



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

ISSUE DATE : 2022-11-22

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MORLAB

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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

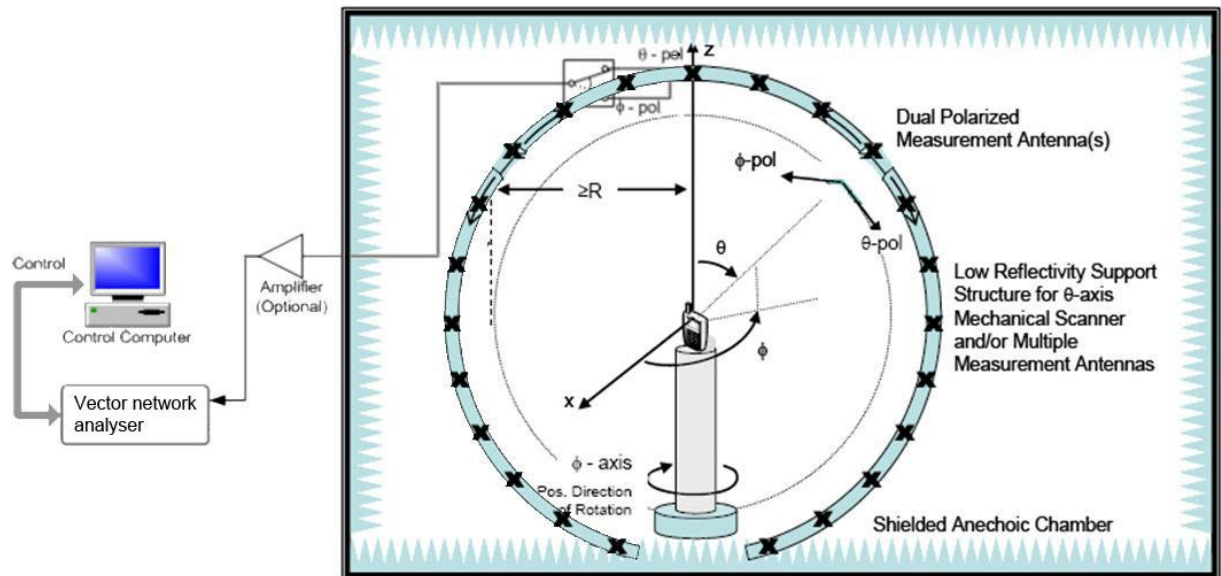
Frequency	VSWR	Impedance (Ω)
2400MHz	1.98	28.63
2440MHz	1.51	34.08
2480MHz	1.84	50.10

2.4.3. Return Loss

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

Annex A Photographs

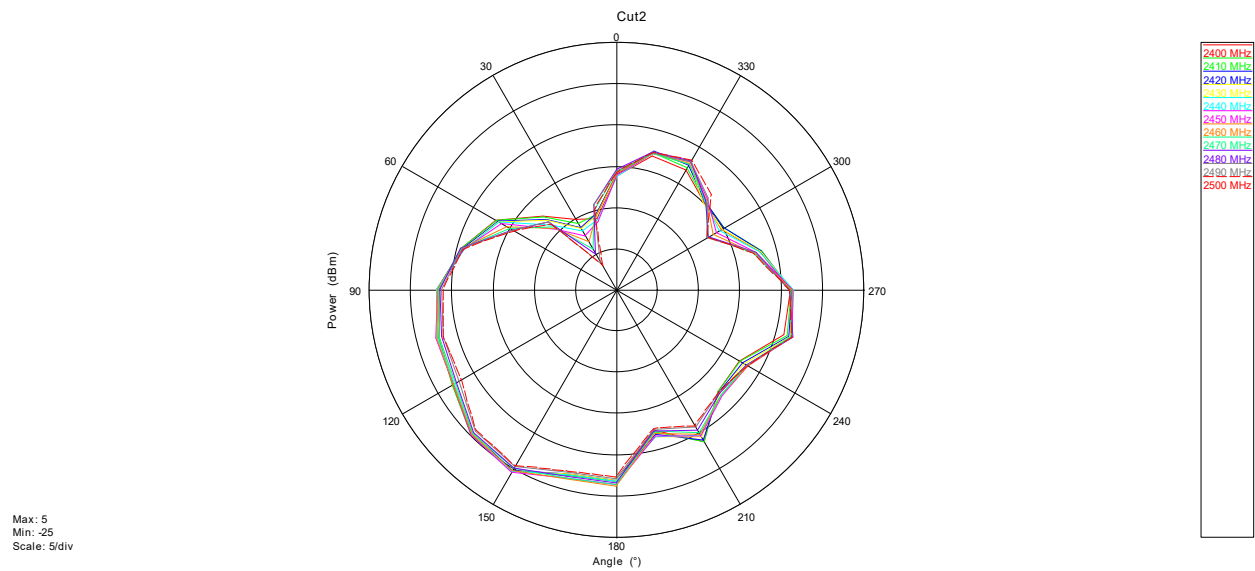
1. Test Setup



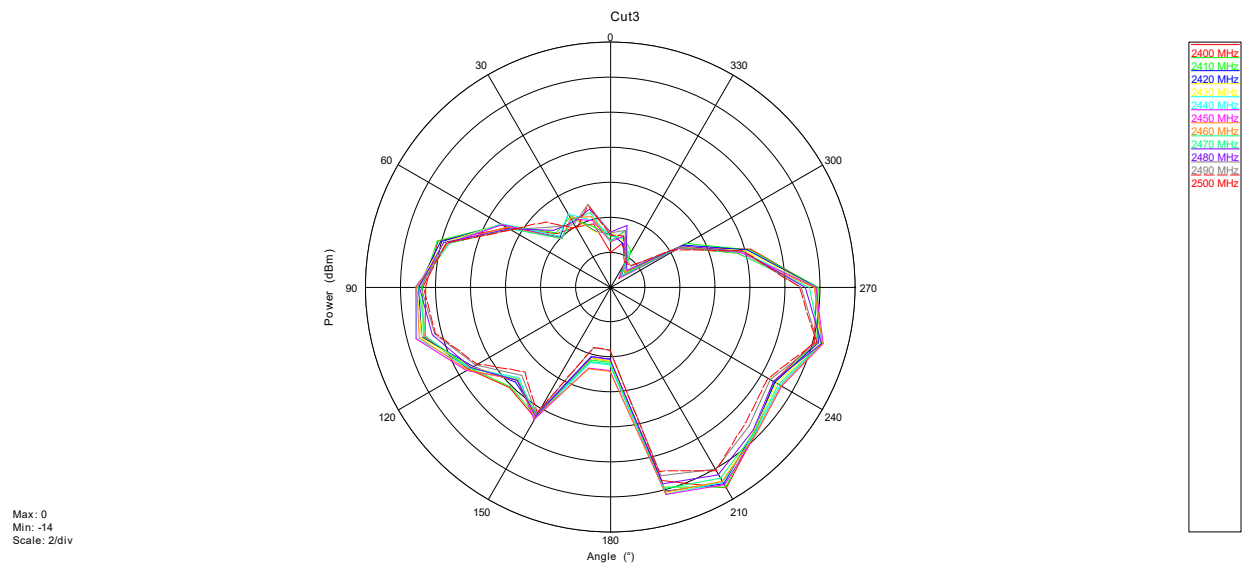


Annex B Figures

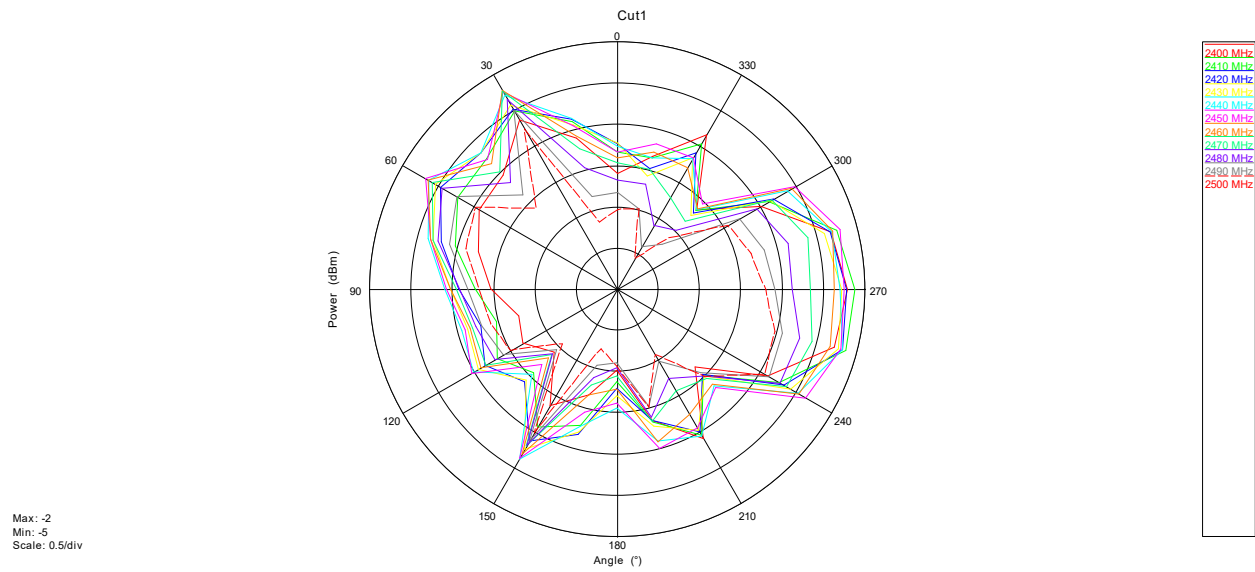
1. 2D Radiation Pattern



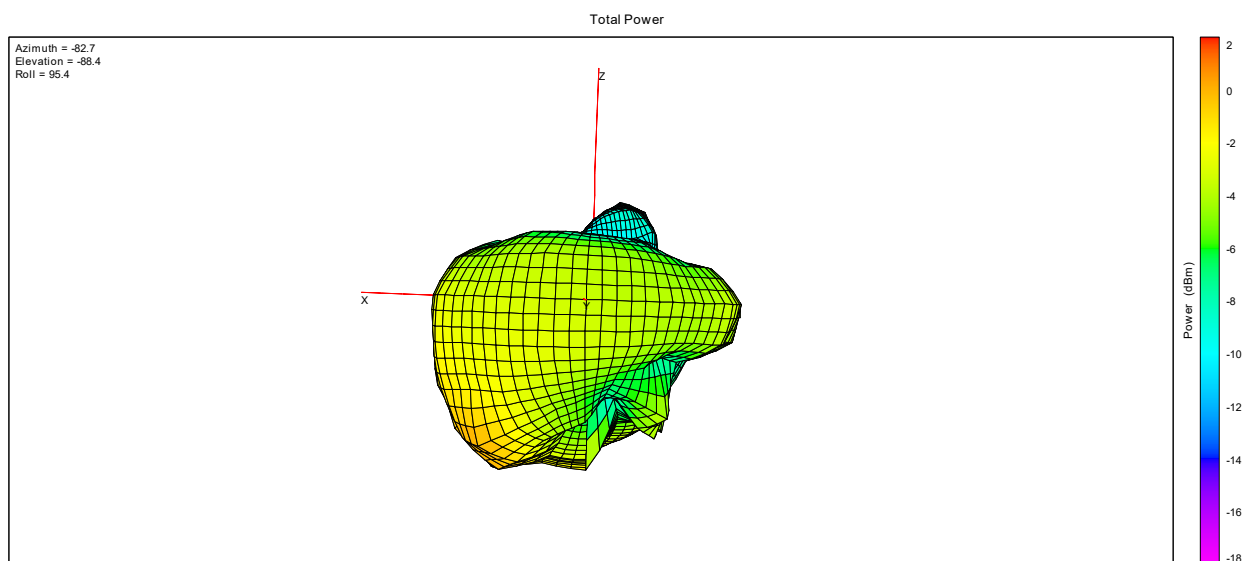
Phi=0°



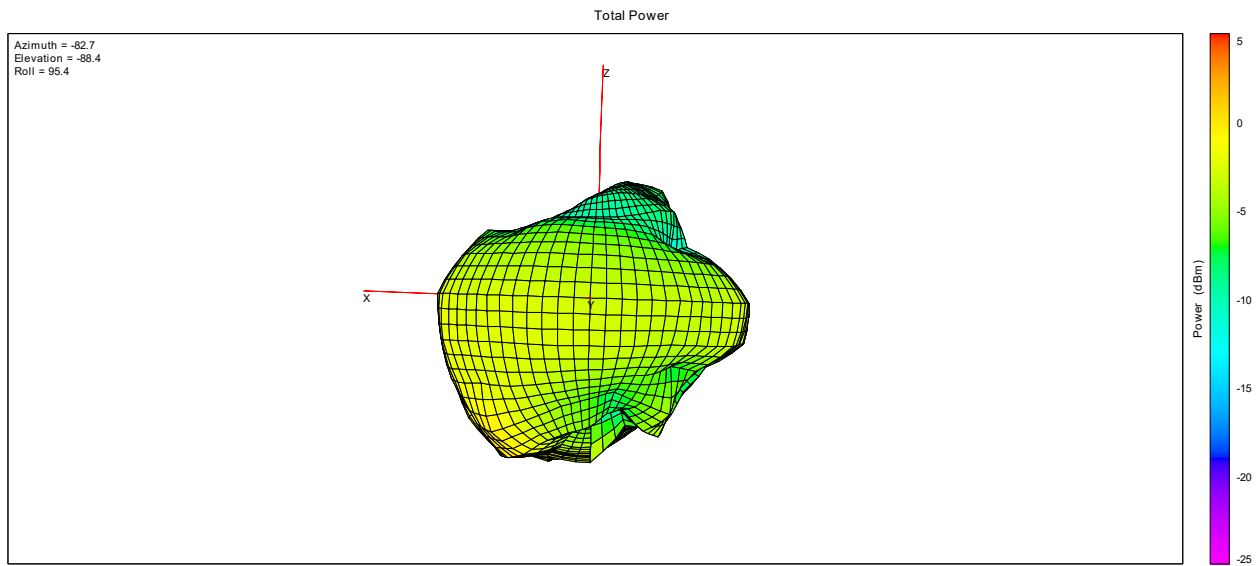
Phi=90°



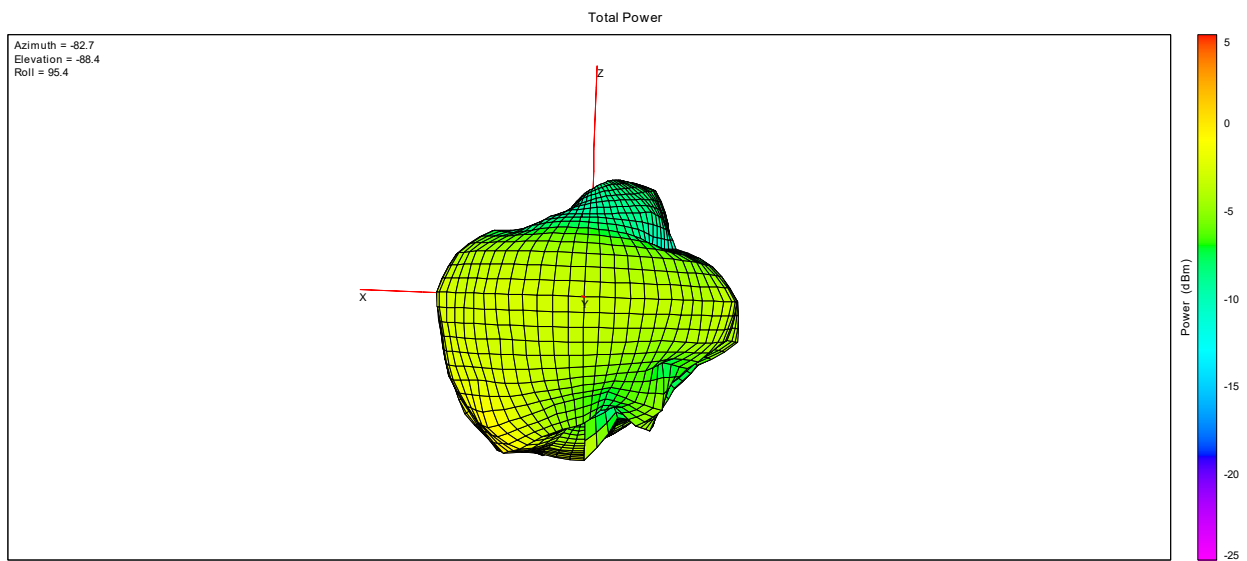
2. 3D Radiation Pattern



2400MHz



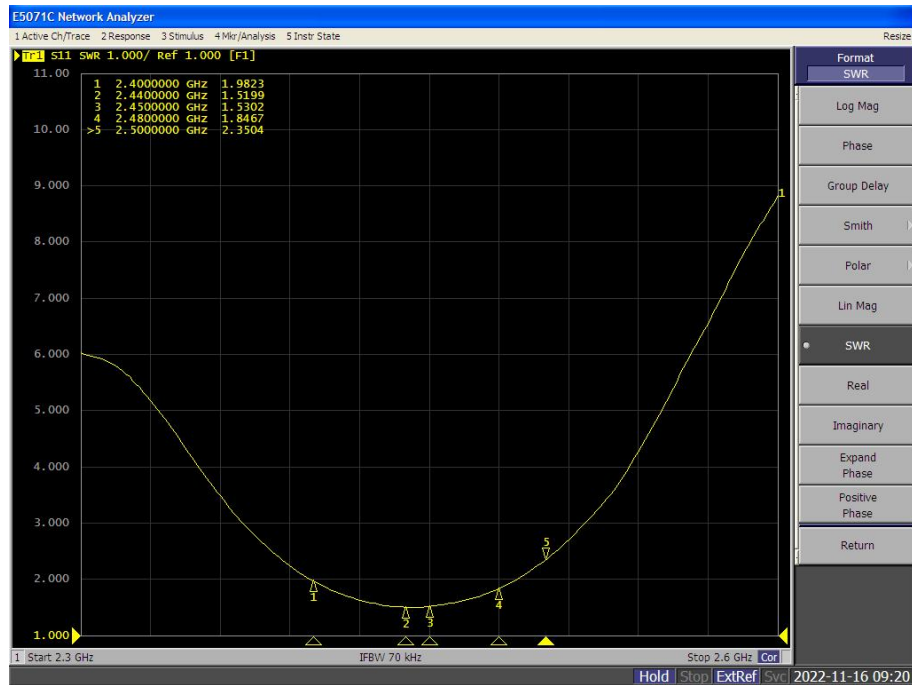
2440MHz



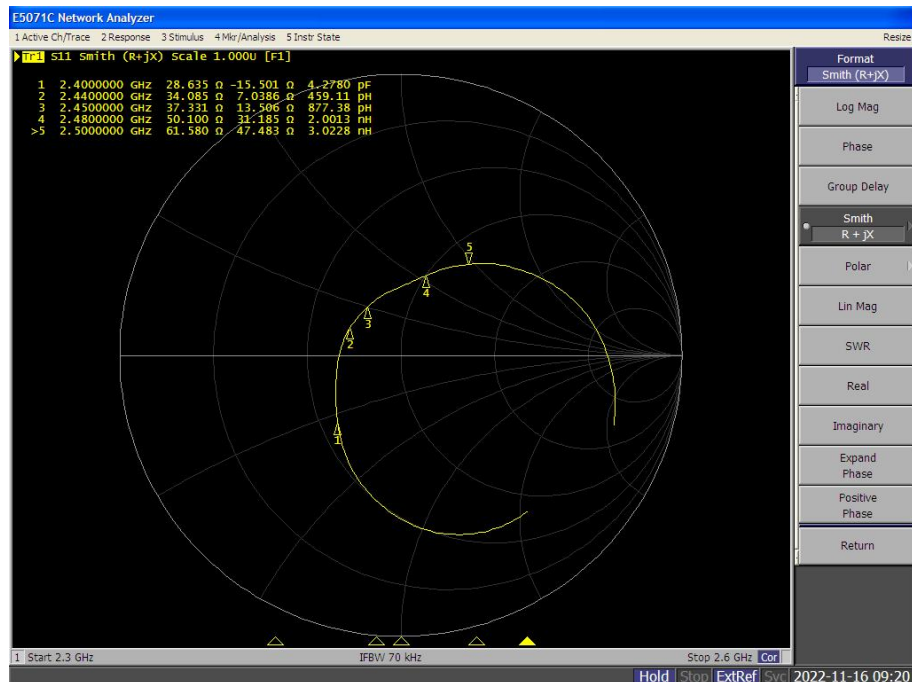
2480MHz



3. VSWR

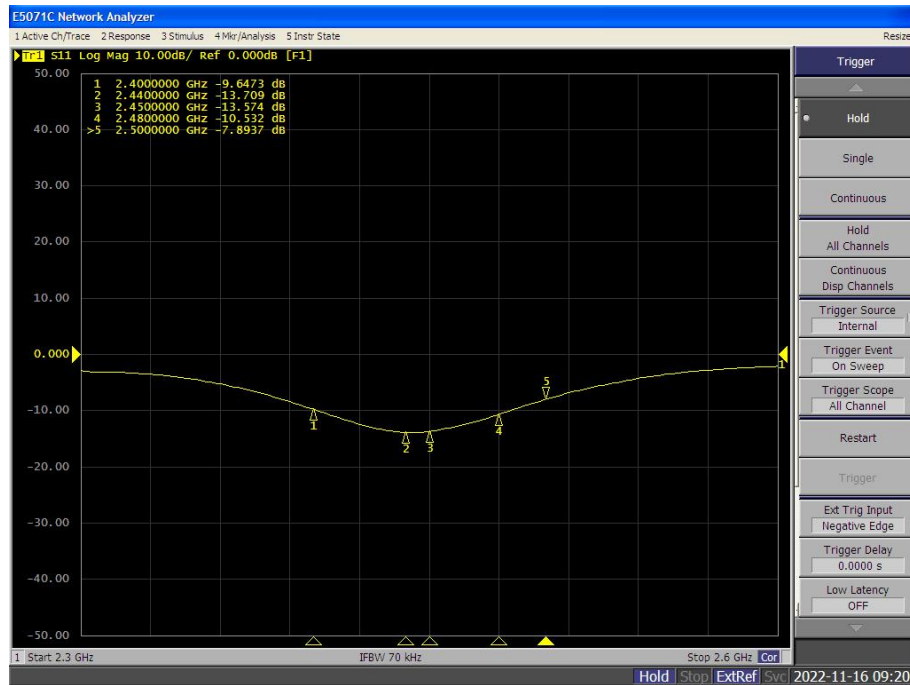


4. Impedance





5. Return Loss





Annex C Photographs

1. Test environment

2. EUT

Refer to EUT Photos



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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 —————