



REPORT No. : SZ24020211E01

TEST REPORT

APPLICANT : JUMBOAUDIO ELECTRONICS CO., LTD

PRODUCT NAME : Bluetooth speaker control module

MODEL NAME : DSP1804SUB/DSP2408USB

TRADE NAME : JUMBOAUDIO

BRAND NAME : N/A

STANDARD(S) : ANSI/IEEE Std 149-2008

RECEIPT DATE : 2024-05-28

TEST DATE : 2024-05-28

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Change History		
Version	Date	Reason for change
1.0	2024-03-02	First edition

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1. Technical Information

Note: Provide by manufacturer.

1.1. Applicant and Manufacturer Information

Applicant:	JUMBOAUDIO ELECTRONICS CO., LTD
Applicant Address:	NO. 15 YANGJIA , WANSHIXU VILLAGE, ZHUANGSHI STREET, ZHENHAI DISTRICT, NINGBO, CHINA
Manufacturer:	JUMBOAUDIO INTERNATIONAL (HK) CO., LIMITED
Manufacturer Address:	LAT/RM 413 4/F LUCKY CENTRE 165-171 WAN CHAROAD WAN CHAI HK

1.2. Equipment Under Test (EUT) Description

Wireless Type	Bluetooth
Frequency	N/A
IMEI	N/A
Sample No.	1#

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2. Test Results

2.1. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	ANSI/IEEE Std 149-2008	IEEE Standard Test Procedures for Antennas

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	

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2.4. Test Results lists

2.4.1. Gain and Efficiency

Frequency	Gain(dBi)	Efficiency(%)
2400MHz	1.70	31.36
2410MHz	1.60	30.61
2420MHz	1.35	28.76
2430MHz	1.09	27.10
2440MHz	0.87	26.24
2450MHz	0.51	24.84
2460MHz	0.24	23.38
2470MHz	-0.19	21.25
2480MHz	-0.55	19.28
2490MHz	-0.84	17.60
2500MHz	-1.09	16.56

2.4.2. VSWR and Impedance

Frequency	VSWR	Impedance (Ω)
2400MHz	2.48	120.01
2440MHz	1.14	56.52
2480MHz	2.22	33.14

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2.4.3.Return Loss

Frequency	Return Loss (dB)
2400MHz	-7.40
2440MHz	-23.49
2480MHz	-8.42

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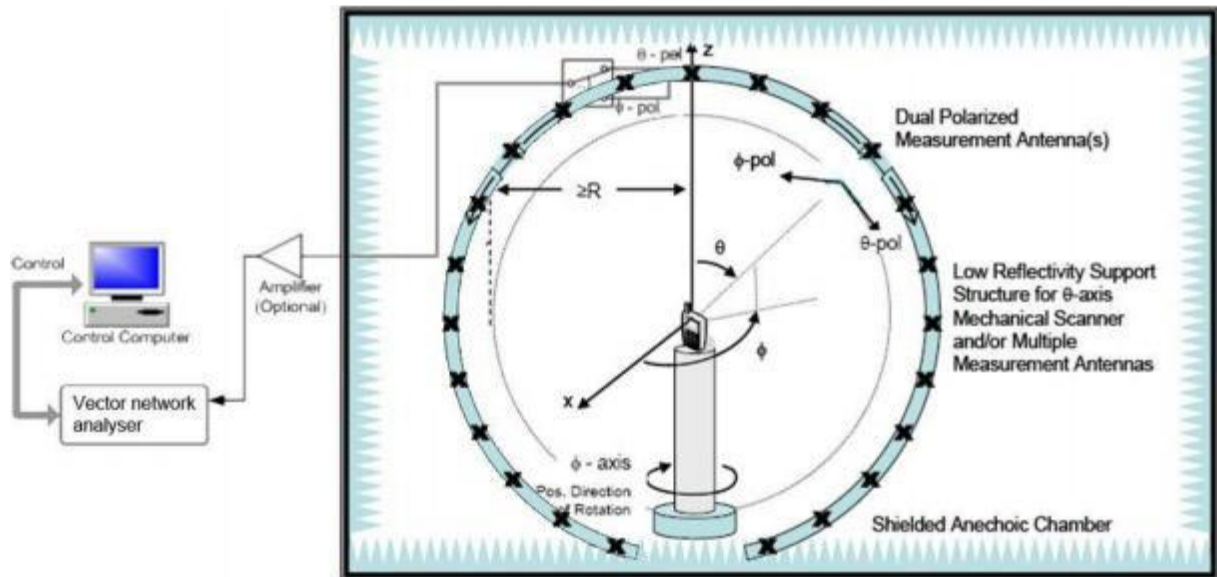
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Annex A Photographs

1. Test Setup



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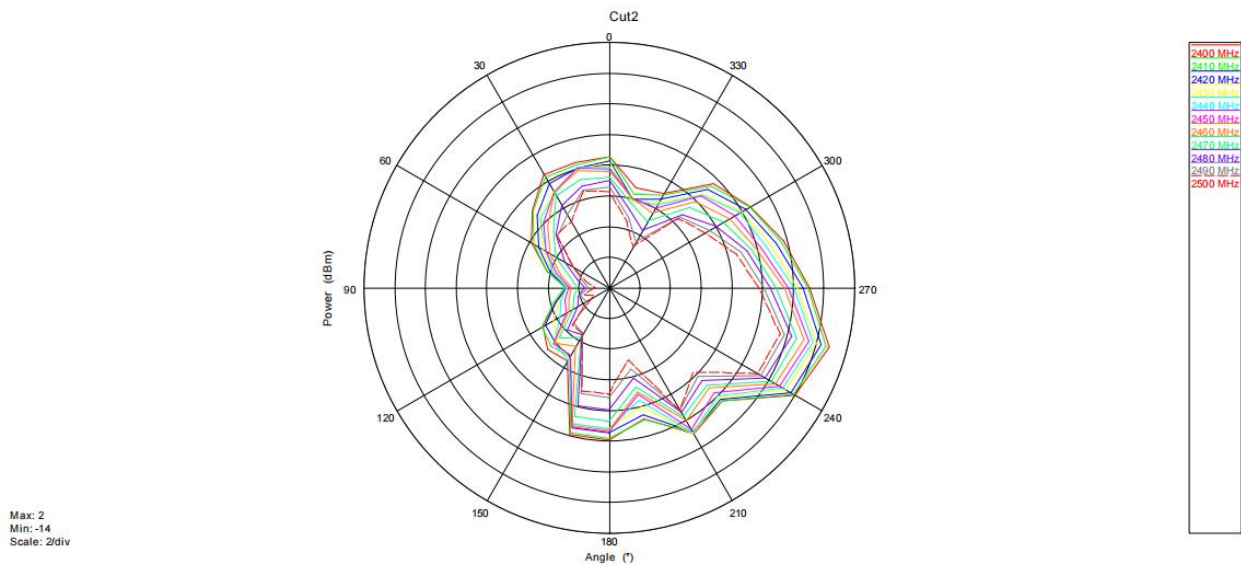




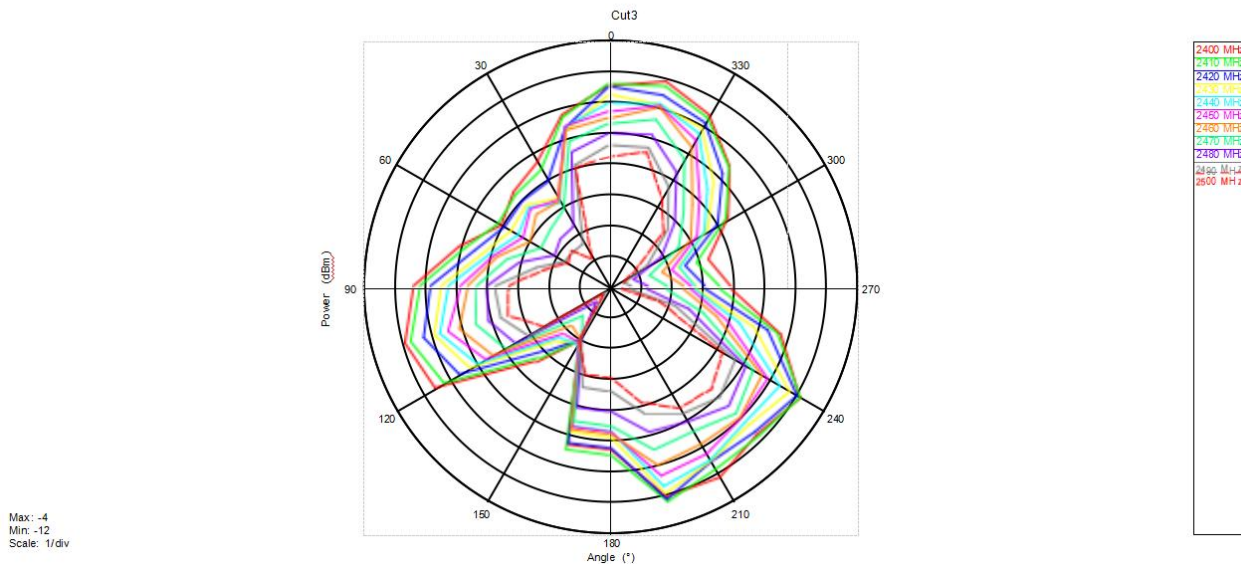
Annex B Figures

1. 2D Radiation Pattern

Phi=0°



Phi=90°



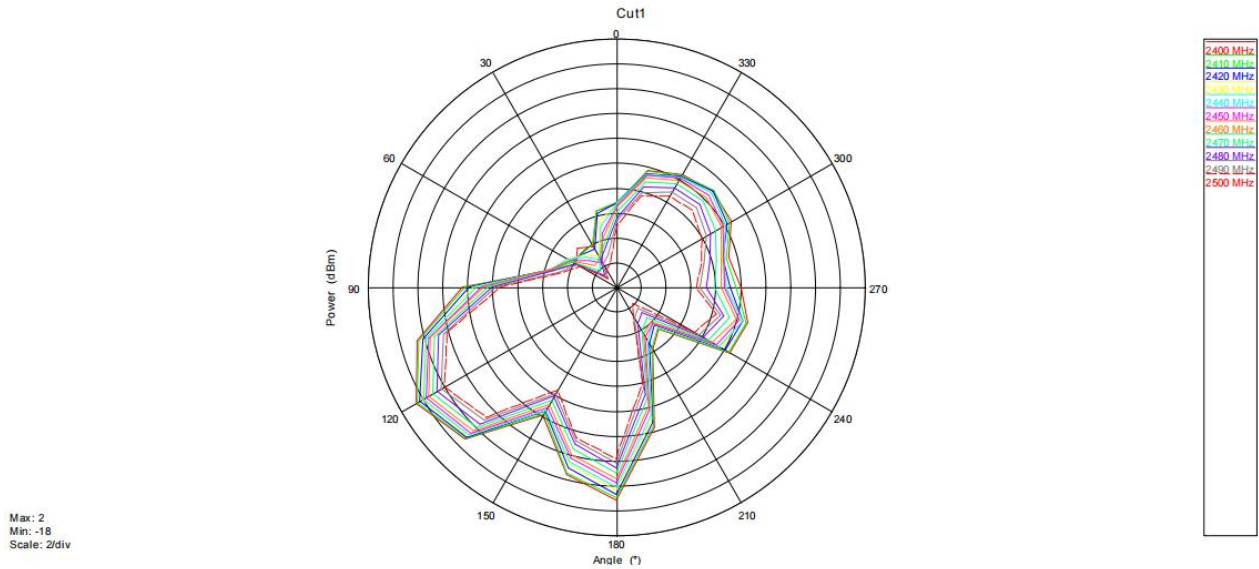
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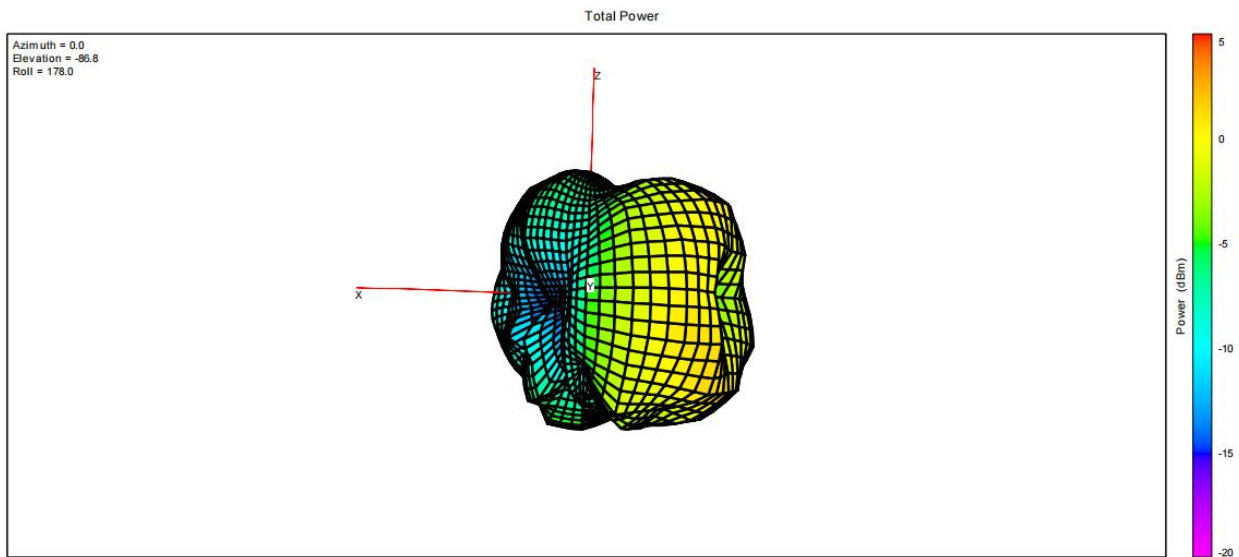


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Theta=90°



2. 3D Radiation Pattern



2400MHz

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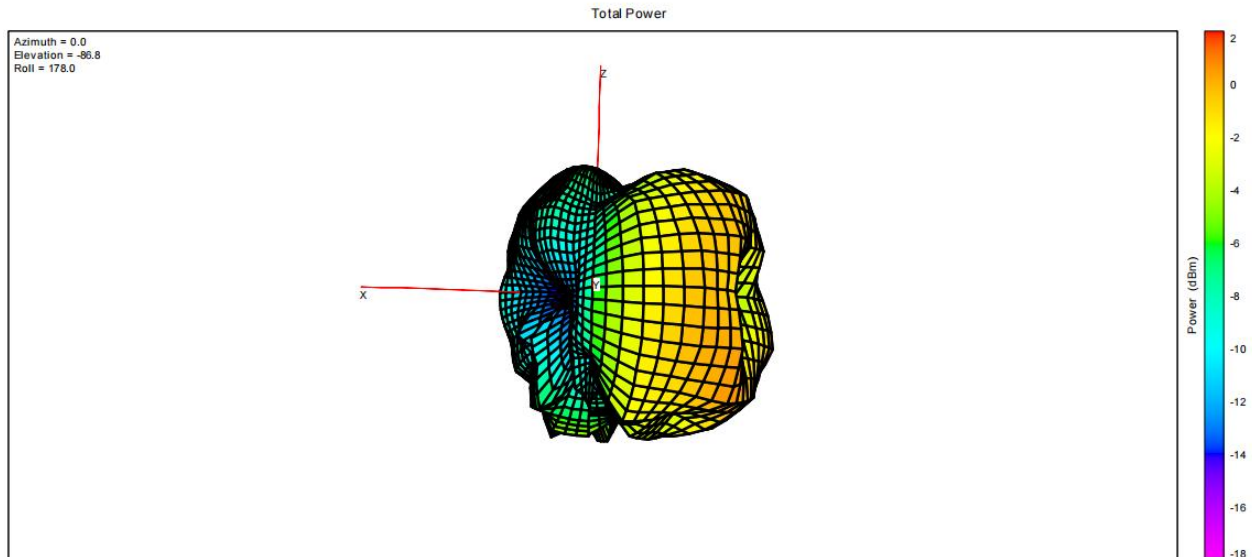
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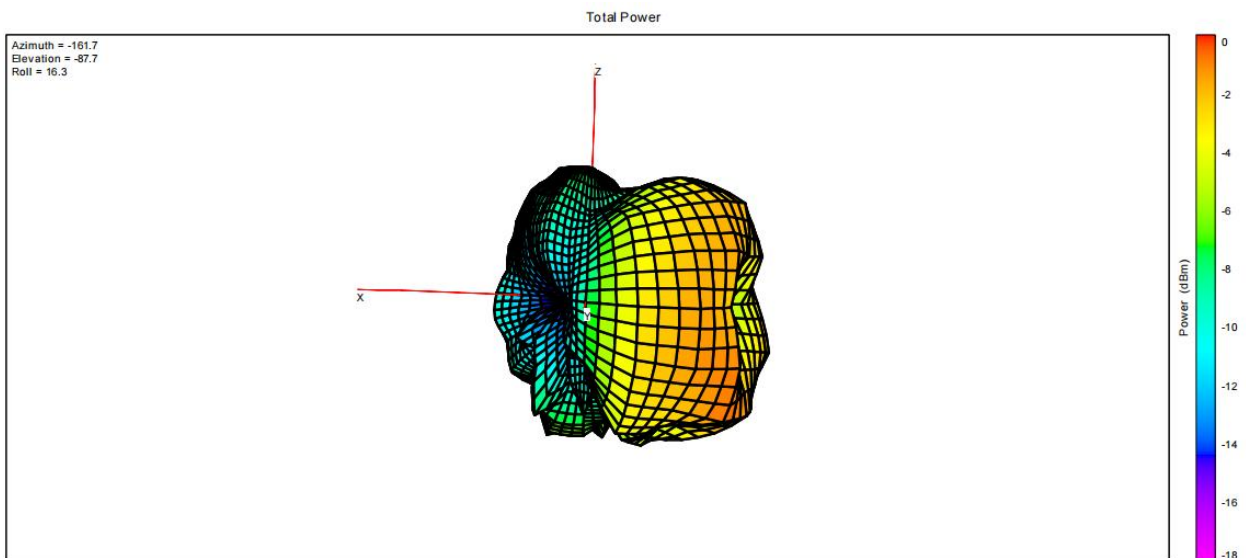




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2440MHz



2480MHz

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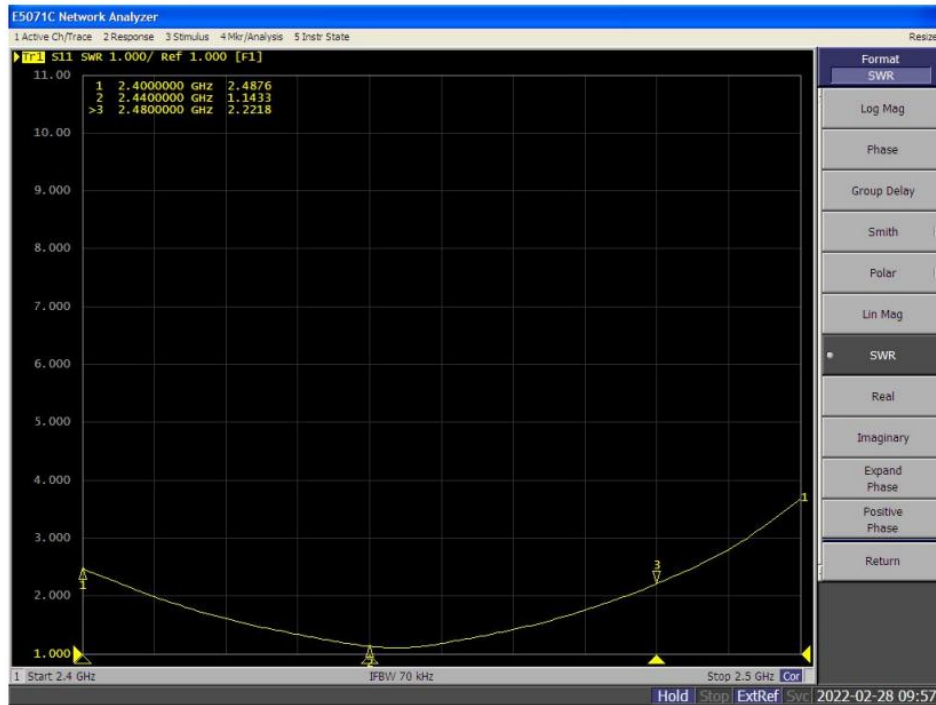
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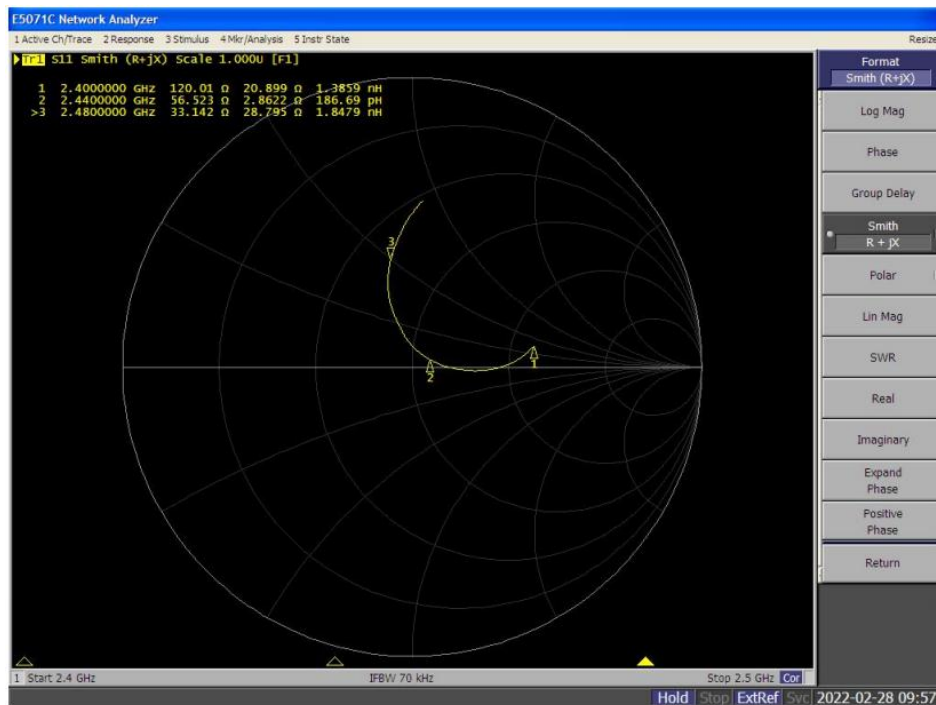




3. VSWR



4. Impedance

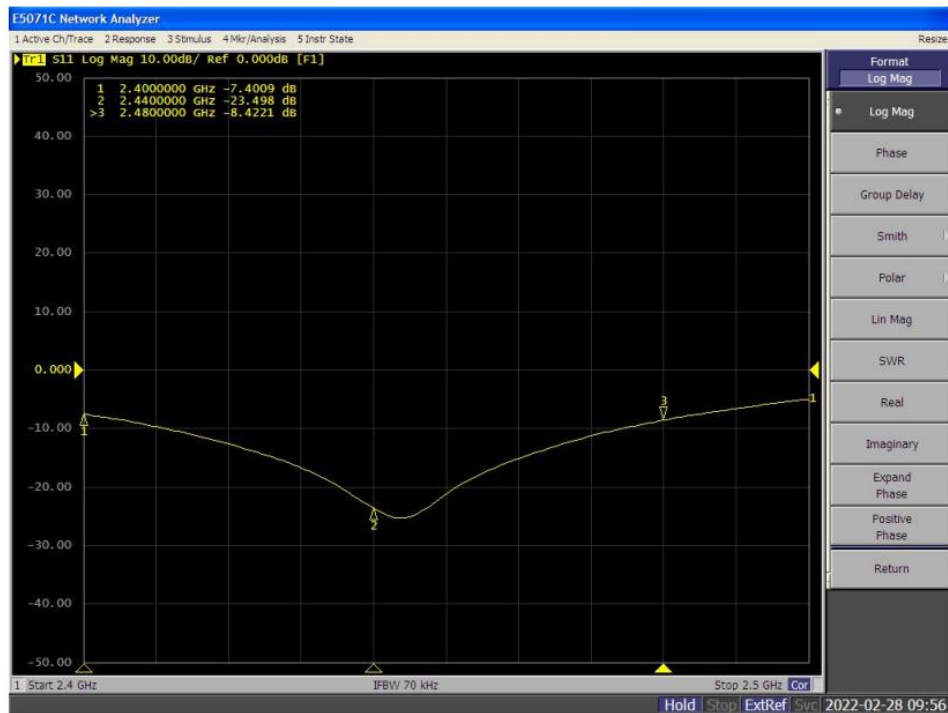


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5. Return Loss



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Annex C Photographs

1. Test environment

See the attached "Antenna Gain Test Photos"

2. EUT

See the attached "Antenna appearance photo"

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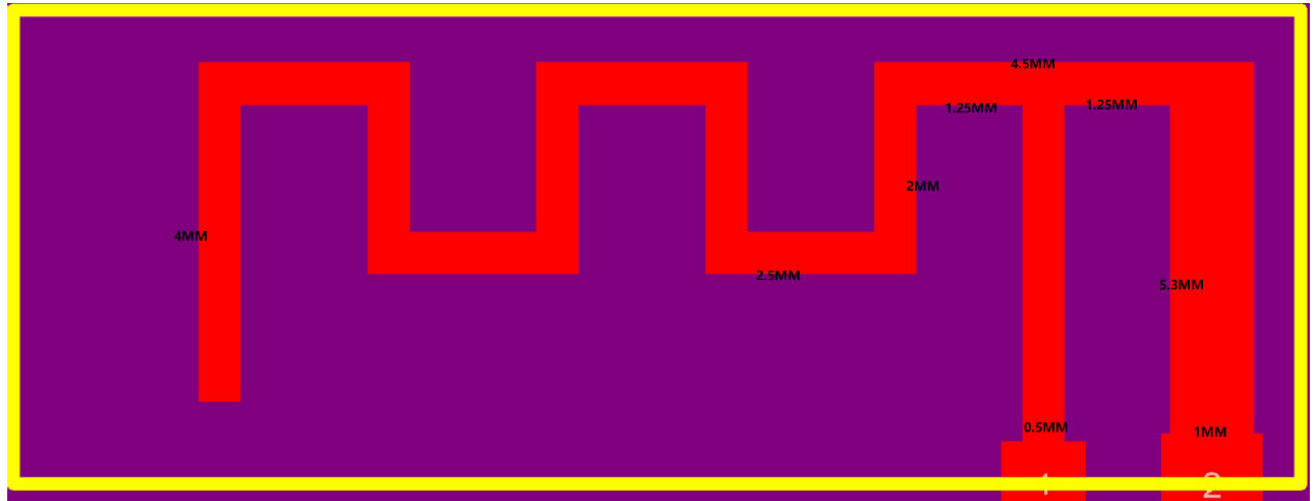
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3. Antenna size



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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	2023.07.26	2024.07.25
2	OTA Chamber	TJ2235-Q17 93	AMS-8923-1 50	ETS	2024.01.06	2025.01.05
3	Antenna Measurement System	1685	EMQuest EMQ-100 V 1.13 Build 21267	ETS	N/A	N/A

————— END OF REPORT —————

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