Approval Sheet

Project Name	SP3136
Material name	SP3136_FPC Antenna_3-in-1 Antenna_46.8 mm_26.22 mm_0.15 mm_Welding_Consumer Grade_Innowave
HuaQin P/N	HQ260030005H0
Sample version	A
Model No.	F001F9901J11000
Vendor	KunShan Innowave Communication Technology CO.,Ltd.
Delivery address	No. 2, Qianmei Road, Dongkeng Town, Dongguan City, Guangdong Province, Ruixiang Industrial Park.

Vendor				Customer			
author	Zuoping.Wu	Date	7-August-24	author		Date	
Approved by	Ping.Yang	Date	7-August-24	Approved by		Date	

Customer confirmation

Sample	□temporary sample ■Approved Sample
Quantity of temporary sample	3 approval sheets & 6 Samples

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Instruction：

1. The basic information of approved samples are based on Hua Qin Sourcing.
2. Agent of vendor under seal
3. Agent of buyer under seal
4. The documents and samples will take effect after being approved .

名称：昆山睿翔讯通通信技术有限公司 联系人：吴作平
上海分公司：上海市浦东新区祖冲之路 1500 号 12A
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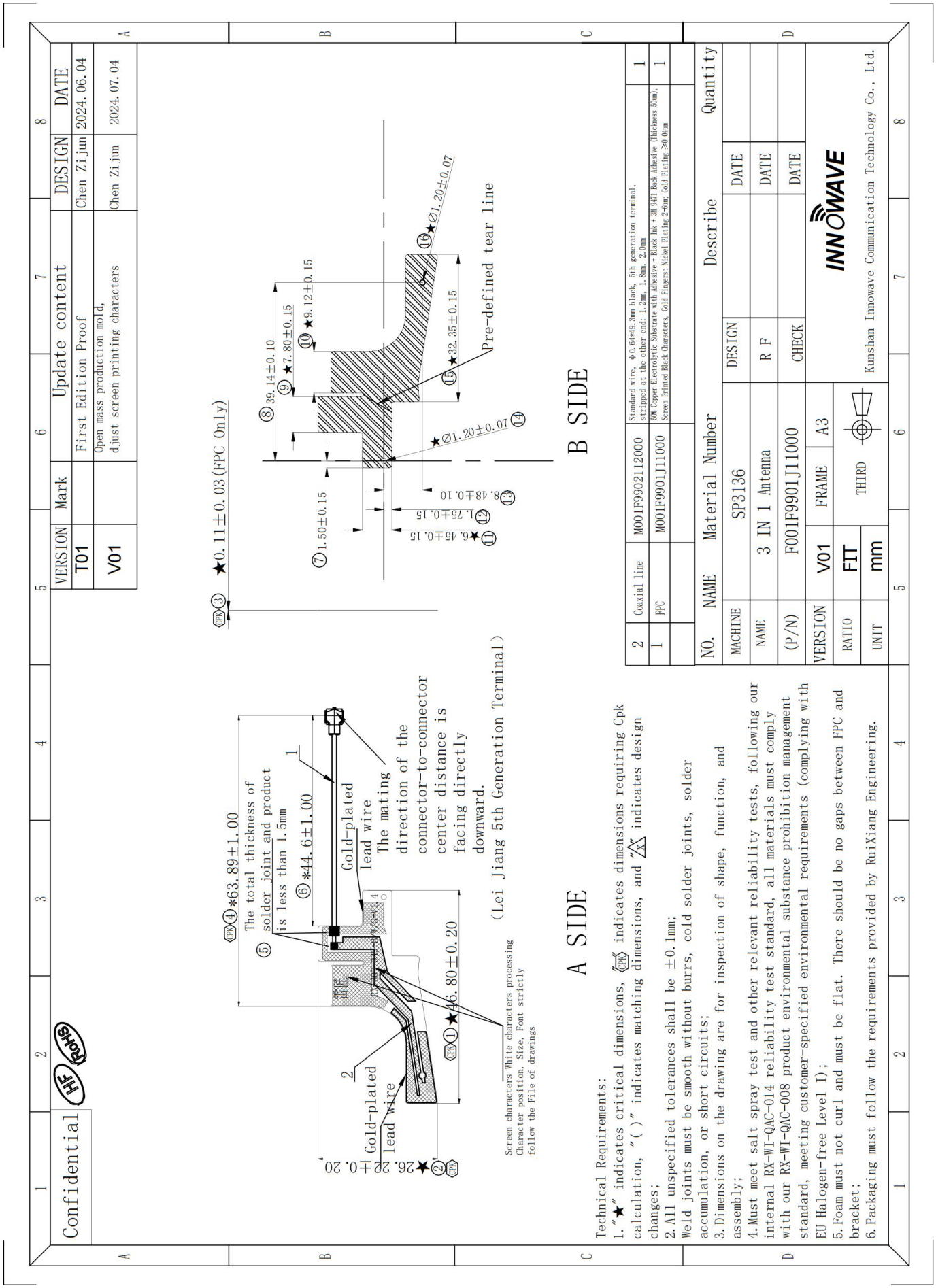
Engineering drawings：



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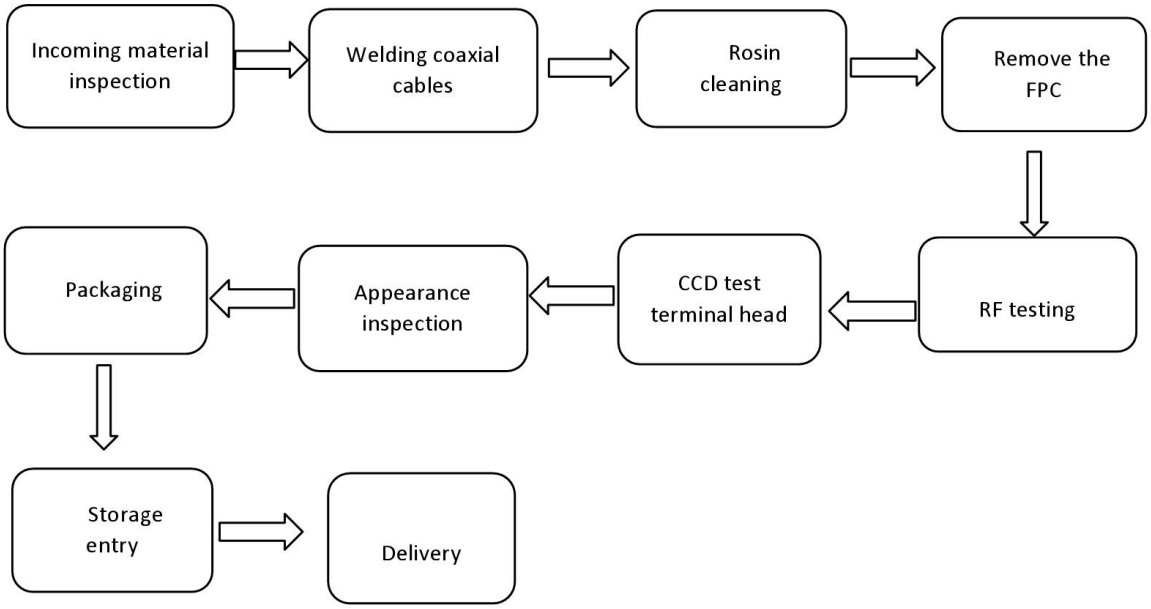
Manufacturing flow chart：

Process Flow Chart

Customer	Hua Qin	Written By	Qiu Xiufei	Orig. Date	2024/7/18
Part Number		Revised By	Qiu Xiufei	Revised Date	2024/7/18
Description	SP3136	Approved By	Pan Haoyan	Approved Date	2024/7/18



Electrical performance report:

1.1 Electrical Performance

1.1-1 Specification Standards

The GPS & WiFi antennas of SP3136 (POS machine) resonate in the frequency bands of 1575.42MHz, 2400MHz - 2500MHz, and 5150MHz - 5850MHz.

1.2 Return Loss Test

1.2-1 Test Setup

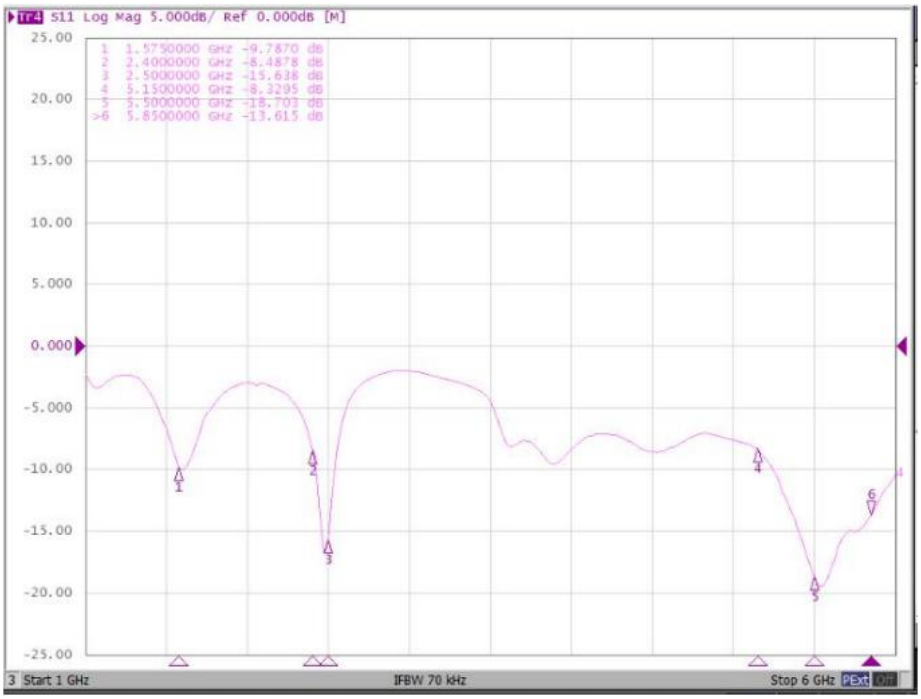
The connection sequence of the return loss test device is: E5071B network analyzer → 50-ohm coaxial cable → 170mm long copper tube → test fixture.

Treatment of the test fixture: A rigid cable is used to lead out an SMA-J connector from the 50-ohm test point of the antenna on the mobile phone PCB, which is connected to a copper tube sleeved with a choke coil, and then other devices are connected in sequence.

1.2-2 Voltage Return Loss Test

The return loss values at the edge frequency points of the main antenna operating band are shown in the following table.

Fre(MHz)	Return loss
1575	-9.78
2400	-8.48
2500	-15.63
5150	-8.32
5850	-13.61



1.2-3 Passive efficiency test results

Frequency (MHz)	Gain (dB)	Efficiency (dB)	Efficiency (%)	Frequency (MHz)	Gain (dB)	Efficiency (dB)	Efficiency (%)	Frequency (MHz)	Gain (dB)	Efficiency (dB)	Efficiency (%)
1545	1.9	-3.4	45.6%	2380	1.9	-8.1	15.5%	5150	1.9	-3.9	40.4%
1550	1.7	-3.4	45.4%	2390	1.9	-7.2	19.3%	5200	1.9	-4.3	37.3%
1555	2.0	-3.3	46.5%	2400	1.9	-6.6	22.1%	5250	1.9	-4.2	37.7%
1560	2.1	-3.2	48.0%	2410	1.9	-6.2	24.3%	5300	1.9	-4.3	36.9%
1565	1.8	-3.4	45.3%	2420	1.9	-6.0	25.4%	5350	1.9	-4.3	37.2%
1570	1.9	-3.4	46.0%	2430	1.9	-5.7	27.2%	5400	1.9	-4.1	38.7%
1575	1.9	-3.0	49.8%	2440	1.9	-5.4	29.1%	5450	1.9	-3.9	40.6%
1580	1.7	-3.2	47.8%	2450	1.9	-5.2	29.9%	5500	1.9	-3.5	44.3%
1585	1.7	-3.2	48.3%	2460	1.9	-5.4	28.8%	5550	1.9	-3.5	44.3%
1590	2.0	-3.0	50.0%	2470	1.9	-5.4	29.0%	5600	1.9	-3.2	47.6%
1595	1.7	-3.3	46.3%	2480	1.9	-5.3	29.6%	5650	1.9	-3.0	49.7%
1600	1.9	-3.2	48.2%	2490	1.9	-5.3	29.6%	5700	1.9	-3.1	48.5%
1605	2.0	-2.9	51.8%	2500	1.9	-5.3	29.6%	5750	1.9	-3.2	48.1%
								5800	1.9	-3.1	49.3%
								5850	1.9	-3.9	41.1%

1.2-4 Active test results

Band	Channel	TRP	TIS
11B	1	14.5	-84.4
	7	14.7	-83.9
	13	15.3	-84.8
11A	Ch	TRP-6M	TIS-54M
	36	11.0	-71.9
	64	10.3	-72.3
	157	7.8	-70.2
	165	8.2	-70.7
GPS			-151.6
UHIS			-148.9
CN			40.3

Main materials list：

Material List/RoHS Report

Material name	SP3136	Supplier	Innowave
Material code	F001F9901111000 F001F9901511000	Material specification	Main Antenna Diversity Antenna

Product composition information

Serial Numb	Material name	Raw material specifications	Material supplier	RoHS controlled substance content (ppm)										Test Lab	Report number	Report date
				Hg	Cd	Pb	DEHP	BBP	DBP	DIBP	Cr6+	PBBs	PBDEs			
1	base material	SHISE131318MT1#	cailungedi	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	SHAEC24028809006	2024.12.20
2	Adhesive backing	3M9471	3M	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	SHAEC24027480901	2024.12.6
3	Solder resist ink	PSM-800	youli	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	ETR25501383	2025.5.20
4	Text ink	ZSR-150	chuanyu	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	ETR24902229M01	2024.9.23
5	gold-plating	Nickel gold	qiansheng	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	CTI	A2240574309101001C	2024.9.20
6	Black Mother	PFA	DAINICHISEIKA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	HKGEC25000107416	2025.4.16
7	tinned copper wire	/	mingxing	ND	ND	46	ND	ND	ND	ND	ND	ND	ND	CTI	A2250174863101001E	2025.3.26
8	Silver plated copper wire	/	hengfeng	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	SHAEC24025471005	2024.11.25
10	isolation	FEP	DAIKIN	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	SHAEC24027284563	2024.12.5
11	terminal	C5210	zijin	ND	ND	4	ND	ND	ND	ND	ND	ND	ND	SGS	CANEC24029407216	2025.1.8
12	Rubber core	PBT 8000	wote	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	CTI	A2250361937104002E	2025.6.3
13	cladding material	gold	qiaofu	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	CANEC25002136401	2025.2.14
14	cladding material	nickel	qiaofu	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	CANEC25002136405	2025.2.14
15	Tin wire	tin	yuexin	ND	ND	6	ND	ND	ND	ND	ND	ND	ND	SGS	SZXEC25000122534	2025.1.17

Packing Requirement:

Packing

Customer part number:	HQ260030005H0	Product Name:	SP3136(FF99) - Three-in-One Antenna Finished Product
Product Specifications:	FPC+cable	Packaging materials:	Cartons、 self-sealing bags
Packaging quantity:	One box	Packing:	Paper PE bag packaging (50 PCS per PE bag)
Packing quantity:	3000		

Figure 1: After the appearance performance inspection is passed, 50 pieces of products are wrapped with pearl cotton around the terminal heads.

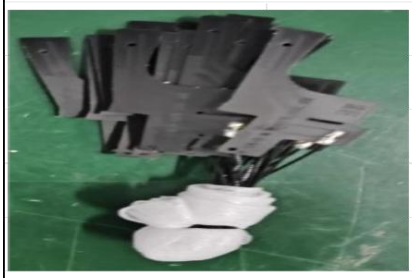
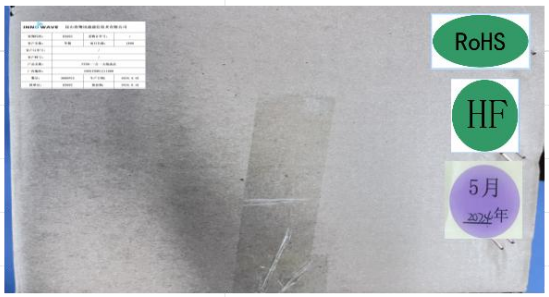


Figure 2: A total of 50 pieces are packed into one self-sealing bag, and the inner label and RoHS label are attached to the front of the bag.

Figure 3: Sixty bags of products were placed in a cardboard box. Each box contained a total of 3,000 pieces.

Figure 4: I-beam type packaging box, and attach the outer box label and RoHS/HF label on the side of the outer box.



Material Details of Packaging Materials

Name	Part Number	Specification	Quantity
FPC type small carton	B01A0061	310*270*160mm	1/3000
Ziplock bags	B02E0002	200*150mm	1/50
RoHS Mark	M0000B2C0171	Green background with black text - Elliptical shape, 2.5 * 1.3 cm	61/3000
Environmental Protection Label	M0000B2C0170	Green background, black circular shape, diameter 3.0 cm	1/3000
Month labels	M0000B2C0174	(From January to December) Diameter of the circle is 2.5 cm	1/3000
interior label	/	100*80mm	1/50
external standard	/	100*80mm	1/3000

Note:
1. The products are manufactured in single units and packed in PE bags for shipment. Each box contains 3,000 PCS of the product. 2. Based on the actual quantity of shipments

fabrication:	Qiu Xiufei	Confirm:	Pan Haoyan	Review:

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