

## SPECIFICATION



深圳市大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.

晶讯 MH028 右耳蓝牙天线

Jing Xun MH028 Right Antenna

产 品 规 格 书

Product Specification

|                                 |                 |                            |                    |
|---------------------------------|-----------------|----------------------------|--------------------|
| 客 户<br>connection               | 晶讯<br>Jing Xun  | 频 段<br>frequency range     | 2402 ~ 2480MHz     |
| 项目名称<br>entry name              | MH028           | 版 本<br>edition             | V09                |
| 物料编号<br>Material No             | 2M-H028X-063-1  | 颜 色<br>Color               | 白色<br>White        |
| 客户料号<br>Customer Item<br>Number | 20. 10. 0052    |                            |                    |
| R F 设计<br>R F Design            | 靳 群<br>Jin.Qun  | 结构设计<br>Structural Design  | 周锐斌<br>RuiBin Zhou |
| 品质经理<br>Quality Manager         | 杨 进<br>Jin.Yang | 技术总监<br>Technical Director | 张 磊<br>Lei Zhang   |
| 日 期<br>Date                     | 2023-12-19      |                            |                    |

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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## 一 项目说明 Project Description

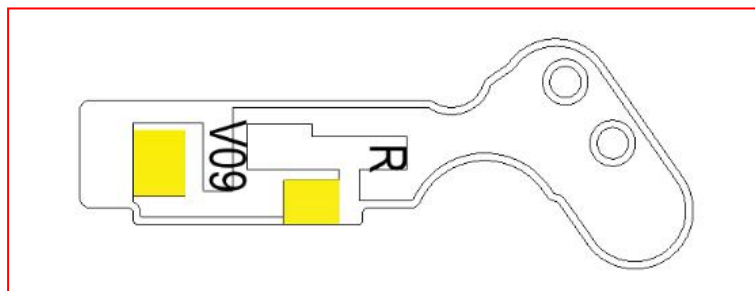
|                                    |                                                    |
|------------------------------------|----------------------------------------------------|
| 客户名:<br>Customer Name:             | 晶讯<br>Jing Xun                                     |
| 整机类型:<br>Type of complete machine: | 蓝牙天线<br>Bluetooth antenna                          |
| 天线频段:<br>Antenna band:             | 2402 ~ 2480MHz                                     |
| 天线形式:<br>Antenna form:             | FPC 天线<br>FPC antenna                              |
| 天线极性:<br>Antenna polarity:         | 线性极化<br>Linear polarization                        |
| 硬件版本:<br>Hardware version:         | 主板: 右耳<br>Motherboard: Right ear                   |
| 天线制造商:<br>Antennamanufacturer:     | 深圳市大显科技有限公司<br>Shenzhen daxian technology co., ltd |
| 测试实验室:<br>Testing laboratory:      | SATIMO 微波实验室<br>SATIMO microwave laboratory        |

## 二 B T 天线组件 Antenna assembly

### 1 规格 specifications

本报告主要提供 MH028 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 MH028 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

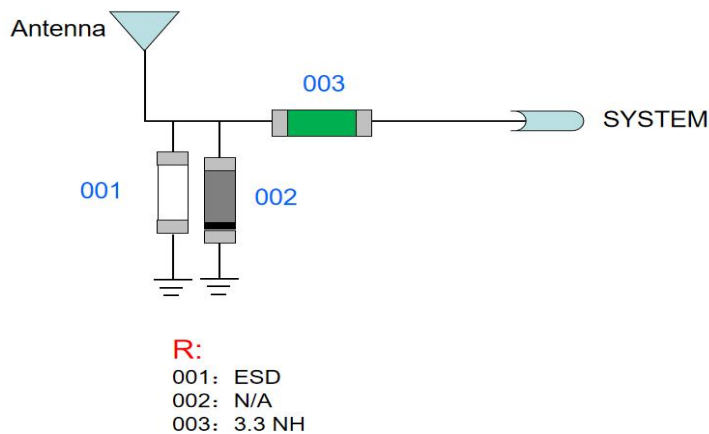
### 1.1.1 电性能指标 Electrical performance index

天线工作频段在 2402~2480 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 2402 and 2480MHz. The following table shows the electrical performance indicators of large display design and mass production antennas.

| Frequency Range | Frequency (MHz) | VSWR     |
|-----------------|-----------------|----------|
| BT              | 2402 ~ 2480     | $\leq 2$ |

### 1.1.2 匹配电路图 Match the circuit diagram



## 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 sponge.

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

Satimo 3D Chamber  $6 \times 4 \times 4$  ( m )

Agilent 8960 E5515c

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 测试装置依次的连接为: 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、Agilent8960 E5515C、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 bel

##### OTA 有源测试 OTA Active Test:

| 自由空间              |      |      |      |        |        |        |
|-------------------|------|------|------|--------|--------|--------|
| MAC:              | TRP  |      |      | TIS    |        |        |
|                   | 0    | 39   | 78   | 0      | 39     | 78     |
| 2C:BE:EB:9F:56:C3 | 8.83 | 9.61 | 9.87 | -90.51 | -91.47 | -90.68 |

| 头模状态              |      |      |      |        |        |        |
|-------------------|------|------|------|--------|--------|--------|
| MAC:              | TRP  |      |      | TIS    |        |        |
|                   | 0    | 39   | 78   | 0      | 39     | 78     |
| 2C:BE:EB:9F:56:C3 | 3.75 | 4.71 | 5.28 | -84.84 | -85.17 | -85.34 |

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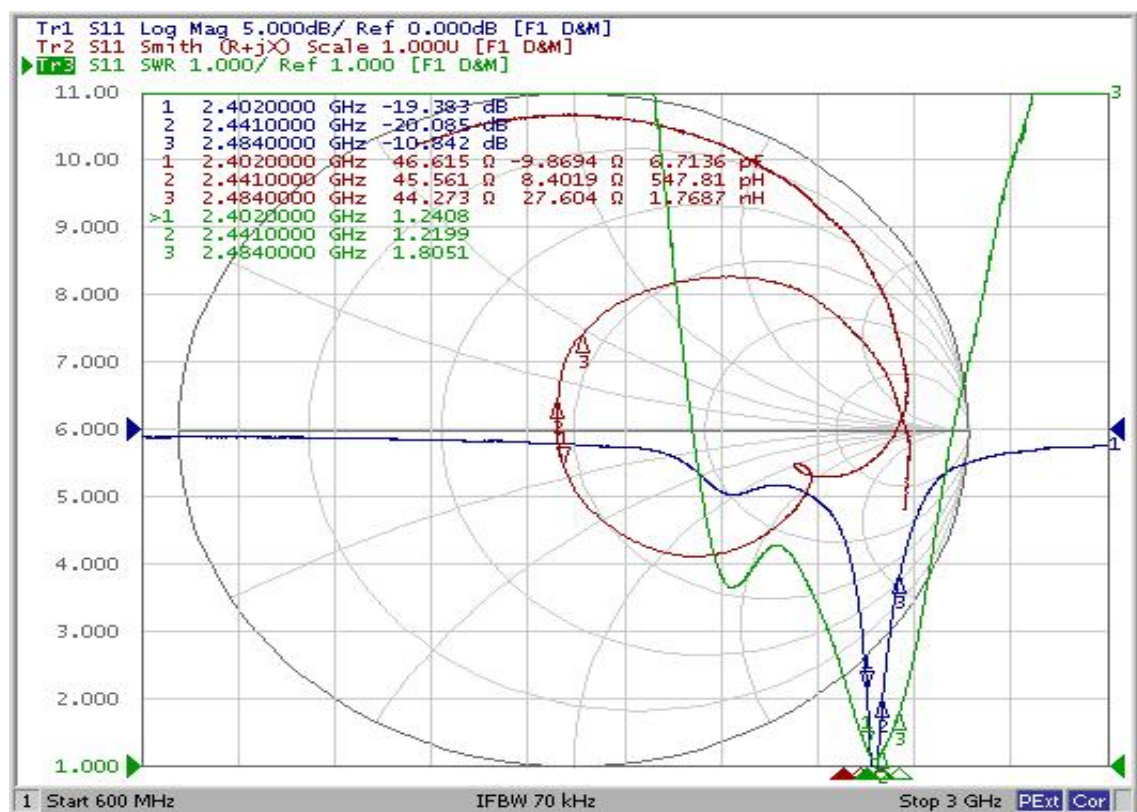
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## 无源效率&amp;增益 Passive efficiency&amp;gain:

| 频率 (MHZ)        | 效率 (%)         | 平均增益 (dB)     | 增益 (dBi)   |
|-----------------|----------------|---------------|------------|
| Frequency (MHz) | Efficiency (%) | AVG Gain (dB) | Gain (dBi) |
| 2400            | 30.90%         | -5.10         | -0.23      |
| 2410            | 29.55%         | -5.29         | -0.36      |
| 2420            | 28.84%         | -5.40         | -0.51      |
| 2430            | 27.16%         | -5.66         | -0.67      |
| 2440            | 27.39%         | -5.62         | -0.32      |
| 2450            | 25.68%         | -5.90         | -0.23      |
| 2460            | 25.39%         | -5.95         | -0.19      |
| 2470            | 26.17%         | -5.82         | -0.18      |
| 2480            | 25.19%         | -5.99         | -0.09      |
| AVG             | 27.36%         | -5.64         | -0.31      |

## 4、VSWR 参数图 VSWR parameter diagram

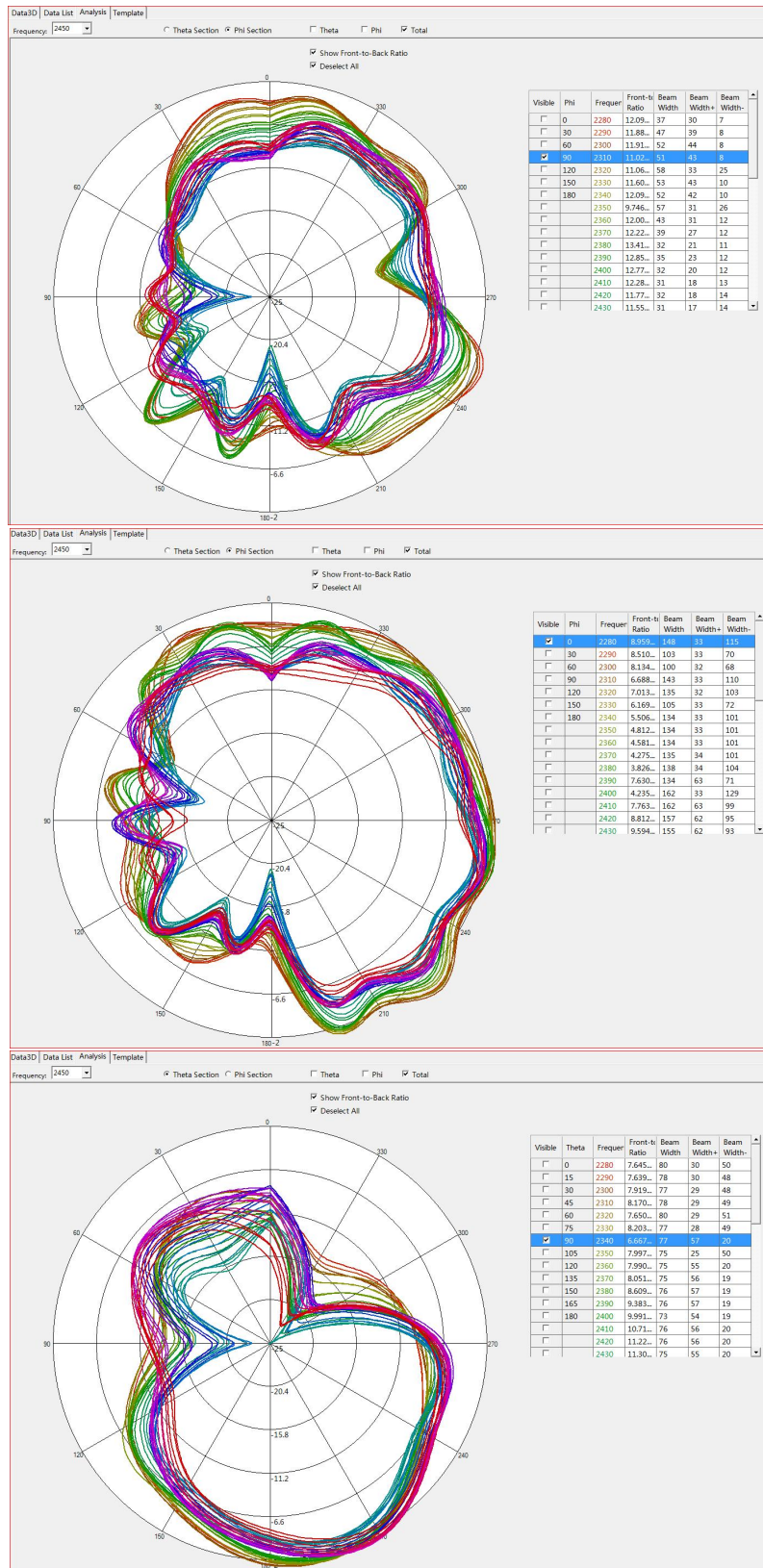


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## 5、无源场型图 Passive Field Pattern Diagram



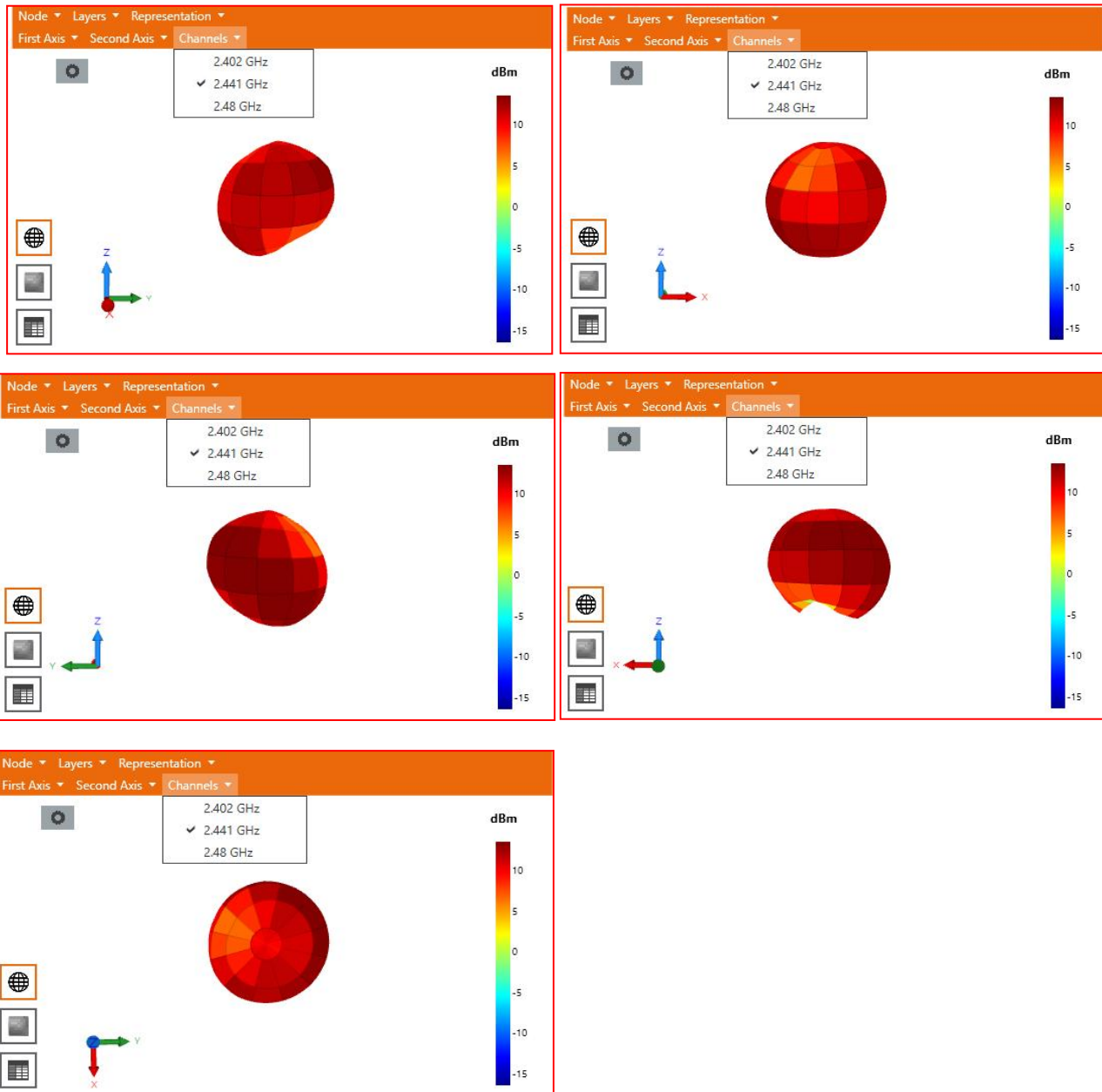
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## 6、有源场型图 Active field pattern diagram

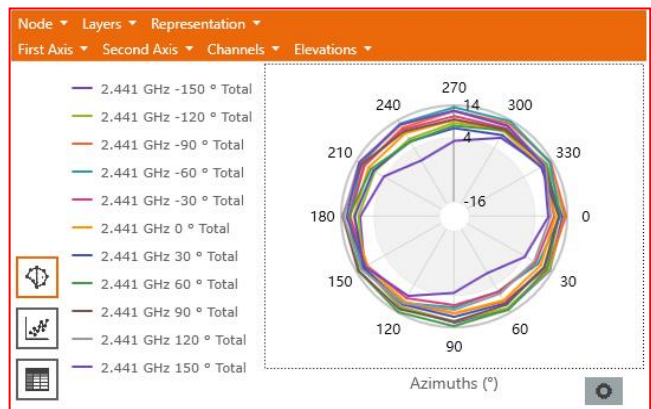
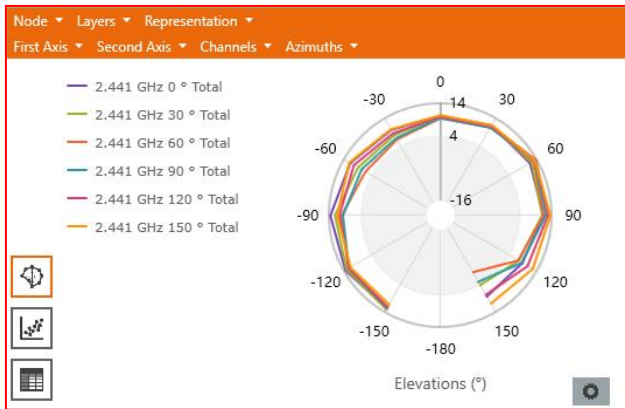
R 边--自由空间状态 R-edge-free space state:

TRP:

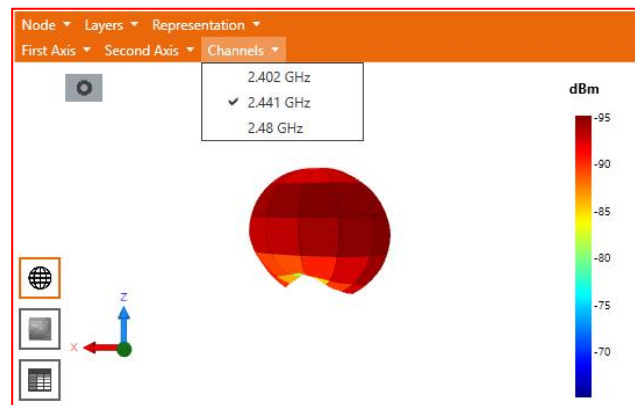
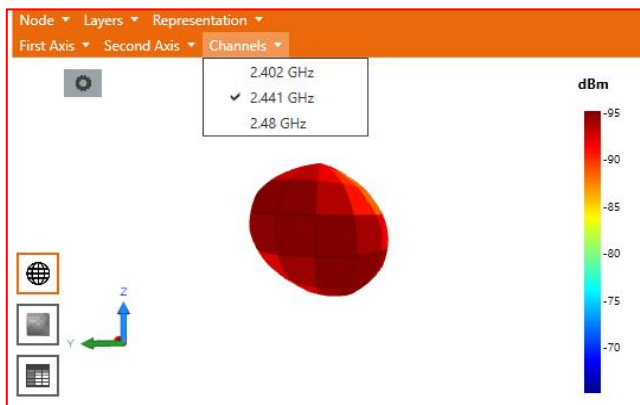
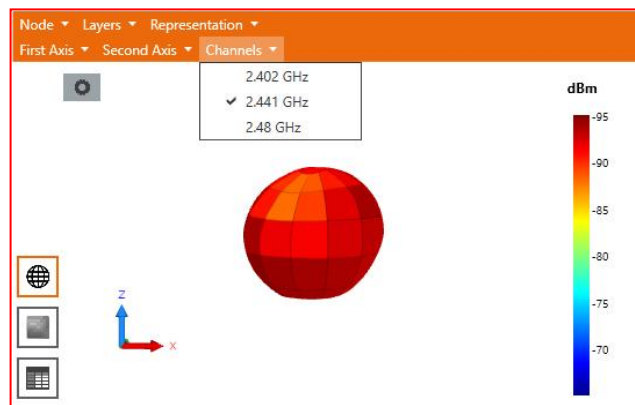
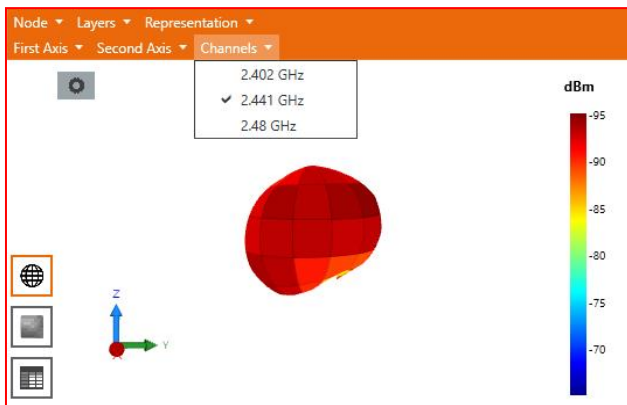


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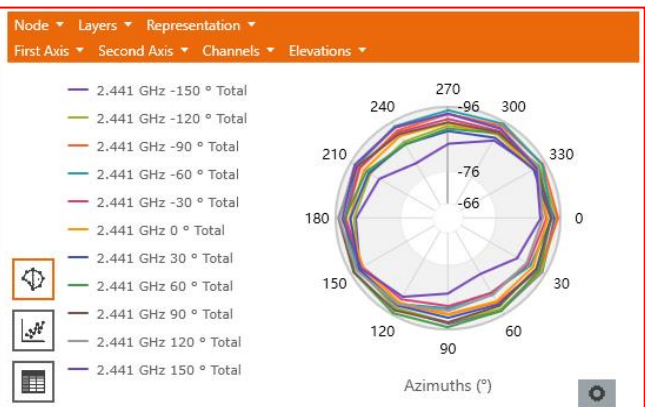
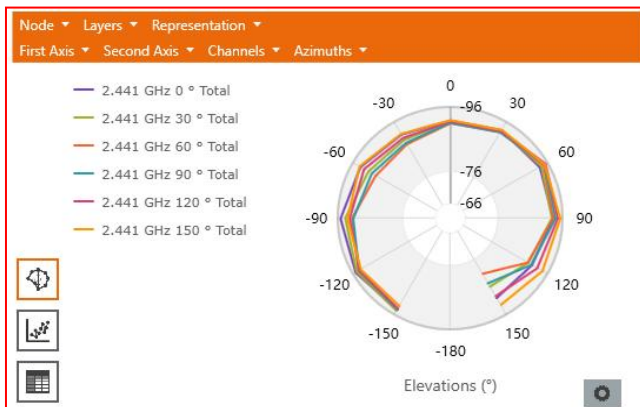
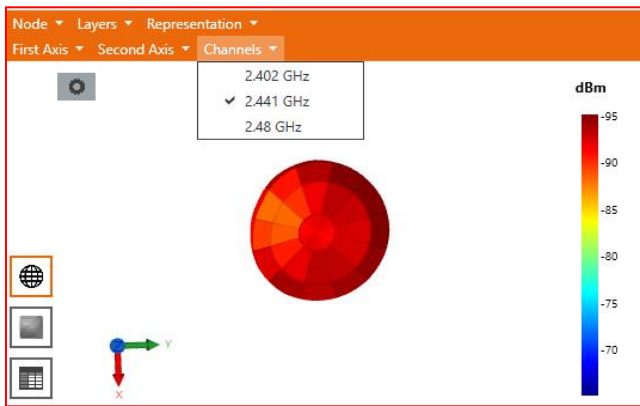


TIS:



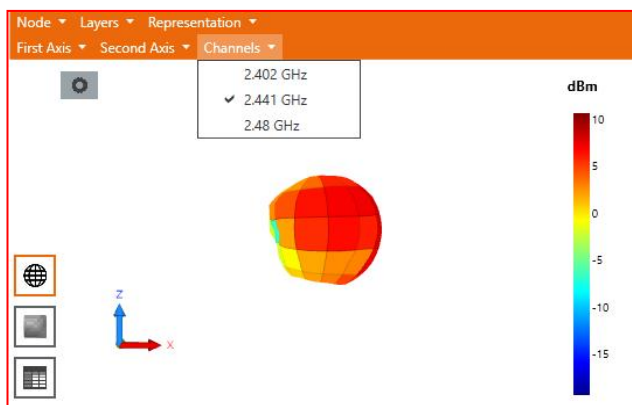
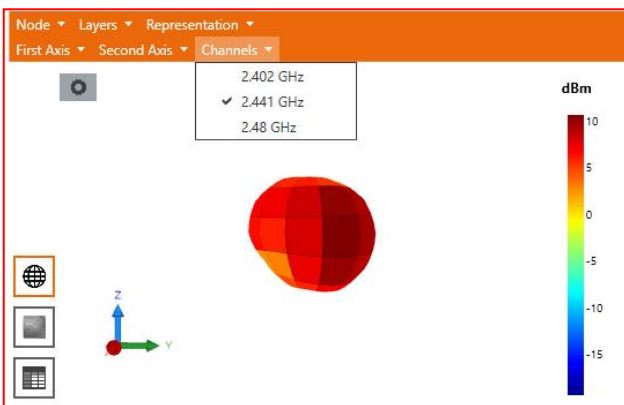
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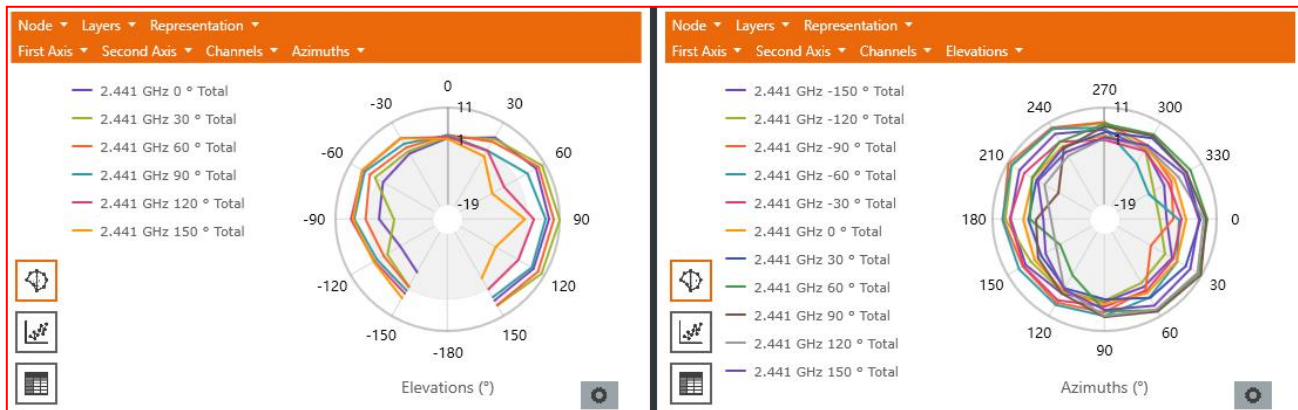
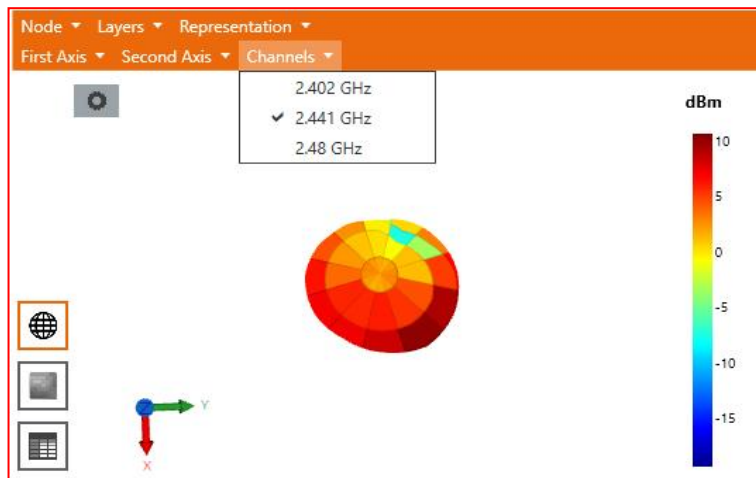
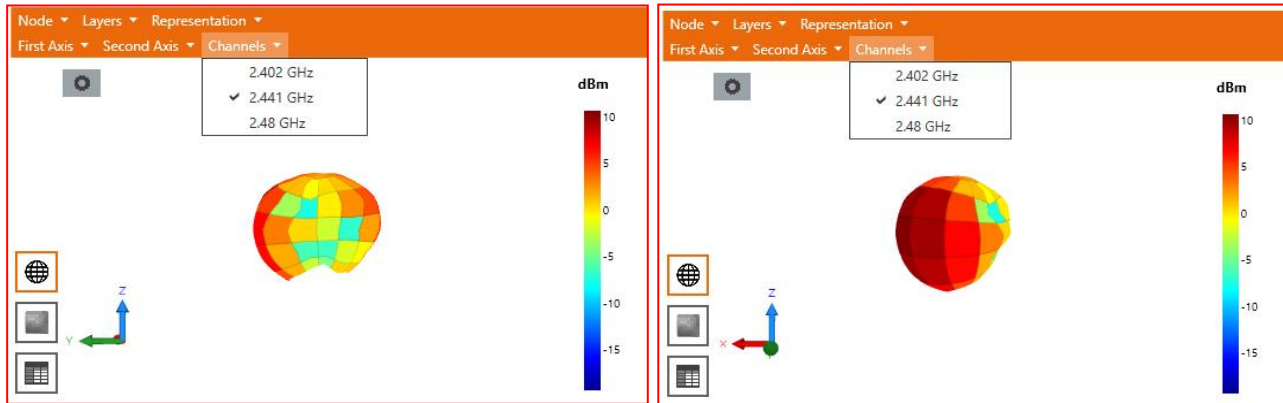
R 边--头模状态 R-edge-die state

TRP:



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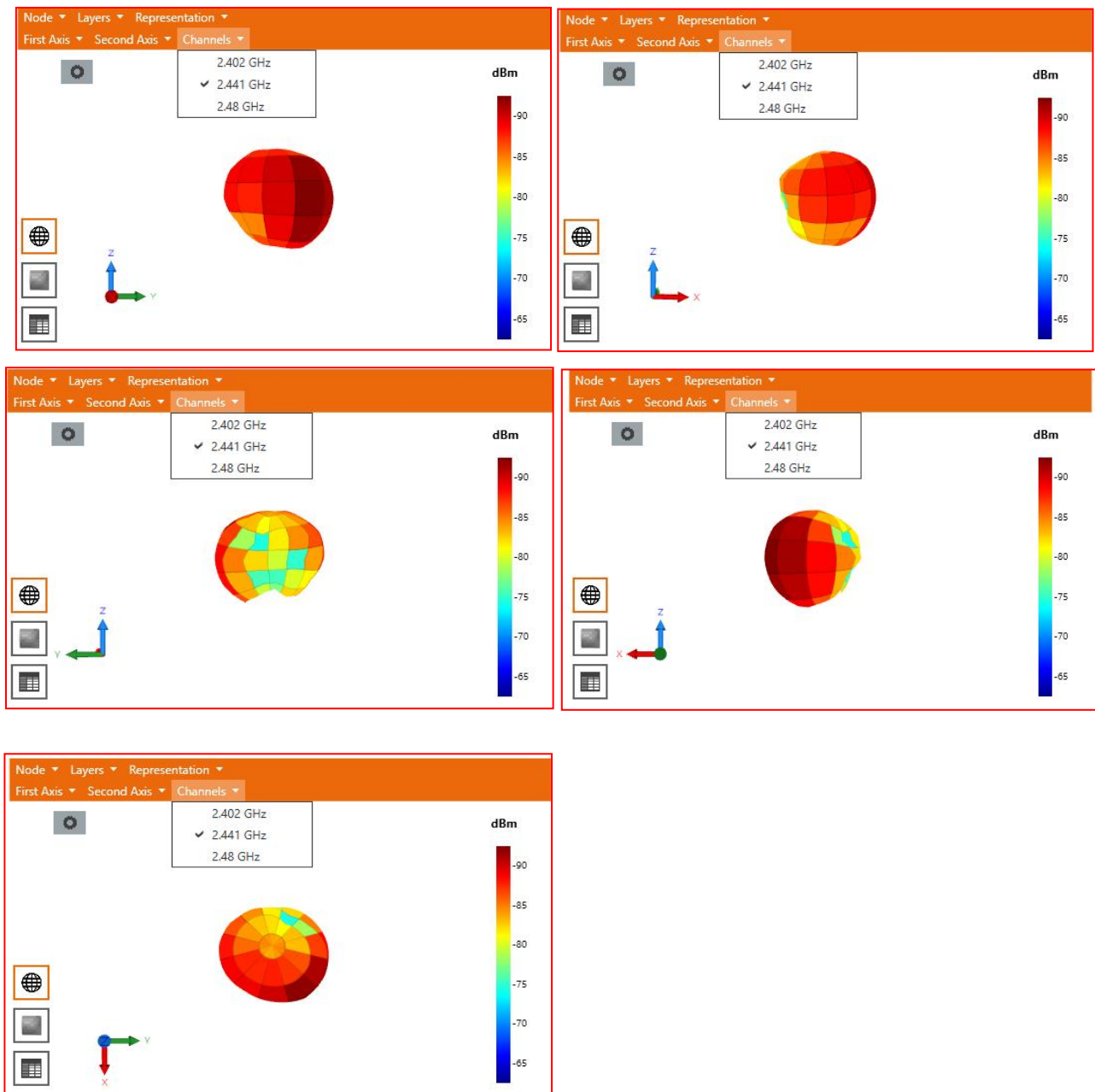
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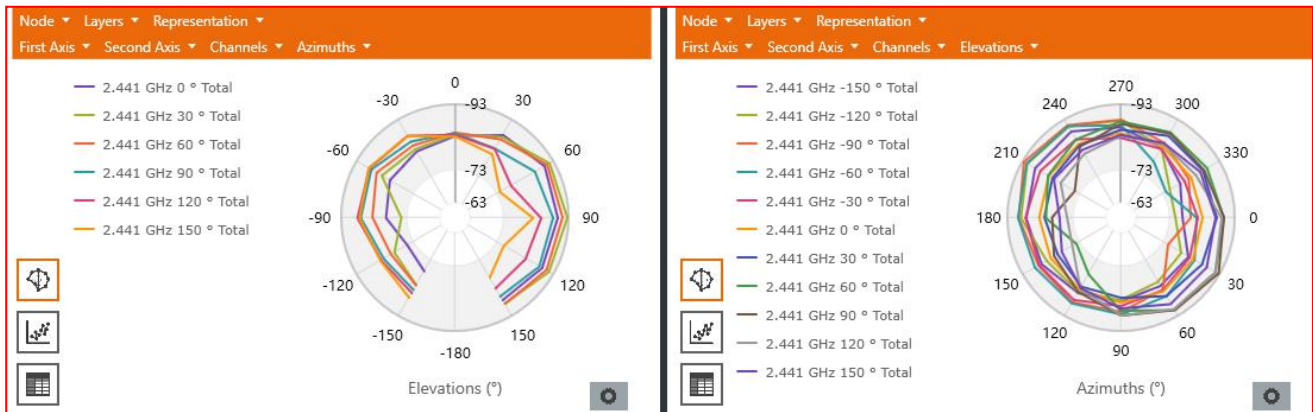
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TIS:



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## 7、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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