



Shenzhen Free Walk Technology Co. LTD

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# APPROVAL SHEET

Customer: Yi lian wu xian

Product: 2.4G/5G PCB Antenna (L=120mm) IPEX-1

Model: KM75

Part Number: Z01-30447-R01

Written By: Hu Tao

Issued Date: 2025-04-29

## CUSTOMER

| ENGINEER R&D DEPT | QUALITY DEPT | APPROVED |
|-------------------|--------------|----------|
|                   |              |          |

Free Walk

| R&D DEPT | ENGINEER R&D DEPT | APPROVED |
|----------|-------------------|----------|
| Hu Tao   | Gu Zhenghua       | Deng Kai |





# Document Change Resume

Form number:QR-ZYX-084      APPROVAL REV: A0

| Product model |                 | Document change record |                |                               |                       |         |        |
|---------------|-----------------|------------------------|----------------|-------------------------------|-----------------------|---------|--------|
| No            | Change the type | File number            | Date of change | Description of change content | Production / revision | edition | remark |
| 1             | size            | ECN2025032801          | 2025. 3. 28    | Axis: 10.6± 0.05              | hutao                 | A1      |        |
| 2             | workmanship     | ECN2025042901          | 2025. 4. 29    | Newly added 3PCS foam         | hutao                 | A2      |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |
|               |                 |                        |                |                               |                       |         |        |

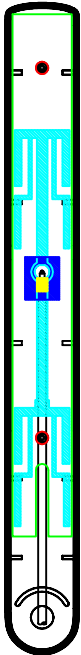
## Index

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## The basic parameters

| A. Electrical Characteristics            |  |
|--|--|
| Frequency                                | 2400 MHz ~2500MHz 5150 MHz ~5850MHz  |
| VSWR                                     | $\leq 2$   |
| Efficiency                               | >50%   |
| Impedance                                | 50 Ohm   |
| Polarization                             | Linear   |
| Gain                                     | ANT 1    2.4G   3.65dBi   5G   4.88dBi<br>ANT 2    2.4G   3.61dBi   5G   4.65dBi |
| B. Material & Mechanical Characteristics |  |
| Material of Radiator                     |  |
| Cable Type                               | $\Phi$ 1.13mm   Black  |
| Connector Type                           | 一代IPEX   |
| Dimension                                |  |
| C. Environmental                         |  |
| Operation Temperature                    | - 20 °C ~ + 60 °C  |
| Storage Temperature                      | - 40 °C ~ + 80 °C  |

| NO | Name        | Material         | Colour | Amount | Remark |
|----|-------------|------------------|--------|--------|--------|
| ①  | RF line     | Ø1.37 line       | black  | 1      |        |
| ②  | lower shell | PC               | white  | 1      |        |
| ③  | upper shell | PC               | white  | 1      |        |
| ④  | PCB         | FR-4             | green  | 1      |        |
| ⑤  | Foam rubber | PE Foam          | gray   | 3      |        |
| ⑥  | IPX         | first generation | golden | 1      |        |



\*117.5±2.0



\*16±0.3

⑤

④

③

②

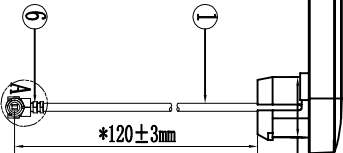


\*4.85±0.1

\*14.82±0.3

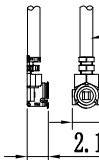
\*10.6±0.05

\*5.82±0.3



Detail A

3.05±0.15  
2.1±0.15



NOTE:

- Mark \* as the key dimension for inspection, and for unmarked tolerance dimensions, check within  $\pm 0.15$ .
- Reference drawings without specified dimensions; Other dimensions are subject to actual configuration.
- Plastic must not have any sharp edges, deformation, oil stains, shrinkage, severe imprinting, or other phenomena.
- There should be no virtual soldering, soldering or other phenomena at the finished solder pads, and the conductivity of the finished product should be tested to be OK.
- The material complies with environmental regulations such as ROHS 2.0

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| The third Angle method |                                    | Machine type         | KM75            | date        | 2025-04-29 | page number | 1/2    |
|------------------------|------------------------------------|----------------------|-----------------|-------------|------------|-------------|--------|
|                        | Note: tolerances refer to standard | Product name         | 2.4G/5G-Antenna | design      |            | audit       | Guidog |
| 10以下                   | $\pm 0.10$                         | Pert. number         | Z01-30447-R01   | engineering |            |             |        |
| 10~20                  | $\pm 0.12$                         | Customer P/N         |                 | FR          |            | MR LI       |        |
| 20~40                  | $\pm 0.15$                         | Material quality     | N/A             | affirm      |            |             |        |
| 40以上                   | $\pm 0.20$                         | appearance treatment |                 | UNIT        | mm         | RATIO       | FIT    |
| Do not observe drawing |                                    |                      |                 |             |            | versions    | A2     |

## Test Equipment & Conditions

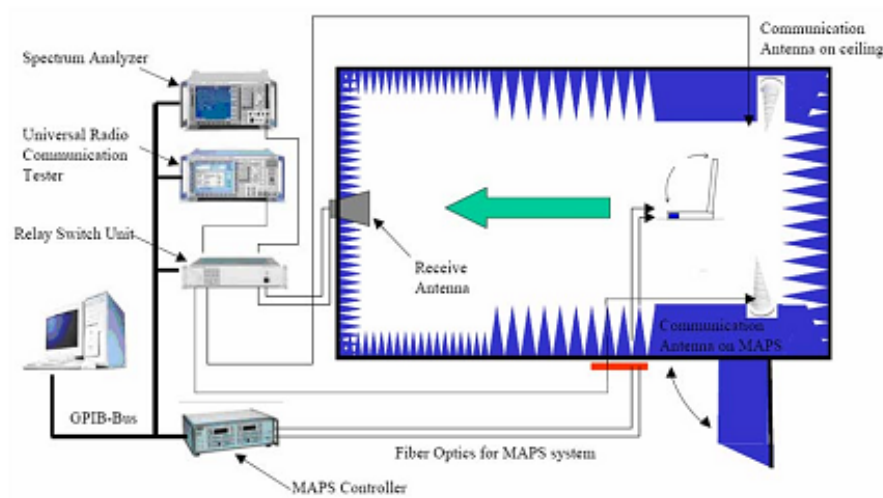
### 1. Network Analyzers :

Agilent 8753D 5071B

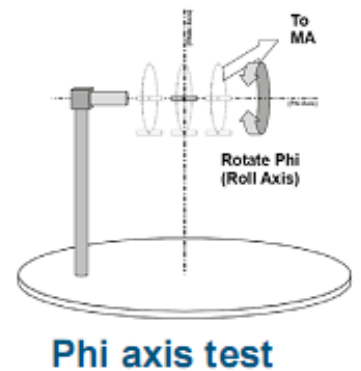
### 2. Communications Test Set:

Agilent 8960

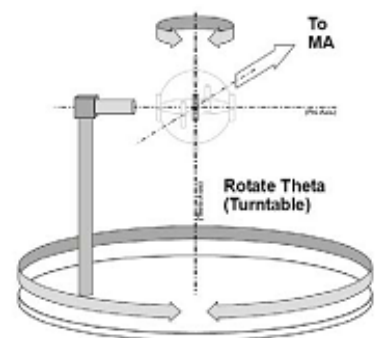
### 3. 3D Chamber Test System



(Testing by 3D anechoic chamber)



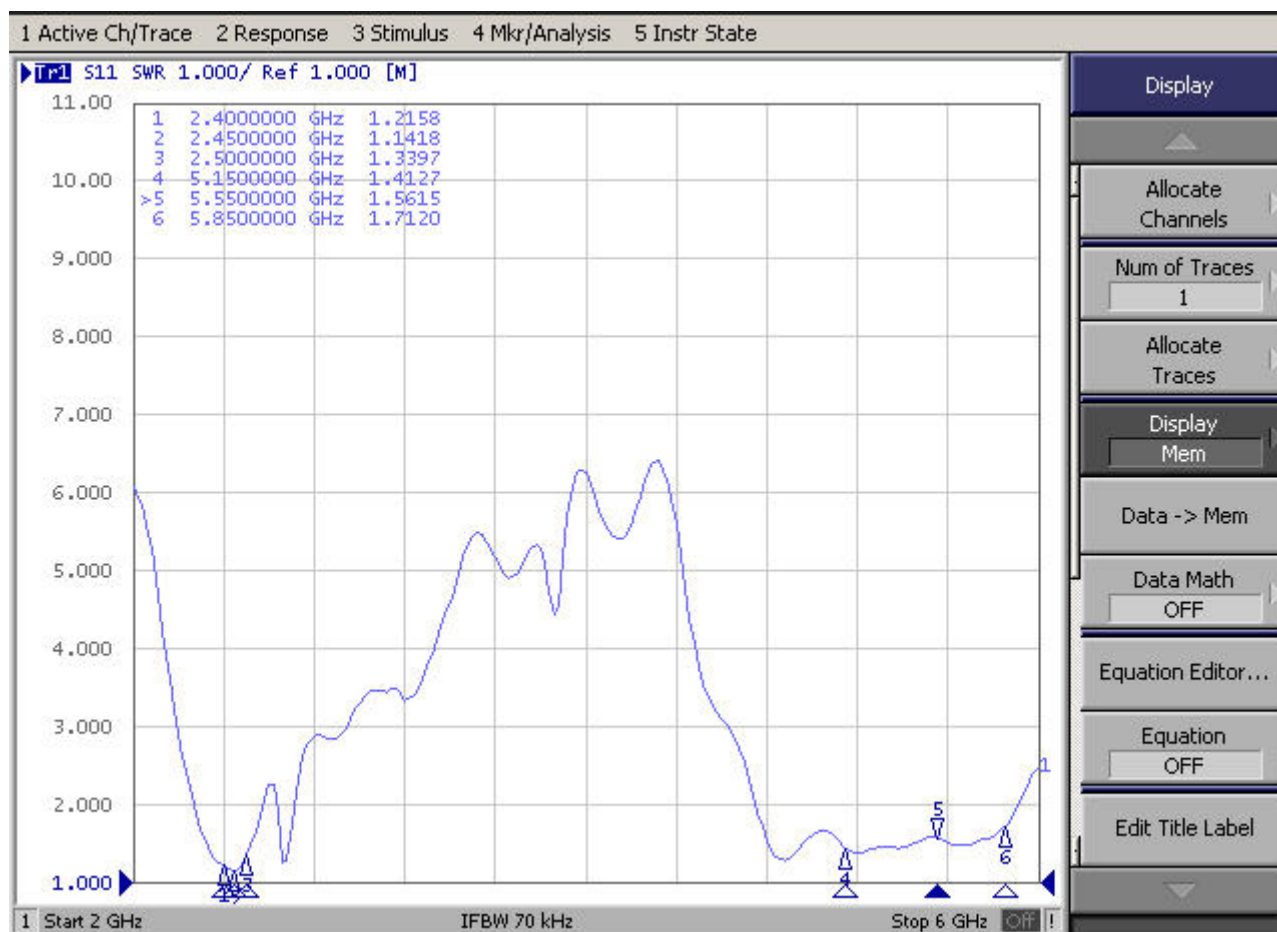
Phi axis test



Theta axis test

# TEST DATA (ANT 1)

## VSWR



(ANT 1)

## Efficiency&Gain

test data

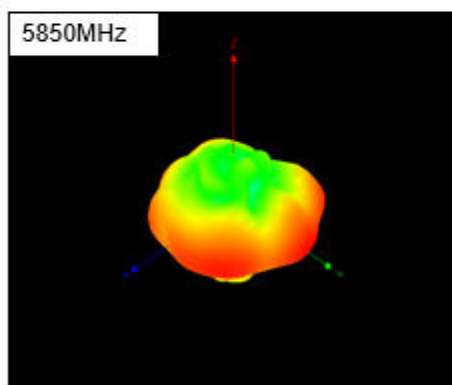
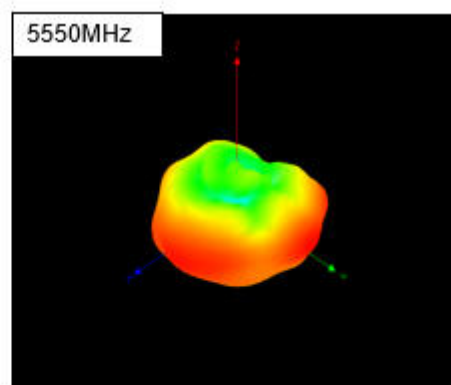
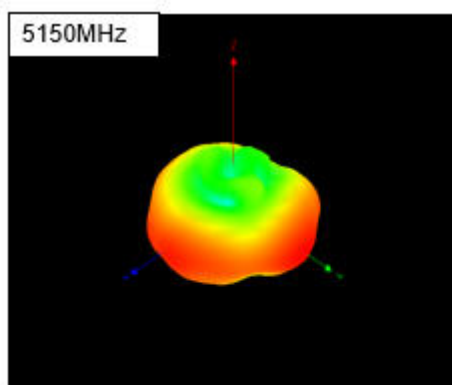
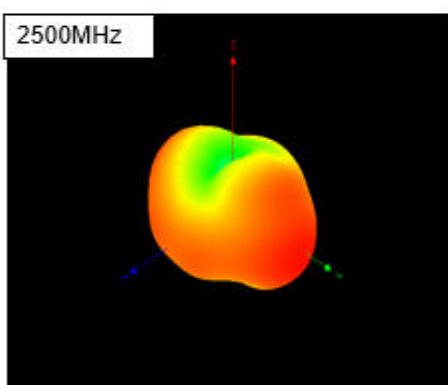
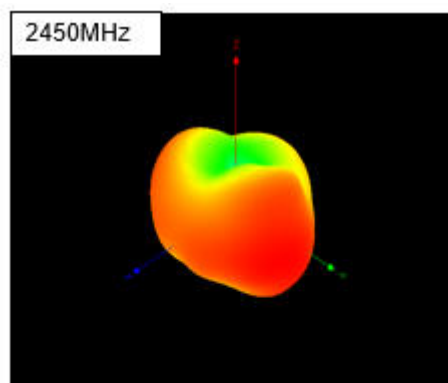
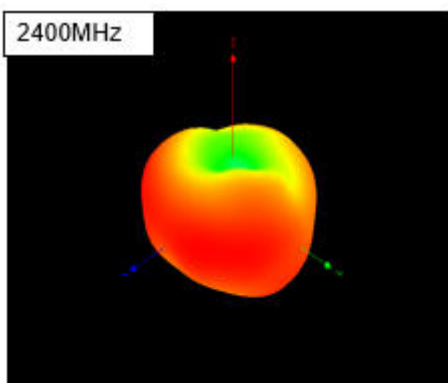
| Frequency / MHz | Efficiency / % | Gain/ dBi |
|-----------------|----------------|-----------|
| 2400            | 66.29          | 2.81      |
| 2410            | 65.51          | 3.30      |
| 2420            | 66.12          | 3.27      |
| 2430            | 65.16          | 3.65      |
| 2440            | 62.23          | 3.00      |
| 2450            | 59.84          | 3.32      |
| 2460            | 63.68          | 3.26      |
| 2470            | 64.57          | 3.55      |
| 2480            | 59.16          | 3.46      |
| 2490            | 55.34          | 2.95      |
| 2500            | 56.23          | 3.29      |

| Frequency / MHz | Efficiency / % | Gain/ dBi |
|-----------------|----------------|-----------|
| 5150            | 64.02          | 4.40      |
| 5200            | 63.48          | 3.78      |
| 5250            | 64.57          | 3.55      |
| 5300            | 58.70          | 3.31      |
| 5350            | 62.54          | 3.74      |
| 5400            | 61.10          | 3.86      |
| 5450            | 68.24          | 4.40      |
| 5500            | 64.16          | 3.99      |
| 5550            | 59.58          | 4.37      |
| 5600            | 65.12          | 4.88      |
| 5650            | 59.58          | 4.71      |
| 5700            | 56.29          | 3.63      |
| 5750            | 56.77          | 3.84      |
| 5800            | 55.09          | 4.08      |
| 5850            | 55.71          | 4.22      |



(ANT 1)

## 3D Patten

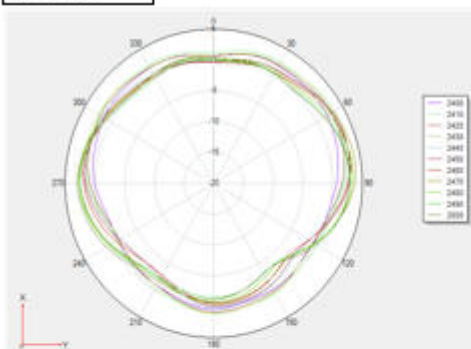


(ANT 1)

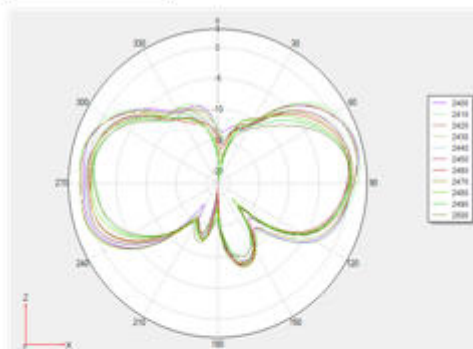
## 2D Patten

2.4G

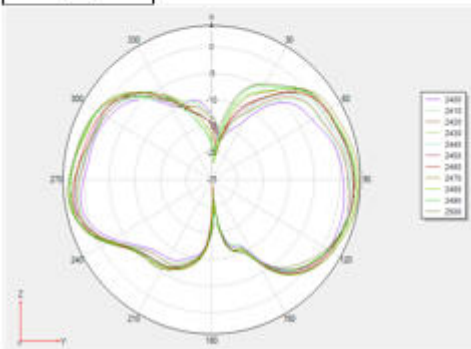
XOY面



ZOX面

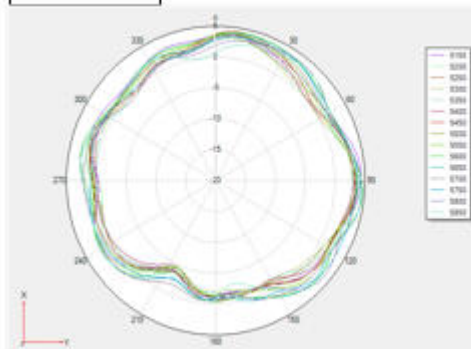


ZOY面

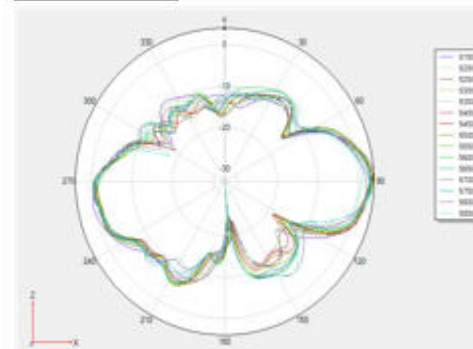


5G

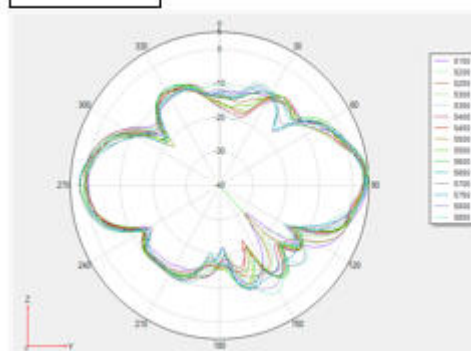
XOY面



ZOX面

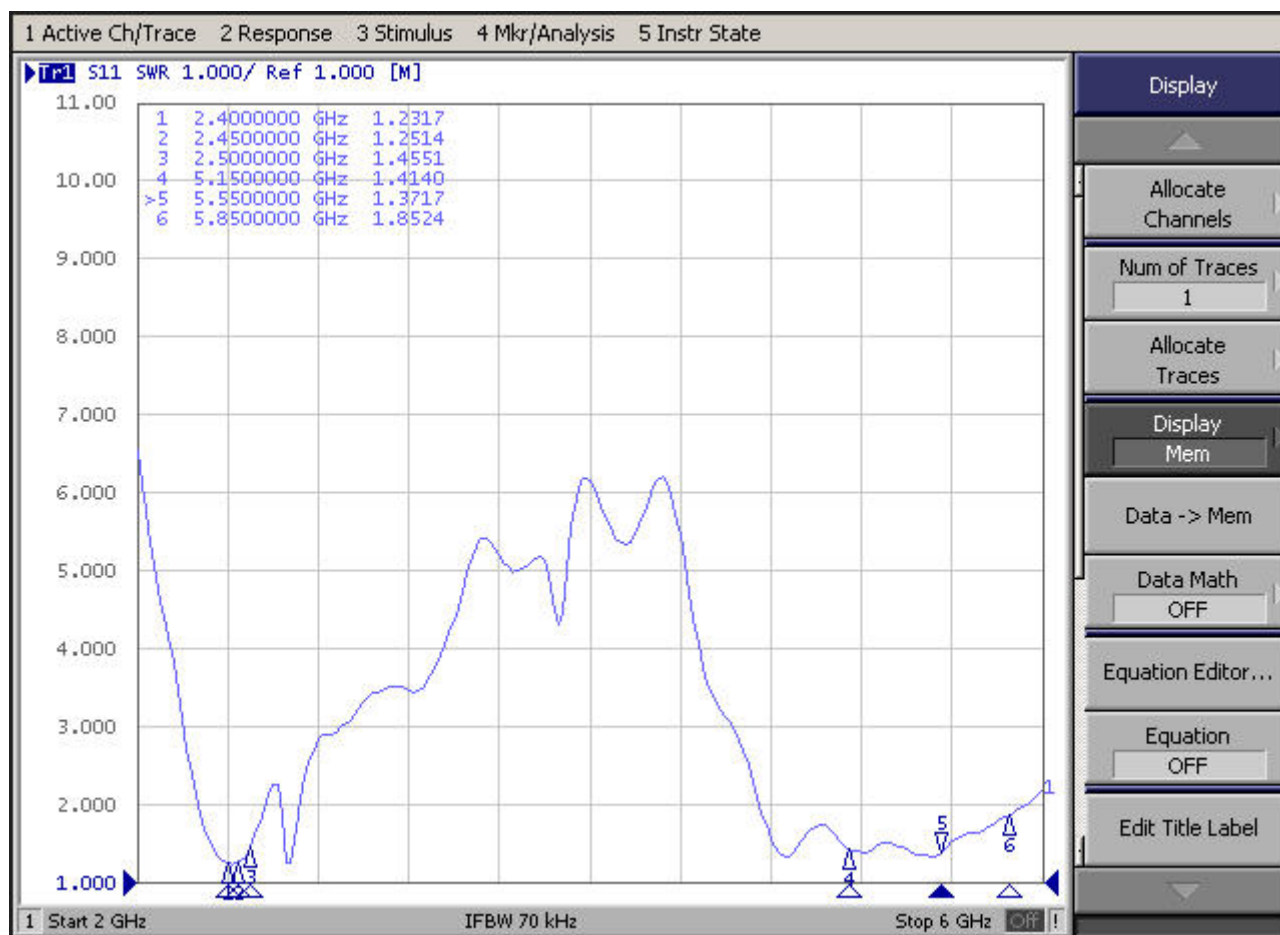


ZOY面



## TEST DATA (ANT 2)

### VSWR



(ANT 2)

## Efficiency&Gain

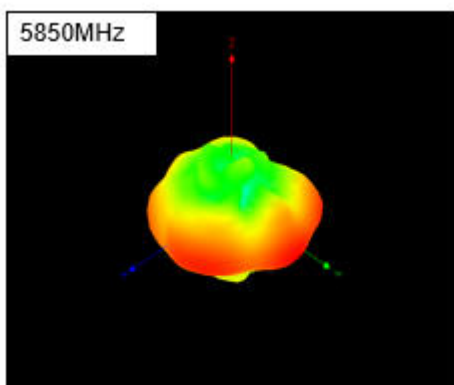
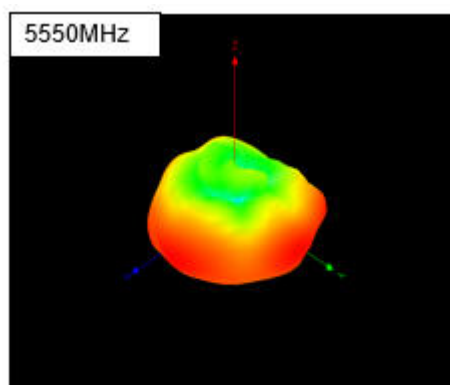
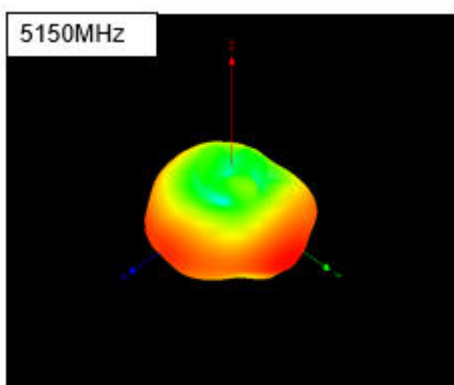
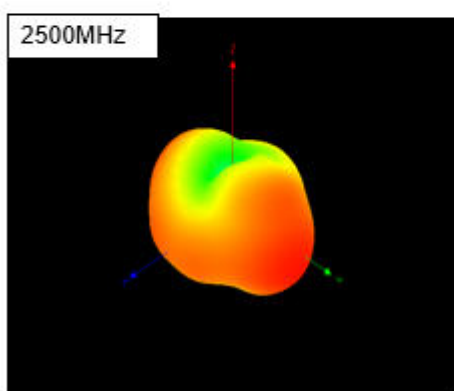
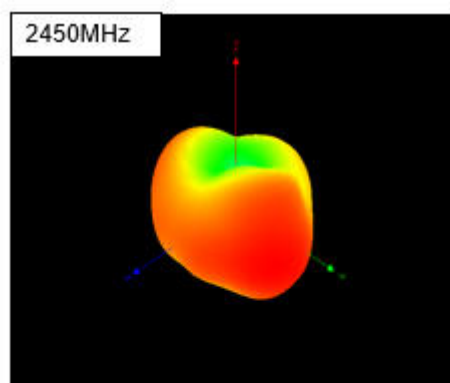
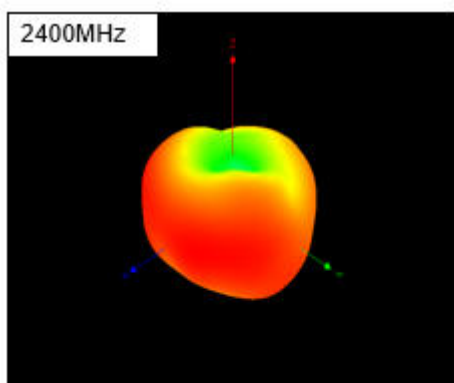
test data

| Frequency / MHz | Efficiency / % | Gain/ dBi |
|-----------------|----------------|-----------|
| 2400            | 66.61          | 2.76      |
| 2410            | 65.68          | 3.17      |
| 2420            | 66.29          | 3.16      |
| 2430            | 65.34          | 3.61      |
| 2440            | 62.37          | 3.00      |
| 2450            | 59.98          | 3.35      |
| 2460            | 63.83          | 3.28      |
| 2470            | 64.71          | 3.55      |
| 2480            | 59.29          | 3.48      |
| 2490            | 55.46          | 2.95      |
| 2500            | 56.62          | 3.47      |

| Frequency / MHz | Efficiency / % | Gain/ dBi |
|-----------------|----------------|-----------|
| 5150            | 63.75          | 4.21      |
| 5200            | 63.34          | 3.75      |
| 5250            | 63.75          | 3.38      |
| 5300            | 57.72          | 3.43      |
| 5350            | 62.02          | 3.55      |
| 5400            | 60.59          | 3.57      |
| 5450            | 67.66          | 4.19      |
| 5500            | 63.21          | 3.82      |
| 5550            | 59.45          | 4.02      |
| 5600            | 64.70          | 4.65      |
| 5650            | 59.08          | 4.36      |
| 5700            | 55.70          | 3.86      |
| 5750            | 56.45          | 4.12      |
| 5800            | 55.87          | 4.22      |
| 5850            | 55.29          | 4.31      |

(ANT 2)

## 3D Patten

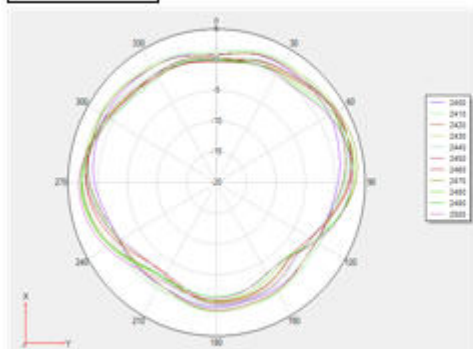


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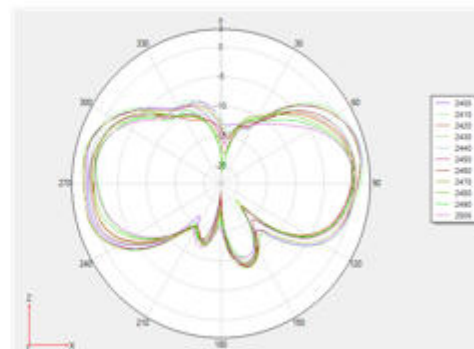
## 2D Patten

2.4G

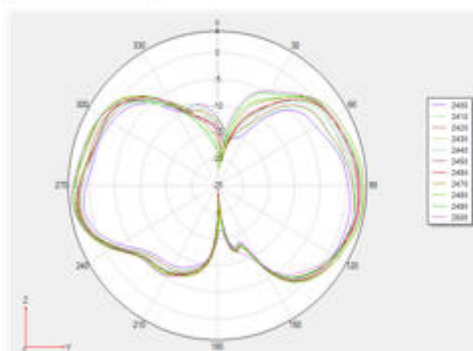
XOY面



ZOX面

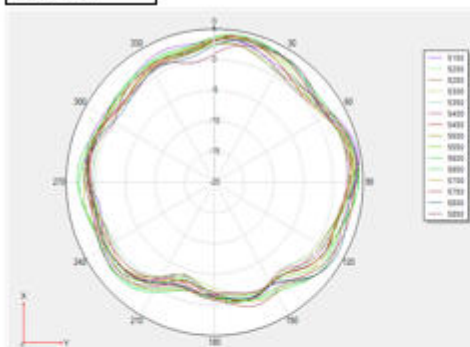


ZOY面

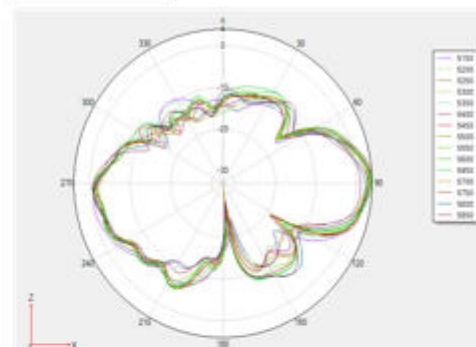


5G

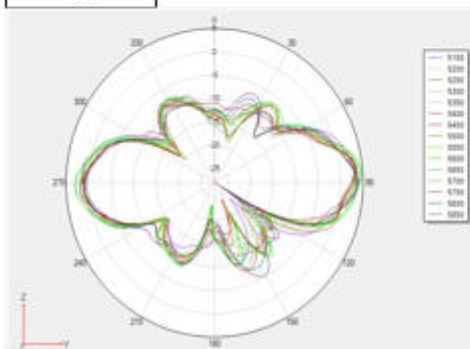
XOY面






ZOX面



ZOY面



Shenzhen free travel communication technology Co., LTD  
ROHS Report List for WIFI Antenna Material Components

| Number | Raw Material Name        | Raw material supplier (manufacturer) | Testing agency | Report Number      | Test date | Detect expiration date | Notes   |
|--------|--------------------------|--------------------------------------|----------------|--------------------|-----------|------------------------|---|
| 1      | PC/PBT                   | yubang                               | CTI            | A2240057268112001  | 2024/3/5  | 2025/3/5               |  PCPBT.pdf   |
| 2      | PCB                      | junxuan                              | CTI            | A2240256191101002E | 2024/5/9  | 2025/5/9               |  FR-4 A2 ROHS.pdf                                    |
| 3      | ABS                      | lejing                               | SGS            | CANPC24004074902   | 2024/3/14 | 2025/3/14              |  ABS HP171-本色 ROHS_CN_240314.pdf                     |
| 4      | Tinned round copper wire | mingxing                             | CTI            | A2240182175102001E | 2024/4/12 | 2025/4/12              |  镀锡圆铜线A2240182175102001E (rohs)088e (2024.04.12).pdf |
| 5      | TIN                      | taiyuan                              | SGS            | CANEC24003588604   | 2024/3/8  | 2025/3/8               |  CANEC24003588604(锡线).pdf                            |
| 6      | FEP BLUE                 | jianlong                             | CTI            | A2240269286101007C | 2024/5/21 | 2025/5/21              |  见龙 (护套) ROHS 蓝色中文.pdf                               |
| 7      | FEP Whine                | jianlong                             | SGS            | A2240269286101002C | 2024/5/21 | 2025/5/21              |  见龙 (护套) ROHS 白色中文.pdf                               |
| 8      | Silk screen ink          | Xinzheng Chemical                    | WT             | WTH24F12305415C    | 2025/1/2  | 2026/1/2               |  丝网油墨WTH24F12305415C-20250102-000111.pdf             |
| 9      | Solder MaskSolder Mask   | Xinzheng Chemical                    | WT             | WTH24F12305406C    | 2025/1/2  | 2026/1/2               |  锡膏WTH24F12305406C-20250102-000111.pdf               |
| 10     | Nickel-Plated Steel      | huapu                                | SGS            | XMNPC24000170702   | 2024/3/6  | 2025/3/6               |  弹簧-XMNP2403000390PC01_CN.pdf                      |

require:

- The submission of component material reports must be in accordance with EU implementation requirements, including testing reports for indivisible care methods and named materials, as well as testing for other environmental regulations and requirements
- If the submitted component materials are to be tested, they must include the composition of the original piece, all materials according to the department's packaging materials, social metal and other materials. No form of control report is accepted. Humorous acceptance of mixed testing reports within three types is accepted, and reports exceeding three types are not accepted
- The company recognizes the reports provided by the following nine testing institutions, SGS, CTI , ITS, Saibao, Noni, CCIC, bv, STS, set
- If the first page of the testing report needs to be stamped with our company's official seal and the side needs to be stamped with a saddle stitch seal, each report must be provided. It is not allowed to alter or forge the price report. The supplier must first review the report themselves to ensure that the submitted report is valid, correct, complete, and the content is clear and distinguishable

Provide electronic copies of report requirements: the report can be scanned together with the list; It can also be scanned separately, but with corresponding numbers for easy querying



# Product packaging specification

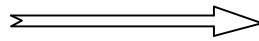
page: 1 of 1

Product Name: antenna

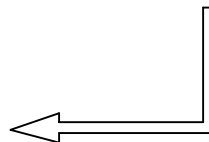
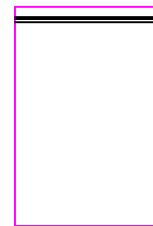
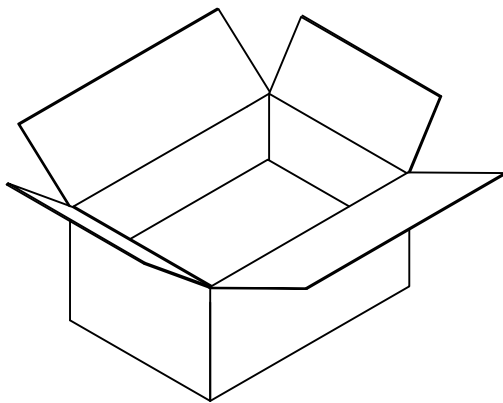
Rea : A00

Except for others

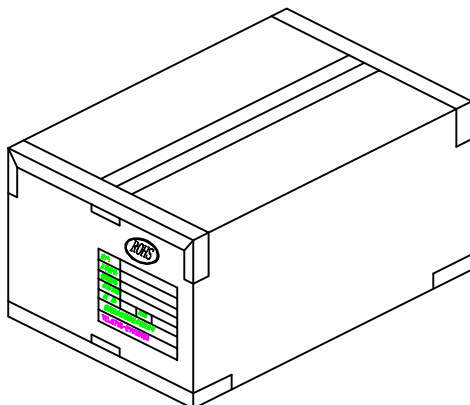
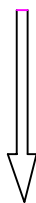
一: Antenna



二: Put them in PE bags, quantity  
is packed in (50 100pcs)  
Subject to the actual situation



三: Put the antenna in the carton



四: Seal the box and paste the  
production label and RoHS  
label on the outer box( actual  
situation shall prevail)