

开发案号 Project: Y2508151413

日期 Date.: 2026.03.12

版本 Ver.: A1

承认书

Antenna SPEC

客户名称 Customer name: 国光电器

调试项目 Customer project: PG Spark Pedal

客户料号 Customer P/N: EAN0053303

博安通料号 B&T P/N: 74220712

规格描述 Spec.: 内置天线 -2.4G- 黑色 1.13 锡锡线 -1 代端子
-L=142mm-FPC-30.4×13mmSpec.: Built-in Antenna - 2.4G - Black 1.13 Tin Wire - 1st Generation Terminal -
L=142mm - FPC - 30.4×13mm

出厂签章 Sealed by corporation:

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客户承认签章 Sealed by customer:

检查 check	审核 verify	批准 approval

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3、产品图面 Product drawing

版次		修改日期	修订内容
A0		25-10-9	
A0-1120		25-11-20	更换FPC（改为A1版）
A1		26-3-12	更新线长及海绵长度（客户变动）

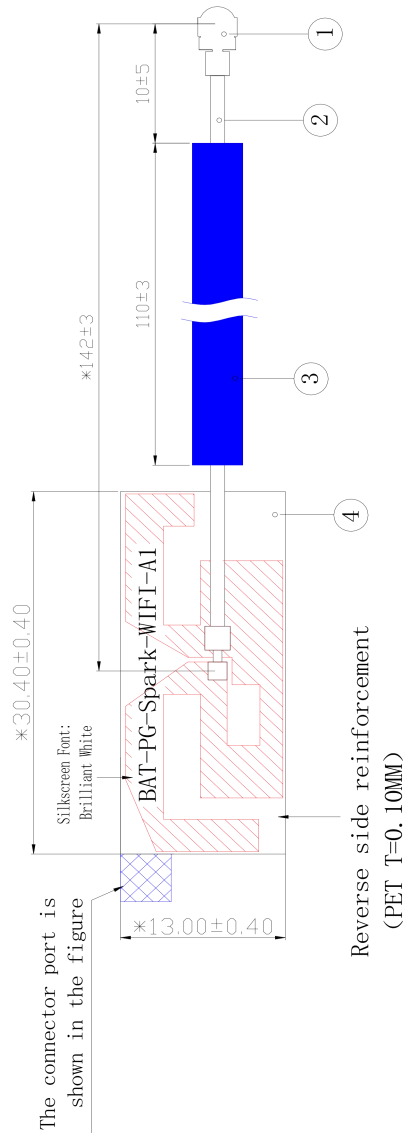
技术要求

1: 天线焊接部位牢固, 线缆尺寸准确 (端子维持力 $\geq 0.8\text{Kgf}$).
2: 丝印颜色为亮白色, 字体清晰不易脱落.
3: "*"为IQC重点检验尺寸.
4: 包装以及品质标准分别参考博安通包装规范和博安通品质标准.
5: 材料符合ROHS2.0.
6: 端子杯口不对朝向.

正视图

序号	零件名称	备注	设计	审核	批 准	李开勇	重量	数量	比例	单位	名称	项目号	料号
①	1代RF端子				1 X	± 0.05			1:1	mm	内置天线-2.4G-黑色1.13锡锡线-1代端子-L=142mm-FPC-30.4×13mm	Y2508151413	74220712
②	同轴线				1~9.99	± 0.10							
③	海绵	机器压合			10~19.99	± 0.15							
④	FPC				20~39.99	± 0.20							
					40~	± 0.30							
第 1 张 共 1 张												博安通	

REV.	Revision Date	Revision Details
A0	25-10-9	
A0-1120	25-11-20	Replace FPC (change to version A1)
A1	26-3-12	Change cable length and sponge length (customer change)



Front view

Technical Requirements

- 1:The antenna solder joint is secure, Cable dimensions must be per drawing(Terminal Retention Force $\geq$ 0.8Kgf).
- 2:Silkscreen Color: Brilliant White, Permanent and legible marking.
- 3:Dimensions marked with an asterisk (*) are critical inspection points for IQC.
- 4:Packaging and quality standards shall refer to B&T Packaging Specification and B&T Quality Standard, respectively.
- 5:The material is compliant with RoHS 2.0 requirements.
- 6:Terminal cup orientation is not directional.

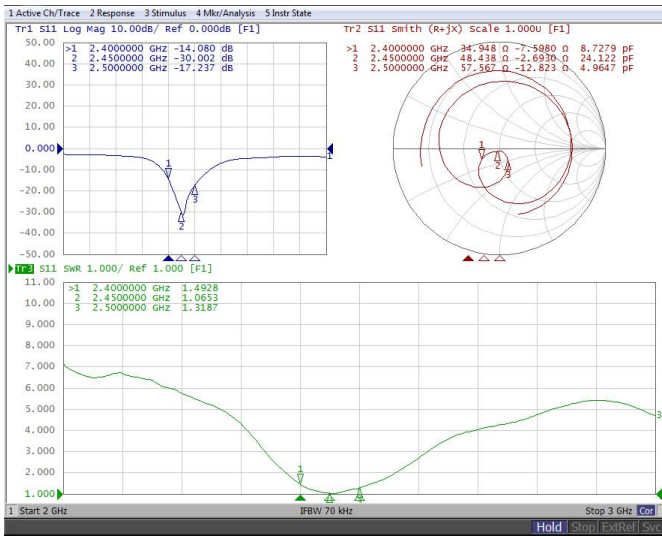
[illegible]

4、性能参数 Properties ¶meter

电气参数 Electrical parameter	
频率范围 Freq Range	2400~2500MHz
输入阻抗 Characteristic Impedance	50 Ω
驻波比 VSWR	<2
增益 Gain	2.63dBi
功率容量 The Max input power	<10w
极化方式 Polarization mode	线极化 Linear polarization
辐射方向 Radiation direction	全向 omnidirectional
接头型号 Joint type	端子 IPEX connector
机械参数 Mechanical parameter	
线长 Length	142 $\pm$ 3mm
端子维持力 Maintain the force	$\geq$ 0.8kgf
同轴电缆 Coaxial cable	黑色 1.13 锡锡线 Black 1.13 tin wire
盐雾测试 Salt spray test	24H
环境参数 Environment parameter	
工作温度 Operating Temp	-30 $^{\circ}$ C~65 $^{\circ}$ C

6、电气性能测试报告 Electrical test report（整机测试 Whole machine testing）

天线 S11 参数图 Antenna S11 parameter diagram



驻波比数据 Standing wave ratio data

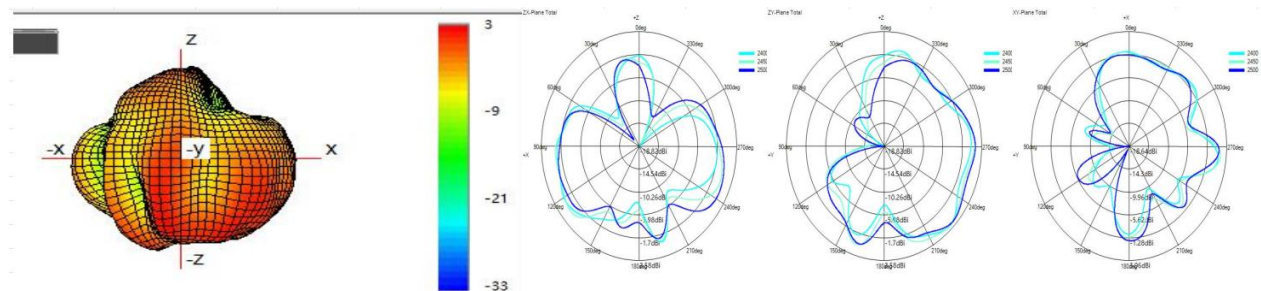
Freq/MHz	2400	2450	2500
VSWR	1.49	1.06	1.31

天线暗室测试数据 Antenna darkroom test data

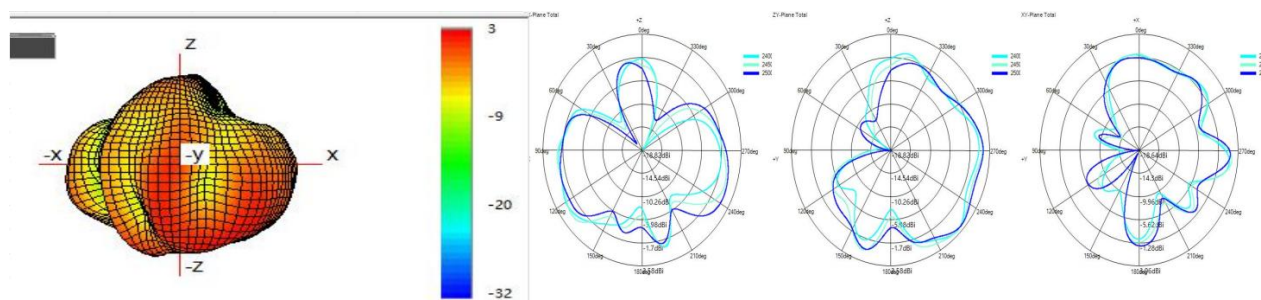
Frequency (MHz)	Gain (dBi)	Efficiency (%)
2400.0	2.56	44.41
2410.0	2.57	45.27
2420.0	2.54	46.55
2430.0	2.61	47.42
2440.0	2.63	47.98
2450.0	2.56	48.21
2460.0	2.38	49.73
2470.0	2.22	47.88
2480.0	2.09	46.63
2490.0	2.14	45.26
2500.0	2.20	45.46

➤ 天线方向图

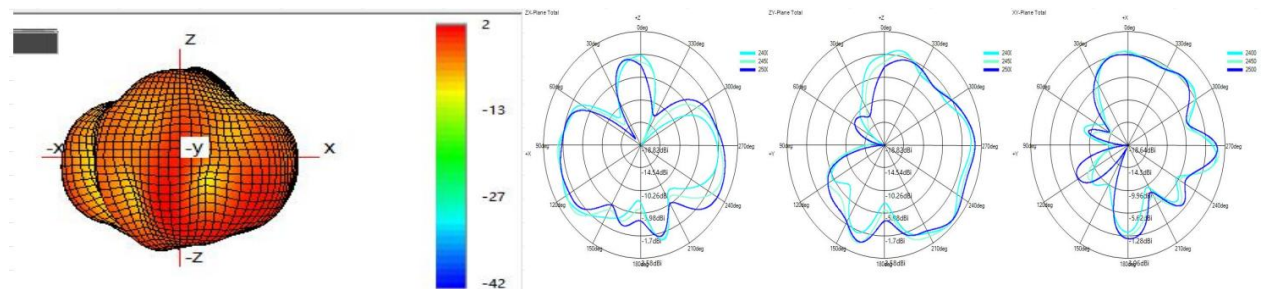
2400MHz



2450MHz



2500MHz



➤ 有源数据

样品	设备	测试项	模式	速率 (Mbps)	信道	频率(MHz)	#2主板 测试值 (dBm)	传导值 (dBm)
PG Spark Pedal	CMW270	TRP	b (ACK)	11	1	2412	16.18	19.87
					7	2442	16.36	19.79
					13	2472	16.23	19.91
			n (ACK)	MCS7	1	2412	15.21	18.56
					7	2442	15.28	18.50
					13	2472	15.18	18.62
		TIS	b	11	1	2412	-82.18	-89
					7	2442	-82.04	-89
					13	2472	-82.34	-89
			n	MCS7	1	2412	-66.5	-74
					7	2442	-66.48	-74
					13	2472	-66.05	-74

6、材料成分及有害物质表 List of Material Composition and Hazardous Substances

项次 Item	规格 Specification	材质 Texture of material	RoHS 检验结果 (PPM) ROHS Test Results (PPM)						ICP 检测编号 ICP test number	检测时间 Test time
			Cd	Pb	Hg	Cr+6	PBB	PBDE		
1	线 wire	FEP	ND	ND	ND	ND	ND	ND	NGBPC26000015815	2026/1/19
		镀锡铜线 Tinned wire	ND	ND	ND	ND	ND	ND	A2250416468101001	2025/6/20
2	端子 Terminal	PBT	ND	2.99	ND	ND	ND	ND	ETR25703519	2025/7/27
		磷青铜 Phosphor Bronze	ND	4	ND	ND	ND	ND	CANEC25027363005	2025/11/13
3	FPC	PI	ND	ND	ND	ND	ND	ND	SHAEC25031840901	2025/12/8
		背胶 Tape	ND	ND	ND	ND	ND	ND	SZXEC25003068038	2025/8/28
4	海绵 Sponge	PU 泡棉 PU Sponge	ND	ND	ND	ND	ND	ND	A2250668424101001	2025/9/18
		背胶 Tape	ND	ND	ND	ND	ND	ND	CANEC25016804237	2025/7/22

产品包装规范

PACKING CRITERION

产品料号 P/N: 74220712

产品规格: 内置天线-2.4G-黑色 1.13 锡锡线-1 代端子-L=142mm-FPC-30.4×13mm

Spec: Built-in Antenna - 2.4G - Black 1.13 Tin Wire - 1st Generation Terminal - L=142mm - FPC - 30.4 × 13mm

一、标签要求 (根据客户名称参考对应的成品标签制作要求, 无要求即按普通标签要求)

contents of label(according to the customer's name, refer to the corresponding finished product label production requirements. If there is no requirement, it will follow the ordinary label requirements.)

内外标签 长 10cm 宽 6cm 左右

The inner and outer labels are about 10cm long and 6cm wide

需方 buyer	*****		
供方 vender	四川博安通通信技术有限公司 Sichuan B&T Technology Co., Ltd.		
物料编码 Purchase No	*****		
生产单号 Material No.	*****		
品名规格 Name specification	*****	检验员 QC	**
数量/单位 Q'ty/Unit	*****	日期 Manufacture date	****.***
追溯码 Trace code	*****	流水号 Serial number	**

二、装箱要求 Packing requirement

作业说明 Operating description:

1. 内包装 inner packing:

产品 50 PCS/小袋/small bag

200 PCS/大袋 big bag

2. 外包装 outer packing:

根据实际包装定数量 Quantity according to actual packing/箱 carton

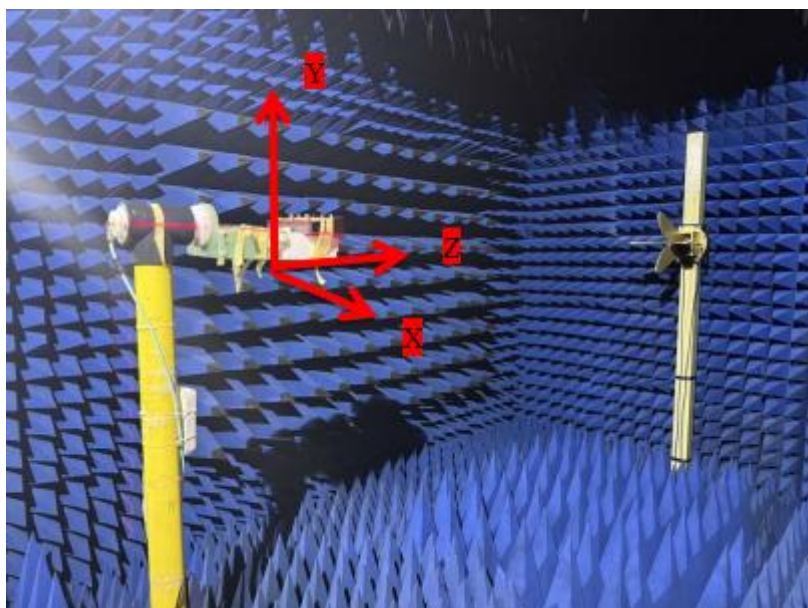
注意事项 Notice:

- 是否要增设隔板、珍珠棉 Whether to add partitions, pearl cotton;
- 标签的贴附, 如 ROHS 等 Labeling, such as ROHS;

8、天线整机安装示意图 Antenna installation position Diagram



9、天线测试暗室摆放位置 Location of antenna test darkroom



10、可靠性测试要求 Reliability test requirements

序号 Serial Number	可靠性试验名称 Reliability Test Name	试验条件 Experimental conditions	判定标准 Judgment criteria
1	恒温恒湿试验 Constant temperature and humidity test	高温:70℃, 湿度:80%RH 24H; 低温 -40℃ 24H;共持续 48H; High temperature: 70 ℃, humidity: 80% RH for 24 hours; Low temperature -40 ℃ for 24 hours; continuous for 48 hours in total;	试验前后外观要求: 金属表面 镀层应无剥落, 裂痕起皱, 分 离等。非金属部分不应变色, 发生开裂, 变形, 脱胶等不良; 电气性能测试符合标准要求; Appearance requirements before and after the experiment: The metal surface coating should be free of peeling, cracks, wrinkles, separation, etc. Non metallic parts should not discolor, crack, deform, or peel off; The electrical performance test meets the standard requirements;
2	高低温冷热冲击试验 High and low temperature thermal shock test	70℃持续 2H、-40℃持续 2H, 6 次循环, 共 24 小时; 70 ℃ for 2 hours, -40 ℃ for 2 hours, 6 cycles, for a total of 24 hours;	试验前后外观要求: 金属表面 镀层应无剥落, 裂痕起皱, 分 离等。非金属部分不应变色, 发生开裂, 变形, 脱胶等不良; 电气性能测试符合标准要求; Appearance requirements before and after the experiment: The metal surface coating should be free of peeling, cracks, wrinkles, separation, etc. Non metallic parts should not discolor, crack, deform, or peel off; The electrical performance test meets the standard requirements;

3	盐雾试验 Salt spray test	配制浓度 $(5 \pm 1)\%$ NaCl 溶液，确保盐溶液的 pH 值为中性 $(6.5 \sim 7.2)$；压力桶温度 $47 \pm 1^\circ\text{C}$，喷雾压力保持在 $1.00 \pm 0.1\text{kgf/cm}^2$，喷雾量 $1.0 \sim 2.0\text{ml}/80\text{cm}^2/\text{h}$；试验时间 24H； Prepare a $(5 \pm 1)\%$ NaCl solution to ensure that the pH value of the salt solution is neutral $(6.5-7.2)$; The pressure barrel temperature is $47 \pm 1^\circ\text{C}$, the spray pressure is kept at $1.00 \pm 0.1\text{kgf/cm}^2$, and the spray volume is $1.0 \sim 2.0\text{ml}/80\text{cm}^2/\text{h}$; The experiment lasted for 24 hours;	产品表面外露区域不可有氧化、锈蚀现象；其它区域盐雾试验后的氧化/生锈面积 $< 1.0\%$ The exposed area of the product surface must not have oxidation or rust; Oxidation/rusting area after salt spray test in other areas $< 1.0\%$
4	端子维持力试验 Terminal holding force test	常温常湿；试验维持力要求：$\geq 0.8\text{kgf}$； Normal temperature and humidity; Test maintenance force requirement: $\geq 0.8\text{kgf}$;	端子与线缆无脱落、松动等；测试后电气性能测试符合标准要求；The terminals and cables are not loose or detached; The electrical performance test after testing meets the standard requirements;
5	端子插拔力试验 Terminal insertion and extraction force test	常温常湿；端子与座子正常连接，插入力 $0.8 \sim 3\text{kgf}$ / 拔出力 $\geq 0.8\text{kgf}$； Normal temperature and humidity; The terminal and seat are connected normally, with an insertion force of $0.8 \sim 3\text{kgf}$ / extraction force of $\geq 0.8\text{kgf}$;	端子插入力/拔出力符合要求，且端子无脱落、损伤等不良； The insertion/extraction force of the terminal meets the requirements, and the terminal has no defects such as detachment or damage;