

SUNNYWAY TECHNOLOGY(CHINA)

ANTENNA SPEC

Customer name: 三旗		Entry name: SI9811
Working band: LTE B2/4/5/12/14/25/71/41/66 5G n2/5/12/14/25/66/71/41		
Motherboard version: A9811M1A2-1		
Sunnyway Material specification		
Specification type	Sunnyway number	Customer number
MAIN Antenna	SZ24247IB75-1	

Revision history			
Date of preparation/change	Change content	Altered person	Edition
2024.10.26	New issue	XUWEI	A

Sunnyway Countersign column				
R&D	ME:	To examine:	QE:	Approval:
	RF:	To examine:		

Customer will sign the column			
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Directory

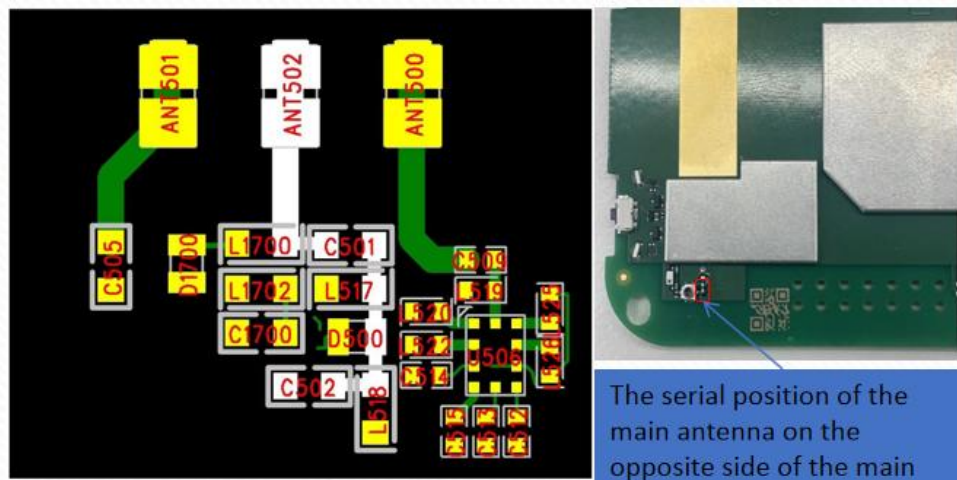
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1. Project information

1.1 Mockup picture



2. Matching circuit



The serial position of the main antenna on the opposite side of the main path is connected in series with 0 ohms

The main antenna matching is as follows:

1. C505 is connected in series with 0 ohms, C509 is connected in series with 0 ohms, and L519 is connected in parallel with a 2.2NH inductor.
2. C501 is connected in series with a 2.0PF capacitor, L517 is connected in parallel with a 100NH inductor, and C502 is connected in series with a 2.2NH inductor.
3. Other tags do not require welding matching.

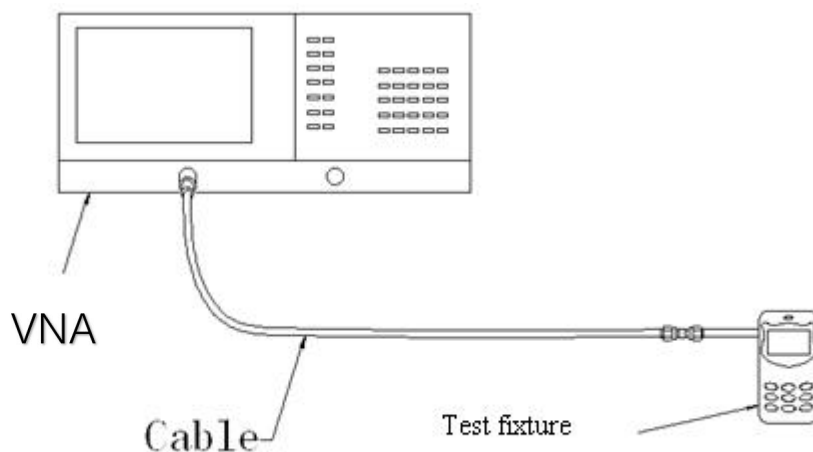
3. Antenna passive testing data

3.1 S11 Description of the test method

Test the equipment: Vector network analyzer (Agilent E5071C)

Test methodology: Use a 50 ohm CABLE cable to export from the instrument test port, use the calibration piece to calibrate and connect the SMA connector of the test fixture, and record the return loss and standing wave ratio corresponding to the relevant frequency point.

Below is a schematic picture of the test:



Test schematic diagram

3.2 Test the environment

Test the system: Multi-probe OTA measurement system (XH-IoT)

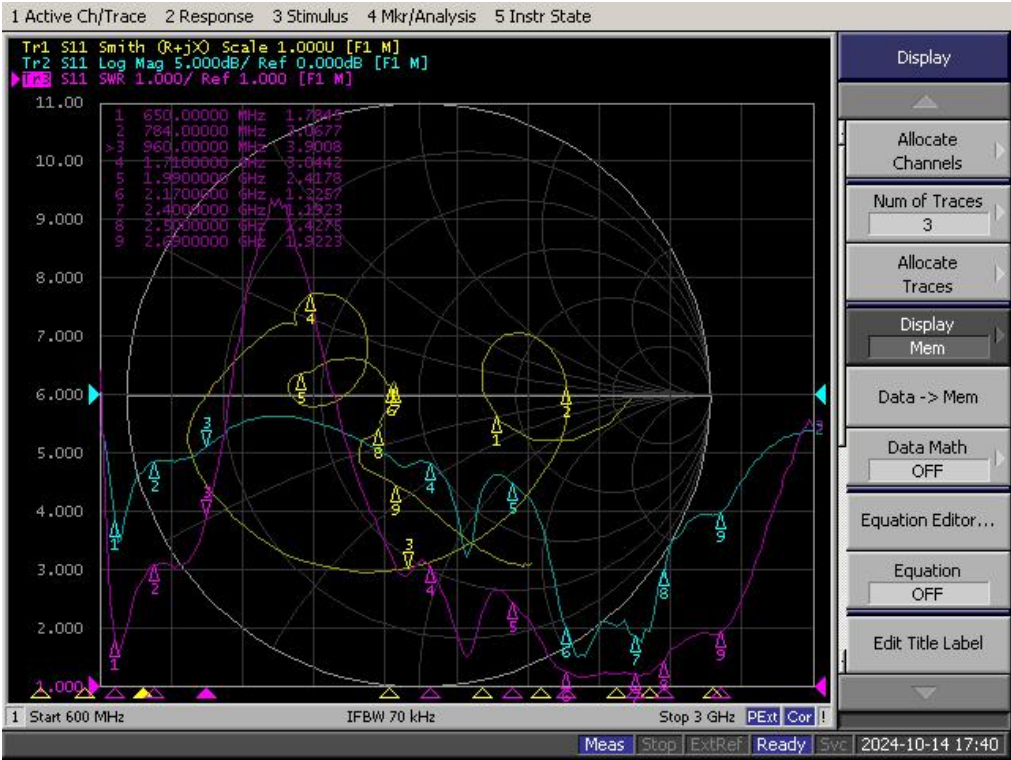
Test the environment: Temperature $22^{\circ}\text{C} \pm 3^{\circ}\text{C}$, humidity $50\% \pm 15\%$

Test the equipment: When testing passive data, use the network analyzer R&S ZND/ Agilent E5071C
When testing active data, use the Agilent 8960/CMW500/SP9500E/SP8315



3.3 S11 Test parameters

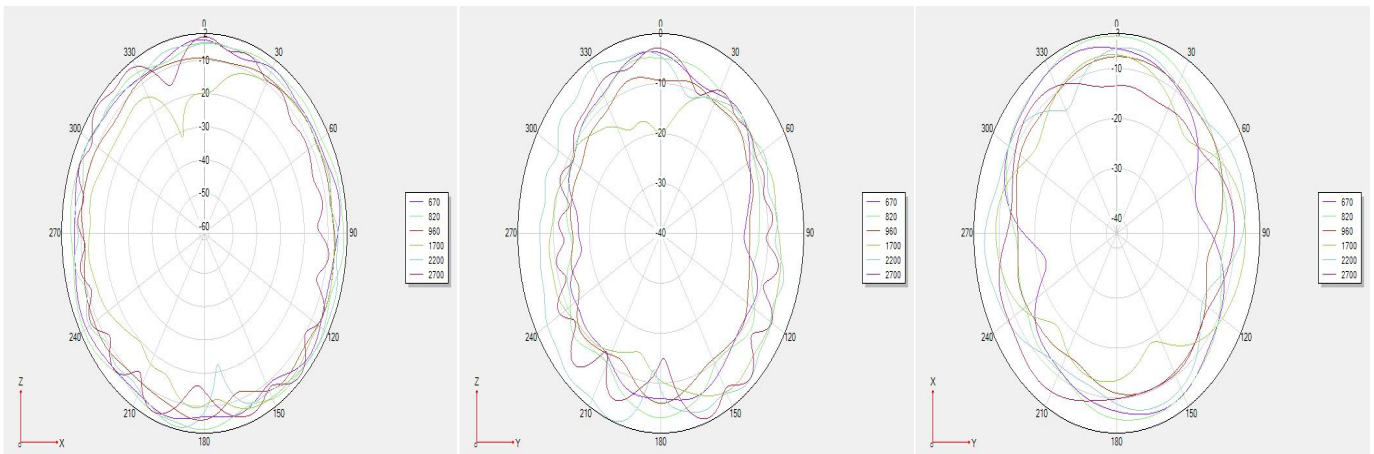
驻波比 VSWR



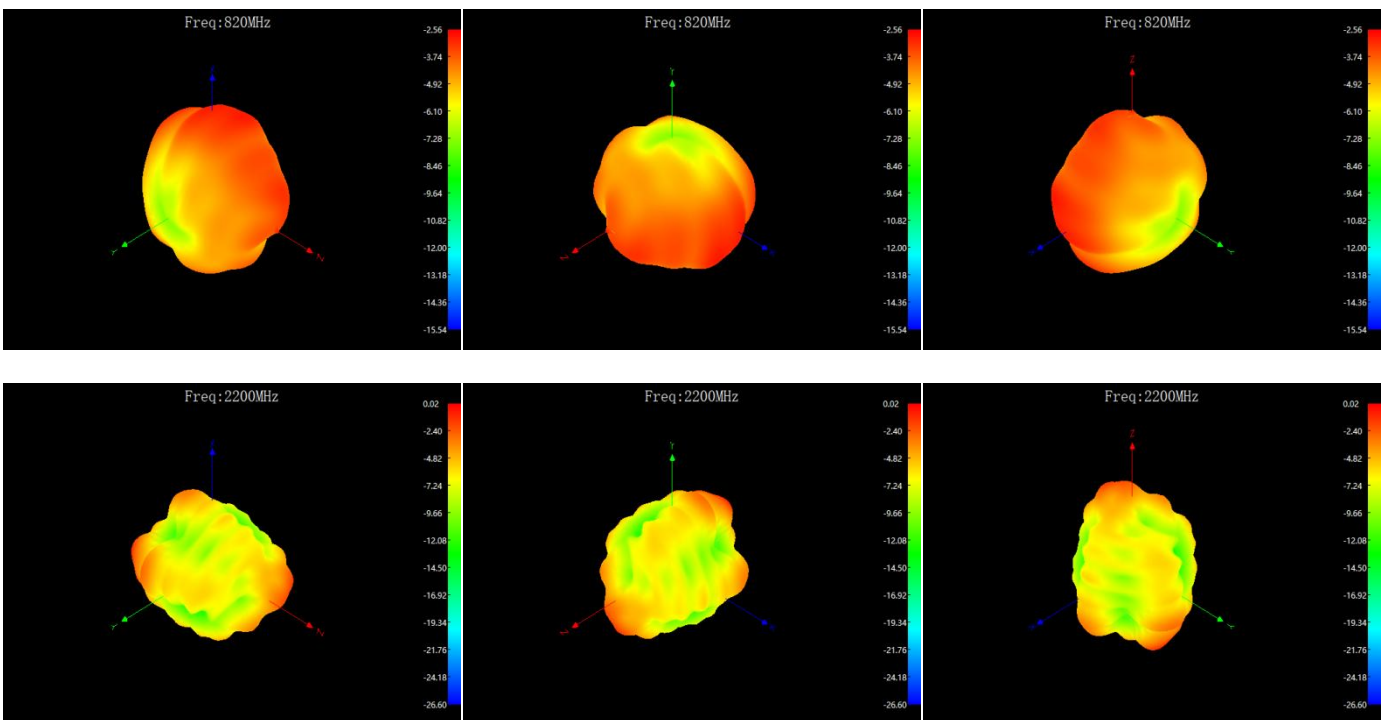
Antenna efficiency and gain

Freq (MHz)	Effi (%)	Gain (dBi)	Freq (MHz)	Effi (%)	Gain (dBi)	Freq (MHz)	Effi (%)	Gain (dBi)	Freq (MHz)	Effi (%)	Gain (dBi)
660	25.43	0.21	1700	40.97	1.28	2100	38.17	1.36	2500	37.13	1.17
670	25.42	0.27	1720	40.53	1.28	2120	39.32	1.49	2520	36.67	1.29
680	24.44	0.2	1740	38.81	1.03	2140	41.17	1.64	2540	36.88	1.33
690	24.32	0.19	1760	38.29	1.09	2160	42.36	1.59	2560	38.31	1.51
700	26.46	0.17	1780	37.26	0.77	2180	43.7	1.52	2580	39.55	1.13
720	25.16	0.21	1800	36.15	0.66	2200	40.32	1.43	2600	39.66	1.05
740	27.16	0.31	1820	35.27	0.7	2220	41.17	1.56	2620	40.23	1.06
760	28.29	0.19	1840	36.05	0.77	2240	42.36	1.73	2640	40.12	1.15
780	29.31	0.53	1860	35.36	0.52	2260	43.7	1.87	2660	39.55	1.09
800	32.09	0.69	1880	36.05	0.62	2280	42.24	1.03	2680	39.89	1.16
820	39.12	1.18	1900	35.66	0.48	2300	41.88	1.05	2700	37.65	1.05
840	38.95	1.32	1920	35.07	0.58	2320	42.02	1.16			
860	39.62	1.43	1940	36.55	0.55	2340	40.93	1.41			
880	38.62	1.25	1960	39.03	0.53	2360	36.99	1.69			
900	40.41	1.44	1980	40.21	0.83	2380	37.75	1.71			
920	39.15	1.31	2000	41.19	0.81	2400	36.13	1.19			
940	40.61	1.28	2020	42.66	0.76	2420	34.87	1.23			
960	35.46	1.12	2040	42.66	0.88	2440	34.98	1.06			
			2060	43.35	1.21	2460	32.85	1.26			
			2080	35.27	1.29	2480	35.92	1.4			

Passive direction diagram



Radiation Apple Figure



3.4 Active test data

4G	Channel	TRP	TIS
LTE B2 (10MHz)	L	20.45	-97.84
	M	20.54	-97.87
	H	20.49	-97.57
LTE B4 (10MHz)	L	19.96	-97.39
	M	19.9	-97.29
	H	20.13	-97.07
LTE B5 (10MHz)	L	19.94	-95.99
	M	19.86	-95.29
	H	19.71	-95.54
LTE B12 (10MHz)	L	20.29	-93.3
	M	20.46	-93.74
	H	21.06	-93.76
LTE B14 (10MHz)	L	18.72	-93.34
LTE B25 (10MHz)	L	20.43	-98.61
	M	20.86	-98.22
	H	20.59	-98.64

4G	Channel	TRP	TIS
LTE B41 (20MHz)	L	19.29	-92.98
	M	19.64	-92.61
	H	19.71	-92.56
LTE B66 (10MHz)	L	19.53	-98.8
	M	19.88	-98.59
	H	20.08	-98.11
LTE B71 (10MHz)	L	16.61	-91.85
	M	17.94	-91.6
	H	17.5	-91.62

5G	Channel	TRP	TIS
N2 (10MHz)	L	19.82	-96.05
	M	19.69	-96.23
	H	19.93	-96.22
N5 (10MHz)	L	19.32	-94.29
	M	19.07	-94.12
	H	18.85	-93.86
N12 (5MHz)	L	18.52	-95.34
	M	18.62	-95.21
	H	18.26	-95.12
N14 (5MHz)	L	18.59	-94.68
N25 (10MHz)	L	19.54	-96.69
	M	19.98	-96.8
	H	20.31	-96.34
N66 (10MHz)	L	19.46	-96.3
	M	19.78	-96.55
	H	20.07	-96.71
N71 (20MHz)	L	17.09	-90.54
	M	17.63	-90.02
	H	18.17	-90.61

5G	Channel	TRP	TIS
N41 (20MHz)	L	19.48	-91.45
	M	19.49	-91.74
	H	20.17	-91.57
N77 (20MHz)	L	19.32	-92.56
	M	19.78	-92.48
	H	19.01	-92.13

4. Environmental treatment methods

No design

5. Standard for mass production antennas

When the antenna is mass-produced, the VSWR is used as the mass production test standard.

According to the differences in the project itself, the following criteria are given:

Freq. (MHz)	Mass production standards
660-960	$VSWR(\text{Production performance}) < VSWR(\text{Confirmed performance}) \pm 0.5$
1710-2690	$VSWR(\text{Production performance}) < VSWR(\text{Confirmed performance}) \pm 0.5$

6. Engineering drawings

