



# TEST REPORT

**APPLICANT** : Feit Electric Company Inc.

**PRODUCT NAME** : PCB Antenna

**MODEL NAME** : Driver-116

**TRADE NAME** : Feit, Naspil

**BRAND NAME** : N/A

**STANDARD(S)** : IEEE Std 149-2021

**RECEIPT DATE** : 2023-02-08

**TEST DATE** : 2023-02-09

**ISSUE DATE** : 2023-03-15

Edited by: *Fang Jinshan*  
Fang Jinshan(Rapporteur)

Approved by: *Chi Shide*  
Chi Shide(Supervisor)

**NOTE:** This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.





# 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 ..... 5
    - 2.4.1.Gain ..... 5
    - 2.4.2.VSWR ..... 5
    - 2.4.3.Return Loss .....6
- Annex A Test Setup Photos ..... 7
- Annex B Figures .....8
  - 1. 2D Radiation Pattern ..... 8
  - 2. 3D Radiation Pattern ..... 9
  - 3. VSWR ..... 11
  - 4. Return Loss ..... 11
- Annex C EUT Photos ..... 12
- Annex D General Information ..... 15
  - 1.1 Identification of the Responsible Testing Laboratory ..... 15
  - 1.2 Identification of the Responsible Testing Location ..... 15
  - 1.3 Test Equipments Utilized .....15

Change History		
Version	Date	Reason for change
1.0	2023-03-15	First edition



# 1. Technical Information

Note: Provide by applicant.

## 1.1. Applicant and Manufacturer Information

<b>Applicant:</b>	Feit Electric Company Inc.
<b>Applicant Address:</b>	4901 Gregg Road Pico Rivera, Ca 90660
<b>Manufacturer:</b>	National State Industries Limited
<b>Manufacturer Address:</b>	XinXing Group, WuLian Village, FengGang Town, DongGuan City, Guangdong Province, 523695 China

## 1.2. Equipment Under Test (EUT) Description

<b>Wireless Type</b>	N/A
<b>Frequency</b>	N/A
<b>IMEI</b>	N/A
<b>Sample No.</b>	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

### 2.4.1. Gain

Frequency (MHz)	Gain(dBi)
2400	-3.49
2410	-3.65
2420	-3.98
2430	-4.23
2440	-4.23
2450	-4.25
2460	-4.34
2470	-4.48
2480	-4.59
2490	-4.62
2500	-4.57

### 2.4.2. VSWR

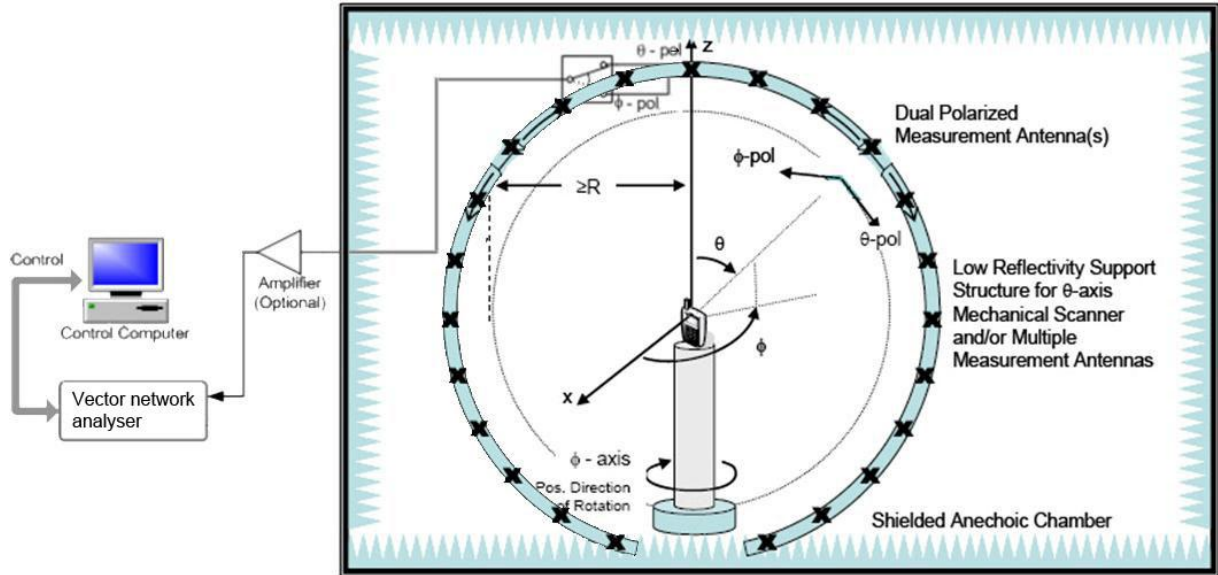
Frequency	VSWR
2400MHz	9.82
2440MHz	9.54
2480MHz	8.36



### 2.4.3.Return Loss

Frequency (MHz)	Return Loss (dB)
2400	-1.77
2440	-1.82
2480	-2.08

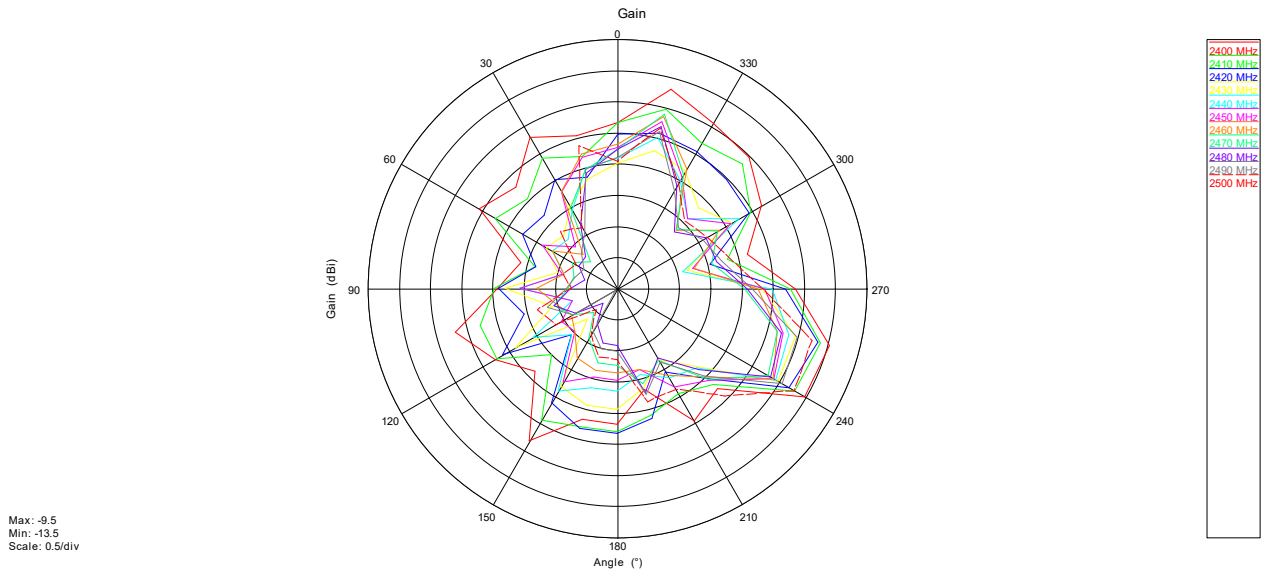
## Annex A Test Setup Photos



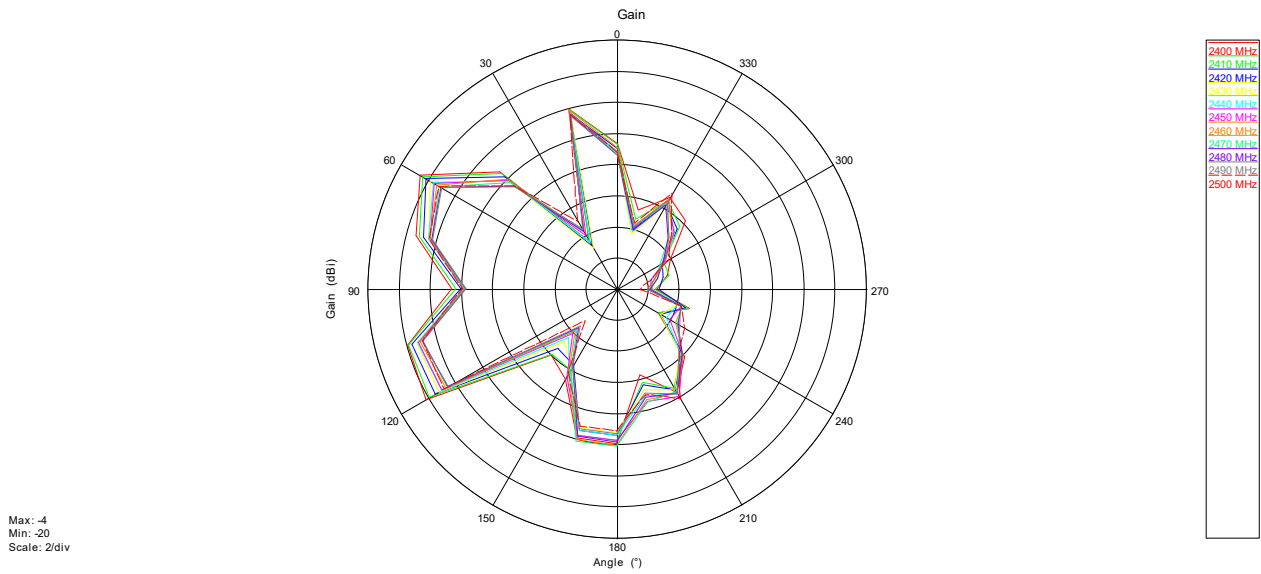
## Annex B Figures

### 1. 2D Radiation Pattern

Phi=0°



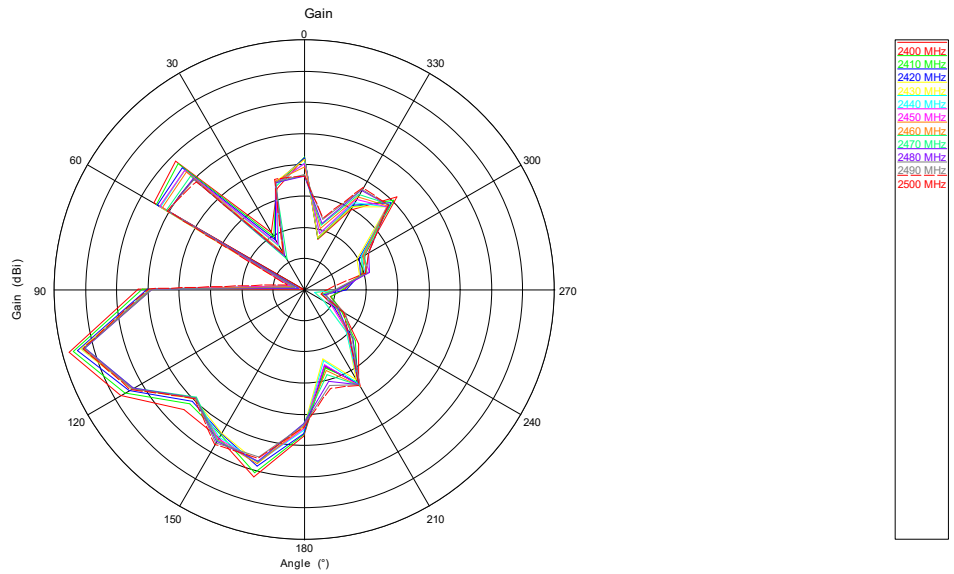
Phi=90°



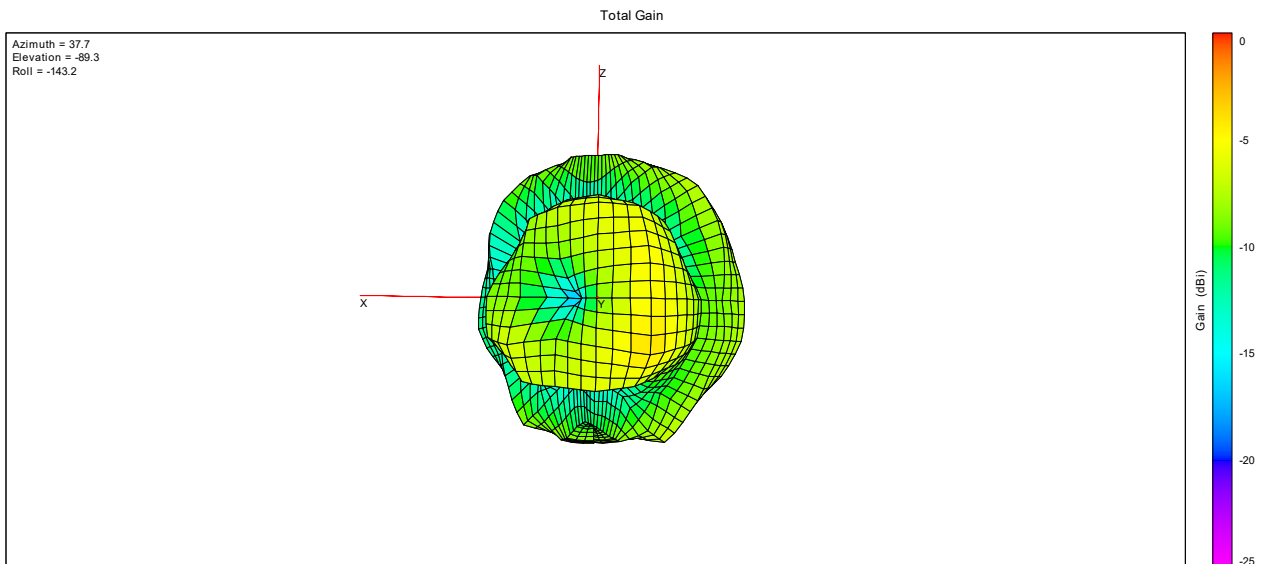




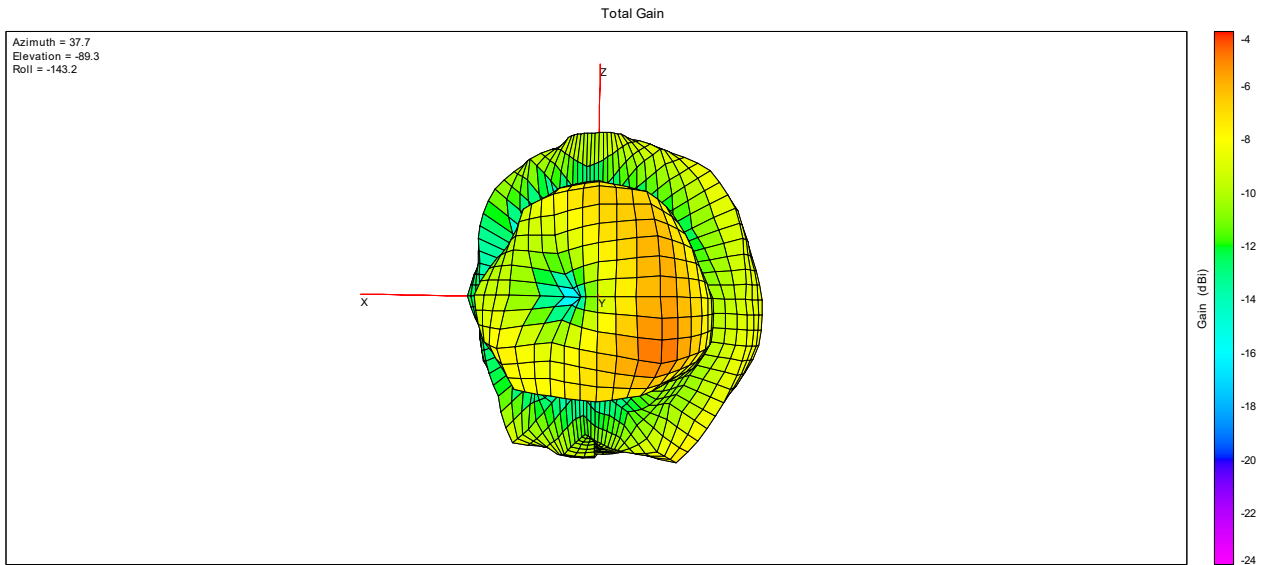
Theta=90°



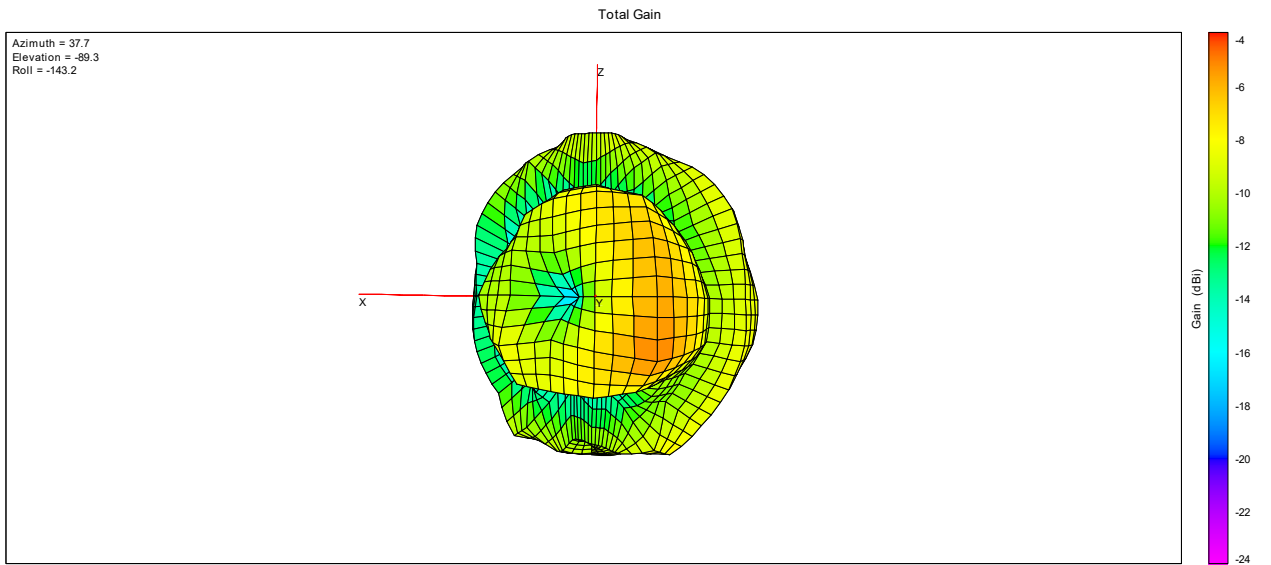
## 2. 3D Radiation Pattern



2400MHz



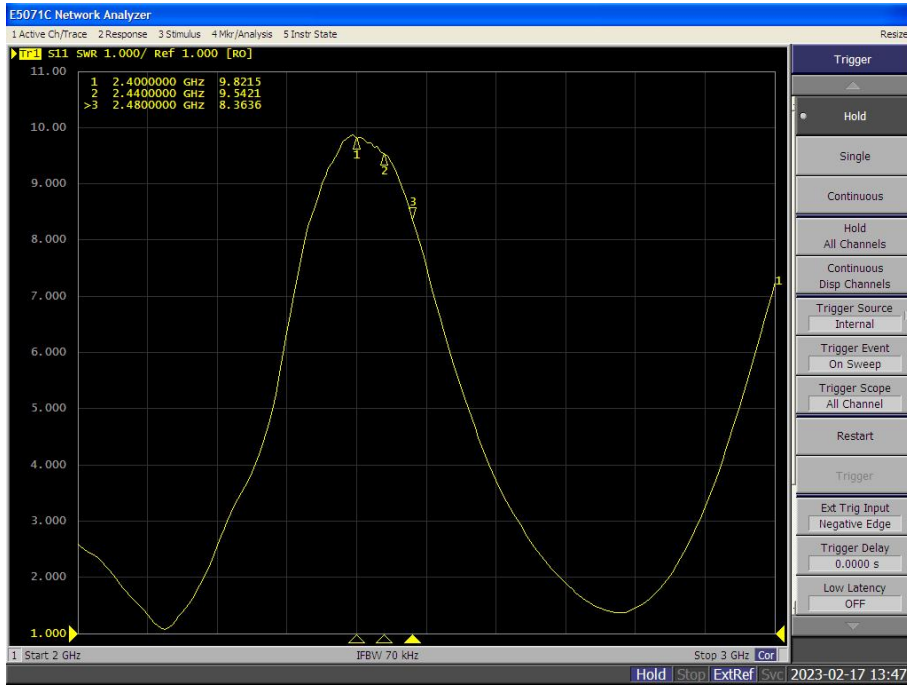
2440MHz



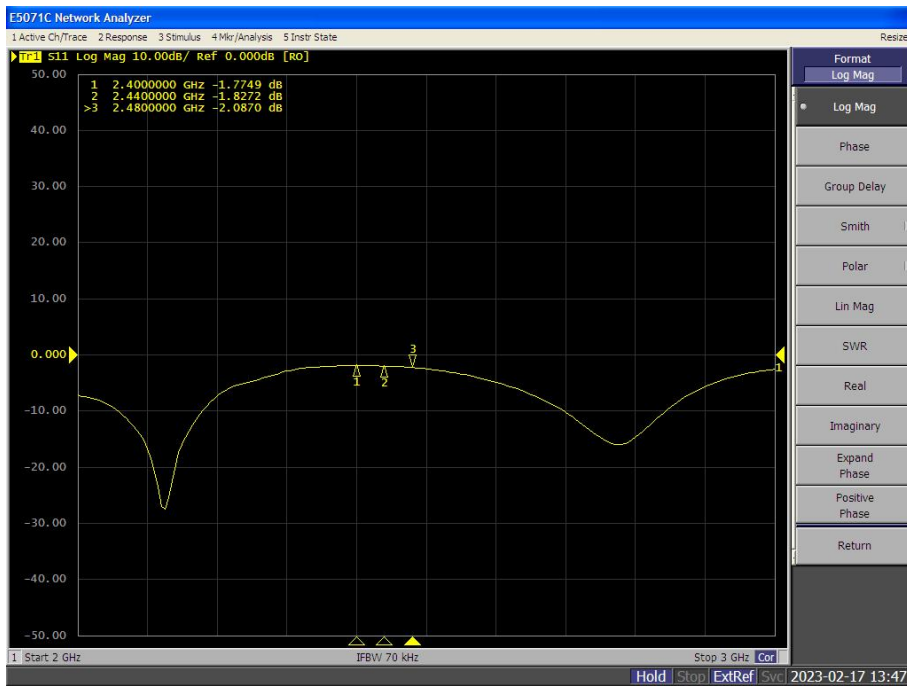
2480MHz



### 3. VSWR

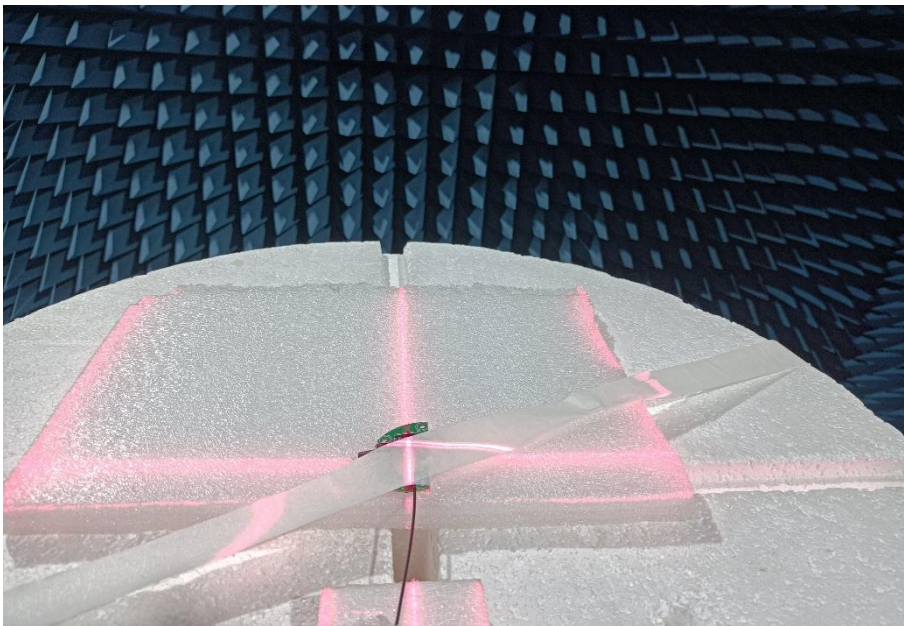
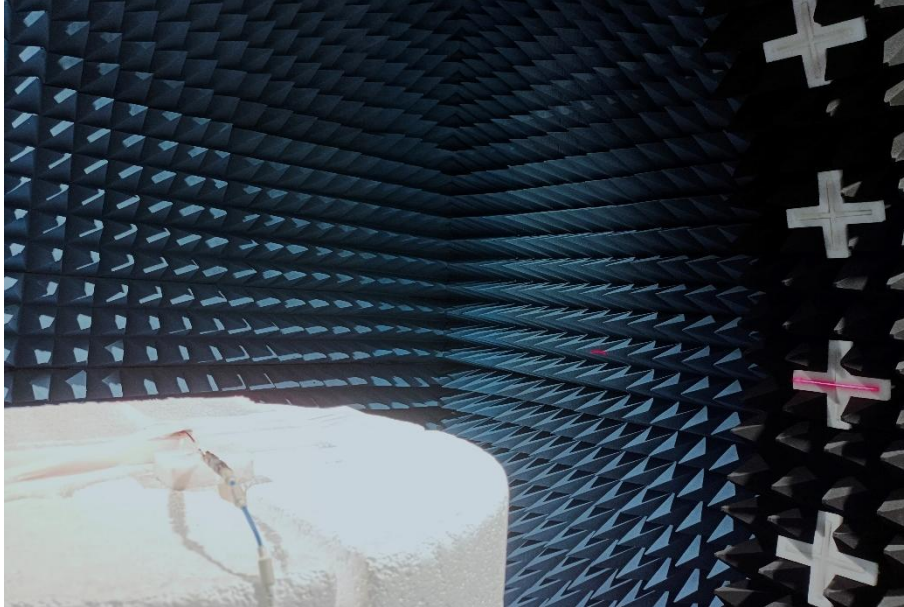


### 4. Return Loss

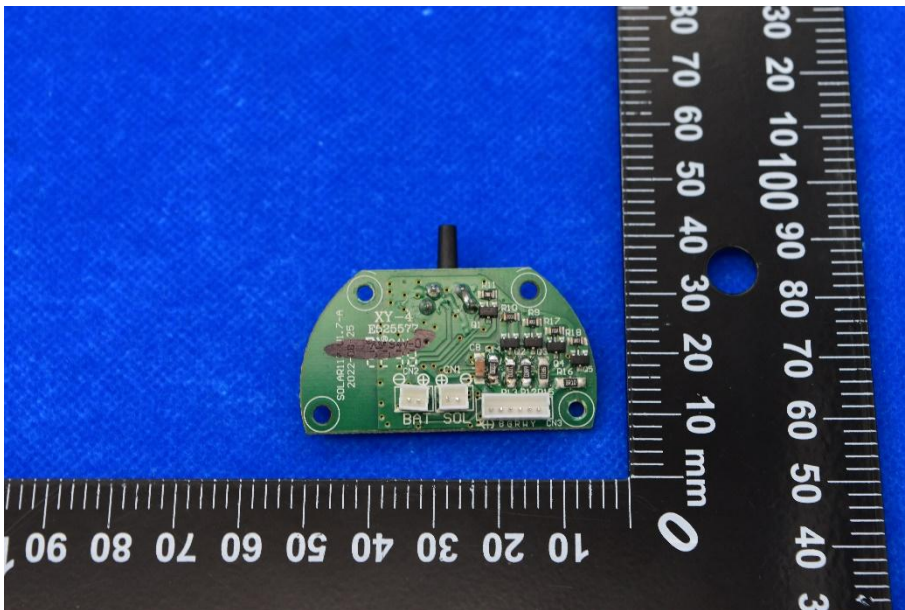
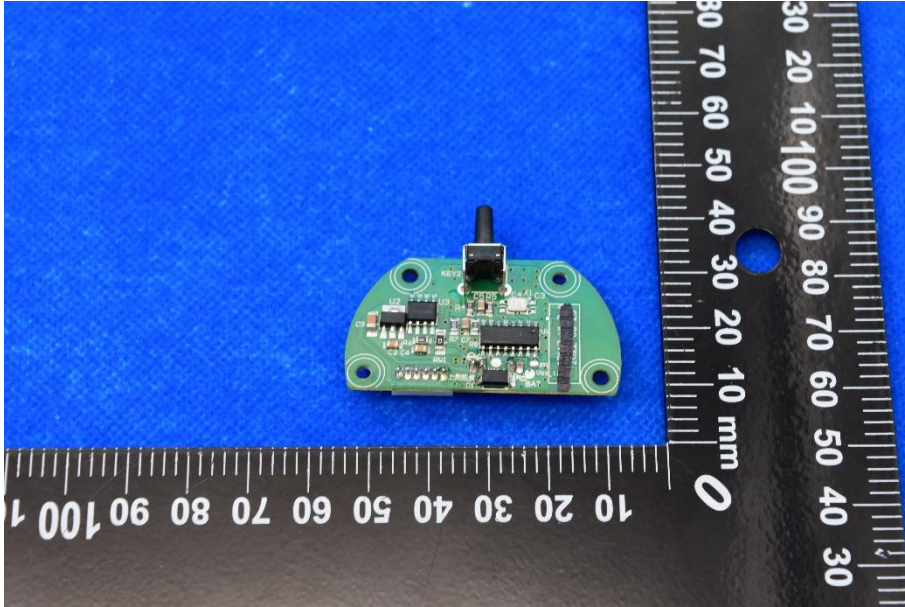


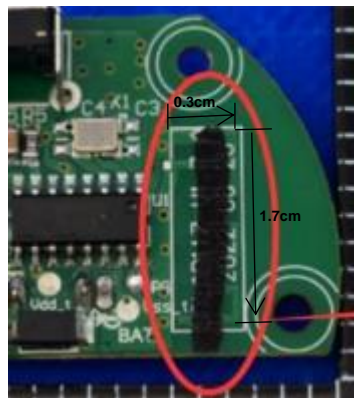
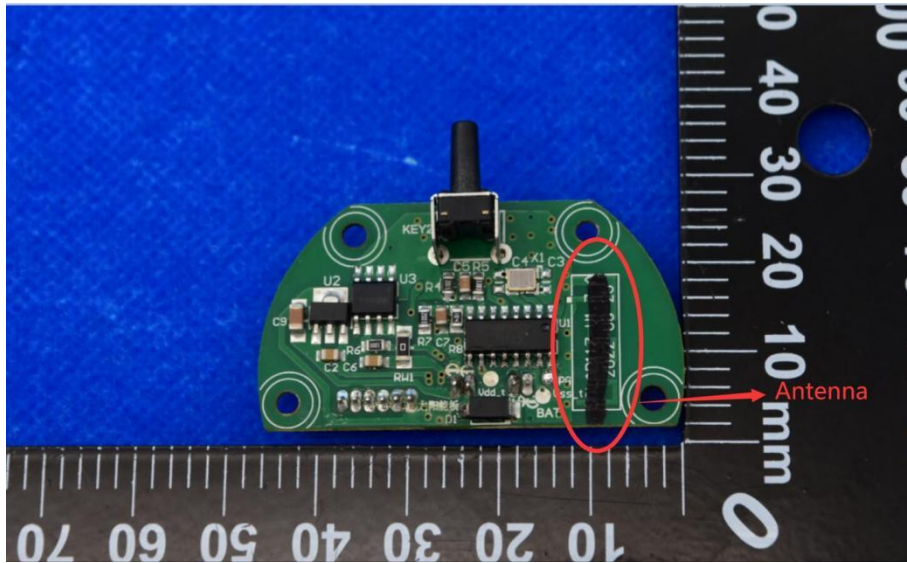
## Annex C EUT Photos

### 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:	FL.1-3, 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:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

### 1.3 Test Equipments Utilized

No.	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-Q1793	AMS-892 3-150	ETS	2022.11.30	2025.11.29
3	Antenna Measurement System	1685	EMQuest EMQ-100 V 1.13 Build 21267	ETS	N/A	N/A

————— END OF REPORT —————