

# SHENZHEN TLT COMMUNICATION CO., LTD.

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# **MST-101L Antenna Specification Sheet**



| Customer               | Master          | Frequency band range | WLAN/BT            |  |
|------------------------|-----------------|----------------------|--------------------|--|
| Types of mobile phones | MST-101L        | Version              | The latest version |  |
| <b>Project Code</b>    | TLT5254         | approve              |                    |  |
| RF Designer            | Mao<br>Hangzhou | RD Designer          | Tang<br>Chunzheng  |  |
| Date                   | 2024.07.08      | Date                 | 2024.07.08         |  |

## 1. Antenna parameters

This report mainly provides the test conditions and results of various electrical and structural properties in the mobile phone test, and is designed by Skyway.

**Electrical parameters** 

#### 1.1.1 Electrical performance evaluation

The frequency band range of the antenna is 2400-2500MHz and 5000-6000MHz. This is an antenna designed and manufactured by Sunny Road.

#### 1.1.2 Matching circuit diagram

Use the original matching circuit diagram on the PCB board

- 1.2 Structural Parameters
- 1.2.1 Antenna Components

The antenna is generally composed of a plastic bracket and a piece of hardware.

### 1.2.2 Performance testing requirements

| Test items                         | description  | Acceptance criteria's  |
|------------------------------------|--|--|
| 1.Low temperature test             | Temperature: -20 °C<br>Time: 24 hours  | <ol> <li>There is no visible damage</li> <li>The electrical performance is up to standard</li> </ol> |
| 2. High temperature test           | Temperature: 80°C<br>Time: 24 hours  | <ol> <li>No visible damage</li> <li>The electrical performance is up to standard</li> </ol>          |
| 3. Salt spray test                 | 5±0.1% salt spray PH value: 6.5-7.2 Temperature: 35±1°C Time e: 24 hours   | <ol> <li>No color change</li> <li>There are no obvious cracks<br/>in the appearance</li> </ol>       |
| 4. Environmental adaptability test | Total value of Pb, Hg, Cr+6, Cd in packing materials are smaller than 50PPM Pb, Hg, Cr+6, PBBs, PBDEs in components are smaller than 50PPM, Cd is smaller than 50PPM |  |

## 2.Test

The antenna is installed in the mobile phone provided by the customer for testing. Figure 3 depicts the antenna being installed in a device (mobile phone).

**Electrical performance test** 

#### 2.1 VSWR Test

**Test the connection** 

Test the VSWR's Device Connection Sequence: AgilentE5062A Network Analyzer → test cable → the customer's mobile phone

#### **2.1.2 VSWR**

The following table depicts the values of the VSWR of the antenna at both ends of the band, and for the graphs of the return loss and VSWR, please refer to Figure 4

| 2400-2500 VSWR  |      |       |  |  |  |
|-----------------|------|-------|--|--|--|
| Frequency (MHz) | 2400 | 2500  |  |  |  |
| VSWR            | 2.2  | 1.3   |  |  |  |
| Return Loss     | -8.3 | -13.2 |  |  |  |

| 5000-6000 VSWR  |      |      |  |  |  |
|-----------------|------|------|--|--|--|
| Frequency (MHz) | 5000 | 6000 |  |  |  |
| VSWR            | 2.5  | 3.9  |  |  |  |
| Return Loss     | -7.2 | -4.5 |  |  |  |

#### 2.2.1 Test environment

Tian Lutong microwave anechoic chamber: The frequency range of the test is from 800MHz to 6GHz, and the reflection of the anechoic chamber from 800MHz-6GHz is less than -50dB in a spherical area with a diameter of 50cm.

### 2.2.2 Test equipment

Agilent 8960 ((5515C) Wireless Communication Test Set, Dipole Antenna, French Satimo Antenna Test System, Printer, etc.

### 3. Summary

The antenna is designed according to the mobile phone sample provided by the customer, and the electrical parameters and result performance of the antenna meet the standard, and we are confident that you will be satisfied.

## 3.1 Antenna Gain and Efficiency

| Frequency (MHz) | 2.40G | 2.45G | 2.50G | 5.15G | 5.50G | 5.85G |
|-----------------|-------|-------|-------|-------|-------|-------|
| Gain (dBi)      | 0.17  | -0.89 | -0.33 | 0.15  | -1.08 | -1.95 |
| Efficiency (%)  | 34.7  | 26.6  | 27.1  | 25.4  | 38.1  | 28.1  |

## 4.1 2D/3D Radiated Pattern

| Test<br>Point ID | Freq.<br>(MHz) | TRP<br>(dBm) | Gain<br>(dBi) | Efficienc<br>y (%) | Efficienc<br>y (dB) |  |  |          |
|------------------|----------------|--------------|---------------|--------------------|---------------------|--|--|----------|
|                  | 2400.0         | 2400.00      | 0.17          | 34.7%              | -4.60               |  |  |          |
| 1 2              | 2405.0         | 2405.00      | -0.90         | 26.5%              | -5.77               |  |  |          |
| 3                | 2410.0         | 2410.00      | -0.24         | 30.3%              | -5.19               |  |  |          |
| 4                | 2415.0         | 2415.00      | 0.23          | 34.0%              | -4.69               |  |  |          |
| 5                | 2420.0         | 2420.00      | -0.11         | 31.8%              | -4.98               |  |  |          |
| 6                | 2425.0         | 2425.00      | 0.05          | 33.3%              | -4.78               | Committee of the last of the l |  |          |
| Z                | 2430.0         | 2430.00      | 0.40          | 36.1%              | -4.42               |  |  |          |
| 8                | 2435.0         | 2435.00      | -0.14         | 31.5%              | -5.02               |  |  |          |
| 9                | 2440.0         | 2440.00      | -0.71         | 27.3%              | -5.64               |  |  |          |
| 10               | 2445.0         | 2445.00      | -0.71         | 27.7%              | -5.58               |  |  |          |
| 11               | 2450.0         | 2450.00      | -0.89         | 26.6%              | -5.75               |  |  | #2.60000 |
| 12               | 2455.0         | 2455.00      | 0.00          | 31.6%              | -5.00               | 2.4G   | 2.45G  | 2.8G     |
| 13               | 2460.0         | 2460.00      | 0.96          | 37,1%              | -4.31               |  |  |          |
| 14               | 2465.0         | 2465.00      | -0.73         | 25.2%              | -5.99               |  |  |          |
| 15               | 2470.0         | 2470.00      | -1.84         | 30.0%              | -5.23               | 1  | The state of the s |          |
| 16               | 2475.0         | 2475.00      | -0.82         | 35.2%              | -4.53               |  |  |          |
| 17               | 2480.0         | 2480.00      | 0.01          | 39.2%              | -4.07               |  |  |          |
| 18               | 2485.0         | 2485.00      | -0.65         | 34.3%              | -4.65               |  |  |          |
| 19               | 2490.0         | 2490.00      | -1.17         | 28.5%              | -5.45               |  |  |          |
| 20               | 2495.0         | 2495.00      | -0.75         | 28.2%              | -5.50               |  |  |          |
| 21               | 2500.0         | 2500.00      | -0.33         | 27.1%              | -5.67               |  | 1000   |          |
| 22               | 5150.0         | 5150.00      | 0.15          | 25.4%              | -5.95               |  |  |          |
| 23               | 5200.0         | 5200.00      | 1.23          | 27.3%              | -5.64               |  |  |          |
| 24               | 5250.0         | 5250.00      | -0.38         | 26.6%              | -5.75               |  |  |          |
| 25               | 5300.0         | 5300.00      | 2.36          | 32,3%              | -4.91               |  |  |          |
| 26               | 5350.0         | 5350.00      | 0.26          | 30.3%              | -5.19               |  |  |          |
| 27               | 5400.0         | 5400.00      | 2.38          | 36.0%              | -4.44               |  |  |          |
| 28               | 5450.0         | 5450.00      | 0.47          | 34.2%              | -4.66               |  |  |          |
| 29               | 5500.0         | 5500.00      | -1.08         | 38.1%              | -4.19               | 5.2G   | 5.5G   | 5.8G     |
| 30               | 5550.0         | 5550.00      | 1.84          | 38.6%              | -4.13               |  |  |          |
| 31               | 5600.0         | 5600.00      | 0.83          | 31,1%              | -5.07               |  |  |          |
| 32               | 5650.0         | 5650.00      | 1.28          | 28.7%              | -5.42               |  |  |          |
| 33               | 5700.0         | 5700.00      | -0.53         | 27.0%              | -5.69               |  |  |          |
| 34               | 5750.0         | 5750.00      | -0.02         | 26.4%              | -5.78               |  |  |          |
| 35               | 5800.0         | 5800.00      | 0.73          | 27.2%              | -5.65               |  |  |          |
| 36               | 5850.0         | 5850.00      | -1.95         | 28.1%              | -5.51               |  |  |          |

## 5. Antenna Dimension

