



# 承 认 书

## SPECIFICATION FOR APPROVAL

Name: PCB Antenna

Item No: Type: TYY-TX3508

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| drawing          |         |          | Customer<br>approve |
|------------------|---------|----------|---------------------|
| MADE             | CHECKED | APPROVED |                     |
| QIU              | 蒋 志 远   | 唐晓宏      |                     |
| DATE: 2023.10.19 |         |          | DATE                |

## 1、specification

The TYY-TX3508 antenna is a PCB antenna (as shown in Figure 1 below)

| The finished product features |              |                           |              |
|-------------------------------|--------------|---------------------------|--------------|
| 电 性 能 指 标                     |              | Electrical Specifications |              |
| 频率范围                          | 2400~2500MHZ | Frequency Range           | 2400~2500MHZ |
| 电压驻波比                         | $\leq 2.0$   | VSWR                      | $\leq 2.0$   |
| 增 益                           | 3.01 DBI     | GAIN                      | 3.01 DBI     |
| 输入阻抗                          | 50 $\Omega$  | Input Impedance           | 50 $\Omega$  |
| 机 械 指 标                       |              | Mechanical Specifications |              |
| 天线颜色                          | 黑色           | Antenna Color             | BLACK        |
| 类型                            | PCB          | Type                      | PCB          |
| 线长度                           | 75mm         | Cable length              | 75mm         |
| 工作温度                          | -40°C~+85°C  | Working Temperature       | -40°C~+85°C  |
| 工作湿度                          | 20~80%       | Working Humidity          | 20~80%       |

**Figure 1 TYY-TX3508 Antenna**

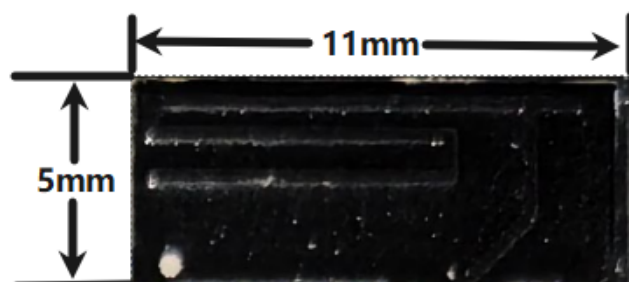
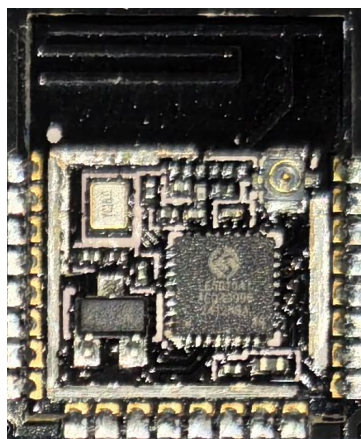


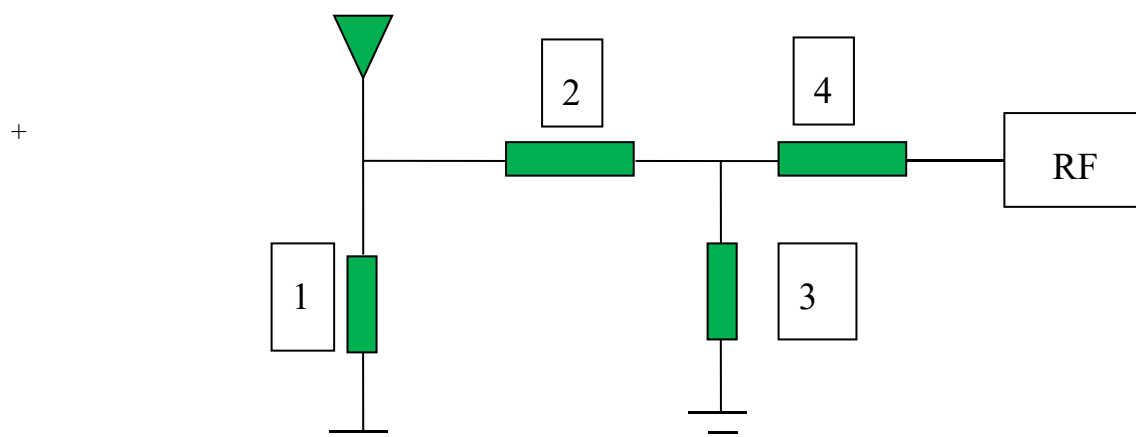
Figure 2 TYY-TX3508 Antenna



Figure 3 Assembly drawings



## 2. Appliance performance



| Component number | 1                 | 2          | 3  | 4 |
|------------------|-------------------|------------|----|---|
| WIFI BEST        | NC                | 0 $\Omega$ | NC |   |
| Original (Spare) | 50 $\Omega$ match |            |    |   |

Figure 4 OTA Microwave anechoic chamber test instrument

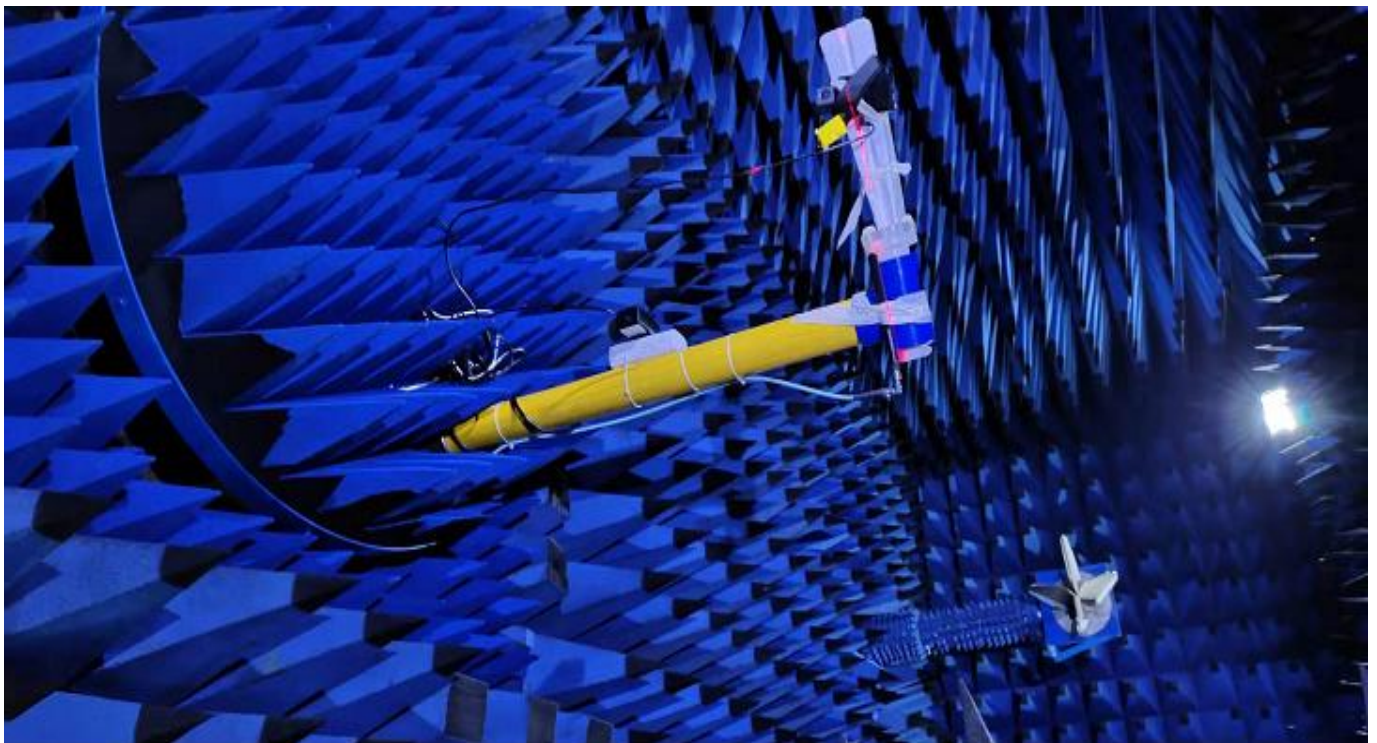
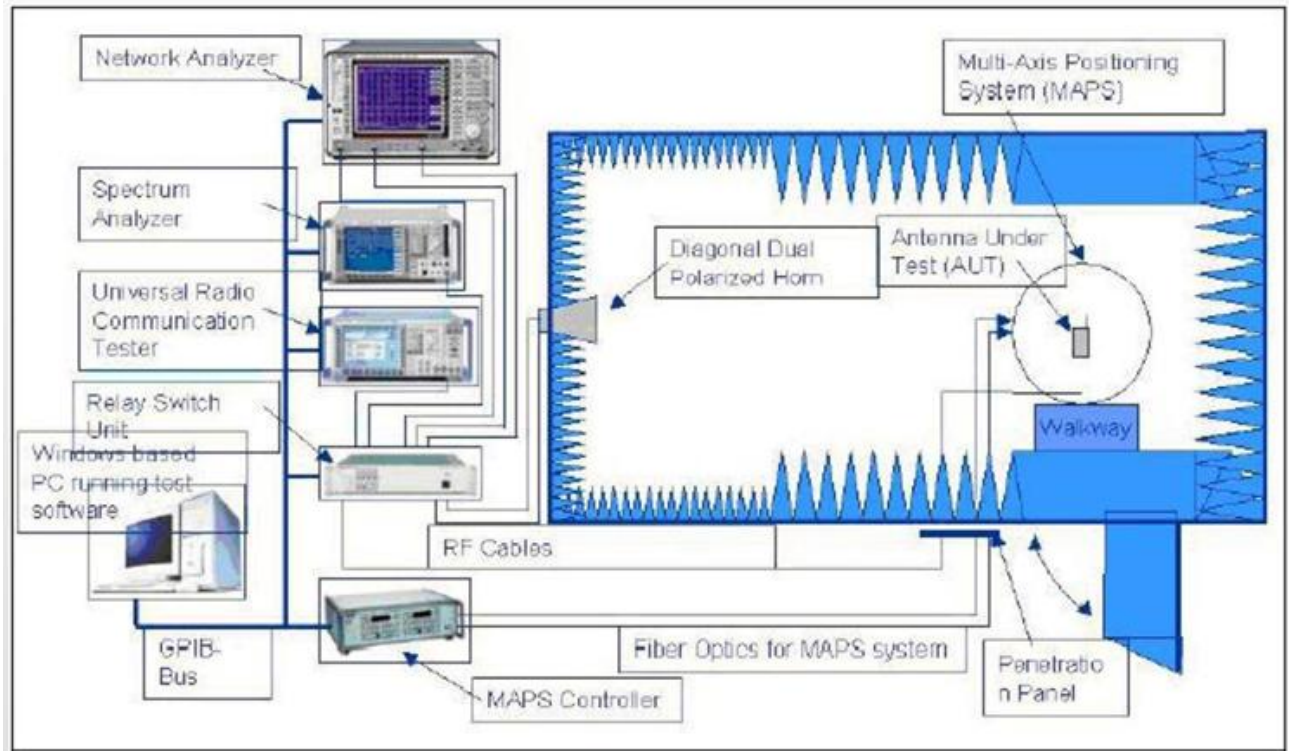


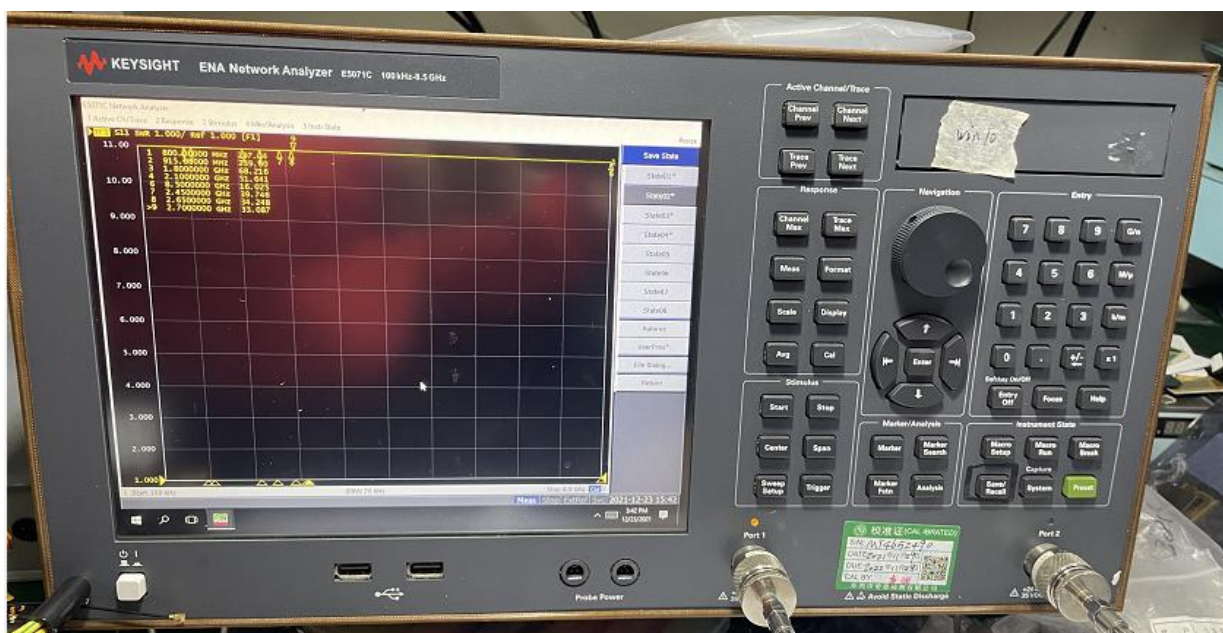
Figure 5 Test Environment: OTA743 darkroom, 8960/W500/8753ES/5071C,  
The machine is placed on the turntable 4  
meters away from the standard horn day in  
the back direction



## 2.3 VSWR

**2.3.1. Test Setup** The VSWR test fixtures are connected in sequence: Agilent E5071B Network Analyzer @50 Ohm Coaxial Cable@120mm Copper Test @ Fixture Handling: The SMA-J connector is led out of the SMA-J connector from the 50 ohm test point of the antenna on the flat panel PCB, connected to the copper tube with chokes, and then connected to other devices in turn.

Figure 6 Agilent E5071B



## WIFI VSWR

### 2.3 VSWR

**2.3.1. Test Setup VSWR** The test setup is sequentially connected to the Agilent E5071B Network Analyzer @50 ohm coaxial

Cable@120mm long Copper Test @ Fixture Handling of Test Fixture: Use a rigid cable to lead the SMA-J connector from the 50 ohm test point of the antenna on the flat panel PCB, connect it to the copper tube with the choke, and then connect the other devices in turn.

## 3 WIFI VSWR

Figure 7 WIFI VSWR



|           |      |      |      |      |      |
|-----------|------|------|------|------|------|
|           |      |      |      |      |      |
| Freq(MHz) | 2412 | 2480 | 2500 | 5700 | 5800 |
| VSWR      | 1.1  | 1.1  | 1.2  | 1.6  | 2.0  |

## 3、3D dynamic testing of the whole machine

### 3.1 The site of the test

TCT Microwave anechoic chamber: The test frequency range is 600MHz-6GHz, the quiet area range is 50cm circumference, and the reflectivity is less than -90 dB.

(Figure 4, Figure 5)

### 3.2 Environmental Treatment

Environmental Treatment: No Environmental Treatment.

Figure 8 2/3/4 LTE Return loss

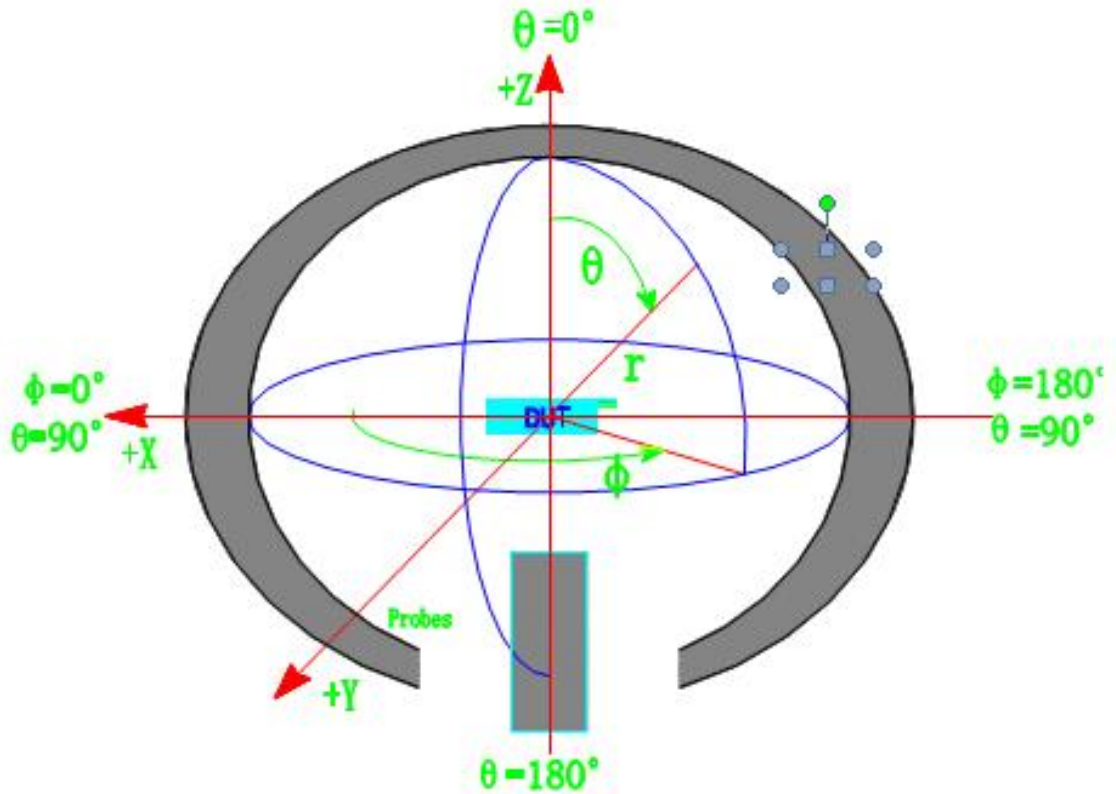


Figure 9 WIFI Passive Test Report (Efficiency & Gain)

| FEITUKEJI                  |        |        |        |        |        |        |        |        |        |        |        |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Frequency ID               | 1      | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 11     |
| Frequency (MHz)            | 2400.0 | 2410.0 | 2420.0 | 2430.0 | 2440.0 | 2450.0 | 2460.0 | 2470.0 | 2480.0 | 2490.0 | 2500.0 |
| Efficiency (dBi)           | -1.72  | -1.68  | -1.52  | -1.25  | -1.06  | -0.83  | -0.61  | -0.47  | -0.64  | -0.87  | -1.04  |
| Gain (dBi)                 | 2.04   | 2.10   | 2.26   | 2.72   | 2.68   | 2.94   | 3.01   | 2.88   | 2.20   | 1.68   | 1.56   |
| Efficiency (%)             | 67.32  | 67.94  | 70.50  | 75.01  | 78.27  | 82.59  | 86.95  | 89.83  | 86.21  | 81.78  | 78.67  |
| Directivity (dB)           | 3.76   | 3.78   | 3.78   | 3.97   | 3.75   | 3.77   | 3.62   | 3.34   | 2.85   | 2.55   | 2.60   |
| Peak Gain Position (Theta) | 83.00  | 82.00  | 83.00  | 85.00  | 88.00  | 92.00  | 88.00  | 93.00  | 97.00  | 73.00  | 75.00  |
| Peak Gain Position (Phi)   | 30.00  | 30.00  | 30.00  | 360.00 | 360.00 | 360.00 | 360.00 | 360.00 | 360.00 | 360.00 | 360.00 |
| Efficiency ThetaPol (%)    | 65.57  | 66.34  | 69.10  | 73.67  | 76.99  | 81.33  | 85.58  | 88.35  | 84.69  | 80.22  | 77.04  |
| Efficiency PhiPol (%)      | 1.75   | 1.60   | 1.40   | 1.35   | 1.28   | 1.26   | 1.37   | 1.49   | 1.51   | 1.57   | 1.63   |
| Upper Hem. Efficiency (%)  | 41.71  | 41.72  | 42.46  | 44.27  | 45.34  | 47.06  | 48.83  | 50.02  | 47.88  | 45.34  | 43.58  |
| Lower Hem. Efficiency (%)  | 25.61  | 26.22  | 28.05  | 30.74  | 32.93  | 35.53  | 38.13  | 39.81  | 38.33  | 36.45  | 35.08  |

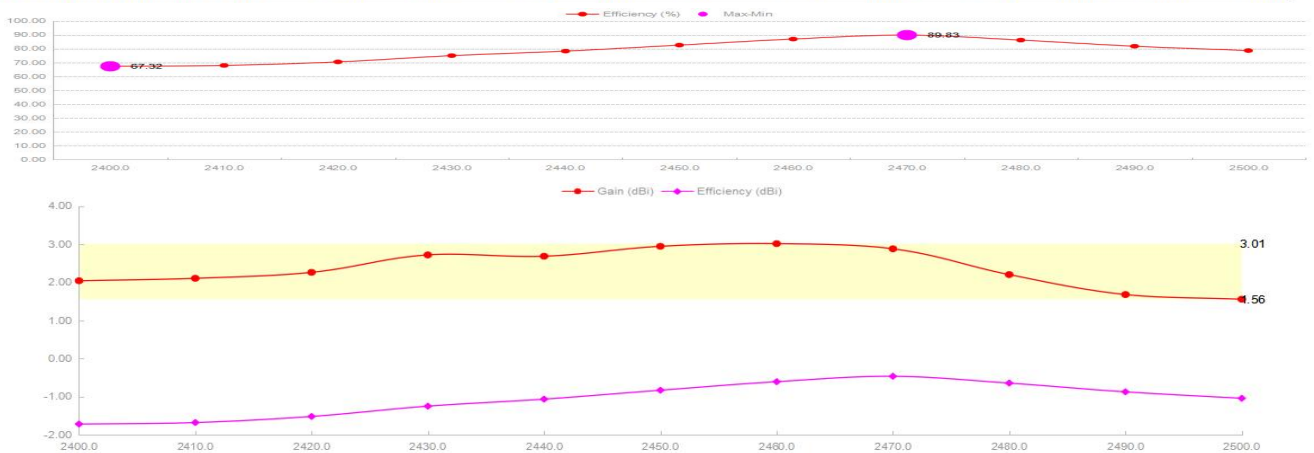
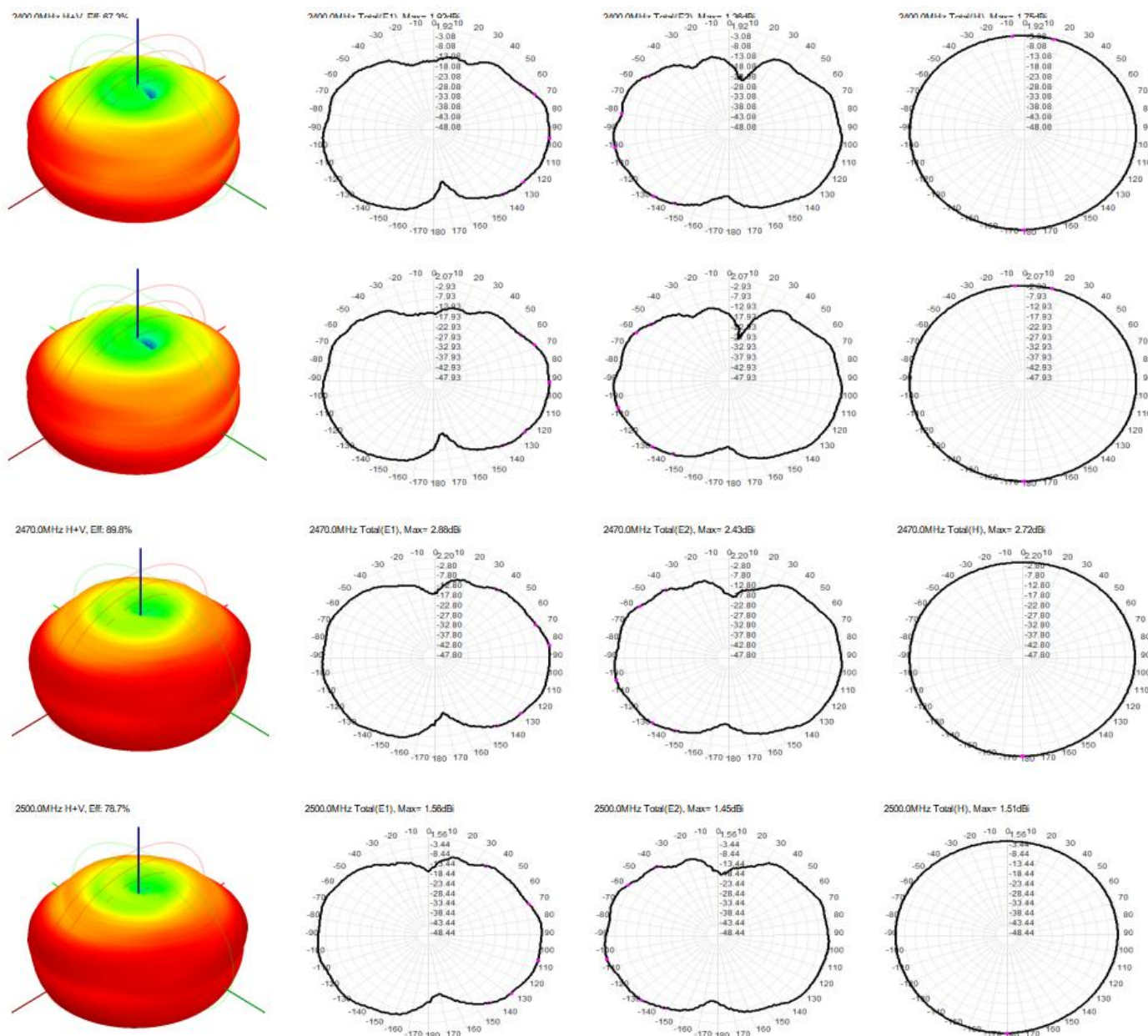


Figure 10 Three-dimensional renderings



## 5、Recommendations & Conclusions

This report is based on the final version of the model project of Shenzhen Lesongge Technology Co., Ltd. to provide the measured antenna electrical performance. As can be seen from the above test data, this antenna provides good electrical performance. Shenzhen Tianyiyuan Electronic Technology Co., Ltd. R&D looks forward to your confirmation, thank you for your cooperation!