

Testing Report

Customer Name: Xiamen Hanin Electronic Technology Co.,Ltd.

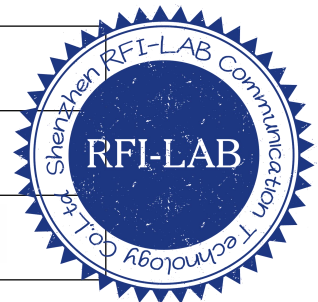
Product Name: WIFI Antenna

Sample Model: 2.4G

Reference Standard: *GB/T 9410-2008; ANSI/IEEE Std 149-2021*

Issue Date: 2023.02.08

| | |
|-------------------|----------------|
| Engineer: Jackson | Date: 2023.2.8 |
| Auditor: Eason | Date: 2023.2.8 |
| Approver: Janson | Date: 2023.2.8 |



Version

| Version No. | Date | Description | Formulate | Approval |
|-------------|------------|-------------------------------|-----------|----------|
| A0 | 2023.02.08 | For the first time, formulate | Jackson | Eason |
| | | | | |
| | | | | |

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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 | \ |
| E-mail | \ |
| Equipment | All the equipment used in the report is fixed in Zone B, West Side of 1/F, Building 1, Tingwei Industrial Park, No.6 Liufang Road, Bao 'an District, Shenzhen |

1.2 Testing principle



1.3 Test equipment

| Equipment | Model No. | Serial No. | Manufacturer | Calibration date | Next calibration date |
|------------------|--------------|----------------|--------------|------------------|-----------------------|
| OTA Test System | RayZone-5000 | RFI-LAB-RF-D00 | GTS | 2021.3.15 | 2023.3.14 |
| Network Analyzer | E5071C | RFI-LAB-RF-D01 | KEYSIGHT | 2022.5.13 | 2023.5.12 |

1.4 Test environment

| | |
|-------------|-----------|
| Temperature | 22.9°C |
| Humidity | 59%RH |
| Pressure | 100.35kPa |

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

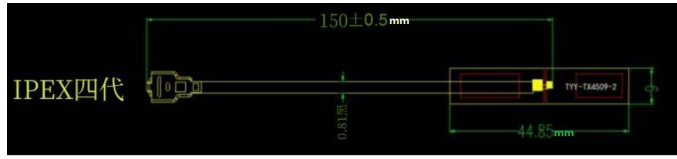
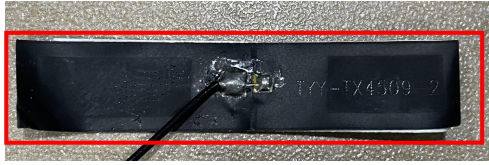
2.1 Client information

| | |
|---------------------|---|
| Name | Xiamen Hanin Electronic Technology Co.,Ltd. |
| Address | Room 305A, Angye Building, Pioneering Park, Torch High-tech,Zone,Xiamen |
| Contacts | / |
| Tel | / |
| E-mail | / |
| Manufacturer | / |

2.2 Description of EUT(S)

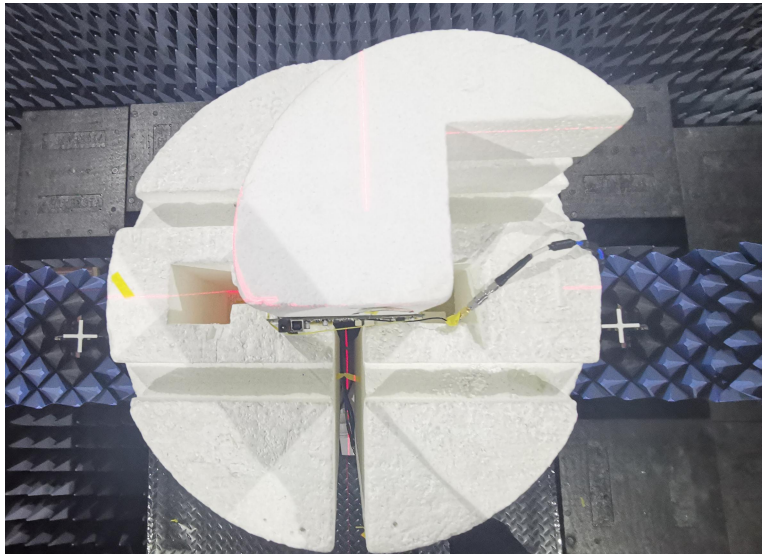
| | |
|------------------------|---|
| Product Name | WIFI Antenna |
| Sample Model | 2.4G |
| Antenna Size | / |
| Serial No. | / |
| Antenna Type | FPC Antenna |
| Test Item | Antenna gain; Efficiency; Radiation pattern |
| Frequency Range | 2400-2500MHz |
| Received Date | 2023.02.08 |
| Test Date | 2023.02.08 |
| Remark | / |

2.3 EUT appearance

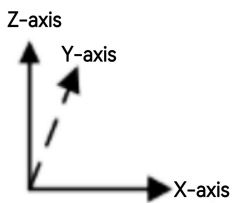
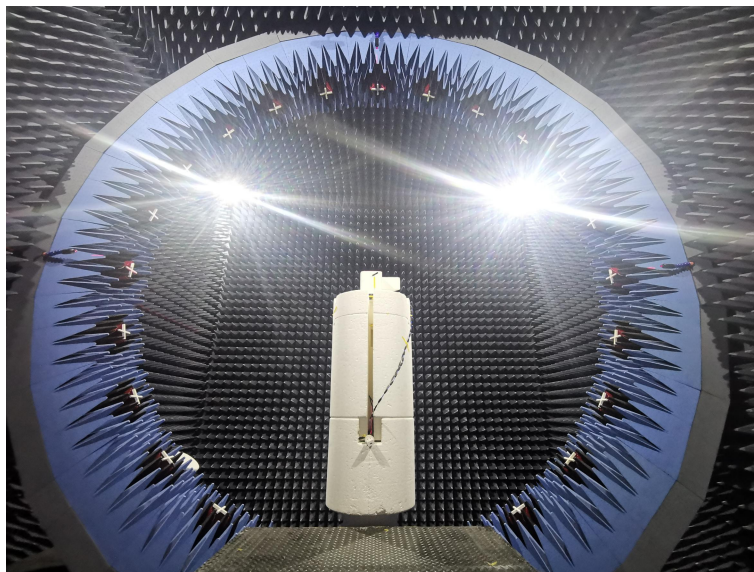


2.4 EUT setup photo of free space OTA testing

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 | | |
| Antenna | Radiation efficiency | IEEE Standard Test Procedures for Antennas | ANSI/IEEE Std 149-2021 |
| | 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 |
|----------------------|-------------|
| Antenna gain | ±0.72dB |
| Radiation efficiency | ±0.72dB |

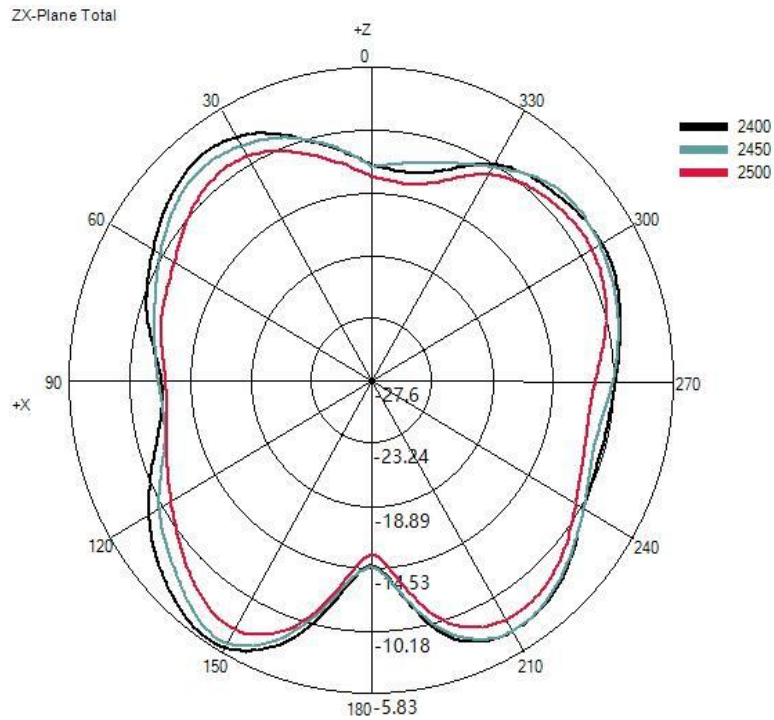
3.3 Test data

3.3.1 Typical free space efficiency and gain

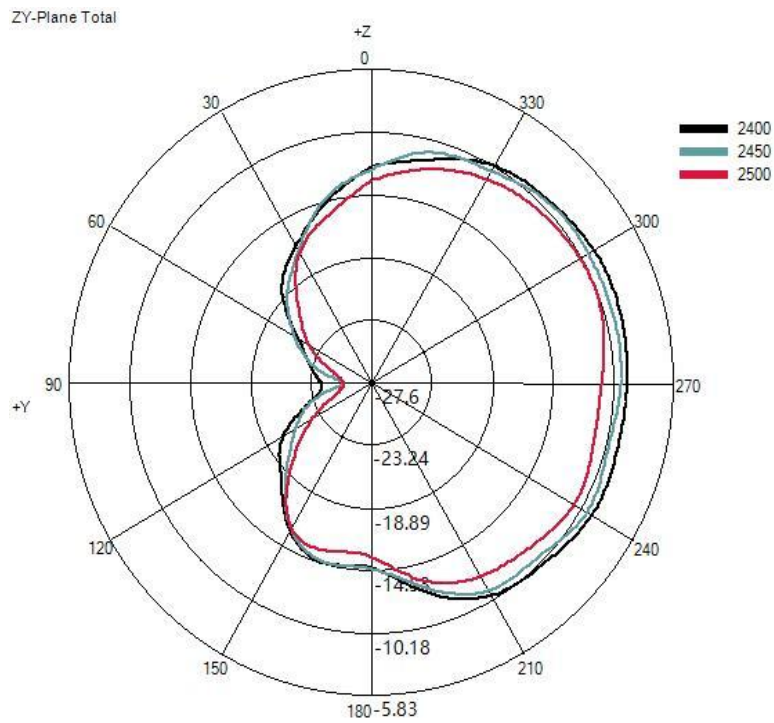
| Frequency/MHz | 2400 | 2410 | 2420 | 2430 | 2440 | 2450 | 2460 | 2470 | 2480 | 2490 | 2500 |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Peak Gain/dBi | -5.83 | -5.95 | -6.03 | -6.51 | -6.69 | -6.55 | -6.81 | -7.10 | -7.23 | -7.34 | -7.56 |
| Efficiency/% | 10.01 | 9.79 | 9.59 | 9.01 | 8.80 | 9.10 | 8.62 | 8.23 | 8.05 | 7.73 | 7.37 |

3.3.2 Typical free space radiation pattern

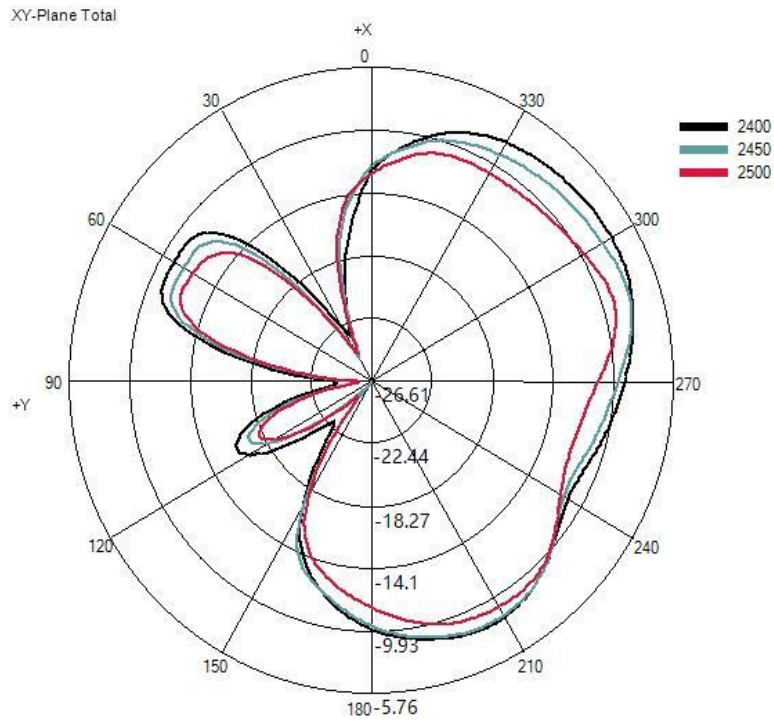
(1) X-Z Plane(unit:dBi):



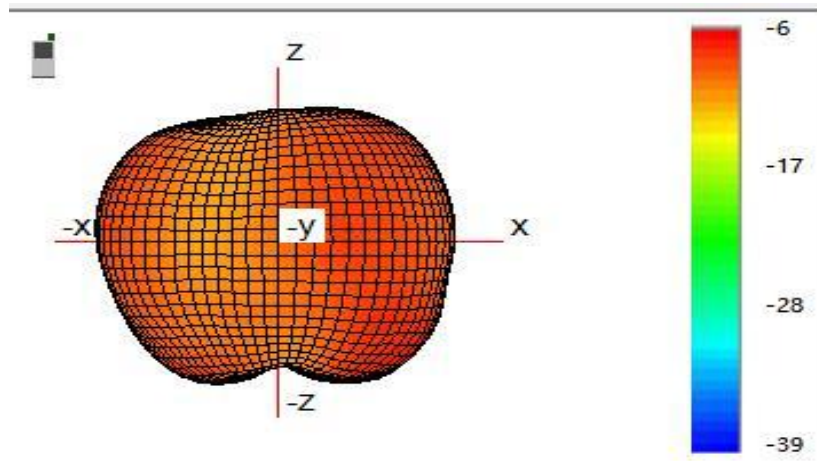
(2) Y-Z Plane(unit:dBi):



(3) X-Y Plane(unit:dBi):



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



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