

# **FPC antenna specification acknowledgement**

## **Product Specifications for Approval**

Company name: Shenzhen Huasheng Electronics Co., LTD

Company Address : 3rd Floor, No. 70, Baotong South Road,  
Henggang Sub-district, Longgang District, Shenzhen City

Antenna band: 2400-2500/5150-5850MHz

Edition: A0

FPC antenna ID: HS-NZ-FPC-001

Date of manufacture 2024-09-20

|                              |  |                           |  |
|------------------------------|--|---------------------------|--|
|                              |  |                           |  |
| <b>Structure:</b>            |  | <b>Radio frequency:</b>   |  |
| <b>Review:</b>               |  | <b>Approved:</b>          |  |
| <b>Customer confirmation</b> |  |                           |  |
| <b>Customer audit:</b>       |  | <b>Customer approval:</b> |  |

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Modification record

| Edition | Date       | Engineer | Modify content |
|---------|------------|----------|----------------|
| A0      | 2024-09-20 |          |                |
|         |            |          |                |
|         |            |          |                |
|         |            |          |                |
|         |            |          |                |

PARTS DRAWING 零件图

ROHS Compliant

| REV | PRODUCT NO.   | DATE         | NAME | DESCRIPTION |
|-----|---------------|--------------|------|-------------|
| AO  | HS-NZ-FPC-001 | 2024. 09. 20 |      | 初始发行        |

①1.37黑线

环剥镀锡

要求

1. 线材外被无破皮. 损伤。

2. 成品须100%测试导通 OK。

3. 成品须100%全检OK。

4. 采用环保制程. 成品符合ROHS要求。

5. 未注公差请以一般公差为准。

测试条件

额定电压: AC 60V

接触阻抗: 20-0hm

耐电压: AC300V

绝缘阻抗: 500m-0hm

特性阻抗: 50 0hm

| NO | Code | Name | Description          | Qty |
|----|------|------|----------------------|-----|
| 3  |      |      |                      | 1   |
| 2  |      | FPC  | 表面黑油                 | 1   |
| 1  |      | 线材   | 1. 37线 单银 黑色 L=125MM | 1   |

| 工作频段<br>(Frequency Range)        | 2400-2500/5150-5850MHZ |
|----------------------------------|------------------------|
| 增益<br>(Gain)                     | 2DBi                   |
| 电压驻波比<br>(VSWR)                  | 对比波形                   |
| 极化方式<br>(Polarization)           | 垂直                     |
| 特性阻抗<br>(Impedance)              | 50 Ω                   |
| 工作温度: -45℃~85℃<br>储存温度: -45℃~85℃ |                        |

角法  
ANGLE PROJECTION  
  
公差  
GENERAL TOLERANCE  
100~200: ± 3.00  
50~100: ± 2.00  
25~50: ± 0.20  
10~25: ± 0.15  
1~10: ± 0.1

| 产品名称 (PRODUCT NAME)                  |           |        |             |     |
|--------------------------------------|-----------|--------|-------------|-----|
| 内置FPC-WIFI-环剥镀锡-1. 37线-黑色-单银-L=125MM |           |        |             |     |
| 产品料号                                 | 单位 (UNIT) | M M    | 比例 (SIZE)   | 1:3 |
| HS-NZ-FPC-001                        | 页数 (PAGE) | 1 OF 1 | 幅面 (FORNMT) | A4  |
| 业务                                   | 仓库        |        |             |     |
| PMC                                  | 生产        |        |             |     |
| 采购                                   | 品质        |        |             |     |

深圳市华圣电子有限公司

# Product characteristic specification sheet

## 一、Product basic features:

| Product type: FPC antenna -WIFI dual frequency - ring stripping tin-1.37 wire - double tin wire - Black -L=125MM |                          |
|------------------------------------------------------------------------------------------------------------------|--------------------------|
| DESCRIPTION                                                                                                      | VALUE                    |
| Frequency range                                                                                                  | 2400-2500/5150-5850MHz   |
| Impedance                                                                                                        | 50 $\Omega$              |
| V.S.W. R                                                                                                         | Contrast sample waveform |
| Gain                                                                                                             | 2DBi                     |
| Radiation                                                                                                        | Omni-directional         |
| Polarization                                                                                                     | linear Vertical          |
| Admitted power                                                                                                   | 1W                       |
| Connector                                                                                                        | /                        |
| Operating temp                                                                                                   | -45℃~+85℃                |
| Storage temp                                                                                                     | -45℃~+85℃                |

## 1. Summary :

This report to account for the measurement setup and result of the Antenna. The measurement setup includes s-parameter, The measured data for Antenna are presented and analysis.

## 2. S-Parameter Measurement :

A. Reflection coefficient:

(a) Instrument: Network Analyzer.

(b) Setup:

- (1) Calibrate the Network Analyzer by one port calibration using O.S.L. calibration kits.
- (2) Connect the antenna under test to the Network Analyzer.
- (3) Measure the S11(reflection coefficient) shown in Fig. 1.
- (4) Generally, the S11 is less than  $-10\text{dB}$  to ensure the 90% VSWR 2.0:1 power into antenna and only less than 10% power back to system.

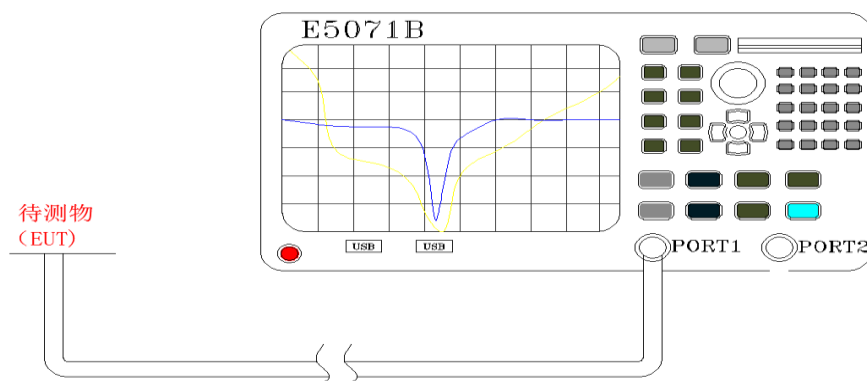


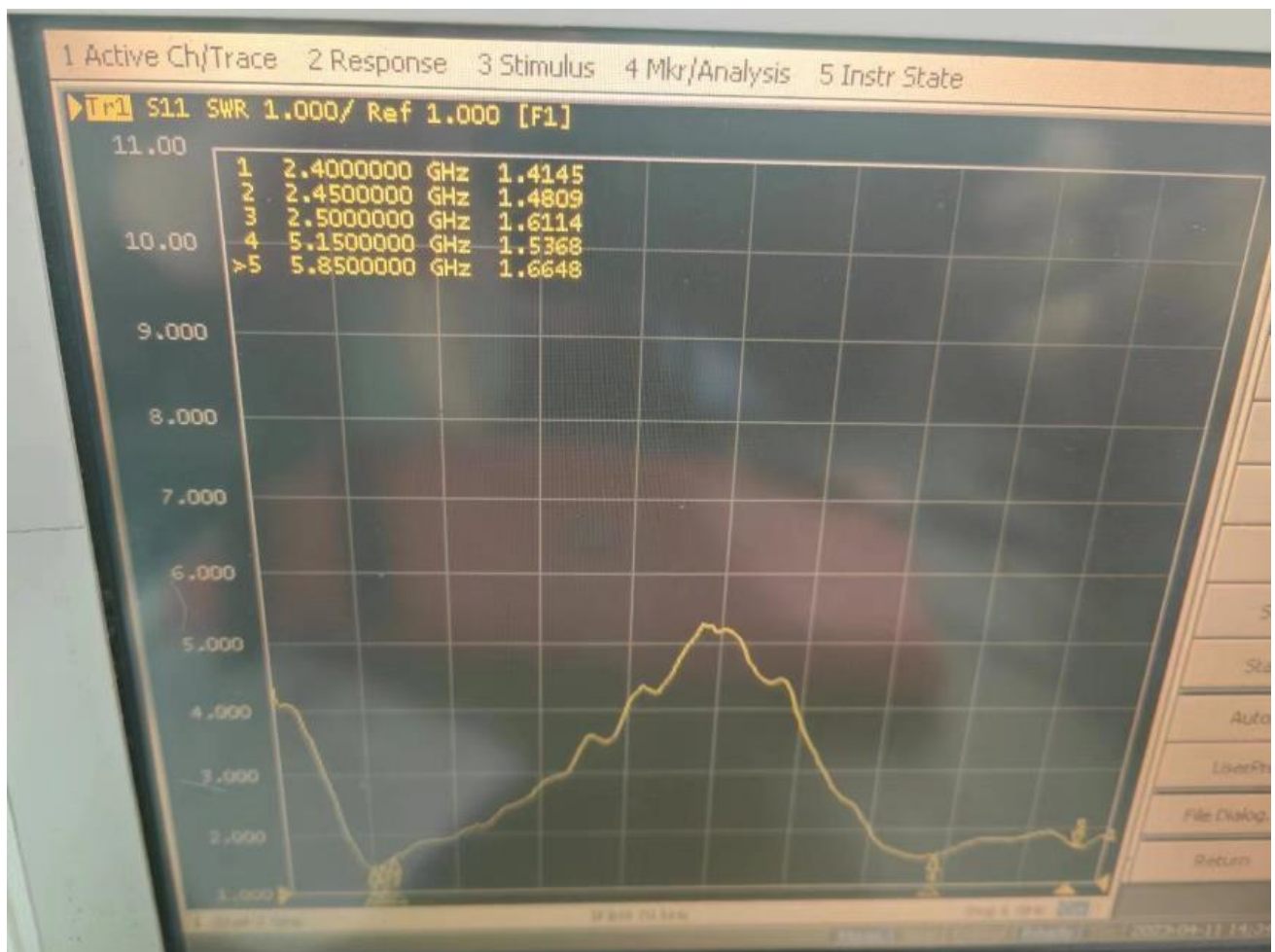
Fig.1 Antenna measured in Network Analyzer

## 3. S-Parameter Measurement Result:

S-Parameter test data:

| Frequency MHz | 2400 | 2450 | 2500 | 5150 | 5850 |
|---------------|------|------|------|------|------|
| V.S.W.R 驻波比   | 1.41 | 1.48 | 1.61 | 1.53 | 1.66 |

S-Parameter test image:



Physical drawing:

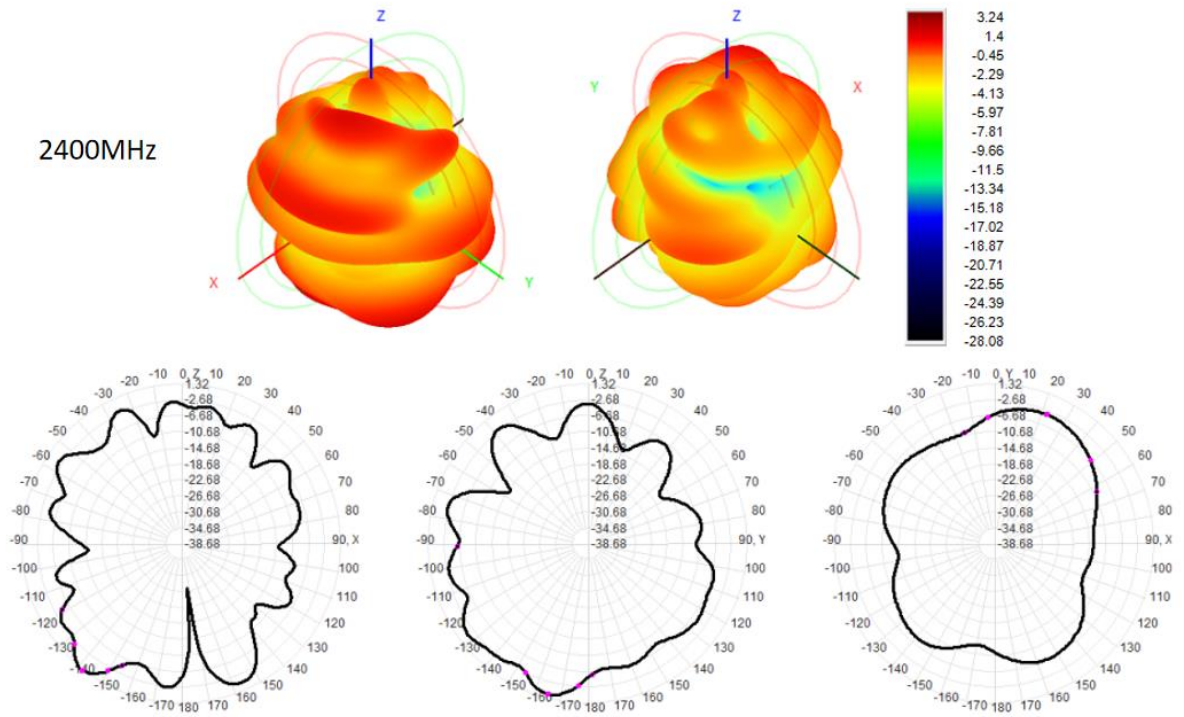


**Passive value:**

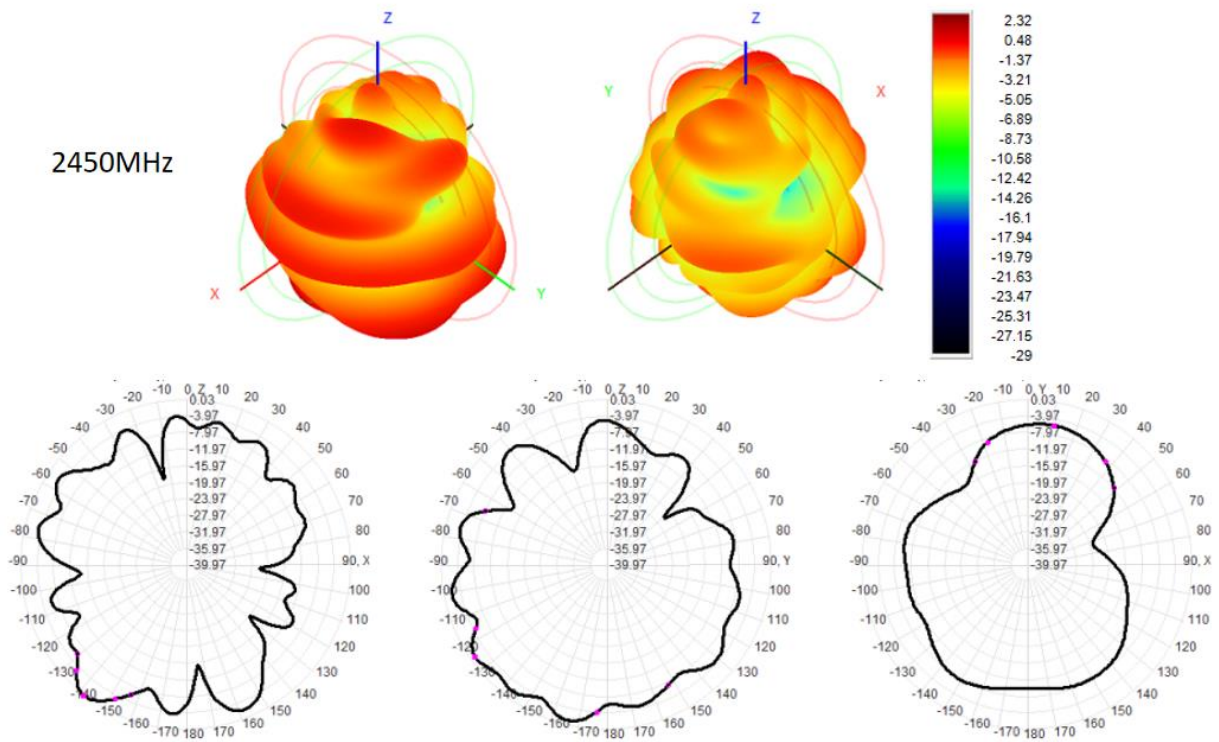
| Frequency (MHz)<br>(工作频段) | Efficiency (%)<br>(效率) | Peak GAIN (dBi)<br>(增益) |
|---------------------------|------------------------|-------------------------|
| 2400                      | 28.37                  | 1.71                    |
| 2450                      | 23.71                  | 1.83                    |
| 2500                      | 29.70                  | 1.88                    |
| 5150                      | 32.45                  | 1.94                    |
| 5850                      | 40.68                  | 2.02                    |

## 2D/3D

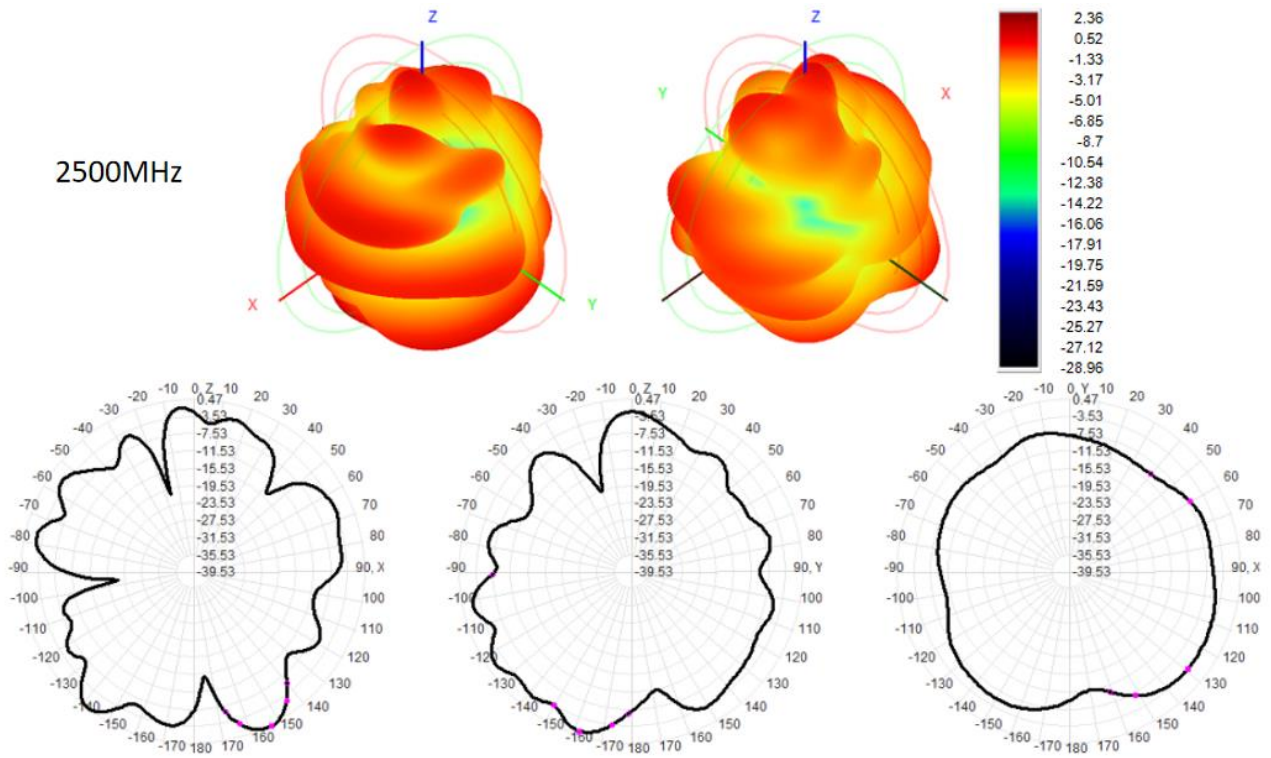
2400MHz



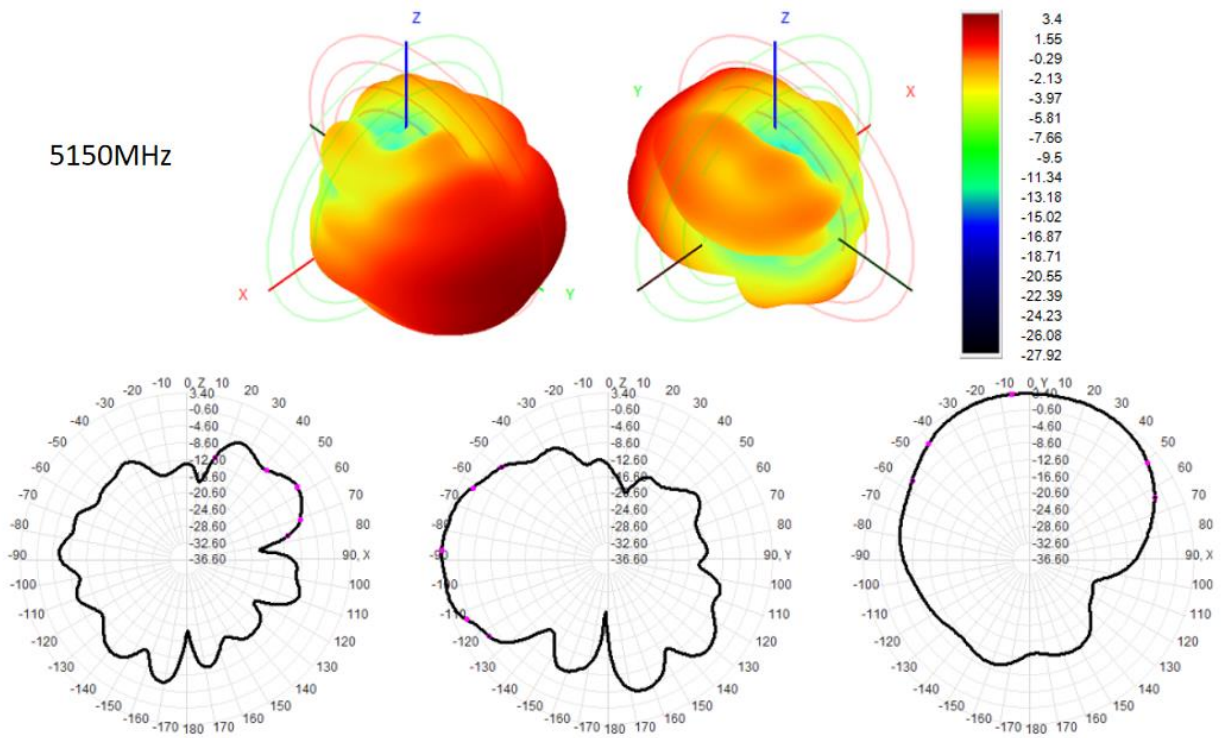
2450MHz



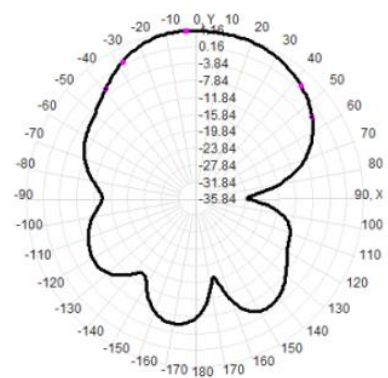
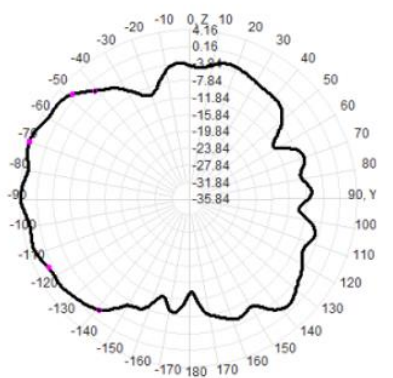
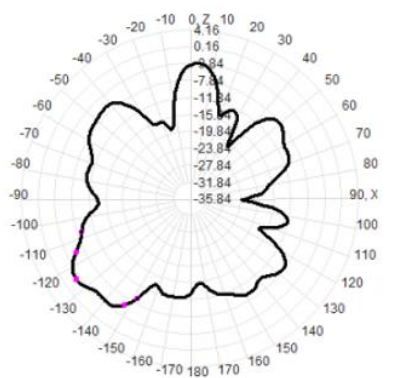
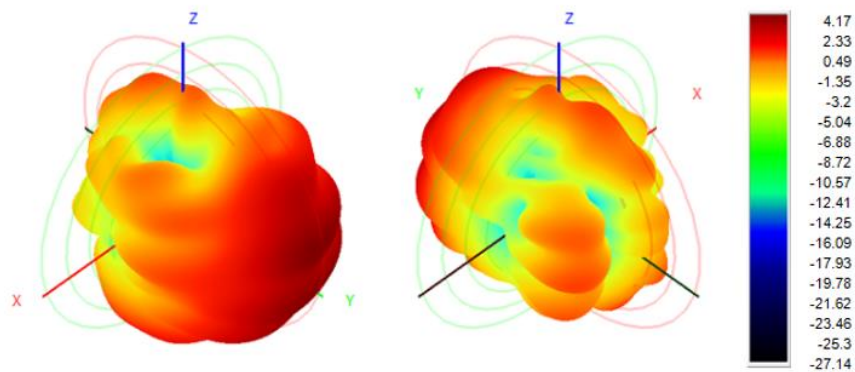
2500MHz



5150MHz



5850MHz



## Environmental test requirements

| sequence | Test item                     | Test methods and conditions                                                                                                                                                                                                                                                                                                                            | Test equipment                | Test result     |
|----------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------|
| 1        | Temperature and humidity test | <p>Refer to EIA 364-31 Method 3, Test Condition A. The purpose of this test procedure is to evaluate in detail the standard test methods used in the products, which are affected by high humidity and heat, affecting the properties of the materials.</p> <p>Requirements:<br/> Temperature: 85℃<br/> Humidity: 90~95% (R.H)<br/> Time: 72 hours</p> | K. SON INS<br><br>THS-A4L-150 | <div>Pass</div> |
| 2        | Low temperature test          | <p>Refer to electronic test specification:<br/> The sample should be placed in a constant temperature environment, the temperature is set at -45 ℃</p> <p>Requirements:<br/> Time: 24 hours</p>                                                                                                                                                        | K. SON INS<br><br>THS-A4L-150 | <div>Pass</div> |
| 3        | High temperature test         | <p>Refer to electronic test specification:<br/> The sample should be placed in a constant temperature environment, the temperature is set at 85℃.</p> <p>Requirements:<br/> Time: 24 hours</p>                                                                                                                                                         | K. SON INS<br><br>THS-A4L-150 | <div>Pass</div> |
| 4        | Thermal shock                 | <p>Refer to electronic test specification:<br/> The sample should be placed in a fixed environment with a temperature set at -45~85℃.</p> <p>Requirements:<br/> More than 8 hours. (30 minutes/time, 12 cycles)</p>                                                                                                                                    | K. SON INS<br><br>THS-A4L-150 | <div>Pass</div> |
| 5        | Salt spray test               | <p>Refer to Feisheng Electronic test specification:<br/> The tested sample shall be placed in a fixed environment under its requirements:<br/> NaCL concentration: 40-60g/1Kg<br/> PH value: 6.5-7.2<br/> Test time: 24H</p>                                                                                                                           | Salt spray testing machine    | <div>Pass</div> |

|  |  |                                                                                                                                                                                                   |  |  |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|  |  | <p>1. Gold plated products are not allowed to rust peeling</p> <p>2. Other nickel-plated tin-plated galvanized products shall not have more than two rust points on the same axis or surface.</p> |  |  |
|--|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

## Mechanical test requirements

| sequence | Test item      | Test methods and conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Test equipment            | Test result |
|----------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------|
| 1        | Vibration test | <p>Test condition A</p> <p>The purpose of this test procedure is to evaluate in detail the standard test methods used in products, which are affected by movement or movement of materials.</p> <p>Requirements:</p> <p>Vibration range: 10-55HZ</p> <p>Displacement amplitude: 0.35mm</p> <p>Acceleration amplitude: 50.0M/S</p> <p><b>Frequency sweep cycle: 30 times</b></p>                                                                                                             | Vibration testing machine | Pass        |
| 2        | Drop test      | <p>Refer to electronic test specification:</p> <p>The measured sample should be placed at a certain height, its height is set at 1M, and it should be freely dropped 3 times in the direction of 6 faces</p> <p>Requirements:</p> <p>The mechanical properties of the product are normal after the drop test</p> <p>Refer to electronic test specification:</p> <p>The object to be measured is fixed by the fixture, and the product assembly cannot fall off after applying a certain</p> | Drop test fixture         | Pass        |

|   |                 |                                                                                                          |                               |      |
|---|-----------------|----------------------------------------------------------------------------------------------------------|-------------------------------|------|
|   |                 | force in the opposite direction.                                                                         |                               |      |
| 3 | Tension<br>test |                                                                                                          | Tensile<br>testing<br>machine | Pass |
|   |                 | <p>Requirements:</p> <p>1. The product assembly shall not fall off.</p> <p>2. Minimum tension: 1.2KG</p> |                               |      |

Note: The above mechanical and environmental parameters are tested electronically before R & D and trial production.