

## Antenna SPEC

|                                     |                                                                                                                                                                            |                         |                     |                      |  |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------------------|--|
| Supplier Name                       | Sunnyway                                                                                                                                                                   |                         |                     |                      |  |
| Material Name                       | Antenna Cells                                                                                                                                                              |                         |                     |                      |  |
| Specifications                      | FPC antenna, 52.91*25.05mm, Silkscreen: SY-LL303(L)-MAIN-V1.0<br>(LL303(L)/ Shang Yuan)                                                                                    |                         |                     |                      |  |
| Project Model                       | LL303(L)                                                                                                                                                                   |                         | Pigment             | Black                |  |
| Material code/material number       | KR3317L30310100                                                                                                                                                            |                         |                     |                      |  |
| Environmental requirements          | <input checked="" type="checkbox"/> RoHS compliant <input type="checkbox"/> no-RoHS <input type="checkbox"/> Confirmed to REACH <input type="checkbox"/> no-REACH          |                         |                     |                      |  |
| Type                                | <input type="checkbox"/> New product recognition <input type="checkbox"/> Material change will be admitted <input type="checkbox"/> Specification changes will be admitted |                         |                     |                      |  |
| State                               | <input type="checkbox"/> Structure sample qualified <input type="checkbox"/> Appearance sample qualified <input type="checkbox"/> Color samples qualified                  |                         |                     |                      |  |
| Description of replacement material |                                                                                                                                                                            |                         |                     |                      |  |
| Date                                | Change description                                                                                                                                                         |                         |                     | Signature            |  |
|                                     |                                                                                                                                                                            |                         |                     |                      |  |
|                                     |                                                                                                                                                                            |                         |                     |                      |  |
|                                     |                                                                                                                                                                            |                         |                     |                      |  |
|                                     |                                                                                                                                                                            |                         |                     |                      |  |
|                                     |                                                                                                                                                                            |                         |                     |                      |  |
|                                     |                                                                                                                                                                            |                         |                     |                      |  |
| Fill in by supplier                 |                                                                                                                                                                            |                         |                     |                      |  |
| Producer/Date                       |                                                                                                                                                                            | Reviewer/Date           |                     | Approver/Date        |  |
| Fill in by the company              |                                                                                                                                                                            |                         |                     |                      |  |
| Structural recognition              | Project recognition                                                                                                                                                        | Procurement recognition | Quality recognition | Hardware recognition |  |
|                                     |                                                                                                                                                                            |                         |                     |                      |  |



# 尚远科技（中国）有限公司

Sunnyway Technology (China) Co. Ltd.

## Antenna SPEC

|                                                  |                 |                       |
|--------------------------------------------------|-----------------|-----------------------|
| Customer name: JimiloT                           |                 | Entry name: LL303 (L) |
| Working frequency band:LTE1/2/3/4/5/7/8/20/28/40 |                 |                       |
| Motherboard version:                             |                 |                       |
| Sunnyway Material specification                  |                 |                       |
| Specification type                               | Sunnyway number | Customer number       |
| MAIN Antenna                                     | SZ22112IB75-1   | KR3317L30310100       |

| Revision history           |                |                |         |
|----------------------------|----------------|----------------|---------|
| Date of preparation/change | Change content | Altered person | Edition |
| 2022.09.07                 | New issue      | Yang XIN       | A       |
|                            |                |                |         |
|                            |                |                |         |

| Sunnyway Countersign column   |                 |             |                     |                  |
|-------------------------------|-----------------|-------------|---------------------|------------------|
| RD                            | ME:             | To examine: | QE:                 | Approval:        |
|                               | RF:             | To examine: |                     |                  |
| Customer will sign the column |                 |             |                     |                  |
| Electronic Engineer           | Project manager |             | Structural Engineer | Quality Engineer |
|                               |                 |             |                     |                  |

Tel: +86-021-64842326 (shanghai); +86-0755-82504258 (shenzhen) Fax: +86-021-64842328

Shanghai R&D Center: 1 / F, Building 4, No. 99, Lane 215, Gaoguang Road, Qingpu District, Shanghai

Shenzhen R&D Center: 6th Floor, Building 5, Nantaiyun Chuanggu Center, Guangming District, Shenzhen

Chongqing R&D Center: 1F, ARM Ecological Industrial Park, No. 19, East Datagu Road, Xiantao, Yubei District, Chongqing

Huizhou Manufacturing Center: Floor 4-5, No. 1, Central Village Road, Longhu Industrial Zone, Shuikou Town, Huicheng District, Huizhou

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

第 2 页 共 9 页

## ITEM

### **1 PROJECT PICTURES**

### **2 TEST FIXTURE**

### **3 MATCHING CIRCUIT**

### **4 S11 TEST**

4.0 S11 test method

4.1 S11 parameter

### **5 CHAMBER TEST DATA**

5.0 test equipment

5.1 active data

### **6 GROUND HANDLING**

### **7 MASS PRODUCTION ANTENNA SPEC**

### **8 Structural drawings**

## 1. PROJECT PICTURES

project pictures shown below:



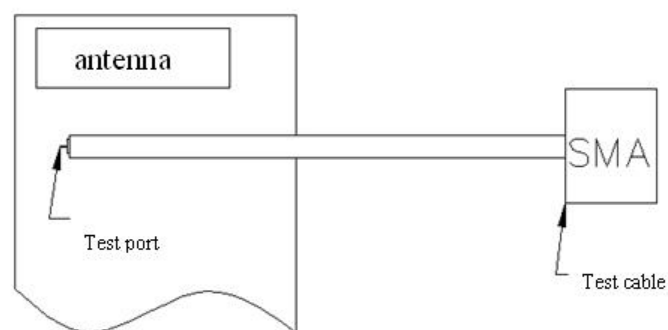
PS:

To ensure that the antenna shipment quality, the final prototype Clients validated the antenna's performance, should be kept in our company for at least a year time, facilitate solving antenna amount during abnormal situation,

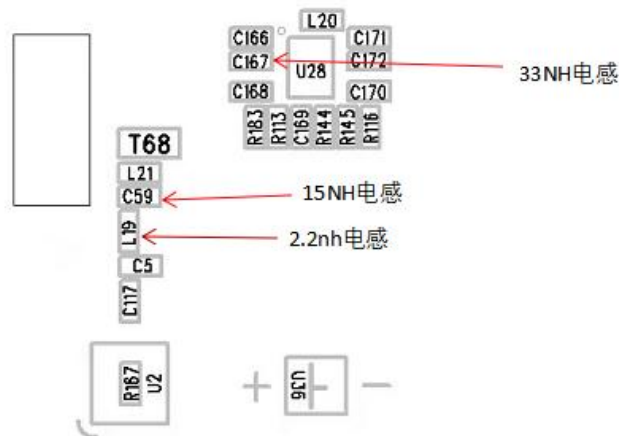
## 2. TEST FIXTURE

Purpose: To test antenna passive parameters as accurately as possible。

methods: the fixture is to use a 50 ohm coaxial cable, one end is connected to the pad after the antenna's matching circuit (the front of the antenna switch) , and the other end is connected to the SMA connector.



### 3. MATCHING CIRCUIT



主路L19串2.2NH电感, C59并15NH电感一路  
C167并33NH电感控制700兆频段

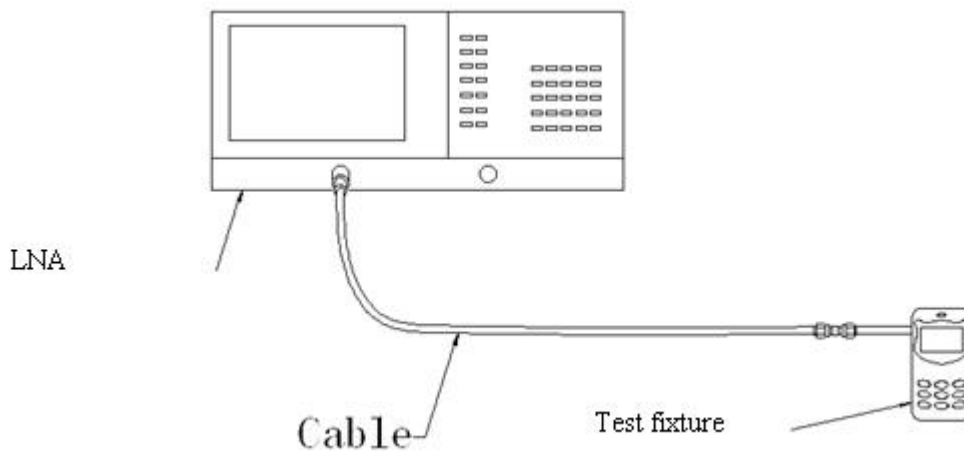
### 4. S11 test

#### 4.0 S11 test method instructions

Test equipment: LNA (Agilent E5071B)

Test method: With a 50 ohm CABLE ,CABLE export from instrument testing port , After the calibration with calibration Key, connected to the SMA connector, Records the return loss and VSWR of the related frequency points.

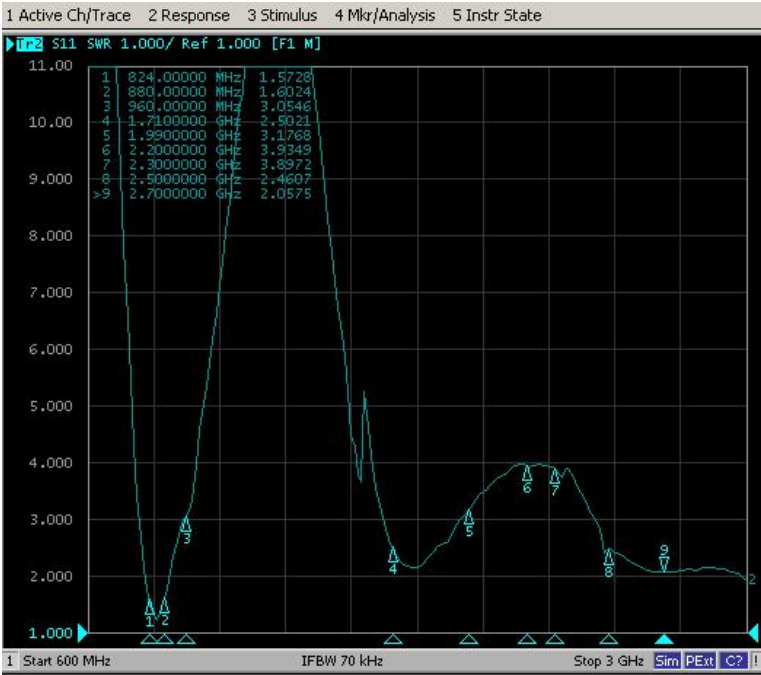
Test schematic diagram is as follows:



Test schematic diagram

4.1 S11 parameter

MIAN ANT VSWR



|         |      |      |
|---------|------|------|
| 频率（MHZ） | 824  | 2700 |
| 驻波比     | 1.57 | 2.05 |

5 CHAMBER TEST DATA

Test equipment

Test system: chamber

Test environment: the temperature of 22 ℃ + 3 ℃, humidity of 50% plus or minus 15%

Test equipment: to test passive status , use Agilent 5071C to test active status, use CMW500.

OTA Test data

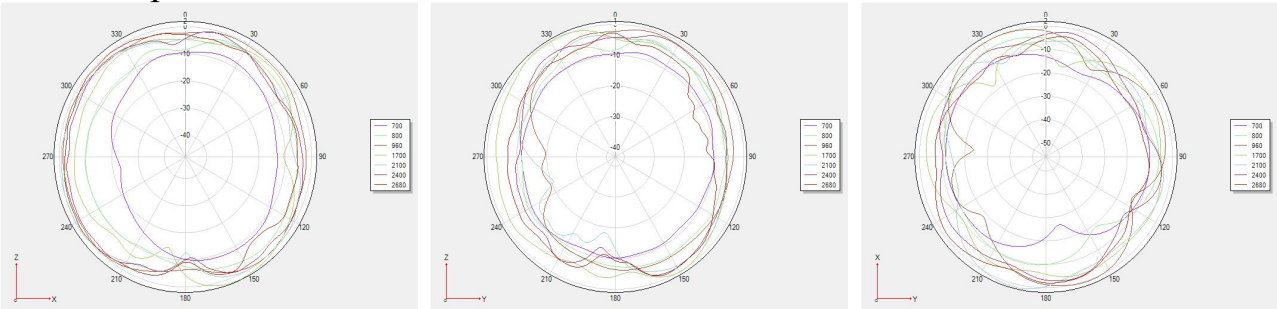
| FDD-LTE 2.1G (B1) |        |        | FDD-LTE 1.9G (B2) |        |        | FDD-LTE 1.8G (B3)  |        |        | FDD-LTE 2.1G (B4)  |        |        | FDD-LTE 2.6G (B7) |        |        |
|-------------------|--------|--------|-------------------|--------|--------|--------------------|--------|--------|--------------------|--------|--------|-------------------|--------|--------|
| 18050             | 18300  | 18550  | 18650             | 18900  | 19150  | 19250              | 19575  | 19900  | 20000              | 20175  | 20350  | 20850             | 21100  | 21350  |
| 19.2              | 18.79  | 17.07  | 18.92             | 20.49  | 18.22  | 18.73              | 19.66  | 18.3   | 19.91              | 19.95  | 18.44  | 20.86             | 19.87  | 21.27  |
| 18.3533333        |        |        | 19.21             |        |        | 18.8966667         |        |        | 19.4333333         |        |        | 20.6666667        |        |        |
| 50                | 300    | 550    | 650               | 900    | 1150   | 1250               | 1575   | 1900   | 2000               | 2175   | 2350   | 2850              | 3100   | 3350   |
| -93.86            | -92.73 | -92.59 | -94.48            | -93.97 | -92.61 | -93.14             | -93.83 | -92.58 | -93.49             | -93.37 | -93.56 | -95.7             | -93.12 | -92.35 |
| -93.06            |        |        | -93.6866667       |        |        | -93.1833333        |        |        | -93.4733333        |        |        | -93.7233333       |        |        |
| FDD-LTE 850M (B5) |        |        | FDD-LTE 900M (B8) |        |        | FDD-LTE 800M (B20) |        |        | FDD-LTE 750M (B28) |        |        |                   |        |        |
| 20450             | 20525  | 20600  | 21500             | 21625  | 21750  | 24200              | 24300  | 24400  | 27260              | 27435  | 27610  |                   |        |        |
| 16.59             | 16.51  | 16.68  | 20.65             | 21.54  | 19.7   | 16.38              | 17.5   | 18.91  | 17.44              | 17.07  | 15.7   |                   |        |        |
| 16.5933333        |        |        | 20.63             |        |        | 17.5966667         |        |        | 16.7366667         |        |        |                   |        |        |
| 2450              | 2525   | 2600   | 3500              | 3625   | 3750   | 6200               | 6300   | 6400   | 9260               | 9435   | 9610   |                   |        |        |
| -95.11            | -94.02 | -95.09 | -94.76            | -94.92 | -96.92 | -90.86             | -91.39 | -92.45 | -88.96             | -91.02 | -92.53 |                   |        |        |
| -94.74            |        |        | -95.5333333       |        |        | -91.5666667        |        |        | -90.8366667        |        |        |                   |        |        |

| TDD-LTE 2.3G (B40) |        |        |
|--------------------|--------|--------|
| 38750              | 39150  | 39550  |
| 18.94              | 20.28  | 19.54  |
| 19.58666667        |        |        |
| -94.42             | -94.09 | -94.73 |
| -94.41333333       |        |        |

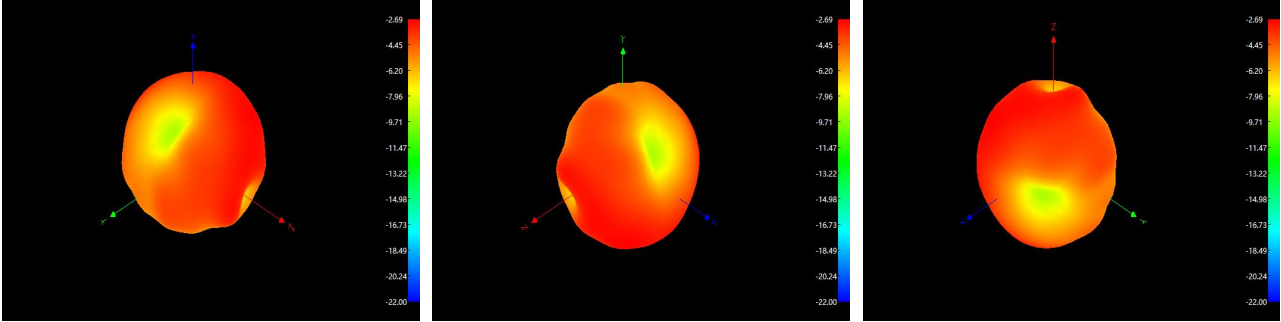
Antenna gain

|            |                                                                                                                                                                                        |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GSM ↵<br>↵ | 850: -4.26dBi ↵<br>900: -4.15dB↵<br>1800: -3.18dB↵<br>1900: -5.19dBi ↵                                                                                                                 |
| FDD ↵<br>↵ | B1: -3.38dBi ↵<br>B2: -4.29 dBi ↵<br>B3: -3.78 dBi↵<br>B4: -3.52 dB ↵<br>B5: -5.19 dBi↵<br>B7: -4.15 dBi ↵<br>B8: -4.39 dBi ↵<br>B20: -4.92 ↵<br>B28A: -3.59 dBi ↵<br>B40: -4.39 dBi ↵ |

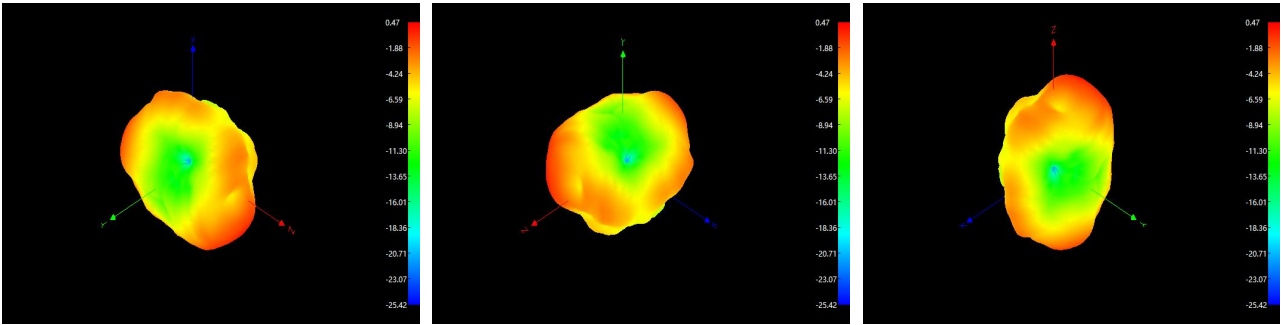
Radiation pattern



3D For 800MHz



3D For 2680MHz



**6. Ground handling**

Environmental treatment is not added, according to the customer's original environmental treatment.

**7. Mass production antenna Spec**

During Mass production, to test VSWR as production test standard

According to the difference of the project itself, the following specification:

| Frequency    | SPEC , Mass Production                              |
|--------------|-----------------------------------------------------|
| 700-960MHz   | VSWR (MP performance) <VSWR(Verify performance)+0.5 |
| 1710-2190MHz | VSWR (MP performance) <VSWR(Verify performance)+0.5 |

8. Structural drawings

