

Shanghai Sunnyway Communication Technology Limited Company

Temporary antenna specification

Customer: Yunxi		The project: 23000
Operating frequency band: LTE Band 1/2/3/4/5/7/12/20/28/66		
Motherboard version: 23000-NOW-DT_V1_0		
Shangyuan material specifications		
Specifications and models	Shangyuan material number	Customer part number
MAIN Antenna	SH24311IB75	

The record of project changes			
Date of preparation/change	Changes	Change of person	version
24.12.19	first edition	linfeng	V1.0

Sunnyway counter-signature bar				
Research and development	ME:	Auditor:	QE:	Approver:
	RF:	Auditor:		
Client Counter-signature bar				
EE	PM		RF	QE

Tel: +86-021-60835368 (Shanghai); +86-0755-82504258 (Shenzhen)

Shanghai R&D Center Address: 1st Floor, Building 4, No. 99, Lane 215, Gaoguang Road,
Qingpu District, Shanghai

Shenzhen R & D Center Address: Shenzhen Guangming District South Taiyun Chuanggu Center 5
Building 6 floor

Chongqing R&D Center Address: C08-1 Building-1, No. 19 Xiantao Data Valley East Road,
Yubei District, Chongqing

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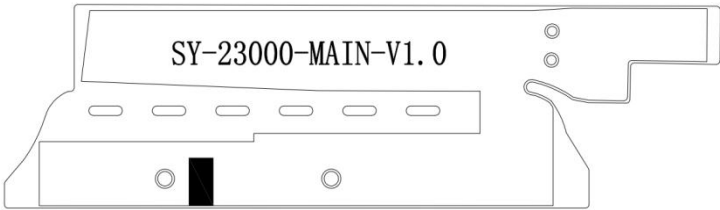
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1. Project information

Machine information



Antenna information



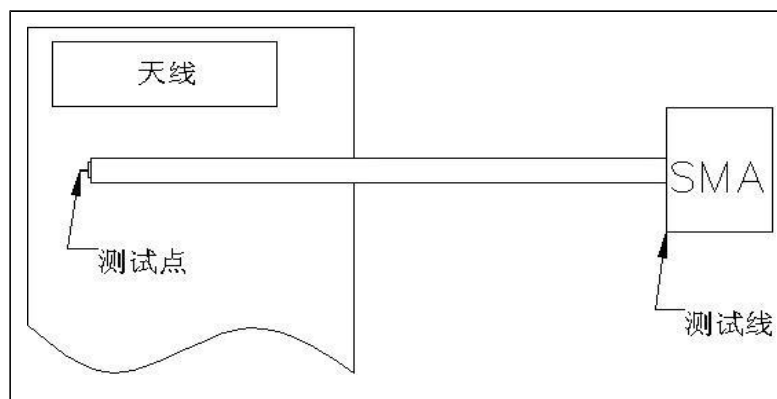
	版本
主天线	SY-23000-MAIN-V1.0
主板	23000-NOW-DT_V1_0

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.
Ensure antenna shipment quality.

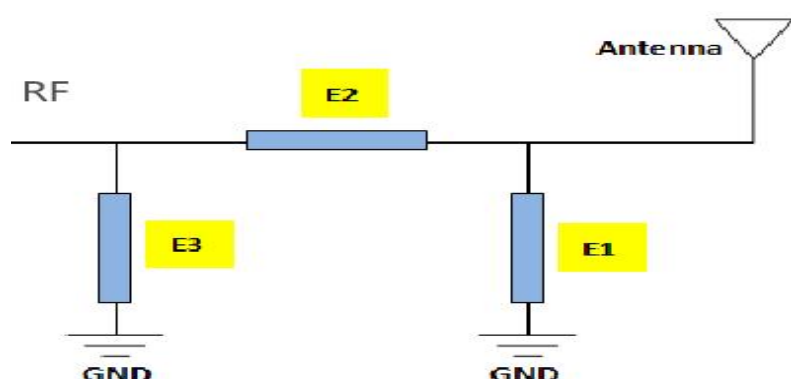
2. Test fixtures

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



Element	Value	
E1	10nH	
E2	0 Ω	
E3	N/A	
E4	0 Ω	
E5	N/A	

Note: There are no changes to the matching circuit.

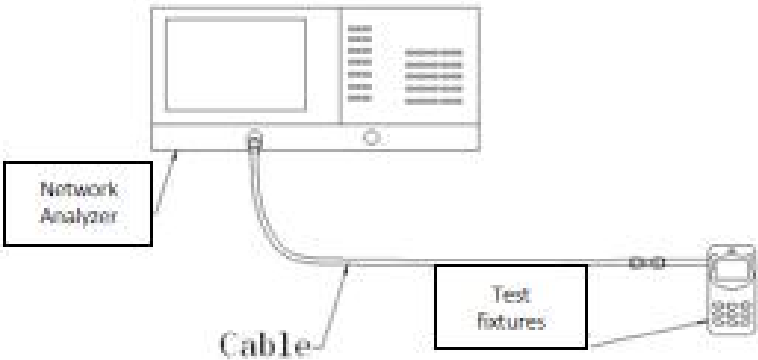
4. S11 test

4.1 S11 Test Method Description

Test Equipment: Network Analyzer (E5071C)

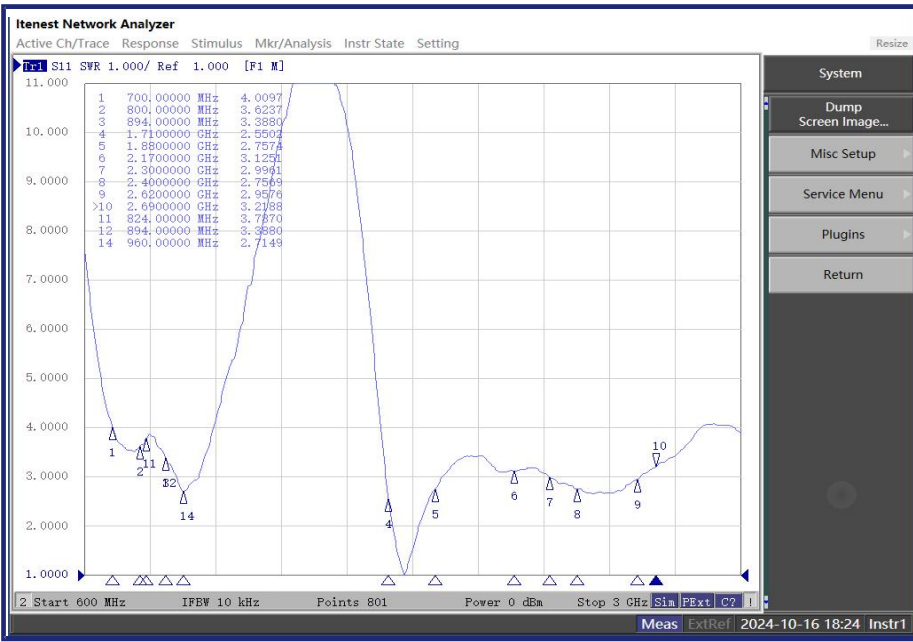
Test method: A 50 ohm CABLE cable is derived from the instrument test port, and the SMA connector of the prototype is connected after calibration using the calibrator to record the return loss and standing wave ratio corresponding to the relevant frequency point.

The test diagram is as follows:



Test the schematic

4.2 S11 parameter



	Main antenna
frequency (MHz)	SWR
700	4.00
824	3.78
960	2.71
1710	2.55
2170	3.12
2300	2.99
2400	2.75
2620	2.95
2690	3.21

5.1 Passive test data

main antenna passive efficiency

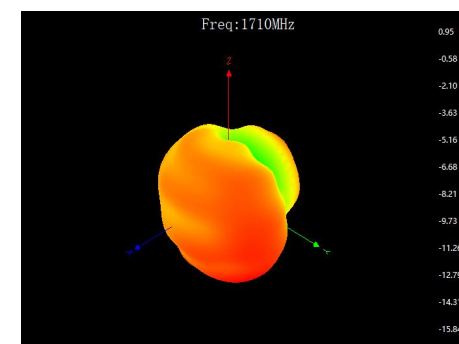
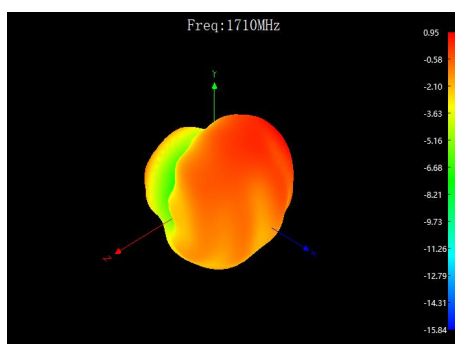
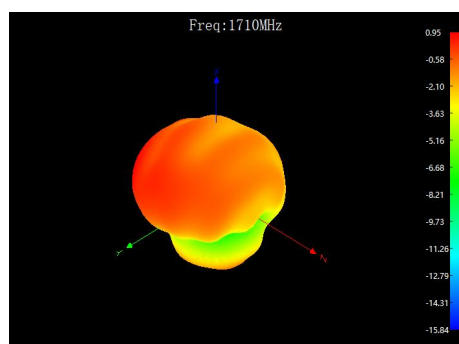
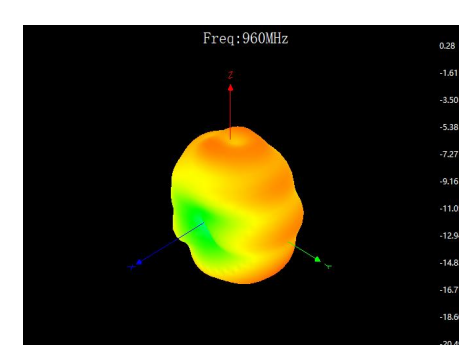
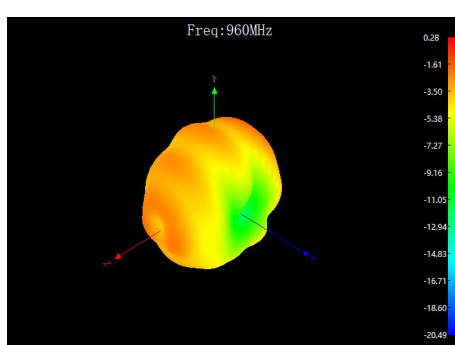
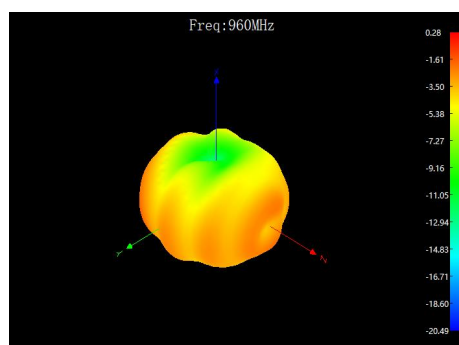
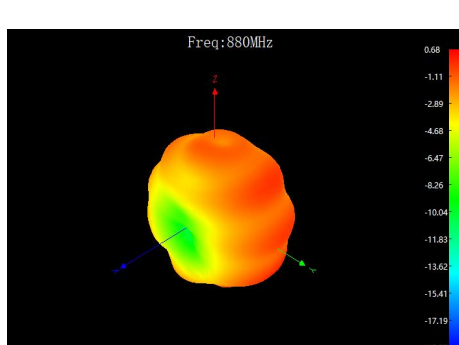
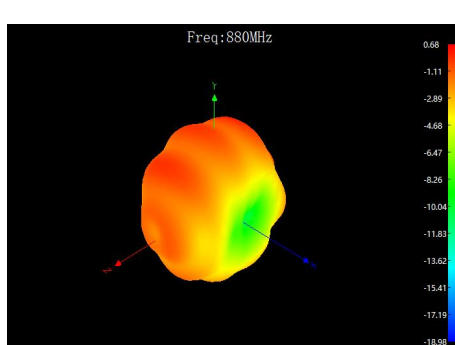
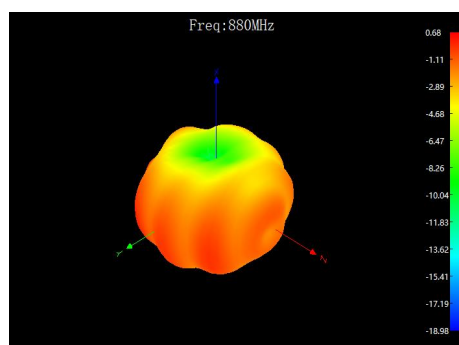
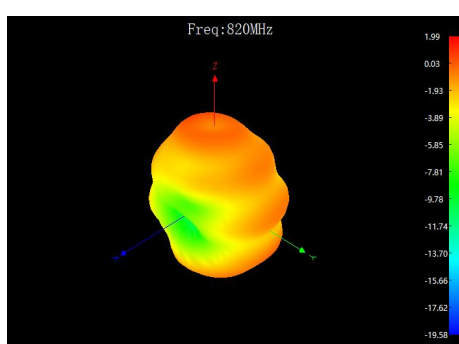
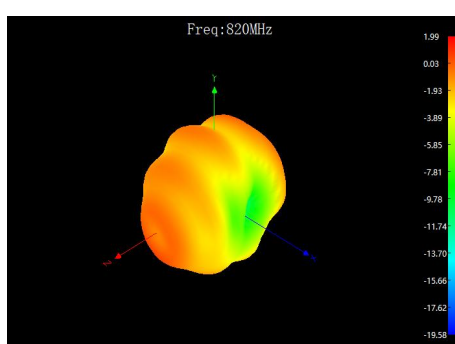
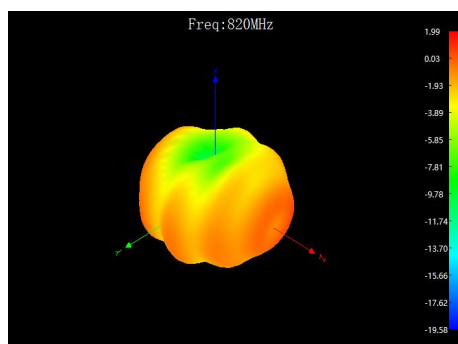
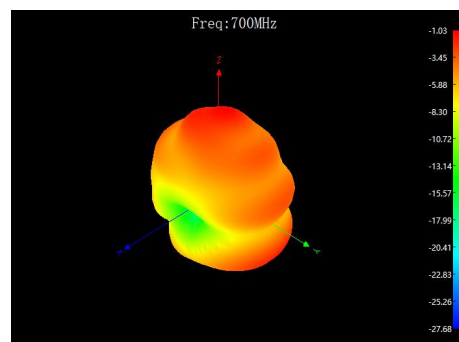
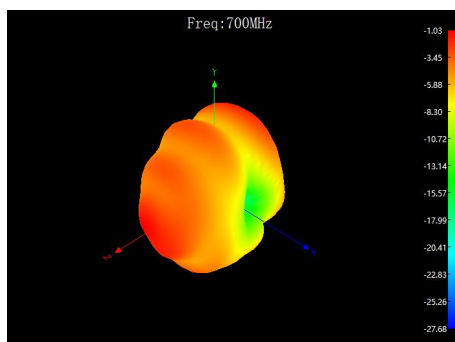
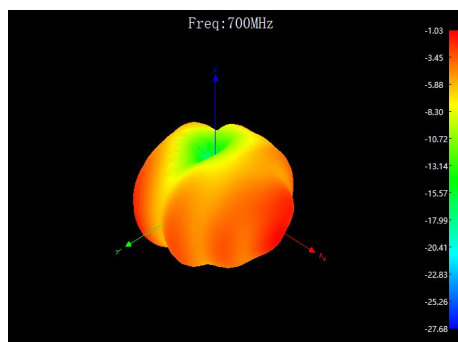
Freq. (MHz)	Effi (dB)	Effi (%)	Gain (dBi)	Freq. (MHz)	Effi (dB)	Effi (%)	Gain (dBi)	Freq. (MHz)	Effi (dB)	Effi (%)	Gain (dBi)
700	-5.91	25.64	-1.03	1710	-4.53	35.24	0.95	2060	-5.03	31.44	-0.47
710	-5.58	27.67	-0.83	1720	-3.76	42.07	0.34	2070	-5.03	31.44	-0.78
720	-5.39	28.91	-1.16	1730	-3.54	44.23	0.96	2080	-4.97	31.85	-0.8
730	-5.19	30.27	-1.39	1740	-3.35	46.28	1.81	2090	-5.16	30.48	-0.44
740	-4.78	33.27	-1.59	1750	-2.99	50.24	2	2100	-4.79	33.19	-0.18
750	-4.31	37.07	-1.59	1760	-2.99	50.24	1.89	2110	-4.63	34.43	0.22
760	-4.67	34.09	-1.12	1770	-3.17	48.16	2.57	2120	-4.5	35.48	0.76
770	-4.01	39.71	-0.16	1780	-3.21	47.75	2.33	2130	-4.22	37.84	0.68
780	-3.6	43.66	0.92	1790	-3.08	49.26	1.89	2140	-4.12	38.73	0.67
790	-3.55	44.12	1.69	1800	-3	50.09	1.94	2150	-4.08	39.08	0.16
800	-3.4	45.7	1.53	1810	-2.98	50.38	2.15	2160	-3.96	40.18	-0.29
810	-3.65	43.12	1.19	1820	-3.1	48.98	1.91	2170	-3.94	40.36	0.3
820	-3.82	41.47	1.99	1830	-3.16	48.29	1.22				
830	-3.76	42.08	2.42	1840	-2.95	50.75	0.96				
840	-3.94	40.34	2.68	1850	-3.34	46.36	1.16				
850	-4.05	39.39	2.78	1860	-3.23	47.53	0.52				
860	-3.94	40.34	2.52	1870	-3.67	42.95	0.24				
870	-4.13	38.67	1.38	1880	-3.78	41.88	0.17				
880	-4.2	38.06	0.68	1890	-4.12	38.73	-0.17				
890	-4.07	39.19	0.84	1900	-4.48	35.65	-0.85				
900	-3.86	41.1	1.51	1910	-4.79	33.19	-0.64				
910	-3.86	41.1	1.91	1920	-4.96	31.92	-0.36				
920	-3.98	40.03	1.62	1930	-4.99	31.7	-0.18				
930	-4.25	37.55	0.92	1940	-4.92	32.21	0.34				
940	-4.43	36.07	0.63	1950	-4.54	35.16	0.43				
950	-4.6	34.64	0.19	1960	-4.37	36.56	0.7				
960	-4.82	32.99	0.28	1970	-4.22	37.84	0.59				
				1980	-4.16	38.37	0.41				
				1990	-4.39	36.39	0.34				
				2000	-4.57	34.91	0.13				
				2010	-4.92	32.21	-0.31				
				2020	-5.06	31.19	-0.37				
				2030	-4.9	32.34	-0.92				
				2040	-4.82	32.97	-0.62				
				2050	-4.91	32.27	-0.41				

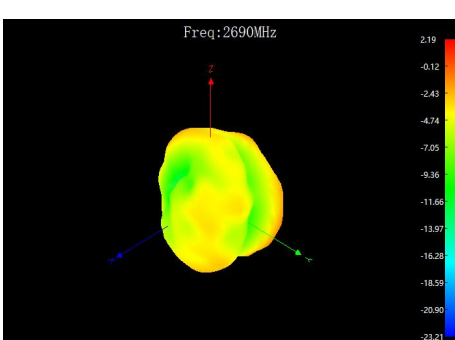
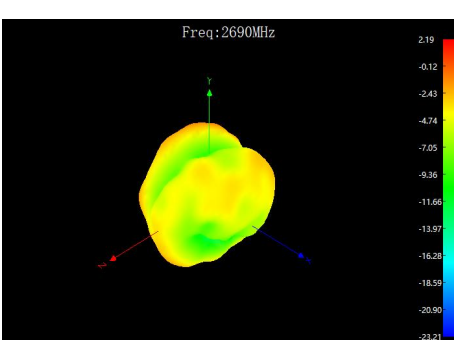
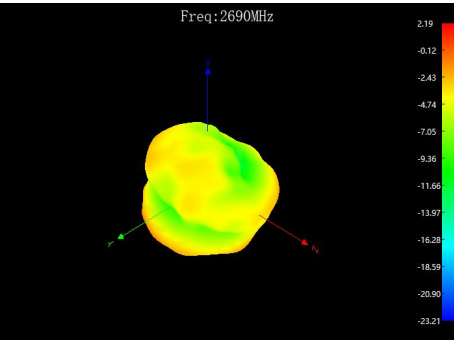
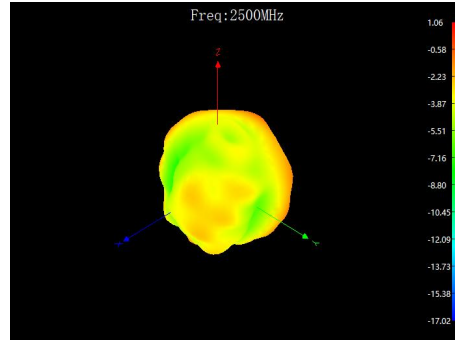
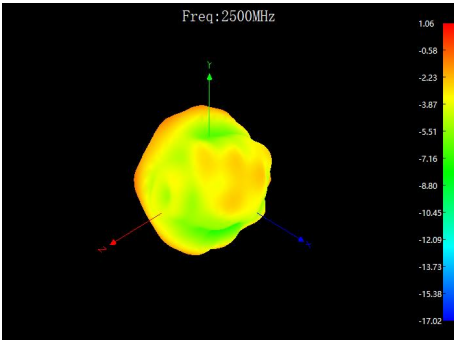
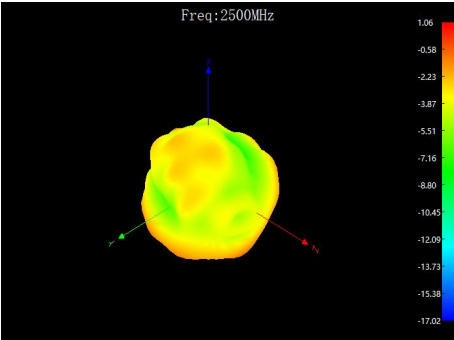
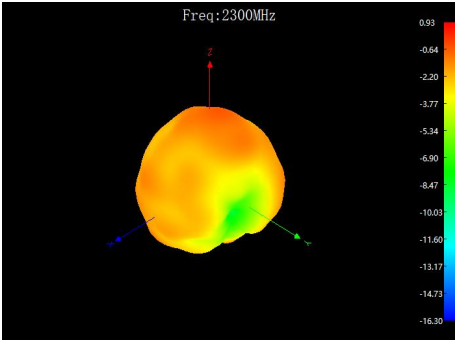
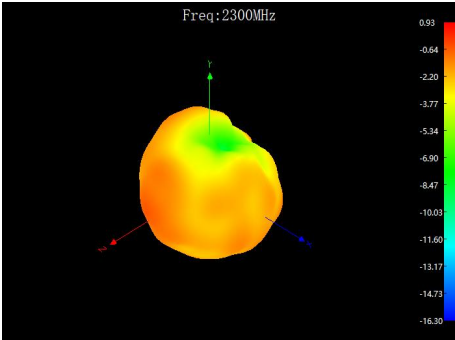
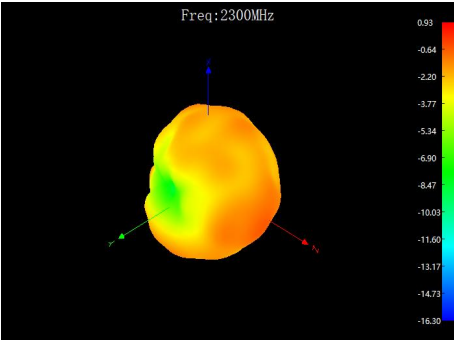
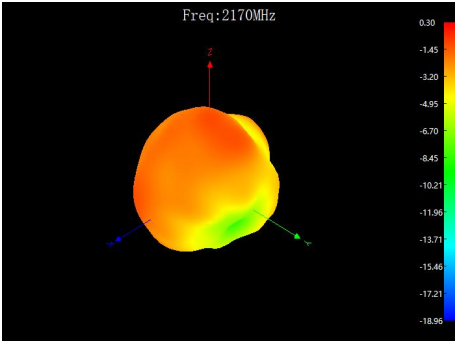
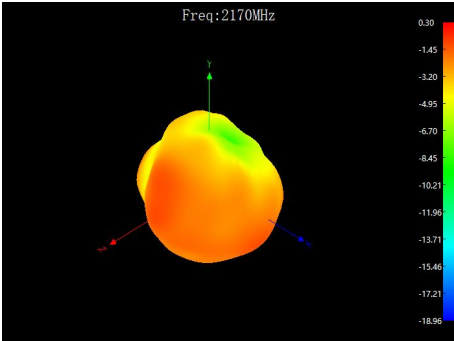
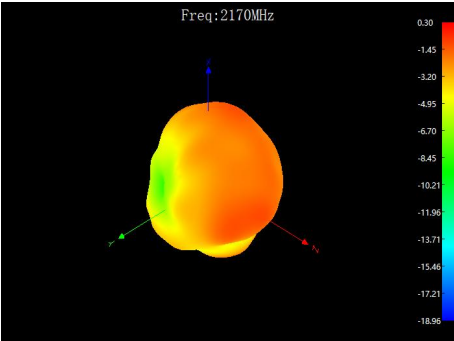
5.1 Passive test data

main antenna passive efficiency

Freq.	Effi	Effi	Gain	Freq.	Effi	Effi	Gain
(MHz)	(dB)	(%)	(dBi)	(MHz)	(dB)	(%)	(dBi)
2300	-3.24	47.42	0.93	2510	-3.87	41.02	1.51
2310	-3.24	47.42	0.21	2520	-3.9	40.74	1.08
2320	-3.2	47.86	-0.17	2530	-4.07	39.17	1.29
2330	-3.18	48.08	-0.16	2540	-4.16	38.37	1.82
2340	-3	50.12	-0.14	2550	-4.15	38.46	1.48
2350	-3.06	49.43	-0.57	2560	-4.19	38.11	1.47
2360	-3.04	49.66	0.44	2570	-4.23	37.76	1.39
2370	-3.05	49.55	-0.17	2580	-4.29	37.24	1.43
2380	-3.08	49.2	0.06	2590	-4.25	37.58	0.53
2390	-3.33	46.45	0.48	2600	-4.2	38.02	0.51
2400	-3.25	47.32	0.61	2610	-3.95	40.27	1.11
2410	-3.37	46.03	0.4	2620	-3.64	43.25	1.2
2420	-3.5	44.67	1.45	2630	-3.46	45.08	1.9
2430	-3.48	44.87	1.01	2640	-3.38	45.92	2.33
2440	-3.58	43.85	0.46	2650	-3.34	46.34	1.66
2450	-3.67	42.95	0.95	2660	-3.42	45.5	2.49
2460	-3.74	42.27	0.08	2670	-3.54	44.26	2.47
2470	-3.71	42.56	0.3	2680	-3.15	48.42	0.95
2480	-3.72	42.46	0.86	2690	-3.22	47.64	2.19
2490	-3.68	42.85	0.43				
2500	-3.74	42.27	1.06				

5.2 3D diagram





5.2 Active test data

Antenna OTA test data

Band	Channel	FREQ (MHz)	OTA (dBm)	
			TRP(dB)	TIS(dB)
LTE FDD-B1 (10M)	10850	1925	19.01	
	18300	1950	20.69	
	18550	1975	20.08	-92.03
LTE FDD-B2 (10M)	18650	1855	19.19	
	18900	1880	20.49	
	19150	1905	19.29	-95.1
LTE FDD-B3 (10M)	19250	1715	19.78	
	19575	1747.5	20.61	
	19900	1780	20.55	-95.89
LTE FDD-B4 (10M)	20000	1715	19.1	
	20175	1732.5	20.77	
	20350	1750	20.48	-92.64
LTE FDD-B7 (10M)	20800	2505	20.55	
	21100	2535	20.89	
	21400	2565	20.01	-93.3
LTE FDD-B12 (10M)	23060	704	16.01	
	23095	707.5	17.15	
	23130	711	16.11	-89.53
LTE FDD-B66 (10M)	24200	837	20.87	
	24300	847	20.68	
	24400	857	20.15	-92.14

6. Prototype grounding treatment

Without any environmental 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
700-960,1710-2690MHz	VSWR (Mass production performance) <VSWR(Acknowledge performance)+1

8 Drawings

