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承认书

Antenna SPEC

客户名称 Customer name: 国光电器 Guoguang Electric

调试项目 Customer project: L05

客户料号 Customer P/N: EAN0059402

博安通料号 B&T P/N: 79220082

规格描述 Spec.: 内置天线-2.4G-FPC-13.1×6.8mm(L05-R)

Spec.: Built-in antenna-2.4G-FPC-13.1×6.8mm(L05-R)

出厂签章 Sealed by corporation:

编写 compilation	审核 verify	批准 approval
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检查 check	审核 verify	批准 approval

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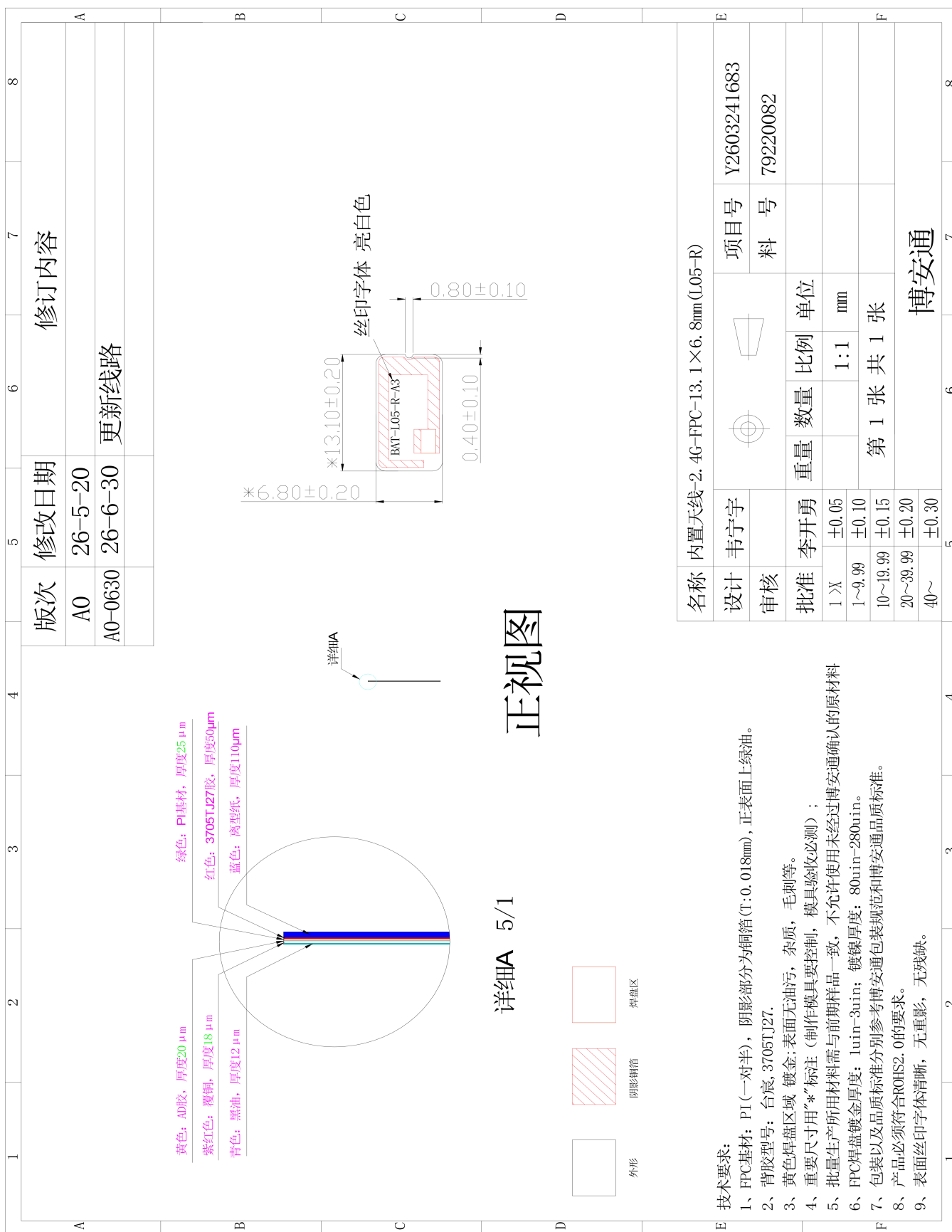
表单编号 Form number: B&T-QR-EN-002 版本 version: B3

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3、产品图面 Product drawing



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Version Modification date				Revised content			
A0				26-5-20			
A0-0630				26-6-30			
Update circuit							

Yellow: AD adhesive, thickness 13 μm

Green: PI substrate, thickness 12.5 μm

Purple red: copper-coated, thickness 18 μm

Red: 3705T127 glue, thickness 50 μm

Cyan: black oil, thickness 12 μm

Blue: Release paper, thickness 110 μm

Detailed A

Front view

Detailed A 5/1

Name				Internal Antenna-2.4G-FPC-13.1×6.8mm (L05-R)			
Sesign		Wei Ningyu		Project number		Y2603241683	
Audit				Part number		79220082	
Approval		Li Kaiyong		Weight		Company	
1 > X		±0.05		Scale		1:1	
1~9.99		±0.10		Quantity		mm	
10~19.99		±0.15		Page 1 of 1			
20~39.99		±0.20		B&T			
40~		±0.30					

Technical requirements:

- FPC base material: PI (one and a half pairs). The shaded area is copper foil (T: 0.018mm), with green solder mask on the top side.
- Adhesive type: Taichen, 3705T127.
- Gold plating in yellow pad area; Surface free of oil, impurities, burrs and so on.
- Important dimensions marked with "*" (mold production to control, mold acceptance must be measured);
- Materials used in mass production should be consistent with previous samples, and raw materials that have not been confirmed by Boantong are not allowed to be used.
- FPC pad gold plating thickness: 1-3 μm; nickel plating thickness: 80-280 μm.
- Packaging and quality standards refer to Boantong packaging specifications and Boantong quality standards respectively.
- The product must meet the requirements of RoHS2.0.
- The silkscreen text on the surface shall be clear, with no ghosting or incomplete characters.

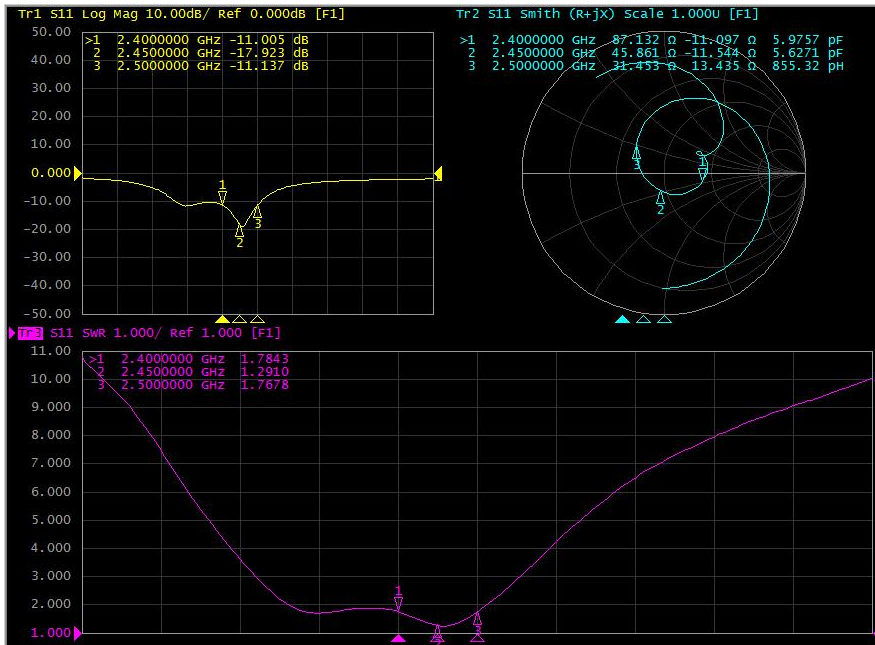
4、性能参数 Properties ¶meter

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	对照工程封样 Project Sample Sealing Comparison
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
环境参数 Environment parameter	
工作温度 Operating Temp	-30℃~65℃

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

自由空间 Free space



驻波比数据 Standing wave ratio data

	Freq/MHz	2400MHz	2450MHz	2500MHz
自由空间	VSWR	1.78	1.29	1.76

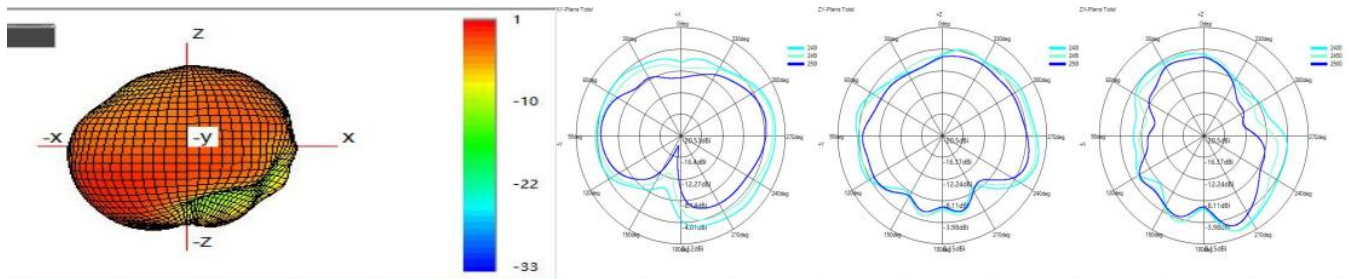
天线暗室测试数据 Antenna darkroom test data

自由空间 Free space

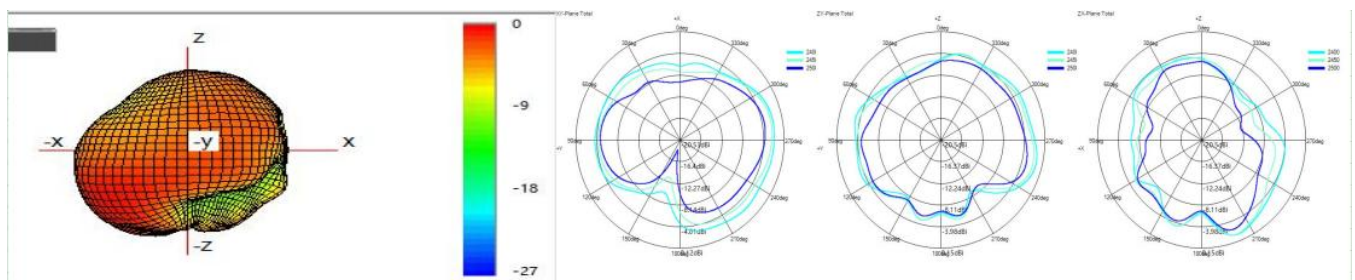
Freq(MHz)	Gain(dBi)	Efficiency(%)
2400	0.11	23.07
2410	0.07	26.36
2420	0.09	27.23
2430	0.11	28.83
2440	-0.09	29.76
2450	-0.26	30.63
2460	-0.28	31.86
2470	-0.34	29.12
2480	-0.74	28.64
2490	-1.07	26.80
2500	-1.23	24.74

➤ 天线方向图

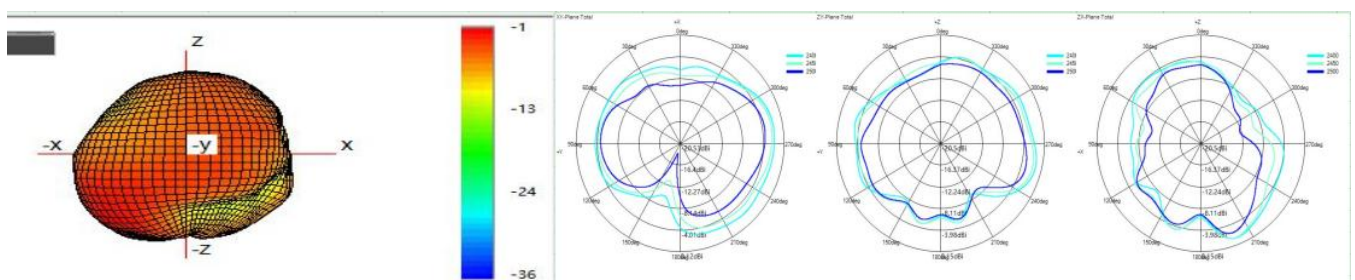
2400M 3D-E1-E2-H



2450M 3D-E1-E2-H



2500M 3D-E1-E2-H



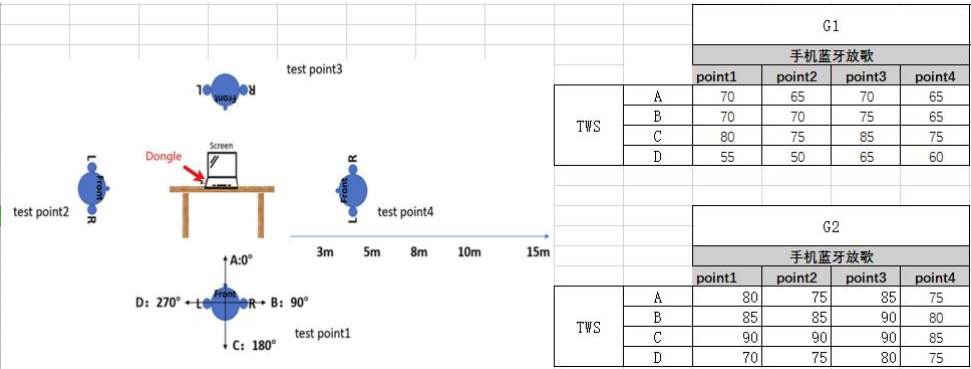
➤ 天线匹配电路示意 Antenna matching circuit schematic



➤ 有源 OTA 数据 Active OTA data

DUT	设备	Brust type	Brust type	BR Packet type	Pattern type	Channel	Test Item	R	L
								测试值 (dBm)	测试值 (dBm)
L05	CMW270	Basic rate	Basic rate	DH1	PRBS9	0	TRP	6.9	5.7
						39		7.21	5.43
						78		6.23	5.12
						0	TIS		
						39			
						78			

➤ TWS 拉锯数据 TWS Ranging Data



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	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

产品包装规范

PACKING CRITERION

产品料号 P/N: 79220082

产品规格: 内置天线-2.4G-FPC-13.1×6.8mm (L05-R)

Spec: Built-in antenna-2.4G-FPC-13.1×6.8mm (L05-R)

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 100 PCS/小袋/small bag

200 PCS/大袋/big bag

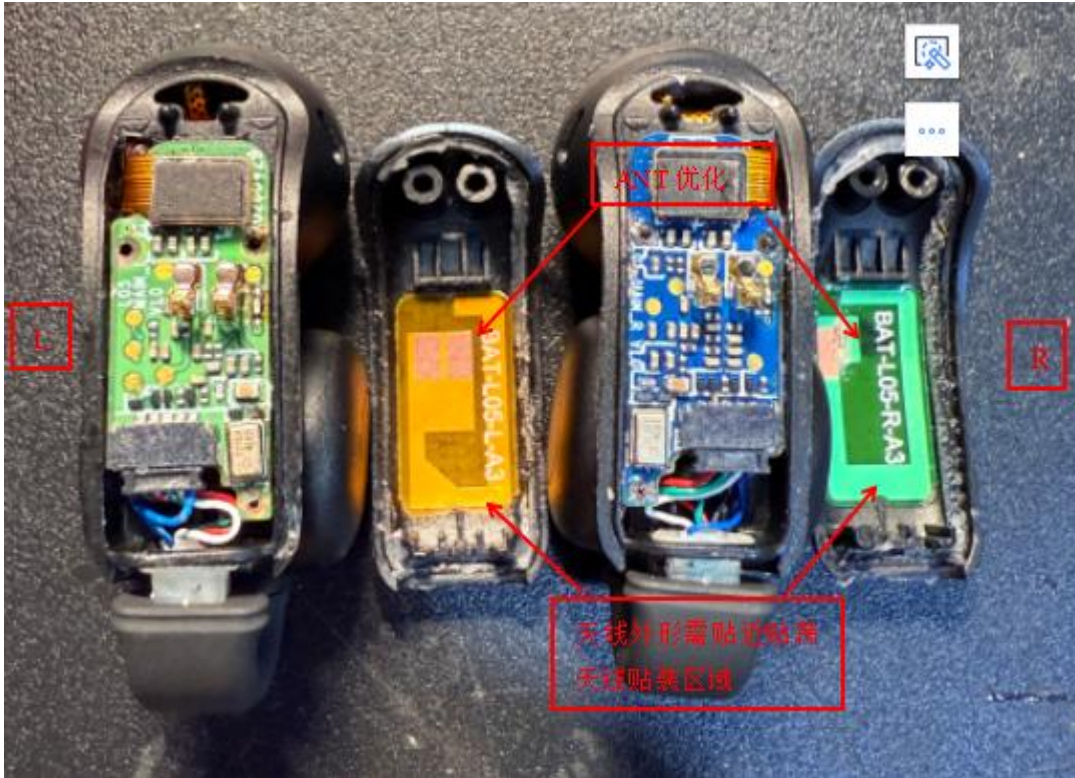
2. 外包装 outer packing:

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

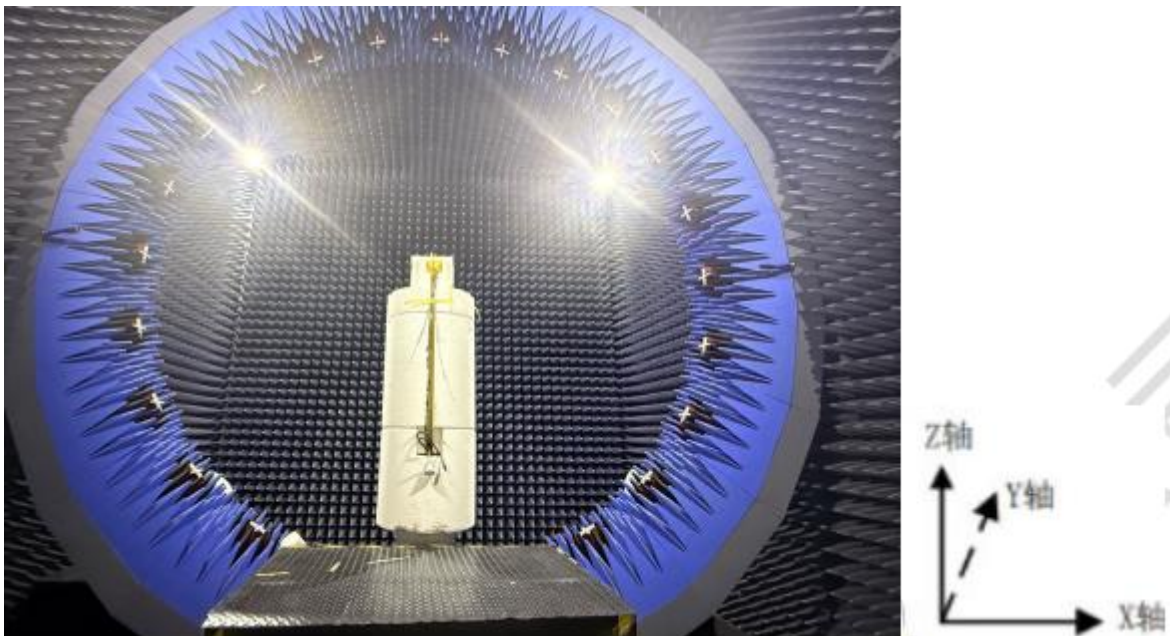
注意事项 Notice:

1. 是否要增设隔板、珍珠棉 Whether to add partitions, pearl cotton;
2. 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 °C, humidity: 80% RH for 24 hours; Low temperature -40 °C 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 °C for 2 hours, -40 °C 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±1) %NACL 溶液, 确保盐溶液的 pH 值为中性 (6.5~7.2); 压力桶温度 47±1℃, 喷雾压力保持在 1.00±0.1kgf/cm ² , 喷雾量 1.0~2.0ml/80cm ² /h; 试验时间 24H; Prepare a (5 ± 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 ± 1 °C, the spray pressure is kept at 1.00 ± 0.1kgf/cm ² , and the spray volume is 1.0~2.0ml/80cm ² /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%