

# Antenna Specification

|                     |                           |
|---------------------|---------------------------|
| Customer Name:      | WAH LUNG TOYS Co., Ltd    |
| Project Name:       | Hf01                      |
| New Material Model: | M02-0600040ROA            |
| Old Material Model: | M1G.0096-ROA              |
| Product Name:       | 2.4G external rod antenna |
| Customer Number:    |                           |
| Antenna Type:       | Monopole                  |
| Version:            | D                         |

| supplier                                                                                                          |  | customer    |  |
|-------------------------------------------------------------------------------------------------------------------|--|-------------|--|
| Prepared by                                                                                                       |  | Purchase    |  |
| Checked by                                                                                                        |  | Engineering |  |
| Approved by                                                                                                       |  | Quality     |  |
| <input checked="" type="checkbox"/> The new material <input type="checkbox"/> Recycle (The number to be recycled) |  |             |  |
| Cachet : 2024-03-01                                                                                               |  | Cachet:     |  |

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[illegible]

#### 4. The performance parameters

| Electrical performance index |                                                                                                           |
|------------------------------|-----------------------------------------------------------------------------------------------------------|
| Frequency range              | 2400-2500MHZ                                                                                              |
| 2.4GHz VSWR                  | $\leq 1.9$                                                                                                |
| Gain                         | $\leq 4.23\text{dBi}$ (Different darkroom and different environment location, the gain will be different) |
| Radiation direction          | omnidirectional                                                                                           |
| The input impedance          | $50\ \Omega$                                                                                              |
| Polarization mode            | Linear polarization                                                                                       |
| The most powerful            | 2W                                                                                                        |
| Mechanical performance index |                                                                                                           |
| Interface form               | SMA Male and female                                                                                       |
| The antenna material         | PCB+hardware+plastic                                                                                      |
| Working temperature          | $-40^{\circ}\text{C}-85^{\circ}\text{C}$                                                                  |
| Working humidity             | 5%-95%                                                                                                    |

## 5. Engineering Drawing

|   |   |   |   |
|---|---|---|---|
| A | B | C | D |
| 8 |   |   | 8 |
| 7 |   |   | 7 |
| 6 |   |   | 6 |
| 5 |   |   | 5 |
| 4 |   |   | 4 |
| 3 |   |   | 3 |
| 2 |   |   | 2 |
| 1 |   |   | 1 |

RoHS  
Compliant  
G P

please refer to operation description.

REMARKS:

1. ALL MATERIALS ARE RoHS COMPLIANT.

|     |                |          |       |             |        |  |
|-----|----------------|----------|-------|-------------|--------|--|
| 4   | SMA connector  |          | black | 17*2 13.0mm | 1      |  |
| 3   | Under the base | ABS      | black | 14.5*φ 13mm | 1      |  |
| 2   | On the base    | ABS      | black | 18*φ 13mm   | 1      |  |
| 1   | The shell      | TPE      | black | 156*φ 13mm  | 1      |  |
| No. | Name           | Material | Color | size        | Amount |  |

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|             |           |                                |             |     |
|-------------|-----------|--------------------------------|-------------|-----|
| Third Angle | Project   | Hf01                           | Designed by |     |
| 0~10 ±0.10  | Part Name | 2.4G external external antenna | Date        |     |
| 10~18 ±0.15 | Part No.  | M02-0600040R0A                 | Checked by  | RF  |
| 18~30 ±0.20 | Material  |                                | Date        |     |
| 30~40 ±0.25 | DWG No.   | 00000216                       | Approved by |     |
| 40~ ±0.30   | Unit      | mm                             | Scale       | 1:1 |

|     |             |          |        |          |
|-----|-------------|----------|--------|----------|
| Rev | Description | Date     | Remark | Location |
| A0  | New drawing | 20210423 |        |          |

## 6. Antenna Test

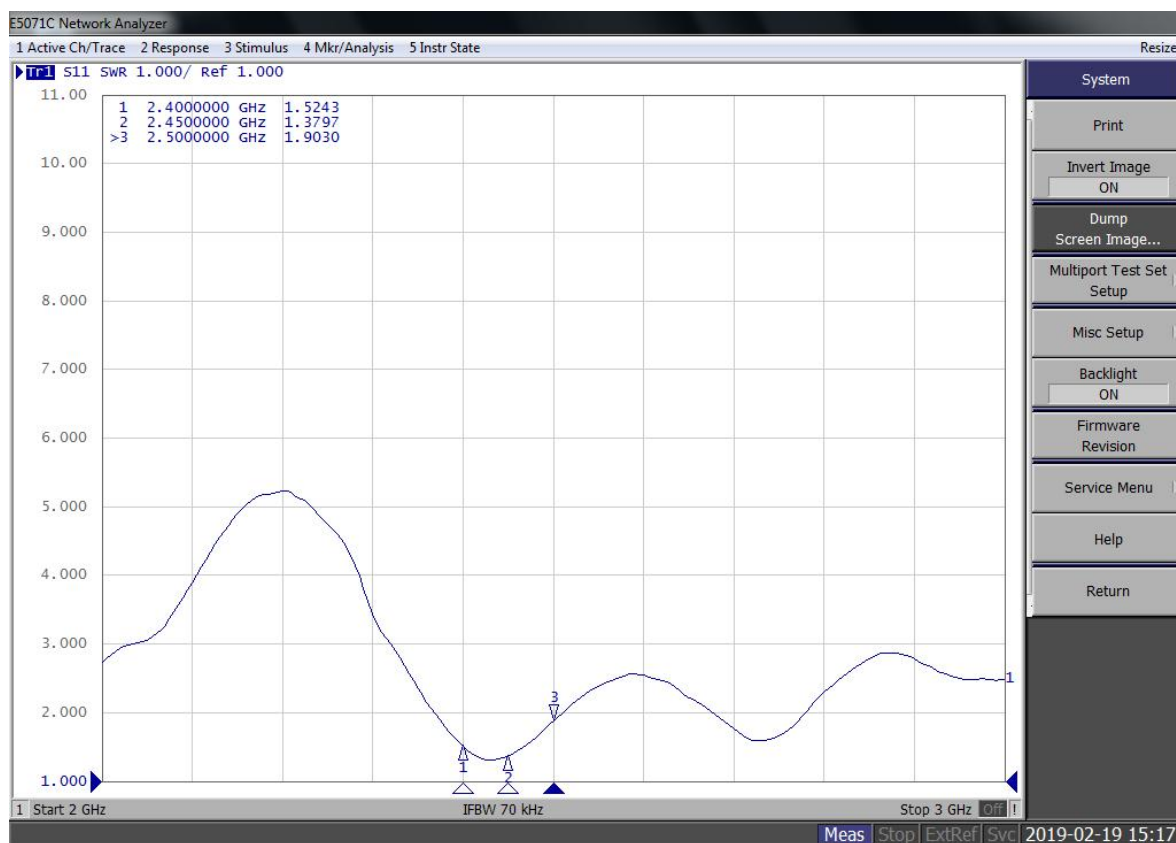
### 6.1 Processing Mode

#### 6.1.1 Matching Circuit (Nothing)

#### 6.1.2 Environmental Treatment (Nothing)

### 6.2 Performance Testing

#### 6.2.1 VSWR



Standing wave ratio data

|      |        |         |        |
|------|--------|---------|--------|
| Freq | 2.4GHz | 2.45GHz | 2.5GHz |
| VSWR | 1.52   | 1.37    | 1.90   |

#### 6.2.2 Active Antenna Test (Nothing)

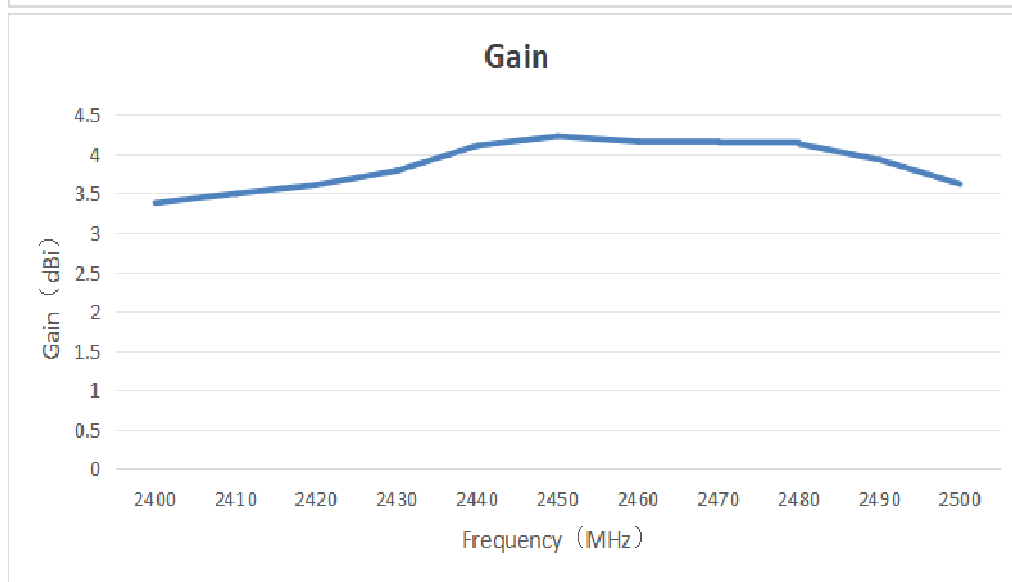
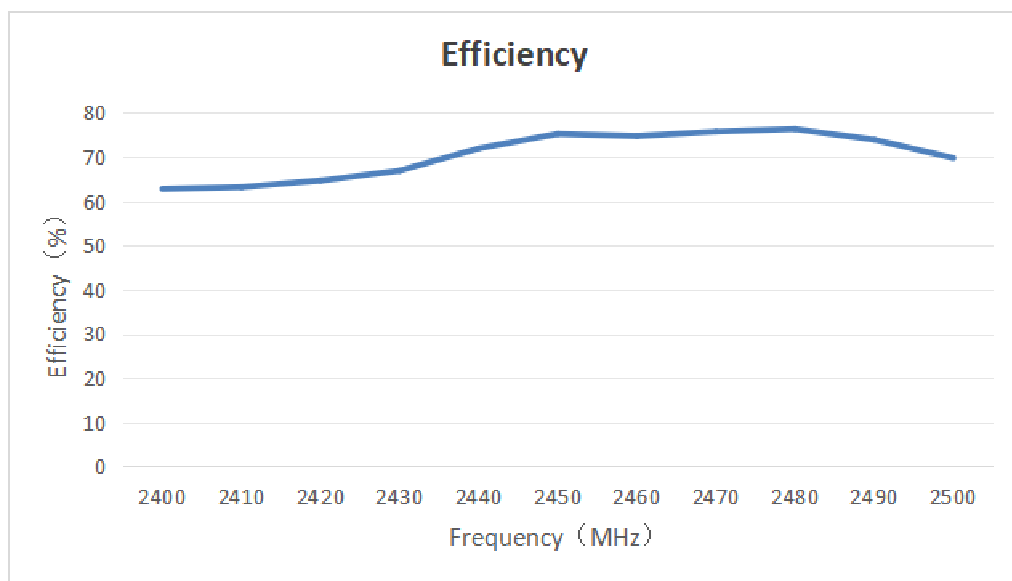
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### 6.2.3 Passive Antenna Test



| Frequency (MHz) | Gain (dBi) | Efficiency (%) | Frequency (MHz) | Gain (dBi) | Efficiency (%) |
|-----------------|------------|----------------|-----------------|------------|----------------|
| 2400            | 3.38       | 62.78          | 2460            | 4.16       | 74.70          |
| 2410            | 3.50       | 63.19          | 2470            | 4.15       | 75.69          |
| 2420            | 3.61       | 64.65          | 2480            | 4.13       | 76.24          |
| 2430            | 3.79       | 66.90          | 2490            | 3.93       | 73.86          |
| 2440            | 4.11       | 71.89          | 2500            | 3.62       | 69.73          |
| 2450            | 4.23       | 75.18          |                 |            |                |

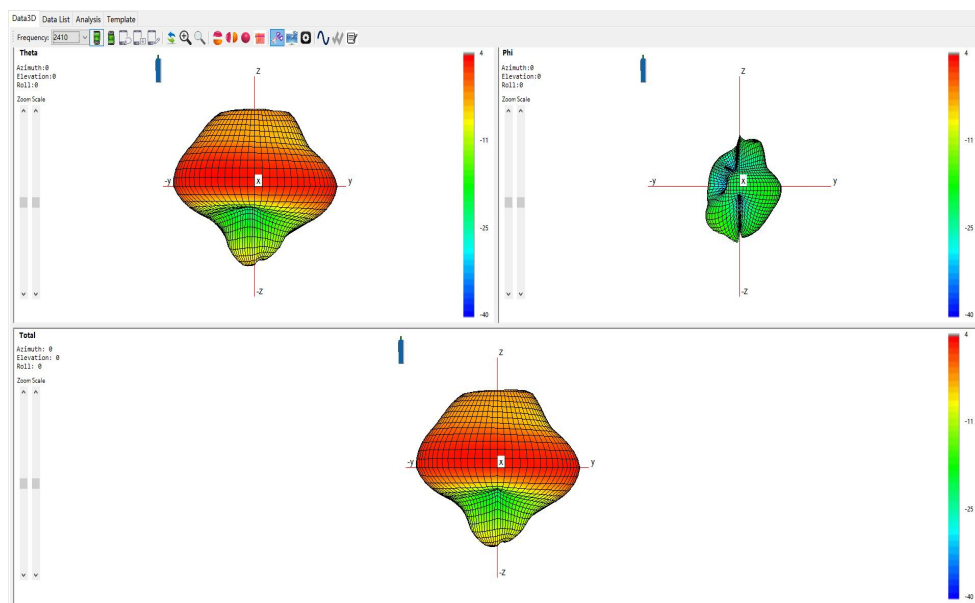
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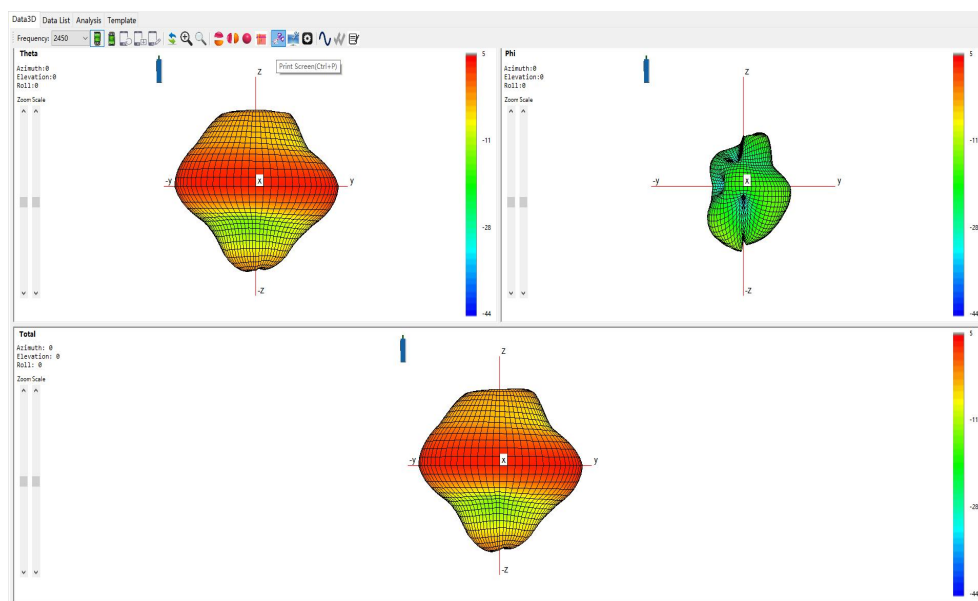
Mailbox: [nfc@imyantenna.com](mailto:nfc@imyantenna.com) Zip code:518057

## 6.2.4 3D graphics



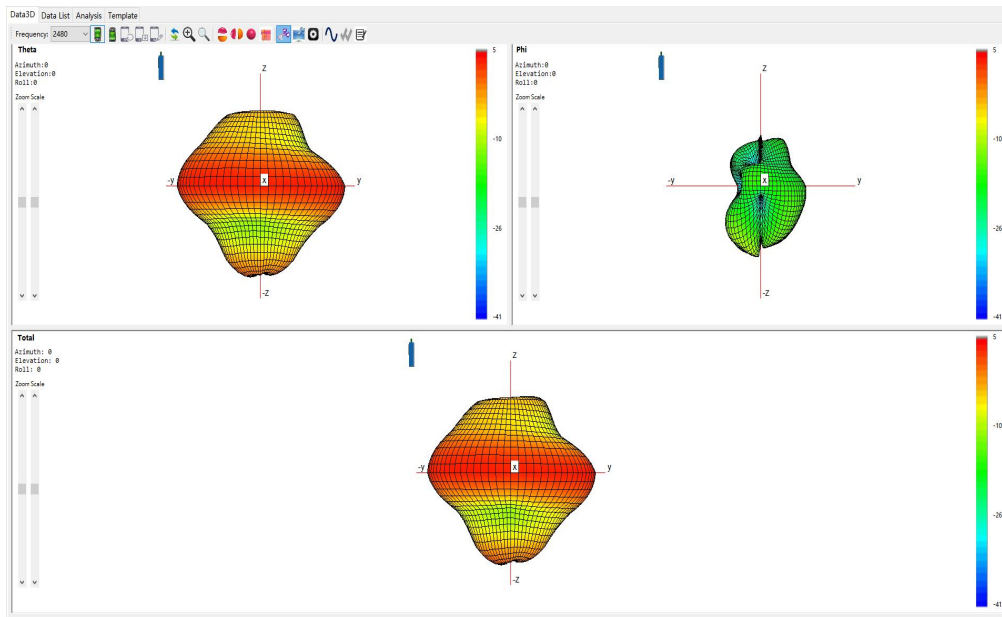
2410MHz

Gain=3.5dBi



2450MHz

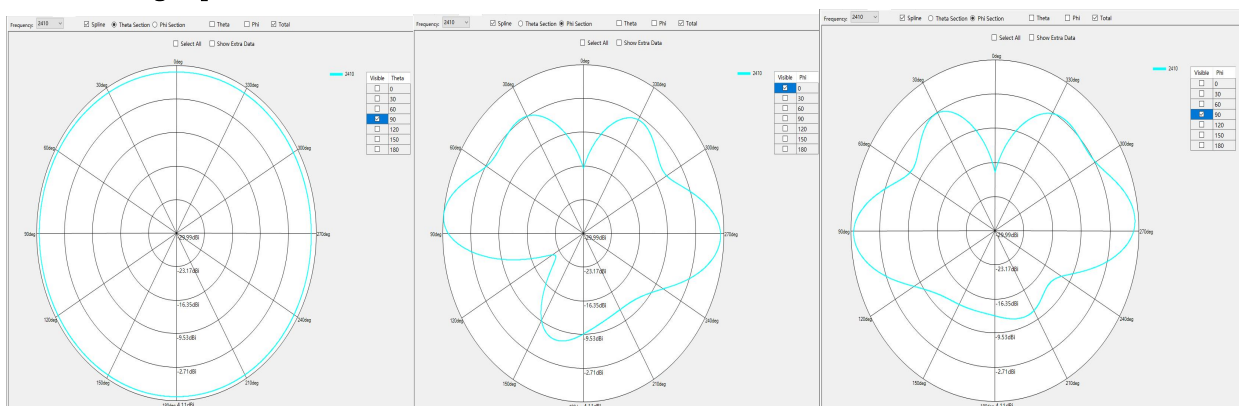
Gain=4.23dBi



2480MHz

Gain=4.13dBi

### 6.2.5 2D graphics



2410MHz

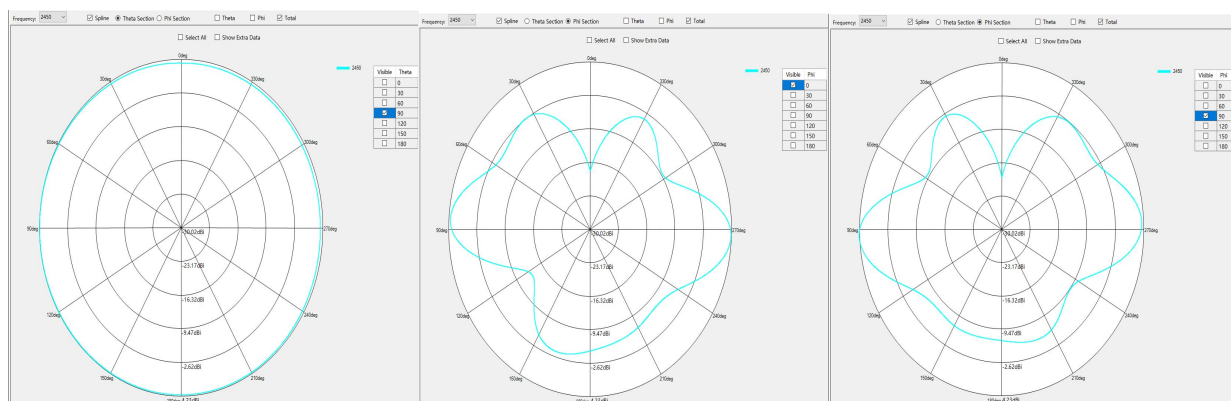
Gain=3.5dBi

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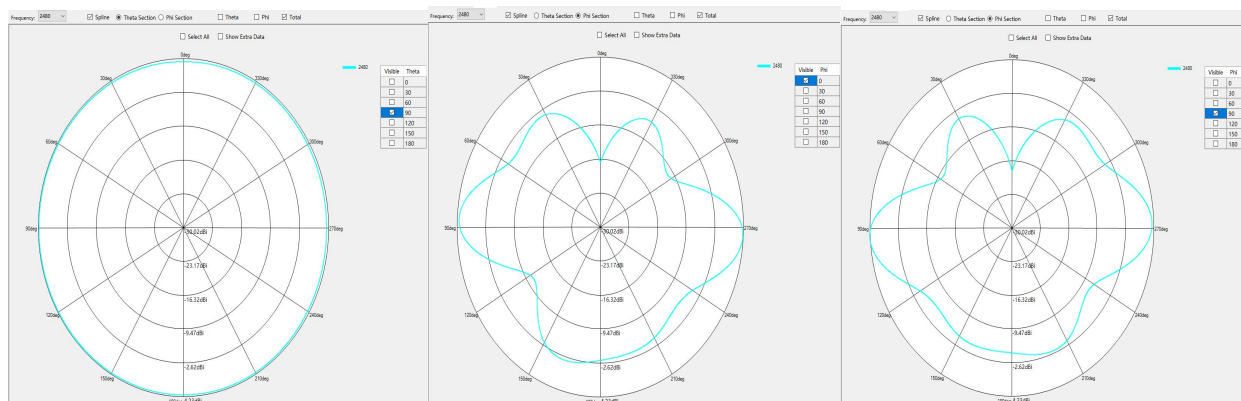
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2450MHz

Gain=4.23dBi



2480MHz

Gain=4.13dBi



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## 7. Antenna placement diagram

please refer to internal photos.

## 8. Inspection Report

|                     |                    |                   |                 |                                                                                         |                           |                  |            |       |       |
|---------------------|--------------------|-------------------|-----------------|-----------------------------------------------------------------------------------------|---------------------------|------------------|------------|-------|-------|
| Project Name        |                    | Hf01              |                 | Antenna Type                                                                            | 2.4G external rod antenna | Inspection Date  | 2024-03-01 |       |       |
| Appearance Standard |                    |                   |                 | 1、No abnormality on the antenna surface                                                 |                           |                  |            |       |       |
| Dimension Standard  |                    |                   |                 | 2、Within the required tolerances based on the drawing                                   |                           |                  |            |       |       |
| No                  | Inspection subject | Standard          | Inspection tool | Sampling number                                                                         | Result                    | Remark           |            |       |       |
| 1                   | Appearance         | As Above          | Visually        | 6PCS                                                                                    | OK                        |                  |            |       |       |
| 2                   | Dimension          | As Below Chart    | Vernier Caliper | 6PCS                                                                                    | OK                        |                  |            |       |       |
| No                  | Inspection Subject | Dimension         | Tool            | Test Results (Recorded six groups of testing data includes the highest & lowest values) |                           |                  |            |       |       |
|                     |                    |                   |                 | 1                                                                                       | 2                         | 3                | 4          | 5     | 1     |
| 1                   | Dimension          | $\Phi 13 \pm 0.3$ | Caliper         | 13.05                                                                                   | 13.08                     | 13.09            | 13.01      | 13.03 | 13.07 |
| 2                   |                    | $195.0 \pm 5.0$   |                 | 196.4                                                                                   | 195.9                     | 196.8            | 195.2      | 196.3 | 195.2 |
| 3                   |                    |                   |                 |                                                                                         |                           |                  |            |       |       |
| Remark              |                    |                   |                 |                                                                                         |                           |                  |            |       |       |
| Supervisor: SAM     |                    |                   | Audit: CHEN     |                                                                                         |                           | Inspector: JOYCE |            |       |       |

Packaging information:

- Put the finished antennas into 330\*230PE bags, each containing 50PCS.
- Each box is packed with 16 PE bags, 800PCS antennas in total, the quantity can be adjusted according to the actual situation.
- Then paste the outer box label on the upper left corner of the long side of the carton (the label size is 80\*50mm).
- Finally, seal the box with two pieces of packing tape in horizontal and vertical shape.

The diagram illustrates the packaging workflow. It begins with a single antenna being placed into a 330x230 mm PE bag, labeled '50PCS/bag'. These bags are then packed into a larger carton, labeled '16bag/box'. The final step shows the completed shipping carton, which is 410x284x310 mm. An arrow points to the location where an 80x50 mm carton label should be affixed to the top-left corner of the front panel. A detailed view of the shipping label is provided, including fields for project name, order number, material code, specifications, date, warehouse, and company name (ShenZhen MyAntenna RF Technology Co., Ltd). Below the main diagram, a table lists various technical parameters such as dimensions, tolerances, angles, and materials, along with a section for project management details like part names, dates, and approvals.

| Project Name      |  | The number of |  |
|-------------------|--|---------------|--|
| The order number  |  | The date of   |  |
| The material code |  | warehouse     |  |
| specifications    |  | Q C           |  |

**Shipping label**

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**Carton label**

80\*50Carton label  
The label content is shown in the upper right corner

| Third Angle |             | Project   |                       | Designed by |              |
|-------------|-------------|-----------|-----------------------|-------------|--------------|
| 0~10 ±0.05  | 0.02        | Part Name | Packaging guide chart | Date        |              |
| 10~18 ±0.10 | 0.03        | Part No.  |                       | Checked by  | RF           |
| 18~30 ±0.12 | 0.02        | Material  |                       | Date        |              |
| 30~40 ±0.15 | 0.04        | Treatment |                       | Approved by |              |
| 40~ ±0.20   | Angle ±0.5° | Color     |                       | Unit        | mm Scale 1:1 |

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| Shipping label                                                                                                               |  |               |  |
|------------------------------------------------------------------------------------------------------------------------------|--|---------------|--|
| The project name                                                                                                             |  | The number of |  |
| The order number                                                                                                             |  | The date of   |  |
| The material code                                                                                                            |  | warehouse     |  |
| specifications                                                                                                               |  | Q C           |  |
|  ShenZhen MyAntenna RF Technology Co.,Ltd |  |               |  |

## 10. QC engineering drawing

| <br><br>QC engineering drawing |                                                                                    |                                        | The file number                                   | MA-QCW-2206-006       | The file name     | 2.4G external rod antenna |                     |                       | To compile         | zhao                   |
|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------------------|-----------------------|-------------------|---------------------------|---------------------|-----------------------|--------------------|------------------------|
|                                                                                                                 |                                                                                    |                                        | version                                           | A                     |                   |                           |                     |                       | audit              |                        |
|                                                                                                                 |                                                                                    |                                        | The release date                                  | 2022-06-11            | Effective date    | 2022-06-11                | The page number     | 1/2                   | approval           | xu                     |
| The serial number                                                                                               | process                                                                            | The name of the process                | Make technical parameters/quality characteristics | Use equipment fixture | Testing equipment | Check the method          | Check the frequency | Using the record      | undertaker         | The relevant documents |
| 1                                                                                                               |  | Incoming inspection                    | Inspection standards/drawings                     | caliper               | /                 | visual                    | AQL sampling        | IQC inspection report | IQC                |                        |
| 2                                                                                                               |                                                                                    | Production of picking                  | Production task list                              | /                     | /                 | /                         | /                   | Material requisition  | Warehouse operator |                        |
| 3                                                                                                               |                                                                                    | Unpacking (unpacking) confirm quantity | Delivery note                                     | /                     | /                 | /                         | /                   | Delivery note         | The operator       |                        |
| 4                                                                                                               |                                                                                    | First appearance                       | Sealed samples samples                            | /                     | visual            | visual                    | /                   | IPQC first inspection | IPQC               |                        |

|    |                                                                                                                                                                                                                                                                   |                              |                                                                |   |                  |             |                |                                |               |  |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------------|---|------------------|-------------|----------------|--------------------------------|---------------|--|
|    |                                                                                                                                                                                  | confirmation                 |                                                                |   |                  |             |                | record                         |               |  |
| 5  | <br><br>       | First piece performance test | The product meets the requirements in the design specification | / | Network analyzer | Test visual | /              | IPQC first inspection record   | IPQC          |  |
| 6  | <br>                                                                                            | Assemble the SMA head        | Technical documents/drawings/BOM                               | / | manual           | visual      | All inspection | Daily production report        | The operator  |  |
| 7  |                                                                                                                                                                                  | inspection                   | IPQC process inspection regulations                            | / | visual           | visual      | 2H             | IPQC process inspection record | IPQC          |  |
| 8  | <br>                                                                                            | Soldering PCB                | Technical documents/drawings/BOM                               | / | manual           | visual      | All inspection | Daily production report        | The operator  |  |
| 9  | <br>                                                                                            | inspection                   | IPQC process inspection regulations                            | / | visual           | visual      | 2H             | IPQC process inspection record | IPQC          |  |
| 10 | <br><br> | Assemble the shell           | Technical documents/drawings/BOM                               | / | manual           | visual      | All inspection | Daily production report        | The operator  |  |
| 11 |                                                                                                                                                                                                                                                                   | inspection                   | IPQC process inspection regulations                            | / | visual           | visual      | 2H             | IPQC process inspection record | IPQC          |  |
| 12 |                                                                                                                                                                                                                                                                   | Appearance all inspection    | Technical documents/drawings/appearance criteria               | / | visual           | visual      | All inspection | Daily production report        | The inspector |  |

|                                                                                                                            |                    |                                     |                                     |                  |                  |             |                |                                |                              |  |
|----------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------|-------------------------------------|------------------|------------------|-------------|----------------|--------------------------------|------------------------------|--|
| 13                                                                                                                         |                    | Test                                | Technical documents/drawings        | /                | Network analyzer | Test visual | All inspection | Daily production report        | The operator                 |  |
| 14                                                                                                                         |                    | Packing (bag) quantity confirmation | Drawing/BOM                         | /                | /                | visual      | All inspection | Daily production report        | The operator                 |  |
| 15                                                                                                                         |                    | inspection                          | IPQC process inspection regulations | /                | visual           | visual      | 2H             | IPQC process inspection record | IPQC                         |  |
| 16                                                                                                                         |                    | Put in storage                      | Production task list                | /                | /                | /           | /              | Warehouse receipt of products  | Warehouse operator           |  |
| 17                                                                                                                         |                    | Pre-shipment inspection             | Shipping note                       | Network analyzer |                  | measurement | AQL sampling   | /                              | OQC                          |  |
| instructions: □ Said operation、 processing; ◇ It means confirm, check, judge, approve; ▽ Put into storage; ↓ Said handling |                    |                                     |                                     |                  |                  |             |                |                                |                              |  |
| mark                                                                                                                       | Modify the content |                                     |                                     |                  | version          | The date of |                | modifier                       | The examination and approval |  |
|                                                                                                                            |                    |                                     |                                     |                  |                  |             |                |                                |                              |  |