# 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**

| Electronic Engineer | Project manager | Structural Engineer | Quality Engineer |
|---|---|---|---|
| | | | |

Sunnyway Technology(CHINA)

Add: 1F, Building 4, No.215-99, GaoGuang Road, QingPu District, Shanghai, China

Tel: +86-021-6083 5368 Fax: +86-021-6484 2328

Email: sales@sunnyway-iot.com Web: www.sunnyway-iot.com

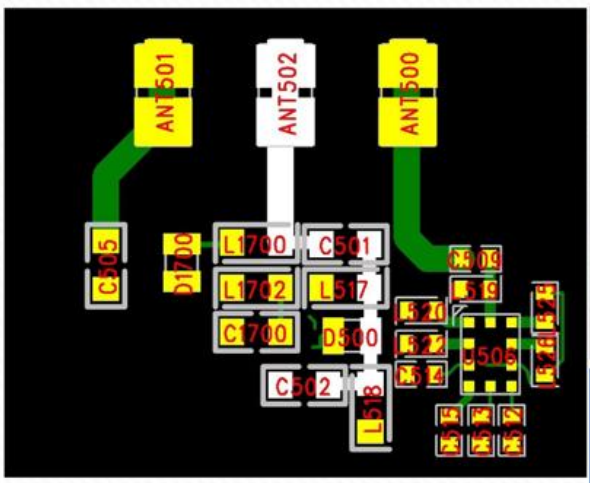
# Directory

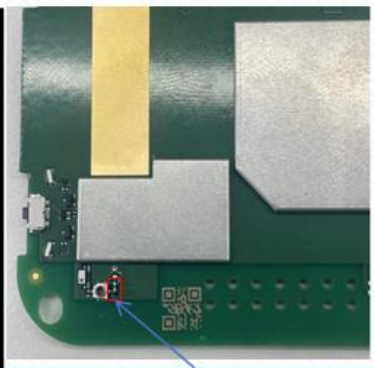


## 1. Project information

### 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.

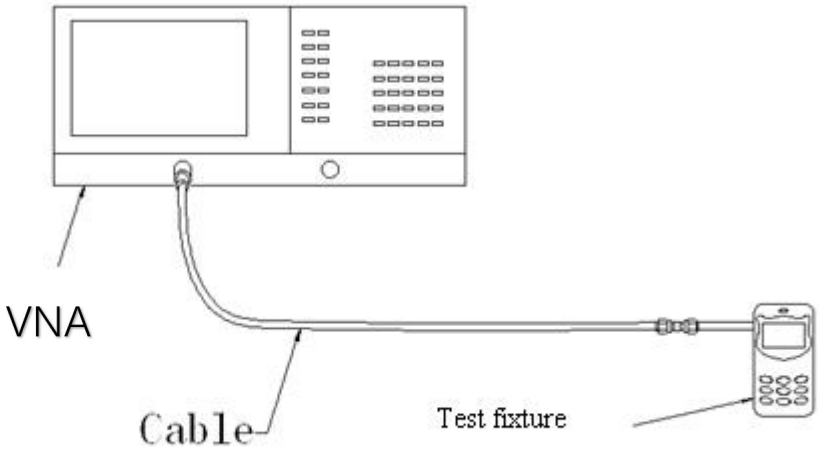
## 3. Antenna passive testing data

### 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

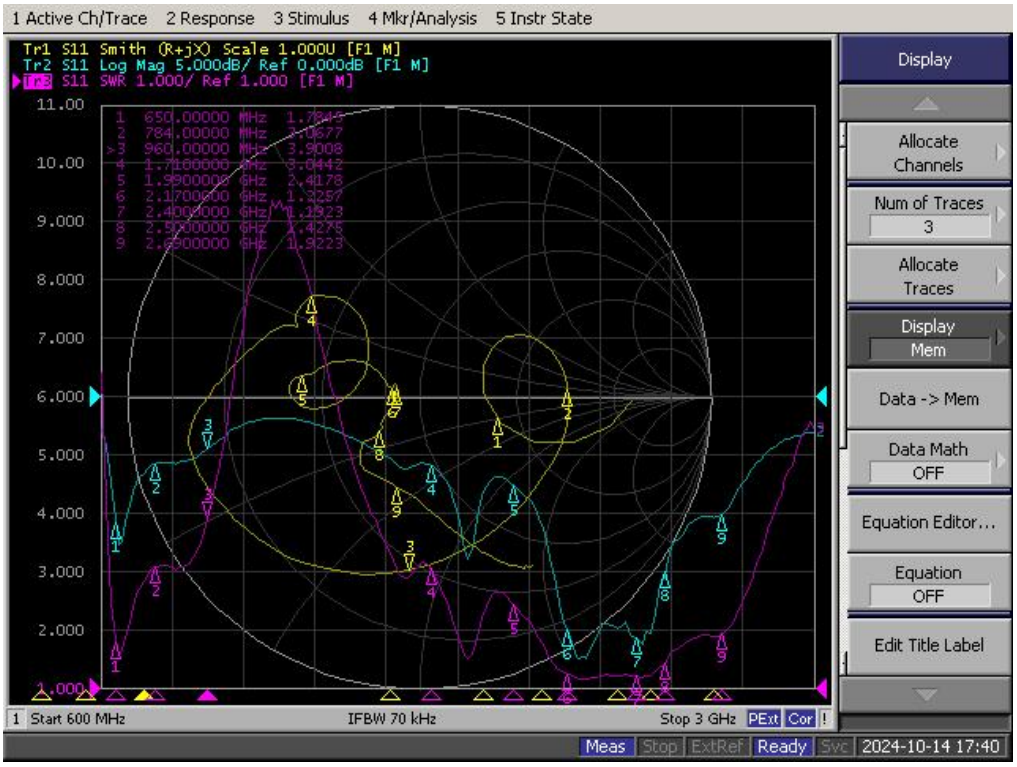
Test the system：Multi-probe OTA measurement system（XH-IoT）

Test the environment：Temperature 22°C±3°C, humidity 50%±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

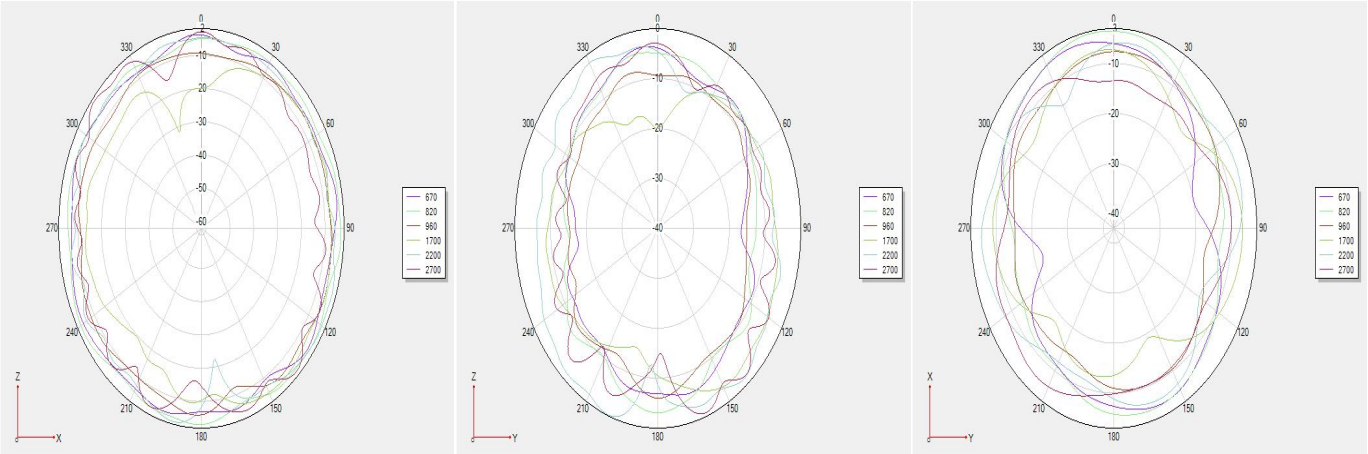
| Freq (MHz) | Effi (%) | Gain (dBi) |
|---|---|---|
| 660 | 25.43 | 0.21 |
| 670 | 25.42 | 0.27 |
| 680 | 24.44 | 0.2 |
| 690 | 24.32 | 0.19 |
| 700 | 26.46 | 0.17 |
| 720 | 25.16 | 0.21 |
| 740 | 27.16 | 0.31 |
| 760 | 28.29 | 0.19 |
| 780 | 29.31 | 0.53 |
| 800 | 32.09 | 0.69 |
| 820 | 39.12 | 1.18 |
| 840 | 38.95 | 1.32 |
| 860 | 39.62 | 1.43 |
| 880 | 38.62 | 1.25 |
| 900 | 40.41 | 1.44 |
| 920 | 39.15 | 1.31 |
| 940 | 40.61 | 1.28 |
| 960 | 35.46 | 1.12 |

| Freq (MHz) | Effi (%) | Gain (dBi) |
|---|---|---|
| 1700 | 40.97 | 1.28 |
| 1720 | 40.53 | 1.28 |
| 1740 | 38.81 | 1.03 |
| 1760 | 38.29 | 1.09 |
| 1780 | 37.26 | 0.77 |
| 1800 | 36.15 | 0.66 |
| 1820 | 35.27 | 0.7 |
| 1840 | 36.05 | 0.77 |
| 1860 | 35.36 | 0.52 |
| 1880 | 36.05 | 0.62 |
| 1900 | 35.66 | 0.48 |
| 1920 | 35.07 | 0.58 |
| 1940 | 36.55 | 0.55 |
| 1960 | 39.03 | 0.53 |
| 1980 | 40.21 | 0.83 |
| 2000 | 41.19 | 0.81 |
| 2020 | 42.66 | 0.76 |
| 2040 | 42.66 | 0.88 |
| 2060 | 43.35 | 1.21 |
| 2080 | 35.27 | 1.29 |

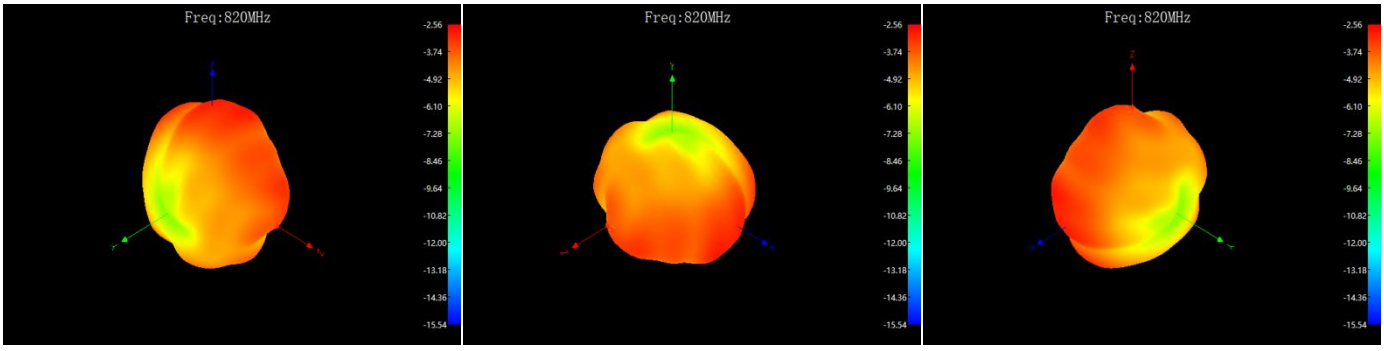
| | | |
|---|---|---|
| 2100 | 38.17 | 1.36 |
| 2120 | 39.32 | 1.49 |
| 2140 | 41.17 | 1.64 |
| 2160 | 42.36 | 1.59 |
| 2180 | 43.7 | 1.52 |
| 2200 | 40.32 | 1.43 |
| 2220 | 41.17 | 1.56 |
| 2240 | 42.36 | 1.73 |
| 2260 | 43.7 | 1.87 |
| 2280 | 42.24 | 1.03 |
| 2300 | 41.88 | 1.05 |
| 2320 | 42.02 | 1.16 |
| 2340 | 40.93 | 1.41 |
| 2360 | 36.99 | 1.69 |
| 2380 | 37.75 | 1.71 |
| 2400 | 36.13 | 1.19 |
| 2420 | 34.87 | 1.23 |
| 2440 | 34.98 | 1.06 |
| 2460 | 32.85 | 1.26 |
| 2480 | 35.92 | 1.4 |

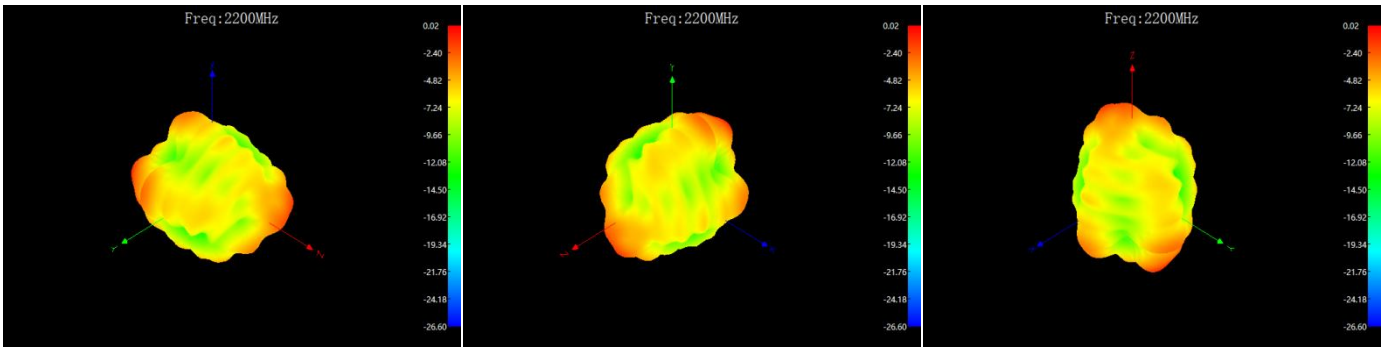
| | | |
|---|---|---|
| 2500 | 37.13 | 1.17 |
| 2520 | 36.67 | 1.29 |
| 2540 | 36.88 | 1.33 |
| 2560 | 38.31 | 1.51 |
| 2580 | 39.55 | 1.13 |
| 2600 | 39.66 | 1.05 |
| 2620 | 40.23 | 1.06 |
| 2640 | 40.12 | 1.15 |
| 2660 | 39.55 | 1.09 |
| 2680 | 39.89 | 1.16 |
| 2700 | 37.65 | 1.05 |

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(Production performance)<VSWR(Confirmed performance)±0.5 |
| 1710-2690 | VSWR(Production performance)<VSWR(Confirmed performance)±0.5 |

# 6. Engineering drawings