

## SPECIFICATION



深圳市大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.

国光 PGReactor-50W BT 天线组件GGEC PGReactor-50W BT Antenna assembly

## 产 品 规 格 书

## Product Specification

|                                 |                                                                                     |                            |                       |
|---------------------------------|-------------------------------------------------------------------------------------|----------------------------|-----------------------|
| 客 户<br>connection               | 国光<br>GGEC                                                                          | 频 段<br>frequency range     | 2400 ~ 2500MHz        |
| 项目名称<br>entry name              | PGReactor--50W                                                                      | 版 本<br>edition             | V07                   |
| 物料编号<br>Material No             | 2P-G50WX-059                                                                        | 颜 色<br>Color               | 黑色+白色<br>Black +White |
| 客户料号<br>Customer Item<br>Number |  |                            |                       |
| R F 设计<br>R F Design            | 靳 群<br>Qun.Jin                                                                      | 结构设计<br>Structural Design  | 周锐斌<br>Ruibin.Zhou    |
| 品质经理<br>Quality Manager         | 潘永杰<br>YongJie.Pan                                                                  | 技术总监<br>Technical Director | 张 磊<br>Lei.Zhang      |
| 日 期<br>Date                     | 2025-07-25                                                                          |                            |                       |

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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## 变更履历 Revision history

[illegible]

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## 一 项目说明 Project Description

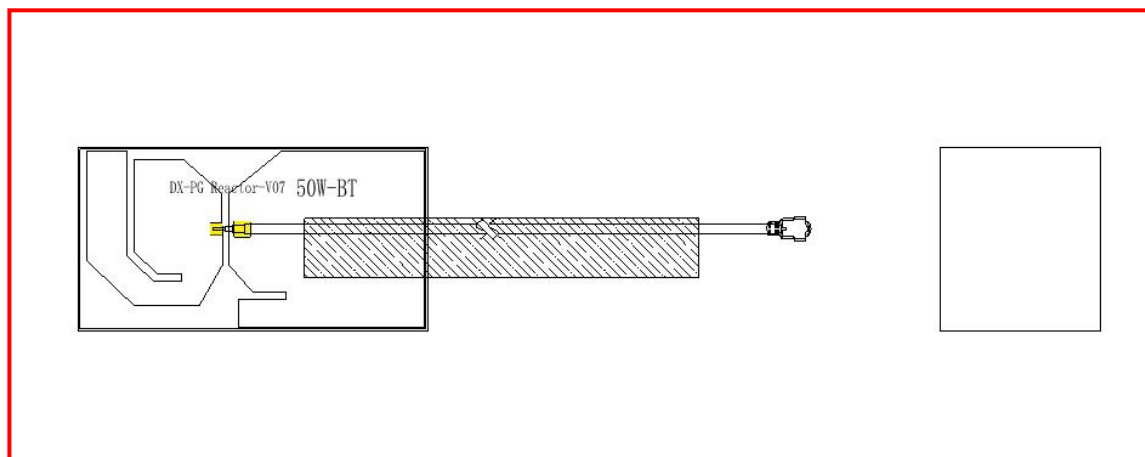
|                                    |                                                                |
|------------------------------------|----------------------------------------------------------------|
| 客户名:<br>Customer Name:             | 国光<br>GGEC                                                     |
| 整机类型:<br>Type of complete machine: | 音箱<br>loudspeaker box                                          |
| 天线频段:<br>Antenna band:             | 2400 ~ 2500MHz                                                 |
| 天线形式:<br>Antenna form:             | FPC+同轴线+线材海绵+EVA 泡棉<br>FPC+Coaxial Cable+Cable Sponge+EVA Foam |
| 馈电形式:<br>Feed form:                | 焊接<br>weld                                                     |
| 硬件版本:<br>Hardware version:         | /                                                              |

## 二 BT 天线组件 BT Antenna assembly

### 1 规格 specifications

本报告主要提供 PG Reactor 50W 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 PG Reactor 50W 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

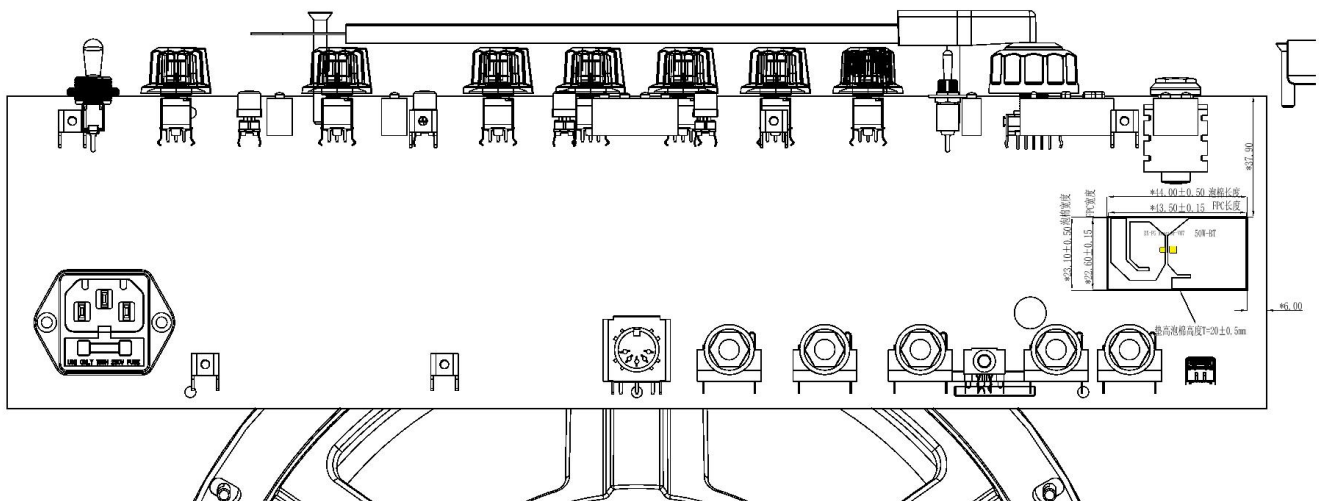
### 1.1.1 电性能指标 Electrical performance index

天线工作频段在 **2400 ~ 2500MHz** 。下表是大显设计和量产天线的电性能的指标。

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 ~ 2500     | $\leq 2$ |

### 1.1.2 天线位置布局 Antenna Location Layout



## 1.2 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+同轴线+线材海绵+EVA 泡棉 组成。

The antenna is mainly composed of FPC+Coaxial Cable+Cable Sponge+EVA Foam.

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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

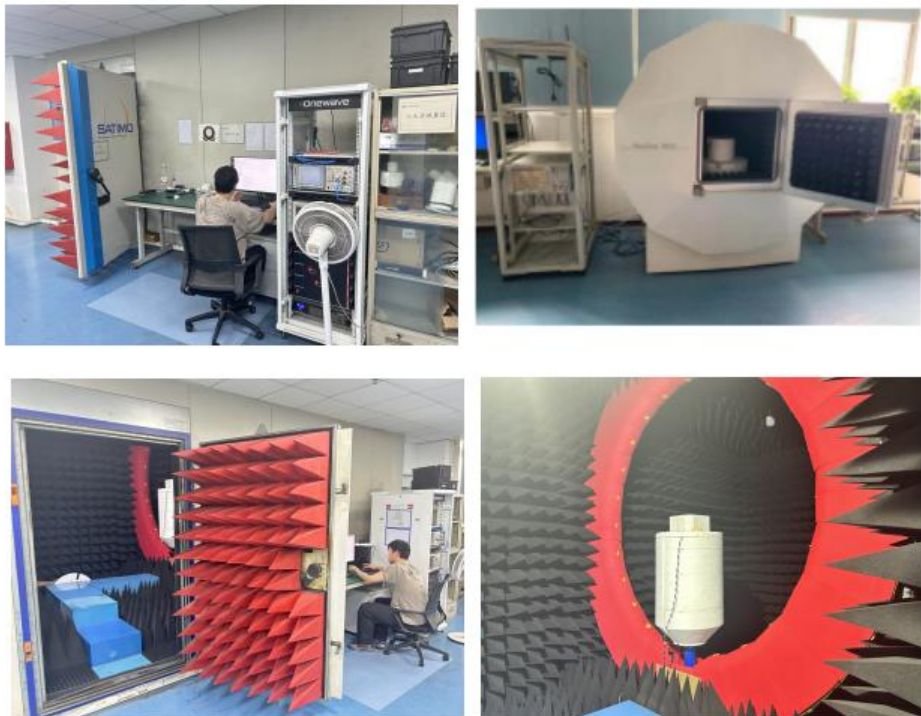


图 2

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 OTA active testing

|    |    | TPR  | TIS    |
|----|----|------|--------|
| BT | 0  | 4.17 | -88.63 |
|    | 39 | 3.64 | -88.57 |
|    | 78 | 3.24 | -88.29 |

##### 主板传导 Motherboard conduction

|    |    | TPR  | TIS   |
|----|----|------|-------|
| BT | 0  | 8.12 | -92.5 |
|    | 39 | 7.82 | -92.5 |
|    | 78 | 7.36 | -92.5 |

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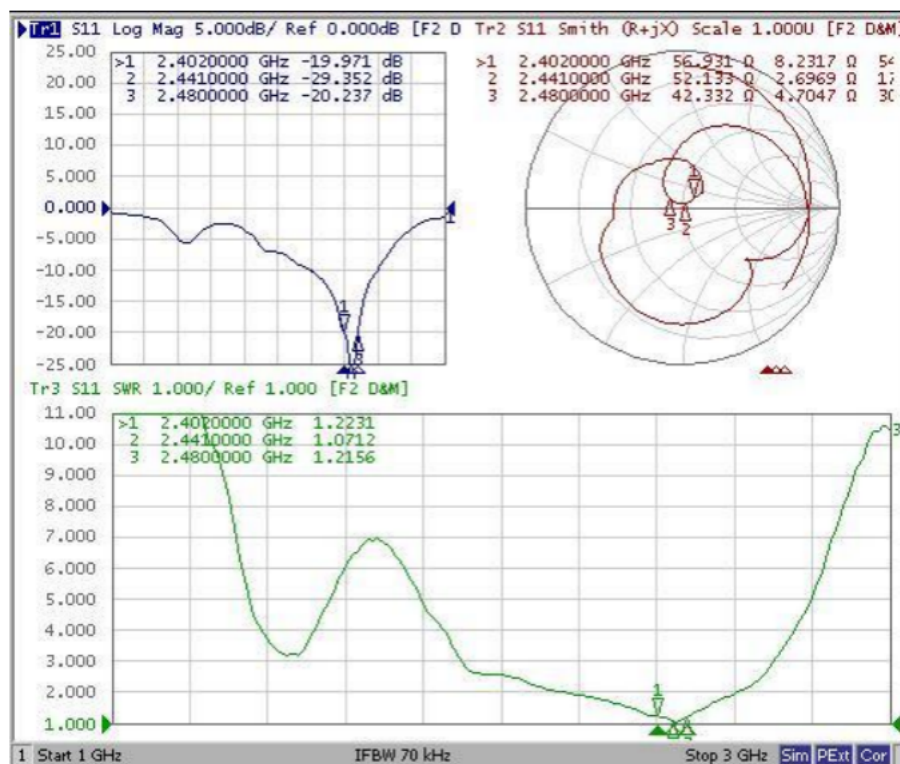
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## 无源效率&amp;增益 Passive efficiency&amp;gain:

| Freq<br>(MHz) | Effi<br>(%) | Effi<br>(dB) | Gain<br>(dBi) |
|---------------|-------------|--------------|---------------|
| 2400          | 41.81       | -3.79        | 2.99          |
| 2410          | 42.72       | -3.69        | 3.06          |
| 2420          | 43.89       | -3.58        | 3.25          |
| 2430          | 44.78       | -3.49        | 3.58          |
| 2440          | 45.23       | -3.45        | 3.95          |
| 2450          | 45.82       | -3.39        | 4.06          |
| 2460          | 44.93       | -3.47        | 4.07          |
| 2470          | 44.14       | -3.55        | 3.81          |
| 2480          | 43.89       | -3.58        | 3.54          |
| 2490          | 42.98       | -3.67        | 3.34          |
| 2500          | 42.31       | -3.74        | 3.06          |

## 4、VSWR 参数图 VSWR parameter diagram

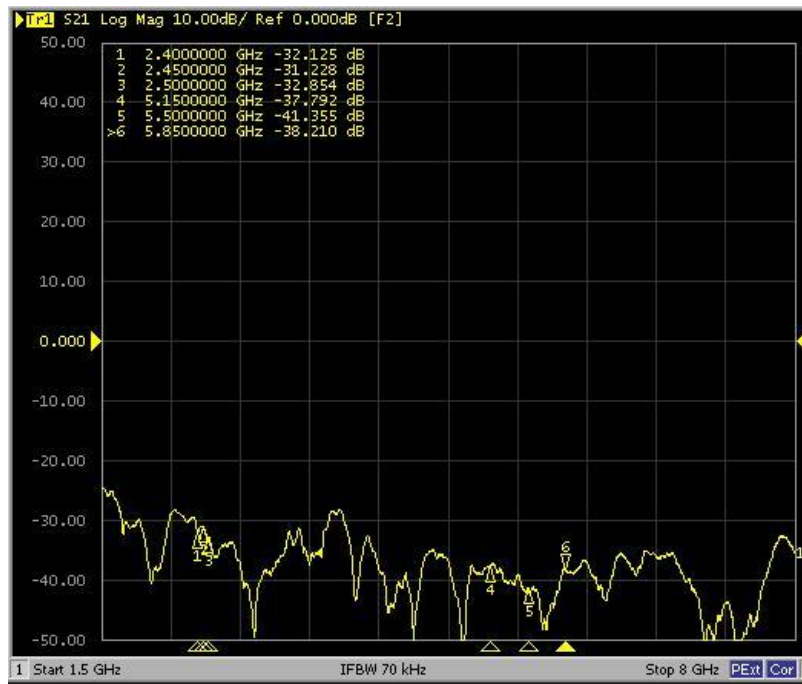


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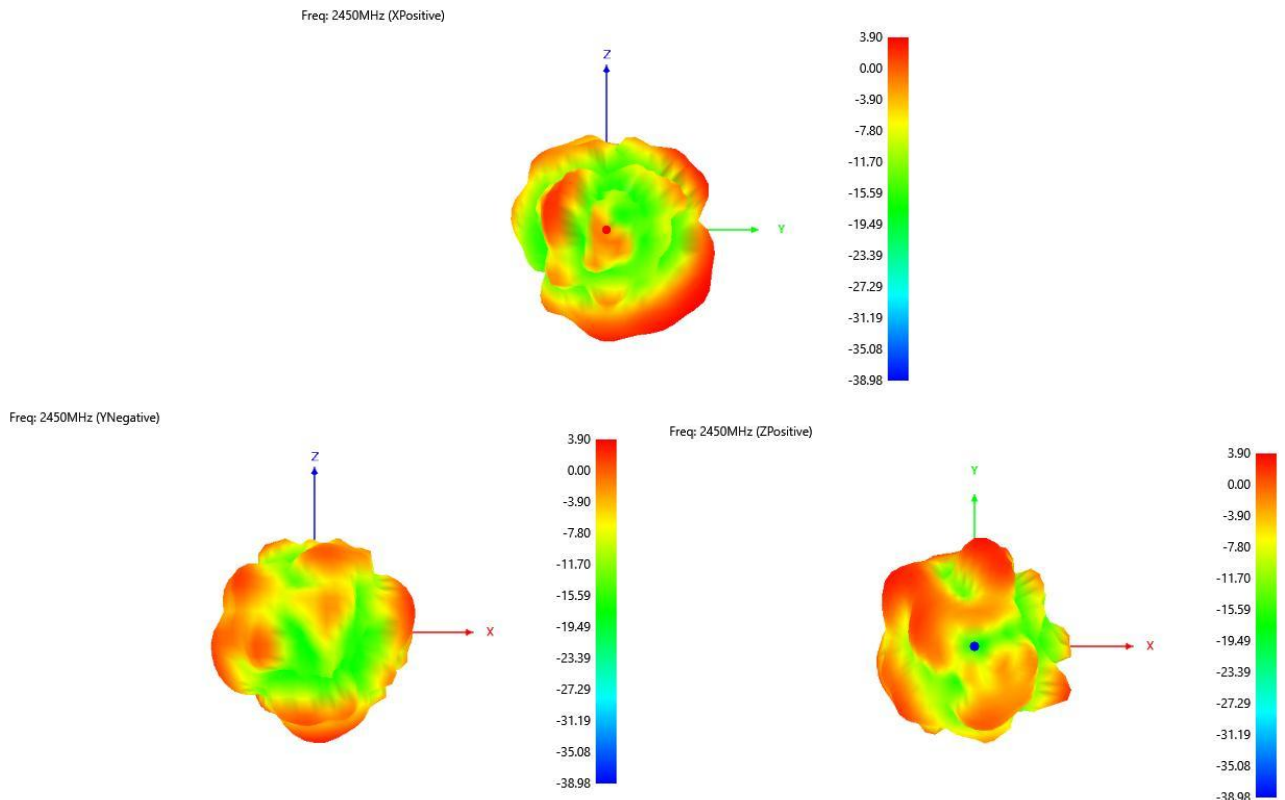
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## 5、天线隔离度 Antenna isolation



## 6、无源效率场型图 Passive efficiency field pattern diagram



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## 7、室外拉距测试 Outdoor draw distance test

拉距测试 pull test:WIFI 天线扣在蓝牙模块上 WIFI antenna attached to Bluetooth module

测试时间 Testing time:2025/07/23

测试场地 Test site:深圳烟草公司附近 Near Shenzhen Tobacco Company

测试手机 Testing mobile phones:Iphone 16 Pore



| 测试手机Tested phone: Iphone 16Pore |         |           |        |         |
|---------------------------------|---------|-----------|--------|---------|
|                                 | 前 ahead | 后 Gempres | 左 left | 右 right |
| BT                              | 105M    | 90M       | 90M    | 85M     |
| WiFi                            | 105M    | 90M       | 90M    | 85M     |

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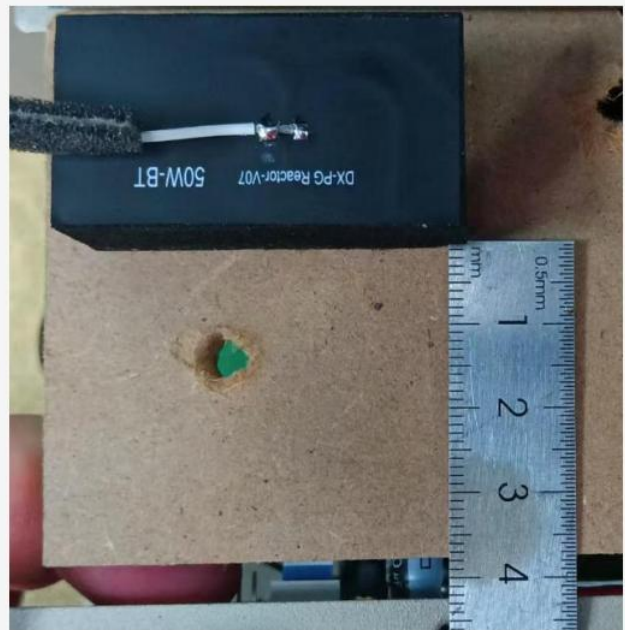
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## 8、天线粘贴位置说明 Antenna Paste Position Descriptio



天线贴在木板内面，距边缘约 5MM.如图  
The antenna is attached to the inner side  
of the board, about 5MM from the edge, as  
shown in the figure



天线贴在木板内面，距下边缘约 35MM.如图  
The antenna is affixed to the inside face  
of the board, about 35MM from the edge,  
as shown in the figure

## 9、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！

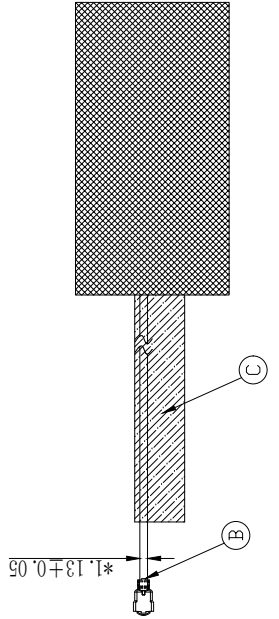
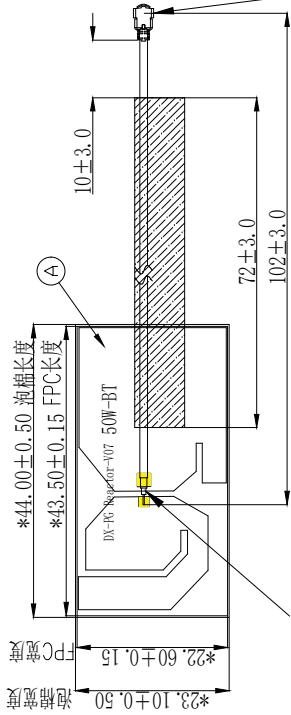
This antenna is designed based on the prototype provided by the customer. The electrical parameters and structural performance have met the technical requirements, please confirm!

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| 1 |  | 2    |  | 3     |       | 4    |    | 5    |  | 6    |  |
|---|--|------|--|-------|-------|------|----|------|--|------|--|
|   |  | 0~10 |  | 10~30 | 30~50 | 50~  | 角度 | O    |  | ⊥    |  |
|   |  | 0.05 |  | 0.10  | 0.15  | 0.20 | 1° | 0.02 |  | 0.03 |  |
|   |  |      |  |       |       |      |    | 0.02 |  | 0.05 |  |

A



端子口朝下  
(Terminal port facing downwards)

B

C

|                                     |                     |                        |             |           |
|-------------------------------------|---------------------|------------------------|-------------|-----------|
| D                                   | 泡沫 (Foam)           | EVA                    | 黑色 (black)  |           |
| C                                   | 线材海绵 (Cable sponge) | PIF                    | 黑色 (black)  |           |
| B                                   | 端子引线 (RF connector) | Cable                  | 白色 (white)  |           |
| A                                   | FPC                 | Electrolytic copper PI | 黑色 (black)  |           |
| 序号 (serial number) 零件名称 (Part Name) |                     | 材质 (material)          | 颜色 (colour) | 备注 (Note) |

技术要求:

(technical requirement.)

1. "\*"为重点尺寸;

(1. "\*"is the key dimension;)

2. 未标注尺寸请依图纸;

(2. Please refer to the drawing for unspecified dimensions;)

3. 不可有虚焊、漏焊、短线、断线等操作不良;

(3. There should be no poor operation such as faulty soldering, missing soldering, short wires, broken wires, etc;)

4. 符合 RoHS 要求 .

(4. Meet RoHS requirements.)



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|                     |                         |                               |            |             |            |
|---------------------|-------------------------|-------------------------------|------------|-------------|------------|
| 机型 (Machine model)  | PG Reactor 50W          | 产品颜色 (Product Color)          | 黑色 (black) | 日期 (date)   | 2025/07/14 |
| 项目编码 (Project Code) | CP-G50WX-059            | 表面处理 (Mold surface treatment) | NA         | 结构 (MD)     | 周锐斌        |
| 零件名称 (Part Name)    | BT天线 (BT antenna)       | 单位 (unit)                     | mm         | 比例 (scale)  | 1:1        |
| 零件编码 (Part Number)  | 2P-G50WX-059            | 第三视角 (Third perspective)      | Φ--        | 射频 (RF)     | 靳群         |
| 材质 (material)       | FPC+sponge+RF connector | 审核 (check)                    | 周康         | 批准 (ratify) | 张磊         |
| 保存路径 (Save Path)    | 当前版本 (current version)  |                               |            |             | A          |

D

1

2

3

4

5

6