

## Antenna Specification

| Technical Parameter  | Indicator requirements                                                                                            |
|----------------------|-------------------------------------------------------------------------------------------------------------------|
| Antenna type         | PIFA                                                                                                              |
| Antenna size         | 2.4G1/5G1: 48*7*0.8mm (without cable)<br>2.4G2/5G2: 48*7*0.8mm (without cable)<br>5G3: 20*8*0.8mm (without cable) |
| Antenna polarization | Linear polarization                                                                                               |
| Frequency range      | 2.4-2.5GHz<br>5.15-5.85GHz                                                                                        |
| VSWR                 | $\leq 2$                                                                                                          |
| Isolation            | $\leq -20$                                                                                                        |
| Gain                 | As below table                                                                                                    |
| Efficiency           | 2.4G: >50%<br>5G: >60%                                                                                            |
| Manufacturer         | Fujian HuiChuangXinGao Electronic Technology Co.,Ltd.                                                             |
| Address              | Huichuang Science Park, Dengbang Industrial Zone, Zhangping City, Fujian Province                                 |
| Issue Date           | 2024.03.15                                                                                                        |
| Engineer             | Sean                                                                                                              |
| Test Lab             | Huichuang OTA Lab                                                                                                 |

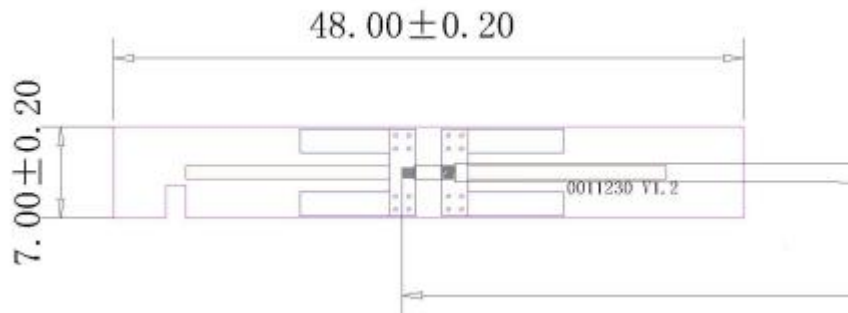
## contents

|                                  |   |
|----------------------------------|---|
| 1. Antenna information.....      | 3 |
| 2. Test equipment and setup..... | 5 |
| 3. Test data.....                | 6 |

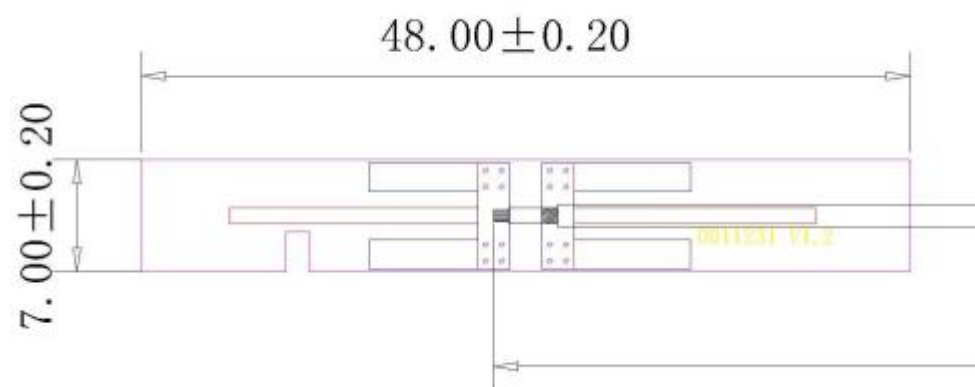
## 1. Antenna information

### 2.4G/5G Antenna 1

Unit: mm

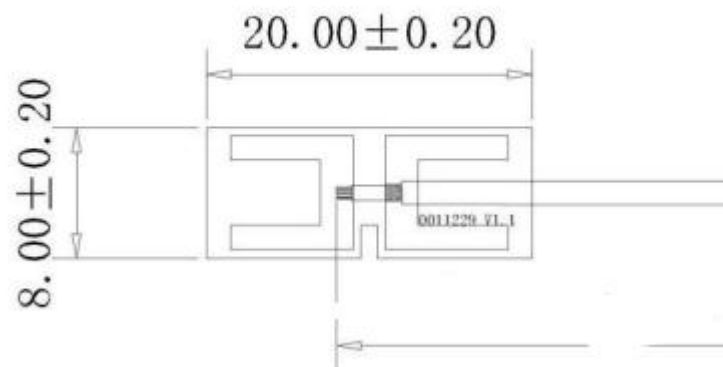


### 2.4G/5G Antenna 2



### 5G Antenna 3

Unit: mm



## **2. Test equipment and setup**

### **1. Network Analyzers: Agilent E5071C**

### 3. Test data

2.4G/5G-1 Antenna: 2400-2500MHz, 5150-5890MHz

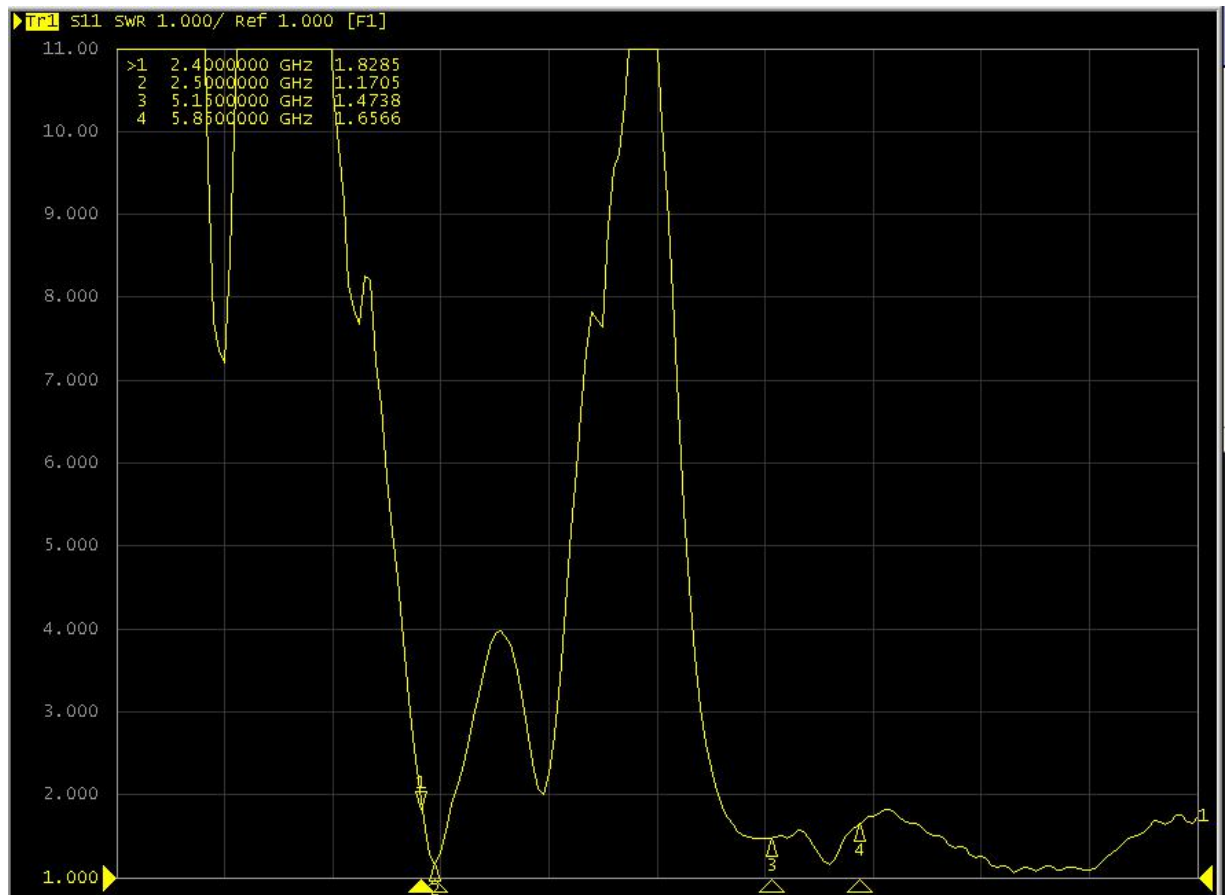
| Freq<br>(MHz) | Effi<br>(%%) | Gain<br>(dBi) |
|---------------|--------------|---------------|
| 2400          | 53.08        | 3.10          |
| 2410          | 53.75        | 3.04          |
| 2420          | 52.01        | 2.95          |
| 2430          | 52.81        | 2.89          |
| 2440          | 54.80        | 3.05          |
| 2450          | 54.16        | 2.86          |
| 2460          | 52.55        | 2.81          |
| 2470          | 52.27        | 2.80          |
| 2480          | 53.09        | 2.96          |
| 2490          | 52.33        | 2.97          |
| 2500          | 51.94        | 3.06          |

| Freq<br>(MHz) | Effi<br>(%%) | Gain<br>(dBi) |
|---------------|--------------|---------------|
| 5150          | 73.02        | 4.41          |
| 5160          | 71.99        | 4.41          |
| 5170          | 69.79        | 4.29          |
| 5180          | 71.79        | 4.44          |
| 5190          | 75.71        | 4.73          |
| 5200          | 75.04        | 4.69          |
| 5210          | 74.69        | 4.71          |
| 5220          | 74.57        | 4.70          |
| 5230          | 75.38        | 4.71          |
| 5240          | 75.66        | 4.82          |
| 5250          | 76.25        | 4.81          |
| 5260          | 77.54        | 4.89          |
| 5270          | 75.06        | 4.80          |
| 5280          | 71.16        | 4.62          |
| 5290          | 72.46        | 4.72          |
| 5300          | 73.10        | 4.81          |
| 5310          | 71.79        | 4.79          |
| 5320          | 73.34        | 4.97          |
| 5330          | 73.23        | 4.98          |
| 5340          | 71.28        | 4.85          |
| 5350          | 72.82        | 5.06          |
| 5360          | 75.69        | 5.21          |
| 5370          | 75.08        | 5.21          |
| 5380          | 73.34        | 5.11          |

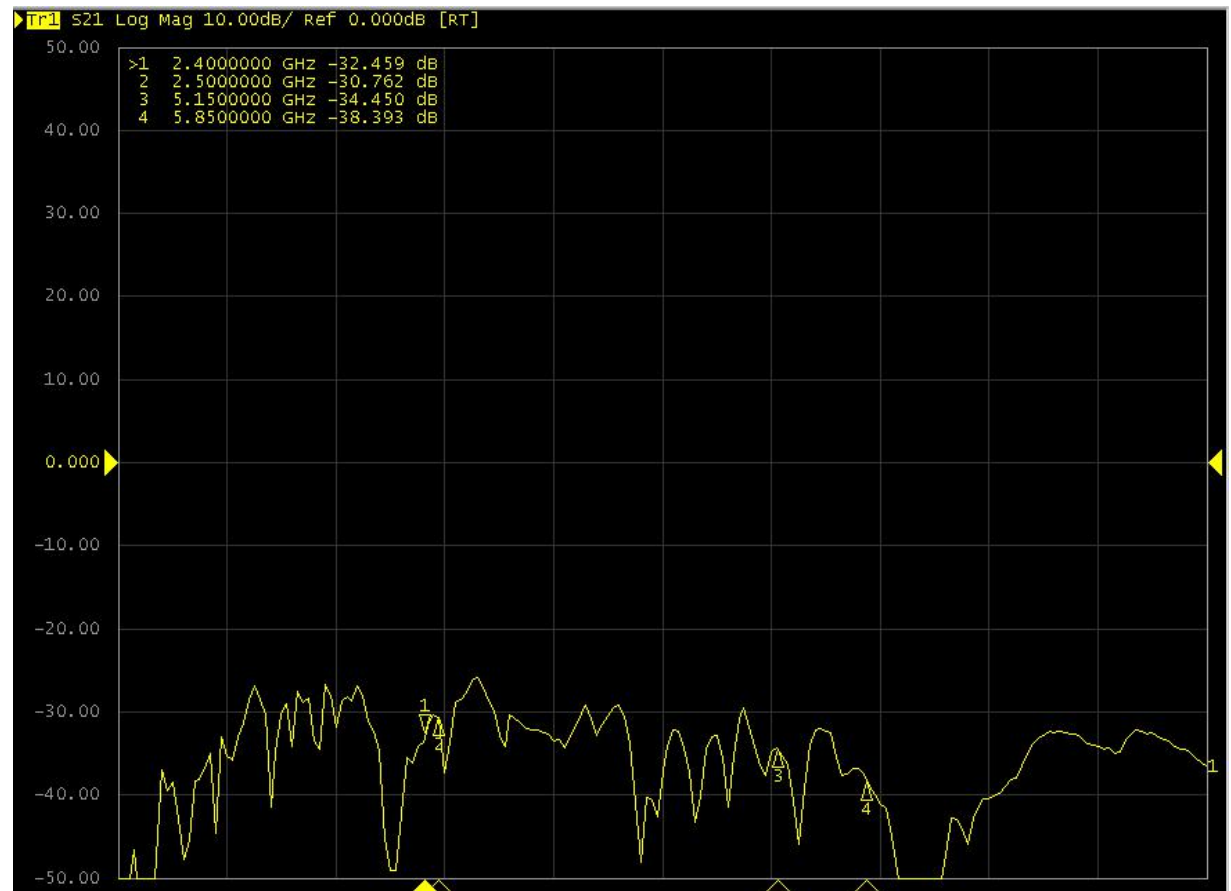
|      |       |      |
|------|-------|------|
| 5390 | 74.01 | 5.19 |
| 5400 | 74.07 | 5.15 |
| 5410 | 73.66 | 5.13 |
| 5420 | 76.40 | 5.27 |
| 5430 | 74.21 | 5.20 |
| 5440 | 69.25 | 4.88 |
| 5450 | 68.11 | 4.88 |
| 5460 | 69.20 | 5.02 |
| 5470 | 69.74 | 5.05 |
| 5480 | 69.06 | 5.10 |
| 5490 | 65.09 | 4.83 |
| 5500 | 64.62 | 4.84 |
| 5510 | 66.64 | 4.87 |
| 5520 | 70.29 | 5.04 |
| 5530 | 74.24 | 5.16 |
| 5540 | 74.78 | 5.15 |
| 5550 | 71.88 | 4.85 |
| 5560 | 76.04 | 5.06 |
| 5570 | 81.73 | 5.32 |
| 5580 | 84.42 | 5.42 |
| 5590 | 83.35 | 5.34 |
| 5600 | 83.27 | 5.31 |
| 5610 | 83.76 | 5.34 |
| 5620 | 85.28 | 5.45 |
| 5630 | 89.70 | 5.67 |
| 5640 | 91.04 | 5.82 |
| 5650 | 84.90 | 5.54 |
| 5660 | 81.03 | 5.33 |
| 5670 | 86.34 | 5.63 |
| 5680 | 90.37 | 5.85 |
| 5690 | 87.67 | 5.80 |
| 5700 | 83.22 | 5.55 |
| 5710 | 80.25 | 5.50 |
| 5720 | 81.73 | 5.52 |
| 5730 | 83.36 | 5.69 |
| 5740 | 83.98 | 5.66 |
| 5750 | 82.22 | 5.69 |
| 5760 | 75.99 | 5.30 |
| 5770 | 76.37 | 5.34 |
| 5780 | 83.20 | 5.78 |
| 5790 | 83.48 | 5.75 |
| 5800 | 80.05 | 5.79 |

|      |       |      |
|------|-------|------|
| 5810 | 80.70 | 5.82 |
| 5820 | 83.79 | 6.08 |
| 5830 | 86.78 | 6.20 |
| 5840 | 87.52 | 6.38 |
| 5850 | 85.75 | 6.31 |

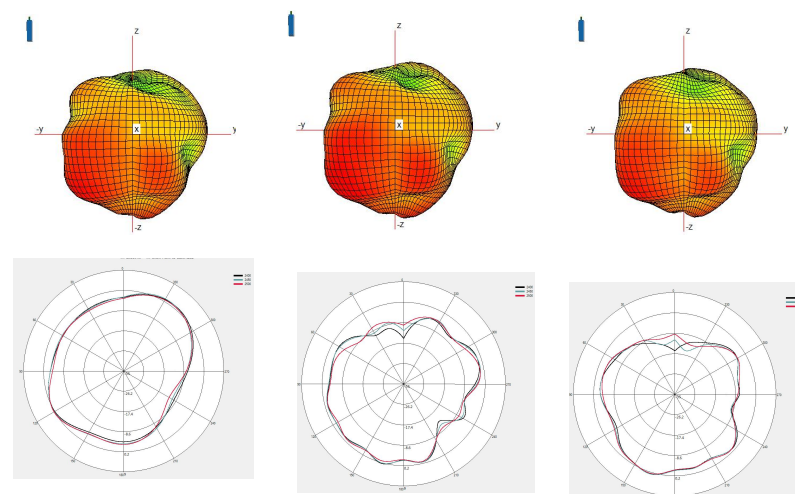
#### Return Loss Test



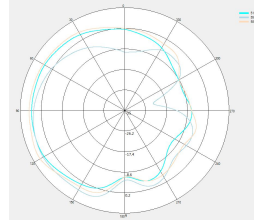
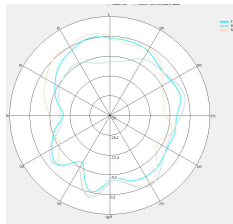
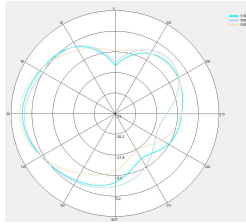
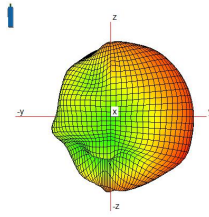
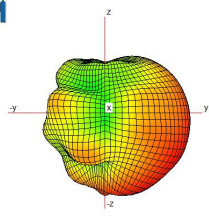
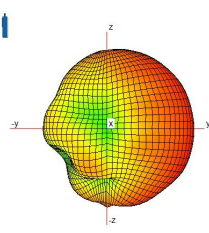
## Isolation testing



## 2.4G



5G



## 2.4G/5G-2 Antenna: 2400-2500MHz, 5150-5850MHz

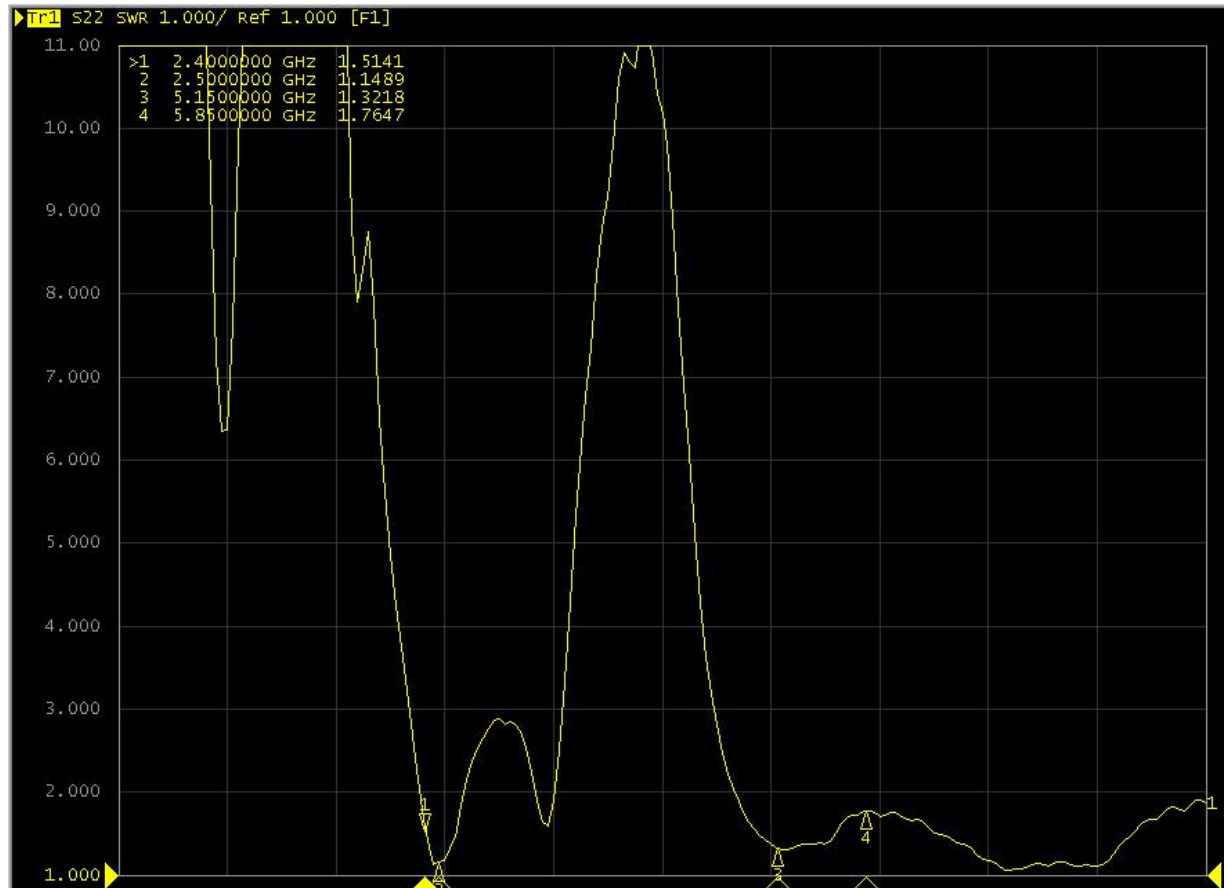
| Freq<br>(MHz) | Effi<br>(%) | Gain<br>(dBi) |
|---------------|-------------|---------------|
| 2400          | 55.30       | 4.01          |
| 2410          | 55.64       | 4.00          |
| 2420          | 53.61       | 3.91          |
| 2430          | 54.04       | 3.89          |
| 2440          | 55.74       | 4.08          |
| 2450          | 54.82       | 3.92          |
| 2460          | 53.07       | 3.85          |
| 2470          | 52.70       | 3.76          |
| 2480          | 53.53       | 3.76          |
| 2490          | 53.04       | 3.60          |
| 2500          | 52.72       | 3.52          |

| Freq<br>(MHz) | Effi<br>(%) | Gain<br>(dBi) |
|---------------|-------------|---------------|
| 5150          | 73.83       | 4.50          |
| 5160          | 72.52       | 4.43          |
| 5170          | 70.61       | 4.35          |
| 5180          | 72.16       | 4.46          |
| 5190          | 75.87       | 4.69          |
| 5200          | 75.23       | 4.65          |
| 5210          | 74.47       | 4.61          |
| 5220          | 74.79       | 4.57          |
| 5230          | 75.67       | 4.55          |
| 5240          | 75.81       | 4.53          |
| 5250          | 77.03       | 4.52          |
| 5260          | 78.31       | 4.54          |
| 5270          | 76.14       | 4.38          |
| 5280          | 72.65       | 4.17          |
| 5290          | 73.69       | 4.20          |
| 5300          | 74.79       | 4.31          |
| 5310          | 73.60       | 4.31          |
| 5320          | 75.24       | 4.50          |
| 5330          | 75.77       | 4.54          |
| 5340          | 73.53       | 4.40          |
| 5350          | 75.21       | 4.58          |
| 5360          | 78.43       | 4.74          |
| 5370          | 77.68       | 4.72          |
| 5380          | 76.48       | 4.65          |
| 5390          | 77.39       | 4.75          |

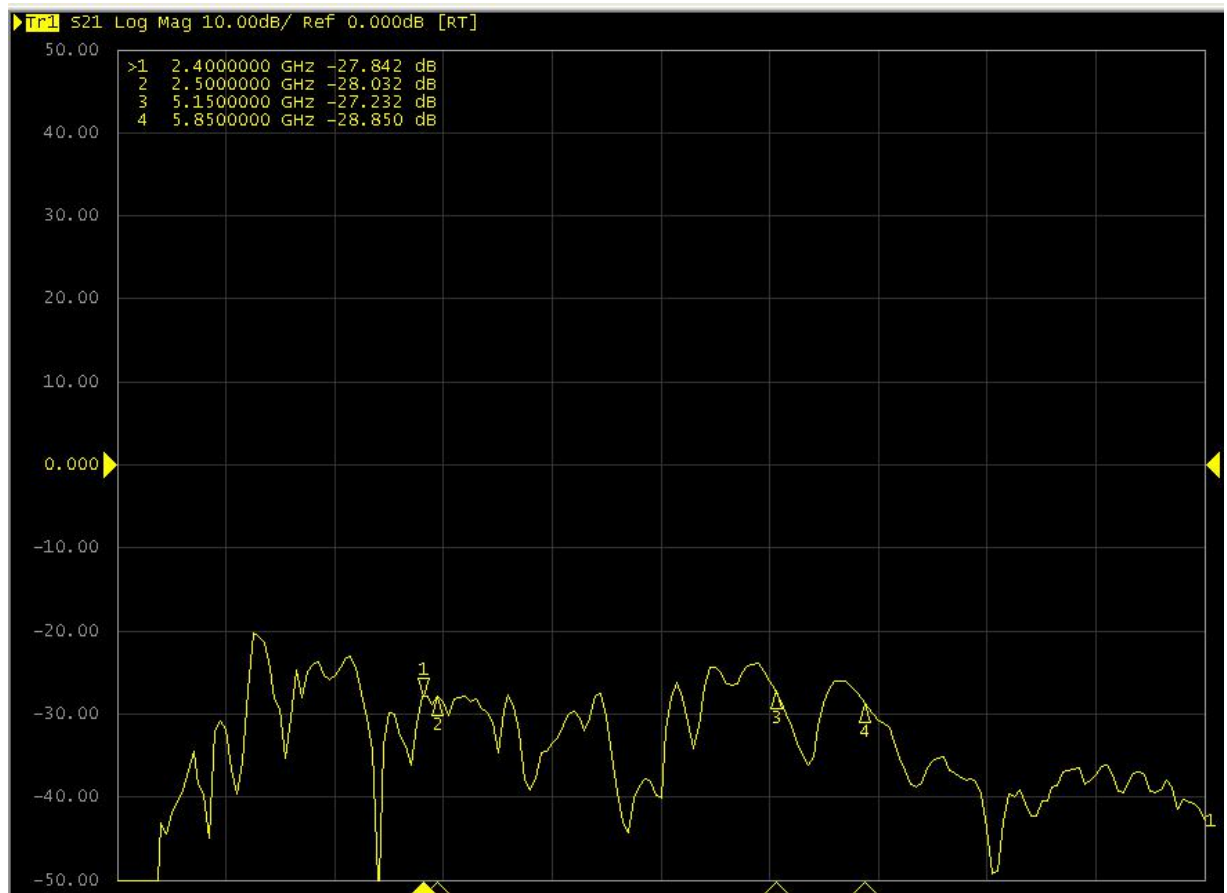
|      |       |      |
|------|-------|------|
| 5400 | 77.37 | 4.72 |
| 5410 | 77.37 | 4.84 |
| 5420 | 80.24 | 5.00 |
| 5430 | 78.51 | 5.04 |
| 5440 | 73.64 | 4.69 |
| 5450 | 72.22 | 4.68 |
| 5460 | 73.62 | 4.77 |
| 5470 | 73.99 | 4.77 |
| 5480 | 73.11 | 4.78 |
| 5490 | 68.66 | 4.51 |
| 5500 | 67.36 | 4.48 |
| 5510 | 68.90 | 4.58 |
| 5520 | 72.07 | 4.80 |
| 5530 | 75.53 | 5.03 |
| 5540 | 75.70 | 5.13 |
| 5550 | 71.74 | 4.89 |
| 5560 | 75.34 | 5.19 |
| 5570 | 80.57 | 5.47 |
| 5580 | 82.65 | 5.65 |
| 5590 | 81.56 | 5.64 |
| 5600 | 80.92 | 5.68 |
| 5610 | 80.95 | 5.63 |
| 5620 | 82.73 | 5.78 |
| 5630 | 86.73 | 5.98 |
| 5640 | 88.17 | 6.11 |
| 5650 | 81.74 | 5.78 |
| 5660 | 77.44 | 5.50 |
| 5670 | 82.70 | 5.76 |
| 5680 | 86.34 | 5.88 |
| 5690 | 83.89 | 5.76 |
| 5700 | 79.61 | 5.47 |
| 5710 | 76.56 | 5.34 |
| 5720 | 77.95 | 5.30 |
| 5730 | 79.50 | 5.43 |
| 5740 | 80.04 | 5.39 |
| 5750 | 78.46 | 5.38 |
| 5760 | 72.33 | 4.96 |
| 5770 | 72.88 | 5.02 |
| 5780 | 79.74 | 5.44 |
| 5790 | 80.13 | 5.41 |
| 5800 | 77.04 | 5.24 |
| 5810 | 77.65 | 5.31 |

|      |       |      |
|------|-------|------|
| 5820 | 80.55 | 5.51 |
| 5830 | 83.58 | 5.66 |
| 5840 | 84.33 | 5.74 |
| 5850 | 82.72 | 5.57 |

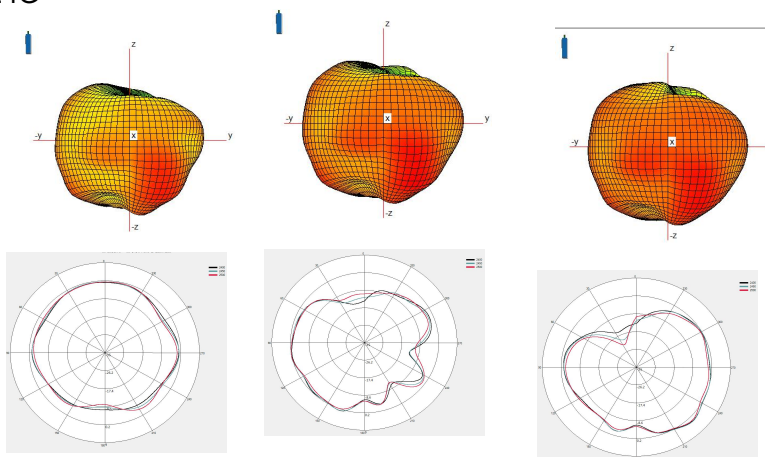
#### Return Loss Test



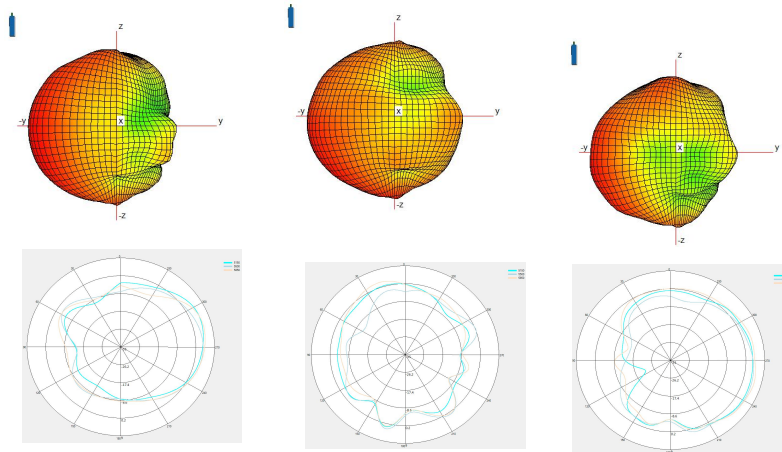
## Isolation testing



## 2.4G



5G

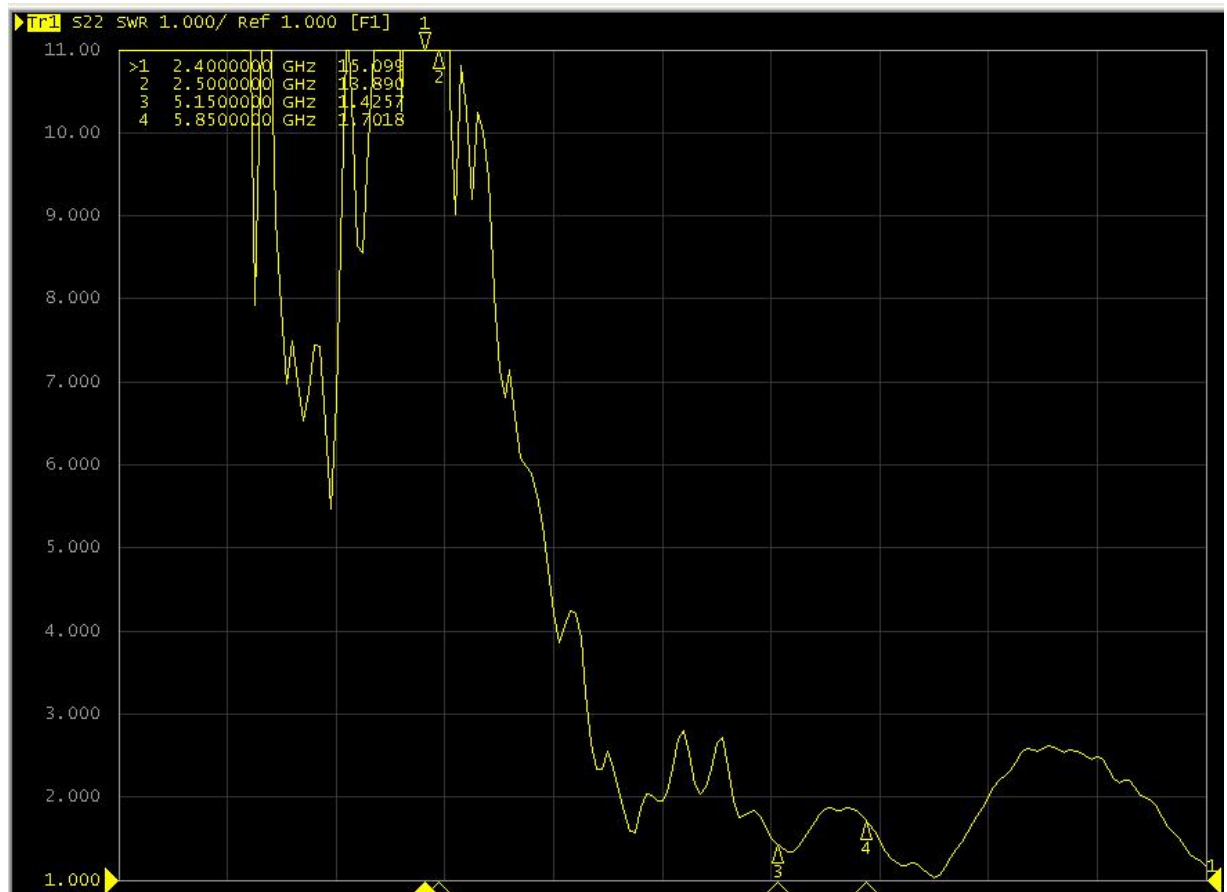


### 5G-3 Antenna: 5150-5850MHz

| Freq<br>(MHz) | Effi<br>(%%) | Gain<br>(dBi) |
|---------------|--------------|---------------|
| 5150          | 71.24        | 5.46          |
| 5160          | 69.50        | 5.38          |
| 5170          | 68.61        | 5.32          |
| 5180          | 69.82        | 5.41          |
| 5190          | 72.87        | 5.58          |
| 5200          | 72.58        | 5.63          |
| 5210          | 70.69        | 5.56          |
| 5220          | 71.60        | 5.58          |
| 5230          | 72.80        | 5.64          |
| 5240          | 71.70        | 5.58          |
| 5250          | 73.85        | 5.68          |
| 5260          | 74.74        | 5.72          |
| 5270          | 72.08        | 5.57          |
| 5280          | 69.59        | 5.33          |
| 5290          | 69.51        | 5.34          |
| 5300          | 70.17        | 5.37          |
| 5310          | 68.90        | 5.24          |
| 5320          | 69.15        | 5.30          |
| 5330          | 70.71        | 5.35          |
| 5340          | 68.90        | 5.24          |
| 5350          | 70.02        | 5.37          |
| 5360          | 74.64        | 5.64          |
| 5370          | 73.33        | 5.60          |
| 5380          | 73.41        | 5.61          |
| 5390          | 76.33        | 5.81          |
| 5400          | 75.82        | 5.80          |
| 5410          | 77.24        | 5.90          |
| 5420          | 80.83        | 6.05          |
| 5430          | 79.01        | 5.95          |
| 5440          | 76.29        | 5.78          |
| 5450          | 74.88        | 5.71          |
| 5460          | 76.43        | 5.72          |
| 5470          | 78.85        | 5.75          |
| 5480          | 77.45        | 5.71          |
| 5490          | 74.11        | 5.51          |
| 5500          | 73.48        | 5.44          |
| 5510          | 75.08        | 5.50          |
| 5520          | 79.55        | 5.72          |
| 5530          | 83.69        | 6.04          |

|      |       |      |
|------|-------|------|
| 5540 | 84.01 | 6.06 |
| 5550 | 81.16 | 5.94 |
| 5560 | 84.25 | 6.02 |
| 5570 | 90.52 | 6.35 |
| 5580 | 92.77 | 6.50 |
| 5590 | 90.33 | 6.33 |
| 5600 | 89.80 | 6.24 |
| 5610 | 89.07 | 6.06 |
| 5620 | 89.61 | 6.09 |
| 5630 | 94.57 | 6.26 |
| 5640 | 95.71 | 6.19 |
| 5650 | 89.44 | 5.81 |
| 5660 | 85.55 | 5.48 |
| 5670 | 90.43 | 5.71 |
| 5680 | 95.01 | 5.83 |
| 5690 | 91.76 | 5.56 |
| 5700 | 87.04 | 5.35 |
| 5710 | 84.44 | 5.20 |
| 5720 | 85.54 | 5.24 |
| 5730 | 87.14 | 5.22 |
| 5740 | 88.44 | 5.23 |
| 5750 | 85.97 | 5.13 |
| 5760 | 79.48 | 4.68 |
| 5770 | 79.74 | 4.67 |
| 5780 | 86.13 | 4.92 |
| 5790 | 86.09 | 4.83 |
| 5800 | 82.17 | 4.59 |
| 5810 | 82.92 | 4.50 |
| 5820 | 85.94 | 4.57 |
| 5830 | 88.29 | 4.61 |
| 5840 | 88.43 | 4.48 |
| 5850 | 85.98 | 4.39 |

Return Loss Test



## Isolation testing

