



REPORT No.: SZ22110117E02A

TEST REPORT

APPLICANT : Zhejiang Lierda Internet of Things Technology Co.,Ltd

PRODUCT NAME : E9x BLE Module

MODEL NAME : LSD4BT-E9x

TRADE NAME : Lierda

BRAND NAME : N/A

STANDARD(S) : IEEE Std 149-2021

RECEIPT DATE : 2022-11-10

TEST DATE : 2022-11-10

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MORLAB

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DIRECTORY

1. Technical Information	3
1.1. Applicant and Manufacturer Information	3
1.2. Equipment Under Test (EUT) Description	3
2. Test Results	4
2.1. Applied Reference Documents	4
2.2. Test Conditions	4
2.3. Measurement Uncertainty	4
2.4. Test Results lists	5
Annex A Photographs	6
Annex B Figures	7
1. 2D Radiation Pattern	7
2. 3D Radiation Pattern	8
Annex C Photographs	12
Annex D General Information	14
1.1 Identification of the Responsible Testing Laboratory	14
1.2 Identification of the Responsible Testing Location	14
1.3 Test Equipments Utilized	14

Change History		
Version	Date	Reason for change
1.0	2022-11-22	First edition

The original report SZ22110117E02 is replaced by this report SZ22110117E02A.



1. Technical Information

Note: Provide by manufacturer.

1.1. Applicant and Manufacturer Information

Applicant:	Zhejiang Lierda Internet of Things Technology Co.,Ltd
Applicant Address:	Room 1402, building 1, No. 1326, Wenyi West Road, Cangqian street, Yuhang District, Hangzhou, Zhejiang
Manufacturer:	Zhejiang Lierda Internet of Things Technology Co.,Ltd
Manufacturer Address:	Room 1402, building 1, No. 1326, Wenyi West Road, Cangqian street, Yuhang District, Hangzhou, Zhejiang

1.2. Equipment Under Test (EUT) Description

Wireless Type	Bluetooth
Frequency	N/A
IMEI	N/A
Sample No.	2#

2. Test Results

2.1. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	IEEE Std 149-2021	IEEE Recommended Practice for Antenna Measurements

2.2. Test Conditions

Test Environment Conditions:

Relative Humidity:	25 ... 75 %
Temperature:	+10 °C to +30 °C

2.3. Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO. When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% Confidence intervals.

Item	Measurement Uncertainty(dB)
Gain	±0.5
VSWR	±0.2
Measurement Uncertainty(95% Confidence Interval) K=2	

2.4. Test Results lists

2.4.1. Gain and Efficiency

Frequency(MHz)	Efficiency(%)	Gain(dBi)
2400	34.61	0.37
2410	35.32	0.41
2420	35.02	0.26
2430	34.97	0.35
2440	35.44	0.47
2450	35.82	0.53
2460	35.08	0.45
2470	33.76	0.38
2480	33.09	0.15
2490	31.55	-0.08
2500	30.76	-0.20

2.4.2. VSWR and Impedance

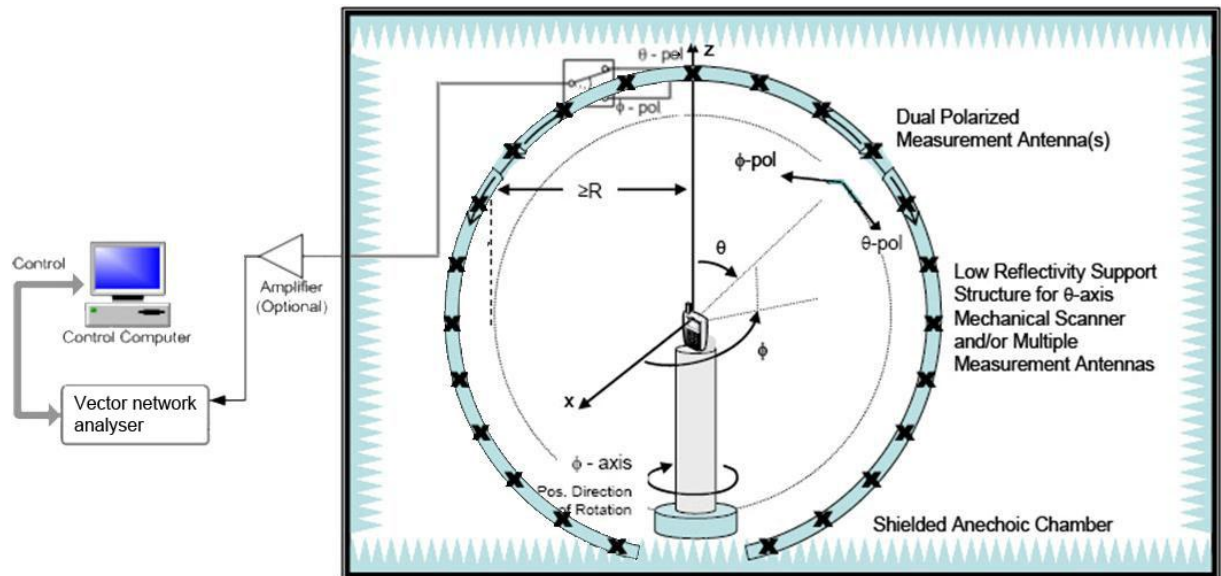
Frequency	VSWR	Impedance (Ω)
2400MHz	1.98	28.63
2440MHz	1.51	34.08
2480MHz	1.84	50.10

2.4.3. Return Loss

Frequency	Return Loss (dB)
2400MHz	-9.64
2440MHz	-13.70
2480MHz	-10.53

Annex A Photographs

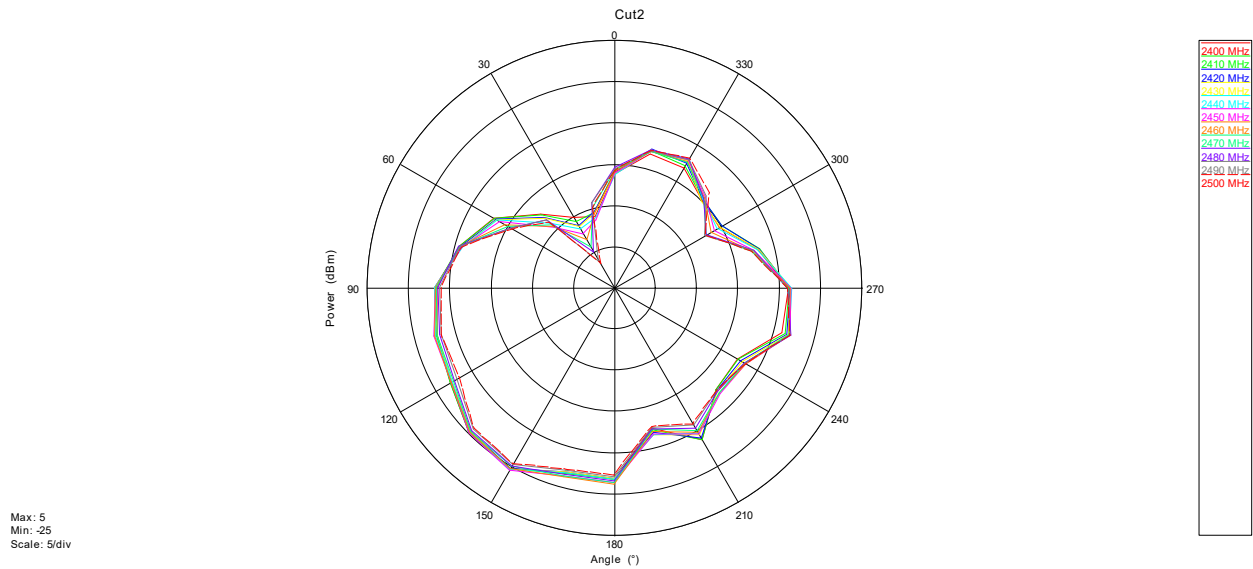
1. Test Setup



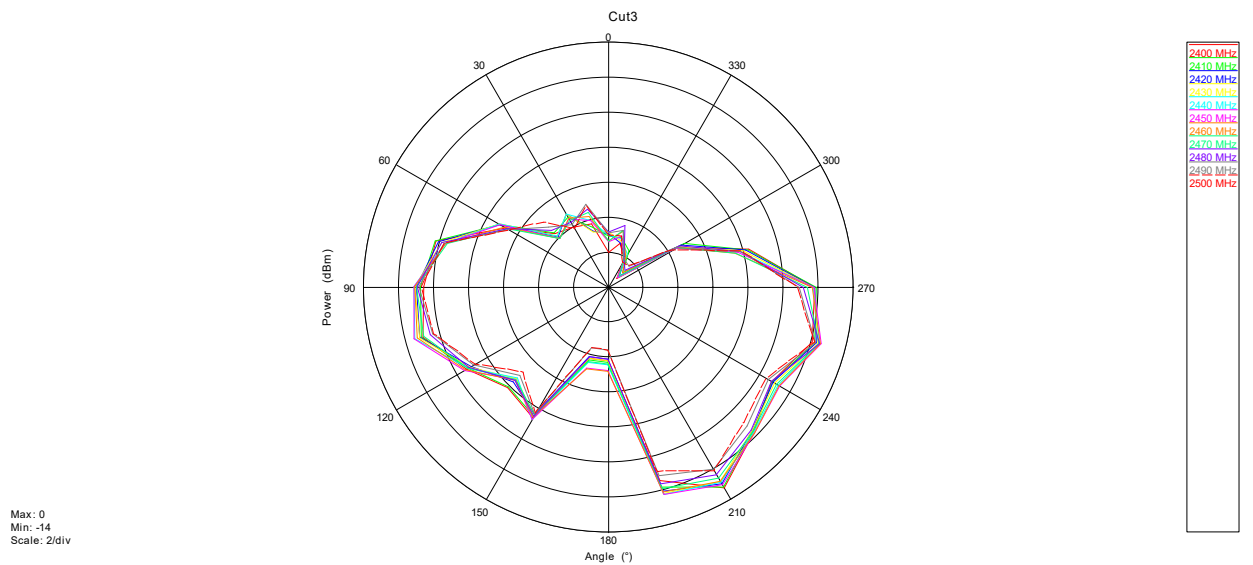


Annex B Figures

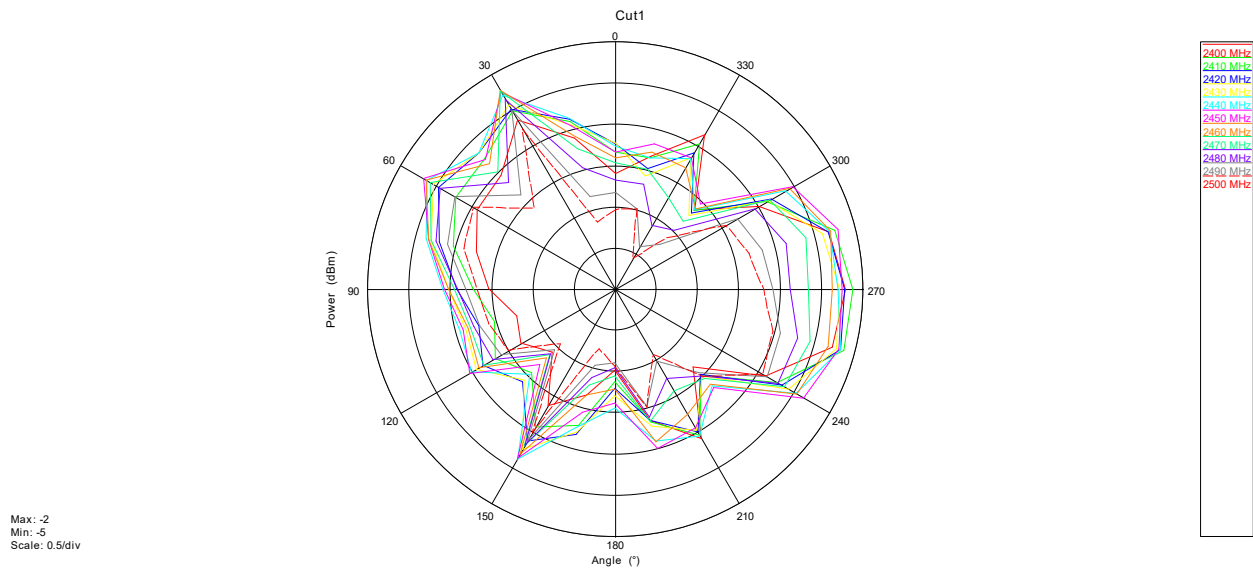
1. 2D Radiation Pattern



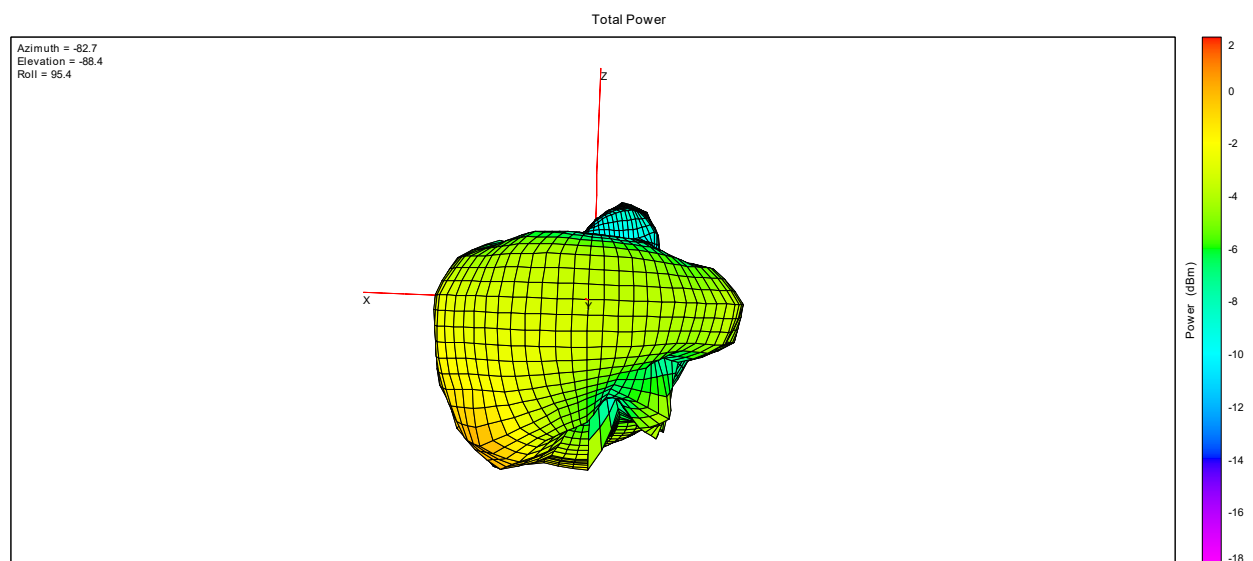
Phi=0°

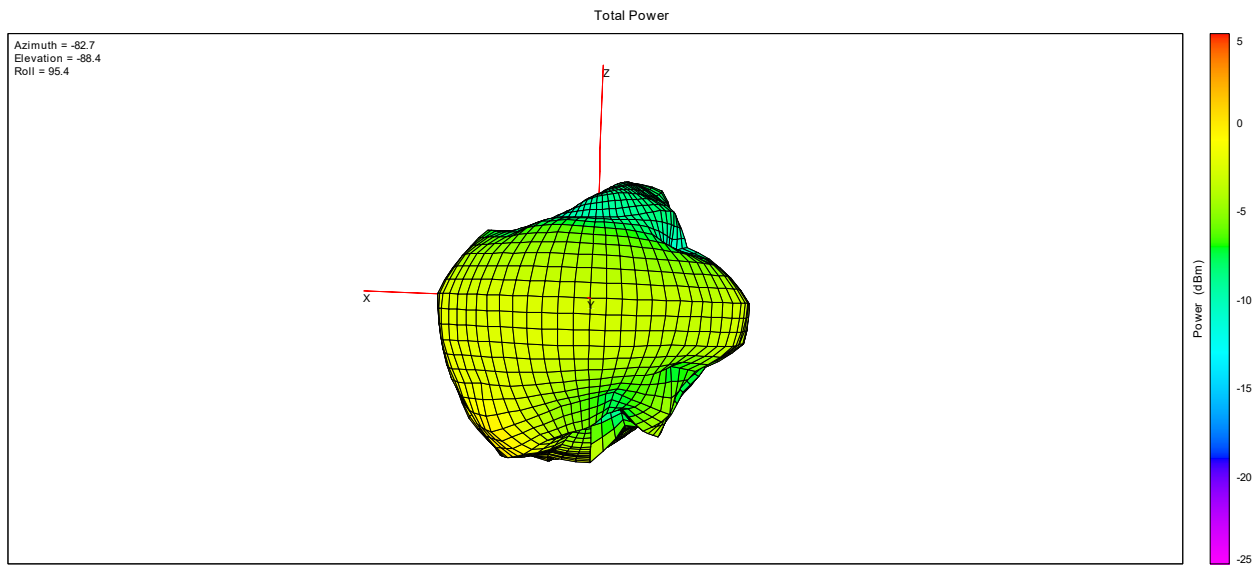


Phi=90°

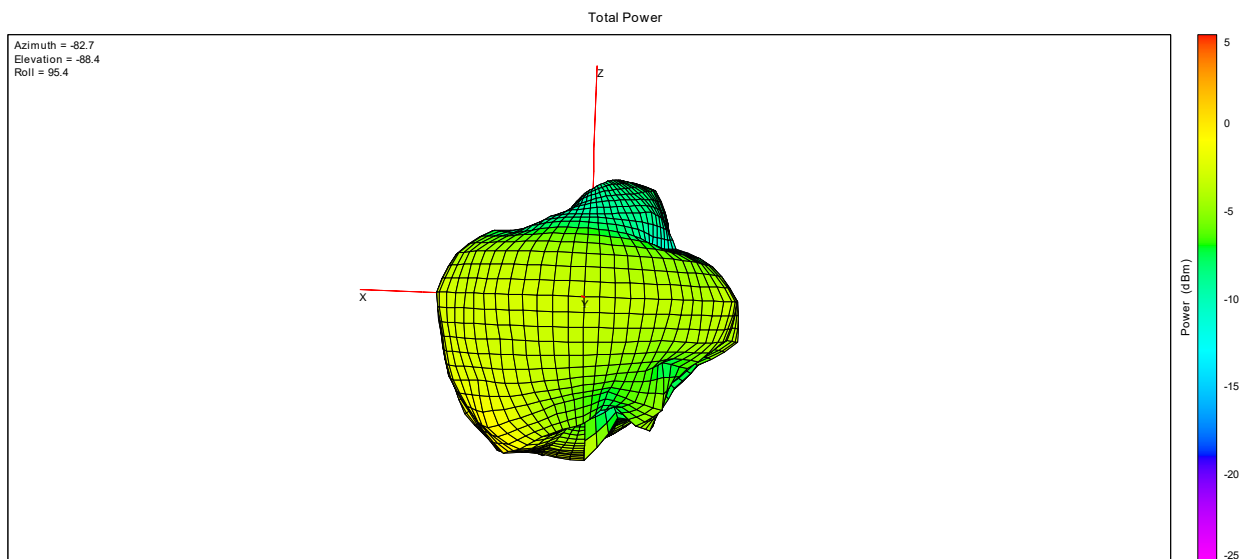


2. 3D Radiation Pattern





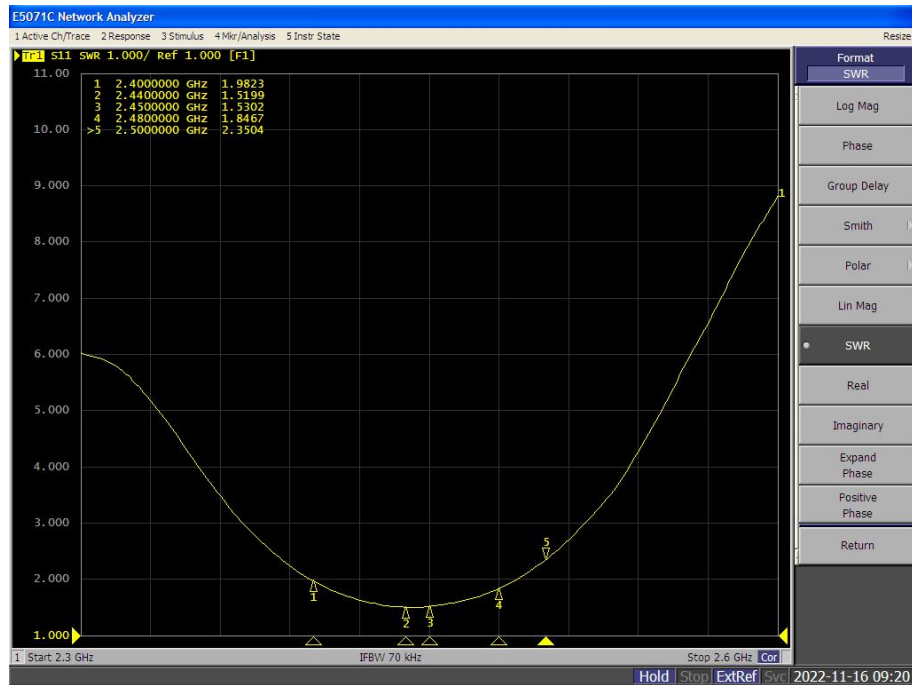
2440MHz



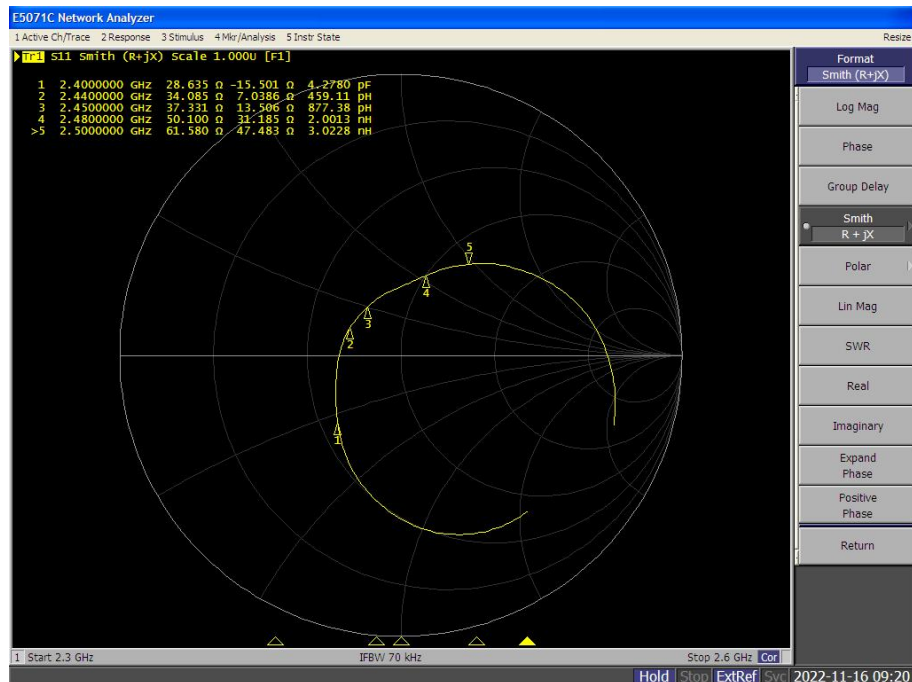
2480MHz



3. VSWR

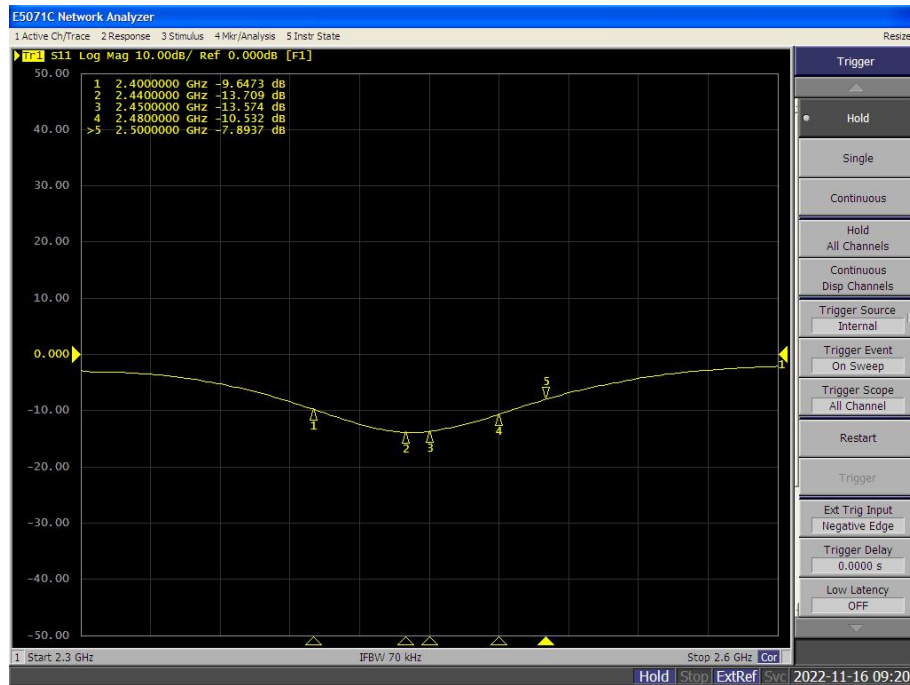


4. Impedance



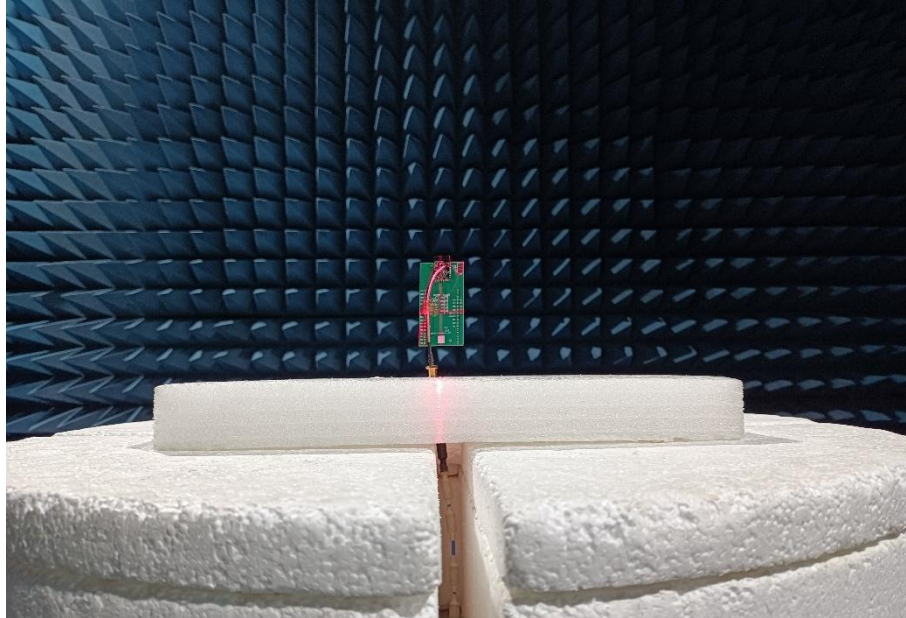


5. Return Loss

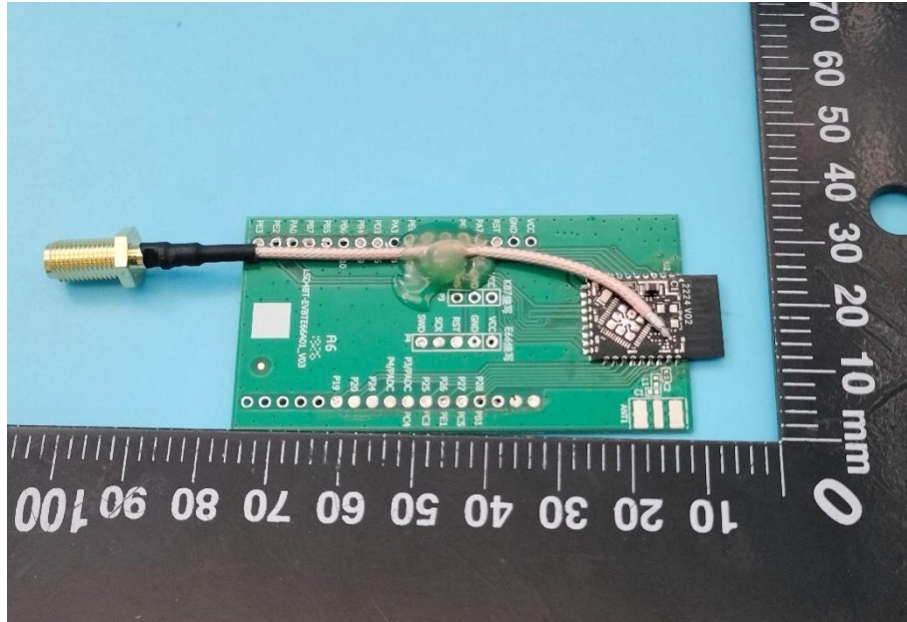


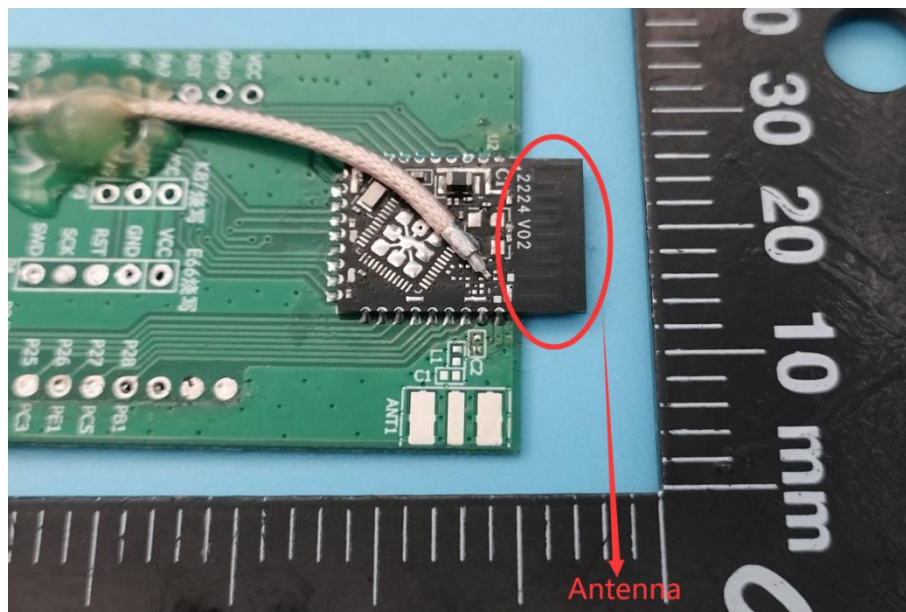
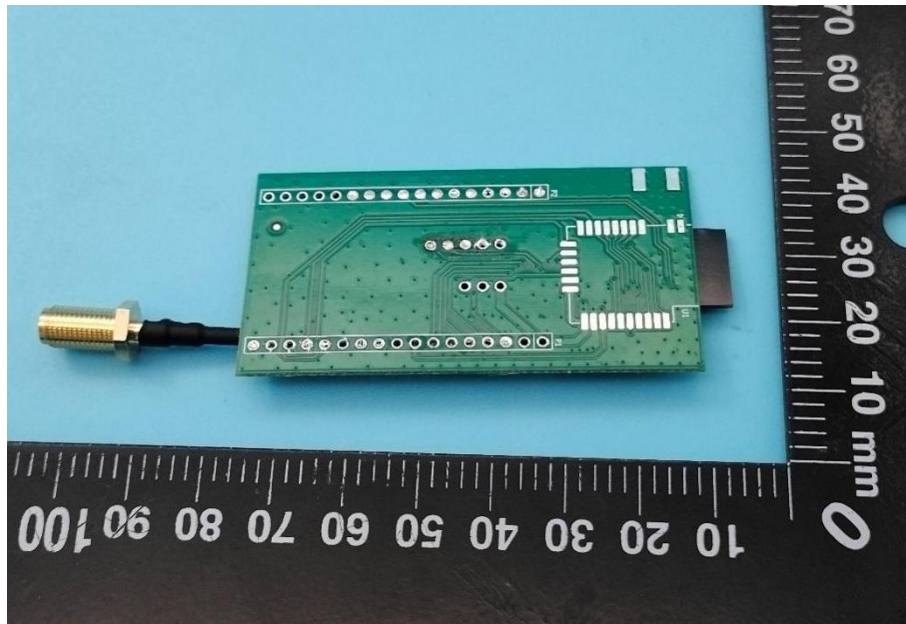
Annex C Photographs

1. Test environment



2. EUT







Annex D General Information

1.1 Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

1.2 Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

1.3 Test Equipments Utilized

No.	Equipement Name	Serial No.	Type	Manufa cturer	Cal.Date	Cal.Due Date
1	Network Analyzer	MY46110140	E5071C	Agilent	2022.07.04	2023.07.03
2	OTA Chamber	TJ2235-Q17 93	AMS-8923-1 50	ETS	2020.01.06	2023.01.05
3	Antenna Measurement System	1685	EMQuest EMQ-100 V 1.13 Build 21267	ETS	N/A	N/A

————— END OF REPORT —————