

样品承认书

SAMPLE SPECIFICATION FOR APPROVAL

供应商名称 SUPPLIER	Sunnyway Technology Co.,Ltd
客户名称 CUSTOMER	Shanghai Guangyi Zhilian Technology Co., LTD
物料名称 DESCRIPTION	FH22-LTE-US-RFID
物料规格 SPECIFICATION	Rear shell antenna bracket assembly
物料编码 CUSTOMER PART NO	320300000197
供应商审核(公章) SUPPLIER APPROVAL	
客户审核 CUSTOMER APPROVAL	
承认日期 APPROVAL DATE	25.5.20

Confirm and sign off			
base band	RF	ME	ID
resource	SQE	PQM	

目 录

1、 sample

need ; no need

2、 Specification sheet, drawings, material report, physical property table, and SOP for fixture inspection

paper archive ; electronic document

3、 Appearance Inspection report

paper archive ; electronic document

4、 dimension report

paper archive ; electronic document

5、 functional test report

paper archive ; electronic document

6、 Reliability Test Report

paper archive ; electronic document

7、 Key dimension CPK

paper archive ; electronic document

8、 Flow chart

paper archive ; electronic document

9、 manner of packing

paper archive ; electronic document

10、 Environmental protection materials (only electronic files are required)

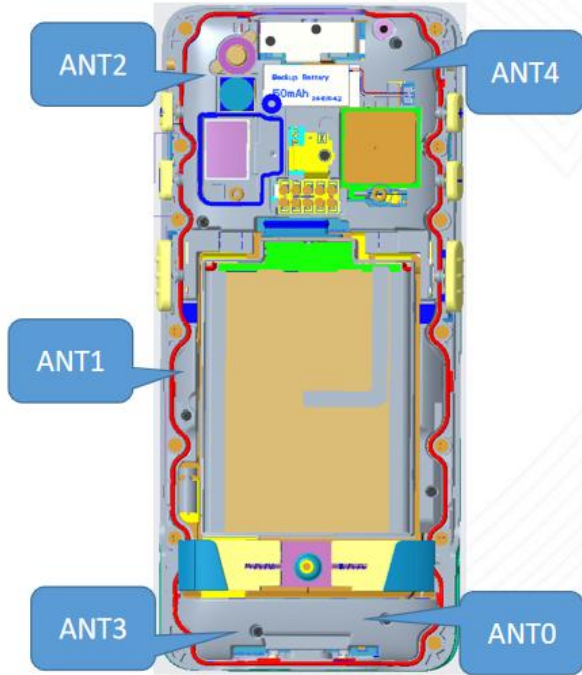
Material composition questionnaire ; RoHS ; Reach ; HF

remark: Provide as needed ; It is not necessary to provide

1. Project information

Machine information

天线布局



No.	Frequency (MHz)	Configuration	Band support
ANT0	LB (699-960MHz)	Main_TRX	B5 B8 B12 B14 B17 B20 B28
	MB (1710-2170MHz)	Main_TRX	B1 B2 B3 B4 B39
	HB (2300-2690MHz)	Main_TRX	B7 B38 B41
ANT1	LB (699-960MHz)	Aux_RX	B5 B8 B12 B14 B17 B20 B28
	MB (1710-2170MHz)	Aux_RX	B1 B2 B3 B4 B39
	HB (2300-2690MHz)	Aux_RX	B7 B38 B41
ANT2	L1 (1559-1606MHz)	Rx	GPS
	2.4G (2400-2500MHz)	TRX CH0	WiFi0+BT
	5G/6E (5180-7125MHz)	TRX CH0	WiFi0
ANT3	2.4G (2400-2500MHz)	TRX CH1	WiFi1
	5G/6E (5180-7125MHz)	TRX CH1	WiFi1
ANT4	860-960	RFID	

Antenna information



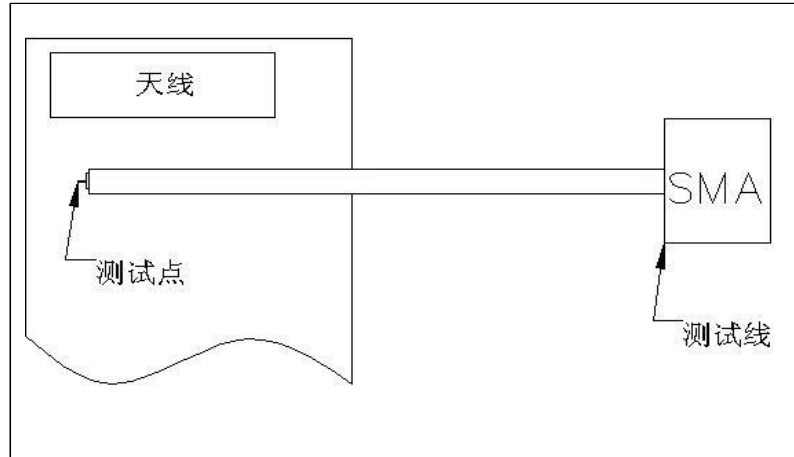
	Version
Antenna	US-V0.1
Small Motheboard	FH22_USB_PCB_V1.1
Mainboard	FH22_MB_PCB_V1.1

Note: The customer finally verified that the antenna performance prototype was retained in our company for at least one year, which is convenient for analysis and solution to abnormal situations in antenna mass production.

2. Test fixtures

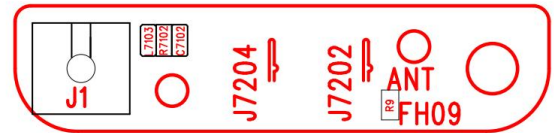
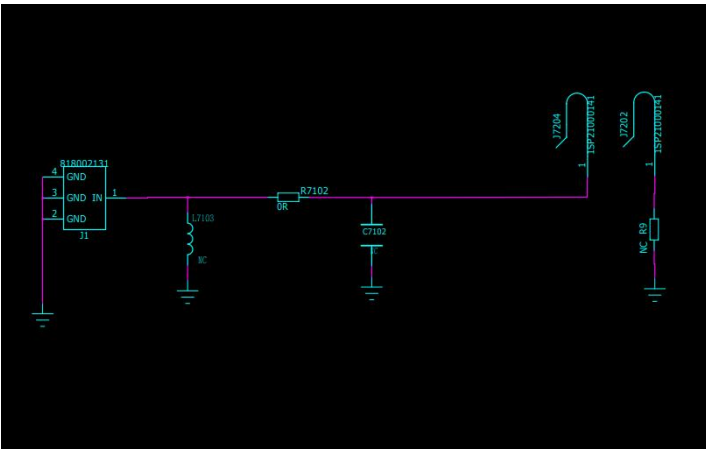
Purpose: To test the passive parameters of the antenna as accurately as possible.

How to make: The prototyping mechanism is made of a 50 ohm coaxial cable, one end is connected to the test point at the back of the matching circuit of the prototype motherboard (the front of the RF test hole), and the other end is connected to the SMA connector. The schematic diagram is as follows:



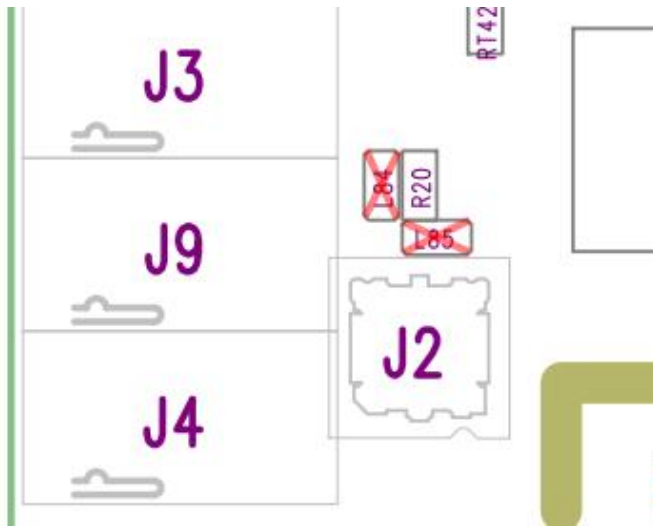
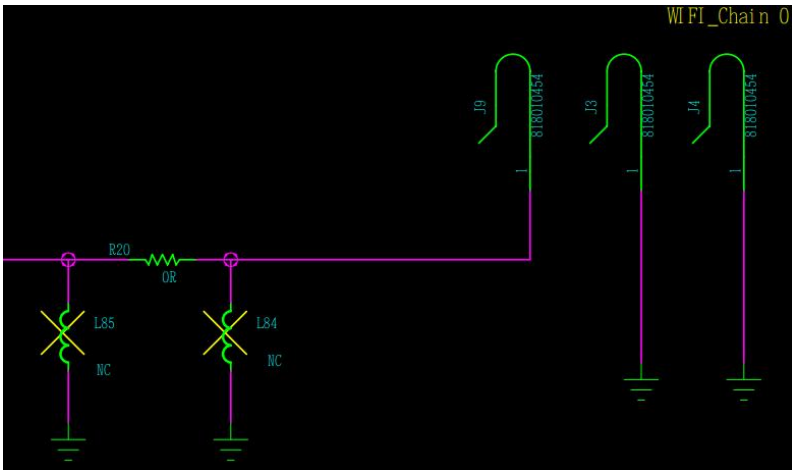
3. Matching circuits

ANT1 antenna



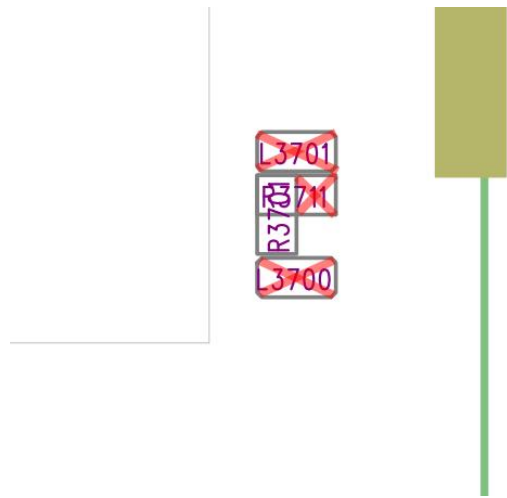
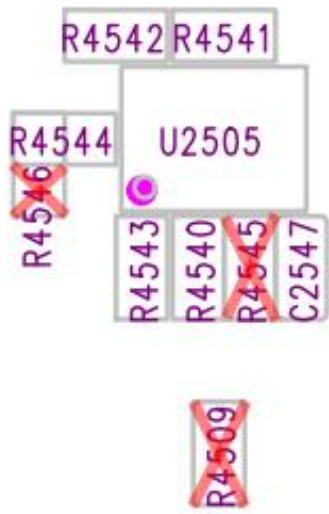
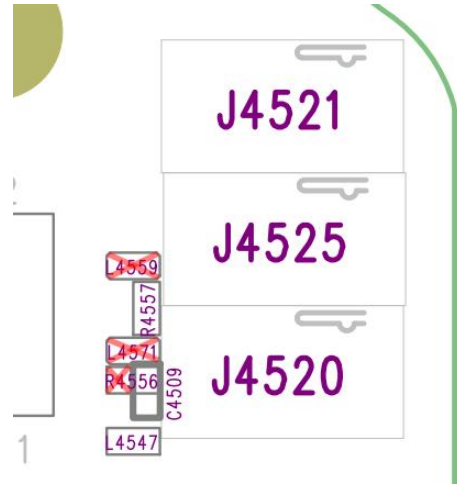
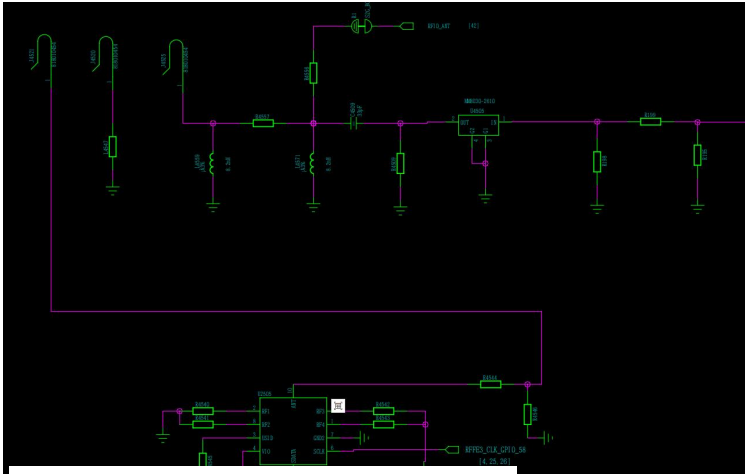
ANT4			
J7204		J7202	
C7102	NC	R9	0R
R7102	0R		
L7103	NC		

ANT2 antenna



ANT2	
J9	
L84	NC
R20	OR
L85	NC

ANT4 antenna



ANT4					
J4521		J4525		J4520	
R4544	NC	L4559	NC	L4547	OR
R4546	OR	R4557	OR		
		L4571	NC		
		R4556	OR		
		C4509	NC		
		L3701	NC		
		R3711	OR		
		R3701	NC		
		L3700	NC		

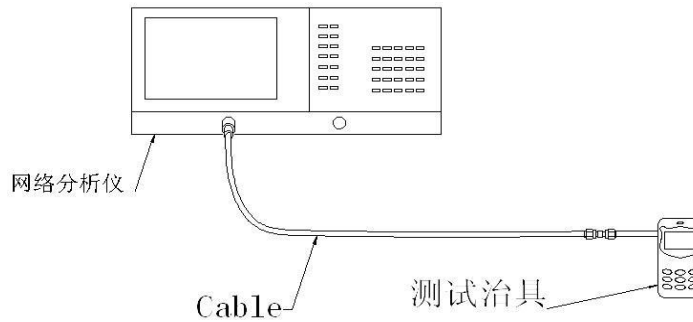
4. S11 test

4.1 S11 Test Method Description

Test Equipment: Network Analyzer (E5071C)

Test method: A 50 ohm CABLE cable is derived from the instrument test port, and the SMA connector of the prototype is connected after calibration using the calibrator to record the return loss and standing wave ratio corresponding to the relevant frequency point.

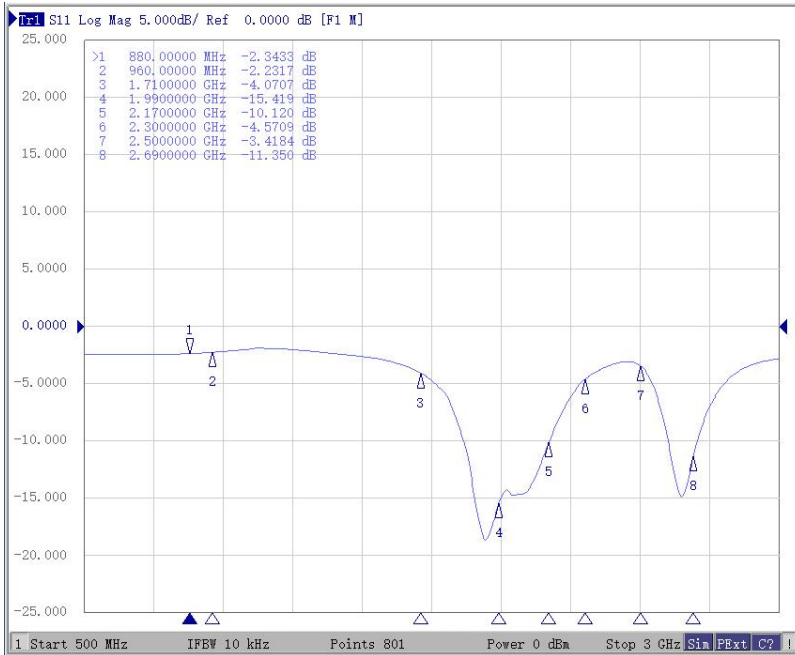
The test diagram is as follows:



Test the schematic

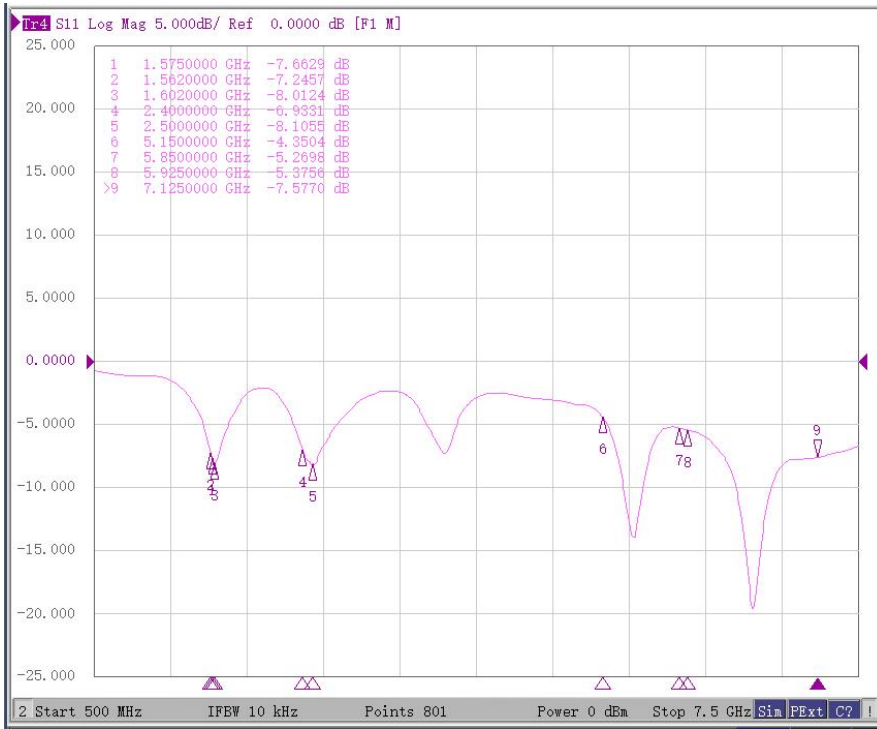
4.2 S11 parameter

ANT1



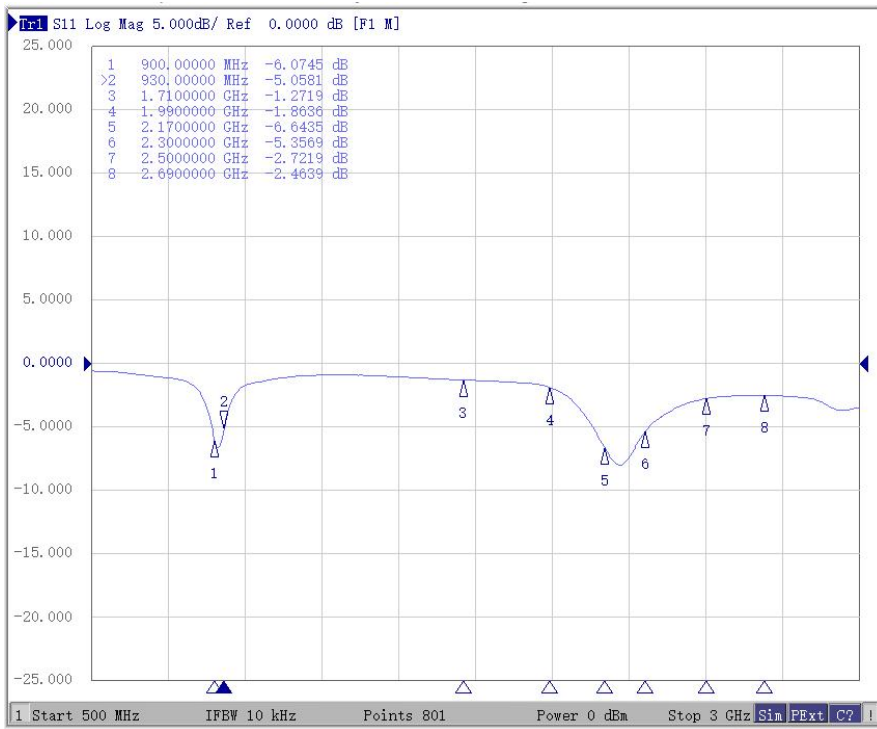
ANT1antenna	
frequency (MHz)	Log Mag
880	-2.34
960	-2.23
1710	-4.07
1990	-15.41
2170	-10.12
2300	-4.57
2500	-3.41
2690	-11.35

ANT2



ANT1antenna	
frequency (MHz)	Log Mag
1575	-7.66
2400	-6.93
2500	-8.10
5150	-4.35
5850	-5.26
5925	-5.37
7125	-7.57

ANT4



ANT1antenna	
frequency (MHz)	Log Mag
900	-6.07
930	-5.05

5.1 Passive test data

ANT1 efficiency

Freq.	Effi	Effi	peak Gain	Freq.	Effi	Effi	peak Gain	Freq.	Effi	Effi	peak Gain
(MHz)	(dB)	(%)	(dB)	(MHz)	(dB)	(%)	(dB)	(MHz)	(dB)	(%)	(dB)
700	-26.42	0.23	-21.85	1700	-8.6	13.8	-2.49	2300	-8.61	13.77	-2.99
710	-26.49	0.22	-21.92	1710	-8.42	14.39	-2.44	2310	-9.12	12.25	-3.46
720	-26.57	0.22	-21.93	1720	-7.88	16.29	-2.11	2320	-9.17	12.11	-3.29
730	-26.54	0.22	-21.91	1730	-7.31	18.58	-1.78	2330	-9.32	11.69	-2.73
740	-26.44	0.23	-21.93	1740	-7.01	19.91	-1.54	2340	-9.62	10.91	-3.14
750	-26.44	0.23	-22.34	1750	-6.88	20.51	-1.51	2350	-9.74	10.62	-3.29
760	-26.36	0.23	-22.51	1760	-6.63	21.73	-1.34	2360	-10	10	-3.62
770	-26.3	0.23	-22.52	1770	-6.51	22.34	-1.2	2370	-10.5	8.91	-3.42
780	-26.16	0.24	-22.23	1780	-6.44	22.7	-1.02	2380	-10.98	7.98	-3.78
790	-26.15	0.24	-22.04	1790	-6.16	24.21	-0.69	2390	-11.71	6.75	-4.6
800	-26.24	0.24	-22.09	1800	-5.87	25.88	-0.11	2400	-11.92	6.43	-4.29
810	-26.2	0.24	-21.88	1810	-5.63	27.35	0.36	2410	-12.19	6.04	-4.99
820	-26.25	0.24	-21.71	1820	-5.37	29.04	0.82	2420	-13.14	4.85	-5.68
830	-26.48	0.22	-21.86	1830	-5.14	30.62	1.35	2430	-12.94	5.08	-5.72
840	-26.64	0.22	-22.22	1840	-4.9	32.36	1.78	2440	-13.01	5	-6.41
850	-26.7	0.21	-22.38	1850	-4.64	34.36	2.19	2450	-13.33	4.65	-5.95
860	-26.94	0.2	-22.46	1860	-4.39	36.39	2.65	2460	-14.08	3.91	-6.64
870	-26.94	0.2	-21.8	1870	-4.26	37.5	2.89	2470	-14.24	3.77	-7.5
880	-26.78	0.21	-20.9	1880	-4.16	38.37	3.1	2480	-14.18	3.82	-7.56
890	-26.56	0.22	-20.02	1890	-4.08	39.08	3.49	2490	-14.26	3.75	-7.69
900	-26.5	0.22	-19.78	1900	-3.85	41.21	3.91	2500	-13.72	4.25	-8.16
910	-26.22	0.24	-19.76	1910	-3.65	43.15	4.18	2510	-13.19	4.8	-7.79
920	-25.81	0.26	-19.46	1920	-3.61	43.55	4.36	2520	-12.46	5.68	-8.04
930	-25.62	0.27	-19.66	1930	-3.49	44.77	4.43	2530	-11.81	6.59	-7.6
940	-25.51	0.28	-19.83	1940	-3.39	45.81	4.38	2540	-11	7.94	-5.72
950	-25.47	0.28	-20.35	1950	-3.36	46.13	4.46	2550	-10.23	9.48	-4.79
960	-25.31	0.29	-21.09	1960	-3.27	47.1	4.45	2560	-9.24	11.91	-3.23
				1970	-3.32	46.56	4.3	2570	-8.57	13.9	-2.18
				1980	-3.53	44.36	4.19	2580	-7.93	16.11	-1.12
				1990	-3.62	43.45	3.98	2590	-7.37	18.32	-0.4
				2000	-3.83	41.4	3.67	2600	-6.93	20.28	0.3
				2010	-3.91	40.64	3.36	2610	-6.64	21.68	0.75
				2020	-4.24	37.67	2.63	2620	-6.51	22.34	0.71
				2030	-4.26	37.5	2.95	2630	-6.14	24.32	0.88
				2040	-4.44	35.97	2.61	2640	-5.81	26.24	1.28
				2050	-4.75	33.5	2.01	2650	-5.75	26.61	1.19
				2060	-5.04	31.33	1.47	2660	-5.63	27.35	1.21
				2070	-5.11	30.83	1.3	2670	-5.53	27.99	1.72
				2080	-5	31.62	1.29	2680	-5.77	26.49	1.13
				2090	-5	31.62	0.8	2690	-5.8	26.3	0.92
				2100	-4.91	32.28	0.56	2700	-6.15	24.27	1.38
				2110	-4.87	32.58	0.61				
				2120	-4.78	33.27	0.01				
				2130	-5.01	31.55	-0.1				
				2140	-4.86	32.66	-0.19				
				2150	-5.07	31.12	-1.08				
				2160	-5.25	29.85	-1.14				
				2170	-5.33	29.31	-1.05				

ANT2 efficiency

Freq.	Effi	Effi	peak Gain	Freq.	Effi	Effi	peak Gain
(MHz)	(dB)	(%)	(dB)	(MHz)	(dB)	(%)	(dB)
1550	-4.28	37.33	0.63	5150	-7.99	15.89	-9.66
1555	-4.28	37.33	0.47	5200	-7.11	19.45	-8.86
1560	-4.17	38.28	0.5	5250	-6.58	21.98	-7.15
1565	-4.15	38.46	0.44	5300	-6.03	24.95	-5.03
1570	-4.08	39.08	0.73	5350	-5.42	28.71	-2.92
1575	-4.03	39.54	0.87	5400	-5.42	28.71	-1.47
1580	-4.01	39.72	0.62	5450	-5.41	28.77	-0.06
1585	-3.97	40.09	1.07	5500	-5.62	27.42	1.67
1590	-3.92	40.55	1.2	5550	-6.41	22.86	2.84
1595	-3.89	40.83	1.02	5600	-6.97	20.09	2.49
1600	-3.85	41.21	0.96	5650	-6.87	20.56	3.21
				5700	-7.14	19.32	2.37
2400	-5.18	30.36	0.16	5750	-6.86	20.61	1.69
2410	-5.39	28.90	0.03	5800	-6.40	22.91	1.7
2420	-5.28	29.63	0.55	5850	-6.00	25.12	1.31
2430	-5.18	30.36	1.02	5900	-6.03	24.95	0.2
2440	-5.31	29.45	1.07	5950	-5.71	26.85	0.97
2450	-5.30	29.54	1.55	6000	-5.58	27.67	-0.77
2460	-5.43	28.64	1.59	6050	-5.36	29.11	-1.62
2470	-5.00	31.59	1.72	6100	-5.09	30.97	-1.35
2480	-5.03	31.40	2.01	6150	-5.06	31.19	-1.3
2490	-5.02	31.50	2.09	6200	-4.80	33.11	-0.98
2500	-5.12	30.74	2.87	6250	-4.60	34.67	-3.01
				6300	-4.45	35.89	-1.94
				6350	-4.09	38.99	-1.98
				6400	-3.76	42.07	-2.86
				6450	-3.52	44.46	-2.8
				6500	-3.16	48.31	-2.81
				6550	-3.29	46.88	-3.39
				6600	-3.31	46.67	-2.98
				6650	-3.60	43.65	-3.17
				6700	-3.86	41.11	-3.58
				6750	-4.36	36.64	-3.13
				6800	-4.69	33.96	-3.32
				6850	-4.67	34.12	-3.41
				6900	-4.89	32.43	-3.08
				6950	-4.68	34.04	-3.15
				7000	-4.57	34.91	-3.95
				7050	-4.66	34.20	-4.1
				7100	-4.47	35.73	-4.07
				7150	-4.48	35.65	-4.89

ANT4 efficiency

Freq.	Effi	Effi	peak Gain
(MHz)	(dB)	(%)	(dB)
900	-6.33	23.28	-1.26
901	-6.34	23.23	-1.29
902	-6.42	22.8	-1.37
903	-6.46	22.59	-1.43
904	-6.4	22.91	-1.41
905	-6.21	23.93	-1.28
906	-6.06	24.77	-1.11
907	-5.89	25.76	-0.93
908	-5.79	26.36	-0.82
909	-5.79	26.36	-0.79
910	-5.9	25.7	-0.85
911	-5.97	25.29	-0.98
912	-6.01	25.06	-1.08
913	-5.97	25.29	-1.1
914	-5.89	25.76	-1.09
915	-5.83	26.12	-1.12
916	-5.72	26.79	-1.08
917	-5.72	26.79	-1.14
918	-5.8	26.3	-1.26
919	-5.87	25.88	-1.36
920	-5.84	26.06	-1.37
921	-5.98	25.23	-1.52
922	-5.99	25.18	-1.58
923	-5.94	25.47	-1.6
924	-5.93	25.53	-1.67
925	-6.04	24.89	-1.86
926	-6.08	24.66	-1.95
927	-6.21	23.93	-2.12
928	-6.34	23.23	-2.26
929	-6.39	22.96	-2.35
930	-6.36	23.12	-2.36

5.2 Active test data

ANT2 Active test data (Free space, Bright screen)

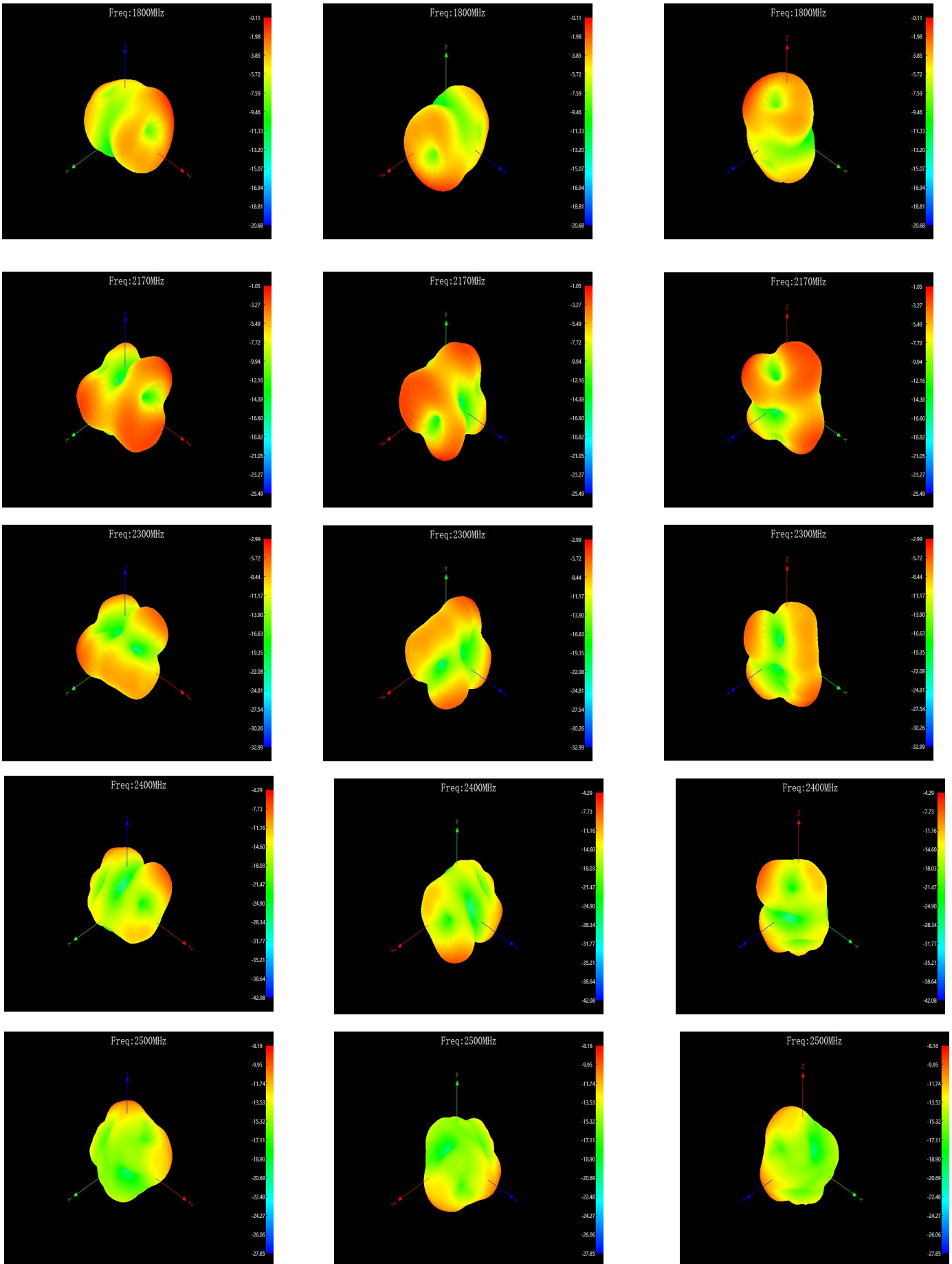
Band	OTA (dBm)		
	CH	TRP	TIS
WiFi-A	36	20.11	
	149	22.68	
	165	23.34	-73.14
WiFi-B	1	13.68	
	6	13.43	
	11	13.03	-80.24

ANT2+ANT3 Coupler Active test data (Free space, Bright screen)

Band	OTA (dBm)		
	CH	TRP	TIS
WiFi-A	36	20.90	
	149	23.75	
	165	24.04	-74.64
WiFi-B	1	16.64	
	6	15.59	
	11	16.47	-83.05
GPS	-148.62		

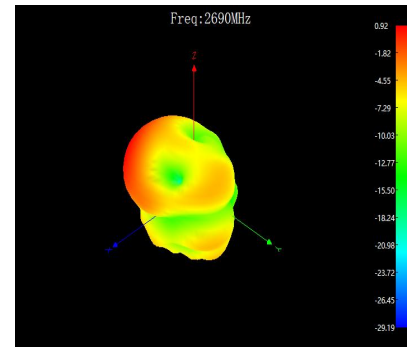
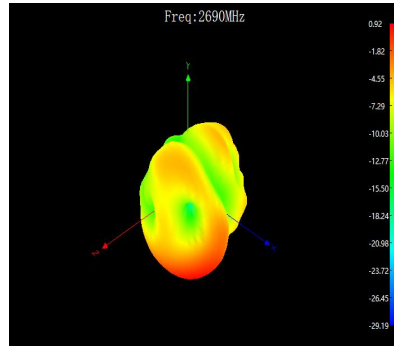
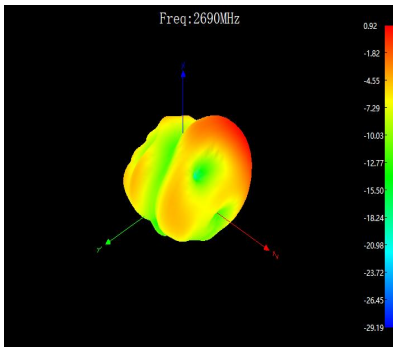
5.3 3D diagram

ANT1

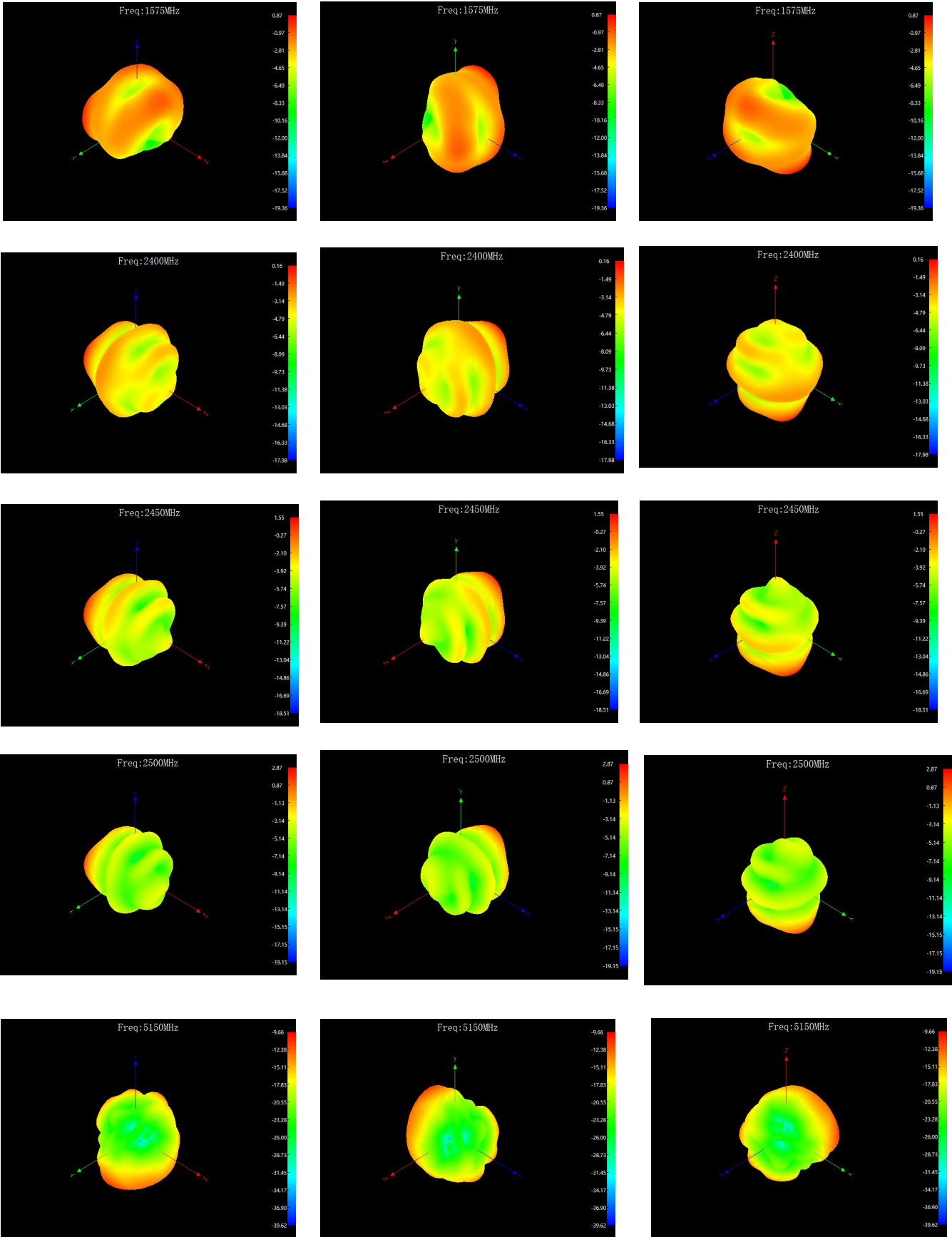


5.3 3D diagram

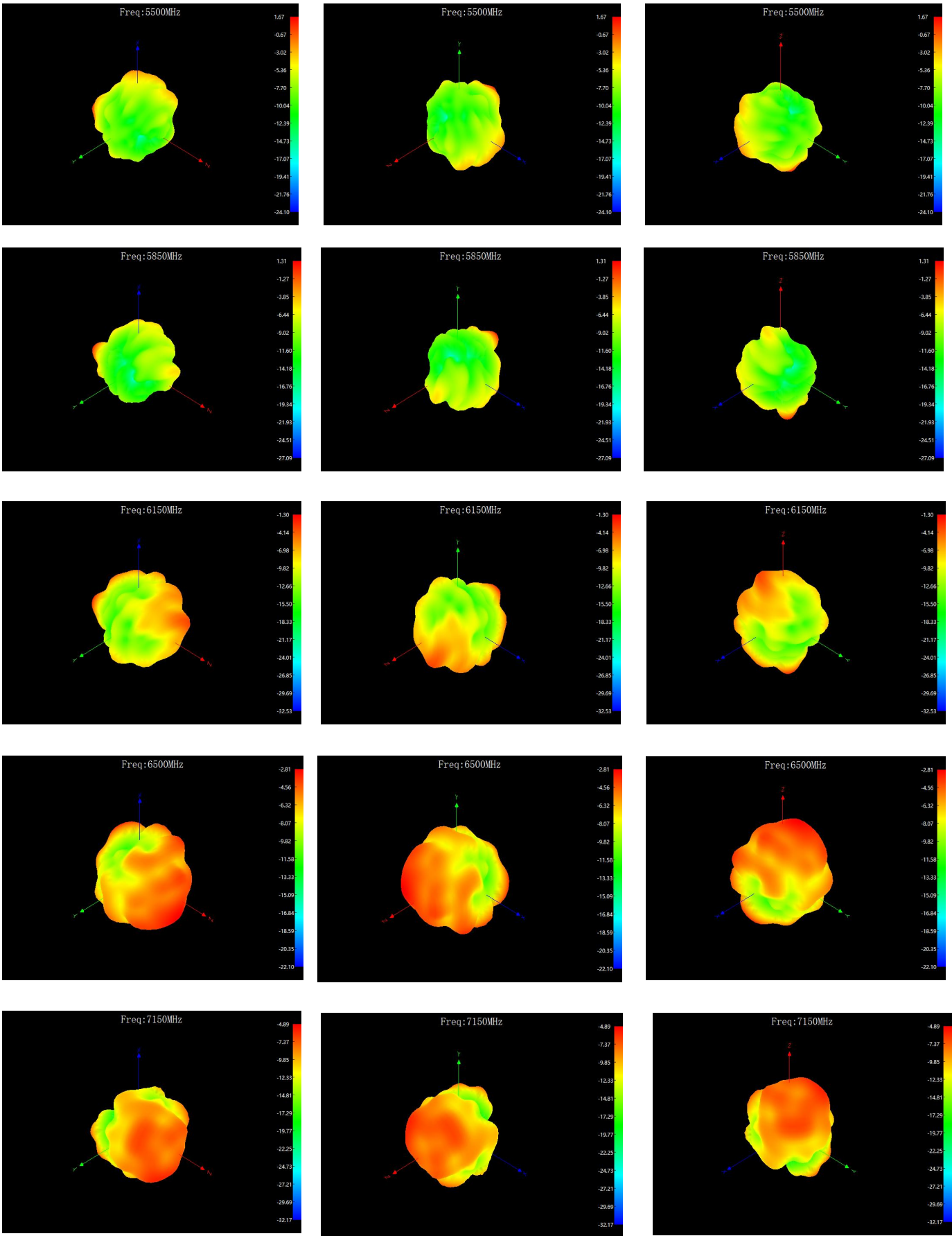
ANT1



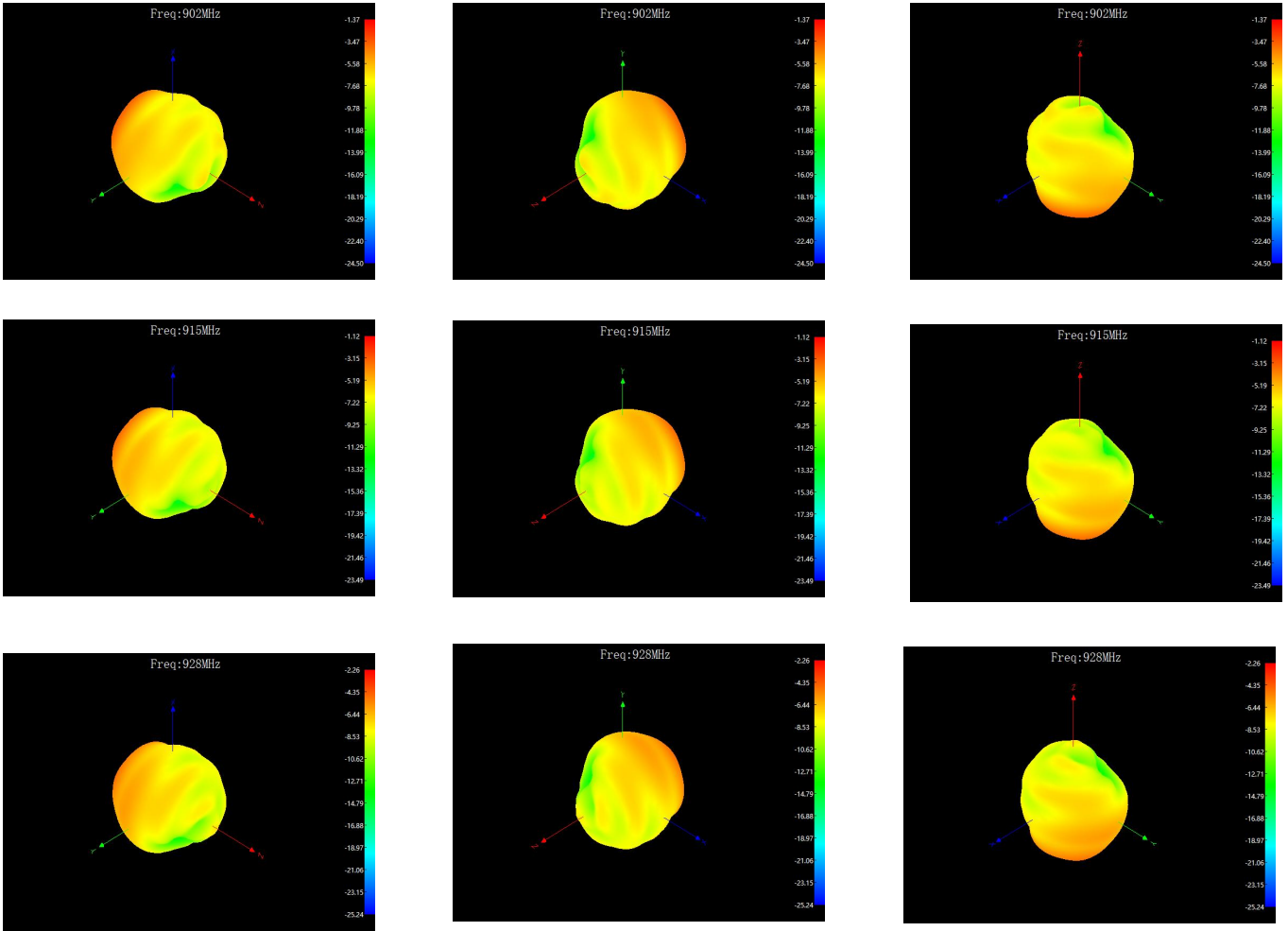
ANT2



ANT2



ANT4



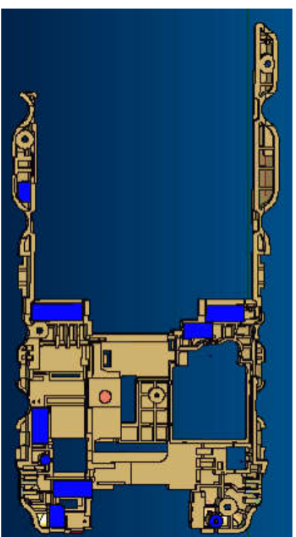
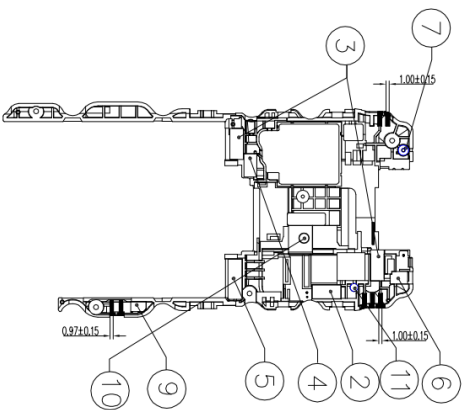
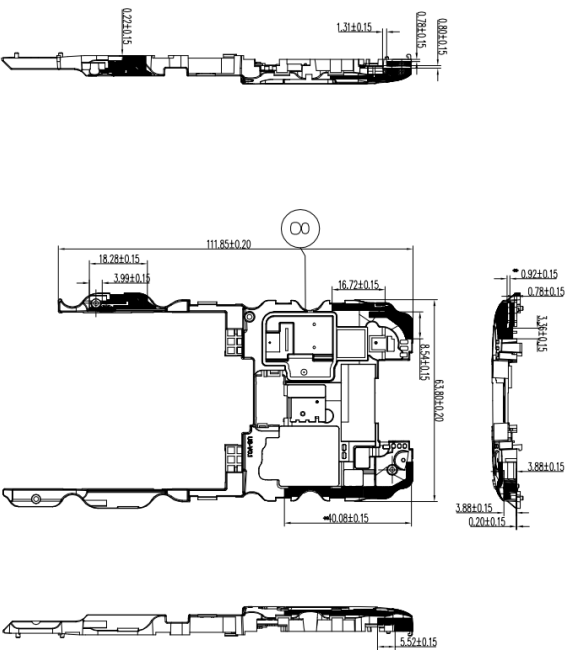
6. Prototype grounding treatment



7. Mass production antenna indicators

When the antenna is mass-produced, the standing wave ratio is used as the mass production test standard. According to the differences in the project itself, the following criteria are given:

frequency (MHz)	Mass production standards
ANT1 791--960; 1710--2690	VSWR (量产性能) <VSWR(承认性能)+1
ANT2 1575; 2400-2500; 5150--7125	VSWR (量产性能) <VSWR(承认性能)+1
ANT4 900-930	VSWR (量产性能) <VSWR(承认性能)+1



⑫	LDS	SP220671D06-2	LDS	black	—
⑪	Overall Top seal foam RF: SP220671D06-12	SP220651D06-12	foam	black	—
⑩	RF connector foam RF: SP220681D12-11	SP220681D12-11	塑料	black	—
⑨	RF connector foam RF: SP220681D06-10	SP220681D06-10	foam	black	—
⑧	Antenna sealing foam RF: SP220681D06-9	SP220681D06-9	foam	black	—
⑦	Shielding foam RF: SP220681D06-8	SP220681D06-8	foam	black	—
⑥	Optical distance marking connector foam RF: SP220681D06-7	SP220681D06-7	foam	black	—
⑤	RF connector foam RF: SP220681D06-6	SP220681D06-6	foam	black	—
④	Antenna connector foam RF: SP220681D06-5	SP220681D06-5	foam	black	—
③	Shielding foam RF: SP220681D06-4	SP220681D06-4	foam	black	2
②	RF connector foam RF: SP220681D06-3	SP220681D06-3	foam	black	—
①	Bracket	SP220651D02-2	DX11355	black	—

- Technical Requirements:
- 1: Dimensions marked with "*" are the key inspection dimensions;
 - 2: The auxiliary materials must not be pasted off-center.
 - 3: The appearance requirements shall be in accordance with the antenna inspection standards
 - 5: Unspecified tolerances shall be referred to the general tolerance table;
 - 6: The size is for reference only. The matching shall prevail

<p>Sunnyway Technology Co., Ltd</p>	
PART NAME: FH22-LTE-4S-REFID slave antenna	DATE: 2025. 3. 5
PART NO: SP250671D87-2	DRAWN: zhangyuantang
RF: Subhangpeng	TEL:
PM: Yuyan	TEL:
MATERIAL:	CHECKED: yujiang
FINISHING:	APPROVED:
COLOR: 黑色	SCALE: 1:1
UNIT: mm	REV: 1.S01

TOLERANCE
 X, X ±0.25
 .XX ±0.25
 .XXX ±0.05
 ANGULAR ∠±0.5°

CPK Report

Part Number(料号)	320300000196	Vendor(供应商)	SUNNYWAY
Description(零件名称)	FH22-LTE-US-RFID slave antenna	Inspected(确认者)	CHENXIAOPING
Tool Number(模号)	/	Inches/MM(英寸/毫米)	MM
Cavity(穴号)	/	Material Name(材质名称)	LDS
		Material Code(材质牌号)	LDS
Revision(版本)	V1.0	Date(日期)	2025.5.20

Dim. Designator(尺寸序号)	1	2																
Nominal(公称尺寸)	0.92	8.54																
+ Tolerance(正公差)	0.15	0.15																
- Tolerance(负公差)	-0.15	-0.15																
Upper Limit(规格上限)	55.00	0.17																
Lower Limit(规格下限)	51.00	0.07																
1	53.22	0.128																
2	53.25	0.122																
3	52.88	0.127																
4	53.35	0.129																
5	53.15	0.122																
6	52.89	0.123																
7	52.96	0.122																
8	52.88	0.129																
9	53.35	0.126																
10	53.65	0.122																
11	52.89	0.118																
12	52.96	0.122																
13	53.15	0.102																
14	52.89	0.125																
15	52.96	0.107																
16	52.88	0.122																
17	53.35	0.121																
18	52.88	0.122																
19	53.35	0.132																
20	53.15	0.122																
MAX.	53.65	0.13																
MIN.	52.88	0.10																
AVERAGE	53.10	0.12																
STDEV	0.23	0.01																
CP	2.93	2.39																
Cpk	2.78	2.28																
TOOLING(测量工具)	two-dimensional measurement	two-dimensional measurement																

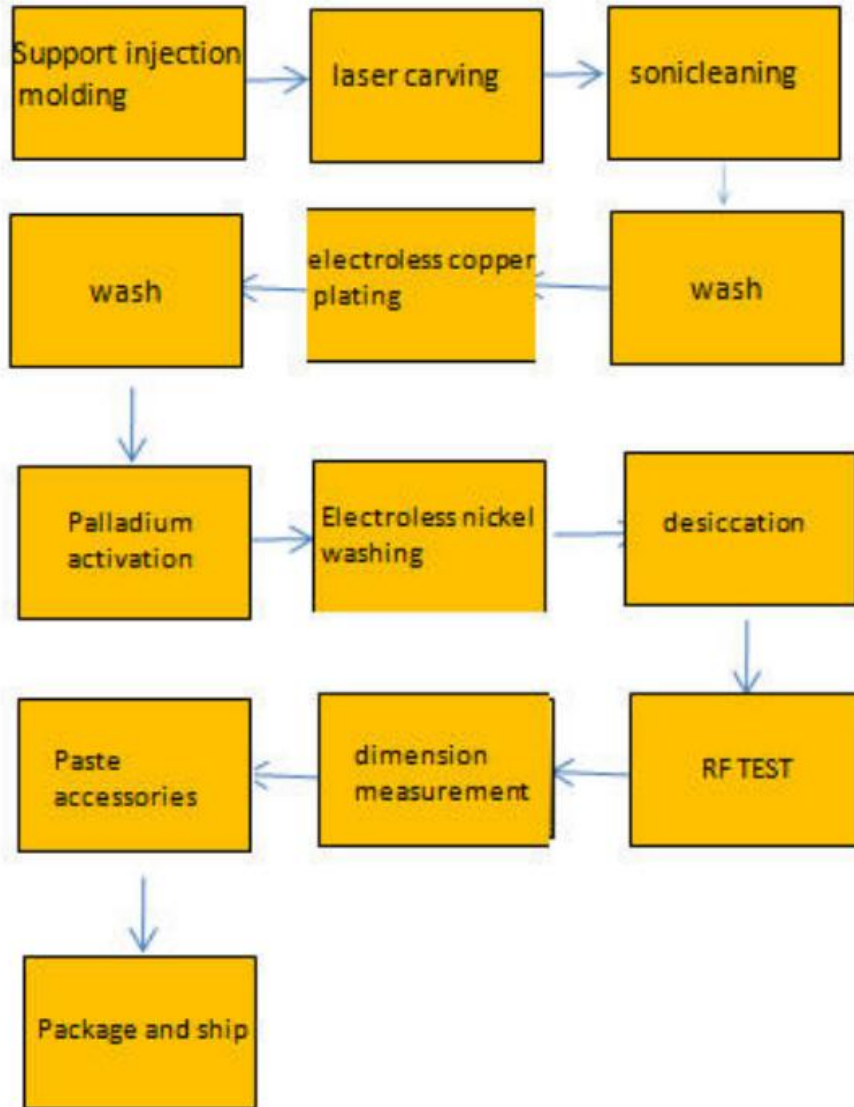
produce: weiyueli

check: chenxiaoping

data:2025.4.8

Process Flow Chart(制造流程图)

Customer(客户)	GUANGYI	Written By(制作)	LINFENG	Orig. Date(制作日期)	2025.5.20
Part Number(料号)	32030000019	Revised By(校订)	YUJIANG	Revised Date(校订日期)	2025.5.20
Description(零件名称)	FH22-LTE-US-RFID	Approved By(确认)	CAOJINMAC	Approved Date(确认日期)	2025.5.20



RoHS 2.0 Restricted Substance Composition Survey Form

SALEABLE PART

Part number	Part name/model	Supplier material number	Manufacturer's name	The green material identification method for suppliers
320300000173	FH22-LTE-US-RFID slave antenna	SH24285IB87-2	SUNNYWAY	RoHS

SUB-PART

serial number	Name (Chinese/English)		Material number (monomer/material component number or grade in the monomer)	Single product Usage amount (g)	供应商	Test report YES/NO	限用物质含量PPM										control method	RoHS Report		remark
	monomer	The material components in the monomer					铅 (Pb)	铅 (Pb)	汞 (Hg)	六价铬 (Cr6+)	多溴联苯 (PBBs)	多溴二苯醚 (PBDEs)	邻苯二甲酸二异丁酯 (DIBP)	邻苯二甲酸(2-乙基己基酯)	邻苯二甲酸丁酯 (DBP)	邻苯二甲酸丁苄酯 (BBP)		serial number	DATA	
1	LDS	Copper-nickel		/	/	有	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	A2240613314101001C	24.10.9	
2	foam	foam		/	/	有	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	CANPC25002258702	2025.2.17	
3	Damping cloth	Damping cloth		/	/	有	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	SGS	TSNEC25000315406	2025.2.18	
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				

produce : weiyueli

check: chenxiaoping

data : 2025.4.8

BOM

■ ROHS2.0

serial number	Part number	name of parts	Part Description	name of the supplier	Supplier model	quantity	YES/NO ROSH	备注 Remark
1	320300000173	FH22-LTE-US-RFID slave antenna	LDS	sunnyway	SH24285IB87-2	1	YES	
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

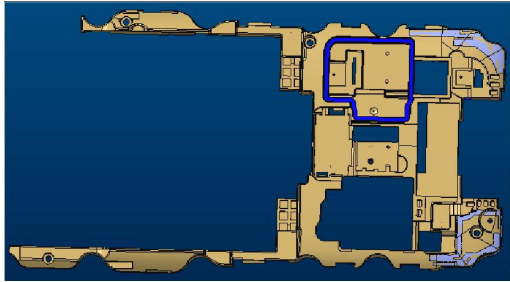
produce : weiyueli

check: chenxiaoping

data : 2025.4.8

manner of packing

1. Single product packaging photos or 2D images (for materials with individual packaging)



2. Single-layer product packaging photos or 2D images (demonstrating neatness and reliability)

reference picture



product name

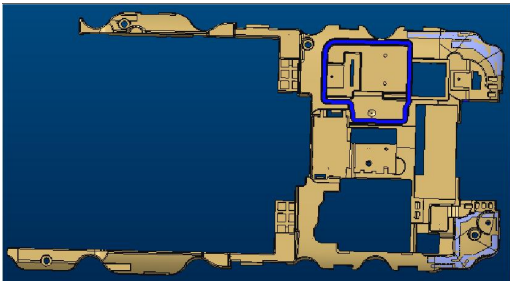
FH22-LTE-US-RFID slave antenna

Product material number

320300000196

material description

3. Photos of all layers of products placed inside the box (demonstrating sealing and



4. Overall photos or 2D images of the entire box after sealing (overall sealing status)

reference picture



Description of packaging methods or packaging materials

Pallet + carton

The quantity of packaging inside the box

The quantity of each layer or each package	
The number of layers or	
The quantity of each box	

remark

5. Single package product labels (material number, product name, quantity, etc.)

customer name:	Shanghai Guangyi Zhilian Technology Co., LTD
product name:	FH22-LTE-US-RFID
order number:	
Shangyuan Technology Coding:	SH25067IB87-2
Customer material code:	320300000196
quantity:	1PCS
supplier:	Sunnyway Technology Co.,Ltd
inspector:	

6. Outer box labels (material number, product name, quantity and other information)

customer name:	Shanghai Guangyi Zhilian Technology Co., LTD
product name:	FH22-LTE-US-RFID
order number:	
Shangyuan Technology Coding:	SH25067IB87-2
Customer material code:	320300000196
quantity:	1PCS
supplier:	Sunnyway Technology Co.,Ltd
inspector:	

1. Prepare the required packaging materials and place them in a favorable position for work. W n2. According to the packaging specification of SYC-BZ01, use cartons (SYC-01) and pallets for packaging. 3. Each box is subject to the actual packaging

Supplier's signature

chenxiaoping

data

2025.5.20