SPECIFICATION

TOPANT

深圳市大显科技有限公司

Shenzhen Daxian Technology Co., Ltd.

佳禾 TP4 BT 天线

Cosonic TP4 BT antenna

产 品 规 格 书

Product Specification

客 户 connection	佳禾 Cosonic	频 段 frequency range	2400 ~ 2500MHz
项目名称 entry name	TP4	版 本 edition	V05
物料编号 Material No	1T-P4XXX-006	颜 色 Color	黑色 Black
客户料号 Customer Item Number			
R F 设计 R F Design	朱远青 YuanQing.Zhu	结构设计 Structural Design	周锐斌 Ruibin.Zhou
品质经理 Quality Manager	李高亮 GaoLiang.Li	技术总监 Technical Director	张 磊 Lei.Zhang
日 期 Date	2026-06-29		

客户确认：
Customer confirmation:

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

深圳市大显科技有限公司

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变更履历
Revision history

版本号 Version number	变更内容 Change content	变更理由 Reason for change	发起变更方 Originating Party	日期 Date	修改人 Modified by
V1.0	创建 found			2026-06-29	
V2.0	更新 update	增加天线极性及增益图 Add Antenna Polarization and Gain Plots		2026-07-15	

索　引
Indexes

一 项目说明 Project Description

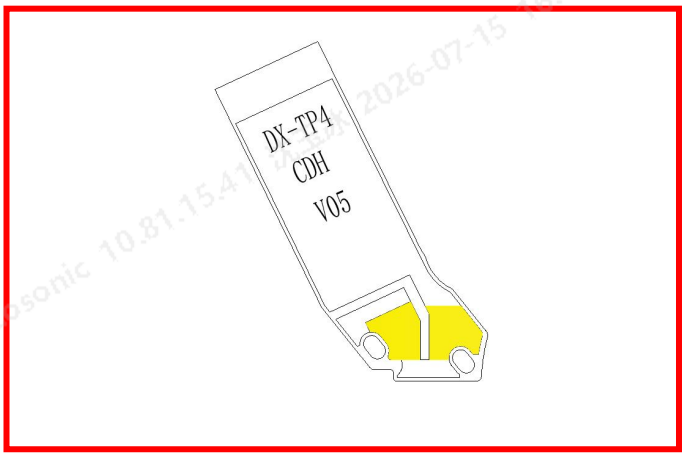
客 户 名： Customer Name：	佳禾 cosonic
整机类型： Type of complete machine：	充电盒 charging case
天线频段： Antenna band：	2400 ~ 2500MHz
天线形式： Antenna form：	FPC
天线极性： Antenna Polarization：	线性极化 Linear Polarization
馈电形式： Feed form：	Top Pin 接触 Top Pin Contact
馈脚数量： Number of feed legs：	2 个 Two

二 BT 天线 BT Antenna

1 规格 specifications

本报告主要提供 TP4 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 TP4 project. The following image shows an antenna with a large display design.



天线外观图

antenna appearing diagram

1.1 电气规格标准 Electrical specifications and standards

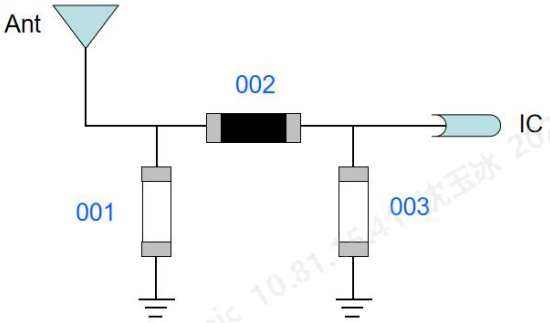
1.1.1 电性能指标 Electrical performance index

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

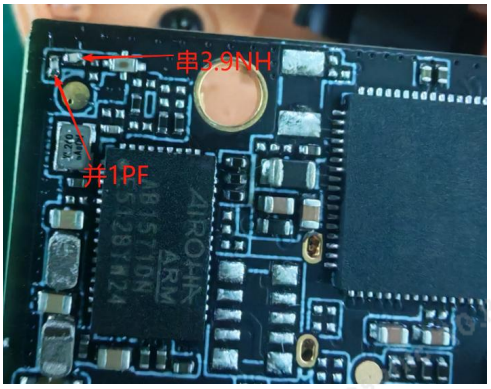
The operating frequency band of the antenna is between 2400 and 2500 MHz. The following table shows the electrical performance indicators of large display design and mass production antennas.

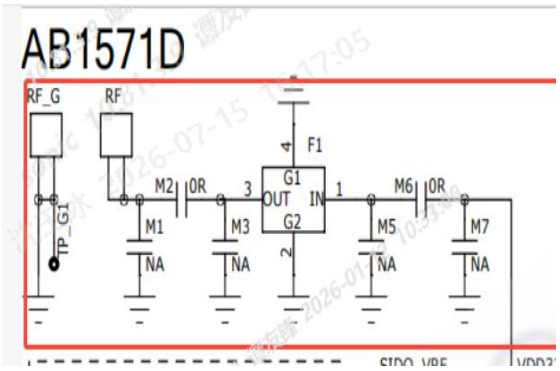
Frequency Range	Frequency (MHz)	VSWR
BT	2400 ~ 2500	≤ 2

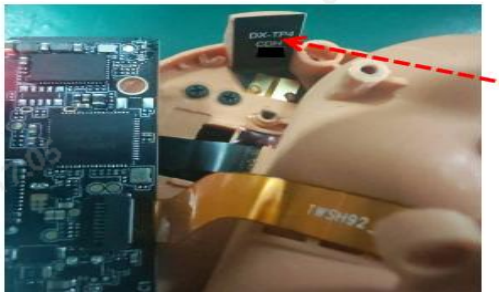
1.1.2 天线摆放位置及天线匹配 Antenna placement and antenna matching



料号位置 Part number location	参数值 parameter value
M1	1PF
M2	3.9NH
M3	N/C







天线采用 FPC 形式，贴在中壳内侧面

The antenna is an FPC type and is mounted on the inside of the rear casing

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 组成。

The antenna is mainly composed of FPC.

2、 测试设备 The Equipment of Active Test

Satimo 3D Chamber　4×4×4(m)

CMW500 E5071C

Network analyzer-R&S ZVL

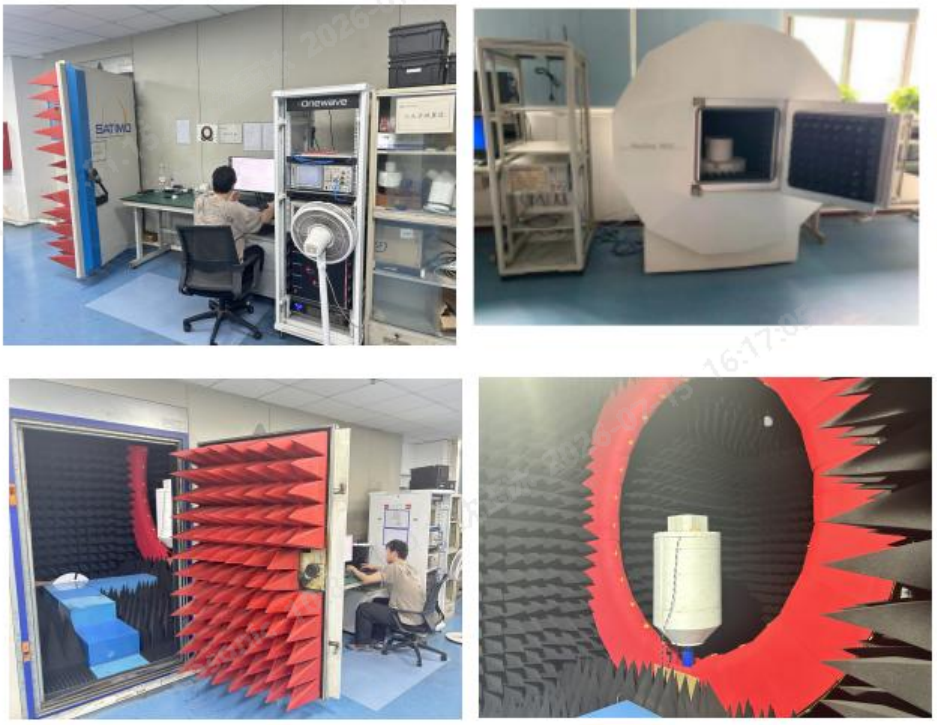


图 2

Figure 2

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 周圆，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 bel

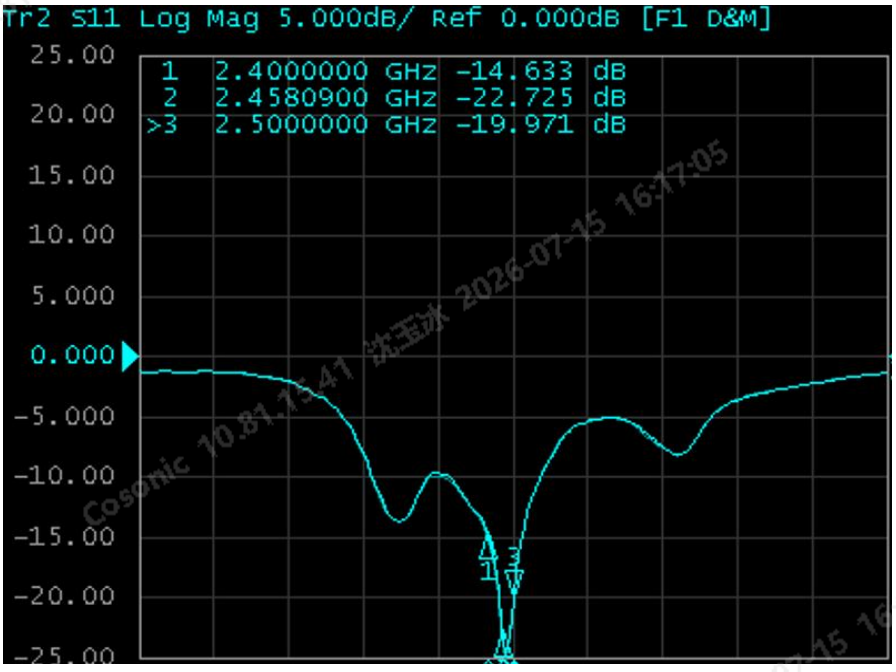
OTA 有源测试 OTA Active Test：

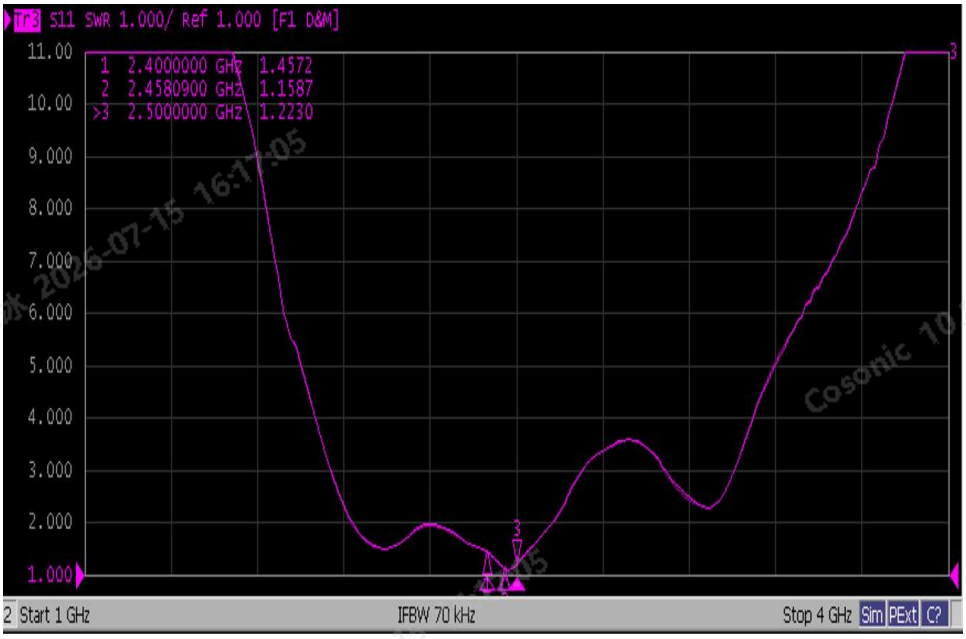
CH	TRP(dBm)	TIS(dBm)
0	3.31	-90.18
39	3.37	-89.41
78	3.42	-89.22

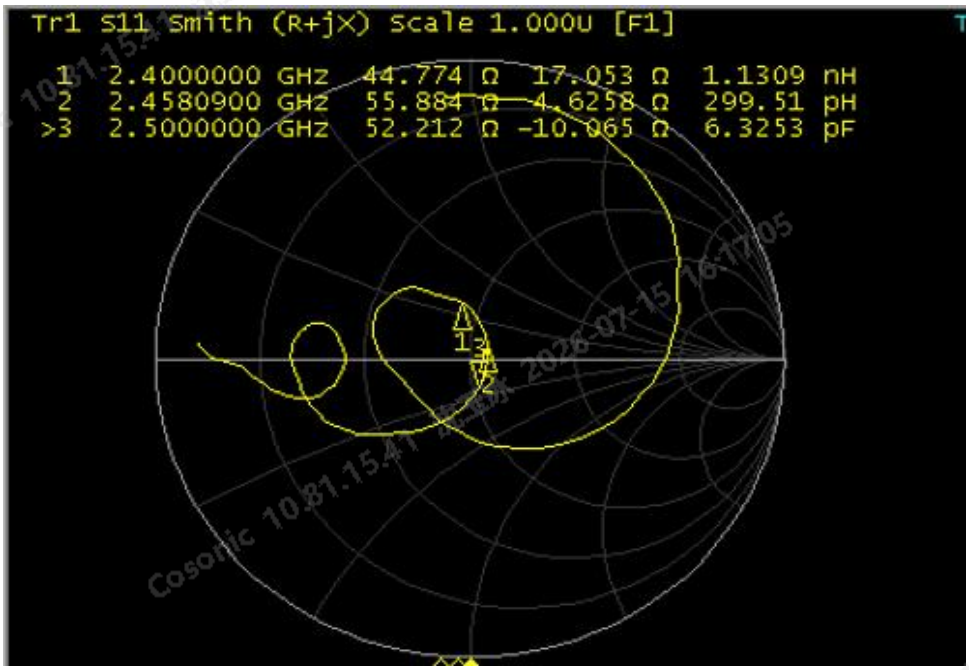
无源效率&增益 Passive efficiency&gain：

Frequency (MHz)	AVG Gain (dB)	Efficiency (%)	Gain (dBi)
2400	-5.02	31.45	1.99
2410	-4.92	32.21	2.15
2420	-4.85	32.74	2.26
2430	-4.87	32.56	2.39
2440	-4.67	34.16	2.3
2450	-4.63	34.42	2.16
2460	-4.67	34.15	2.22
2470	-4.78	33.26	2.31
2480	-4.88	32.53	2.3
2490	-5.07	31.15	2.27
2500	-5.19	30.25	2.3
AVG	-4.86	32.62	2.24

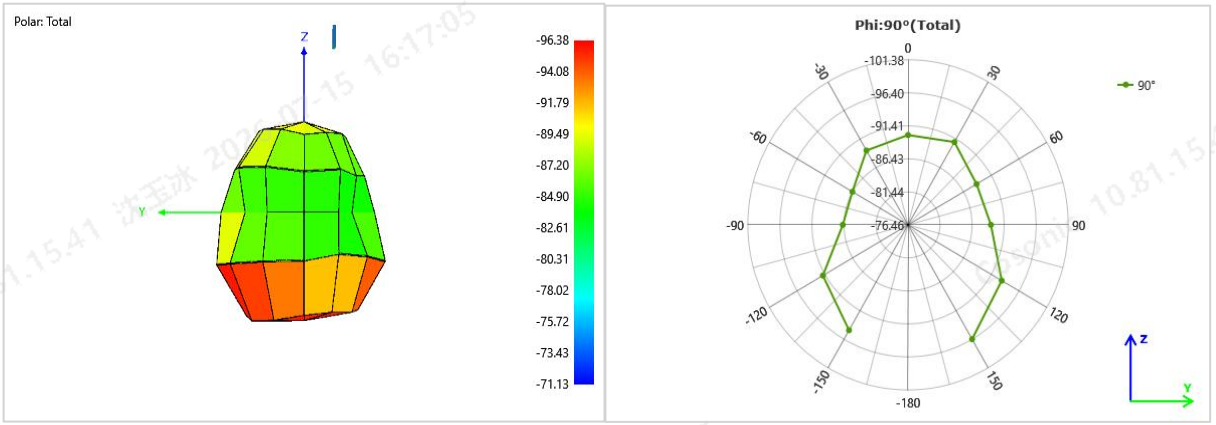
4、VSWR 参数图 VSWR parameter diagram

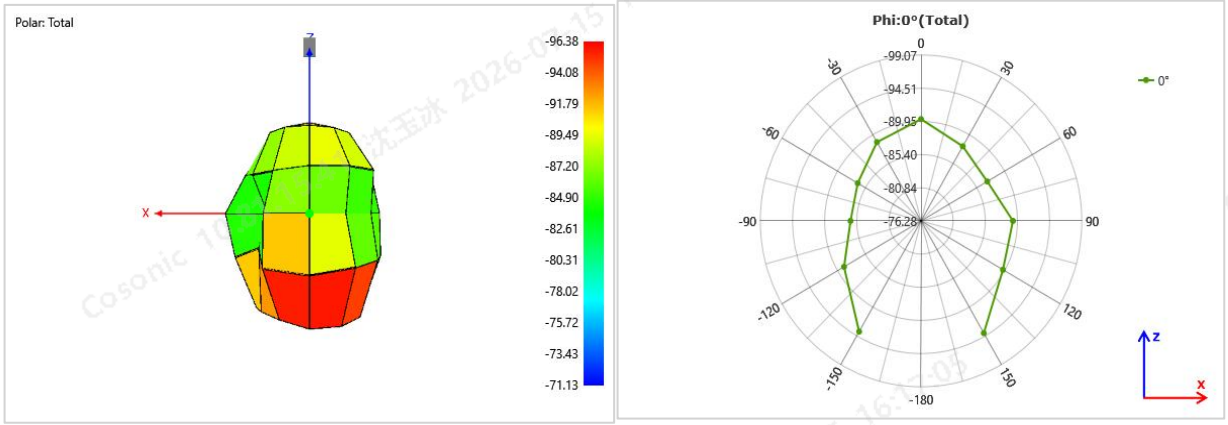


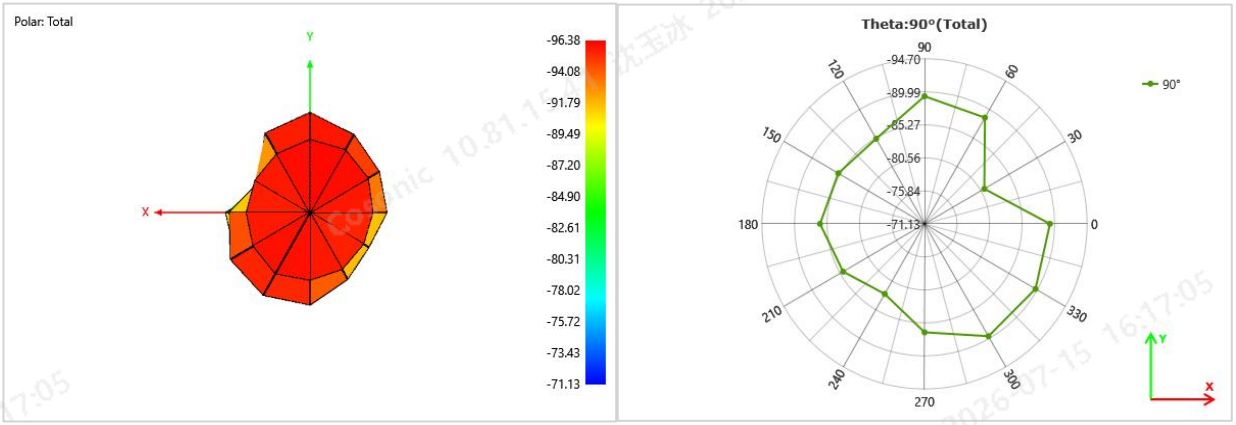




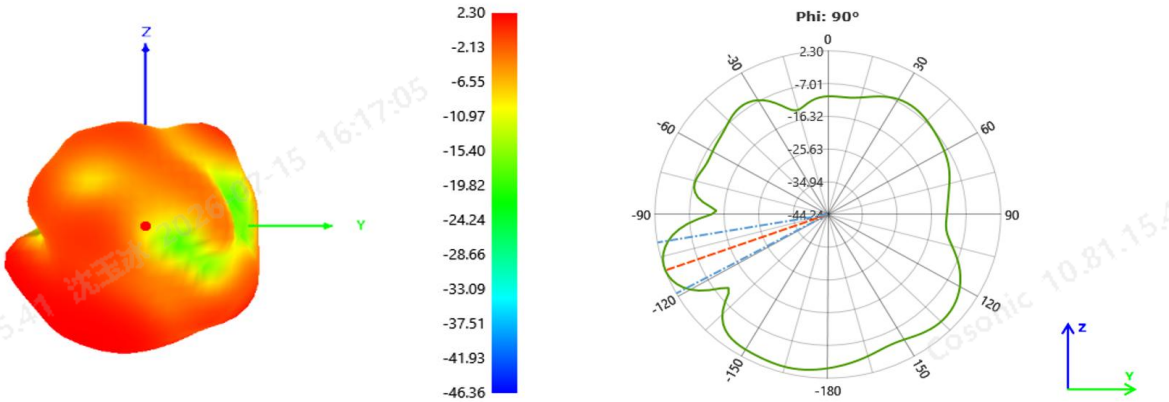
5、有源 OTA 测试 2D&3D 辐射场型图 Active OTA Test2D& 3D Radiation Field Patterns：

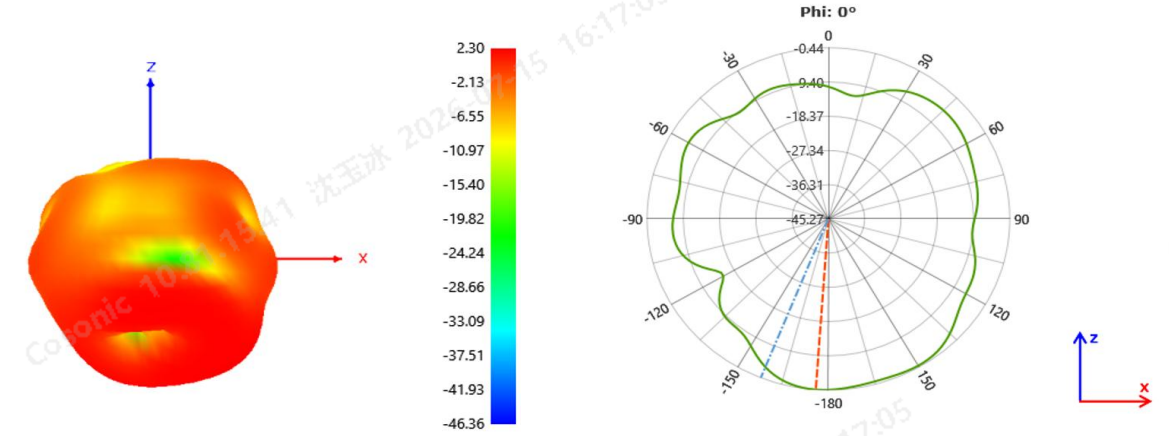


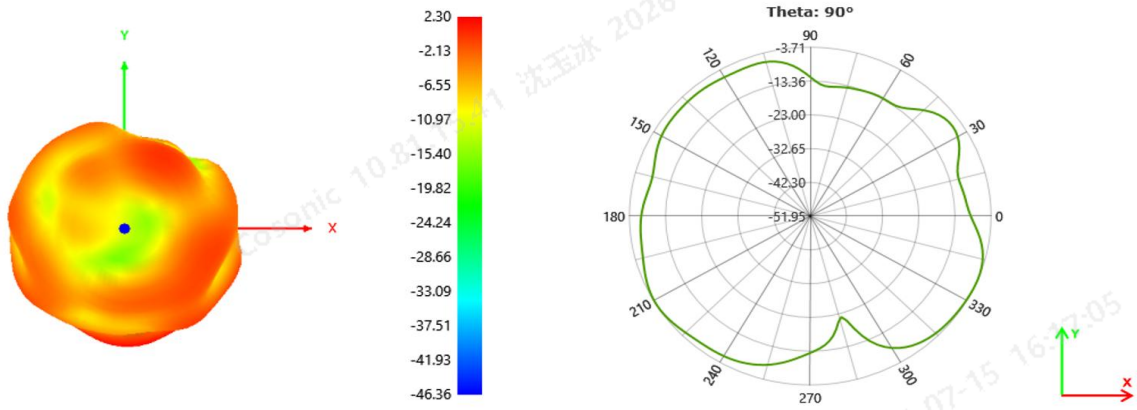


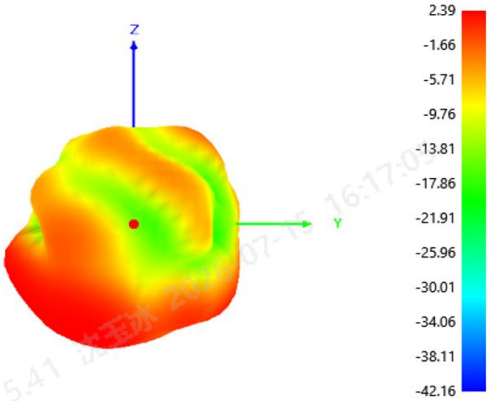


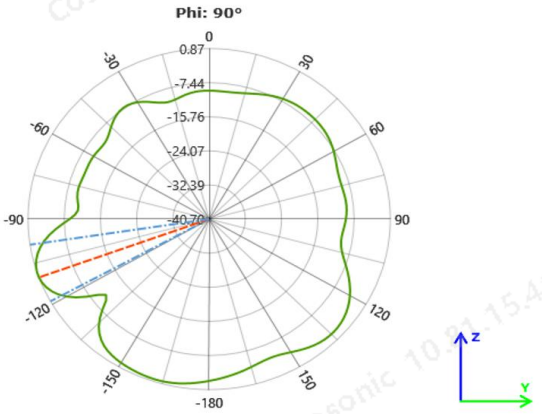
6、无源场型图 Passive field pattern diagram

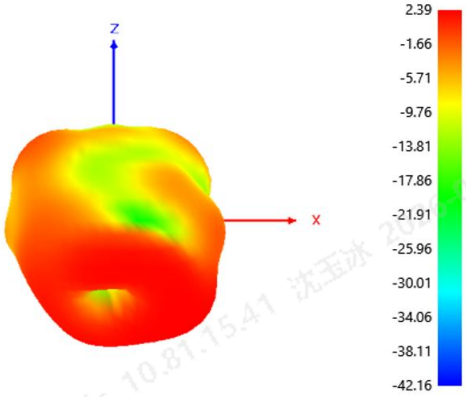


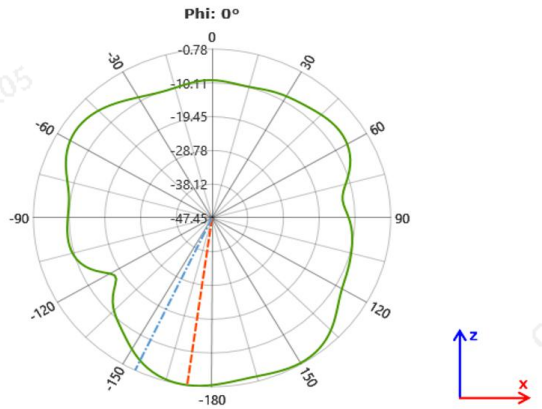


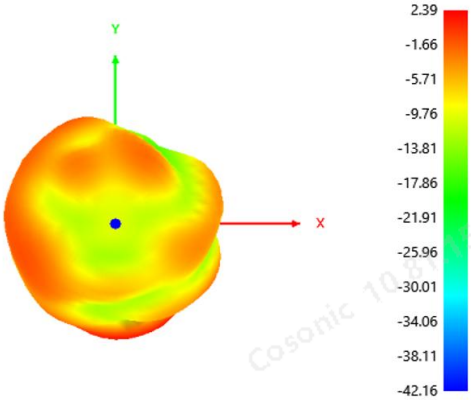


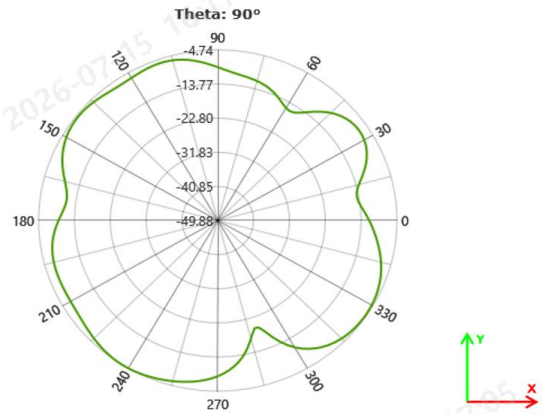










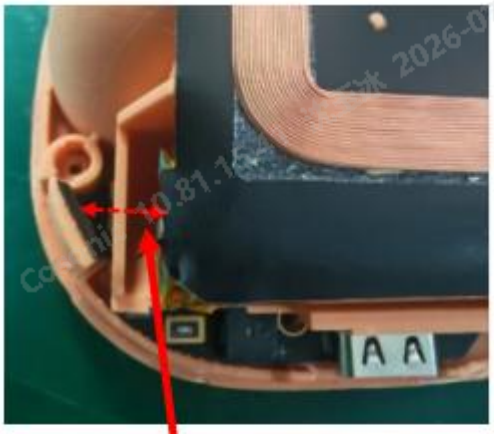


7、产品在暗室的摆放图片 Pictures of product placement in darkroom

8、天线安装注意事项 Antenna Installation Precautions

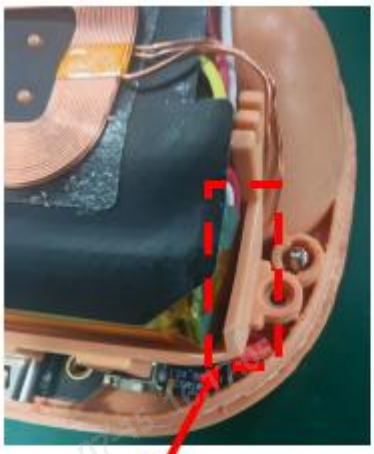
电池装配示意图

Battery assembly diagram



电池尽量远离天线区

Keep the battery as far away from the antenna area as possible



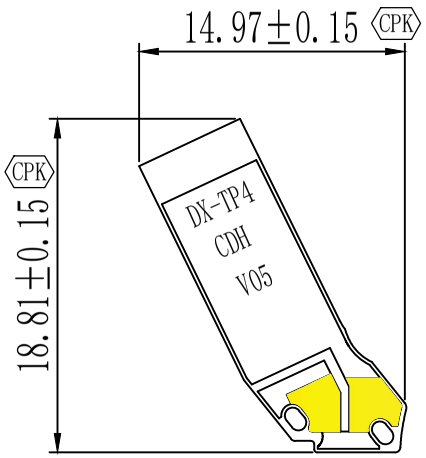
尽量靠右边电池仓边缘装配

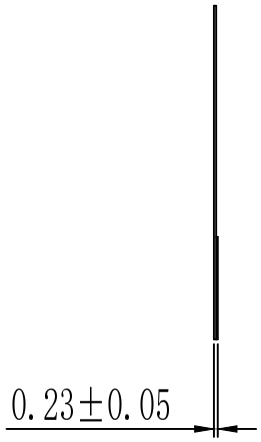
Assemble as close as possible to the right-hand edge of the battery compartment

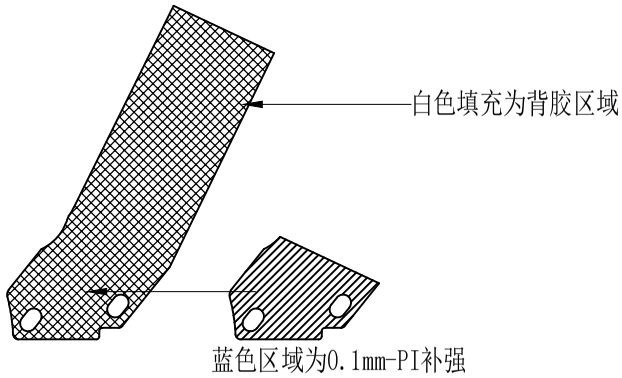
9、结论 conclusion

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!

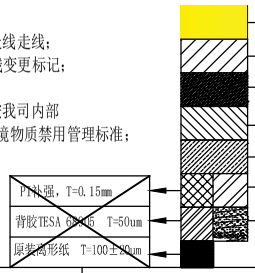






技术要求:

1. 正面代表FPC铺铜走线覆盖油墨或覆盖膜部分,
   背面代表背胶原装胶纸部分;
2. 带“*”尺寸为重点尺寸,带 “CPK”需要做CPK的尺寸,
   “( )”为实配尺寸, “⚠”为设计变更;
   未注公差参照公差表;
3. 表面干净，无脏污，无露铜，脱落等不良;
4. 红色线 ▭ 为FPC的最大外形，绿色线▬为天线走线;
   黄色线——为离型纸切断线，蓝色线—— 为天线变更标记;
   ▭为镀金区,▬为背胶区,▭为离形纸手撕位;
5. 满足盐雾实验/附着力测试等相关可靠性测试，按我司内部
   可靠性试验标准执行，所有物料均符合我司产品环境物质禁用管理标准;
6. FPC来料按半切方式制作;
7. 产品包装必须干净、整洁，包装过程
   不允许对产品造成脏污。



层叠图及材料规格
镍2-6um; 金≥0.03um
黑色油墨 T=15±5um 白色丝印
电解铜 T=0.5oz（18um）
热固胶 T=20um
PI基材 T=25um
背胶3M55261 T=100um
原装离形纸 T=100±20um

公差表	
长宽50mm以下规则的外形到外形	±0.15
长宽50mm以上不规则的外形到外形	±0.20
走线到外形	±0.15
走线到走线	±0.05
孔径	±0.10
孔中心到外形	±0.15
孔中心到孔中心	±0.10
油墨到走线	±0.30
补强或背胶到外形	±0.35

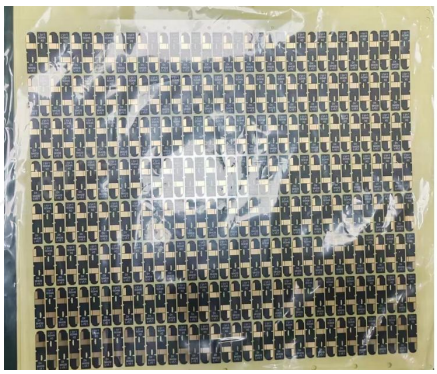
机 种	TP4		名 称	充电盒天线	审核 吴锡欢
项目编码	CT-P4XXX-006		R F	胡鹏	批准 张磊
零件编码	1T-P4XXX-006-1		结构	周锐斌	日期 2026-06-16
版 本	A1	图框 A4			
比 例	1:1	第三视角			
单 位	MM				

TOPANT

深 圳 大 显 科 技 有 限 公 司
Shenzhen Daxian Technology Co., Ltd.

一、包装方式 Packing method：

1 .整版 FPC Full FPC:



2. 入盒包装，每盒50版 Packed in boxes with 50 editions per box;

二、运输要求 Transport requirements：

产品包装件运输时，应防潮、防破损、防污染。

When the product package is transported, it should be moisture-proof, damage-proof and pollution-proof.

三、存储要求 Storage requirements：

产品包装件应在仓库内堆放，库房应干燥、通风、清洁。

Product packages should be stacked in the warehouse, which should be dry, ventilated and clean.