样品承认书

Sample acknowledgement

Document No.:TDV

P/N		
Sample adaptor		M17QF18-NAXA/WBG Antenna
Sample description		
Development division	**corpuscle**	
	structure	
Development recognition		
Quality department		
Purchasing department		
remark		
Manufacturer		SHENZHEN TLT COMMUNICATION CO.,LTD
Address		Building 1, Rooms 108-109, Shanhai Science and Innovation Park, Zhongyu Guan Avenue, Longhua New District, Shenzhen City, China

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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** ℃ time: **24 hours**	1. No obvious damage 2. Electrical performance up to standard
2. High temperature test	temperature:.: **80**℃ 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**℃ **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

	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.

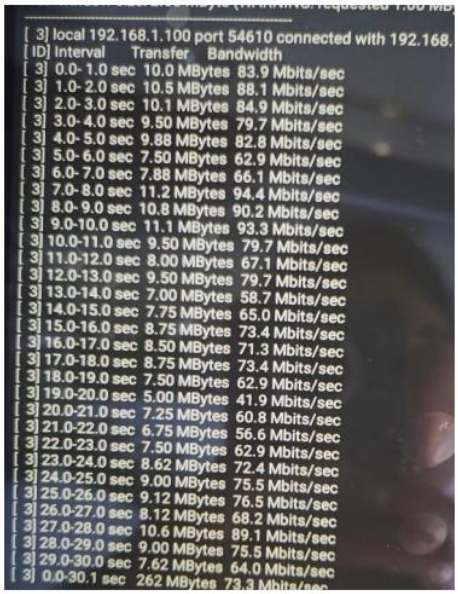
3. WiFi&GPS Graphs and test data

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：

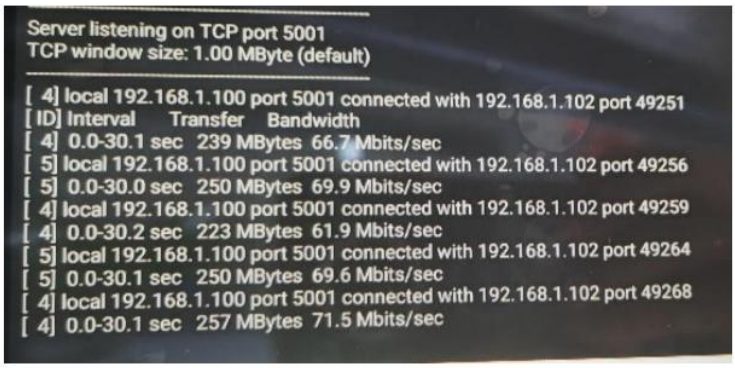
3.2Throughput field measurement

3.2 WIFI 吞吐量场测



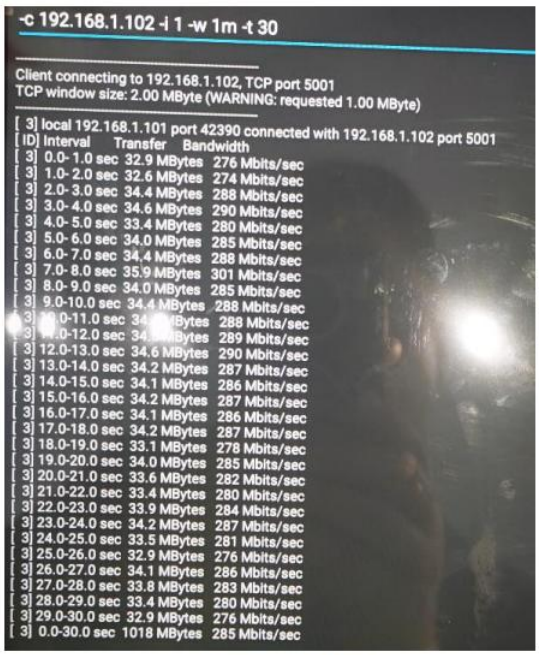
2.4G 上传：73.3M

2.4G Up： 73.3M



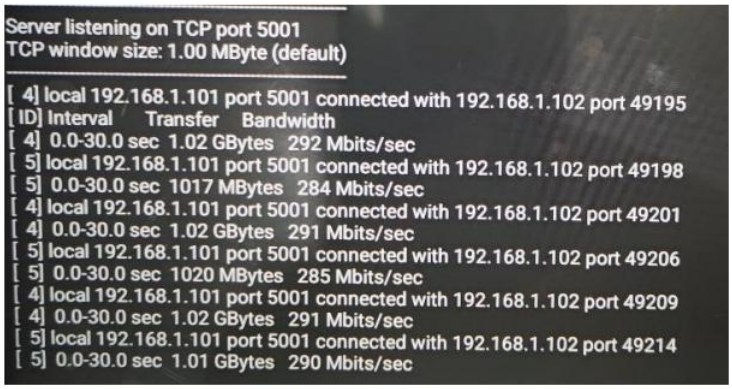
2.4G 下载：69.6M

2.4G Down： 69.6M



5G 上传：285M

5G Up :285M

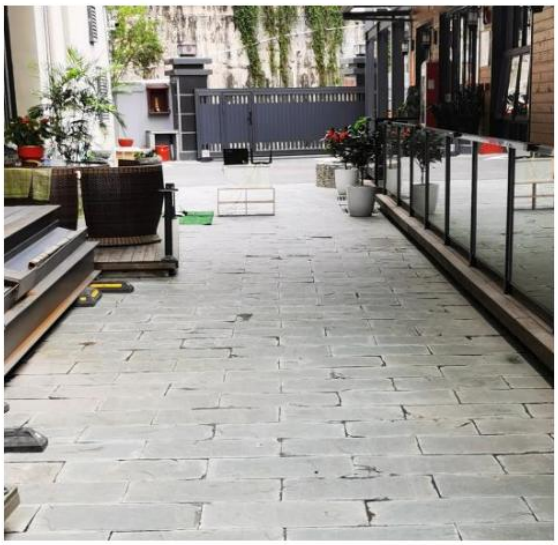


5G 下载：290M

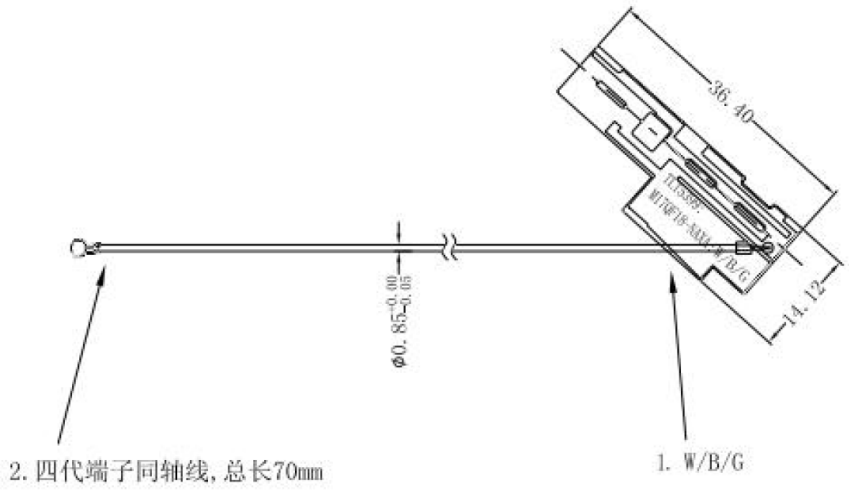
5G Down： 290M

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