

# Antenna Testing Report

**Customer :** Apical Technology

**Project Name :** CJ2031

**Antenna version:**SY-CJ2031-WIFI-V0.3

**Antenna type:**PIFA

**Antenna Manufacturer:** Sunnyway Technology(CHINA)

**Address:** The 6th floor, Building 5, Nantaiyun Innovation Valley Center,  
Guangming District, Shenzhen City

**Report version:** June 6, 2024 A0  
**Author:** KaiYu Chen

| Version | Report date | Remark              |
|---------|-------------|---------------------|
| A0      | 2024.6.6    | Antenna test report |
| A1      |             |                     |
| A2      |             |                     |
| A3      |             |                     |
| A4      |             |                     |
| A5      |             |                     |
| A6      |             |                     |
| A7      |             |                     |
| A8      |             |                     |
| A9      |             |                     |

1.Record·····

2.Project Overview ·····

3.Equipment List·····

4. Antenna mounting position·····

5.Project picture and test Device·····

6.Matching modification·····

7.Passive parameters ·····

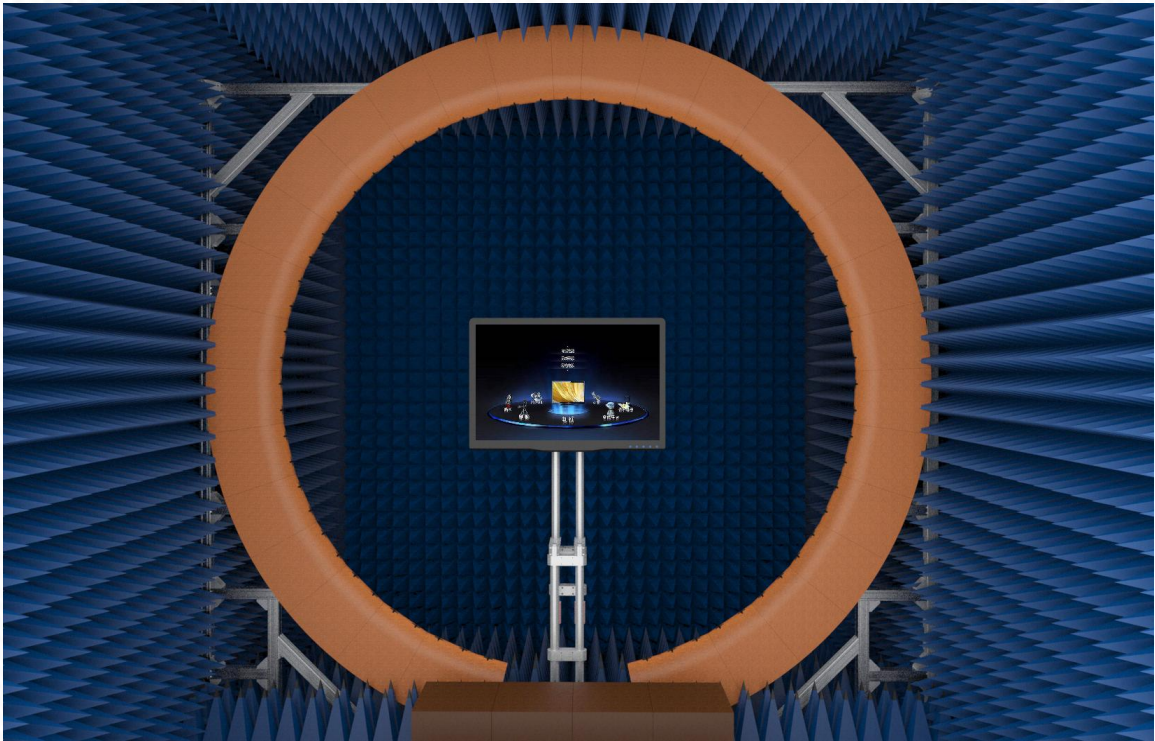
8.Passive efficiency and gain ·····

9.OTA test data ·····

10.Directiona pattern ·····

11.Summary·····

|                        |                                              |                                                                                                                             |
|------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Prototype status       | Debugging machine                            | <div>Project pictures</div> <div></div> |
| Device type            | tachograph                                   |                                                                                                                             |
| Number of antennas     | WIFI antenna                                 |                                                                                                                             |
| Frequency band         | 2G: N/A                                      |                                                                                                                             |
|                        | 3G: N/A                                      |                                                                                                                             |
|                        | 4G-LTE: N/A                                  |                                                                                                                             |
|                        | 5G-NR: N/A                                   |                                                                                                                             |
|                        | WIFI 802.11 a/b/g/n (2400-2500/5150-5850MHz) |                                                                                                                             |
| Structural style       | FPC                                          |                                                                                                                             |
| Environment adjustment | Have change                                  |                                                                                                                             |
| Matching modification  | No changed                                   |                                                                                                                             |



The industry's top 64 sensors OTA chamber

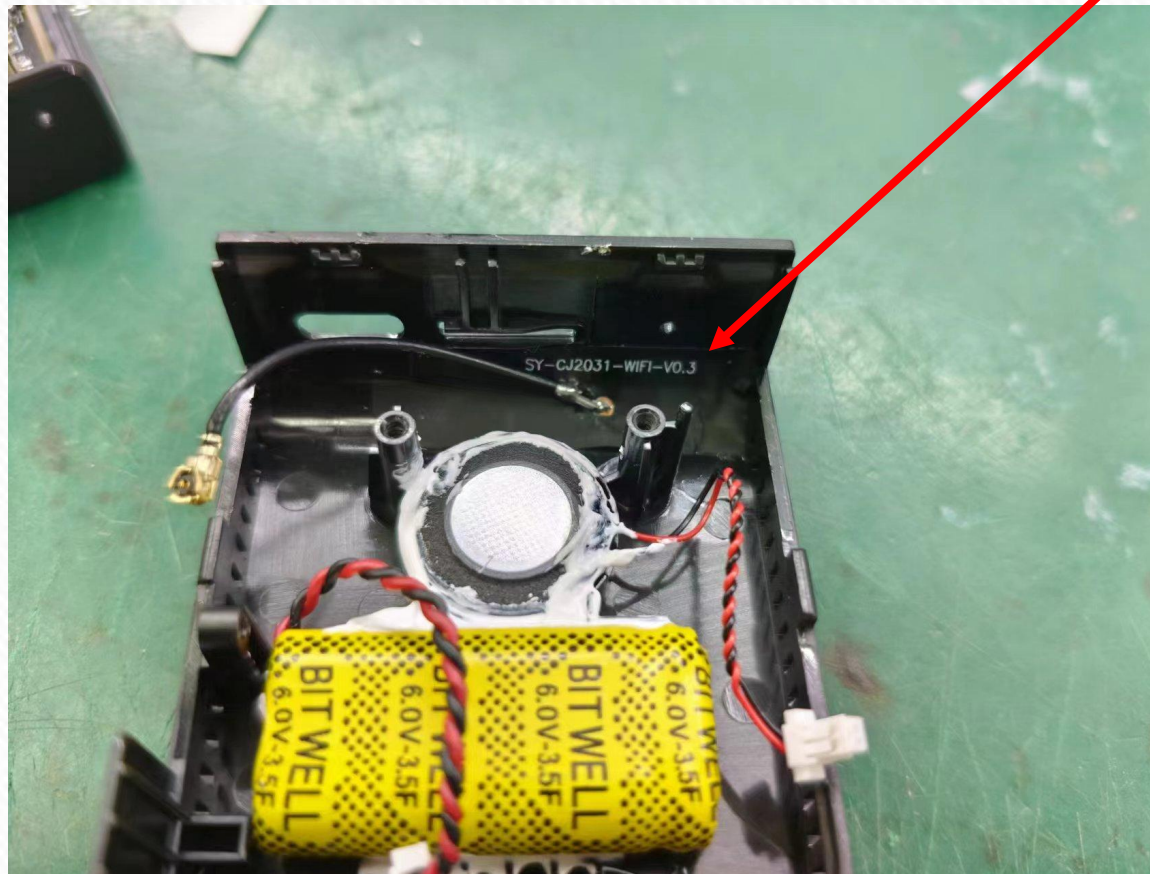
Frequency range: 400MHz-11GHz

Device Llimitation: 2M

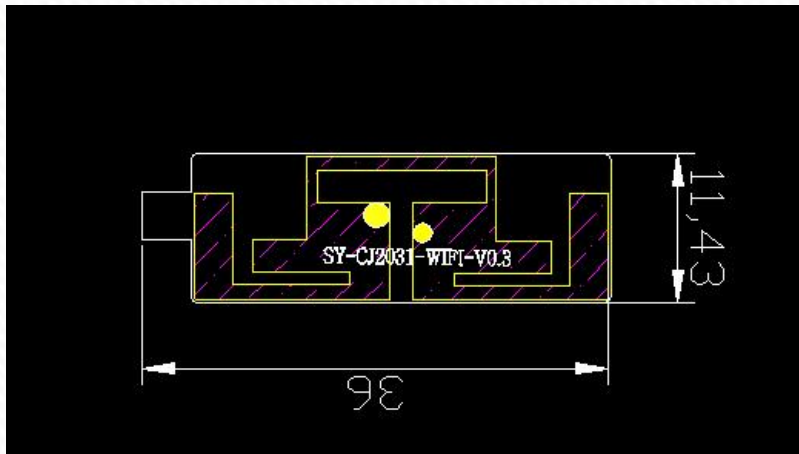
Load-bearing limitation:100KG

| Equipments Items                          | Total Quantity | Quantity for Shanghai R&D | Quantity for Shenzhen R&D | Quantity for ChongQing R&D |
|-------------------------------------------|----------------|---------------------------|---------------------------|----------------------------|
| OTA chamber                               | 10             | 4                         | 5                         | 1                          |
| 5G Tester (SP9500-CTS)                    | 3              | 1                         | 1                         | 1                          |
| R&S Tester (high configuration CMW500)    | 6              | 3                         | 2                         | 1                          |
| Japan Anritsu Tester (Dual Channel 8820)  | 4              | 2                         | 2                         | --                         |
| NB-IoT Tester (SP8315)                    | 3              | 1                         | 1                         | 1                          |
| Agilent Tester (8960)                     | 9              | 4                         | 4                         | --                         |
| Agilent Network Analyzer (E5062A)         | 7              | 3                         | 3                         | 1                          |
| Agilent Network Analyzer (E5071C 8.5GHZ ) | 11             | 5                         | 5                         | 1                          |
| Agilent Network Analyzer (E5071B 8.5GHZ ) | 7              | 3                         | 3                         | 1                          |
| R&S Network Analyzer (ZND)                | 9              | 4                         | 4                         | 1                          |
| R&S Network Analyzer (ZVB)                | 3              | 1                         | 1                         | 1                          |
| OTA head hand / ear hand / arm hand       | 5              | 2                         | 2                         | 1                          |
| GPS/WIFI active test equipment            | 5              | 2                         | 2                         | 1                          |

WIFI Antenna

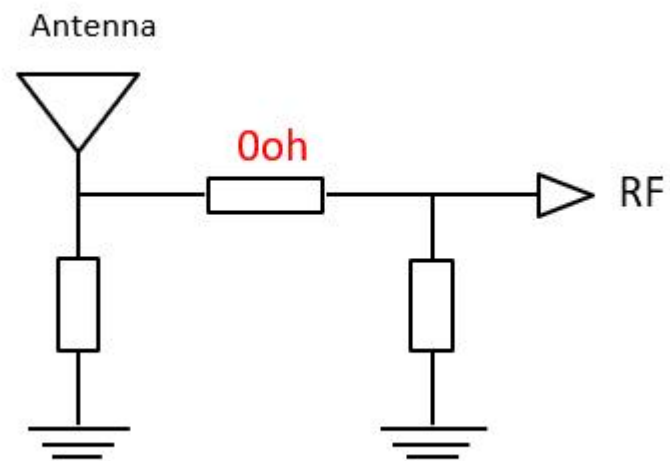


2D pictures

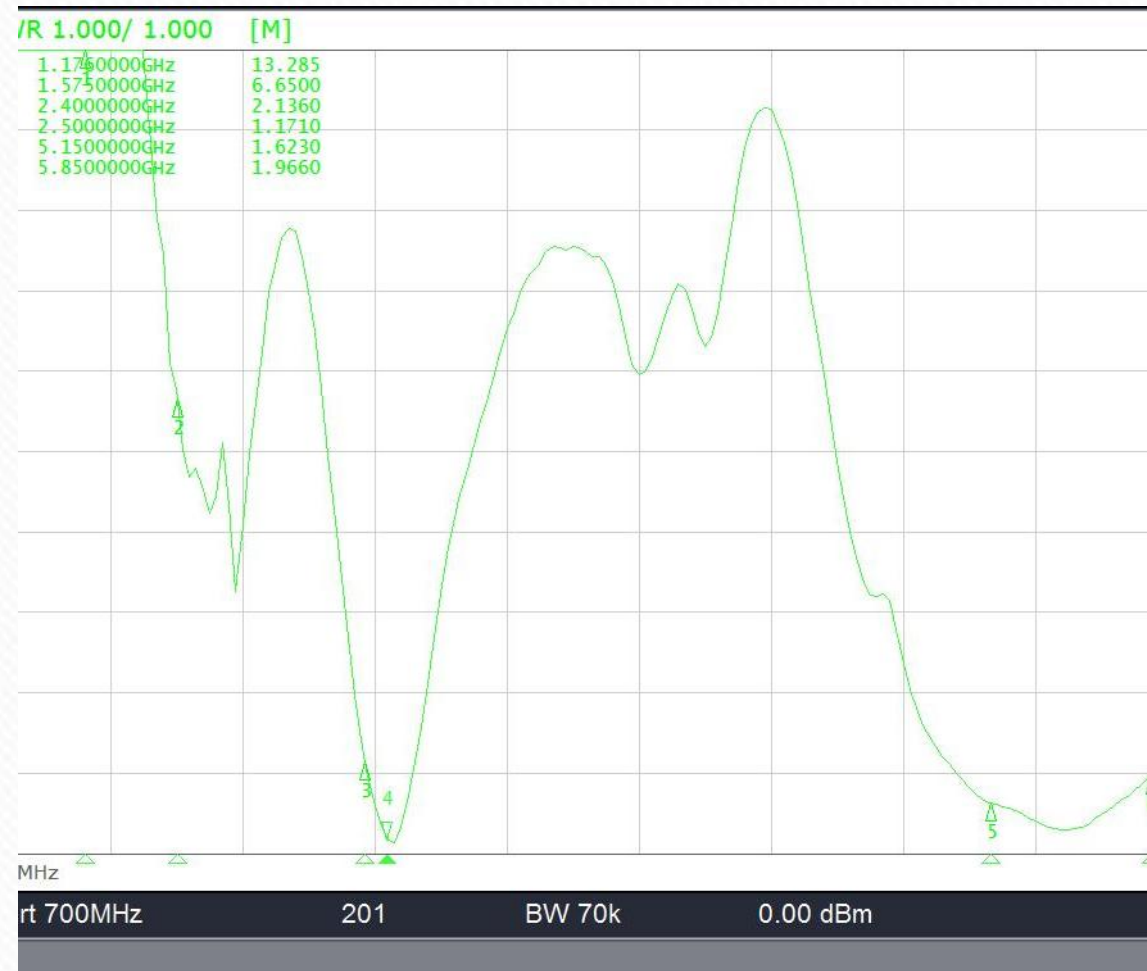


Antenna pictures





## VSWR

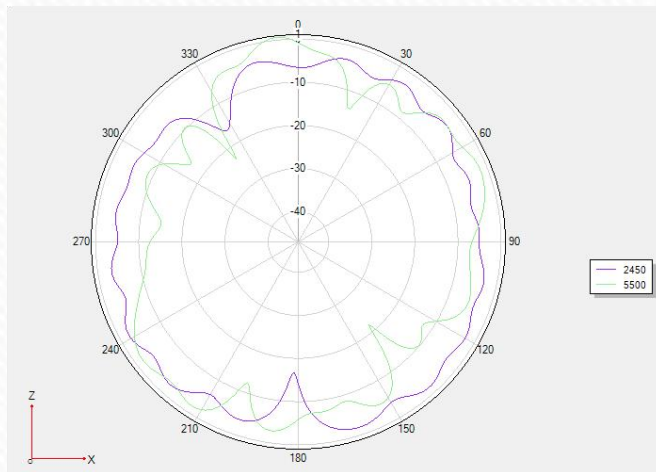


| Frequency/Mhz | MaxGain/dBi | Efficiency / % | Frequency/Mhz | MaxGain/dBi | Efficiency / % |
|---------------|-------------|----------------|---------------|-------------|----------------|
| 2400          | 1.36        | 35.99          | 5150          | 2.21        | 30.51          |
| 2410          | 1.35        | 36.1           | 5200          | 2.71        | 30.64          |
| 2420          | 1.3         | 35.55          | 5250          | 3.15        | 33.55          |
| 2430          | 1.54        | 37.18          | 5300          | 3.53        | 35.27          |
| 2440          | 1.59        | 37.35          | 5350          | 3.42        | 34.96          |
| 2450          | 1.53        | 37.29          | 5400          | 3.66        | 38.39          |
| 2460          | 1.42        | 37.12          | 5450          | 3.77        | 39.36          |
| 2470          | 1.2         | 36.6           | 5500          | 3.76        | 40.27          |
| 2480          | 1.11        | 36.55          | 5550          | 3.82        | 40.25          |
| 2490          | 0.88        | 35.99          | 5600          | 3.57        | 40.65          |
| 2500          | 0.61        | 34.59          | 5650          | 3.83        | 43.56          |
|               |             |                | 5700          | 4.14        | 43.43          |
|               |             |                | 5750          | 3.92        | 42.19          |
|               |             |                | 5800          | 3.78        | 42.13          |
|               |             |                | 5850          | 4.25        | 41.32          |

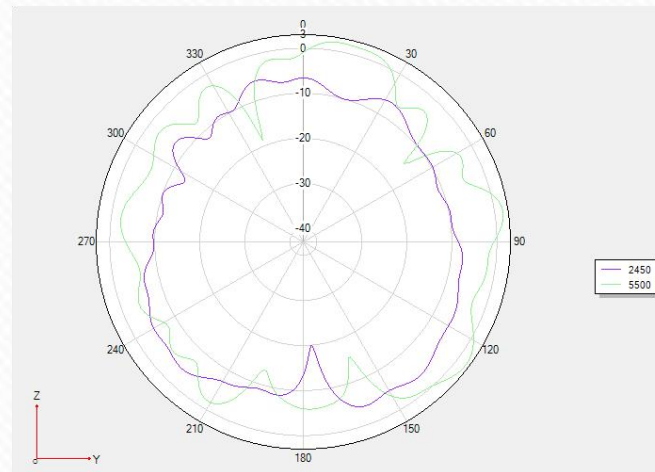
| Measurement | Band               | Channel | Total  |
|-------------|--------------------|---------|--------|
| TRP         | WIFI_B (1M)        | 1       | 13.43  |
| TRP         | WIFI_B (1M)        | 7       | 14.52  |
| TRP         | WIFI_B (1M)        | 13      | 13.89  |
| TIS(EIRP)   | WIFI_B (11M)       | 13      | -80.44 |
| TRP         | WIFI_G (6M)        | 1       | 12.07  |
| TRP         | WIFI_G (6M)        | 7       | 12.77  |
| TRP         | WIFI_G (6M)        | 13      | 12.75  |
| TIS(EIRP)   | WIFI_G (54M)       | 13      | -65.25 |
| TRP         | WIFI_N_ISM (6.5M)  | 1       | 10.77  |
| TRP         | WIFI_N_ISM (6.5M)  | 7       | 11.02  |
| TRP         | WIFI_N_ISM (6.5M)  | 13      | 11.42  |
| TIS(EIRP)   | WIFI_N_ISM (65M)   | 13      | -62.12 |
| TRP         | WIFI_A (6M)        | 36      | 10.18  |
| TRP         | WIFI_A (6M)        | 149     | 11.42  |
| TRP         | WIFI_A (6M)        | 165     | 10.54  |
| TIS(EIRP)   | WIFI_A (6M)        | 165     | -68.51 |
| TRP         | WIFI_N_UNII (6.5M) | 36      | 8.67   |
| TRP         | WIFI_N_UNII (6.5M) | 149     | 9.37   |
| TRP         | WIFI_N_UNII (6.5M) | 165     | 8.55   |
| TIS(EIRP)   | WIFI_N_UNII (6.5M) | 165     | -63.54 |

2D:

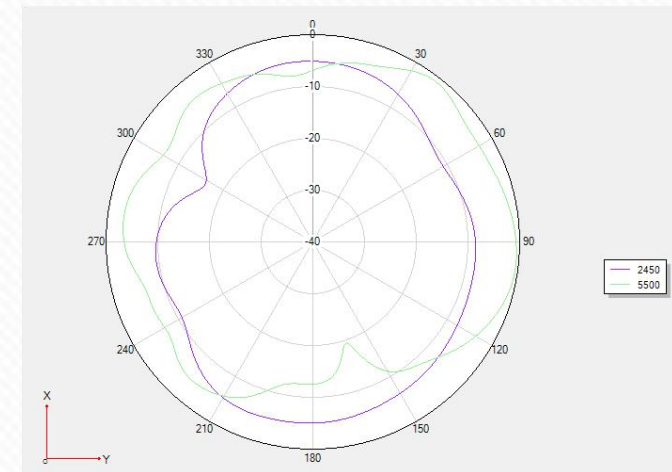
phi 0°



phi 90°

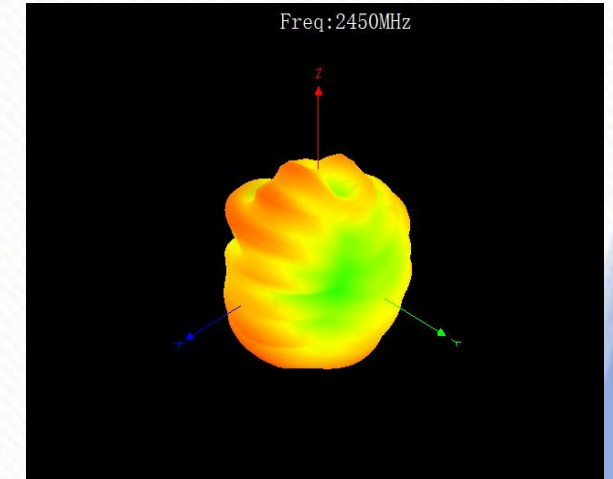
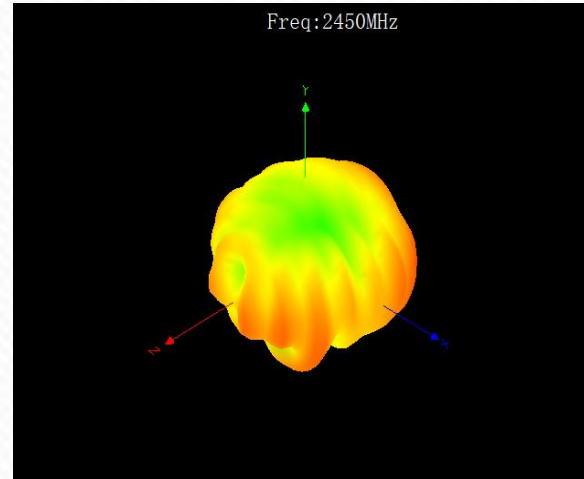
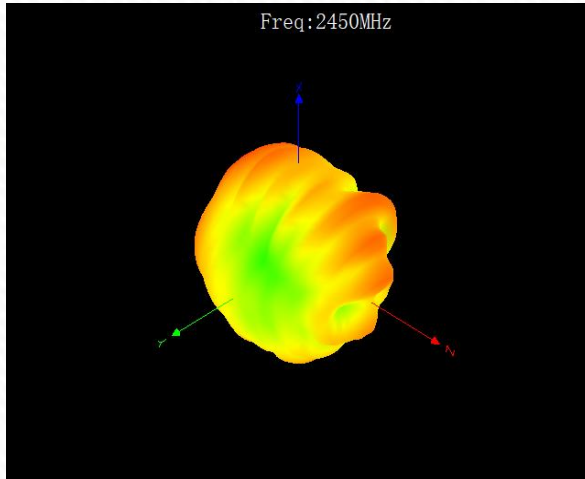


theta 90°

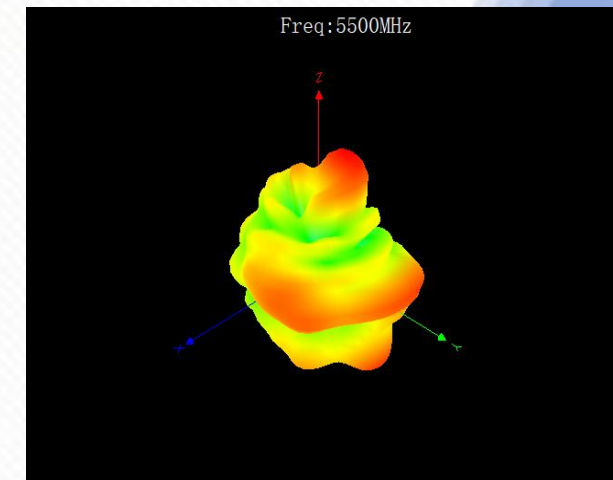
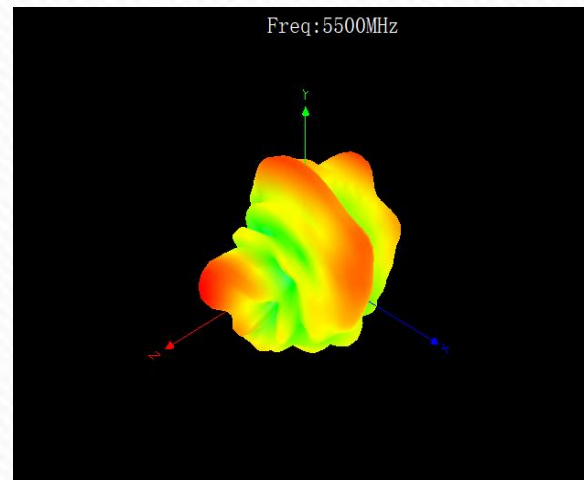
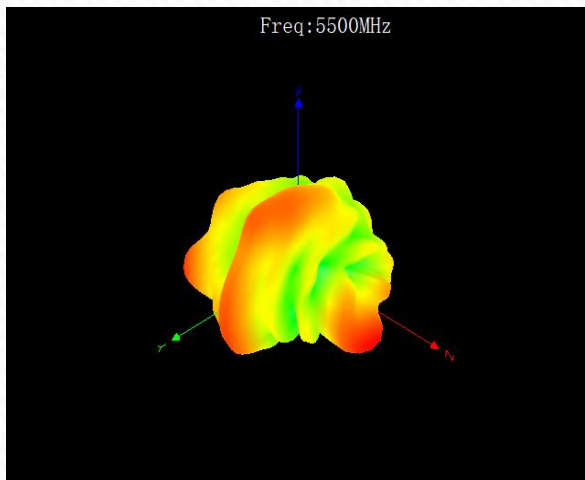


3D:

2450MHz:



5500MHz:



1. The antenna matching is have changed.
2. The antenna environment is not increased.
3. The antenna performance test is OK.

# Thank You

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