shanghai Shangyuan Communication Technology Co., LTD

Skyline
Acknowledgment

Customer name: Xiangcheng	Project name: R2351
Working frequency band: G4/W1/2/4/5/8 FDD: 1/2/3/4/5/7/8//12/17/20/25/26/28/38/40/41 GPS/WIFI2.4G/5G	
Motherboard version:	

Shangyuan material specifications

specifications and models	Shangyuan material number	Customer part number

Change your resume

Date of preparation/change	Change content	Change of person	edition

Shangyuan co-signature bar

research and development	structure:	examine and verify:	Quality Engineer:	ratify:
	radio frequency:	examine and verify:		

Customer signature bar

electronic engineer	project manager	construction engineer	Quality engineer

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catalogue

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1.item information

Machine information

Antenna information

	Antenna version
main antenna	
diversity	
triangle	

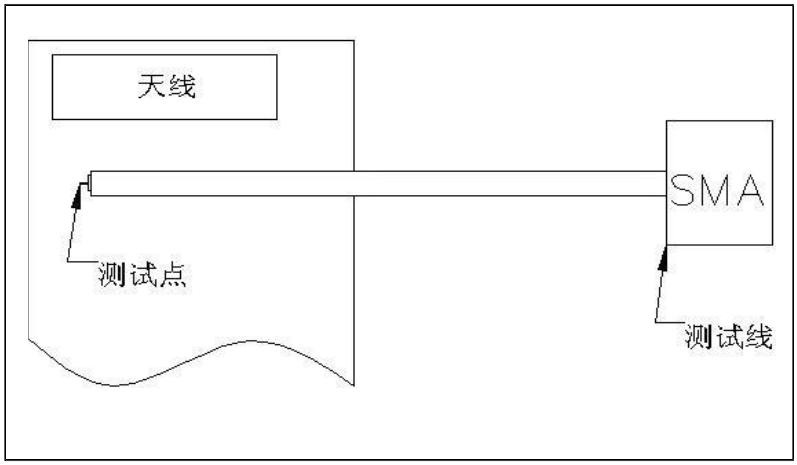
Note: The customers final antenna performance prototype will be retained in our company for at least one year, so as to analyze and solve the abnormal situation in the mass production of antenna,

ensure antenna quality of shipment.

2. Test tools

Objective: To test the passive parameters of the antenna as accurately as possible.

Making method: The prototype fixture is made by connecting one end of a 50 ohm coaxial cable to the test point at the back end of the matching circuit of the prototype motherboard (the front end of the RF test hole), and the other end to the SMA connector. The schematic diagram is as follows:



3.building-out circuit

Logical matching		
Main antenna main road		
item	mate	
L0531	NC	
C0533	0Ω	
L0532	12nH	
R0531	0Ω	
C0534	NC	
C0535	NC	
R0532	0Ω	
C0532	0Ω	
Main antenna switch		
c0531	NC	tunner logic
C0530	0Ω	
L0501	NC	
RF1	C0522	0Ω	GSM900 WCDMA8/1 FDD:1/8
RF2	C0524	2.2NH	GSM850,FDD:5,20/7/38/41
RF3	C0523	27NH	TDD:40
RF4	C0525	NC	GSM:1800/1900 FDD:3

Distributed antenna matching

Main road

item	mate
C0402	15NH
C0400	3PF

Distributed antenna switch

			tunner logic
	C0443	NC	
	C0442	0Ω	
	L0502	NC	
RF1	C0537	0Ω	GSM900,1900,W:1/8 FDD:1/8TDD:40
RF2	C0538	3.3NH	GSM:850,1800 FDD:3.5,20,7TDD:38/41
RF3	C0539	12NH	NC
RF4	C0540	NC	NC

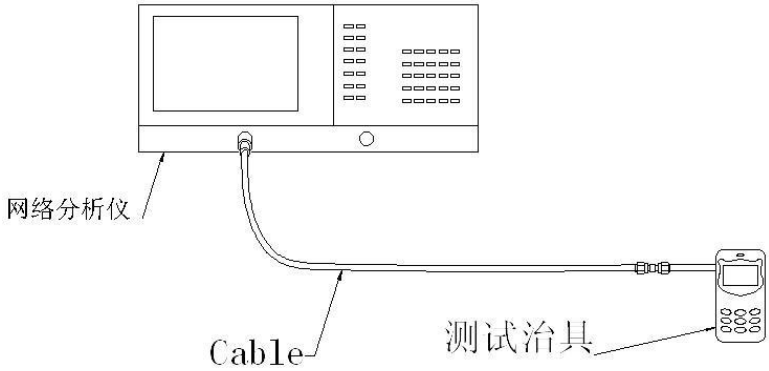
4. S 11 Test

1. S 11 Test method description

Test equipment: Network Analyzer (E5071C)

Test method: A 50 ohm CABLE cable is exported from the instrument test port, and the SMA connector of the sample machine fixture is connected after calibration with a calibration piece, and the echo loss and standing wave ratio corresponding to the relevant frequency points are recorded.

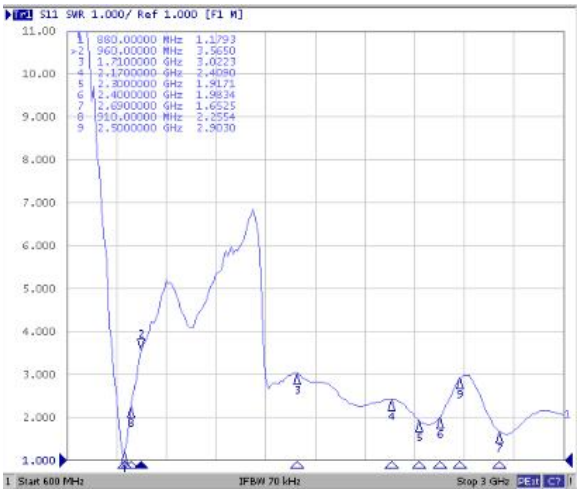
The test diagram is as follows:



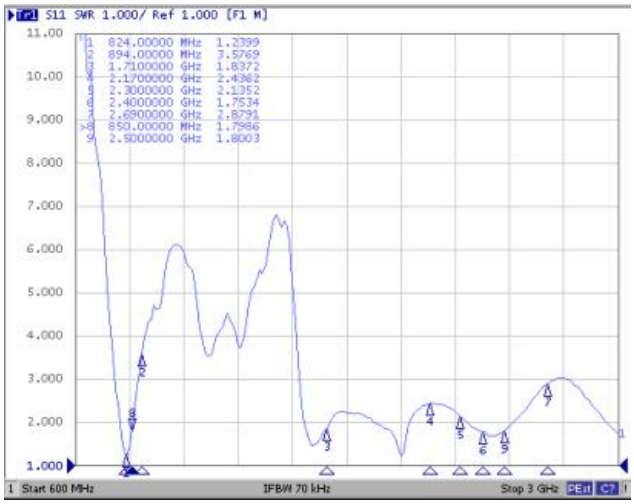
Schematic diagram of the test

4.2 S11 parameters

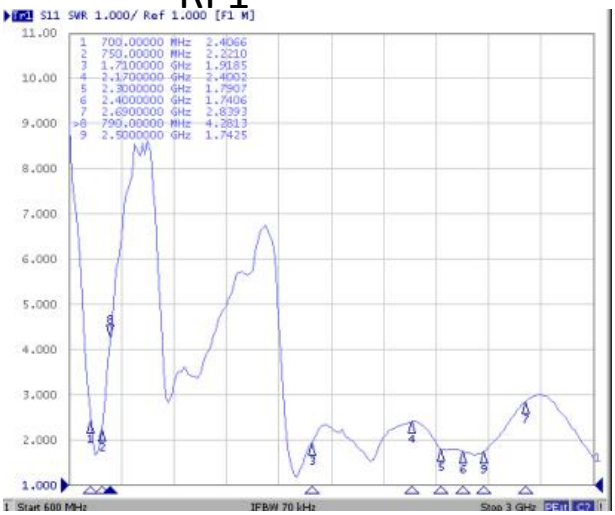
Main antenna



RF1



RF2

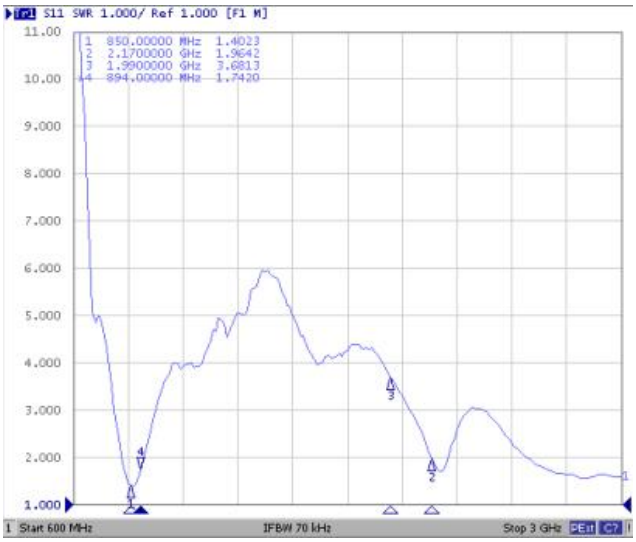


RF3

RF4

Diversity antenna

RF1



RF2

RF3

Diversity antenna 2

GPS/WIFI

5 Dark room test data

Test system: shielded dark room

Test environment: temperature 22℃± 3℃, humidity 50%±15%

Test equipment: Use network analyzer Agilent E5062C when testing passive data

When testing active data, use the comprehensive tester Agilent 8960 /CMW500/E4438c

5.1 Passive test data

5.1.1 Passive efficiency of the main antenna

frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)	frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)	frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)
700	0.92	-6.41	22.84	1820	2.16	-4.62	34.49	2340	1.83	-5.13	30.71
710	0.52	-5.71	26.85	1830	2.49	-4.56	35.02	2350	1.77	-5.39	28.88
720	0.54	-6.02	25.02	1840	2.28	-5.27	29.71	2360	1.65	-5.65	27.24
730	0.4	-6.32	23.33	1850	2.32	-5	31.63	2370	1.58	-5.71	26.85
740	0.2	-7.08	19.58	1860	2.3	-5.28	29.62	2380	1.8	-5.57	27.76
750	0.61	-7.24	18.9	1870	2.11	-4.91	32.26	2390	1.96	-5.25	29.82
760	1.38	-6.87	20.58	1880	2.12	-4.63	34.42	2400	1.89	-5.31	29.46
770	1.3	-6.92	20.34	1890	1.76	-4.94	32.06	2500	1.88	-5.66	27.14
780	-2.66	-8.43	14.35	1900	1.72	-4.9	32.38	2510	1.73	-5.94	25.46
790	-2.97	-7.9	16.2	1910	1.45	-5.48	28.31	2520	1.66	-6.13	24.37
frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)	1920	1.46	-5.47	28.36	2530	1.99	-5.74	26.69
820	-0.92	-6.28	23.55	1930	2.05	-5.32	29.4	2540	2.02	-5.66	27.14
830	-1.68	-6.14	24.31	1940	2.54	-4.49	35.53	2550	2.3	-5.08	31.06
840	-0.46	-4.87	32.57	1950	2.67	-3.96	40.17	2560	2.16	-5.15	30.52
850	-0.64	-5.65	27.2	1960	1.97	-4.16	38.36	2570	1.99	-5.26	29.81
860	-1.15	-6.24	23.78	1970	1.97	-4.03	39.57	2580	1.64	-5.52	28.08
870	-0.56	-6.99	20.02	1980	2.06	-4.14	38.55	2590	1.35	-5.83	26.13
880	-0.55	-6.51	22.33	1990	1.63	-4.58	34.87	2600	1.1	-6.11	24.5
890	-1.75	-7.82	16.51	2000	1.03	-5.21	30.12	2610	0.78	-6.32	23.33
frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)	2010	0.09	-5.75	26.62	2620	0.75	-6.24	23.74
880	0.26	-4.39	36.37	2020	-0.43	-5.67	27.11	2630	0.71	-6.32	23.36
890	0.83	-4.05	39.36	2030	-2.26	-6.66	21.57	2640	0.77	-6.25	23.73
900	0.18	-4.38	36.5	2040	-2.29	-6.79	20.93	2650	1.19	-5.83	26.09
910	-0.71	-5.73	26.72	2050	-3.09	-7.32	18.56	2660	1.11	-6	25.15
920	-1.28	-6.82	20.82	2060	-2.27	-6.48	22.47	2670	0.84	-6.43	22.76
930	-0.9	-7.32	18.54	2070	-1.4	-5.71	26.85	2680	1.93	-6.88	20.52
940	-0.68	-7.2	19.04	2080	-1.38	-5.72	26.81	2690	1.47	-7.58	17.46
950	0.54	-5.95	25.42	2090	-0.73	-5.61	27.48				
960	0.94	-5.31	29.45	2100	-0.29	-5.88	25.8				
1710	3.04	-4.03	39.57	2110	-0.12	-5.86	25.96				
1720	2.81	-4.34	36.8	2120	-0.14	-6.3	23.47				
1730	2.96	-4.05	39.37	2130	0.08	-6.04	24.91				
1740	2.77	-4.52	35.31	2140	0.58	-5.4	28.82				
1750	2.79	-4.49	35.59	2150	0.25	-5.8	26.27				
1760	2.87	-4.27	37.44	2160	0.51	-5.24	29.92				
1770	2.53	-4.83	32.87	2170	0.56	-5.46	28.43				
1780	2.67	-3.94	40.4	2300	1.26	-5.87	25.9				
1790	2.91	-3.74	42.23	2310	1.47	-5.6	27.52				
1800	2.51	-3.72	42.43	2320	1.65	-5.3	29.48				
1810	2.38	-3.96	40.19	2330	1.7	-5.11	30.81				

5.1.2 Diversity antenna efficiency

frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)
750	-2.65	-8.37	14.55
760	-3.03	-8.79	13.2
770	-3.68	-9.48	11.28
780	-2.44	-7.73	16.86
790	-2.89	-7.81	16.57
frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)
850	1.14	-6.84	20.7
860	1.54	-6.44	22.68
870	1.93	-5.95	25.39
880	2.07	-5.74	26.64
890	1.91	-5.83	26.1
frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)
920	-1.71	-7.25	18.86
930	-1.19	-6.75	21.11
940	-0.97	-6.45	22.66
950	-0.87	-6.26	23.66
960	-1	-6.35	23.18
1880	-1.89	-6.72	21.29
1890	-1.49	-6.37	23.06
1900	-0.08	-5.42	28.73
1910	0.28	-5.13	30.68
1920	-0.08	-5.29	29.59
1930	0.09	-5.12	30.75
1940	1.74	-4.89	32.41
1950	0.7	-5.9	25.7
1960	0.88	-5.86	25.93
1970	1.05	-5.77	26.47
1980	1.42	-5.55	27.83
1990	1.97	-5.59	27.62
2000	2.06	-5.61	27.45
2010	1.78	-5.82	26.18
2020	0.35	-7.01	19.88
2030	-0.73	-7.7	16.98
2040	-1.43	-8.09	15.54
2050	-2.18	-8.49	14.17
2060	-1.01	-7.44	18.04
2070	-1.23	-7.55	17.58
2080	-0.09	-6.83	20.73
2090	-0.14	-6.83	20.73
2100	-0.79	-7.33	18.51
2110	-1.96	-8.1	15.5
2120	-2.9	-8.79	13.2
2130	-2.95	-8.72	13.41
2140	-3.54	-9.07	12.39
2150	-3.1	-8.77	13.27
2160	-2.67	-8.52	14.07
2170	-2.65	-8.55	13.97

Diversity 2 efficiency

frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)
2400	0.9	-5.11	30.83
2410	1.27	-4.84	32.8
2420	1.23	-5.04	31.34
2430	1.27	-5.23	29.96
2440	1.39	-5.35	29.15
2450	1.51	-5.49	28.25
2460	2.01	-5.21	30.11
2470	2.17	-5.27	29.7
2480	2.67	-4.99	31.72
2490	2.68	-5.17	30.44
2500	2.74	-5.28	29.64
2510	2.85	-5.27	29.72
2520	3.01	-5.24	29.95
2530	3.09	-5.31	29.46
2540	2.83	-5.51	28.11
2550	2.89	-5.49	28.28
2560	2.91	-5.54	27.93
2570	2.86	-5.61	27.49
2580	2.95	-5.55	27.86
2590	2.65	-5.8	26.28
2600	2.59	-5.86	25.94
2610	2.21	-6.03	24.93
2620	2.57	-5.63	27.36
2630	2.03	-6.02	25.03
2640	1.74	-6.4	22.93
2650	2.46	-5.04	31.34
2660	2.72	-5.02	31.49
2670	2.48	-5.2	30.18
2680	3.01	-5.36	29.12
2690	2.51	-5.75	26.62
2700	2.21	-5.83	26.12

Three-way antenna efficiency

frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)
1520	0.53	-4.86	32.69
1530	0.59	-4.85	32.72
1540	0.54	-4.62	34.52
1550	1.09	-3.81	41.6
1560	0.91	-4.35	36.74
1570	1.16	-4.34	36.78
1580	0.59	-5.08	31.04
1590	0.3	-4.85	32.72
1600	-0.23	-4.44	35.96
1610	-0.79	-4.75	33.48

frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)
2400	3.43	-5	31.6
2410	3.4	-4.89	32.43
2420	3.22	-4.97	31.83
2430	3.2	-4.85	32.71
2440	3.11	-4.85	32.7
2450	3.05	-5.06	31.22
2460	3.15	-4.98	31.73
2470	3.31	-5.07	31.11
2480	3.59	-4.77	33.38
2490	3.66	-4.85	32.7
2500	3.61	-4.92	32.22

frequency (MHz)	gain (dBi)	productiveness (dBi)	productiveness (%)
5200	2.8	-3.23	47.55
5220	3.22	-2.91	51.16
5240	3.23	-3.05	49.58
5260	2.87	-3.44	45.25
5280	2.71	-3.39	45.76
5300	2.32	-3.84	41.26
5320	2.78	--3.43	45.35
5340	2.57	-3.7	42.66
5360	1.99	-4.3	37.16
5380	2.26	-3.88	40.92
5400	2.07	-4.11	38.81
5420	1.63	-4.18	38.21
5440	1.23	-4.52	35.3
5460	1.16	-4.79	33.19
5480	1.35	-4.93	32.13
5500	1.48	-4.73	33.67
5520	1.59	-4.68	34.08
5540	1.41	-4.74	33.57
5560	1.44	-4.9	32.36
5580	1.73	-4.81	33.04
5600	1.88	-4.8	33.12
5620	1.23	-5.41	28.78
5640	0.51	-5.76	26.55
5660	0.66	-5.86	25.95
5680	0.42	-6.26	23.67
5700	1.16	-5.87	25.9
5720	0.99	-6.03	24.95
5740	0.96	-6.07	24.72
5760	1.31	-5.9	25.68
5780	1.31	-5.95	25.39
5800	1.35	-6.04	24.86
5820	1.26	-6.05	24.84
5840	3.06	-5.26	29.79
5860	3.5	-4.98	31.75

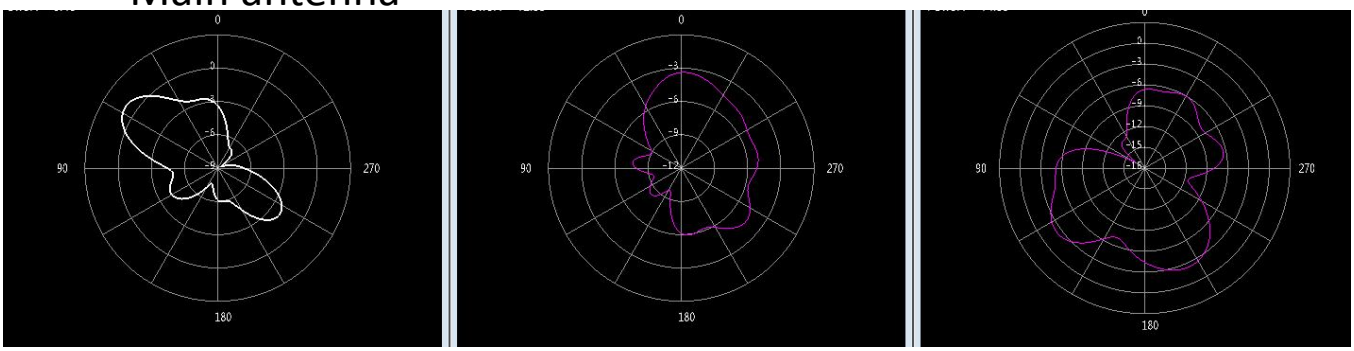
5.2 Active test data

5.2.1 Active test data (free space, screen off)

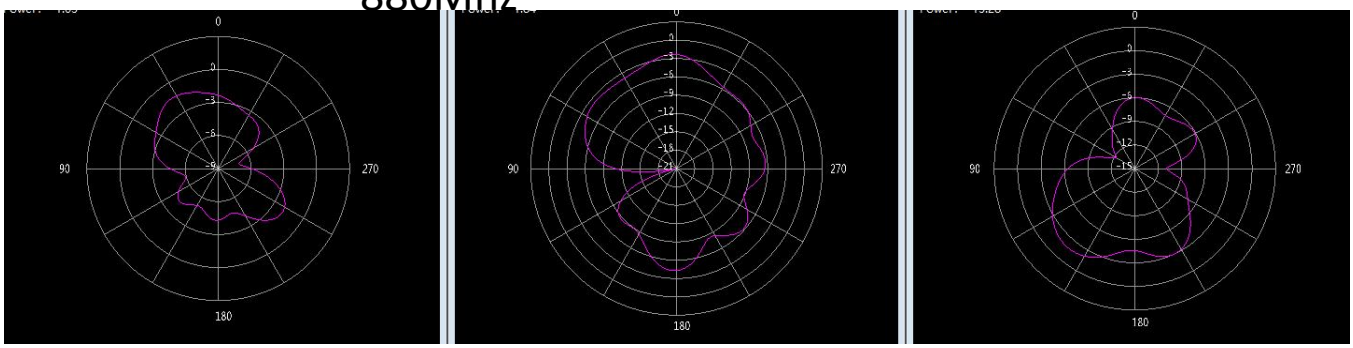
Band	TRP	TIS	Band	TRP	TIS
WCDMA_B1	18.83		FDD_B17	13.13	
	19.77			13.49	
	19.39	-104.22		13.6	-89.44
WCDMA_B2	19.47		FDD_B25	18.38	
	18.37			17.62	
	16.76	-107.19		17.04	-94.64
WCDMA_B4	18.13		FDD_B26	16.67	
	18.2			17.16	
	17.98	-105.87		17.55	-94.12
WCDMA_B5	18.46		FDD_B28	13.34	
	18.92			13.88	
	18.93	-105.46		14.29	-91.5
WCDMA_B8	18.98		FDD_B66	17.12	
	17.72			17.03	
	17.08	-103.15		17.55	-95.03
FDD_B1	19.06		TDD_B38	17.06	
	19.56			17.76	
	19.38	94.29		18.24	-94.51
FDD_B2	17.84		TDD_B41	17.16	
	18.07			17.91	
	17.29	-95.41		17.96	-94.57
FDD_B3	18.1		Band	Channel	Total	TIS
	18.12		WIFIB	1	15.1	
	17.8	-94.46		7	14.67	
FDD_B4	18.2			13	13.59	-75.17
	18.15		Band	Channel	Total	TIS
	18.51	-94.52	WIFIA	36	14.26	
FDD_B5	18.67			149	12.79	
	19.32			165	13.46	-74.51
	19.6	-94.37				
FDD_B7	18.12		Band	Channel	TIS
	17.85		GPS	1575.42	-145.81
	17.49	-96.05			
FDD_B12	13.46				
	13.61				
	14.26	-89.03			

6. 2D direction diagram

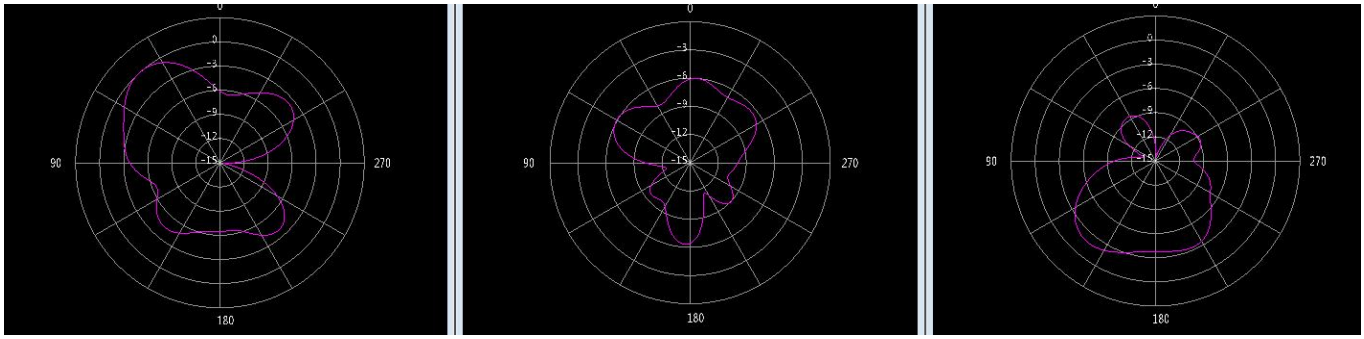
Main antenna



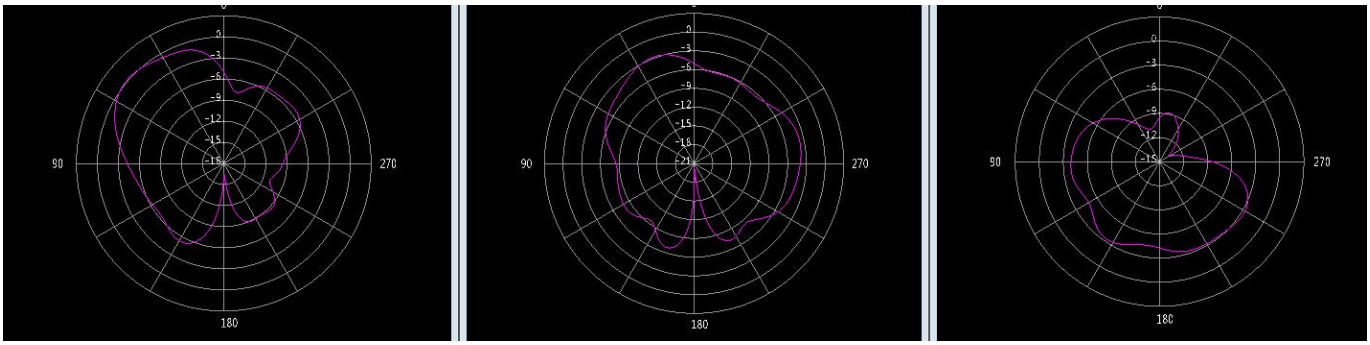
880Mhz



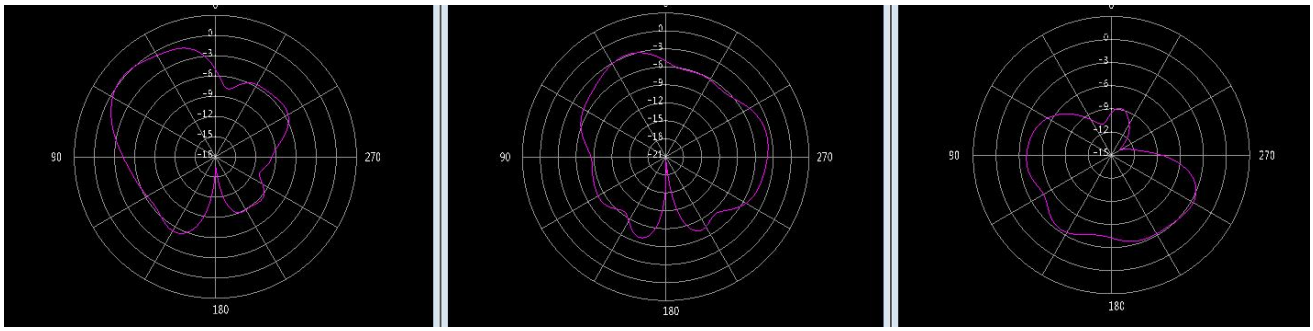
850Mhz



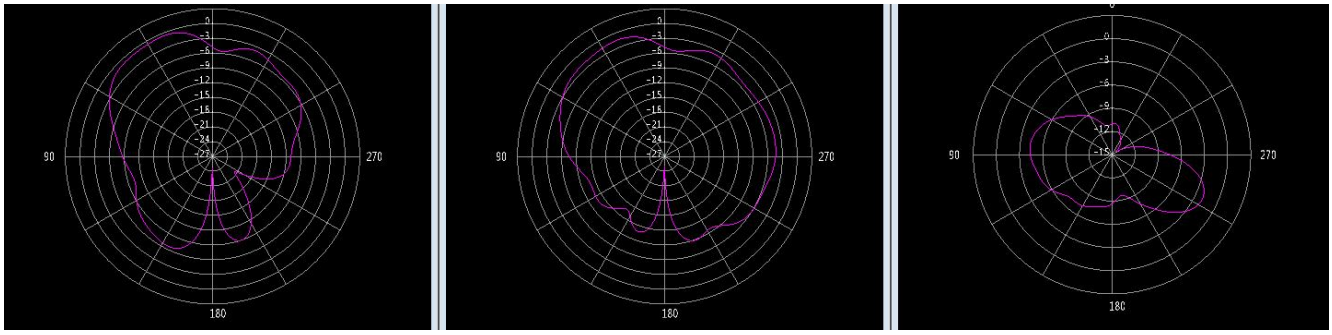
700Mhz



1880Mhz

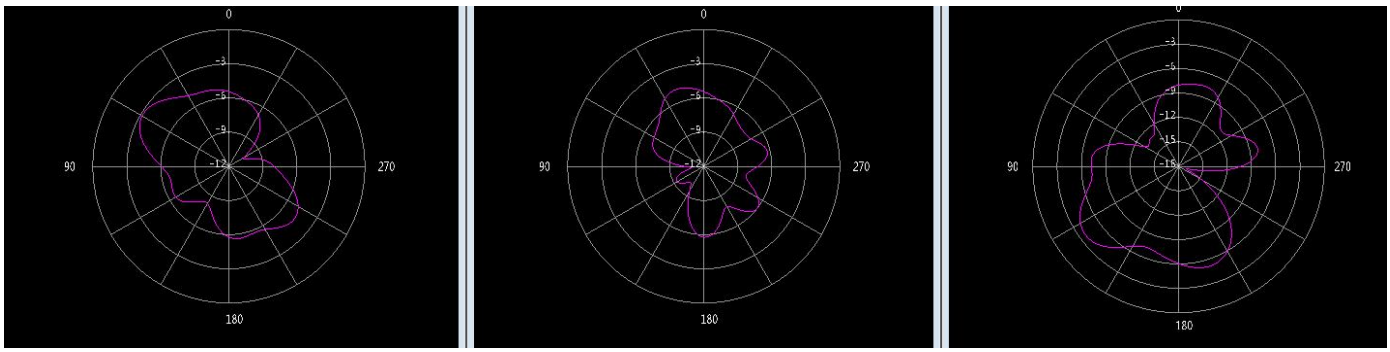


2170Mhz

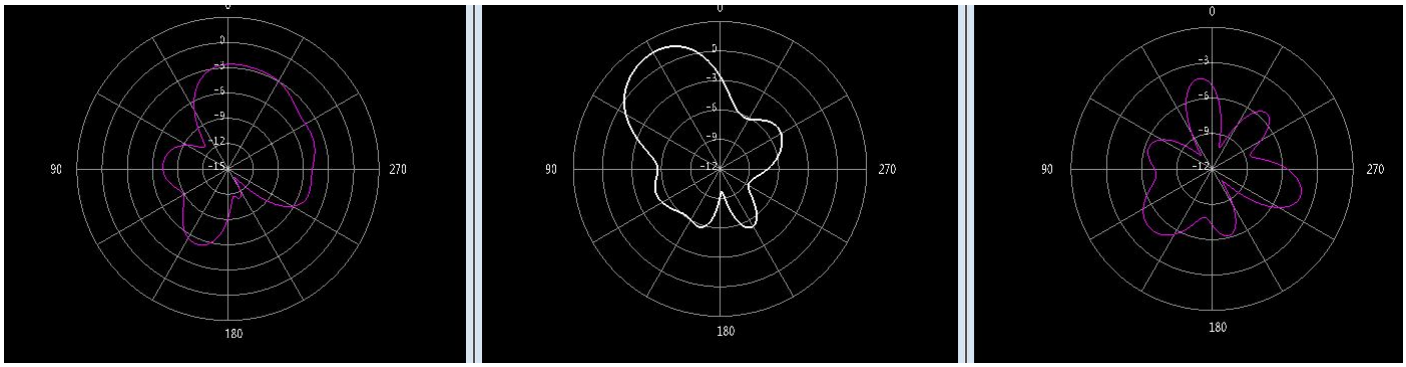


2550Mhz

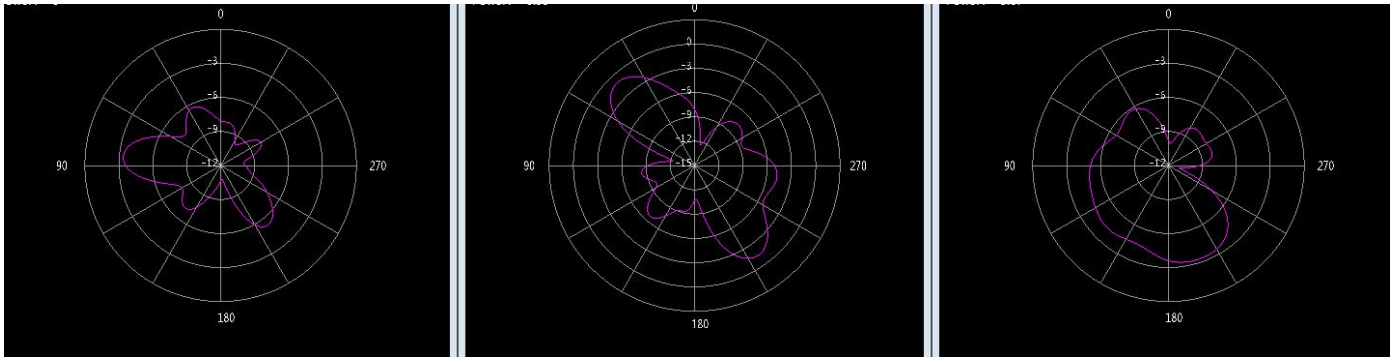
Diversity antenna



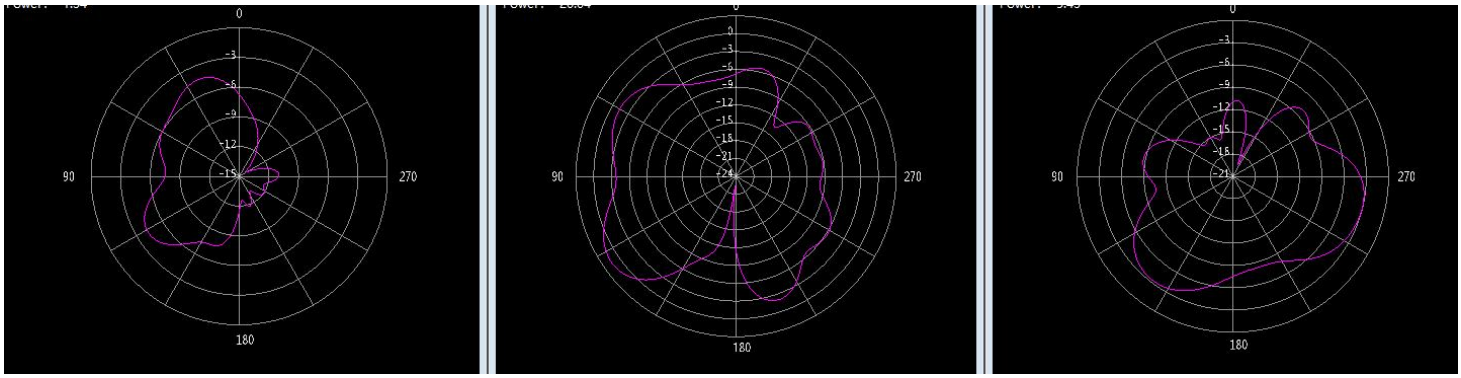
790Mhz



890Mhz

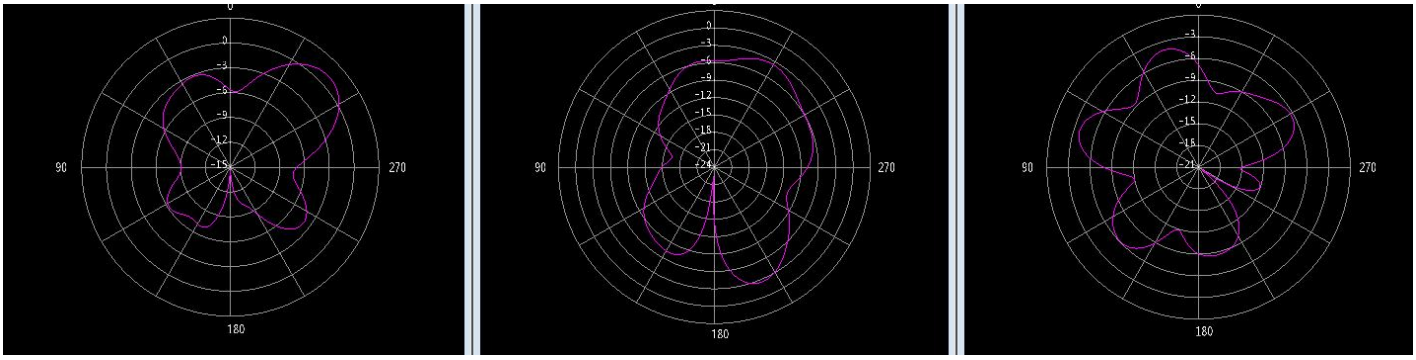


960Mhz



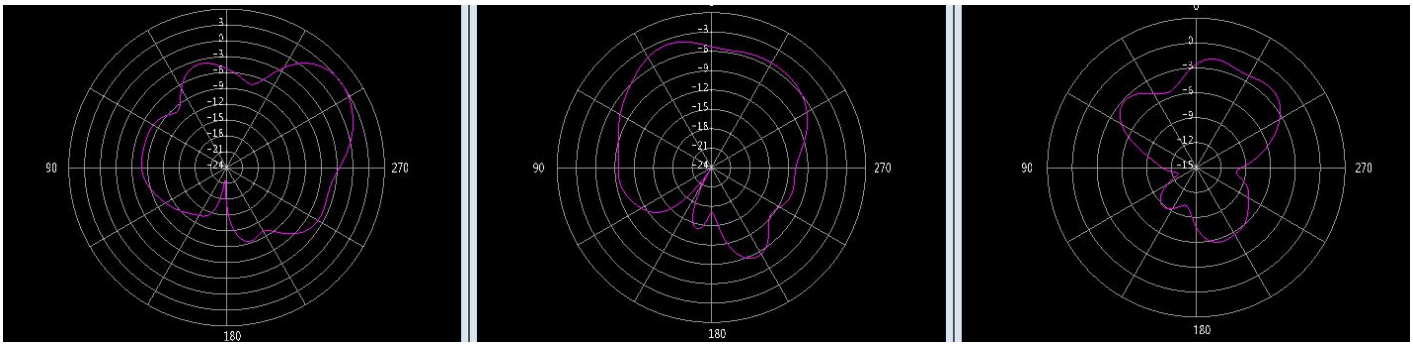
2170Mhz

Diversity antenna 2

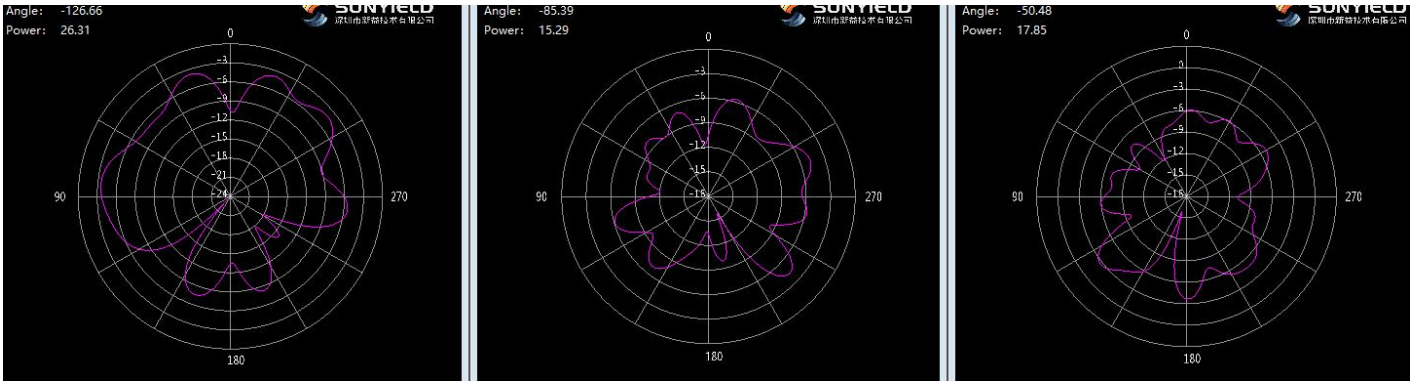


2450Mhz

Triangle Antenna



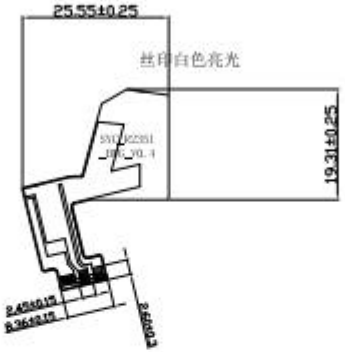
2450Mhz



5500Mhz

版本	修改内容	修改人	日期

正面



背胶面

技术要求

1. 出货包装要求：（整版包装出货）
2. 铜泊表面涂黑色哑光;
3. 油墨要均匀;
4. 带"*"符号尺寸为重点尺寸;
5. 背胶用3M9471;
6. 基材使用PI　T=0.5Mil;
7. 铜箔厚0.5oz,电解铜;
8. 镀金区域盐雾测试过48H,金厚>0.5u";
9. 未注倒圆角均为0.2，工艺沿边为0.2mm;
10. 未注公差按一般公差表;
11. 产品符合RoHS3.0要求。

铜箔区域

镀金区域

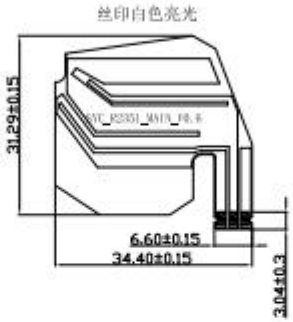
全部背胶

上海尚远通讯科技有限公司			
	PART NAME: RZ331 二合一天线	DATE:	2025.4.7
	PART NO: SH244021B75-2	DRAWN:	张迪方
TOLERANCE X.X ±0.25 .XX ±0.25 .XXX ±0.05 ANGULAR ∠±0.5°	RF: 姜昊	Tel:	
	PM: 马幕寒	Tel:	
	MATERIAL:	CHECKED:	于姜
	FINISHING:	APPROVED:	
UNIT:mm	COLOUR: 黑色	SCALE:1:1	REV:LS04

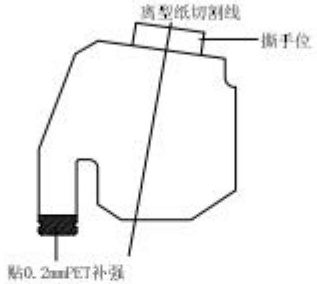
SUNNYWAY 尚远科技

版本	修改内容	修改人	日期

正面



背胶面



技术要求

1. 出货包装要求：（整版包装出货）
2. 铜泊表面涂黑色哑光;
3. 油墨要均匀;
4. 带"*"符号尺寸为重点尺寸;
5. 背胶用3M9471;
6. 基材使用PI　T=0.5Mil;
7. 铜箔厚0.5oz,电解铜;
8. 镀金区域盐雾测试过48H,金厚>0.5u" ;
9. 未注倒圆角均为0.2，工艺沿边为0.2mm;
10. 未注公差按一般公差表;
11. 产品符合RoHS3.0要求。

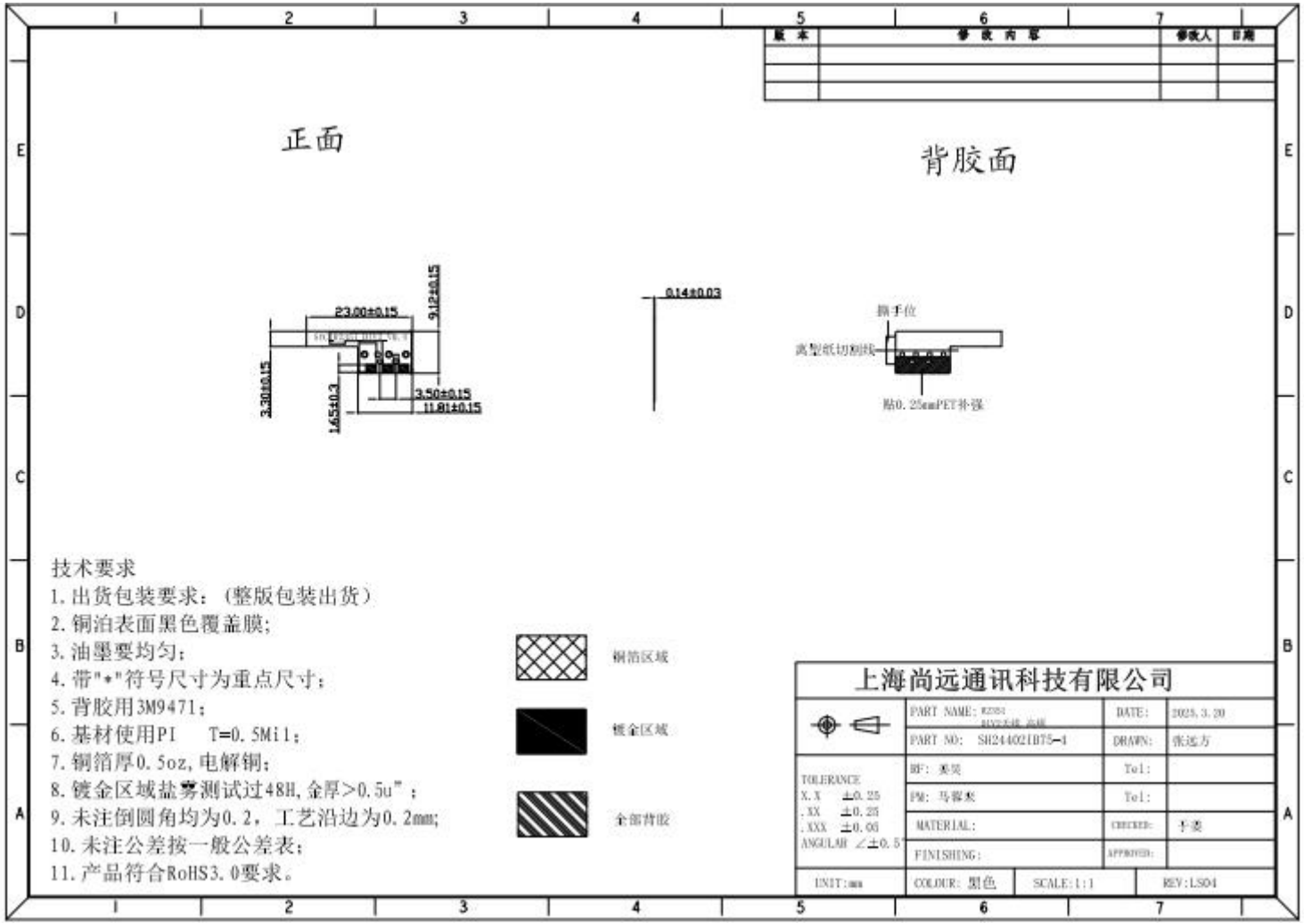
铜箔区域

镀金区域

全部背胶

上海尚远通讯科技有限公司			
	PART NAME: R2351 MAIN天线	DATE:	2025.4.7
	PART NO: SH244021B75-1	DRAWN:	张远方
TOLERANCE X.X ±0.25 .XX ±0.25 .XXX ±0.05 ANGULAR ∠±0.5°	RF: 姜昊	Tel:	
	PM: 马蓉来	Tel:	
	MATERIAL:	CHECKED:	于姜
	FINISHING:	APPROVED:	
UNIT:mm	COLOUR: 黑色	SCALE:1:1	REV:LS05

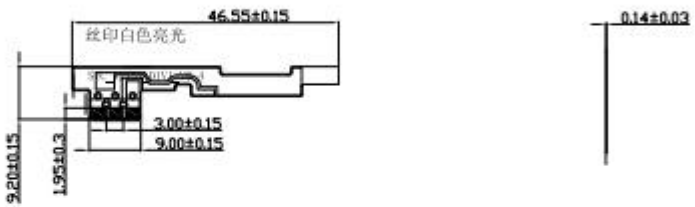
SUNNYWAY 尚远科技



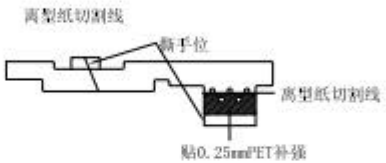
版本
修改内容
修改人
日期
正面
背胶面
23.00±0.15
9.12±0.15
3.30±0.15
1.65±0.3
3.50±0.15
11.81±0.15
0.14±0.03
撕手位
离型纸切割线
贴0.25mmPET补强
技术要求
1.出货包装要求：(整版包装出货)
2.铜泊表面黑色覆盖膜;
3.油墨要均匀;
4.带"*"符号尺寸为重点尺寸;
5.背胶用3M9471;
6.基材使用PI T=0.5Mil;
7.铜箔厚0.5oz,电解铜;
8.镀金区域盐雾测试过48H,金厚>0.5u";
9.未注倒圆角均为0.2，工艺沿边为0.2mm;
10.未注公差按一般公差表;
11.产品符合RoHS3.0要求。
铜箔区域
镀金区域
全部背胶
上海尚远通讯科技有限公司
PART NAME:
PART NO: SH24402IB75-4
DATE: 2025.3.20
DRAWN: 张远方
TOLERANCE
X.X ±0.25
.XX ±0.25
.XXX ±0.05
ANGULAR ∠±0.5°
RF: 姜昊
PM: 马蓉寒
MATERIAL:
FINISHING:
Tel:
Tel:
CHECKED: 于姜
APPROVED:
UNIT:mm
COLOUR: 黑色
SCALE:1:1
REV:LS04

版本	修改内容	修改人	日期

正面



背胶面



技术要求

1. 出货包装要求：（整版包装出货）
2. 铜泊表面黑色覆盖膜；
3. 油墨要均匀；
4. 带"*"符号尺寸为重点尺寸；
5. 背胶用3M9471；
6. 基材使用PI　T=0.5Mil；
7. 铜箔厚0.5oz，电解铜；
8. 镀金区域盐雾测试过48H，金厚>0.5u"；
9. 未注倒圆角均为0.2，工艺沿边为0.2mm；
10. 未注公差按一般公差表；
11. 产品符合RoHS3.0要求。

铜箔区域

镀金区域

全部背胶

上海尚远通讯科技有限公司			
	PART NAME: RS301 DIY1天线 中条线	DATE:	2025.3.20
	PART NO: SH24402IB75-3	DRAWN:	张远方
TOLERANCE X.X ±0.25 .XX ±0.25 .XXX ±0.05 ANGULAR ∠±0.5°	RF: 姜昊	Tel:	
	PM: 马蓉来	Tel:	
	MATERIAL:	CHECKED:	于姜
	FINISHING:	APPROVED:	
UNIT:mm	COLOUR: 黑色	SCALE:1:1	REV:LS04

SUNNYWAY 尚远科技