

# Shenzhen Kaipushen Communication Technology Co., Ltd

## Acknowledgment

CustomerName:	Kailai		
Product Name:	EPA-399A BTAerial (Antenna+touch)		
Specifications:	black/Adhesive backing -ROHS/REACH		
Productnumber:			
Customer code:	23-0011960-0		
Complies with environmental standards:	<b>ROHS</b>		
supplier		Customer	
Creation Date		Creation Date	
Approved Date		Approved Date	
Date of approval		Date of approval	

**Manufacturer:** Shenzhen Kaipushen Communication Technology Co., Ltd

**Supplier address:** 2nd Floor, Building 1, Yulong Building, Longcheng Industrial Zone, No.440, Longguan Avenue, Longhua District, Shenzhen

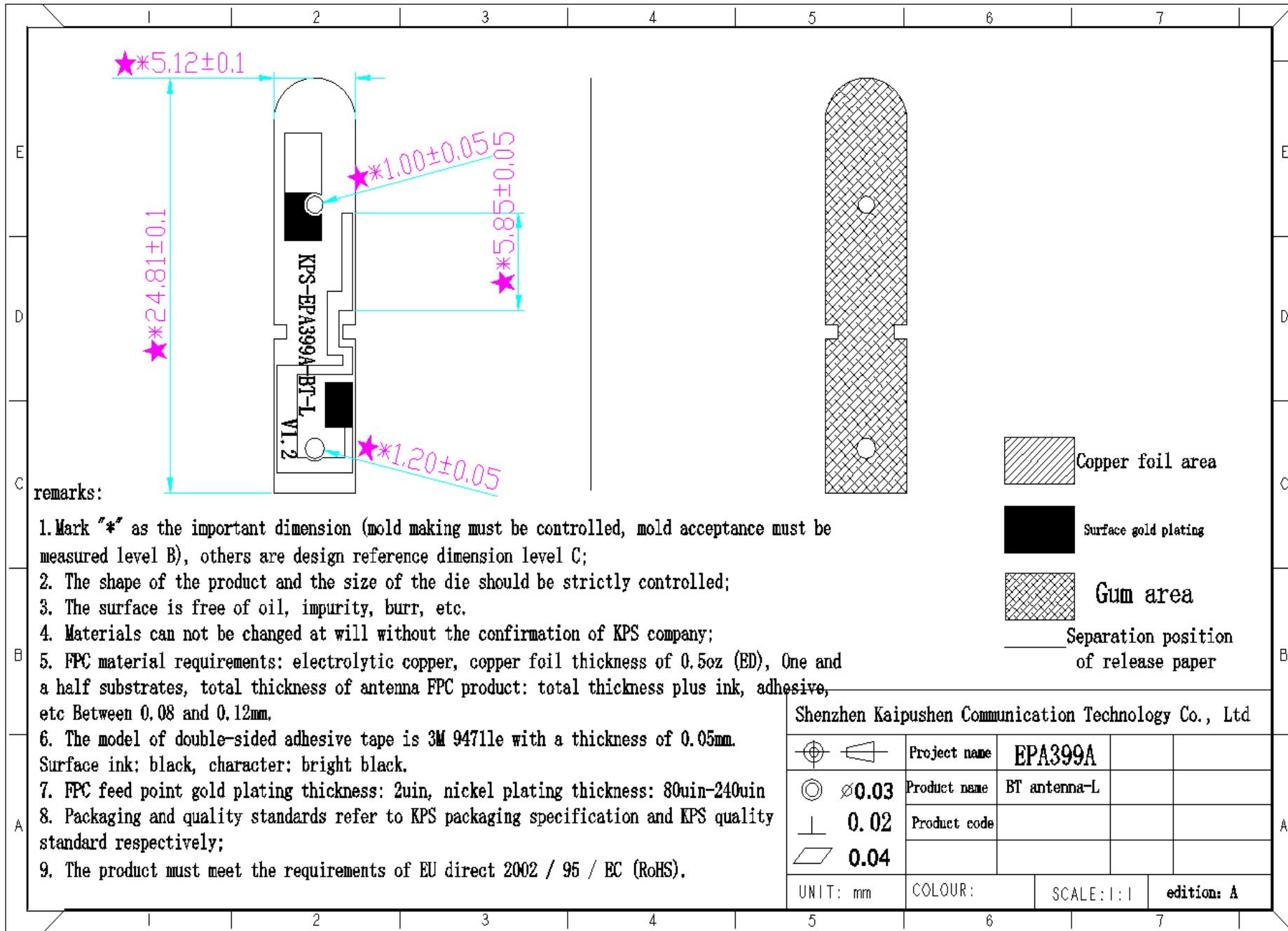
**Tel:** 0755-29351613

**Fax:**0755-29351510

# Contents

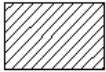



- 1、 Cover
- 2、 Contents
- 3、 ICD Drawing(BT aerial)
- 4、 Electrical and mechanical performance description
- 5、 Full dimensional measurement report
- 6、 QC engineering drawing
- 7、 inspection specification
- 8、 Rohs means
- 9、 Salt spray test report
- 10、 High-low temperature test
- 11、 Package

### 3. ICD drawings








remarks:

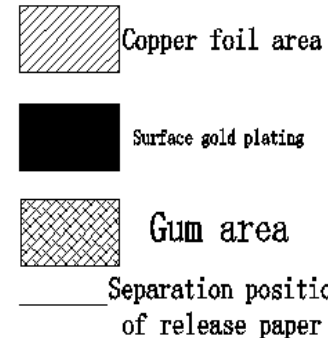
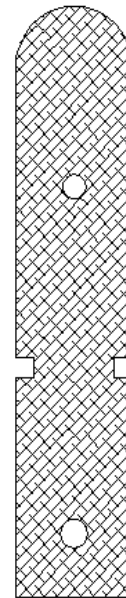
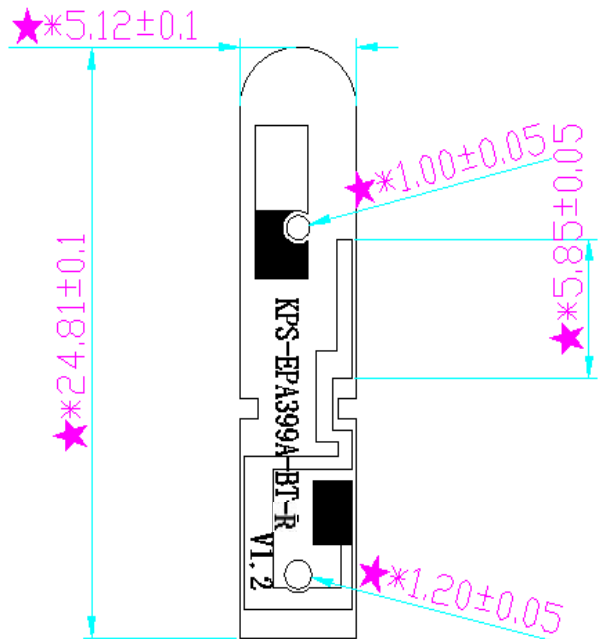
1. Mark "\*" as the important dimension (mold making must be controlled, mold acceptance must be measured level B), others are design reference dimension level C;
2. The shape of the product and the size of the die should be strictly controlled;
3. The surface is free of oil, impurity, burr, etc.
4. Materials can not be changed at will without the confirmation of KPS company;
5. FPC material requirements: electrolytic copper, copper foil thickness of 0.5oz (ED), One and a half substrates, total thickness of antenna FPC product: total thickness plus ink, adhesive, etc Between 0.08 and 0.12mm.
6. The model of double-sided adhesive tape is 3M 9471le with a thickness of 0.05mm. Surface ink: black, character: bright black.
7. FPC feed point gold plating thickness: 2uin, nickel plating thickness: 80uin-240uin
8. Packaging and quality standards refer to KPS packaging specification and KPS quality standard respectively;
9. The product must meet the requirements of EU direct 2002 / 95 / EC (RoHS).

 Copper foil area  
 Surface gold plating  
 Gum area  
 Separation position of release paper

Shenzhen Kaipushen Communication Technology Co., Ltd

		Project name	EPA399A		
	∅0.03	Product name	BT antenna-L		
	0.02	Product code			
	0.04				

UNIT: mm      COLOUR:      SCALE: 1:1      edition: A



remarks:

1. Mark "\*" as the important dimension (mold making must be controlled, mold acceptance must be measured level B), others are design reference dimension level C;
2. The shape of the product and the size of the die should be strictly controlled;
3. The surface is free of oil, impurity, burr, etc.
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Shenzhen Kaipushen Communication Technology Co., Ltd

		Project name	EPA399A		
		Product name	BT antenna-R		
		Product code			

UNIT: mm      COLOUR:      SCALE: 1:1      edition: A

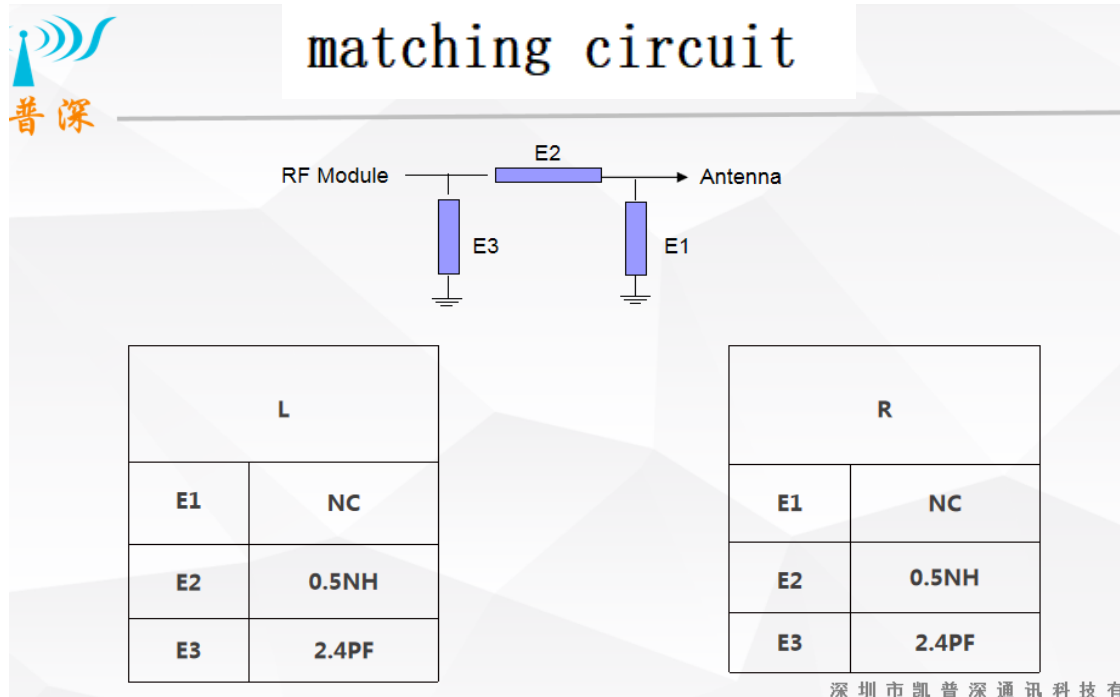
## 5.1 electrical properties

### 5.1-1 specification

BT antenna resonates at 2400m-2480m .

### 5.1-2 Matching circuit of antenna .

The matching circuit is as follows:



## 5.2 Standing wave ratio (SWR) test

### 5.2-1 Test settings

The standing wave ratio (SWR) test device is connected in turn to: E5071B Network analyzer-50 ohm coaxial Cable→150 mm long copper tube→Test the fixture.

Test the treatment of fixture: Draw out the SMA-J connector from the PCB antenna at the 50 point with a hard cableConnect with copper tube with choke ring and connect other devices i

The following table shows the standing wave ratio of the edge frequency points of the worki

### 6.2-2 Voltage standing wave ratio test :

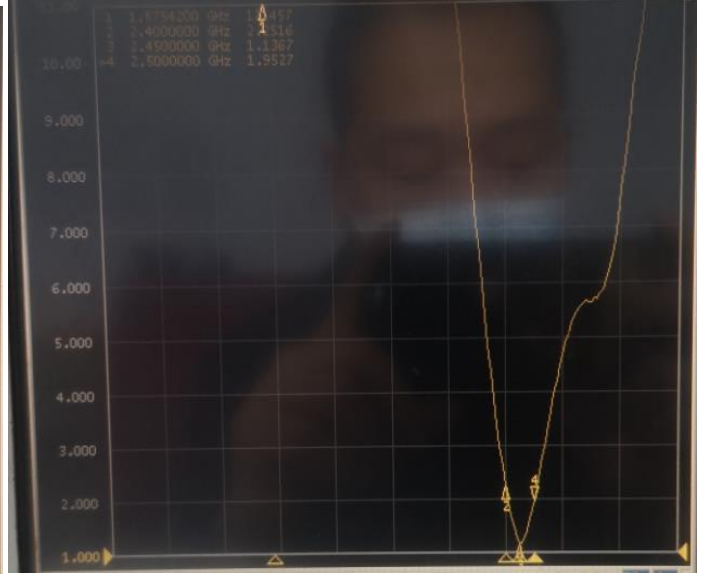
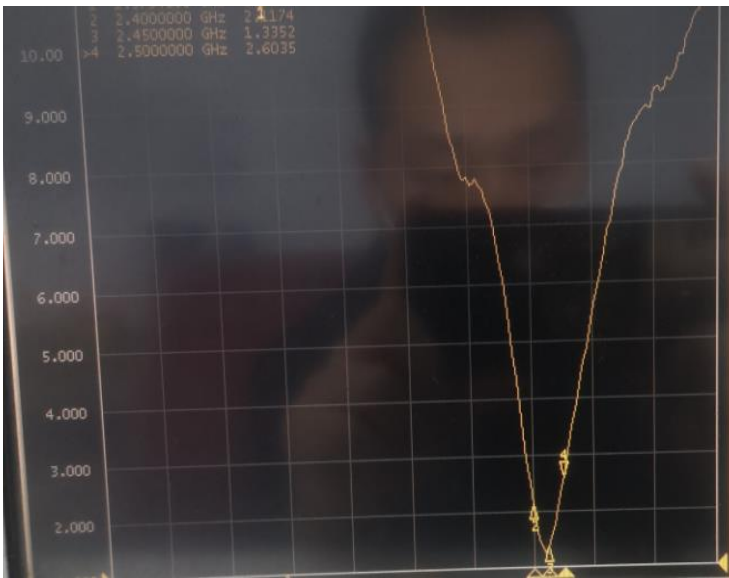
The following table shows: Standing Wave Ratio of Edge Frequency Points in the Operating Frequency Band of BT Antennas :

L	Fre (MHZ)	2402	2440	2480
	SRW	2.1	1.3	2.6

R	Fre (MHZ)	2402	2440	2480
	SRW	2.2	1.1	1.9

L

R



1. The above diagram shows the standing wave ratio curve

**6.2-4 Whole machine active test data:**

Main antenna test data:

BT	L			R		
	0	39	78	0	39	78
CHANNEL	0	39	78	0	39	78
TRP	3.1	3.9	3.9	1.5	1.2	0.8
TIS	-88.6	-88.5	-88.3	-86.6	-85.5	-84.3

Main antenna head mold test data:

BT	L			R		
	0	39	78	0	39	78
CHANNEL	0	39	78	0	39	78
TRP	-6.1	-5.7	-5.6	-4.5	-4.8	-6.2
TIS	-80.2	-80.5	-80.8	-80.5	-80.8	-81.2

6.2-6 Passive test data of BT antenna:

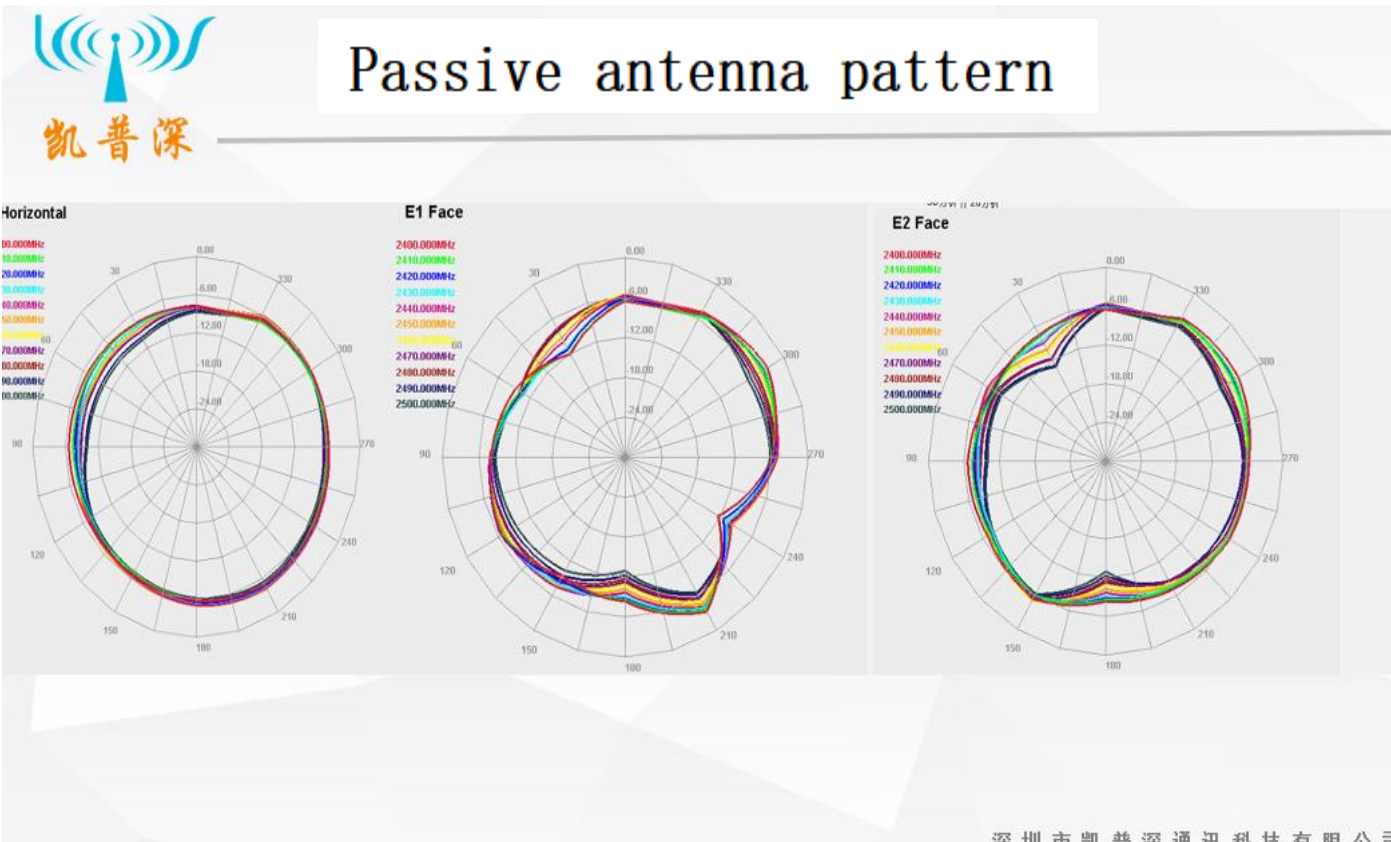
L

frequency	efficiency	attenuation	gain
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	20.92	-6.79	-3.21
2410	21.92	-6.59	-3.01
2420	21.26	-6.72	-2.95
2430	23.99	-6.2	-2.87
2440	24.77	-6.06	-2.75
2450	26.73	-5.73	-2.59
2460	22.1	-6.56	-2.91
2470	21.97	-6.58	-2.99
2480	21.5	-6.68	-3.12
2490	21.42	-6.69	-3.26
2500	20.19	-6.95	-3.41

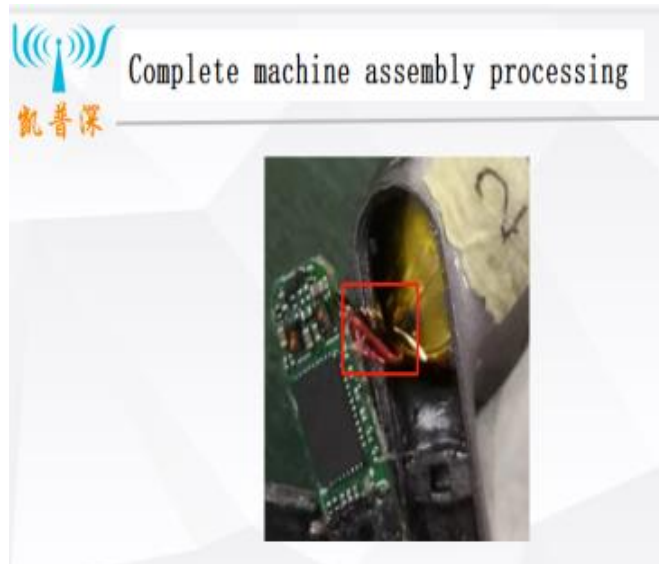
R

frequency	efficiency	attenuation	gain
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	22.48	-6.48	-3.37
2410	22.68	-6.44	-3.39
2420	23.58	-6.27	-3.34
2430	24.42	-6.12	-3.26
2440	26.53	-5.76	-2.91
2450	26.72	-5.73	-2.99
2460	25.71	-5.9	-3.26
2470	23.9	-6.22	-3.57
2480	24.03	-6.19	-3.53
2490	25.16	-5.99	-3.11
2500	25.53	-5.93	-3.83

Passive field pattern diagram



environmental treatment





# Full dimensional measurement report

NO.	Customer	Kailai		part name		BT aerial		Qty					Material	Electrolytic copper
	Supplier	Kaipushen		Measure tools		Quadratic		Measure unit		mm			Measure date	2023/4/6
	Size (DIMENSION )	Upper	+ TOL.	- TOL.	Lower	Act mea 1	Act mea 2	Act mea 3	Act mea 4	Act mea 5	Act mea 6	Act mea 7	UPPER $\leq$ 100%	LOWER $\leq$ 100%
1	24.91	25.01	0.10	0.10	24.95	24.93	24.88	24.92	24.85	24.87	24.89	24.90	20%	60%
2	5.12	5.22	0.10	0.10	5.02	5.08	5.07	5.11	5.09	5.07	5.13	5.05	10%	70%
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														

Table: Chenjian

Audit: Wuxingtuo

Date: April 6th, 2023

KPS 深圳市凯普深通讯科技有限公司 天线专家 Shenzhen cape deep communication technology co., LTD		QC schedule drawing					file number	KPS--QPA-QA004		Enactment Date		
							file version	A/01		Page	page 1	
technological process		Control focus			management responsibility	method		Inspection method			corrective action	
Order Number	Main Processes	project name	aControl Project	Regulatory standards	person liable	Normal sampling number	person in charge	Inspection method	Examines the tool	Record type	Solution	
	▽	begin										
1	○	Receiving	quantity/product name/specifications	《Engineering BOM》 《Material receiving operation instruction》	Material clerk					《Electronic account》	Contact the supplier and issue 《returning note》	
2	◇	Incoming inspection	specifications/model/pack	《Engineering BOM》 《Sampling inspection plan》 《IQC incoming material inspection instruction》	IQC	MA=0.25 MI=0.65	IQC	1. visual 2. Machine test 3. sample	Two dimensional vernier caliper	《IQC incoming inspection record》	Inspection: OK, stamped with pass seal. The inspection shall be labeled as nonconforming product and issued at the same time 《8D Report Problem Solving Report》, Notify the supplier of return and improve.	
3	○	material	quantity/product name/specifications	《 production instruction》 《Material receiving operation instruction》	Material clerk					《Material requisition and distribution registration form》		
4	○	pack	pack quantity/indicate	《Finished product packaging operation instruction》	packager							
5	○	Delivery inspection	product appearance bad record Dimensional test Bad sign Good product packaging ROHS compliance	《Engineering BOM》 《Sampling inspection plan》 《OQC Final inspection operation instruction》	OQC	MA=0.25 MI=0.65	OQC	1. visual 2. Machine test 3. sample	Two dimensional vernier caliper	《OQC finished product inspection record》	If the number of times of the same type of the same type missing in the daily inspection is great, OQC issues the 8D report problem solving report to the production manager for analysis and improve	
6	○	delivery	product namespecification quantity delivery note	《Finished product shipping operation instruction》	Material clerk					《Electronic account》		
	▽	finish										
character	Revision date	Revised content				Revised ; Revised	Acknowledged by	Fiction		auditing	approval	
①												
②								date		date	date	
③												

Shenzhen Kaipushen Communication Technology Co., Ltd		file NO	
		Enactment Date	
<b>FPC antenna inspection specification</b>		Page	
		edition	A0

1. Purpose and purpose: rigorous testing , Control the use of defective products and ensure product quality requirements.

2. applicable scope: FPC aerial.

3. content

item	content	tool	Inspection standards and technical requirements	Defect Description	stratum
packin g	characteristic	visual	The outer package is clearly labeled, Indicate, product name、 specifications、 quantity、 date.	The identification is not clear and cannot be identified.	MIN
	Matter	visual	Uniform packaging, Clean and tidy, unabroken , No impact on handling 、 Storage, No wrong installation 、 mixed 、 Less clothes.	Inconsistent packaging, Dirty、 damp、 damaged. , Affect handling 、 Storage.	MIN
appear ance	surface	visual	FPC is not damaged、 Copper Exposed、 dehiscence、 chromatic aberration、 Yijiao,Gold finger is free of oxidation and brittle crack.	FPC is damaged、 Copper Exposed、 dehiscence、 chromatism、 rubber overflowing ,Oxidation of golden finger、 Brittle crack .	MAJ
structu re	measurement	vernier caliper	Board size (dimensions) Same as template	The size is different from the sample .	MAJ
	Material	sample plate	Same as template.	Material is different from template	MAJ
perform ance	Electroplate	electro plating Machine	Golden finger degree golden brightness, coverage rate 100%	The gold plating is not bright, or the gold plating coverage is low.	MAJ
	forced jointing	chassis	FPC IS pasted on its enclosure consistent with the preset pasting position None	FPC is pasted on its enclosure, Inconsistent with the preset pasting position , More or less .	MAJ

Formulate :

auditing :

Approve:

# RoHS restricted substance composition questionnaire

Information of supplied products												
Customer name	Description of Material/model	entry name	manufacturer				Green material identification					
Kailai	BT aerial	EPA399A	Shenzhen Kaipushen Communication Technology Co., Ltd				/					
Product composition information												
Order Number	part name	Specification	component supplier	Third party test report		Content of restricted substances PPM						remarks
				date for	number	(Pb)	(Cd)	(Hg)	(Cr <sup>6+</sup> )	(PBB)	(PBDE)	
1	adhesive	3M9471LSE	3M	2023.01.04	SHAEC2217569205	○	○	○	○	○	○	
2	base material	One and a half electrolytic copper	Kwai Lungti	2023.02.15	SHAEC23001049106	○	○	○	○	○	○	
3	plating	FPC Electrolytic Nickel Gold	Xindasheng	2022.04.12	A2220136788101001E	○	○	○	○	○	○	
4	Solder mask black oil	PSM-800FSDM-A	Youli	2022.08.05	ETR22705905	○	○	○	○	○	○	
5	Text white oil	KTM-150FWM	Chuanyu	2022.10.17	ETR22A01347M01	○	○	○	○	○	○	

written by: Wuxintuo

Filled by: Department: Quality

# Salt spray test report

Date: April 6th, 2023

Item	EPA399A-BT aerial	Customer	Kilai
Supplier	Shenzhen Kaipushen Communication Technology Co., Ltd	National Test standard	GB/T 2423.2-2008
Sample situation	Sample qty: 5PCS		
	Base material: one-sided, one-to-half adhesive electrolytic copper	Plating: Sinking Gold $\geq 3U''$	
Test time	2023年04月06日 9时 00 分至 2023年04月07日 9时 00 分 共计 24 H		
Test type:	<input checked="" type="checkbox"/> NSS	<input type="checkbox"/> ASS	<input type="checkbox"/> CASS
Test condition	Salt solution: 5%		PH:7.0
	Chamber temp: 35° C		Relative humidity: 85%
	Spray way: <input checked="" type="checkbox"/> Continuous <input type="checkbox"/> intermittent		Compressed air pressure: 1kg/cm <sup>2</sup>
	Salt spray sedimentation rate: 1-2ml/80cm <sup>2</sup> /h		Fog fluid collection: 1.4ml/80cm <sup>2</sup> /h
	Test cycle: __1__ cycle		Spray time: 24 h
Test results	Appearance after test: appearance intact, without obvious change		
	Coating: no spalling, no rust		
	Surface spraying, silk screen: no falling off, no bubbles.		
Explanation: 1、Salt spray test operating standards in accordance with the People's Republic of China national standard GB/T2423.17-2008 implementation. 2、The test piece results are determined according to the national standard GB/T6451-02 of the People's Republic of China.			
Operator by/date: Jian Chen Approved by/date: : Wu Xingtuo April 7th, 2023			

# High-low temperature test record

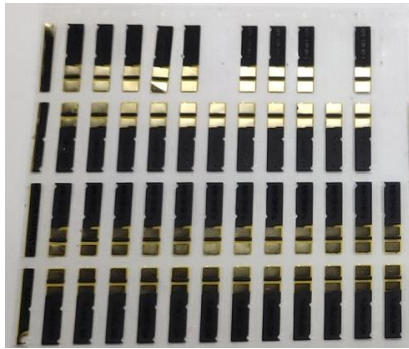
Product name	EPA399A	Customer name	Kailai	
Test qtu	6 pcs	Test date	2023/4/6	
Cycle number	1	Time	24H	
TestCondition: High temp: + <u>65</u> degree      Humidity: <u>90</u> % RH Low temp: - <u>20</u> degree Test time: high temp: <u>24</u> H      low temp: <u>24</u> H				
Test item	Uncycled test		Cycled test	
No	After high temp	After low temp	After high temp	After low temp
1	OK	/		
2	OK	/		
3	OK	/		
4	OK	/		
5	OK	/		
6	OK	/		
After test deficiency:				
Reason analysis:				
Improvement measures:				
Test results:      ✓ Pass <input type="checkbox"/> Fail				

Operator by/date: Jian Chen

Approved by: Wu Xingtuo

# Packing

Customer:	Kailai	Material name:	EPA399A-BT aerial
packing qty:	one carton	Packing material:	Carton
Qty/carton:		Packing way :	Ziplock bag



Picture 1: Single package



Picture 2: Packing way



Picture 3: Packing view (front, side, top)



Picture 4: packing label

Note: If you need to fit the antenna processing, according to the shell factory blister tray packaging shipping!

Fiction : Wu Xingtuo

auditing: LiMinghui