



深圳市橙子数字科技有限公司承认书

Shenzhen Orange Digital Technology Co., Ltd

公司名称

MANUFACTORY: 深圳市亿圣邦科技有限公司(Shenzhen Yishengbang Technology Co., LTD)

品 名

规 格

DESCRIPTION: BT 天线(Antenna) SPECIFICATION: SLK-CZ-3212F-R-160I-W-1.13DS

料 号

机 型

PART NO.: 101100221 MODEL NO.: C1

图 号

日 期

DRAWING NO.: _____ D A T E: 2025-4-23

批准人(APPROVED BY)

工程师 (Engineer)	PCB 工程师 (PCB Engineer)	安规工程师 (Safety Engineer)	部品工程师 (Parts Engineer)	经 理 (Manager)
承认章 APPROVED BY				
日期(Date):				

注：此承认书需附上详细的样品规格书、图纸、ROHS 报告资料等。共五套完整的资料。承认书一式五份，每份承认书样品数量不得少于 2PCS。(Note: This acknowledgement letter needs to be accompanied by detailed sample specifications, drawings, ROHS report materials, etc. There are a total of five complete sets of materials. The acknowledgement letter shall be made in five copies, and the sample quantity of each acknowledgement letter shall not be less than 2PCS.)

深圳市亿圣邦科技有限公司

样品承认书

Shenzhen Yishengbang Technology Co., LTD
Sample acceptance letter

SPECIFICATION FOR APPROVAL

公 司 名 称 (corporate name): 深圳市橙子数字科技有限公司
(Shenzhen Orange Digital Technology Co., Ltd)

物 料 代 码 (Material code): 101100221

规 格 型 号 (Specification and model): C1

承 认 日 期 (Admitted date): _____

供 应 商 名 称 (Supplier Name): 深圳市亿圣邦科技有限公司
(Shenzhen Yishengbang Technology Co., LTD)

供 应 商 规 格 型 号 (Supplier specifications and models):
BT:SLK-CZ-3212F-R-160I-W-1.13DS

承 认 签 章(Admit signature)					
供 应 商 承 认 (Supplier acknowledges)			深圳市橙子数字科技有限公司 (Shenzhen Orange Digital Technology Co., Ltd)		
工 程 师 (Engineer)	审 核 (To examine)	批 准 (Approval)	工 程 师 (Engineer)	审 核 (To examine)	批 准 (Approval)
范新竹 (Xin Zhu Fan)	黄 震 (Zhen Huang)	林 美 财 (Mei Cai Lin)			
盖章签署 (Seal and sign)			盖章签署 (Seal and sign)		
日 期 (Date)		2025-04-23	日 期 (Date)		
批示 (Instructions): ☐ 接受 (Accept) ☐ 有条件接受 (Conditional acceptance)					
备注 (客户填写) Remarks (to be filled in by the customer):					

供应商名称 (Supplier Name): 深圳市亿圣邦科技有限公司
(Shenzhen Yishengbang Technology Co., LTD)

供应商地址 (Supplier Address):
深圳市宝安区深圳前湾硬科技产业园 C 栋 101
(101, Building C, Qianwan Hard Technology Industrial
Park, Bao'an District, Shenzhen)

电 话 (Telephone): 18025305599
电 话 ((Telephone)): 18666299104

修订履历(Change History)

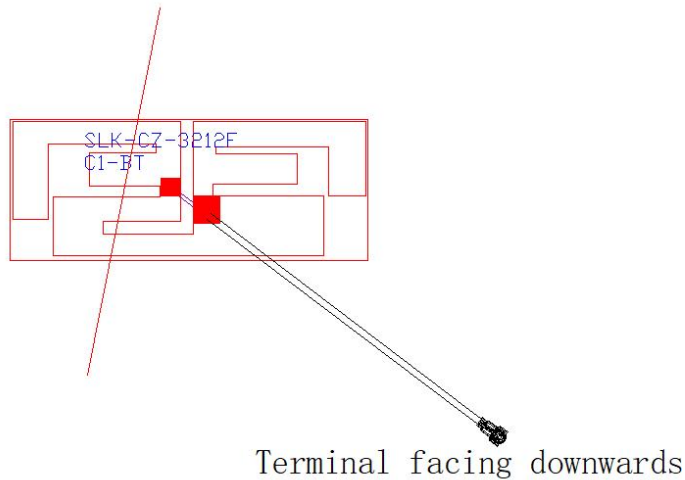
版本 REVISION	修改项次 DESCRIPTION	修改日期 DATE
A0	首次制定(First formulation)	2025.04.23

目录(Catalogue)

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BT

4. 产品编号说明(Explanation of Product number):



产品代码(Product Code):

- (1) 客户(Customer):橙子(Orange)
- (2) 天线名称(Antenna Name):BT天线 (BT Antenna)
- (3) 连接器(Connector):1.13白色低损线, 总长160mm, 1代端子
(1.13 white low loss wire, total length 160mm, 1st generation terminal)

5. 特征(Features)

- *性能稳定可靠(Stable and reliable in performances)
- *尺寸紧凑(Compact size)
- *符合RoHS标准(RoHS compliance)

6. 应用(Applications)

- * 蓝牙(Bluetooth)
- * 需要蓝牙功能时的手持设备
(Hand-held devices when Bluetooth functions are needed)

7. 说明(Description)

Holy bond的FPC天线系列是专为蓝牙应用而设计的。基于Holy bond的专有设计和工艺, 这种FPC天线具有出色的稳定性和灵敏度, 能够始终如一地提供高信号接收效率。

(Holy bond’s FPC antenna series are specially designed for Bluetooth applications. Based on Holy bond’s proprietary design and processes, this FPC antenna has excellent stability and sensitivity to consistently provide high signal reception efficiency.)

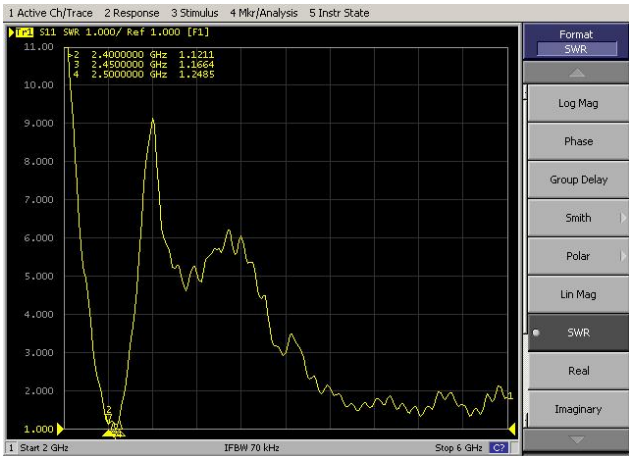
8. 电气规格(Electrical Specifications)

8-1

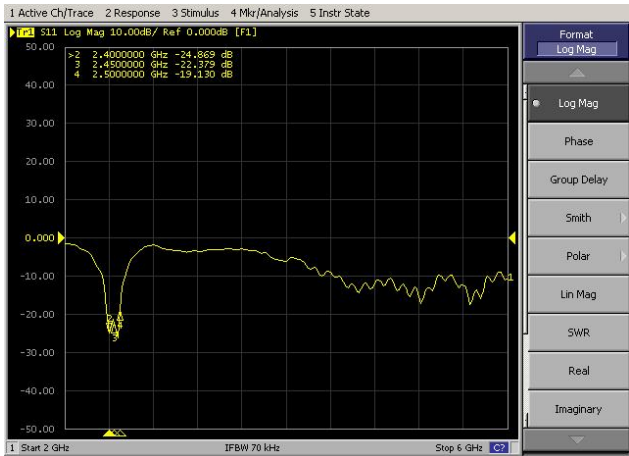
特点(Characteristics)	规格 (Specifications)	单位 (Unit)
外形尺寸(Outline Dimensions)	32.29x12.68x0.12	mm
中心频率(Center Frequency)	2.4-2.5	GHz
带宽(-10dB以下回波损耗) (Bandwidth(under-10dB return loss))	130min	MHz
VSWR	3max	

8-2.

VSWR



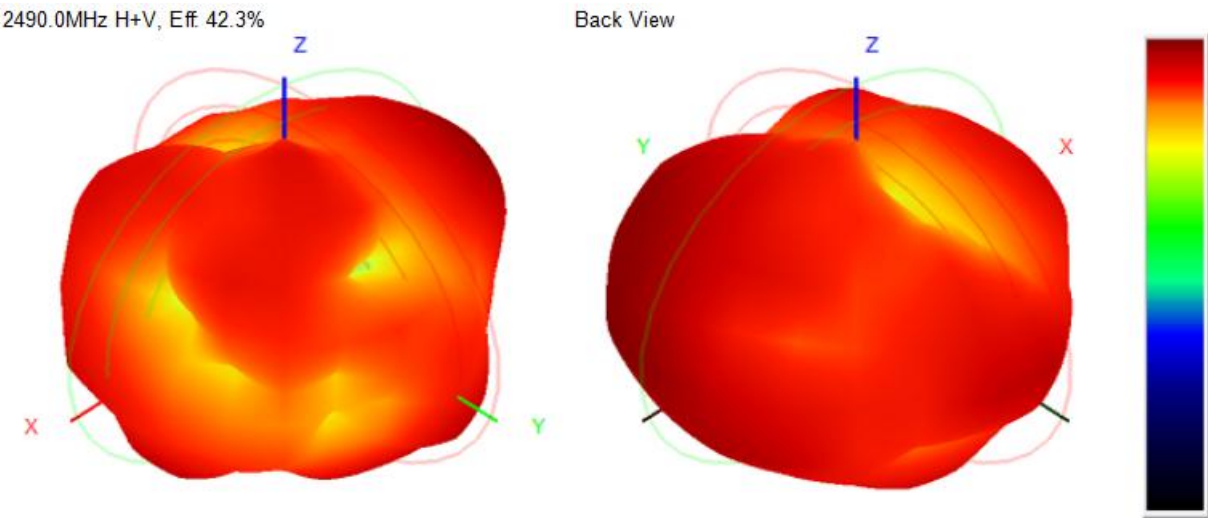
S11



8-3.WIFI+BT 天线增益/效率/3D 辐射方向图

(WIFI +BT Antenna Gain/Efficiency/Radiation Pattern of 3D)

Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0	2500.0
Efficiency (dBi)	-3.38	-3.48	-3.46	-3.55	-3.65	-3.75	-3.65	-3.80	-3.76	-3.73	-3.73
Gain (dBi)	1.31	1.48	1.52	1.47	1.21	1.25	1.46	1.48	1.60	1.69	1.50
Efficiency (%)	45.87	44.84	45.04	44.11	43.08	42.15	43.14	41.67	41.98	42.31	42.31



9.可靠性测试(reliability testing)

9-1 盐雾试验(Salt Spray Test)

测试项目 (Test project)	盐雾测试 (Salt Spray Test)																						
产品规格型号 (Product specifications and models)	SLK-CZ-3212F-R-160I-W-1.13DS	检测数量 (Number of detections): 5PCS																					
检测时间 (Testing time): 2025-4-21		完成时间 (Completion time): 2025-4-22																					
试验/检验设备 (Testing/Inspection Equipment): 1. HY-60D 盐雾测试仪 (HY-60D Salt Spray Tester) 2. HP-8753ES 网络分析仪 (HP-8753ES Network Analyzer)																							
试验/检验条件 (Test/Inspection Conditions): 1. 盐雾箱内温度为35±2℃; 试验室温度22-30℃ (The temperature inside the salt spray box is 35 ± 2 °C; Laboratory temperature: 22-30 °C) 2. 盐雾沉降速度经24h喷雾后每80cm 面积为1-2ML/h氯化钠浓度为50±10g/L, PH值 为6.5/7.2(The settling speed of salt spray is 1-2ML/h per 80cm area after 24h spray, the concentration of sodium chloride is 50 ± 10g/L, and the PH value For 6.5/7.2)																							
判定标准 (Judgment criteria): 1. 电气测试符合标准要求: 电压驻波比测试合格 (Electrical testing meets standard requirements: voltage standing wave ratio test is qualified); 2. 金属表面镀层无氧化、剥落、裂痕、分离等不良; 非金属部分无变色、变形、脱胶、开裂等不良 (The metal surface coating has no defects such as oxidation, peeling, cracking, separation, etc; Non metallic parts have no discoloration, deformation, delamination, cracking or other defects)																							
<table><tr><td></td><td>评价等级 (Evaluation level)</td><td>不良描述 (Bad description)</td></tr><tr><td>样品编号 (Sample number)</td><td></td><td></td></tr><tr><td>1</td><td>合格 (qualified)</td><td>无 (nothing)</td></tr><tr><td>2</td><td>合格 (qualified)</td><td>无 (nothing)</td></tr><tr><td>3</td><td>合格 (qualified)</td><td>无 (nothing)</td></tr><tr><td>4</td><td>合格 (qualified)</td><td>无 (nothing)</td></tr><tr><td>5</td><td>合格 (qualified)</td><td>无 (nothing)</td></tr></table>				评价等级 (Evaluation level)	不良描述 (Bad description)	样品编号 (Sample number)			1	合格 (qualified)	无 (nothing)	2	合格 (qualified)	无 (nothing)	3	合格 (qualified)	无 (nothing)	4	合格 (qualified)	无 (nothing)	5	合格 (qualified)	无 (nothing)
	评价等级 (Evaluation level)	不良描述 (Bad description)																					
样品编号 (Sample number)																							
1	合格 (qualified)	无 (nothing)																					
2	合格 (qualified)	无 (nothing)																					
3	合格 (qualified)	无 (nothing)																					
4	合格 (qualified)	无 (nothing)																					
5	合格 (qualified)	无 (nothing)																					
试验 / 检验 判定 (Test/Inspection Judgment) : ☒ 合格 (qualified) ☐ 不合格 (unqualified) ☐ 不作判定 (Not making a judgment)																							
测试员 (Tester): 王鑫源 (Xin Yuan Wang) 审核 (to examine): 王国行 (Guo Xing Wang) 批准 (approval): 郭亮 (Liang Guo)																							

9-2 温度/湿度测试(Temperature / Humidity test)

测试项目 (Test project)	恒温恒湿测试 (Constant temperature and humidity test)	
产 品 规 格 型 号 (Product specifications and models)	SLK-CZ-3212F-R-160I-W-1.13DS	检 测 数 量 (Number of detections): 5PCS
检测时间 (Testing time): 2025-4-21		完 成 时 间 (Completion time): 2025-4-22

试验/检验设备 (Testing/Inspection Equipment):

1. 程式恒温恒湿试验箱 (Programmable constant temperature and humidity test chamber)
2. HP-8753ES 网络分析仪 (HP-8753ES Network Analyzer)

试验/检验条件(Test/Inspection Conditions):

1. 常温25℃，湿度65%环境下测试 (Tested at room temperature of 25 °C and humidity of 65%)
2. +80±2℃ 85-90%RH /-30±2℃ 0%RH 2 小时一个循环 时间 24H
(+80 ± 2 °C 85-90% RH/-30 ± 2 °C 0% RH 2 hours per cycle time 24H)

判定标准(Judgment criteria):

1. 电气测试符合标准要求：电压驻波比测试合格 (Electrical testing meets standard requirements: voltage standing wave ratio test is qualified);
2. 金属表面镀层无氧化、剥落、裂痕、分离等不良；非金属部分无变色、变形、脱胶、开裂等不良 (The metal surface coating has no defects such as oxidation, peeling, cracking, separation, etc; Non metallic parts have no discoloration, deformation, delamination, cracking or other defects)

样品编号 (Sample number)	评价等级 (Evaluation level)	不良描述 (Bad description)
1	合格 (qualified)	无 (nothing)
2	合格 (qualified)	无 (nothing)
3	合格 (qualified)	无 (nothing)
4	合格 (qualified)	无 (nothing)
5	合格 (qualified)	无 (nothing)

试验 / 检验判定 (Test/Inspection Judgment): ☒ 合格 (qualified)
☐ 不合格 (unqualified) ☐ 不作判定 (Not making a judgment)

测试员 (Tester): 王鑫源 (Xin Yuan Wang) 审核 (to examine):
 王国行 (Guo Xing Wang) 批准 (approval): 郭亮 (Liang Guo)

9-3 strain relief test(应力释放试验)

测 试 项 目 (Test project)	拉力测试(tensile test)	
产 品 规 格 型 号 (Product specifications and models)	SLK-CZ-3212F-R-160I-W-1.13DS	检 测 数 量 (Number of detections): 5PCS
检测时间(Testing time): 2025-4-21		完 成 时 间 (Completion time):2025-4-22

试验/检验设备 (Testing/Inspection Equipment):

1. 拉力测试计(Tensile testing meter)

试验/检验条件(Test/Inspection Conditions):

1. 温度: 18-25℃ (Temperature: 18-25 °C)

2. 湿度 $\leq 70\%RH$ (Humidity $\leq 70\% RH$)

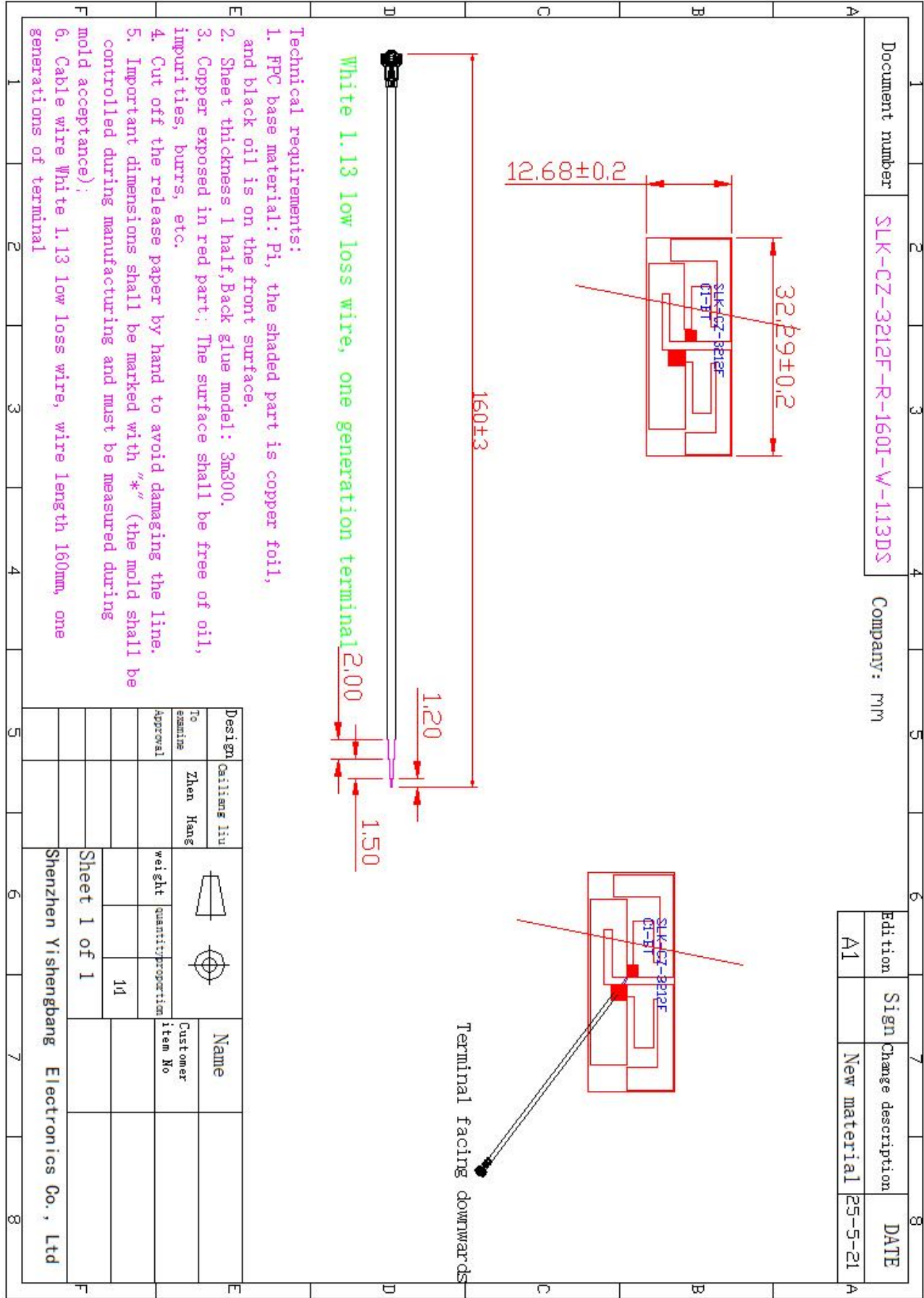
测试结果: 合格 (Test result: Qualified)

项目(project) 条件 (condition)	端子与射频线缆之间的维持力 $\geq 1\text{kgf}$ (The maintenance force between the terminal and the RF cable is $\geq 1\text{kgf}$)				
测 试 次 数 (Test frequency)	1	2	3	4	5
测试结果(test result)	1.25	1.24	1.25	1.23	1.22

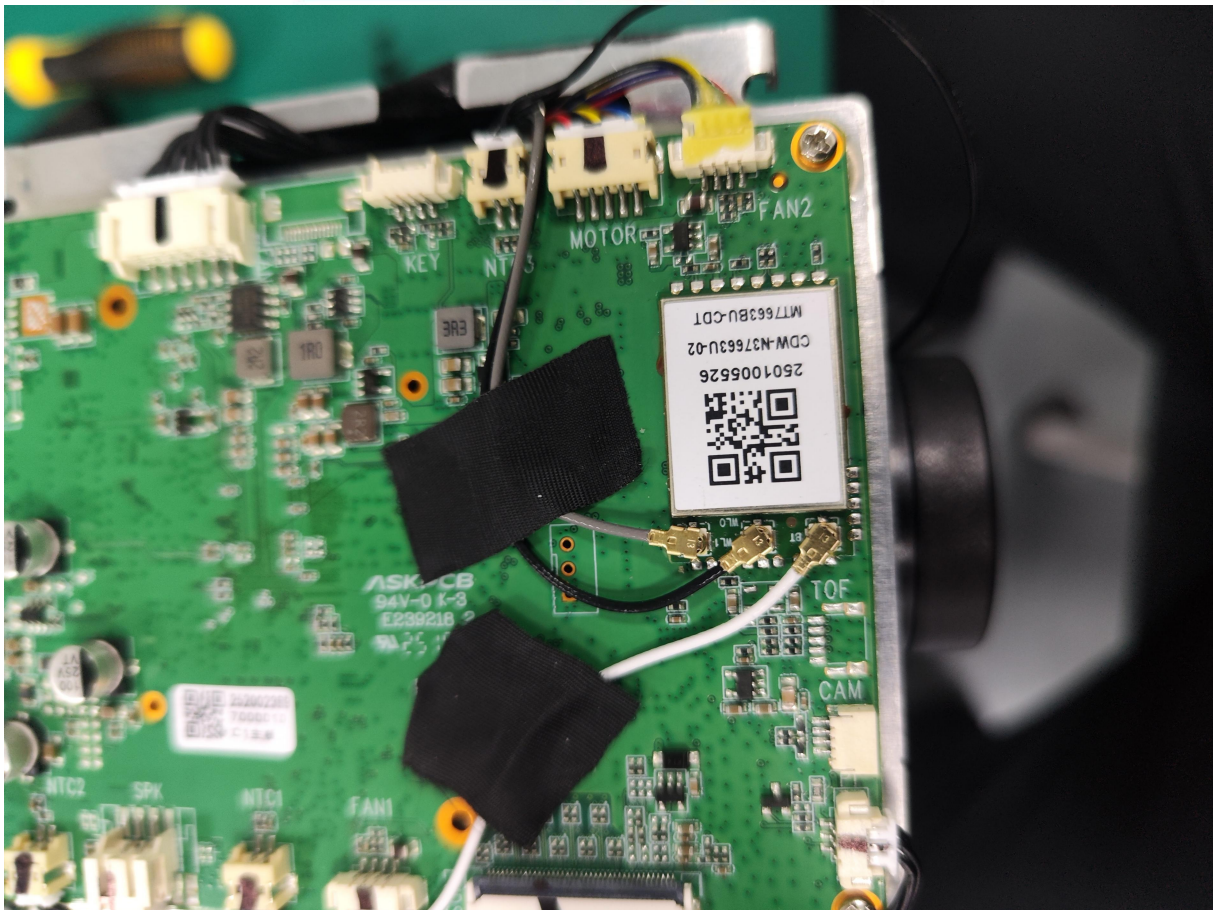
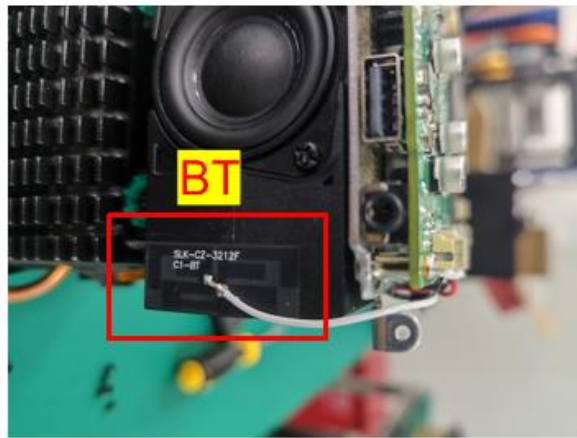
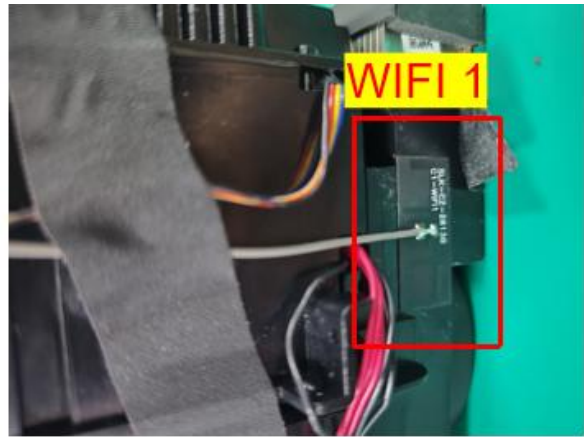
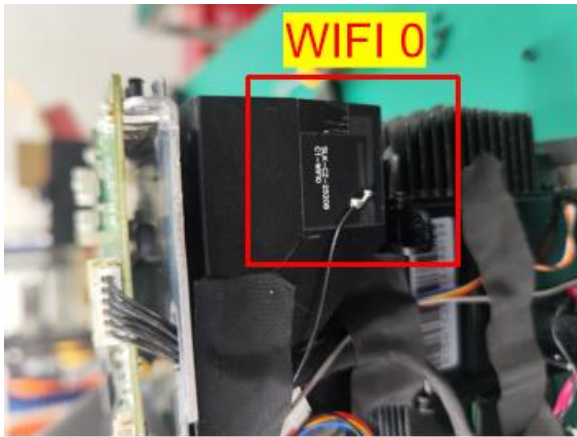
试验 / 检验判定 (Test/Inspection Judgment): ☒ 合格 (qualified)
☐ 不合格 (unqualified) ☐ 不作判定 (Not making a judgment)

测试员(Tester): 王鑫源(Xin Yuan Wang) 审核(to examine):
王国行(Guo Xing Wang) 批准(approval): 郭亮(Liang Guo)

10. 天线尺寸 (单位: mm) (Antenna Dimensions (unit: mm))



11. 天线图片(Antenna Picture)



12.样品检验报告(Sample inspection report)

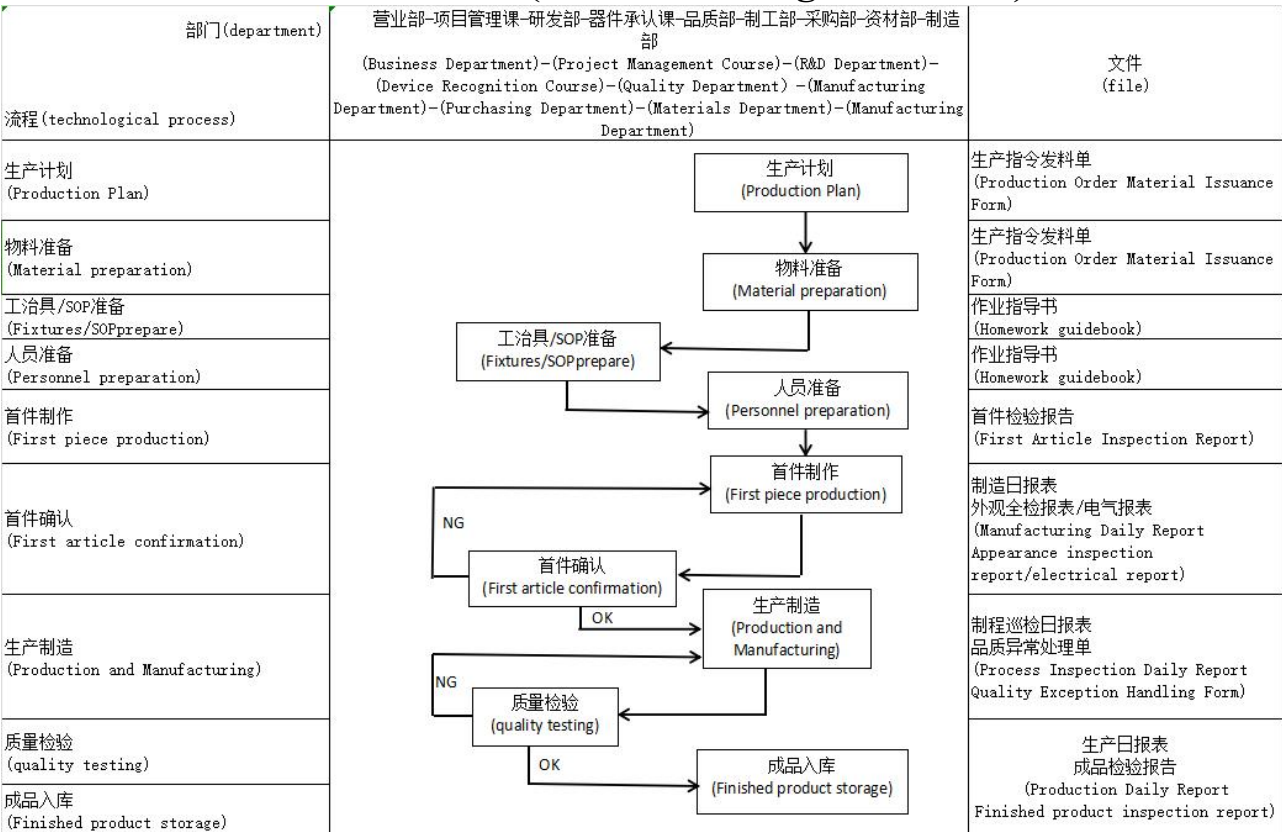
日期(date): 2025-4-22

客户名称 (Customer Name)	深圳市橙子数字科技有限公司 (Shenzhen Orange Digital Technology Co., Ltd)				
产品型号 (Product model)	SLK-CZ-3212F-R-160I-W-1.13DS				
序号(Serial number)	外观 (appearance)	电性能 (Electrical performance)	尺寸(size)		
			FPC 长度 (FPC length)	FPC 宽度(FPC width)	线长 (Line length)
1	合格 (qualified)	合格 (qualified)	32.29	12.68	160
2	合格 (qualified)	合格 (qualified)	32.29	12.68	160
3	合格 (qualified)	合格 (qualified)	32.29	12.68	160
4	合格 (qualified)	合格 (qualified)	32.29	12.68	160
5	合格 (qualified)	合格 (qualified)	32.29	12.68	160
备注: FPC 长宽尺寸公差正负 0.25MM (使用卡尺), 线长尺寸公差正负 3.0MM (使用直尺) (Note: The length and width tolerance of FPC is plus or minus 0.25mm (using a caliper), and the length tolerance of the wire is plus or minus 3.0mm (using a ruler))					

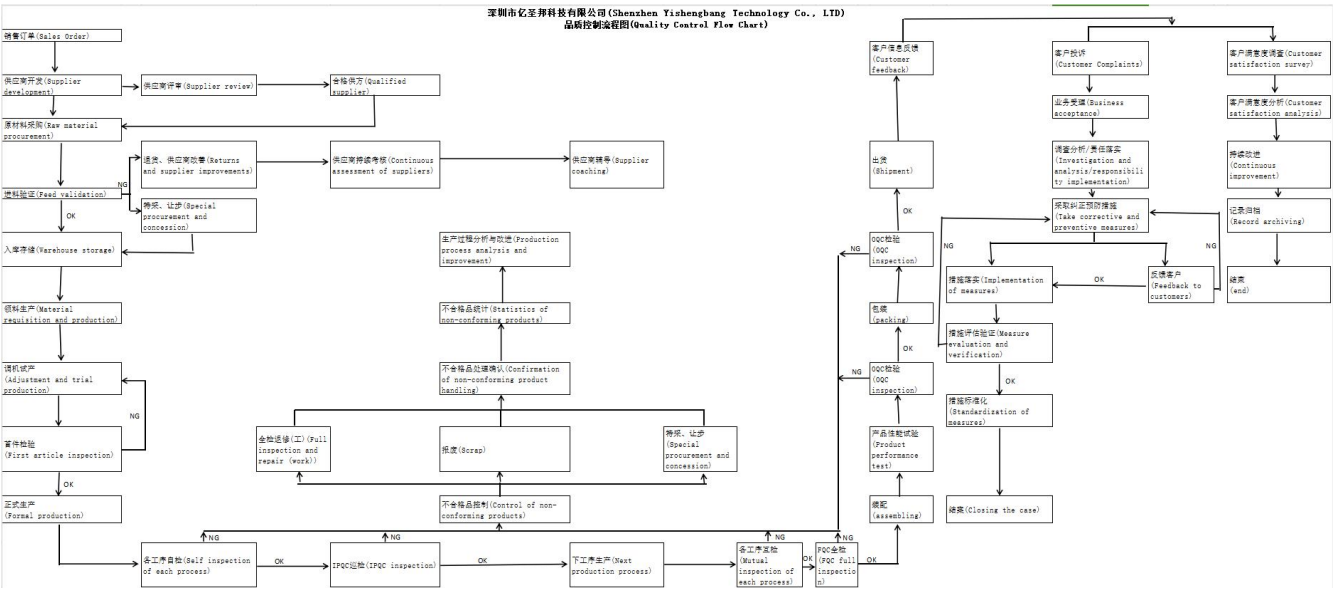
测试员(Tester): 王国行(Guo Xing Wang)

审核(to examine): 黄震(Zhen Huang)

13.应力释放试验制造流程图(Manufacturing flow chart)



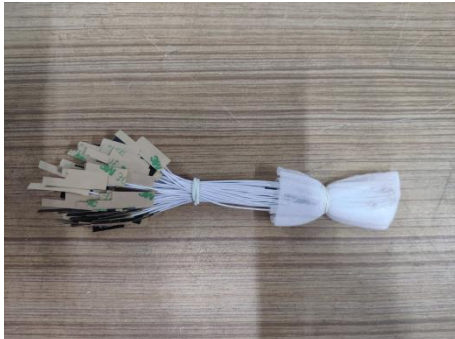
14.QC 工程图(QC engineering drawing)



15.SGS 报告(SGS Report)

(天线) 有害物质检测报告及MSDS报告清单表																				
序号	部品名称	均质材料名称	有害物质含量 (单位: ppm)												检测机构简称	检测报告编号	生效日期	RoHS报告附件	MSDS	备注
			Pb	Cd	Hg	Cr ⁶⁺	PBBs	PBDEs	DBP	BBP	DEHP	DIBP	Cl	Br						
1	射频线	镀锡铜线	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	SGS	SZXBC24002490604	2024/8/8			
		FEP	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA						
2	IPEX端子	镍镀层	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	CTI	A2240410234101002E	2024/7/11			
3		金镀层	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	CTI	A2240410234101001E	2024/7/11			
5	锡	无铅锡丝	68	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	SGS	CANEC24014166402	2024/7/4			
6	FPC	胶纸	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	SGS	SHAEC24027480901	2024/12/6			
7		油墨	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	SGS	ETR24600712	2024/6/14			
8		铜材	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	SGS	SHAEC24028809006	2024/12/20			

16.示例(Packing)

客户(customer):	产品(product):	颜色(colour):
客户料号(Customer part number):	本司料号(Our company's part number):	日期(date): 2025.4.15
  1. 品质部按照检测指导书对单个天线进行外观和性能全检后，按照 50PCS 每扎包扎。 (After conducting a comprehensive inspection of the appearance and performance of a single antenna according to the inspection manual, the quality department will wrap 50 pieces per bundle.) 2.产线按照 200PCS 每袋进行包装作业。 (The production line packages 200PCS per bag.)   4. 封箱称重，放入成品仓，待出货。 (Sealed and weighed, placed in the finished waiting for shipment.) 3.按照客户标签要求，贴好标签装箱作业。 (According to the customer's label product warehouse, requirements,label and pack the goods.) 备注：内包装：每包 200PCS (Note: Inner packaging: 200PCS per pack) 外包装：纸箱尺寸 510X300X220MM 每箱 4000PCS。 Outer packaging: cardboard box size 510X300X220MM, 4000PCS per box. 跟据实际订单数量，纸箱尺寸有可能会有差异。 According to the actual order quantity, there may be differences in the size of the cardboard boxes. 根据不同客户，制作不同的内外包装标签。 Produce different inner and outer packaging labels according to different customers.		
工程部(engineering department): 范新竹(Xin Zhu Fan)	品质部(Quality Department): 郭亮(Liang Guo)	核准(approval): 黄震(Zhen Huang)