

## SPECIFICATION



深圳市大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.

志丰 WAVE FLEX3 (KS658) 右耳蓝牙天线Kingstate WAVE FLEX3 (KS658) Right ear Bluetooth Antenna

## 产 品 规 格 书

## Product Specification

|                                 |                    |                            |                     |
|---------------------------------|--------------------|----------------------------|---------------------|
| 客 户<br>connection               | 志丰<br>Kingstate    | 频 段<br>frequency range     | 2400~2480MHz        |
| 项目名称<br>entry name              | WAVE_FLEX3(KS658)  | 版 本<br>edition             | R12                 |
| 物料编号<br>Material No             | 2F-LEX3-007        | 颜 色<br>Color               | 黄色<br>Yellow        |
| 客户料号<br>Customer Item<br>Number |                    |                            |                     |
| R F 设计<br>R F Design            | 刘 啸<br>Xiao.Liu    | 结构设计<br>Structural Design  | 周锐斌<br>Rui Bin Zhou |
| 品质经理<br>Quality Manager         | 李高亮<br>GaoLiang.Li | 技术总监<br>Technical Director | 张 磊<br>Lei Zhang    |
| 日 期<br>Date                     | 2026-05-21         |                            |                     |

客户确认:

Customer confirmation:

装配是否符合贵司要求: ☐OK ☐NGWhether the assembly meets your company's requirements: ☐OK ☐NG

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Shenzhen Daxian Technology Co., Ltd.

深圳市龙岗区布吉镇吉华路 513 号上水径村(国防培训基地  
对面) 达成工业园综合楼 7 楼  
TEL:0755-28576002  
FAX:0755-84276383

Buji Town, Longgang District, Shenzhen, China Jihua Road 513,  
Shangshuijing Village (opposite the national defense  
training base) Dacheng Industrial Park, Building 7.  
TEL:0755-28576002  
FAX:0755-84276383

## 变更履历

## Revision history

[illegible]

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## 一 项目说明 Project Description

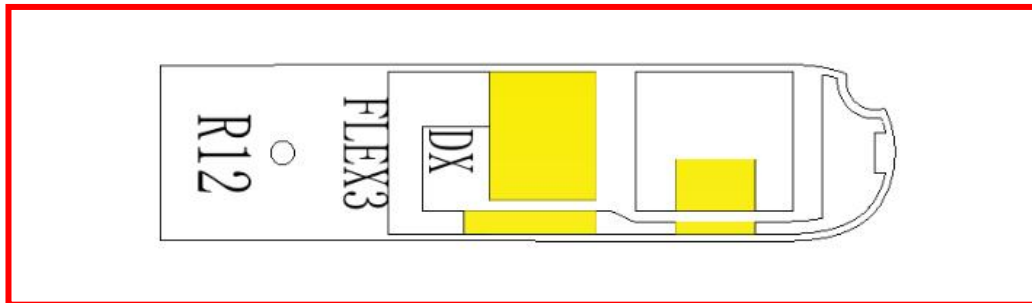
|                                           |                             |
|-------------------------------------------|-----------------------------|
| 客 户 名:<br><b>Customer Name:</b>           | 志丰<br><b>Kingstate</b>      |
| 整机类型:<br><b>Type of complete machine:</b> | 蓝牙天线<br>Bluetooth antenna   |
| 天线频段:<br><b>Antenna band:</b>             | 2400 ~ 2480MHz              |
| 天线形式:<br><b>Antenna form:</b>             | PIFA 天线<br>PIFA antenna     |
| 天线极性:<br><b>Antenna polarity:</b>         | 线性极化<br>Linear polarization |

## 二 BT 天线组件 Antenna assembly

### 1 规格 specifications

本报告主要提供 **WAVE FLEX3(KS658)** 项目天线的各项电气和结构性能参数的测试状况。下图为大显设计的天线图片。

This report mainly provides the testing status of various electrical and structural performance parameters of the antenna for the **WAVE FLEX3(KS658)** project. The following image shows an antenna with a large display design.



天线外观图

antenna appearing diagram

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## 1.1 电气规格标准 Electrical specifications and standards

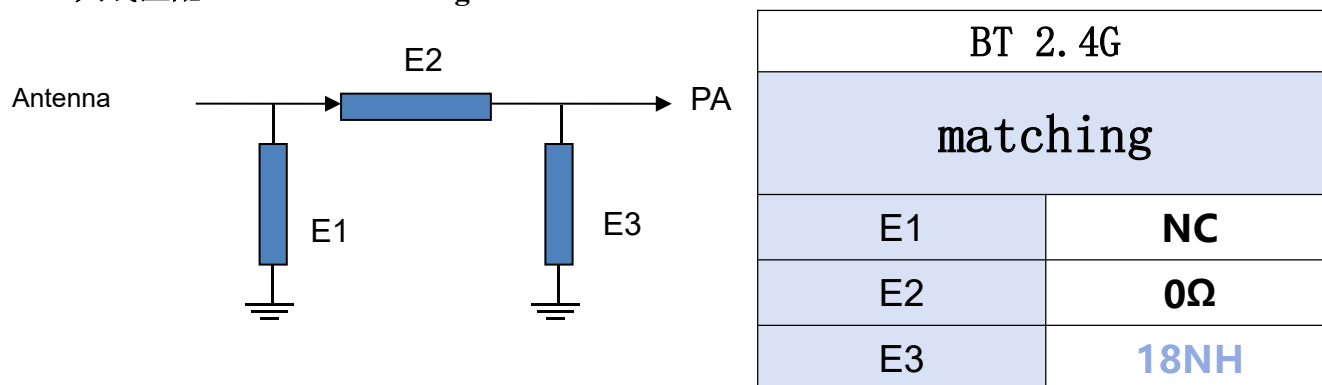
### 1.1.1 电性能指标 Electrical performance index

天线工作频段在 2400 ~ 24800 MHz。下表是大显设计和量产天线的电性能指标。

The operating frequency band of the antenna is between 2400 and 2500 MHz. The following table shows the electrical performance indicators of large display design and mass production antennas.

| Frequency Range | Frequency (MHz) | VSWR     |
|-----------------|-----------------|----------|
| BT              | 2400 ~2480      | $\leq 2$ |

### 1.1.2 天线匹配 Antenna matching



## 2 结构规格标准 Structural specifications and standards

### 1.2.1 天线组成 Antenna composition

天线主要是由 FPC 组成。

The antenna is mainly composed of FPC .

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## 2、测试设备 The Equipment of Active Test

Satimo 3D Chamber  $4 \times 4 \times 4$  ( m )

CMW500 E5071C

Network analyzer-R&S ZVL

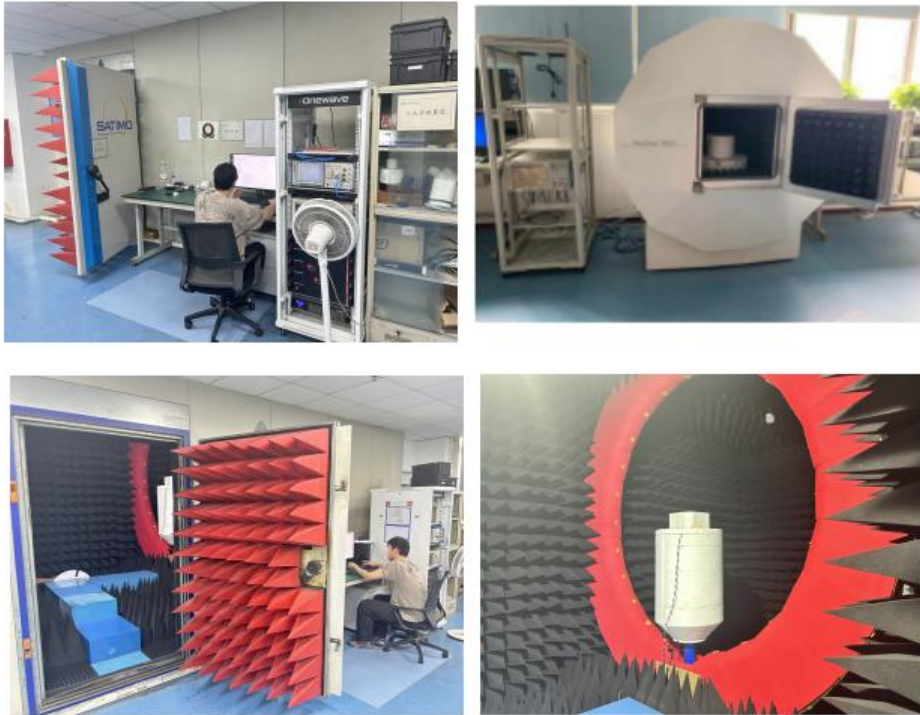


图 2

Figure 2

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### 3 测试 test

#### 3.1 驻波(VSWR)的测试 Test of standing wave (VSWR)

##### 3.1.1 测试连接: VSWR 测试装置依次连接为: R&S ZVL 网络分析仪 → 测试线 → 测试治

Test connection: The VSWR test device is sequentially connected as follows: R&S ZVL network analyzer → test line → test fixture

##### 实测(附图)Actual measurement (attached drawing)

#### 3.2 增益及效率、功率 (TRP)、灵敏度 (TIS) 的测试

##### Gain and efficiency, power (TRP), sensitivity (TIS) testing

##### 3.2.1 测试的场地 Test site:

大显微波暗室。测试频率范围为 400MHz—6GHz, 静区范围为 50cm 圆周, 反射率小于 -50 dB。

Large display microwave anechoic chamber. The test frequency range is 400MHz - 6GHz, the static zone range is 50cm circumferential, and the reflectivity is less than - 50dB.

##### 3.2.2 测试的仪表 Tested Instruments:

R&S ZVL 网络分析仪、CMW500 E5071C、标准喇叭天线、法国 SATIMO-SG24SYSTEM 系统、打印机等。

R&S ZVL network analyzer, Agilent 8960 E5515C, standard horn antenna, French SATIMO-SG24SYSTEM system, printer, etc.

##### 3.2.3 测试数据: 在微波暗室中, 测试的功率和灵敏度相关的数值如下表

Test data: In a microwave anechoic chamber, the values related to the power and sensitivity tested are shown in the table below

##### OTA 有源测试数据 OTA Active Test Data:

##### 不可拆 (前腔不带螺丝) Non-detachable (front chamber has no screws)

| R (右耳) 自由空间<br>R-side - free space |    |           |           |
|------------------------------------|----|-----------|-----------|
| BAND                               | CH | TRP (dBm) | TIS (dBm) |
| BT                                 | 0  | 6.16      | -86.15    |
|                                    | 39 | 7.09      | -86.64    |
|                                    | 78 | 6.02      | -86.29    |

| R (右耳) 头模状态<br>R-side-head mold |    |           |           |
|---------------------------------|----|-----------|-----------|
| BAND                            | CH | TRP (dBm) | TIS (dBm) |
| BT                              | 0  | 0.28      | -78.59    |
|                                 | 39 | 0.86      | -79.54    |
|                                 | 78 | -0.62     | -80.9     |

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## 可拆状态（前腔带螺丝） Dismantled state (front chamber with screws)

| R（右耳）自由空间<br>R-side - free space |      |           |           |
|----------------------------------|------|-----------|-----------|
| BAND                             | CH   | TRP (dBm) | TIS (dBm) |
| BT                               | 4.06 | -83.51    | 4.06      |
|                                  | 5.36 | -84.66    | 5.36      |
|                                  | 4.97 | -85.27    | 4.97      |

| R（右耳）头模状态<br>R-side-head mold |    |           |           |
|-------------------------------|----|-----------|-----------|
| BAND                          | CH | TRP (dBm) | TIS (dBm) |
| BT                            | 0  | 0.44      | -78.54    |
|                               | 39 | 1.34      | -80.1     |
|                               | 78 | 0.05      | -81.19    |

## 无源效率&amp;增益 Passive efficiency&amp;gain:

自由空间 Free space

| Frequency(MHz) | Gain(dBi) | Efficiency(dB) | Efficiency(%) |
|----------------|-----------|----------------|---------------|
| 2400           | -5.04     | -7.17          | 19.17         |
| 2410           | -4.88     | -7.13          | 19.38         |
| 2420           | -4.73     | -7.09          | 19.54         |
| 2430           | -4.81     | -7.02          | 19.86         |
| 2440           | -4.51     | -6.95          | 20.18         |
| 2450           | -4.37     | -6.91          | 20.39         |
| 2460           | -4.03     | -6.87          | 20.58         |
| 2470           | -3.78     | -6.84          | 20.71         |
| 2480           | -3.58     | -6.79          | 20.94         |

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头模状态 Head mold

| Frequency(MHz) | Gain(dBi) | Efficiency(dB) | Efficiency(%) |
|----------------|-----------|----------------|---------------|
| 2400           | -7.32     | -12.55         | 5.56          |
| 2410           | -7.15     | -12.33         | 5.85          |
| 2420           | -6.97     | -12.29         | 5.9           |
| 2430           | -6.83     | -12.18         | 6.05          |
| 2440           | -6.65     | -12.06         | 6.22          |
| 2450           | -6.78     | -11.84         | 6.55          |
| 2460           | -6.93     | -12            | 6.31          |
| 2470           | -6.99     | -12.17         | 6.07          |
| 2480           | -7.21     | -12.23         | 5.98          |

#### 4、VSWR 参数图 VSWR parameter diagram

自由空间 Free space

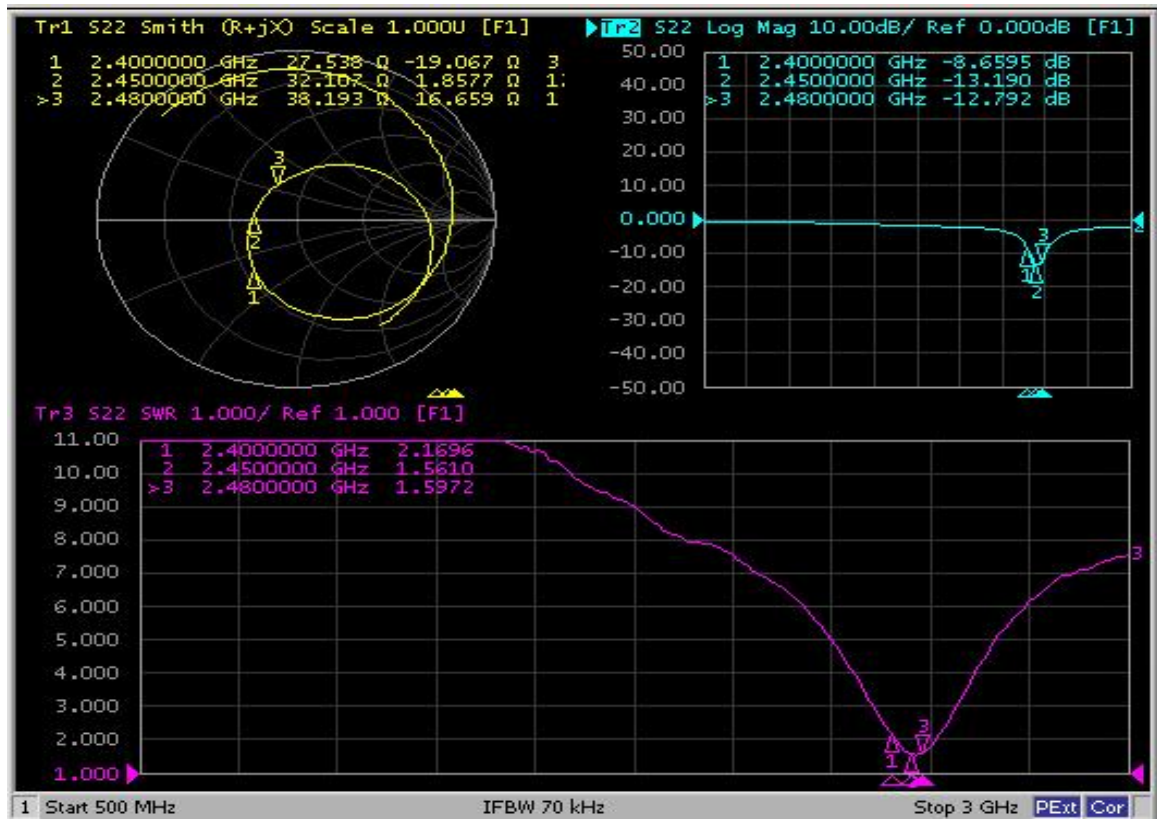


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头模状态 Head mold

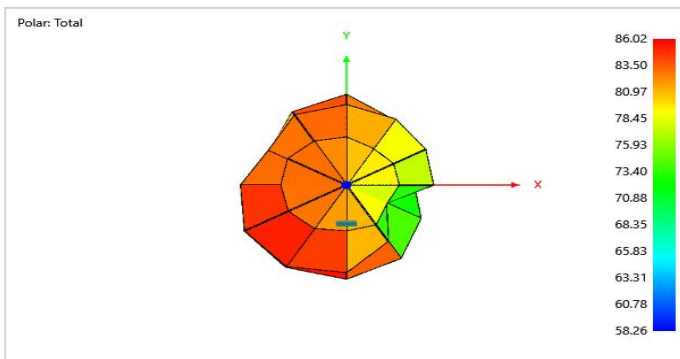
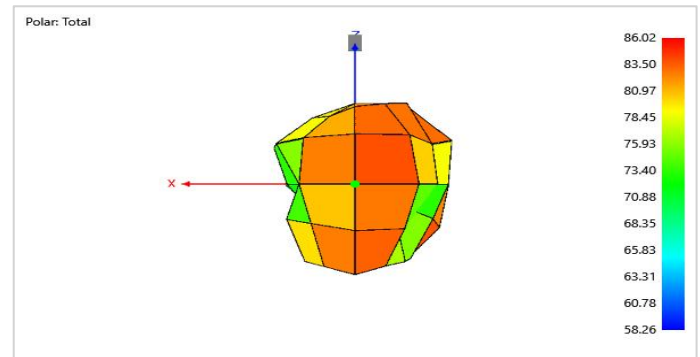
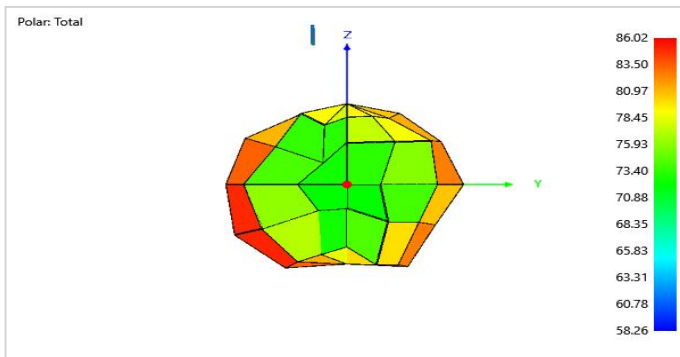
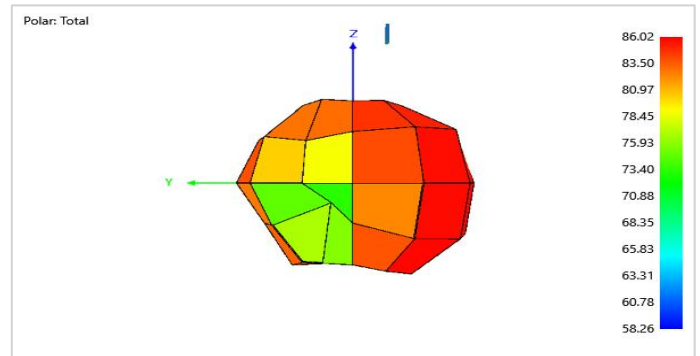
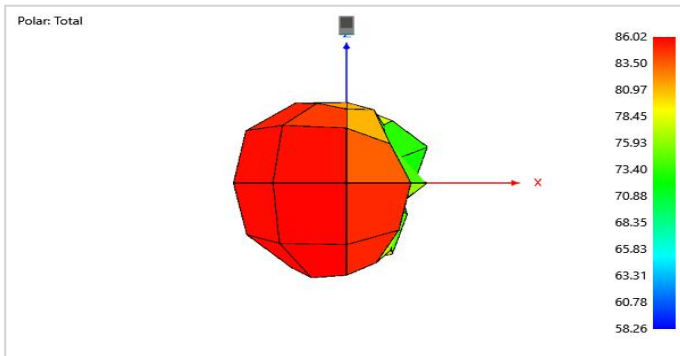
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## 5、OTA 场型图 OTA pattern diagram

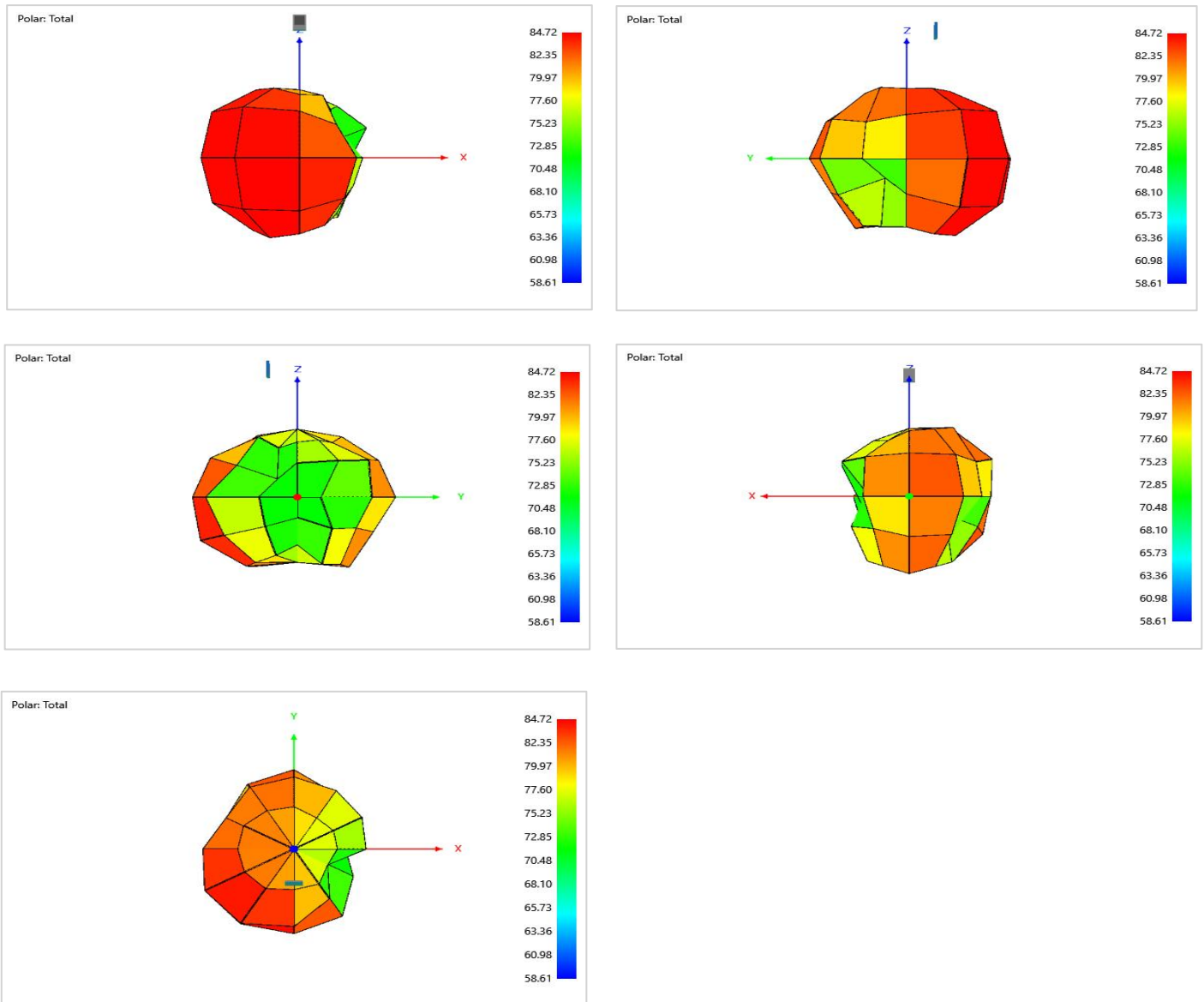
### 不可拆头模状态 3D 图



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## 可拆头模状态 3D 图 3D diagram of the detachable head model



## 6、结论 conclusion

此天线是在客户提供样机基础上设计，电参数和结构性能已达到技术要求，请确认！

This antenna is designed based on the prototype provided by the customer. The electrical parameters and structural performance have met the technical requirements, please confirm!

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