

TC2 规格承认书

客户名称 / Customer	INSTA360
客户料号 / Customer P/N.	QT.A00003203
供应商 / Supplier	深圳市中天迅通信科技股份有限公司 Shenzhen ZTX Communication Technology Co., Ltd
供方料号 / Supplier P/N.	1.03.03164
时间 / Time	23-Apr-24
版本 / Version	A2

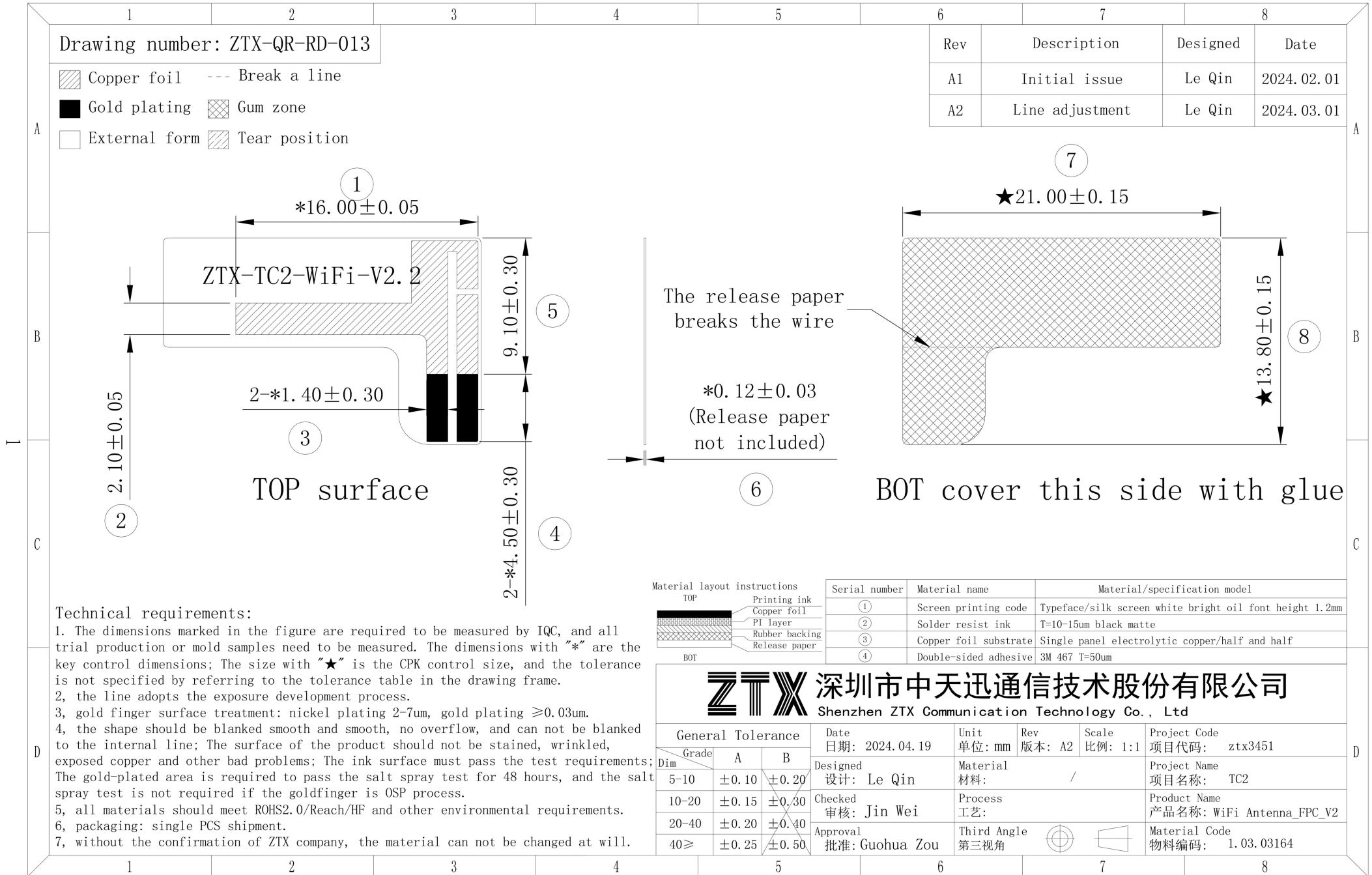
供应商会签 Approval			
批准 Approval	品质承认 QA Approval	工程承认 PE Approval	研发承认 RD Approval
Guohua. Zou	Zhao. Zhang	2024.04.23 研发专用章	Jin. Wei

客户承认 Customer Approval			
批准 Approval	品质承认 QA Approval	研发承认 RD Approval	采购承认 PUR Approval

注：会签必须手工签字确认；

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Process Capability Index assessment report

Customer name : INSTA360						Product name: TC2 WIFI antenna						acknowledge		verify		consummate	
Product material: FPC						date : 2024/1/15						Deng Howard		Yi Ailing		Ou Mingjian	
NO	Spec	21.00		13.80												remark	
		0.15	0.15	0.15	0.15												
1		21.02		13.82													
2		21.00		13.81													
3		21.01		13.80													
4		20.99		13.83													
5		20.98		13.81													
6		20.97		13.83													
7		20.99		13.84													
8		21.00		13.82													
9		21.01		13.81													
10		20.99		13.84													
11		21.02		13.82													
12		21.02		13.84													
13		21.00		13.83													
14		20.96		13.82													
15		20.98		13.80													
16		21.01		13.84													
17		21.03		13.83													
18		20.99		13.85													
19		21.00		13.82													
20		20.99		13.84													
21		21.00		13.82													
22		21.01		13.81													
23		21.02		13.84													
24		21.03		13.81													
25		21.01		13.83													
26		20.99		13.84													
27		21.02		13.85													
28		21.02		13.83													
29		20.99		13.86													
30		21.00		13.84													
31		21.01		13.83													
32		20.99		13.82													
MAX		21.03		13.86		0.00		0.00		0.00		0.00		0.00		1. Mass production can be carried out if the CPK value is "satisfied", but the inspection needs to be strengthened. 2. CPK values are "very satisfied" in the case of mass production can be sampled inspection. 3. If one CPK value does not meet the requirement of "meet", the reason should be analyzed and improved.	
MIN		20.96		13.8		0		0		0		0		0			
X		21.00		13.83		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!			
M		21.15		13.95		0.00		0.00		0.00		0.00		0.00			
CP		2.964		3.376		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!			
SN-1		0.017		0.015		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!			
K		0.0104		0.1833		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!		#DIV/0!			
CPK/ determine		2.933	Very content	2.757	Very content	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!		
Final decision	The CPK value is "very satisfied" with the production conditions and can be mass-produced.																

样品检测报告

Sample test report

客户名称 Customer name	INSTA360		产品名称 Product name	TC2 WIFI antenna		数量 quantity	10 PCS	
产品材质 Product material	FPC		材料颜色 Material color	black		日期 date	2024/1/15	

产品类型: ☐ 新模样品 ☐ 改模样品 ☐ 量产 ☐ 其它
Product type: ☐ New shape ☐ Changed shape ☐ Mass production ☐ Others

NO	type	Drawing size	Upper toleranc e	Lower toleranc e	Measured size										determ ine	remark
					1	2	3	4	5	6	7	8	9	10		
1	*	16.00	0.05	0.05	16.01	15.99	15.98	15.99	15.98	15.99	16.00	16.01	15.98	15.99	OK	
2		2.10	0.05	0.05	2.09	2.08	2.11	2.10	2.11	2.09	2.11	2.10	2.09	2.12	OK	
3	*	1.40	0.30	0.30	1.46	1.50	1.48	1.49	1.47	1.50	1.49	1.47	1.50	1.46	OK	
4	*	4.50	0.30	0.30	4.49	4.48	4.49	4.48	4.50	4.48	4.49	4.49	4.51	4.52	OK	
5		9.10	0.30	0.30	9.03	9.05	9.04	9.02	9.06	9.02	9.05	9.03	9.04	9.01	OK	
6	*	0.12	0.03	0.03	0.13	0.12	0.14	0.11	0.12	0.12	0.11	0.13	0.12	0.11	OK	
7	#	21.00	0.15	0.15	20.99	21.01	21.01	21.00	21.00	20.99	21.00	21.01	21.00	21.00	OK	
8	#	13.80	0.15	0.15	13.82	13.83	13.84	13.84	13.85	13.81	13.83	13.82	13.84	13.85	OK	
9																
10																
11																
12																
13																
14																

外观:OK
Appearance :OK

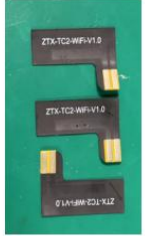
其它:驻波一致性测试OK
Other: Standing wave conformance test OK

Final decision: ☒ OK ☐ NG

核准(Approved by): Deng Howard 审核(Checked by): Yi Ailing 测试(Name of operator):Li Lihua

remark

Form Number : ZTX-QR-QA-016 Version: A1

测试报告(Test Report)							
样品名称 (Product name)	wifi antenna	样品型号 (Part Model)	TC2	环境温度 (Ambient temperature)	20±5℃	测试日期 (Date of test)	2024/1/9
样品数量 (Specimens quantity)	16PCS	客户料号 (Customer number)	/	相对湿度 (Relative humidity)	50-60%RH	委托单位 (Client/Dept)	品质部 Quality department
测试原因 (Test reasons)	☒ 新型号/材料验证 ☐ 新工艺验证 ☐ ORT测试 ☐ 过期物料 ☐ 客户投诉要求 ☐ 高不良率 ☐ 其他: 定期可行性分析 ☒ New model/Material Verification ☐ New process verification ☐ ORT test ☐ Expired materials ☐ Customer complaints/requests ☐ High defect rate ☐ Other: Periodic feasibility analysis			测试依据 (Test documentation)	☐ 产品图纸 ☒ 天线可靠性检验基准书 ☐ 客户要求 ☐ 出货检验基准书 ☐ 其他: ☒ Drawings ☒ Antenna reliability Test reference book ☐ Customer requirements ☐ Shipping inspection basis ☐ Other:		
序号 (NO)	测试项目 (Test project)	样品数 (Samples Qty.)	测试仪器 (Test equipment)	测试条件与要求 (Test condition and note)	测试结果 (Test result)	结论 (Conclude) (Pass/Fail)	样品图片/实测值 Sample picture/measured value
1	盐雾测试Salt spray test	3	盐雾测试机 Salt spray testing machine	Conditions: 1. Place the product in the test chamber at 30 degrees ±5 degrees 2. Debug the test chamber parameters: NaCl (no water); Concentration 5%±1%; pH value: 6.5 ~ 7.2; Laboratory temperature: 32~38℃; Compressed air pressure :1.0±0.01 (KG/M2) spray volume :1.0 ~ 2.0ML/80CM2/H. Relative humidity :85%±2%; Test product placement Angle :30 degrees +/-10 degrees 3. The storage time is 48 hours. 4. After cleaning, place at room temperature for 2 hours for observation Requirements: plating (coating) layer without falling off, foaming, corrosion, oxidation and other undesirable phenomena; The surface of the product should not have rust spots and other undesirable phenomena	No peeling and oxidation of coating were observed.	Pass	
2	高温测试 High temperature test	3	高低温交变湿热试验箱 High and low temperature alternating wet heat test chamber	1. Place the sample in a high temperature environment of 85℃ for 48 hours and take it out 2. Leave for 2 hours at room temperature.	After the test, the product has no deformation, no discoloration, no falling off, no warping	Pass	
3	低温测试 Low temperature test	3	低温冰箱 Cryogenic refrigerator	1. Keep the sample at a low temperature of -40℃ for 48 hours and then take it out 2. Leave for 2 hours at room temperature.	After the test, the product has no deformation, no discoloration, no falling off, no warping	Pass	
4	高温高湿储存测试 High temperature and high humidity storage test	3	高低温交变湿热试验箱 High and low temperature alternating wet heat test chamber	1. Sample 3pcs 2. Place the test sample in the test box (temperature 70±2℃, humidity 90% ~ 95%RH), and take it out for inspection after 48H.	After the test, the product has no deformation, no discoloration, no falling off, no warping	Pass	
5	百格试验 Baique test	1	百格刀 Cross-cut cutter	Use a knife to draw 10×10 (100)1mm×1mm small grids on the surface of the test sample ≥10mm square meters, each line should be deep and the bottom of the ink layer; Brush the test area five times in the diagonal direction with a brush to clean up debris; Stick the small grid under test firmly with 3M600 glue, and wipe the tape with a rubber to increase the contact area and strength between the tape and the tested area; Grab one end of the tape with your hand and pull it off quickly at 90 degrees. If the coating shedding area is less than 5%, it is qualified. If the coating shedding area is more than 5%, it is unqualified	The coating did not fall off after the test.	Pass	
6	粘性测试 Viscosity test	3	/	1. Attach the FPC to the plastic, keeping pressure 2. Place at room temperature for 48 hours and observe	The product has no warping after the test	Pass	

备注(Comments):

核准(Approved by):Deng Howard 审核(Checked by):Yi Ailing 测试(Name of operator): Li Lihua

Antenna related information

Antenna type : Monopole Antenna

Antenna gain : 2.4G Gain-2.07dBi,5G Gain-2.07dBi,

Polarization mod:linear polarization

VSWR



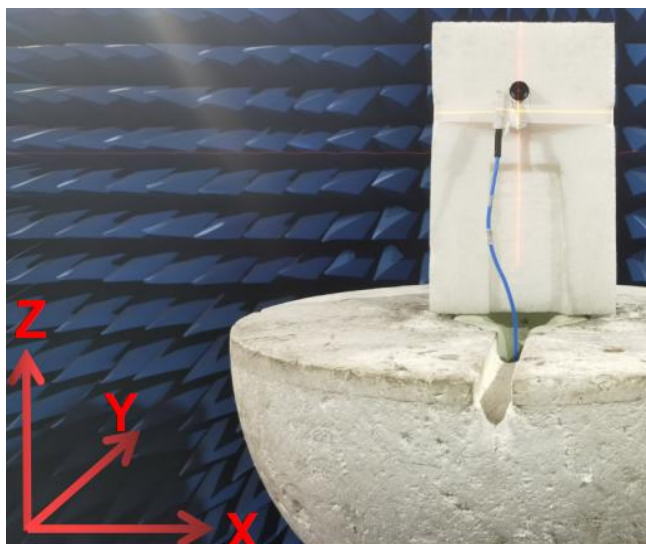
Active Test

Camera is in the AP mode				Camera is in STA mode				BLE	Channels	TRP	TIS
11A	Channels	TRP (6M)	TIS (6M)	11A	Channels	TRP (6M)	TIS (6M)		L	-4.33	-66.13
	36	8.57	-61.22		36	8.79	-63.22		M	-4.48	-62.41
	149	9.17	-71.39		149	9.32	-72.57		H	-4.11	-65.25
	161	8.68	-69.25		161	8.77	-71.36				
11AC	Channels	TRP (6M)	TIS (6M)	11AC	Channels	TRP (6M)	TIS (6M)				
	36	8.68	-62.39		36	8.55	-61.46				
	149	9.02	-70.46		149	9.25	-71.32				
	161	8.53	-68.47		161	8.71	-72.31				

Passive Test

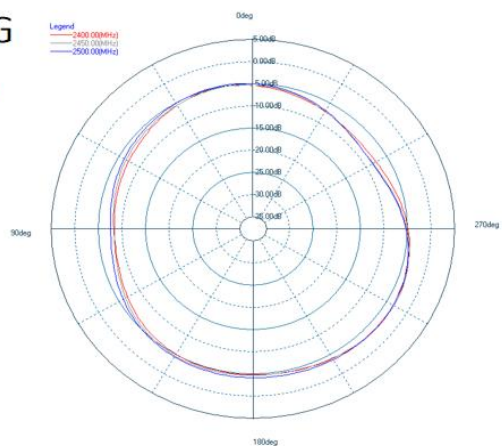
Frequency	Efficiency	Efficiency . dB	Gain . dBi
2400MHz	32%	-4.94	-2.51
2410MHz	32%	-5.00	-2.38
2420MHz	32%	-4.99	-2.41
2430MHz	32%	-4.97	-2.33
2440MHz	32%	-5.02	-2.18
2450MHz	32%	-4.95	-2.42
2460MHz	32%	-4.97	-2.31
2470MHz	32%	-4.97	-2.39
2480MHz	33%	-4.82	-2.18
2490MHz	33%	-4.84	-2.22
2500MHz	34%	-4.73	-2.07
5150MHz	30%	-5.30	-2.07
5200MHz	29%	-5.37	-2.69
5250MHz	29%	-5.38	-2.72
5300MHz	29%	-5.33	-2.71
5350MHz	32%	-4.97	-2.55
5400MHz	35%	-4.59	-2.64
5450MHz	32%	-4.92	-2.77
5500MHz	33%	-4.75	-2.51
5550MHz	36%	-4.49	-2.07
5600MHz	36%	-4.41	-2.09
5650MHz	34%	-4.62	-2.33
5700MHz	32%	-5.01	-2.41
5750MHz	32%	-4.99	-2.52
5800MHz	30%	-5.25	-2.63
5850MHz	29%	-5.32	-2.07

2D/3D Radiation Pattern Results

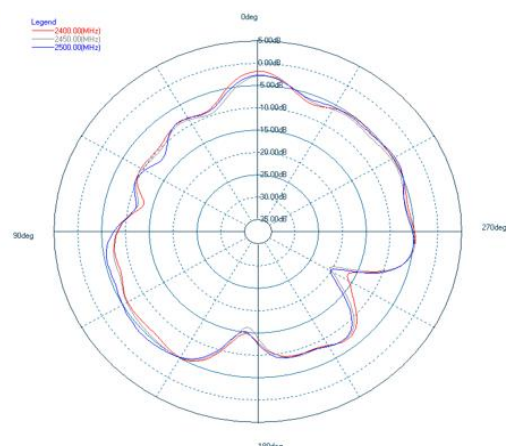


2.4G

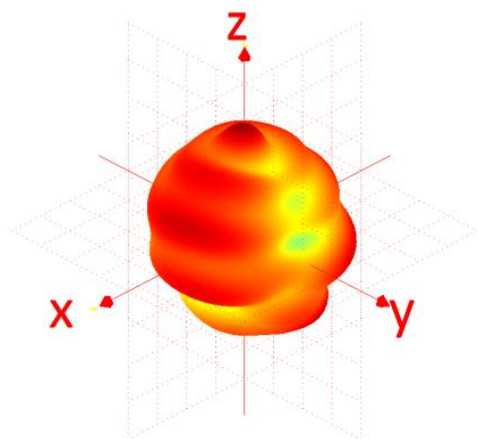
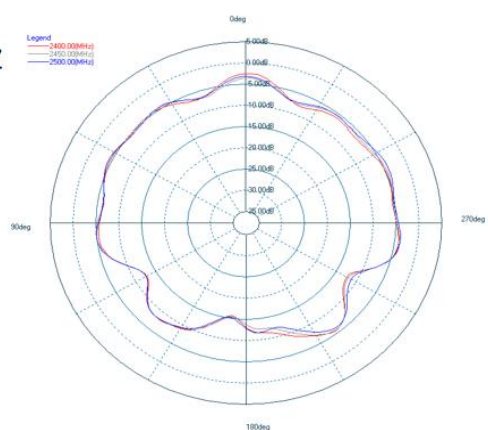
xoy



yoz

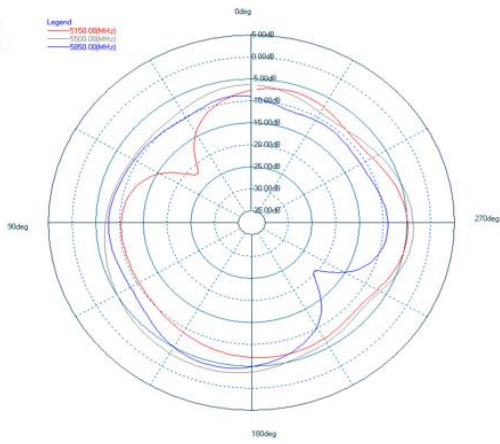


xoz

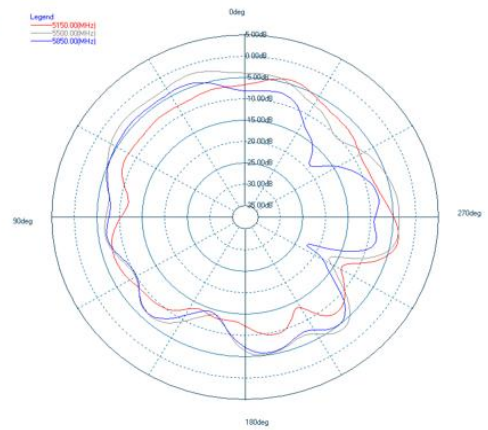


5.8G

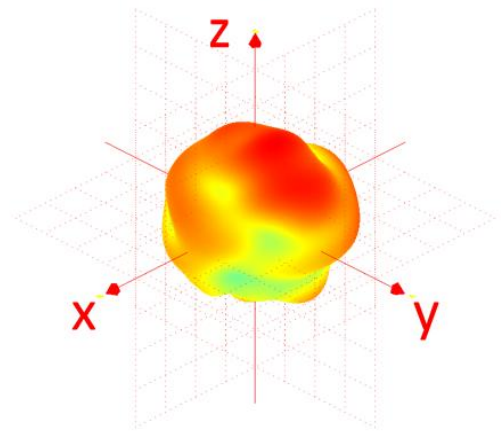
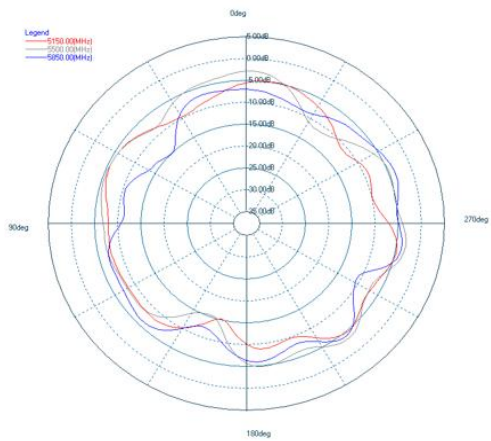
xoy



yoz

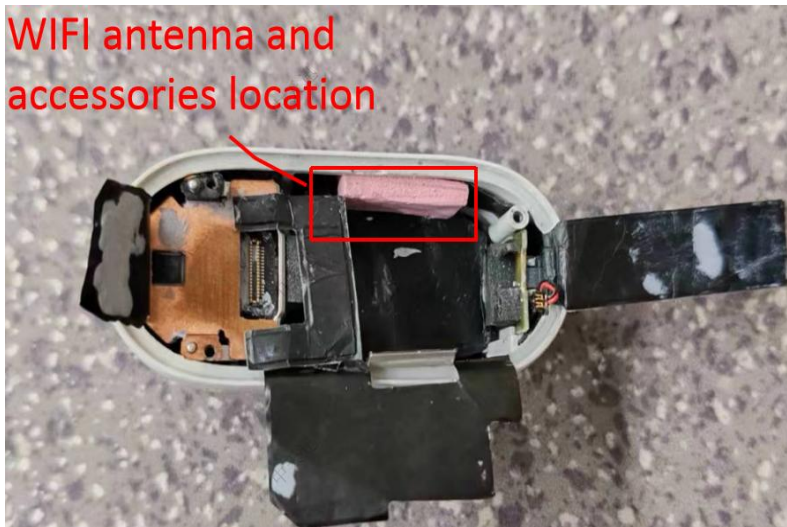


xoz



Environment treatment

WIFI antenna and accessories location



原材料检测清单

 深圳市中天讯通信科技股份有限公司
SHENZHEN ZHONGTIAN XUN Communication Technology Co., Ltd.

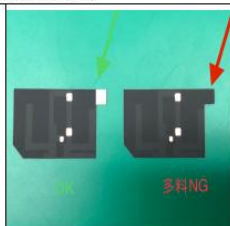
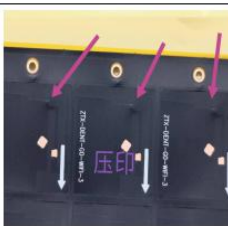
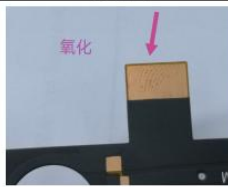
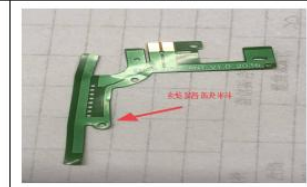
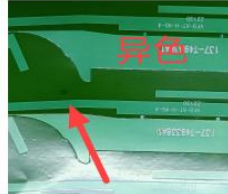
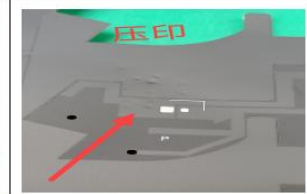
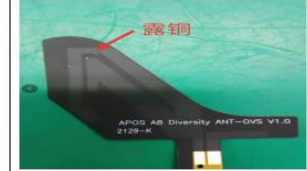
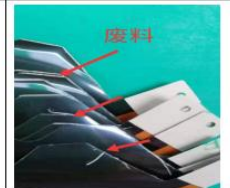
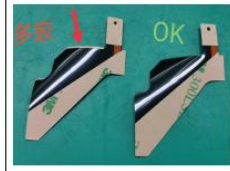
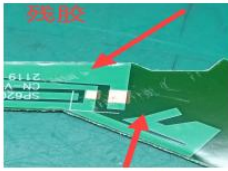
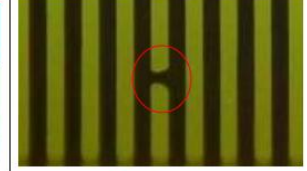
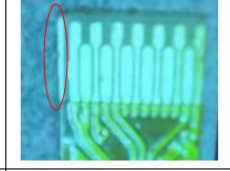
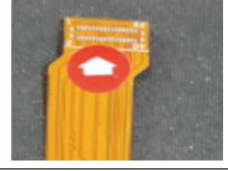
Supplier/代理商:	ZHONGTIAN XIN Communication Technology Co., Ltd
Contact window/联系窗口:	Quality department
Phone/电话:	18824953019
E-mail/邮件:	sae@china2tr.com
Product model/产品型号:	TC2-WIFI antenna PFC antenna
Date/日期:	2024.1.19

[illegible]

表编号: ZTX-QE-QA-063 版本: A1 保存10年

title		FPC SIP		File number		ZTX-QD-SP-004		
Formulation department	Quality department	Set a date	2023/9/28	Set a date	A1	pagination	1/3	
I. Inspection basis: 1. Specifications and limit samples recognized by customers 2. Engineering drawing file/acknowledgement letter/sample 3. part appearance inspection standards			II. Sampling level: 1, Appearance: GB/T2828.1-2012/ISO2859-1:1999 sampling level (II level) a single positive Constant sampling scheme: Automobile products shall be sampled according to: C=0; AQL: CR(0), MA (0.4) MI (1.0). 2, size: N=10, C=0					
III. inspection conditions: 1. Lighting & Vision: illumination 800Lux-1200Lux 2. Visual acuity: the visual acuity of the inspector (including correction) should be above 1.0 3. Visual time: Confirm defects within 10 seconds 4. Visual distance: the distance between the naked eye and the measured object is 30cm to 35cm 5. Visual Angle: The inspected item rotates 45 degrees from side to side								
IV. Classification of defects: CRITICAL: Likely to cause injury to the operator of the machine or equipment; Potentially hazardous effects that can lead to safety related failures or non-compliance with the government Laws and regulations: Affecting mechanical or electrical performance, the product will have a major quality accident after assembly or during customer use. MAJOR defect: Performance does not meet the expected goal, but does not cause dangerous or unsafe phenomenon; But it will affect the performance and assembly of the product. MINOR defects: refers to the defects that have no impact on the function and performance of the product and do not lead to grade reduction, and may cause user dissatisfaction but can be tolerated. 5. Defect code comparison table								
Name (unit)	Diameter (mm)	Length (mm)	Area (mm ²)	Number (number)	Width (mm)	Distance (mm)	Height (mm)	
Code letter	D	L	S	N	W	DS	H	
6. homework content:								
Scope of inspection					Inspection tool	critierion	Grade defect	remark
item	content							
a p p e a r a n c e	Particle and spot defects: Appearance: thickness OK, D≤0.1mm, regardless but not dense: 0.1mm < D≤0.2mm, N≤2, DS≥30mm; 0.2mm < D≤0.25mm, N≤1; If the value is greater than 0.25mm, this parameter is not allowed. Non-appearance surface: Thickness is OK, D≤0.5mm does not affect the fit acceptable.				Accept within range	MI	MI	
	Scratch: Appearance: L≤3mm, W≤0.05mm, excluding: L≤3mm, 0.05mm < W≤0.15mm, N≤2, DS≥15mm; L≤3mm, 0.15mm < W≤0.2mm, N≤1; W > 0.2mm or L > 3mm is not allowed. Non-appearance surface: L≤10mm, W≤0.5mm, does not affect the fit acceptable.							
	Scratches: Appearance: do not show the bottom: L≤3mm, W≤0.03mm, excluding: L≤3mm, 0.03mm < W≤0.05mm, N≤2, DS≥30mm; W > 0.05mm or L > 3mm, not allowed. Non-appearance surface: L≤5mm, W≤0.2mm, the bottom is not allowed.				Accept within range	MI		
	Gold finger pressure point: H≤0.02mm and the number of pressure points per gold finger N≤2 slight pressure point D≤0.25mm Or refer to customer limit signature							Accept within range
	Overflow: W≤0.1mm				Accept within range	MI		
	Ink pressure point: Appearance: no feel, D≤0.1mm, regardless but not dense: 0.1mm < D≤0.2mm, N≤2, DS≥15mm; If the value is greater than 0.2mm, it is not allowed. Non-appearance surface: D≤0.3mm, no feel, does not affect the fit acceptable							
	Back adhesive attached/missing material (offset) : W≤0.3mm							
	Ink surface dirt: Appearance: inspection light 30cm naked eye can not be seen, or spot defect standard. Non-appearance surface: the dirty area can not exceed one quarter, and the smearing effect is not allowed							
	Gold finger scratch: no coating damage, L≤3mm, W≤0.03mm, excluding: 0.03mm < W≤0.05mm, L≤3mm, N≤2, DS≥15mm; W > 0.05mm or L > 3mm, not allowed							
	Gold finger scratches: W≤0.15mm, L≤3mm, N≤2, DS≥15mm; If W > 0.15mm or L > 3mm, it is not allowed							
	Pile glue: no feel, D≤0.5mm does not affect the fit acceptable				Accept within range	MI		
	Multi-material, missing material: L≤0.2mm, W≤0.1mm							
	Poor punching of release paper							
	Rough edge of the release paper							
	Porous, wrong hole, few hole							
	Goldfinger deviation (according to the drawing control, the conventional distance between the two sides and the edge subtracted <0.05mm)							
	SMT edge joint leakage, loose							
	Missing patch strength & steel sheet							
	Goldfinger lack of material, oxidation							
	Goldfinger fold							
	Release paper offset				Accept within range	MI		
	worn							
	The golden finger is dirty							
Surface exposed copper substrate, copper residue								
Color difference with sample								
Oxidation and corrosion								
Screen printing content does not match, screen printing characters blurred, incomplete								
				Sample according to color limit	MI			
				Not allow	MI			
				Not allow	MI			

title		FPC SIP		File number		ZTX-QD-SP-004		
Formulation department	Quality department	Set a date	2023/9/28	Set a date	A1	pagination		2/3
Scope of inspection					Inspection tool	criterion	Grade defect	remark
item	content							
appearance	Waste residue				visual	Not allow	MI	According to the customer's requirements for appearance, the inspection standard can be adjusted appropriately to meet customer requirements.
	cockle					Not allow	MI	
	The line doesn't match the drawing					Not allow	MA	
	Line open, short circuit					Not allow	CR	
	Rubber residue					Not allow	MI	
	Back rubber fold: no feel and according to scratch defect standard					Not allow	MI	
	Non-locating hole					Not allow	MA	
	The ink surface is dirty					Not allow	MI	
dimension	The key control dimensions (IQC required grade) marked in the controlled Engineering Drawing shall be measured, and the excess dimensions shall be judged by the results of trial assembly				Quadratic element/microscope	Not allow	MI	Each batch will draw 10PCS
性能	According to the controlled "engineering drawing" file, open circuit, short circuit, resistance value is not allowed to test the coating line with the multimeter pass-through file, and FPC should have a full test process.				multimeter	Not allow	CR	Routine test
包装	1. Material packaging and marking meet our requirements				visual	Not allow	MI	Check according to the drawing requirements, if there is
	2. Each batch of incoming materials shall be accompanied with					Not allow	MI	
	3. The inside and outside packaging of the material are not allowed to be damaged by extrusion					Not allow	MI	
	4. each box and the minimum package are not allowed to have a few phenomena					Not allow	MA	
可靠性	1, according to the requirements of the drawing to do neutral salt spray test, brine pH value is required between 6.5 and 7.2, salt spray test is completed				Salt spray machine	Not allow	MA	2PCS per batch, according to the drawing or customer requirements, if there is no requirement, according to the routine
	2, sampling the test sample is placed in the test box (temperature 70±2℃, humidity 90% ~ 95%RH), after 72 hours to take out the inspection, after the test of the product coating surface can not produce oxidation, the product can not bubble, peel, stratification, product electrical function is intact,FPC normal conduction				Constant temperature and humidity	Not allow	MA	
	3. Use a grid knife to mark 100 small grids of 10×10 of 1mm×1mm on the surface of the coating, stick to the grid coating with 3M glue, and quickly tear 3M glue at a 90 degree Angle with the coating. The same position is repeatedly tested three times, and the loss area of the coating in the grid is less than 5%				Hundred grid knife 3M glue	Not allow	MA	
	4, coating thickness test: sample, the coating area with scissors cut off the test platform, and then test, gold-plated thickness according to the requirements of the drawing				Film thickness tester	Not allow	MA	
	5. Screen printing adhesion test, stick the screen with 3M adhesive, and quickly tear 3M adhesive at a 90 degree Angle with the test surface, the same position				3M adhesive	Not allow	MA	
	6, viscosity test: sample,FPC paste on the shell material, need to do pressure, placed at room temperature for 48H after observation, not warped				Plastic case	Not allow	MA	
	7, solder pad weldability test, using a soldering iron on the solder pad to test the solder pad weldability, solder pad eating area must be ≥95%, After the test, the pad should not bubble, fall off, etc				Soldering iron	Not allow	MA	
	8, put the sample on a flat table, hit the multimeter to buzz, two pens contact FPC gold finger test conduction				multimeter	Not allow	MA	
	9, bending test, bending 180 degrees at the position of the copper foil line, after bending the copper foil line and ink surface are not allowed to be detached,					Not allow	MA	
HSF compliance	1, the environmental report must meet the requirements of RoHS2.0 within the validity period or material content				multimeter	Not allow	CR	Draw 1PCS per batch
	2, all packaging RoHS mark is not clear or not allowed				visual	Not allow	CR	
Description:								
1, if the size is found to be out of whack, it must be confirmed with other accessories, and the actual matching result is the final judgment basis								
2. The sampling standard for reliability test is 2PCS of random samples.								
3. HSF compliance test is to extract 2PCS when new products or suppliers change, and then check with the report provided by suppliers.								

title		FPC SIP		File number		ZTX-QD-SP-004	
Formulation	Quality	Set a date	2023/9/28	Set a date	A1	pagination	3/3
7、bad illustration:							
sample							
Descriptio	multi-material		coining		Less ink		
determine	Not allow		Not allow		Not allow		
sample							
Descriptio	Scalding		oxidation		Line shortage		
determine	Not allow		Not allow		Not allow		
sample							
Descriptio	Screen shift		heterochromia		coining		
determine	Not allow		Not allow		Not allow		
sample							
Descriptio	Less release paper		starving		Copper leakage		
determine	Not allow		Not allow		Not allow		
sample							
Descriptio	scrap		Poor punching		Hole deviation		
determine	Not allow		Not allow		Not allow		
sample							
Descriptio	gluey		Rubber residue		Open circuit		
determine	Not allow		Not allow		Not allow		
sample							
Descriptio	A cut on the goldfinger		cockle		short-circuit		
determine	Not allow		Not allow		Not allow		
sample							
Descriptio	The goldfinger is skewed		Missing joint or joint off		FPC back glue black		
determine	Not allow		Not allow		Not allow		