

Product Number: TLT5399-M17QF18-NAXA-WBG

Product Name: Mobile Phone Antenna

# 样品承认书

Sample acknowledgement

Document No. :TDV



<b>P/N</b>		
<b>Sample adaptor</b>		M17QF18-NAXA/WBG Antenna
<b>Sample description</b>		
<b>Development division</b>	<b>corpuscle</b>	
	<b>structure</b>	
<b>Development recognition</b>		
<b>Quality department</b>		
<b>Purchasing department</b>		
<b>remark</b>		
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Form number: QESP-023-F06C

Product Number: TLT5333-M17QF9P-WBG

Product Name: Mobile Phone Antenna

# 深圳天路通电子有限公司



## 天路通

**SHENZHEN TLT COMMUNICATION CO.,LTD.**

**M17QF9P- WBG Antenna FPC**



Customer	yanghua	Antenna type	WIFI/BT/GPS
category	M17QF18-NAXA	edition	Latest version
No.	TLT5399	ratify	
RF designer	mao hangzhou	RD designer	tang chunzheng
date	2024-4-12	date	2024-4-12

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1. Antenna parameter

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

Electrical parameter

1.1.1 Electrical performance evaluation

The frequency band range of the antenna is 2400MHz~2480MHz. This is an antenna designed and manufactured by Tiantong.

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 hardware sheet

1.2.2 Performance test requirement

Test item	Description	Acceptance criteries
1.Low temperature test	temperature:: -20 °C time: 24 hours	1. No obvious damage 2. Electrical performance up to standard
2. High temperature test	temperature:: 80°C time: 24 hours	1. No obvious damage 2. Electrical performance up to standard
3. Salt spray test	5±0.1% Salt spray PH : 6.5-7.2 temperature: 35±1°C Time :24 hours	1. No color change 2. No obvious cracks in appearance
4.Environmental adaptability test	Total value of Pb、Hg、Cr+6、Cd in packing materials is smaller thall 50PPM Pb、Hg、Cr+6、PBBs、PBDEs in components are smaller than 500PPM, 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) for electrical performance testing.

VSWR Test

Test connection

Device connection sequence for testing VSWR: AgilentE5062A Network analyzer → Test cable → Customer supplied mobile phone

2.1.2 VSWR

The table below describes the values of the voltage standing wave ratio of the antenna at both ends of the frequency band, in relation to the backloss and standing wave ratio

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	GPS	WIFI-2.4G		WIFI-5.0G	
Frequency (MHz)	1.575G	2.4G	2.48G	5.15G	5.85G
VSWR	1.65	1.69	1.82	1.71	1.68
Return Loss	-12.1	-11.2	-13.3	-11.9	-12.3

## 2.2 Gain and efficiency testing

Frequency (GHz)	1.575G	2.40G	2.48G	5.18G	5.85G
Gain (dBi)	2.15	1.96	2.07	2.11	2.05
Efficiency (%)	41.3	39.7	40.7	41.1	40.5

### 2.2.1 Test environment

**Tianlu Microwave darkroom:** The frequency range of the test is from 800MHz to 6GHz, and in the 50cm diameter spherical area, the darkroom reflects less than -50dB from 800MHz to 6GHz.

### 2.2.2 Testing Devices

Agilent 8960((5515C) wireless communication test device, dipole antenna, French Satimo antenna test system, printer, etc.

### 3. WiFi&GPS Graphs and test data

3.1 WIFI field test: Test environment: open environment, 15 meters away from our router, the test is as follows

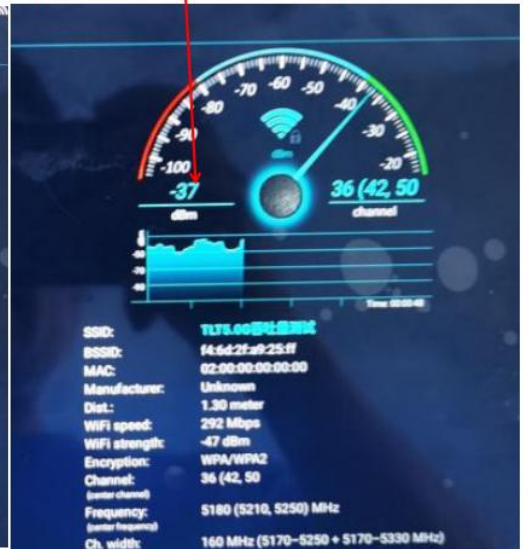
3.1 WIFI 场测：测试环境：空旷环境，距离我司路由器 15 米，测试如下：



2.4G-WIFI 显示-34DBm,信号满格

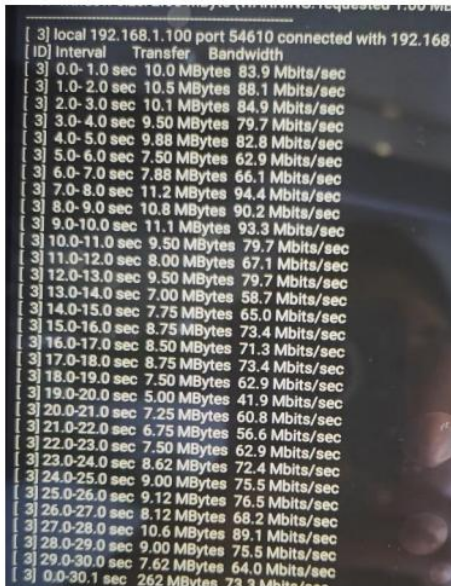


5G-WIFI 显示-37DBm,信号满格



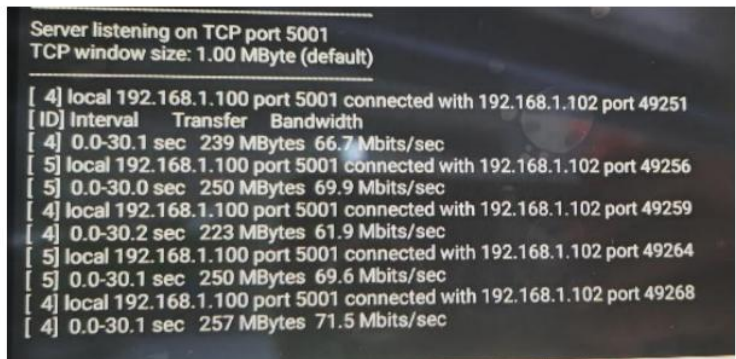
### 3.2 Throughput field measurement

#### 3.2 WIFI 吞吐量场测



2.4G 上传：73.3M

2.4G Up: 73.3M



2.4G 下载：69.6M

2.4G Down : 69.6M

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```
~ 192.168.1.102 -l 1 -w 1m -t 30
Client connecting to 192.168.1.102, TCP port 5001
TCP window size: 2.00 MByte (WARNING: requested 1.00 MByte)
[ 3] local 192.168.1.101 port 42390 connected with 192.168.1.102 port 5001
[ID] Interval Transfer Bandwidth
[ 3] 0.0-1.0 sec 32.9 MBytes 276 Mbits/sec
[ 3] 1.0-2.0 sec 32.6 MBytes 274 Mbits/sec
[ 3] 2.0-3.0 sec 34.4 MBytes 288 Mbits/sec
[ 3] 3.0-4.0 sec 34.6 MBytes 290 Mbits/sec
[ 3] 4.0-5.0 sec 33.4 MBytes 280 Mbits/sec
[ 3] 5.0-6.0 sec 34.0 MBytes 285 Mbits/sec
[ 3] 6.0-7.0 sec 34.4 MBytes 288 Mbits/sec
[ 3] 7.0-8.0 sec 35.9 MBytes 301 Mbits/sec
[ 3] 8.0-9.0 sec 34.0 MBytes 285 Mbits/sec
[ 3] 9.0-10.0 sec 34.4 MBytes 288 Mbits/sec
[ 3] 10.0-11.0 sec 34.4 MBytes 288 Mbits/sec
[ 3] 11.0-12.0 sec 34.6 MBytes 289 Mbits/sec
[ 3] 12.0-13.0 sec 34.6 MBytes 290 Mbits/sec
[ 3] 13.0-14.0 sec 34.2 MBytes 287 Mbits/sec
[ 3] 14.0-15.0 sec 34.1 MBytes 285 Mbits/sec
[ 3] 15.0-16.0 sec 34.2 MBytes 287 Mbits/sec
[ 3] 16.0-17.0 sec 34.1 MBytes 287 Mbits/sec
[ 3] 17.0-18.0 sec 34.2 MBytes 287 Mbits/sec
[ 3] 18.0-19.0 sec 33.1 MBytes 278 Mbits/sec
[ 3] 19.0-20.0 sec 34.0 MBytes 285 Mbits/sec
[ 3] 20.0-21.0 sec 33.6 MBytes 282 Mbits/sec
[ 3] 21.0-22.0 sec 33.4 MBytes 280 Mbits/sec
[ 3] 22.0-23.0 sec 33.9 MBytes 284 Mbits/sec
[ 3] 23.0-24.0 sec 34.2 MBytes 287 Mbits/sec
[ 3] 24.0-25.0 sec 33.5 MBytes 281 Mbits/sec
[ 3] 25.0-26.0 sec 32.9 MBytes 276 Mbits/sec
[ 3] 26.0-27.0 sec 34.1 MBytes 286 Mbits/sec
[ 3] 27.0-28.0 sec 33.8 MBytes 283 Mbits/sec
[ 3] 28.0-29.0 sec 33.4 MBytes 280 Mbits/sec
[ 3] 29.0-30.0 sec 32.9 MBytes 276 Mbits/sec
[ 3] 0.0-30.0 sec 1018 MBytes 285 Mbits/sec
```

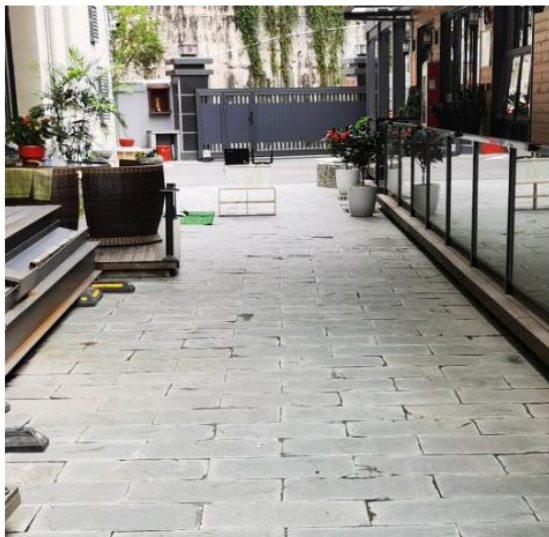
5G 上传: 285M  
5G Up :285M

```
Server listening on TCP port 5001
TCP window size: 1.00 MByte (default)
[ 4] local 192.168.1.101 port 5001 connected with 192.168.1.102 port 49195
[ID] Interval Transfer Bandwidth
[ 4] 0.0-30.0 sec 1.02 GBytes 292 Mbits/sec
[ 5] local 192.168.1.101 port 5001 connected with 192.168.1.102 port 49198
[ 5] 0.0-30.0 sec 1017 MBytes 284 Mbits/sec
[ 4] local 192.168.1.101 port 5001 connected with 192.168.1.102 port 49201
[ 4] 0.0-30.0 sec 1.02 GBytes 291 Mbits/sec
[ 5] local 192.168.1.101 port 5001 connected with 192.168.1.102 port 49206
[ 5] 0.0-30.0 sec 1020 MBytes 285 Mbits/sec
[ 4] local 192.168.1.101 port 5001 connected with 192.168.1.102 port 49209
[ 4] 0.0-30.0 sec 1.02 GBytes 291 Mbits/sec
[ 5] local 192.168.1.101 port 5001 connected with 192.168.1.102 port 49214
[ 5] 0.0-30.0 sec 1.01 GBytes 290 Mbits/sec
```

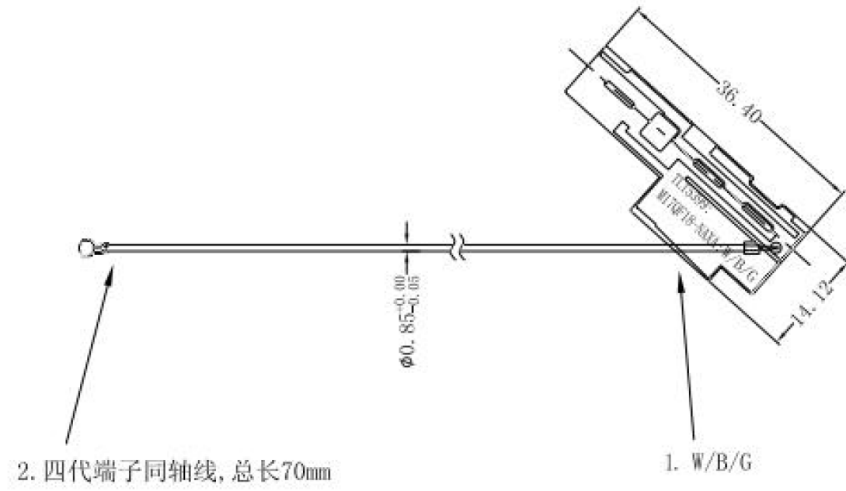
5G 下载: 290M  
5G Down: 290M

test environment: On the roof of the 13th floor of our company, the GPs test is as follows

测试环境: 在我司 13 楼楼顶, 用 GPS test 测试如下:



#### 4. Antenna 2D



2. Total length of four terminals coaxial line: 70mm