

Sunnyway Technology(Shenzhen)Co.,LTD.

ANTENNA SPEC

Customer name: PAX		Entry name: A99LA-MAIN		
Workingband : GSM850/900/1900 WCDMA2/4/5/8+LTE LTE Band B2/B4/B5/B7/B8/B28/B38/B40/B41/B66				
Motherboard version:				
Sunnyway Material specification				
Specification type	Sunnyway number	Customer number		
MAIN Antenna	SZ24386IB75-1			
Revision history				
Date of preparation/change	Change content	Altered person	Edition	
2024.06.05	New issue	XU	A	
Sunnyway Countersign column				
R&D	ME:	To examine:	QE:	Approval:
	RF:	To examine:		
Customer will sign the column				
Electronic Engineer	Project manager	Structural Engineer	Quality Engineer	

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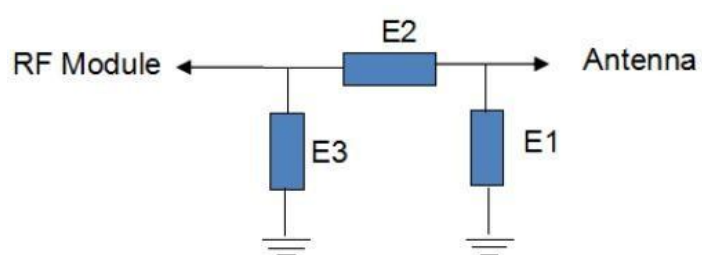
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1. Project information

1.1 Mockup picture

2. Matching circuit

Element	Value
E1	N/A
E2	0 欧姆
E3	N/A



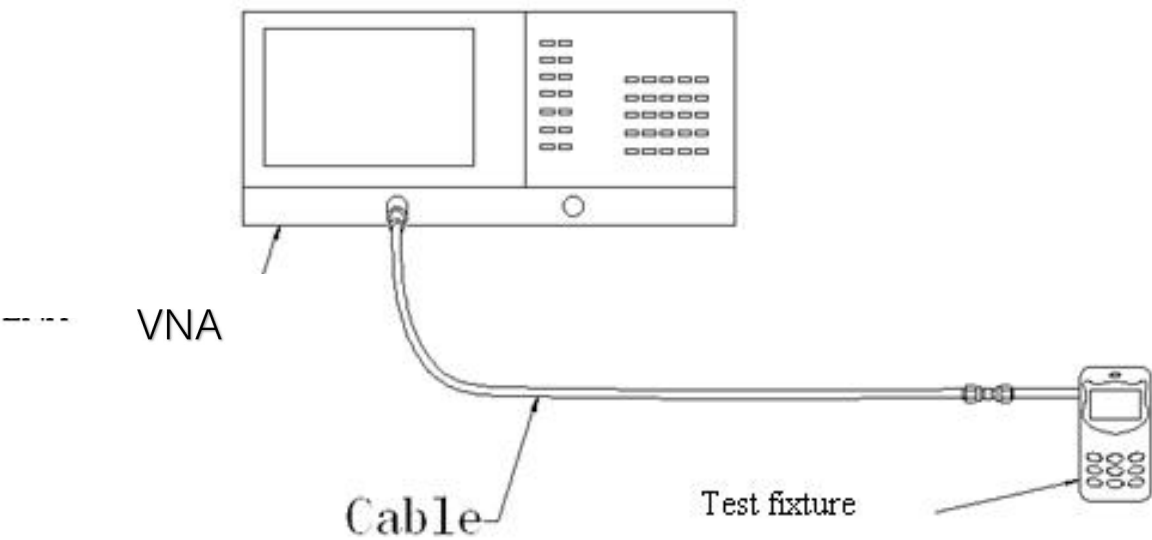
3. Antenna passive testing data

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 S11 Test parameters

(Freq.) MHz	703	960	1710	2170	2450	2690
VSWR	1.40	4.62	1.28	1.47	1.79	1.30

VSWR

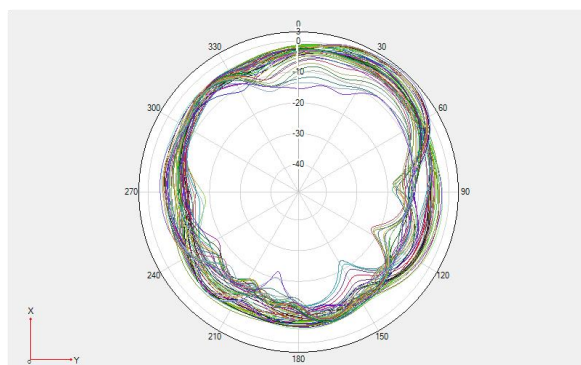
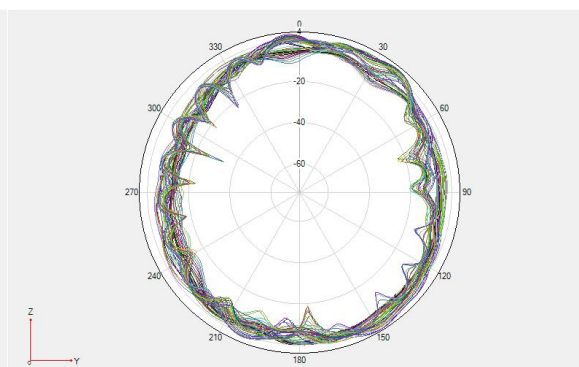
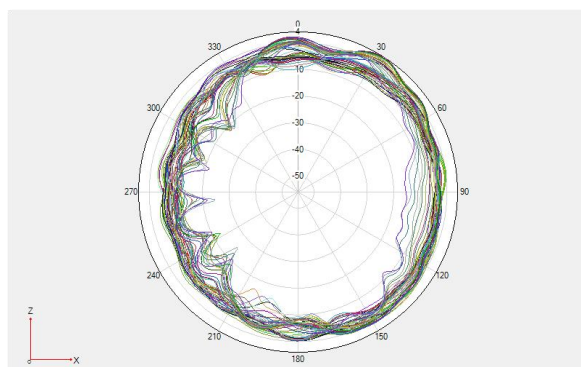


3.3 Antenna efficiency and gain

Frequency/Mhz	MaxGain/dBi	Efficiency / %
800	-6.62	9.06
810	-5.41	10.86
820	-4.69	12.94
830	-3.67	16.03
840	-3.33	18.03
850	-3.01	19.77
860	-2.87	21.33
870	-2.4	22.54
880	-2.53	22.8
890	-2.74	20.99
900	-2.89	20.37
910	-3.03	19.5
920	-2.9	19.59
930	-2.58	19.28
940	-2.24	20.46
950	-2.48	20
960	-3.02	19.54

Frequency/Mhz	MaxGain/dBi	Efficiency / %
1710	2.66	34.91
1770	2.79	36.73
1830	2.16	27.35
1890	1.47	25.94
1950	1.18	23.88
2010	0.73	21.73
2070	0.05	21.63
2130	1.33	24.32
2190	1.54	21.68
2250	1.71	22.08
2310	1.76	23.55
2370	2.59	25.29
2430	3.5	25.12
2490	4.69	27.23
2550	4.49	26.3
2610	3.83	26.06
2690	3.88	26.79

3.4 Directional diagram



4. Antenna active testing data

4.1 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



4.2 OTA Active test data

Item	Measurement	Band	Total
1	TRP	FDD_B2(10MHz)	20.22
2	TRP	FDD_B2(10MHz)	20.49
3	TRP	FDD_B2(10MHz)	20.32
4	TIS(RSSI)	FDD_B2(10MHz)	-91.89
5	TRP	FDD_B4(10MHz)	21.46
6	TRP	FDD_B4(10MHz)	21.54
7	TRP	FDD_B4(10MHz)	20.92
8	TIS(RSSI)	FDD_B4(10MHz)	-91.99
9	TRP	FDD_B5(10MHz)	16.63
10	TRP	FDD_B5(10MHz)	16.72
11	TRP	FDD_B5(10MHz)	16.95
12	TIS(RSSI)	FDD_B5(10MHz)	-89.59
13	TRP	FDD_B7(10MHz)	16.96
14	TRP	FDD_B7(10MHz)	17.81
15	TRP	FDD_B7(10MHz)	16.98
16	TIS(RSSI)	FDD_B7(10MHz)	-92.31
17	TRP	FDD_B8(10MHz)	18.63
18	TRP	FDD_B8(10MHz)	18.81
19	TRP	FDD_B8(10MHz)	17.85
20	TIS(RSSI)	FDD_B8(10MHz)	-89.44

Item	Measurement	Band	Total
21	TRP	FDD_B28(10MHz)	15.04
22	TRP	FDD_B28(10MHz)	16.14
23	TRP	FDD_B28(10MHz)	17.44
24	TIS(RSSI)	FDD_B28(10MHz)	-91.36
25	TRP	TDD_B38(20MHz)	19.72
26	TRP	TDD_B38(20MHz)	19.26
27	TRP	TDD_B38(20MHz)	18.67
28	TIS(RSSI)	TDD_B38(20MHz)	-92.92
29	TRP	TDD_B40(20MHz)	20.02
30	TRP	TDD_B40(20MHz)	20.63
31	TRP	TDD_B40(20MHz)	20.38
32	TIS(RSSI)	TDD_B40(20MHz)	-94.06
33	TRP	TDD_B41(20MHz)	17.57
34	TRP	TDD_B41(20MHz)	17.36
35	TRP	TDD_B41(20MHz)	18.29
36	TIS(RSSI)	TDD_B41(20MHz)	-92.06
37	TRP	FDD_B66(10MHz)	20.38
38	TRP	FDD_B66(10MHz)	20.08
39	TRP	FDD_B66(10MHz)	20.12
40	TIS(RSSI)	FDD_B66(10MHz)	-92.97

Item	Measurement	Band	Total
1	TRP	WCDMA_B2	20.27
2	TRP	WCDMA_B2	20.19
3	TRP	WCDMA_B2	19.76
4	TIS(RSSI)	WCDMA_B2	-102.85
5	TRP	WCDMA_B4	19.04
6	TRP	WCDMA_B4	19.98
7	TRP	WCDMA_B4	19.39
8	TIS(RSSI)	WCDMA_B4	-102.73
9	TRP	WCDMA_B5	16.74
10	TRP	WCDMA_B5	17.57
11	TRP	WCDMA_B5	16.86
12	TIS(RSSI)	WCDMA_B5	-103.55
13	TRP	WCDMA_B8	17.83
14	TRP	WCDMA_B8	17
15	TRP	WCDMA_B8	17.78
16	TIS(RSSI)	WCDMA_B8	-103.12

Item	Measurement	Band	Total
17	TRP	GSM850	25.27
18	TRP	GSM850	25.15
19	TRP	GSM850	26.17
20	TIS(RSSI)	GSM850	-101.32
21	TRP	GSM900	25.97
22	TRP	GSM900	26.3
23	TRP	GSM900	25.64
24	TIS(RSSI)	GSM900	-102.5
25	TRP	PCS1900	25.9
26	TRP	PCS1900	26.24
27	TRP	PCS1900	27.63
28	TIS(RSSI)	PCS1900	-102.46

5. Environmental treatment methods

No design

6. 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
824-960	$VSWR(\text{Production performance}) < VSWR(\text{Confirmed performance}) + 0.5$
1710-2690	$VSWR(\text{Production performance}) < VSWR(\text{Confirmed performance}) + 0.5$

7. Engineering drawings

