



# TEST REPORT

Product : WiFi Module  
Model Name : CB3S  
Report No. : PTC24010602005E-RF01

## Prepared for

NIE-TECH Co., Ltd

Jilian commercial center 9001, Jinxiu road No.2, Changan Town,Dongguan City, GuangDongProv.,  
CHINA

## Prepared by

Precise Testing & Certification Co., Ltd

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Report No.: PTC24010602005E-RF01

## 1 Test Result Certification

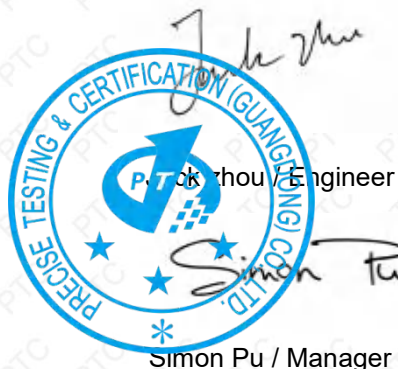
Applicant's name : NIE-TECH Co., Ltd  
Address : Jilian commercial center 9001, Jinxiu road No.2, Changan Town, Dongguan City, Guangdong Prov., CHINA  
Manufacture's name : NIE-TECH Co., Ltd  
Address : Jilian commercial center 9001, Jinxiu road No.2, Changan Town, Dongguan City, Guangdong Prov., CHINA  
Product name : WiFi Module  
Model name : CB3S  
Standards : GB/T 9410-2008; ANSI/IEEE Std 149-1979  
Test Date : Jan. 23, 2024 to Jan. 24, 2024  
Date of Issue : Jan. 24, 2024  
Test Result : Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the GB/T 9410 and ANSI/IEEE Std 149 requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of PTC, this document may be altered or revised by PTC, personal only, and shall be noted in the revision of the document.

Test Engineer:

Technical Manager:





Report No.: PTC24010602005E-RF01

#### Revision History of Report

| Vision No. | Date          | Revisions     | Modifier |
|------------|---------------|---------------|----------|
| 00         | Jan. 24, 2024 | Initial Issue |          |



## Contents

|                                                    |    |
|----------------------------------------------------|----|
| 1 Test Result Certification .....                  | 2  |
| 2 Test Summary .....                               | 5  |
| 3 Test Site .....                                  | 6  |
| 3.1 Test Facility .....                            | 6  |
| 3.2 Measurement Uncertainty .....                  | 6  |
| 3.3 List Of Test And Measurement Instruments ..... | 6  |
| 3.4 Test environmental .....                       | 6  |
| 3.5 Test Setup .....                               | 7  |
| 4 EUT Description .....                            | 8  |
| 5 Test Data .....                                  | 9  |
| 5.1 Typical free space efficiency and gain .....   | 9  |
| 5.2 Typical free space radiation pattern .....     | 10 |
| 5.3 3D Pattern .....                               | 12 |
| 6 EUT setup photo of free space OTA testing .....  | 14 |
| 7 EUT appearance .....                             | 15 |



## 2 Test Summary

| Name                         | Parameter            | Method                                                               | Standard no.           |
|------------------------------|----------------------|----------------------------------------------------------------------|------------------------|
| Mobile communication antenna | Antenna gain         | Generic specification for antennas used in the mobile communications | GB/T 9410-2008         |
|                              | Radiation pattern    |                                                                      |                        |
| Antenna                      | Radiation efficiency | IEEE Standard Test Procedures for Antennas                           | ANSI/IEEE Std 149-1979 |
|                              | Gain and directivity |                                                                      |                        |



Report No.: PTC24010602005E-RF01

### 3 Test Site

#### 3.1 Test Facility

|         |                                                                               |
|---------|-------------------------------------------------------------------------------|
| Name    | Precise Testing & Certification Co., Ltd                                      |
| Address | Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China |

#### 3.2 Measurement Uncertainty

The uncertainty was calculated on the basis of the GUM published by ISO, using the inclusion factor of K=2 and the 95% confidence level to express the extended uncertainty.

| Item                 | Uncertainty         |
|----------------------|---------------------|
| Antenna gain         | $\pm 0.68\text{dB}$ |
| Radiation efficiency | $\pm 0.68\text{dB}$ |

#### 3.3 List Of Test And Measurement Instruments

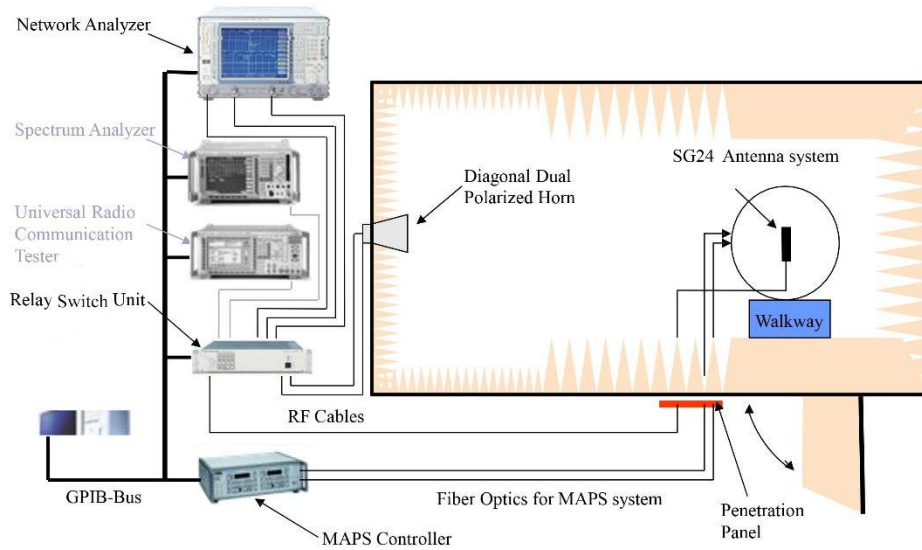
| Name of Equipment          | Manufacturer     | Serial No. | Last Cal.    | Calibration Interval |
|----------------------------|------------------|------------|--------------|----------------------|
| 24 probe microwave chamber | YIHENG ELECTPONC | 4*4*4      | Jan. 10,2024 | 1 Year               |
| Network Analyzer           | E5071C           | Agilent    | Jan. 10,2024 | 1 Year               |
| XH.PassiveTest 2.7.6       | XH-IOT           | /          | /            | /                    |

#### 3.4 Test environmental

| Environment Parameter                            | Selected Values During the Testes |            |
|--------------------------------------------------|-----------------------------------|------------|
| Relative Humidity                                | 45% to 55%                        |            |
| Value                                            | Temperature( $^{\circ}\text{C}$ ) | Voltage(V) |
| NTNV                                             | 20 to 24                          | N/A        |
| Note: NV: Normal Voltage; NT: Normal Temperature |                                   |            |



### 3.5 Test Setup





## 4 EUT Description

|                 |                                                |
|-----------------|------------------------------------------------|
| Product Name    | WiFi Module                                    |
| Sample Model    | CB3S                                           |
| Size            | /                                              |
| Test Item       | Antenna gain; Radiation pattern and efficiency |
| Antenna Type    | PCB Antenna                                    |
| Frequency Range | 2400MHz-2500MHz                                |



## 5 Test Data

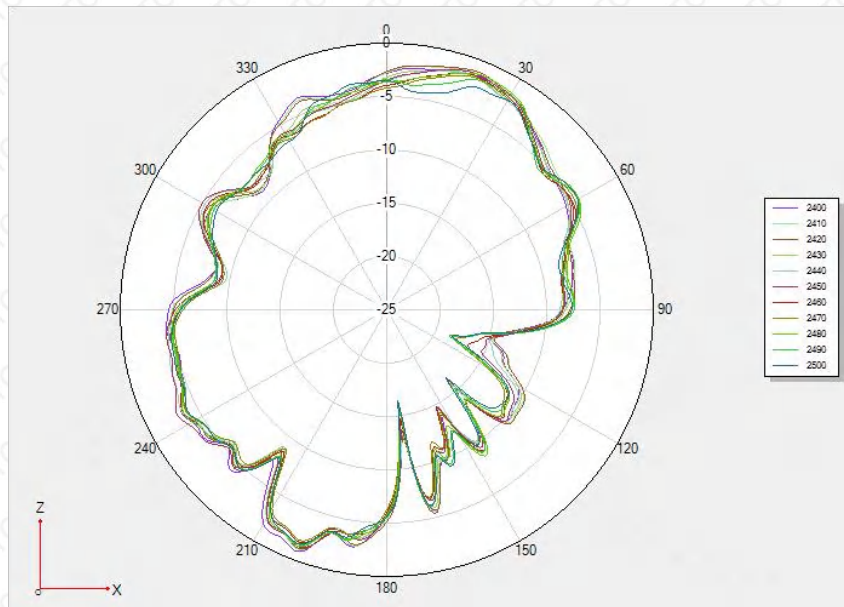
### 5.1 Typical free space efficiency and gain

| Frequency/MHz | Efficiency / dB | Efficiency / % | Max Gain/dBi | Avg Gain/dBi |
|---------------|-----------------|----------------|--------------|--------------|
| 2400          | -3.09           | 49.09          | 4.75         | -3.09        |
| 2410          | -3.04           | 49.66          | 4.99         | -3.04        |
| 2420          | -3.17           | 48.19          | 5.26         | -3.17        |
| 2430          | -3.17           | 48.19          | 4.88         | -3.17        |
| 2440          | -3.2            | 47.86          | 4.56         | -3.2         |
| 2450          | -3.41           | 45.6           | 4.58         | -3.41        |
| 2460          | -3.53           | 44.36          | 4.31         | -3.53        |
| 2470          | -3.57           | 43.95          | 4.1          | -3.57        |
| 2480          | -3.52           | 44.46          | 4.55         | -3.52        |
| 2490          | -3.52           | 44.46          | 4.41         | -3.52        |
| 2500          | -3.36           | 46.13          | 4.18         | -3.36        |

## 5.2 Typical free space radiation pattern

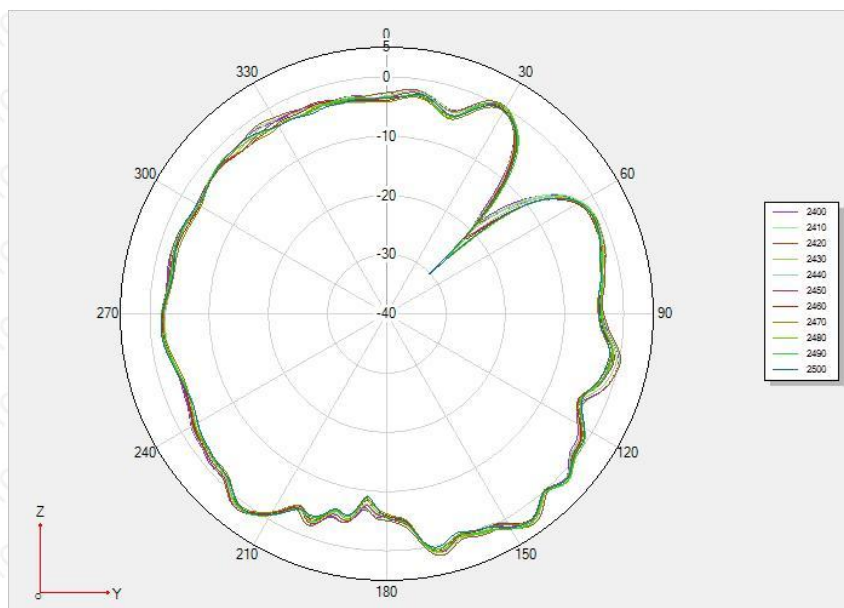
(1) X-Z Plane:

V Phi=0



(2) Y-Z Plane:

V Phi=90

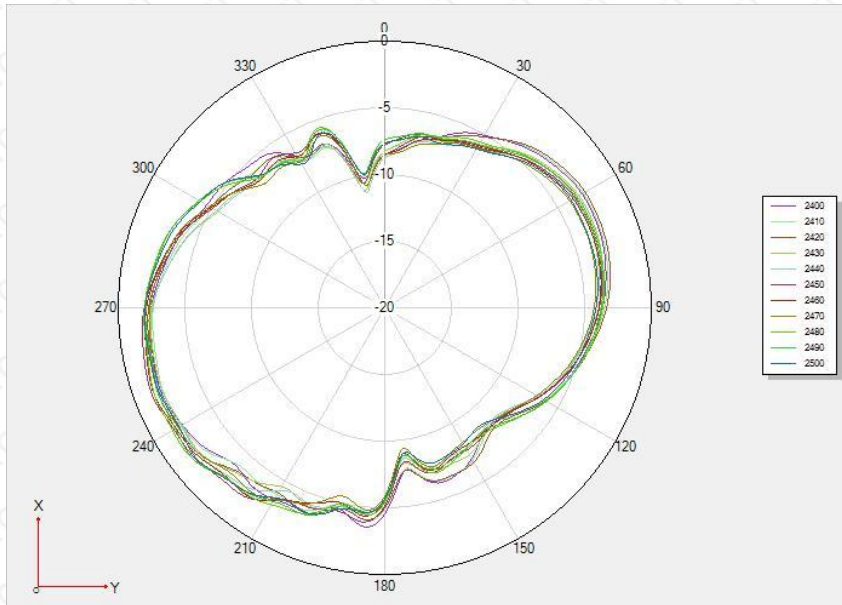




Report No.: PTC24010602005E-RF01

(3)X-Y Plane:

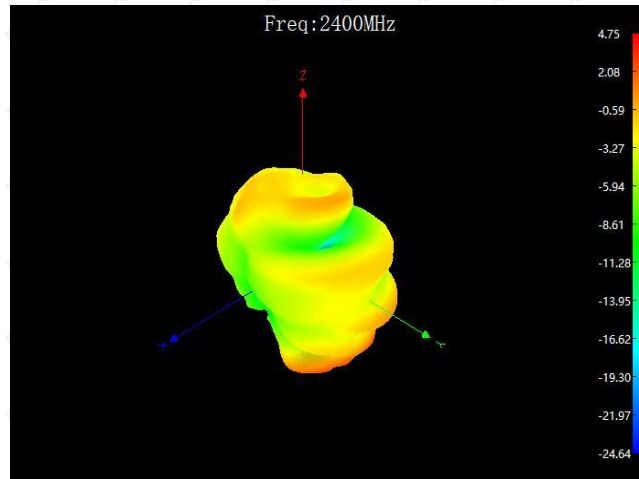
H Theta=90



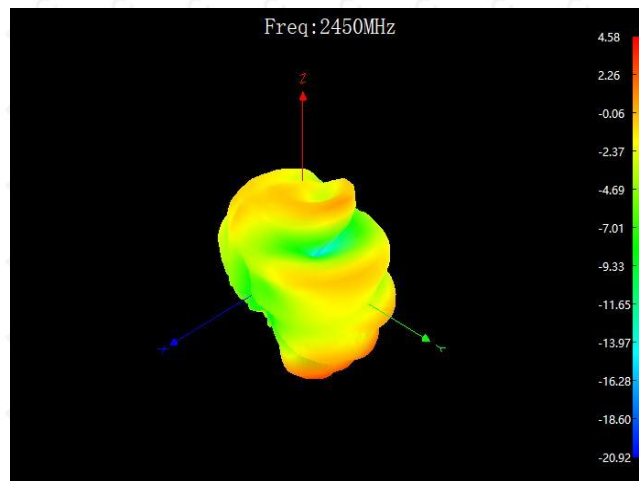


## 5.3 3D Pattern

3D Pattern for 2400MHz



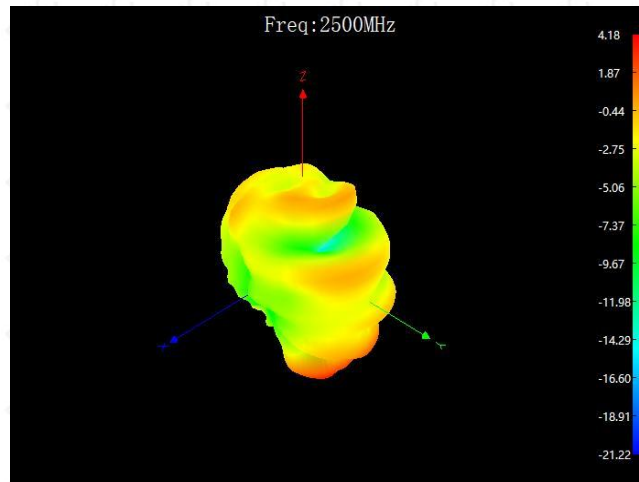
3D Pattern for 2450MHz





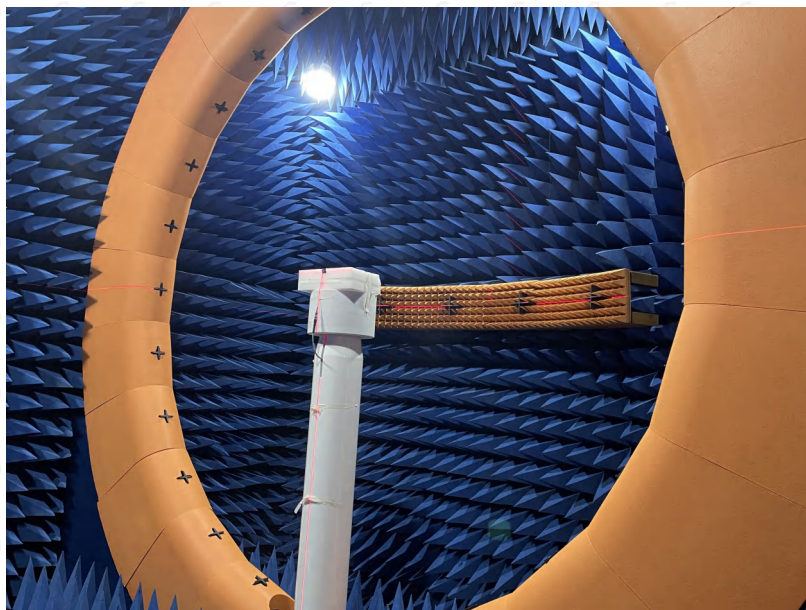
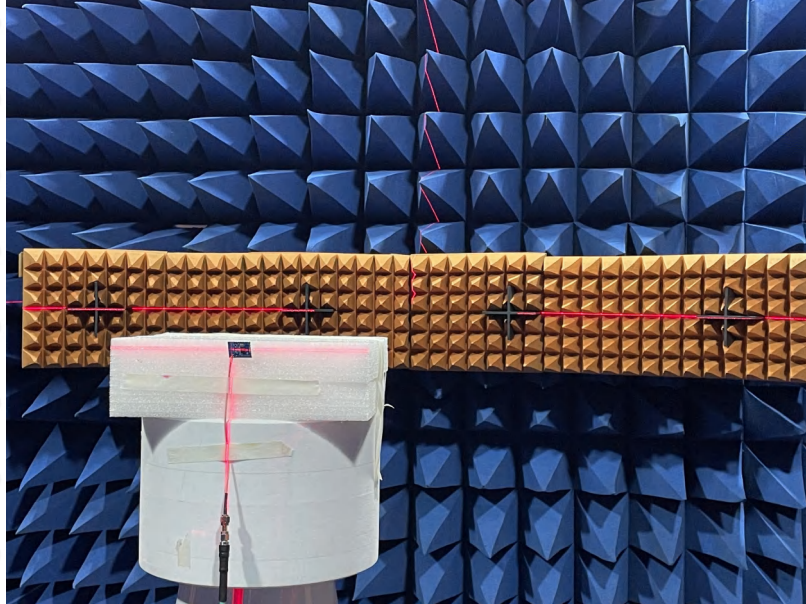
Report No.: PTC24010602005E-RF01

### 3D Pattern for 2500MHz





## 6 EUT setup photo of free space OTA testing

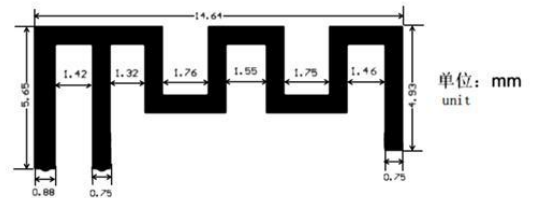




## 7 EUT appearance



### 4. Antenna Dimensions



\*\*\*\*\*THE END REPORT\*\*\*\*\*