

开发案号 Project: Y230901473

日期 Date.: 2024. 06. 27

版本 Ver.: A5

承认书

Antenna SPEC

客户名称 Customer name: 国光

调试项目 Customer project: Vega Mini

客户料号 Customer P/N: EAN00364

博安通料号 B&T P/N: 74220244

规格描述.: VZPT-内置天线-2.4G-灰色 1.13 锡锡线-1 代端子
-L=73mm-FPC-26×22.5mm

Spec.: VZPT-built-in antenna-2.4G-grey 1.13 tin wire-first
generation terminal-L=73mm-FPC-26×22.5mm

出厂签章 Sealed by corporation:

编写 compilation	审核 verify	批准 approval
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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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型号 Model:74220244

公司名称: 四川博安通通信技术有限公司

Company Name: Sichuan B&T Technology Co., Ltd.

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文件制定/修订/废止履历表 Document making / revising / abolishing resume

版本 Version	日期 Date	制定/修订内容 Develop/revise content	制定 Formulate	核准 approval
A0	2023.09.11	首次制定 First formulation	邱翠萍 Qiucui ping	吕杰/刘立华 Lv jie/Liulihua
A0-0919	2023.09.19	增加拉距数据 Add pull distance data	黄飞辉 Huangfei hui	吕杰/刘立华 Lv jie/Liulihua
A1	2023.12.07	更新 FPC 公差及冲断位改手撕拉耳位 Updated FPC tolerance and thrust position instead of hand tear pull Lvg position	黄飞辉 Huangfei hui	吕杰/刘立华 Lv jie/Liulihua
A2	2024.04.10	更新增益 (客户认证用) Update gain (for customer authentication)	邱翠萍 Qiucui ping	吕杰/刘立华 Lv jie/Liulihua
A3	2024.04.17	项目名称由之前: Blaster 改成 Vega mini Project name from before: Blaste Change into Vega mini	邱翠萍 Qiucui ping	吕杰/刘立华 Lv jie/Liulihua
A4	2024.06.25	更新线长和海棉位置调整, FPC 加大焊盘 Update line length and sponge position adjustment, FPC increase pad	邱翠萍 Qiucui ping	吕杰/刘立华 Lv jie/Liulihua
A5	2024.06.27	更新 FPC 丝印:m 变成了大写 M Update FPC silk screen: m changed to capital M	邱翠萍 Qiucui ping	吕杰/刘立华 Lv jie/Liulihua

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3、产品图面 Product drawing

Version		modification date	Revised content
A0	23-9-11		
A1	23-12-6		Updated FPC tolerances and hand tear bits
A2	24-4-17		Update FPC silk screen content
A3	24-6-25		Update the line length and sponge position adjustment, and enlarge the FPC pad
A4	24-6-26		Update FPC silk screen; m changed to capital M

Technical requirements

- The antenna welding part is firm and the cable size is accurate (the holding force of the connector is $\geq 1\text{kgf}$).
- The silk screen color is the original color of the substrate, and the font is clear and not easy to fall off.
- "*" indicates the dimensions that are key to IQC inspection.
- The packaging and quality standards refer to the Boantong Packaging Specifications and B&T Quality Standards respectively.
- The materials comply with ROHS, REACH, VOC, California 65, PAHS, and TSCA.
- The connector port identification direction

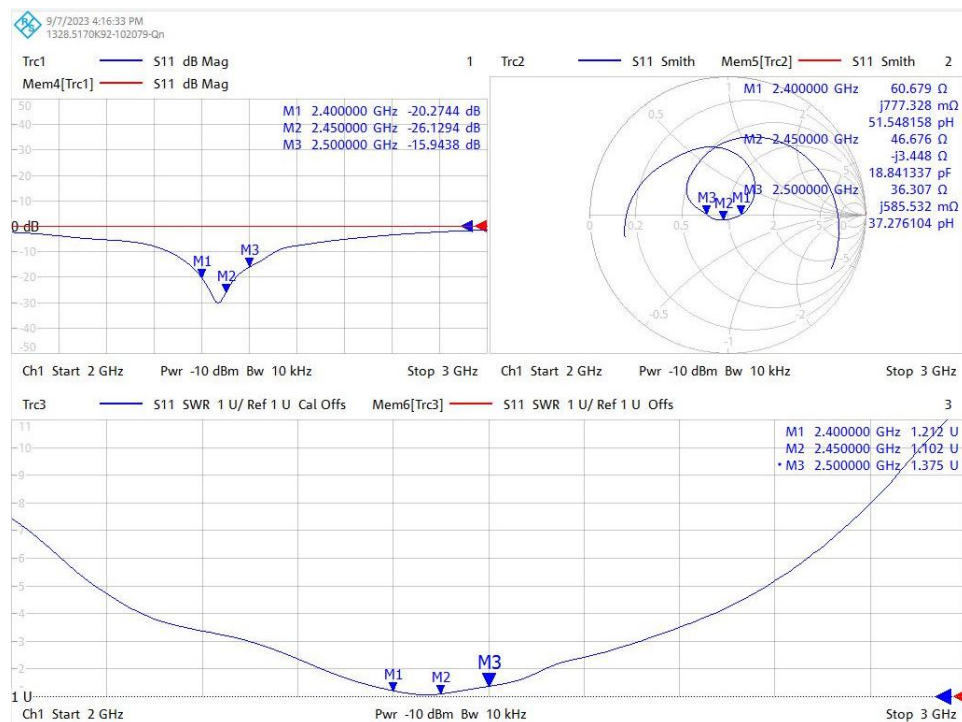
Number	Part Name	remarks	Design	Tang hailin	weight	quantity	proportion	Company	name	Project number
①	1st connector		toexamine						VZPT-built-in antenna-2.4G-grey	
②	Coaxial line								1.13 tin wire-first generation	
③	Shockproof sponge	Manual fold and stick	approval						terminal-L=73mm-FPC-26×22.5mm	
④	FPC		1>X	±0.05			1:1	mm	Y230901473	
			1~9.99	±0.10					74220244	
			10~19.99	±0.15						
			20~39.99	±0.20						
			40~	±0.30						
Page 1 1 in total										

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	<2.0
增益 Gain	$\geq 1.5\text{dBi}$, $\leq 2.5\text{dBi}$
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	
总长 Length	73 $\pm$ 3mm
端子维持力 Maintain the force	$\geq 1\text{kgf}$
同轴电缆 Coaxial cable	灰色 1.13 锡锡线 Grey 1.13 tin tin cable
盐雾测试 Salt spray test	24H
环境参数 Environment parameter	
工作温度 Operating Temp	-30 $^{\circ}\text{C}$ ~65 $^{\circ}\text{C}$

5、电气性能测试报告 Electrical test report (整机 complete machine test)

➤ 天线 S11 参数图 Antenna S11 parameter diagram



➤ 驻波比数据 VSWR

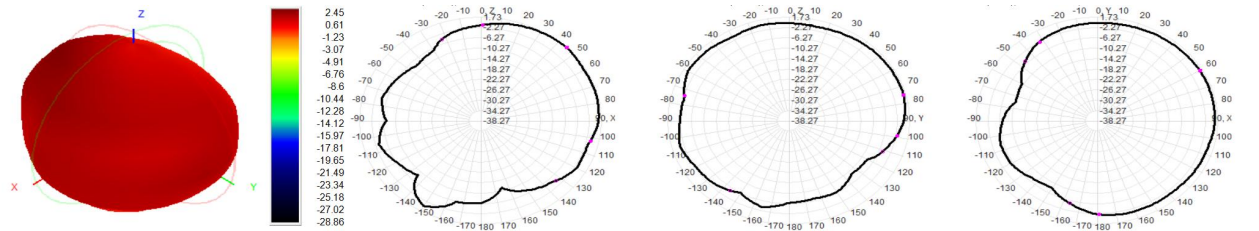
Freq/MHz	2400MHz	2450MHz	2500MHz
VSWR	1.21	1.10	1.37

➤ 天线暗室测试数据 Antenna darkroom test data

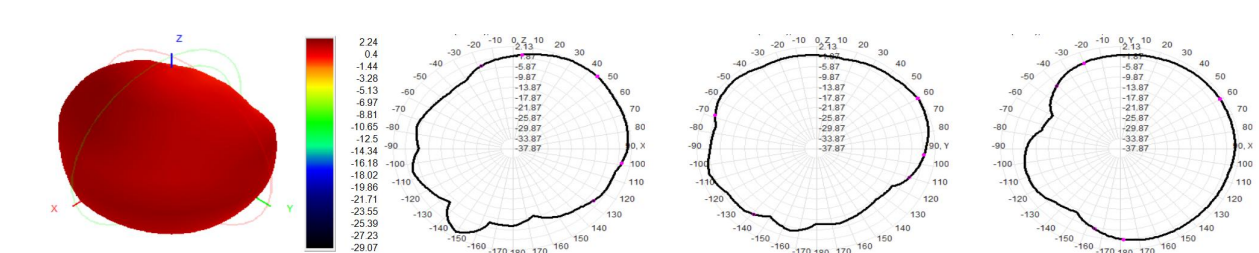
Frequency (MHz)	Efficiency (dBi)	Gain (dBi)	Efficiency (%)
2400	-2.22	2.24	60.00
2410	-2.28	2.16	59.15
2420	-2.33	2.22	58.49
2430	-2.39	2.26	57.69
2440	-2.30	2.45	58.89
2450	-2.34	2.44	58.34
2460	-2.37	2.41	57.96
2470	-2.43	2.31	57.13
2480	-2.50	2.19	56.20
2490	-2.49	2.08	56.31
2500	-2.65	1.96	54.29

➤ 天线方向图 Antenna pattern

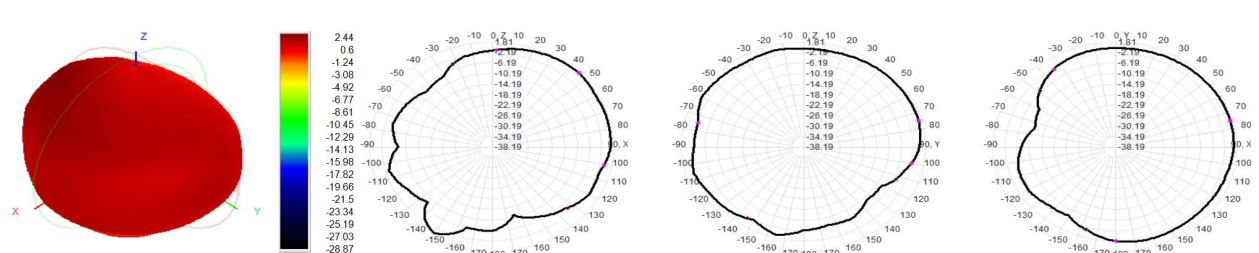
2440M 3D-E1-E2-H



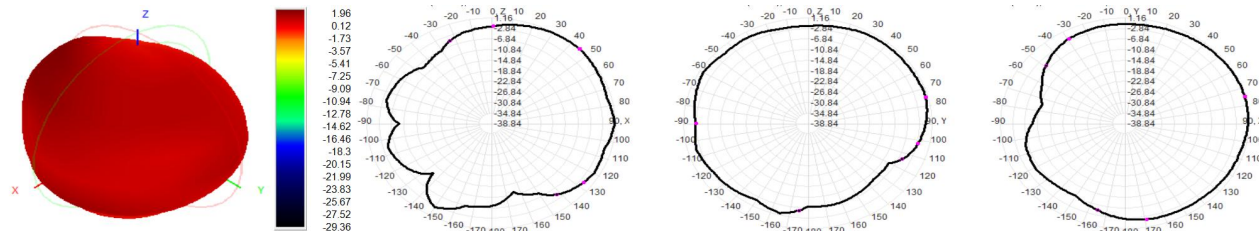
2400M 3D-E1-E2-H



2450M 3D-E1-E2-H



2500M 3D-E1-E2-H



➤ 有源 OTA 测试数据 OTA test data

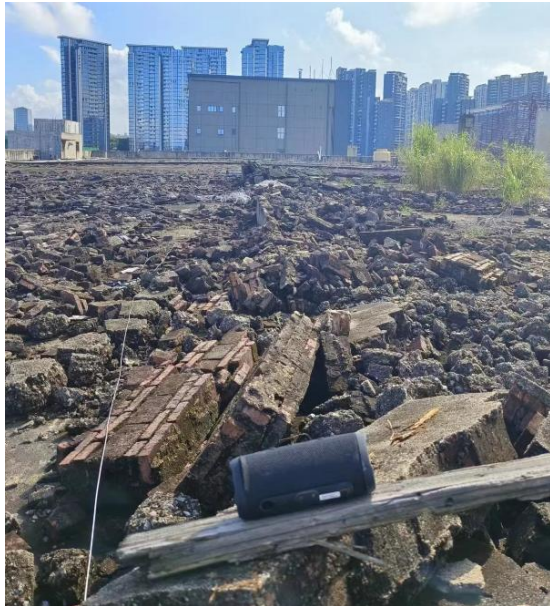
DUT	Equipment	trust typ	Packet Type	Test Item	Channel	Frequency (MHz)	测试值 (dBm)	传导值	效率
Blaster	CMW270	asic Rat	DH5	TRP	0	2402	4.38	7.54	-3.16
					39	2441	4.62	7.48	-2.86
					78	2480	4.03	7.12	-3.09
				TIS	0	2402	-89.15	-92	-2.85
					39	2441	-89.46	-92	-2.54
					78	2480	-89.39	-92	-2.61

Frequency (MHz)	Efficiency (dBi)	Gain (dBi)	Efficiency (%)
2400	-2.22	2.24	60.00
2410	-2.28	2.16	59.15
2420	-2.33	2.22	58.49
2430	-2.39	2.26	57.69
2440	-2.30	2.45	58.89
2450	-2.34	2.44	58.34
2460	-2.37	2.41	57.96
2470	-2.43	2.31	57.13
2480	-2.50	2.19	56.20
2490	-2.49	2.08	56.31
2500	-2.65	1.96	54.29

➤ 拉距测试 Pull distance test

测试环境：空旷楼顶，无任何干扰源。

Test environment: empty roof, no source of interference.



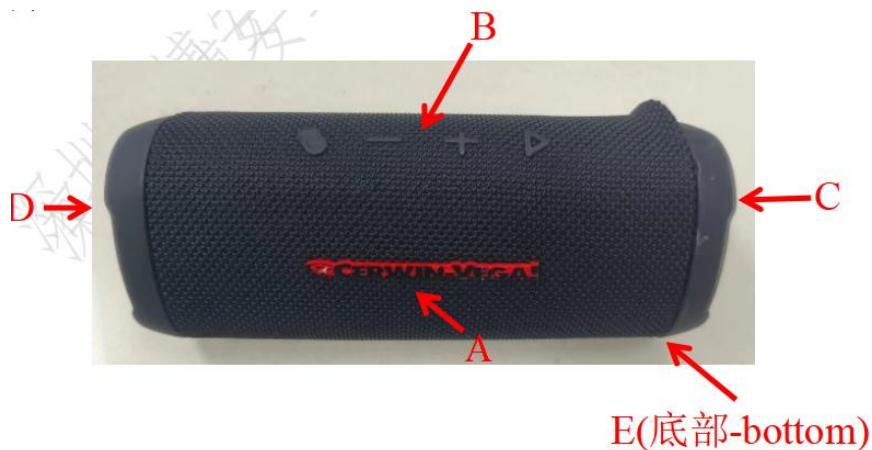
测试环境示意

Test environment signal

测试方法：将设备放于高平台上，使用手机连接设备进行音乐播放，同时在音乐正常播放无卡顿、断续时远离设备，当音乐出现卡顿、断续时往回靠近设备，直至音乐恢复正常，按照以上方法找出领界值，记录方向和直线距离。本次测试使用手机为 VIVO X90。

Test method: put the device on the high level platform, use the mobile phone to connect the device to play music. At the same time, stay away from the device when the music is playing normally or intermittent. When the music is intermittent, approach the device until the music returns to normal, find out the boundary value according to the above method, record the direction and straight line distance. The mobile phone used in this test is the VIVO X90.

设备方向示意：



测试结果：

test result:

测试方向 Test direction	A 面 A face	B 面 B face	C 面 C face	D 面 D face	E (底部) E(bottom)
距离 (设备置于木板上) Distance (equipment placed on wooden board)	70m	70m	70m	70m	85m
距离 (设备置于水泥上) Distance (equipment placed on cement)	55m	55m	55m	55m	85m

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	NGBPC24000131241	2024/1/16
		镀锡铜线 Tinned wire	ND	ND	ND	ND	ND	ND	CANEC23005577501	2023/7/7
2	端子 Terminal	PBT	ND	3.76	ND	ND	ND	ND	ETR23705930	2023/8/4
		磷青铜 Phosphor Bronze	ND	6	ND	ND	ND	ND	CANEC24000977301	2024/1/22
3	FPC	PI	ND	ND	ND	ND	ND	ND	SHAEC24000428805	2024/1/12
		背胶 Tape	ND	ND	ND	ND	ND	ND	SHAEC23021627701	2023/12/27
4	海绵 Sponge	PU 泡棉 PU Sponge	ND	ND	ND	ND	ND	ND	A2230532385101004E	2023/10/21
		背胶 Tape	ND	ND	ND	ND	ND	ND	A2230621001101001	2023/11/30

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

产品包装规范

PACKING CRITERION

产品料号 P/N: 74220244

产品规格: VZPT-内置天线-2.4G-灰色 1.13 锡锡线-1 代端子-L=73mm-FPC-26×22.5mm
 Spec : VZPT-built-in antenna-2.4G-grey 1.13 tin wire-first generation terminal-L=73mm-FPC-26×22.5mm

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 wid

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

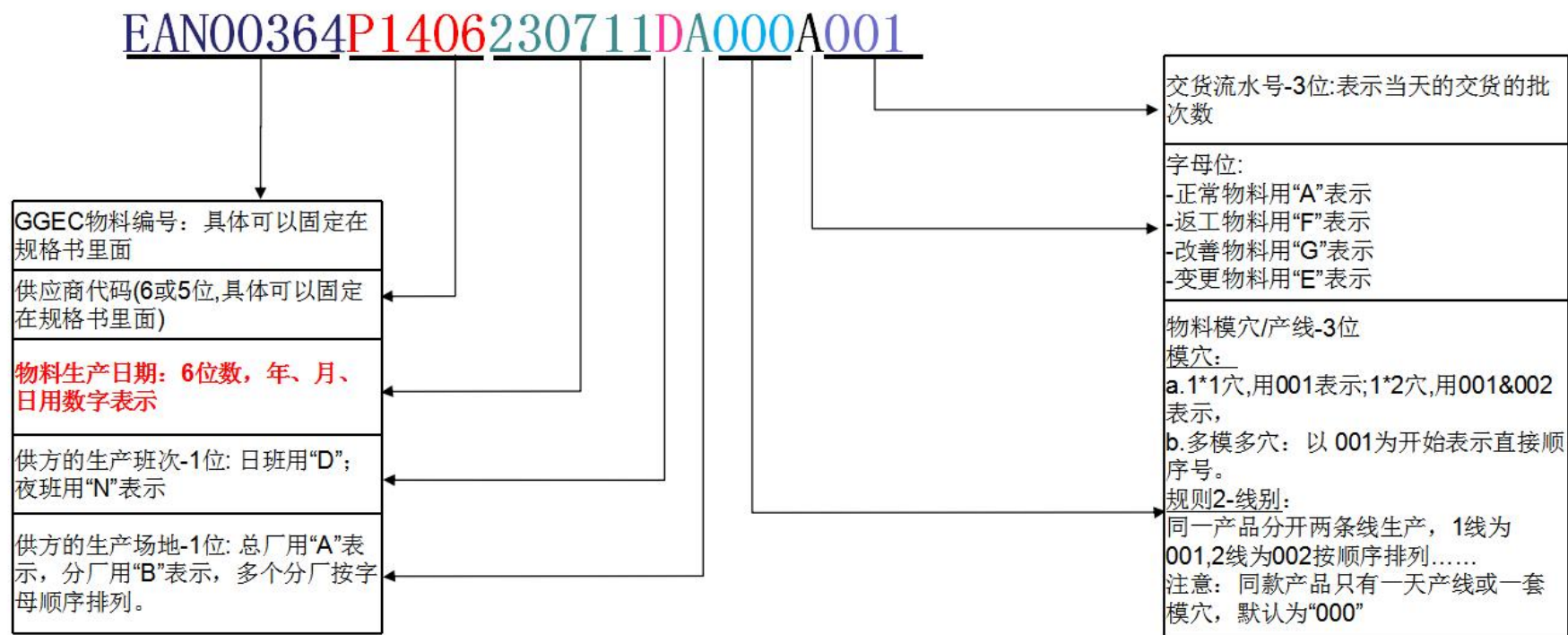
2. 外包装 outer packing:

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

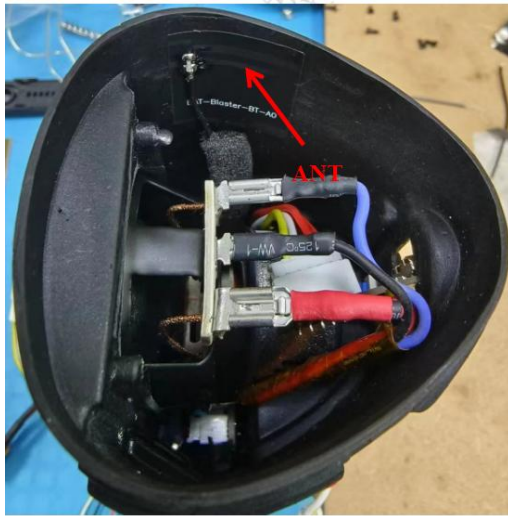
注意事项 Notice:

- 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;

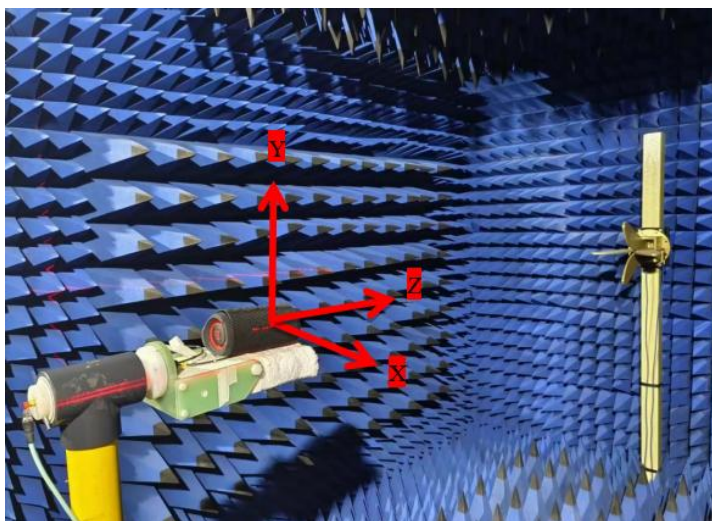
GGEC I 条形码打印规则



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 Antenna test darkroom placement



10、可靠性测试要求 Reliability test requirements

序号 No.	可靠性试验名称 Reliability Test Name	试验条件 Test Conditions	判定标准 Evaluation Criteria
1	恒温恒湿试验 Constant Temperature and Humidity Test	高温:70°C, 湿度:80%RH 24H; 低温 -40°C 24H;共持续 48H; High temperature: 70° C, Humidity: 80%RH for 24 hours; Low temperature: -40° C for 24 hours; Total duration 48 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; Before and after the test, the appearance requirements: The metal surface plating should have no peeling, cracks, wrinkling, separation, etc. Non-metal parts should not change color, have cracks, deformation, glue detachment, and other defects; Electrical performance tests should meet the standard requirements;
2	高低温冷热冲击试验 High and Low Temperature Shock Test	70°C持续 2H、-40°C持续 2H, 6 次循环, 共 24 小时; 70° C for 2 hours, -40° C for 2 hours, 6 cycles, total 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; Before and after the test, the appearance requirements: The metal surface plating should have no peeling, cracks, wrinkling, separation, etc. Non-metal parts should not change color, have cracks, deformation, glue detachment, and other defects; Electrical performance tests should meet 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, ensure the pH value of the salt solution is neutral $(6.5 \sim 7.2)$; Pressure pot temperature $47 \pm 1^\circ\text{C}$, spray pressure maintained at $1.00 \pm 0.1 \text{ kgf/cm}^2$, spray rate $1.0 \sim 2.0 \text{ ml}/80 \text{ cm}^2/\text{h}$; Test duration 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 should not have oxidation or rusting; Other areas after the salt spray test, the oxidation/rust area should be less than 1.0%;
4	端子维持力试验 Terminal Retention Force Test	常温常湿; 试验维持力要求: $\geq 1.0 \text{ kgf}$; Ambient temperature and humidity; Test retention force requirement: $\geq 10 \text{ kgf}$;	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; Terminals and cables should not fall off or loosen; After the test, the electrical performance should meet the standard requirements;
5	端子插拔力试验 Terminal Insertion and Withdrawal Force Test	常温常湿; 端子与座子正常连接, 插入力/拔出力 $\geq 1.0 \text{ kgf}$ Ambient temperature and humidity; Terminals and sockets are normally connected, insertion force/withdrawal force $\geq 1.0 \text{ kgf}$;	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; Insertion force/withdrawal force should meet the requirements, and the terminals should not fall off or be damaged;