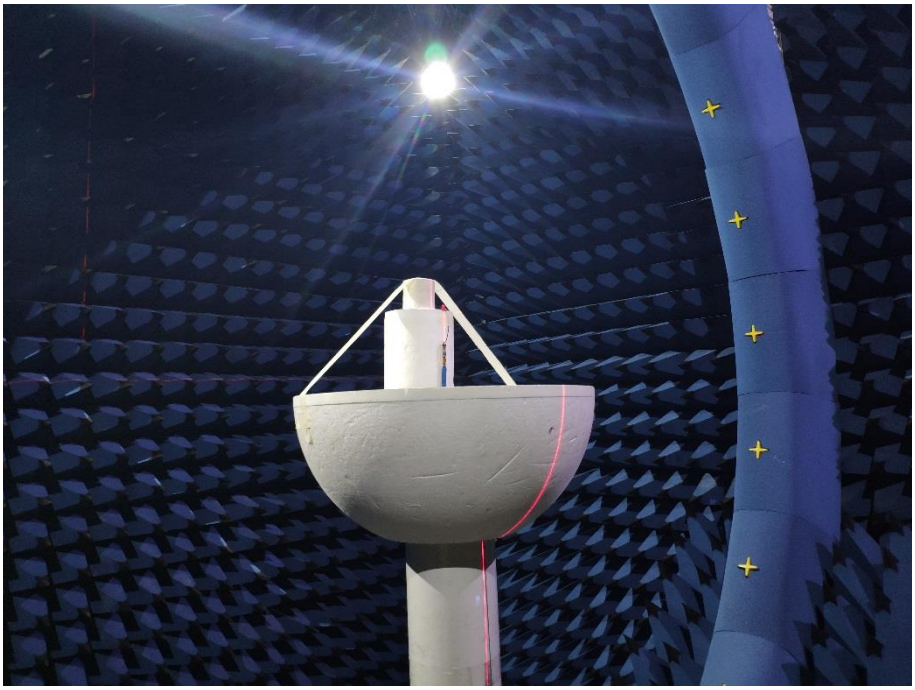


B2.3 THETA=90

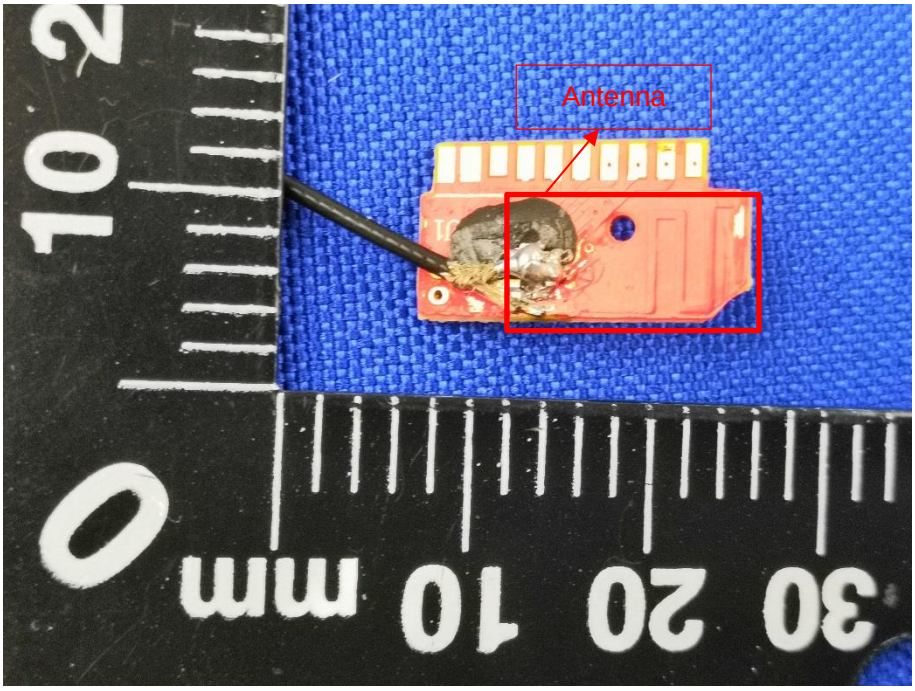


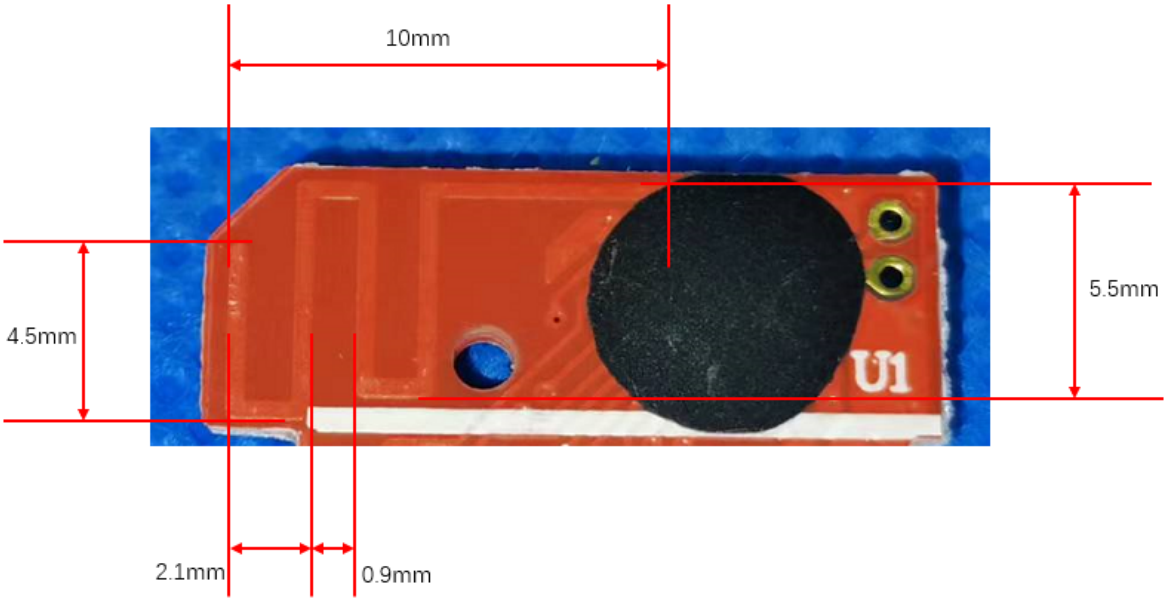
ANNEX C TEST SETUP PHOTO





ANNEX D EUT PHOTO





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