



中国认可
国际互认
检测
TESTING
CNAS L3572

REPORT No.: SZ22090079E01A

TEST REPORT

APPLICANT : SHENZHEN HEIMAN TECHNOLOGY CO.,LTD.

PRODUCT NAME : Antenna

MODEL NAME : N/A

TRADE NAME : N/A

BRAND NAME : N/A

STANDARD(S) : IEEE Std 149-2021

RECEIPT DATE : 2022-09-07

TEST DATE : 2022-09-08

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MORLAB

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Change History		
Version	Date	Reason for change
1.0	2022-10-28	First edition

The original report SZ22090079E01 is replaced by this report SZ22090079E01A.



1. Technical Information

Note: Provide by manufacturer.

1.1. Applicant and Manufacturer Information

Applicant:	SHENZHEN HEIMAN TECHNOLOGY CO.,LTD.
Applicant Address:	101, NO.4 DAFU INDUSTRIAL PARK, KUKENG COMMUNITY, GUANLAN STREET, LONGHUA DISTRICT, SHENZHEN, GUANGDONG, CHINA
Manufacturer:	SHENZHEN HEIMAN TECHNOLOGY CO.,LTD.
Manufacturer Address:	101, NO.4 DAFU INDUSTRIAL PARK, KUKENG COMMUNITY, GUANLAN STREET, LONGHUA DISTRICT, SHENZHEN, GUANGDONG, CHINA

1.2. Equipment Under Test (EUT) Description

Wireless Type	Z24@ZigBee/matter 2.4GHz
Frequency	N/A
IMEI	N/A
Sample No.	1#

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

Frequency	Gain(dBi)
2405 MHz	-2.41
2410 MHz	-2.27
2415 MHz	-2.35
2420 MHz	-2.31
2425 MHz	-2.34
2430 MHz	-2.41
2435 MHz	-2.29
2440 MHz	-2.31
2445 MHz	-2.24
2450 MHz	-2.10
2455 MHz	-2.03
2460 MHz	-1.92
2465 MHz	-1.92
2470 MHz	-1.77
2475 MHz	-1.61
2480 MHz	-1.52



2.4.2. Efficiency

Frequency	Efficiency(%)
2405 MHz	31.11
2410 MHz	30.84
2415 MHz	30.28
2420 MHz	30.70
2425 MHz	30.28
2430 MHz	30.60
2435 MHz	31.13
2440 MHz	31.90
2445 MHz	32.57
2450 MHz	33.55
2455 MHz	34.46
2460 MHz	35.16
2465 MHz	35.89
2470 MHz	36.36
2475 MHz	37.04
2480 MHz	37.60



2.4.3. VSWR

Frequency	VSWR
2405 MHz	2.30
2410 MHz	2.22
2415 MHz	2.16
2420 MHz	2.11
2425 MHz	2.05
2430 MHz	1.99
2435 MHz	1.94
2440 MHz	1.90
2445 MHz	1.86
2450 MHz	1.81
2455 MHz	1.77
2460 MHz	1.74
2465 MHz	1.71
2470 MHz	1.69
2475 MHz	1.66
2480 MHz	1.64



2.4.4. Impedance

Frequency	Impedance (Ω)
2405 MHz	115.08
2410 MHz	109.24
2415 MHz	101.93
2420 MHz	93.60
2425 MHz	84.27
2430 MHz	75.95
2435 MHz	68.50
2440 MHz	61.87
2445 MHz	55.76
2450 MHz	50.55
2455 MHz	46.66
2460 MHz	43.18
2465 MHz	40.04
2470 MHz	37.32
2475 MHz	35.23
2480 MHz	33.80

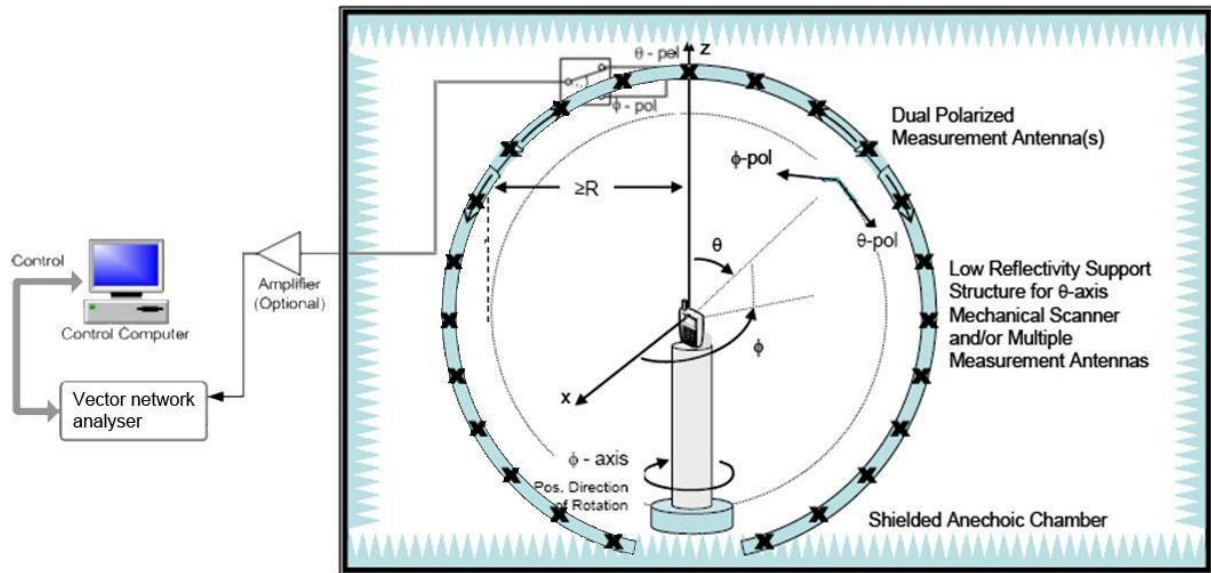


2.4.5. Return Loss*

Frequency	Return Loss (dB)
2405 MHz	-8.08
2410 MHz	-8.41
2415 MHz	-8.69
2420 MHz	-8.93
2425 MHz	-9.24
2430 MHz	-9.56
2435 MHz	-9.87
2440 MHz	-10.12
2445 MHz	-10.39
2450 MHz	-10.74
2455 MHz	-11.11
2460 MHz	-11.36
2465 MHz	-11.57
2470 MHz	-11.75
2475 MHz	-12.02
2480 MHz	-12.29

Annex A Photographs

1. Test Setup

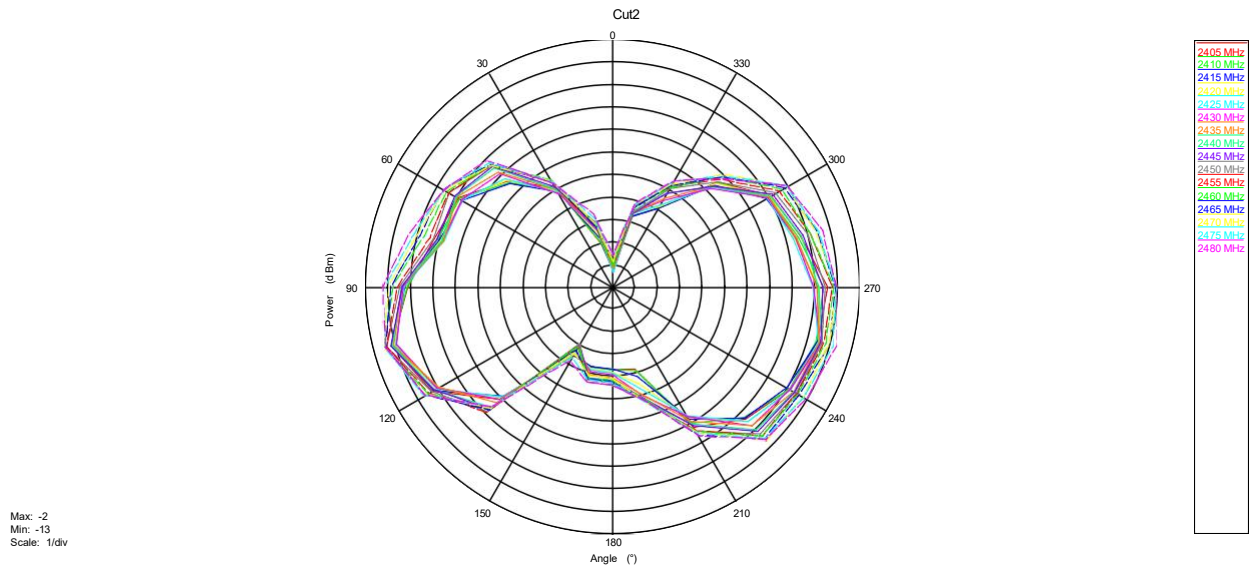




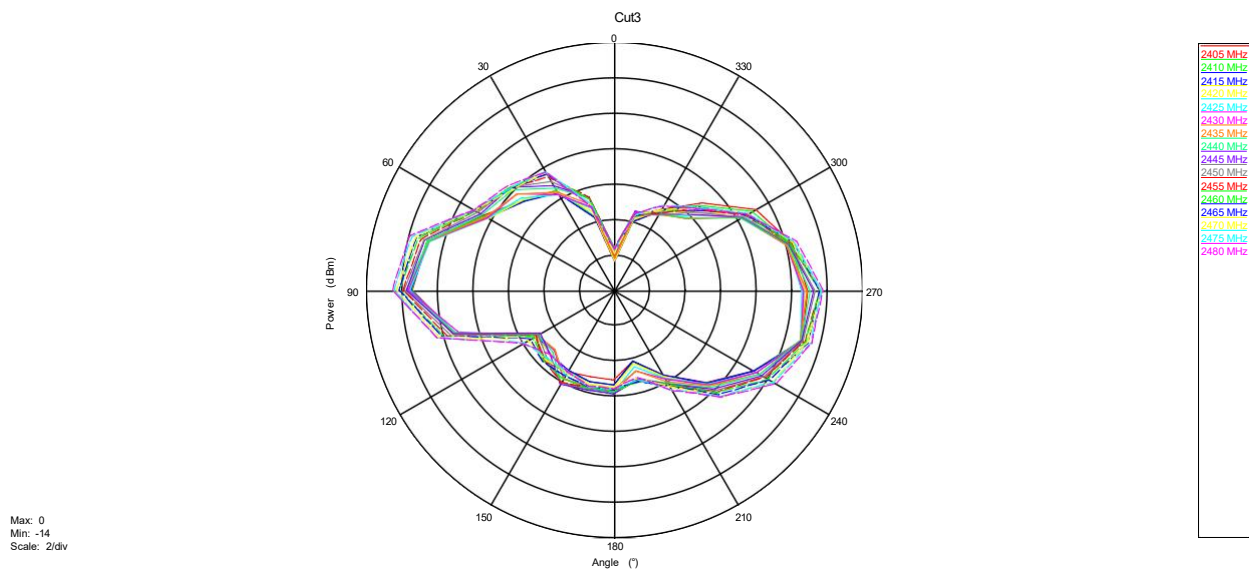
Annex B Figures

1. 2D Radiation Pattern

Phi=0°

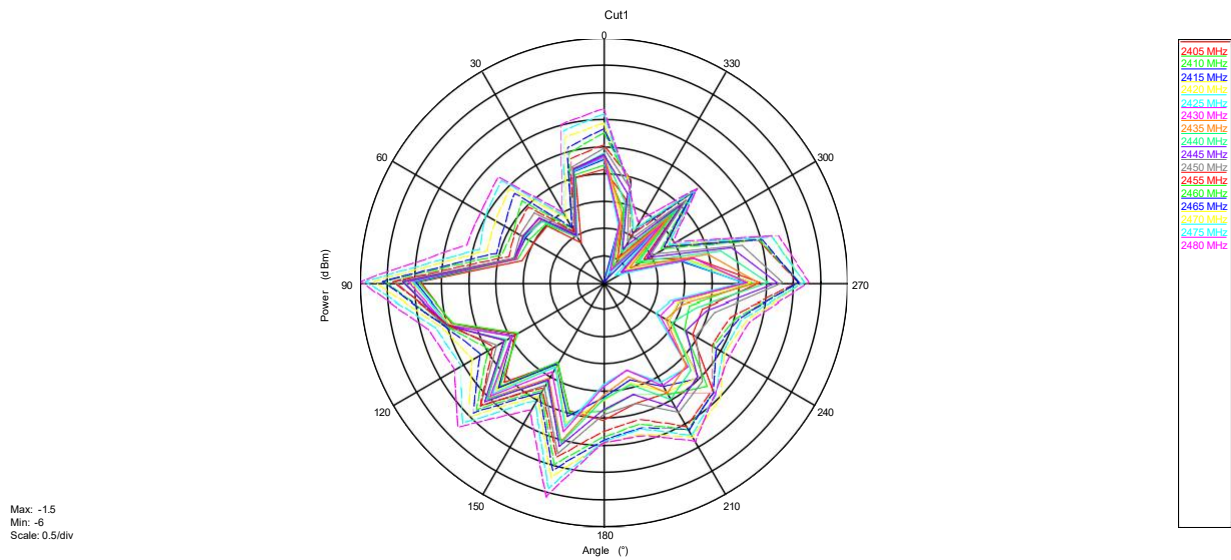


Phi=90°

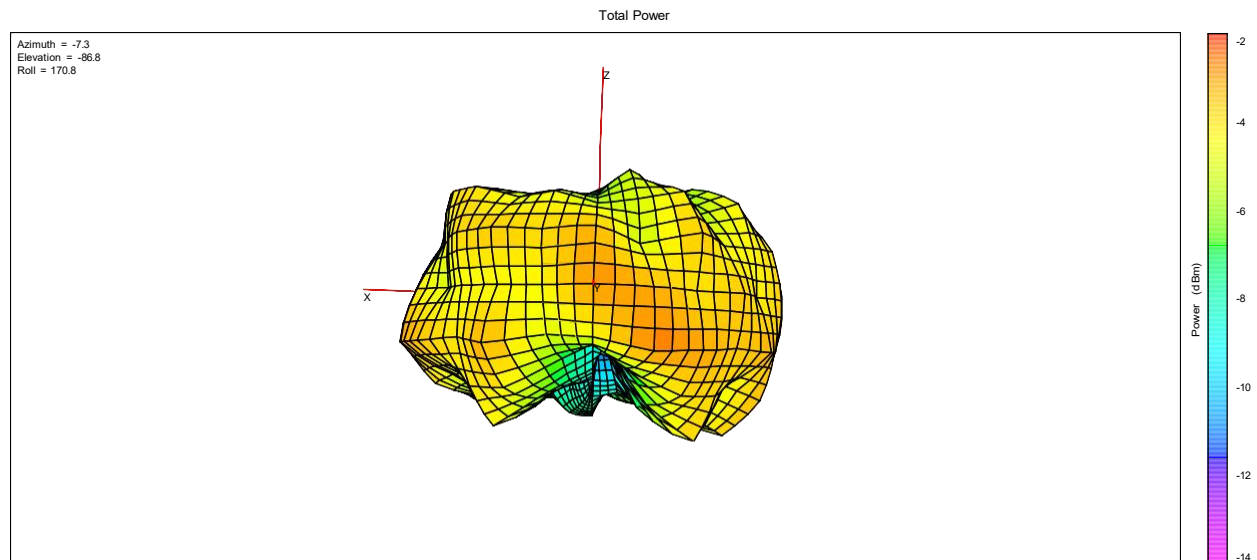




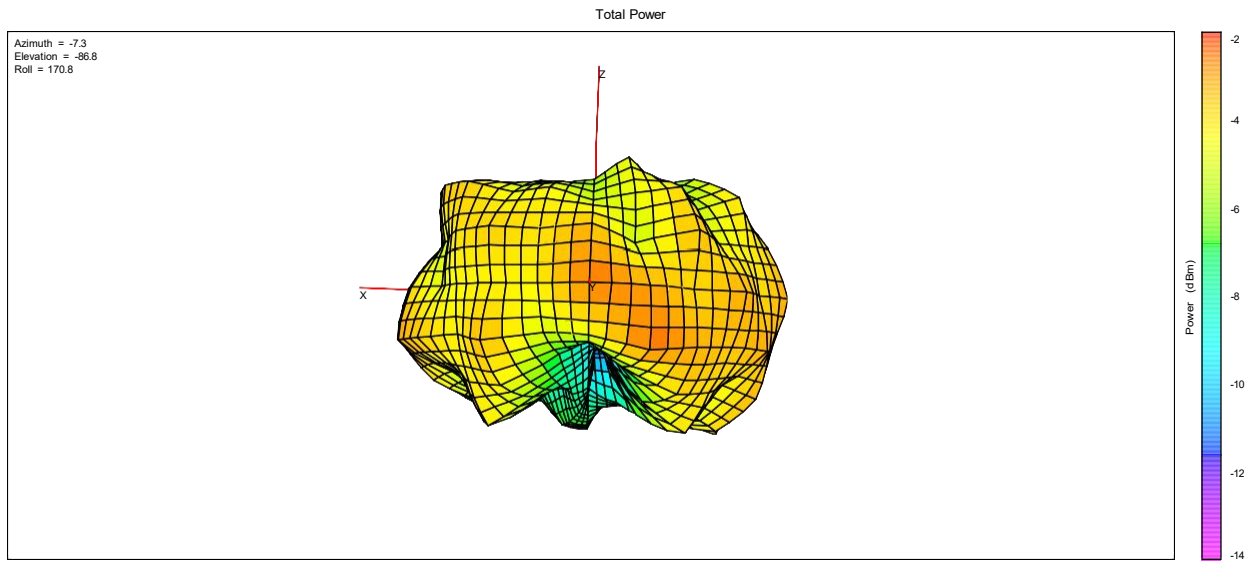
Theta=90°



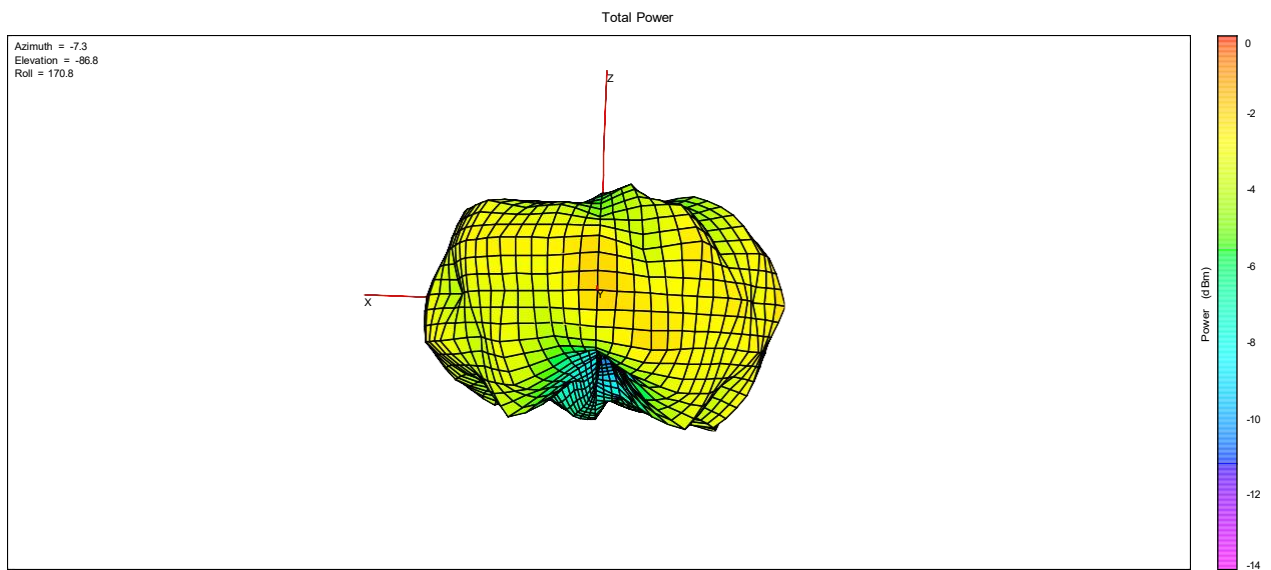
2. 3D Radiation Pattern



2405MHz



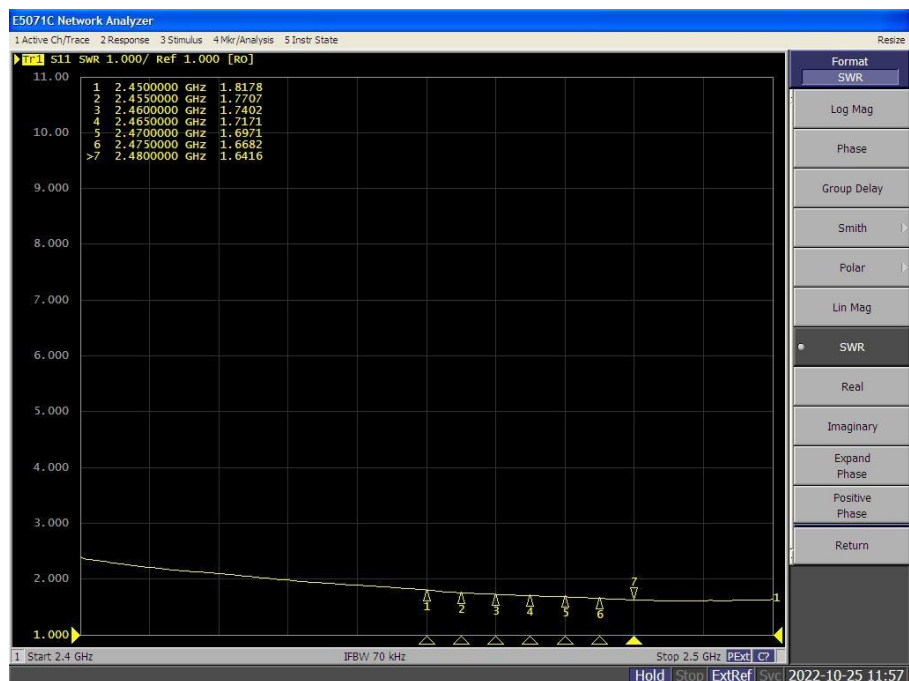
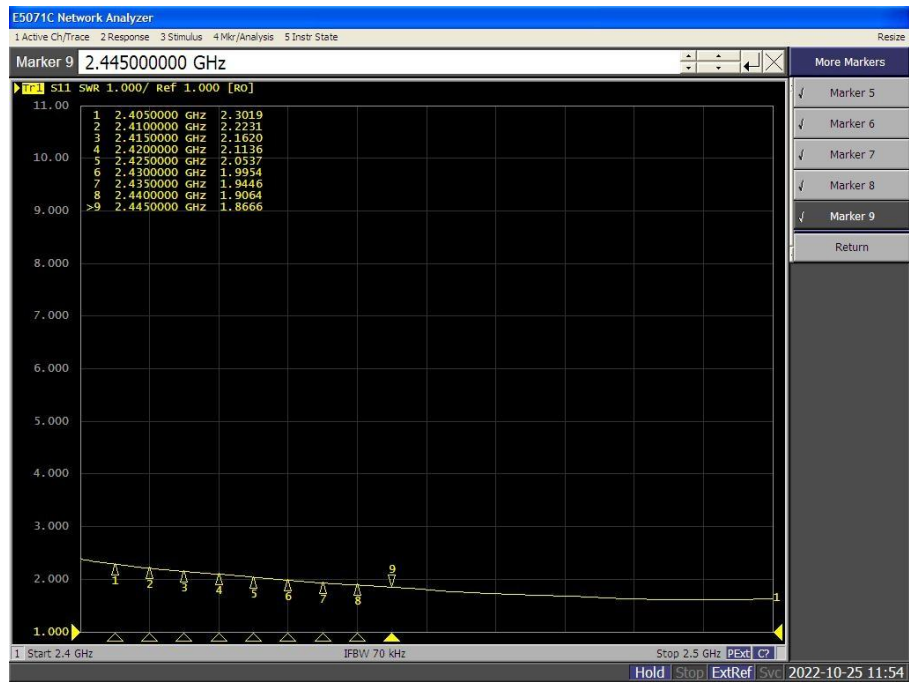
2440MHz



2480MHz

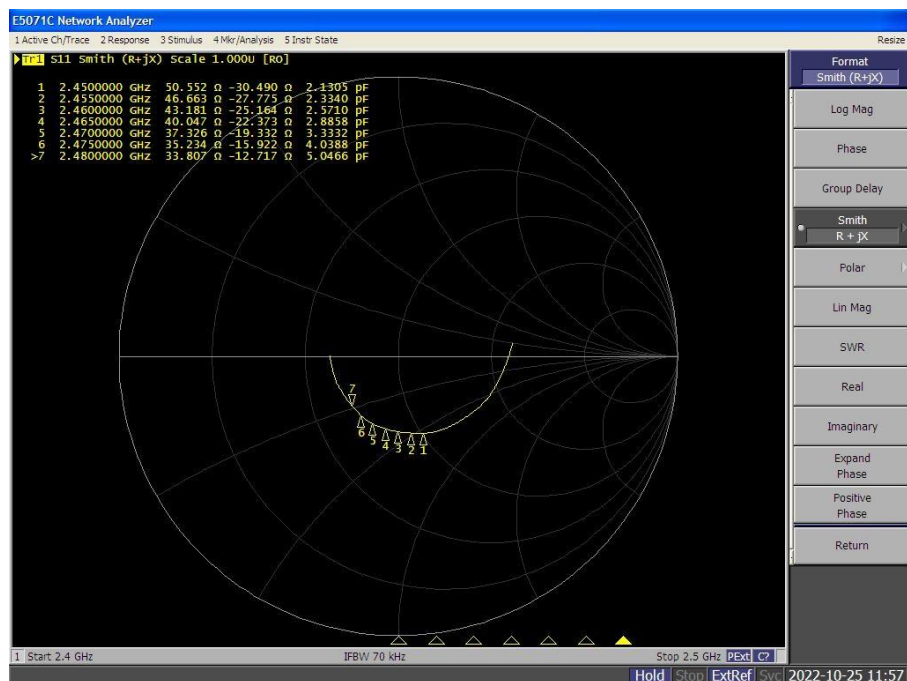
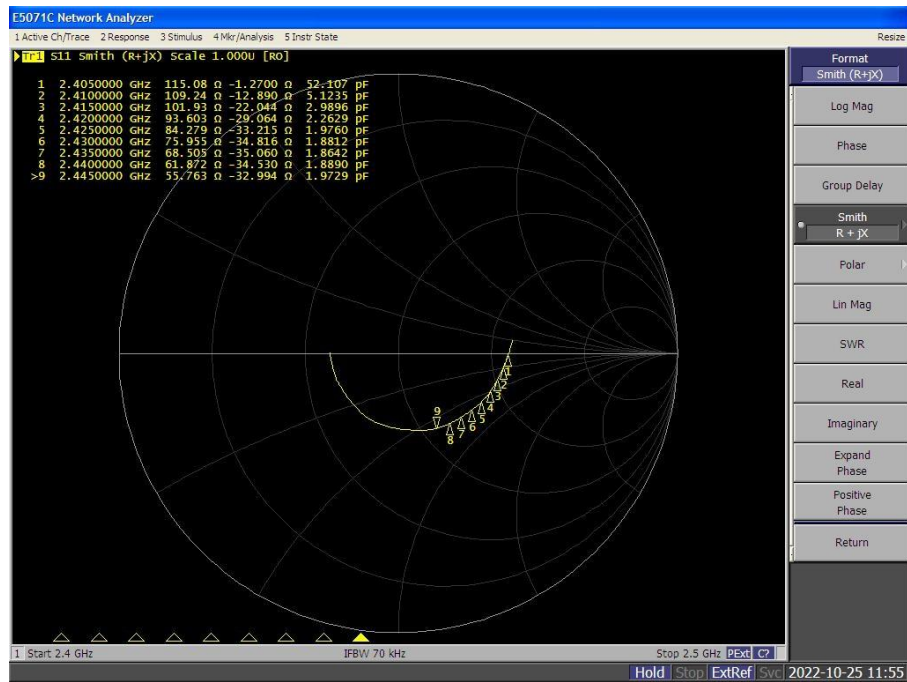


3. VSWR



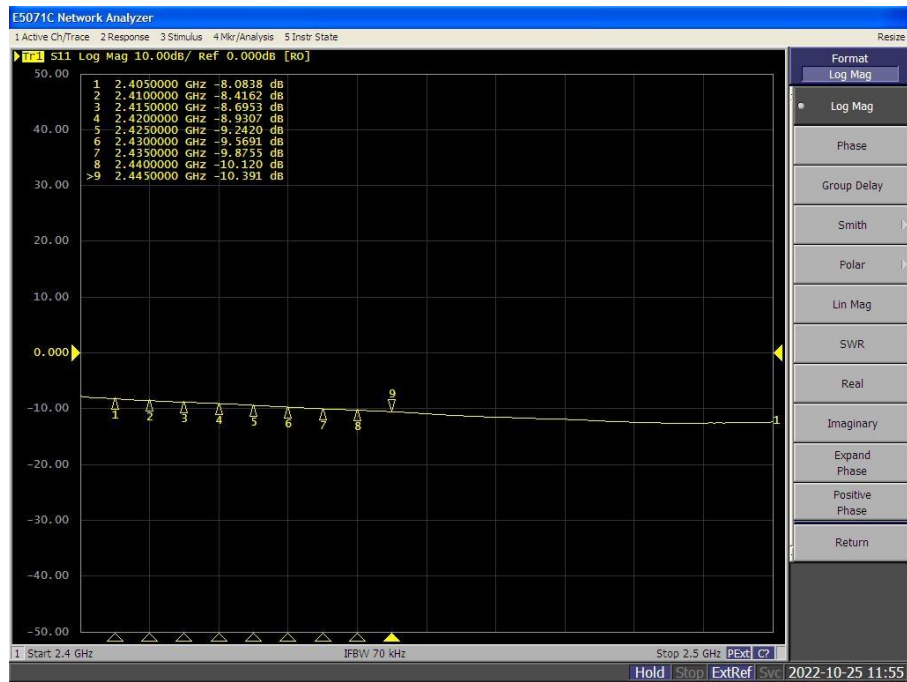


4. Impedance



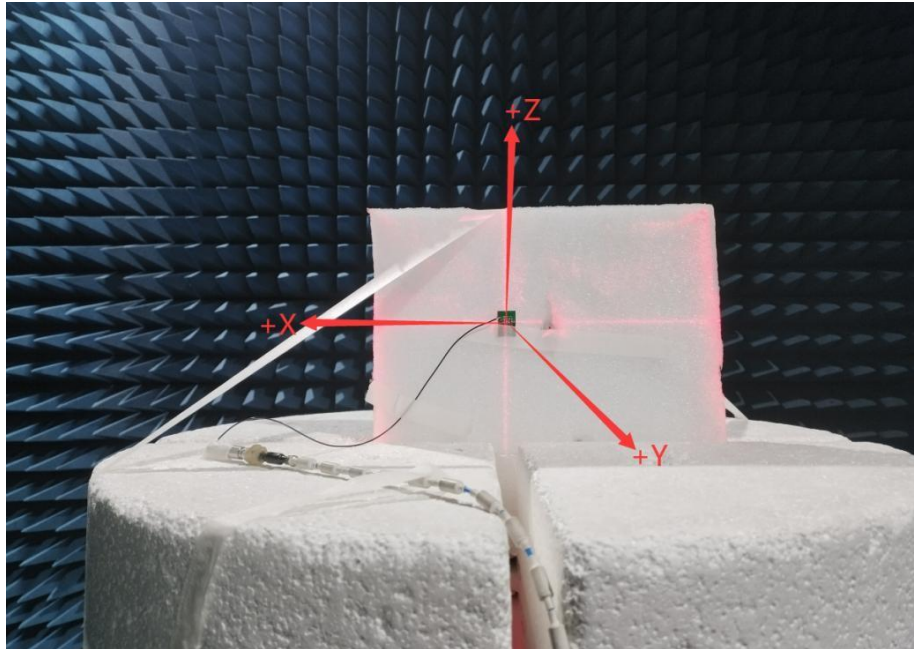


5. Return Loss*

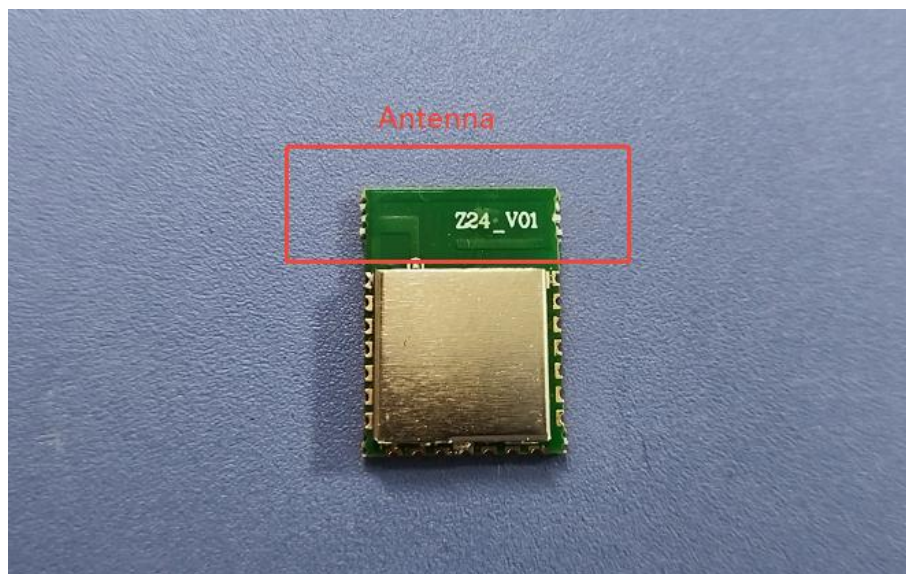


Annex C Photographs

Test environment



EUT





Annex D General Information

1.1 Considerations

"*" indicates that the project is not recognized by CNAS.

1.2 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

1.3 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

1.4 Test Equipments Utilized

No.	Equipment Name	Serial No.	Type	Manufacturer	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 —————