

# Testing Report

Customer Name: DONGGUAN YUNMEI ELECTRONICS CO.,LTD

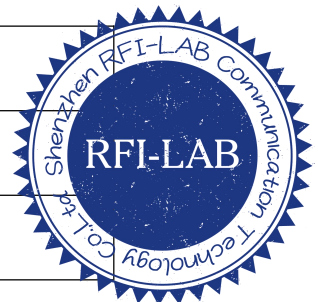
Product Name: bluetooth Antenna

Sample Model: Inverted F1 Antenna

Reference Standard: *GB/T 9410-2008; ANSI/IEEE Std 149-1979*

Issue Date: 2022.9.2

|                   |                |
|-------------------|----------------|
| Engineer: Jackson | Date: 2022.9.1 |
| Auditor: Eason    | Date: 2022.9.2 |
| Approver: Janson  | Date: 2022.9.2 |



## Version

| Version No. | Date     | Description                   | Formulate | Approval |
|-------------|----------|-------------------------------|-----------|----------|
| A0          | 2022.9.2 | For the first time, formulate | Jackson   | Eason    |
|             |          |                               |           |          |
|             |          |                               |           |          |

## Contents

|                                                       |    |
|-------------------------------------------------------|----|
| 1.General Information .....                           | 3  |
| 1.1 General information of testing institutions ..... | 3  |
| 1.2 Testing principle .....                           | 3  |
| 1.3 Test equipment .....                              | 4  |
| 1.4 Test environment .....                            | 4  |
| 1.5 Statement .....                                   | 4  |
| 2.Sample Information .....                            | 5  |
| 2.1 Client information .....                          | 5  |
| 2.2 Description of EUT(S) .....                       | 5  |
| 2.3 EUT appearance .....                              | 6  |
| 2.4 DUT setup photo of free space OTA testing .....   | 6  |
| 3.Test Results .....                                  | 7  |
| 3.1 Test standard .....                               | 7  |
| 3.2 Test uncertainty .....                            | 7  |
| 3.3 Test data .....                                   | 8  |
| 3.3.1 VSWR parameters .....                           | 8  |
| 3.3.2 VSWR data .....                                 | 8  |
| 3.3.3 Typical free space efficiency and gain .....    | 8  |
| 3.3.4 Typical free space radiation pattern .....      | 9  |
| (The following is blank) .....                        | 10 |

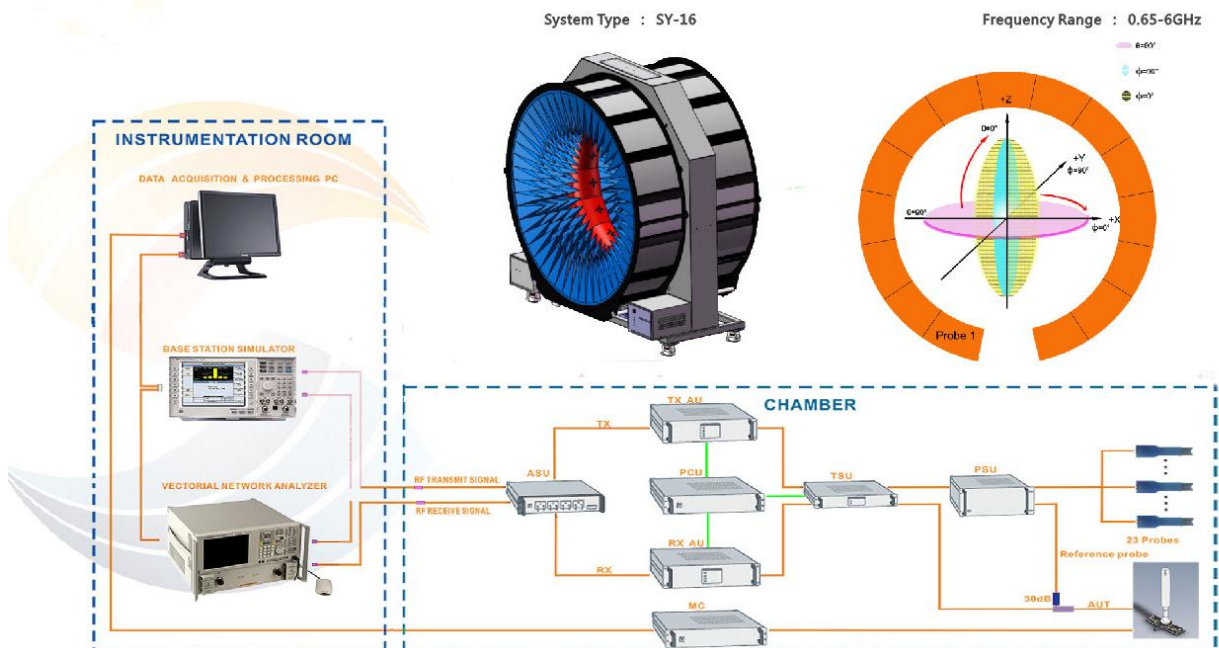
# 1.General Information

## 1.1 General information of testing institutions

|           |                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------|
| Name      | Shenzhen RFI-LAB Communication Technology Co., Ltd.                                                     |
| Address   | 10/F A, Lingyun Bld, Liufang Rd, Baoan District, SZ                                                     |
| Tel       | 13631623357                                                                                             |
| E-mail    | liss@tech-now.com                                                                                       |
| Equipment | All the equipment used in the report is fixed in<br>10/F A, Lingyun Bld, Liufang Rd, Baoan District, SZ |

## 1.2 Testing principle

### Multi-Probe OTA Measurement System



### 1.3 Test equipment

| Equipment                  | Model No. | Serial No.     | Manufacturer | Calibration date | Next calibration date |
|----------------------------|-----------|----------------|--------------|------------------|-----------------------|
| 16 probe microwave chamber | 3*3*2.5   | RFI-LAB-RF-A00 | SUNYIELD     | 2021.3.15        | 2023.3.14             |
| Network Analyzer           | E5071C    | RFI-LAB-RF-A02 | Agilent      | 2022.5.13        | 2023.5.12             |
| Network Analyzer           | E5071C    | RFI-LAB-RF-C02 | KEYSIGHT     | 2022.5.13        | 2023.5.12             |

### 1.4 Test environment

|             |           |
|-------------|-----------|
| Temperature | 23.9℃     |
| Humidity    | 58%RH     |
| Pressure    | 100.14kPa |

### 1.5 Statement

- (1) The test results in the report are only applicable to the tested samples and the tested samples work under the environment described in the report.
- (2) Only Shenzhen RFI-LAB Communication Technology Co., Ltd. have the right to modify the report, and the modification information shall be annotated in the revision form.
- (3) Any objection to this report shall be raised within 30 days after formal confirmation of the report.
- (4) This report is invalid if there is any evidence that the sample information provided is falsified.
- (5) The report is invalid without the signature of the auditor and approver.

## 2.Sample Information

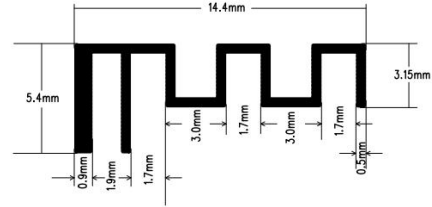
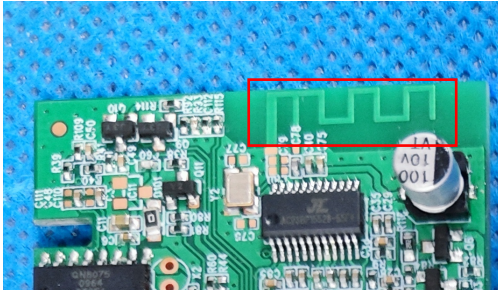
### 2.1 Client information

|                 |                                                    |
|-----------------|----------------------------------------------------|
| <b>Name</b>     | DONGGUAN YUNMEI ELECTRONICS CO., LTD               |
| <b>Address</b>  | No.58, Xiangxi, Jin'an Road, Liaobu Town, Dongguan |
| <b>Contacts</b> | Fengyuan Liao                                      |
| <b>Tel</b>      | 13600427799                                        |
| <b>E-mail</b>   | fyiao@yunmeidg.com                                 |

### 2.2 Description of EUT(S)

|                        |                                                   |
|------------------------|---------------------------------------------------|
| <b>Product Name</b>    | bluetooth Antenna                                 |
| <b>Sample Model</b>    | Inverted F1 Antenna                               |
| <b>Size</b>            | /                                                 |
| <b>Serial No.</b>      | /                                                 |
| <b>Test Item</b>       | VSWR; Antenna gain; Efficiency; Radiation pattern |
| <b>Frequency Range</b> | 2400-2500MHz                                      |
| <b>Received Date</b>   | 2022.8.31                                         |
| <b>Test Date</b>       | 2022.9.1                                          |
| <b>4Remark</b>         | The length of the RF cable is 40mm                |

## 2.3 EUT appearance

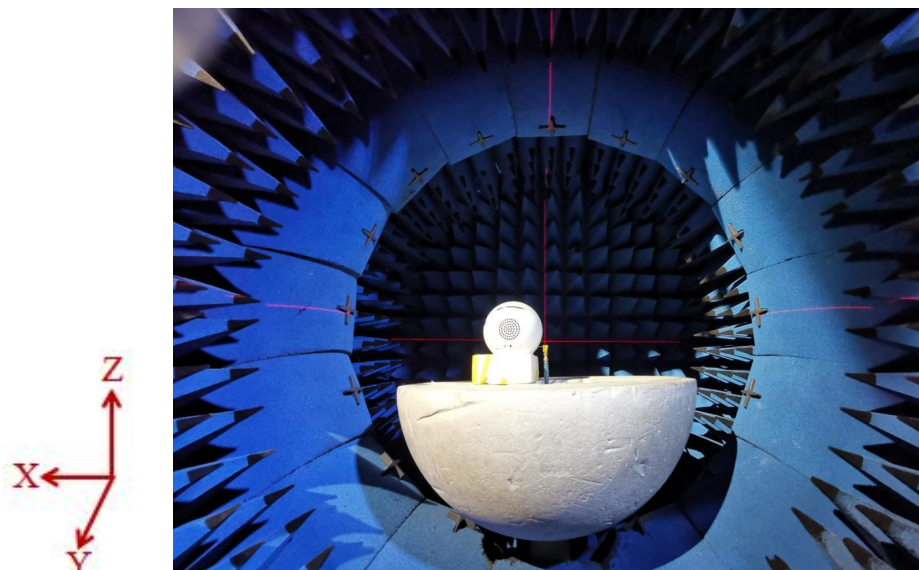


## 2.4 DUT setup photo of free space OTA testing

Planform



Front view



## 3. Test Results

### 3.1 Test standard

| 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    |                                                                      |                        |
|                              | VSWR                 |                                                                      |                        |
| Antenna                      | Radiation efficiency | IEEE Standard Test Procedures for Antennas                           | ANSI/IEEE Std 149-1979 |
|                              | Gain and directivity |                                                                      |                        |

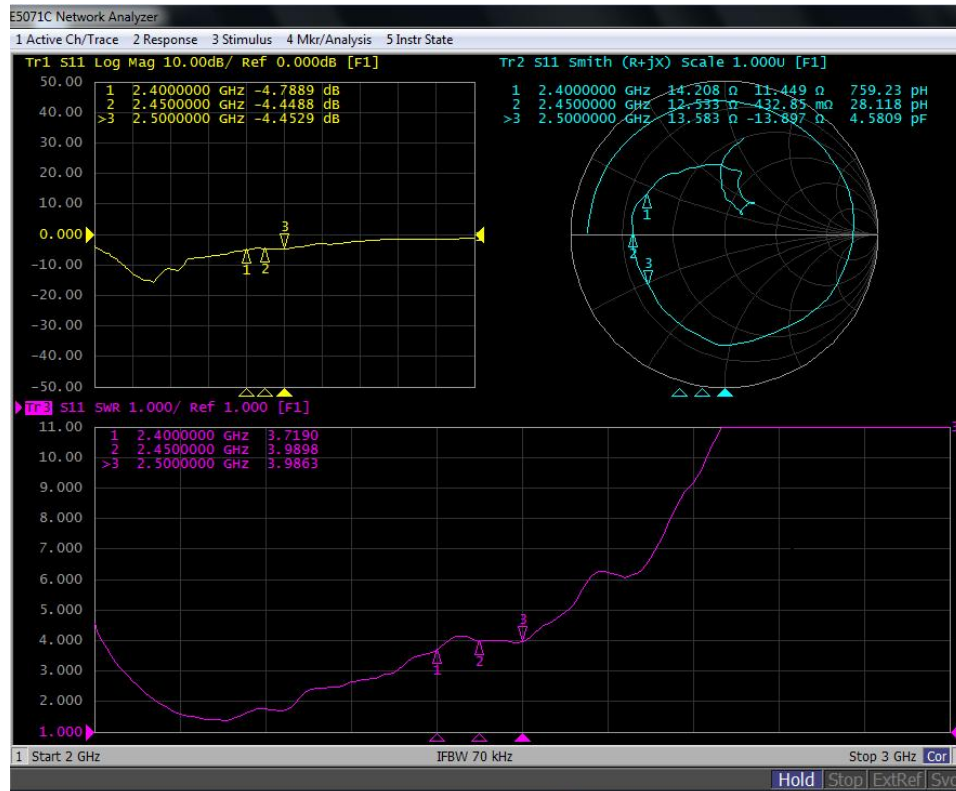
### 3.2 Test uncertainty

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      |
|----------------------|------------------|
| VSWR                 | $\pm 0.3$        |
| Antenna gain         | $\pm 1\text{dB}$ |
| Radiation efficiency | $\pm 10\%$       |

### 3.3 Test data

#### 3.3.1 VSWR parameters



#### 3.3.2 VSWR data

| Frequency/MHz | 2400   | 2450   | 2500   |
|---------------|--------|--------|--------|
| VSWR          | 3.7190 | 3.9898 | 3.9863 |

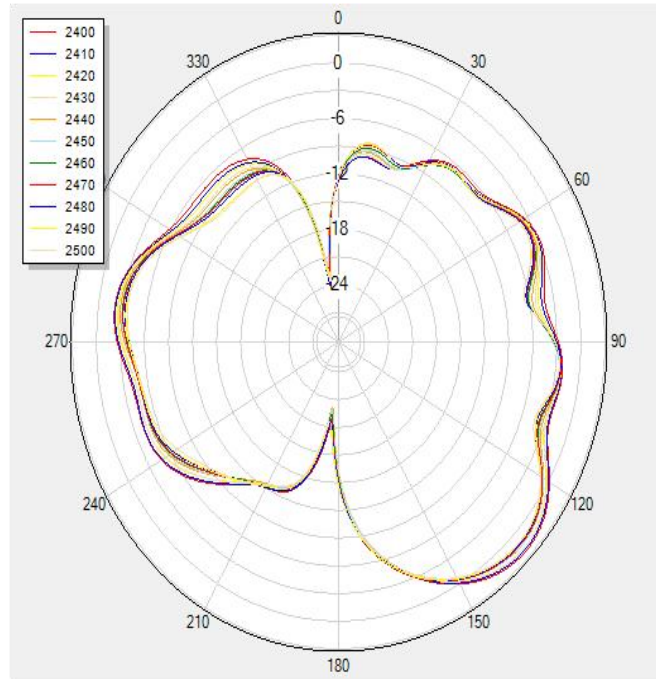
#### 3.3.3 Typical free space efficiency and gain

| Frequency/MHz | 2400  | 2410  | 2420  | 2430  | 2440  | 2450  | 2460  | 2470  | 2480  | 2490  | 2500  |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Peak Gain/dBi | 2.4   | 2.22  | 1.94  | 1.92  | 1.51  | 1.48  | 1.28  | 1.32  | 1.17  | 1.09  | 1.02  |
| Efficiency/%  | 30.37 | 29.46 | 28.23 | 27.90 | 26.51 | 26.07 | 25.80 | 26.03 | 25.30 | 24.75 | 24.34 |

### 3.3.4 Typical free space radiation pattern

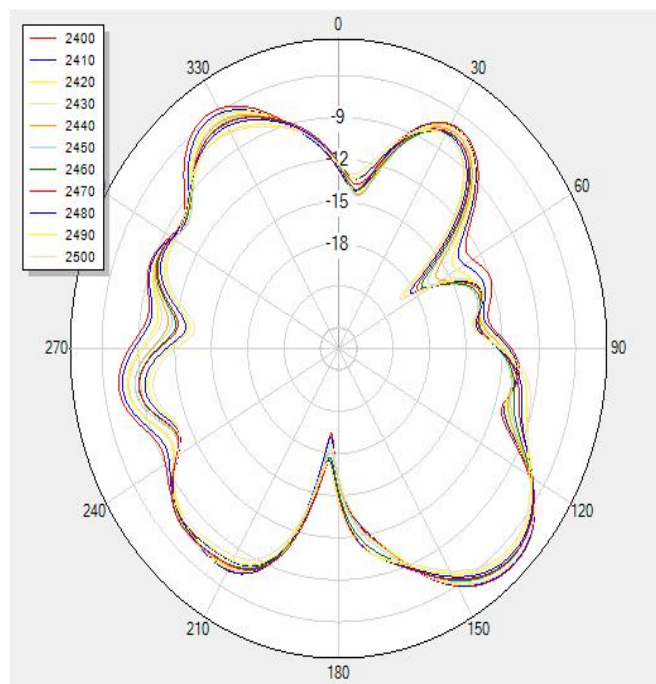
(1) X-Z Plane:

**V Phi=0**



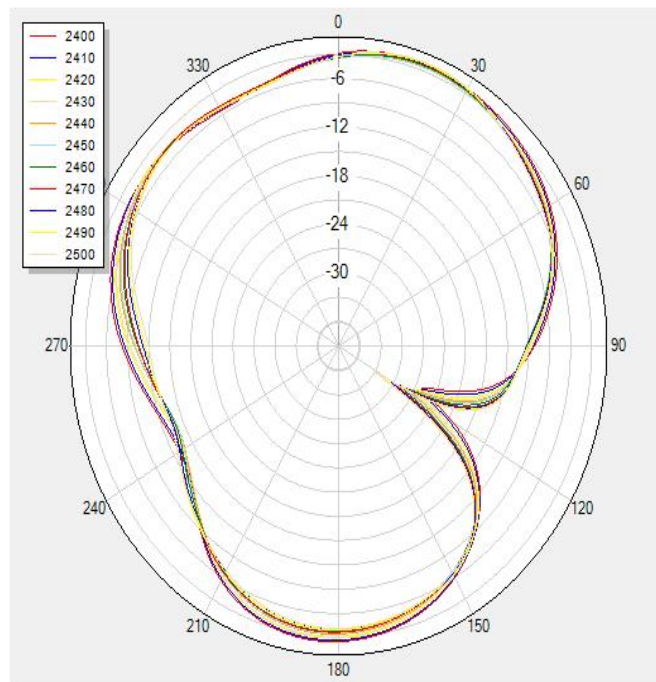
(2) Y-Z Plane:

**V Phi=90**

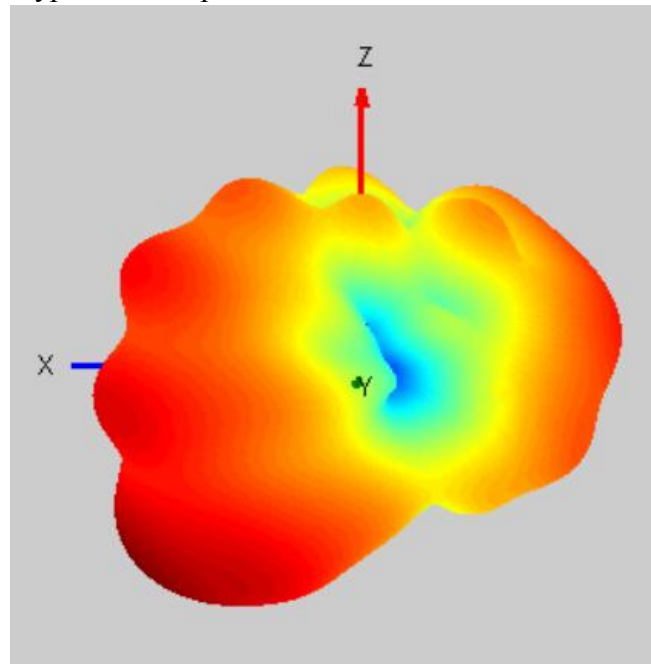


(3) X-Y Plane:

**H Theta=90**



(4) Typical Free Space 3D Radiation Pattern at 2.45GHz:



-----  
**End**

**(The following is blank)**