SHENZHEN TLT COMMUNICATION CO.,LTD

Building 1, Rooms 108-109, Shanhai Science and Innovation Park, Zhongyu Guan Avenue, Longhua New District, Shenzhen City

M16QF7 antenna The Product Recognition Letter

The Customer	yanghua	Band range	2.4/5.8/GPS
Model	M16QF7	Version	Latest version
Project code name	TLT 5376	Approval	
RF Designer	Mao Hangzhou	RD Designer	Tang Chunzheng
Date of this	2024-4-10	Date of this	2024-4-10
Customer Information	on:		

Metric

1.Antenna parameters

- 1.1 Electrical parameters
 - 1.1.1 Electrical Performance Assessment
 - 1.1.2 distribution circuit diagram
- **1.2 Structural parameters**
- 1.2.1 antenna assembly
- **1.2.2** Performance test requirements

2.The test

- 2.1 The VSWR test
 - 2.1.1 test connection
 - 2.1.2 voltage standing to wave ratio
- 2.2 GAIN & EFFCIENCY
 - 2.2.1 test environment
 - 2.2.2 Test Equipment

3.Summary

4. Attachment diagram

4.1 Parameter diagram of return loss and voltage standing wave ratio

5.WIFI graphics and test data

- 5.1.1 WIFI field test
- 5.1.2 WIFI throughput test
- 5.2 Gain and efficiency tests

6.Antenna assembly and processing drawing file

7.Antenna 2D profile

1.Antenna parameters

This report mainly provides test conditions and results for various electrical and structural properties in devicetests, The antenna designed by TLT.

Electrical parameters

1.1.1 Electrical Performance Assessment

The band range of the antenna is 2400MHz-2500MHz and 5000MHz[~]5800MHz. below are the basic parameters of the electrical performance of the antenna. This is designed antenna and produced by Tian Lu Tong.

1.1.2 distribution circuit diagram

Use the original matching circuit diagram on the PCB board

1.2 Structural parameters

1.2.1 antenna assembly

Antennas generally consisted of plastic supports and hardware pieces.

1.2.2 can test the requirements

Test item	description	Acceptance criteri e s
1. crytemperature test	temperature:-20℃ Time: 24 hours	The 1. had no obvious damage The 2. electrical performance meets the standard
The 2. high-temperature test	temperature.: 80℃ Time: 24 hours	The 1. had no obvious damage The 2. electrical performance meets the standard
3. salt fog test 4. environmental adaptability test	5 ± 0.1% salt mist PH-value: 6.5-7.2 temperature: 35±1℃ Tim e: e:24 hours 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	1.No color was changed 2.There are no obvious cracks in the appearance

2.The test

Antenna are installed in a customer provided phone for testing. describes the antenna in mobile) for the equipment (electrical performance test).

2.1The VSWR test

2.1.1Test the connection

Test VSWR order of device connections: Agilent E8753 network analyzer \rightarrow test cable \rightarrow customer-provided machine

2.1.2 voltage standing to wave ratio

The table below describes the values of the voltage resident wave ratio of the antenna at the two endpoints of the frequency band, involving drawings about the return impairment and resident wave ratio, please refer .

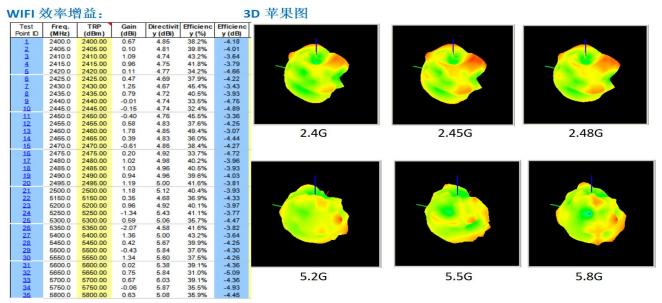
	GPS	WIF	I-2.4G	WIFI-	5.0G
Frequency (MHz)	1.575G	2.4G	2.48G	5.15G	5.85G
VSWR	1.71	1.69	1.82	1.70	1.68
Return Loss	-12.2	-11.2	-13.3	-11.9	-12.3

2.2 GAIN & EFFCIENCY

2.2.1 test environment

Skyway microwave dark chamber: The test frequency range from 800MHz to 6GHz, in a 50cm diameter spherical area, and the dark chamber is reflected less than-50 dB. from 800MHz—6GHz 2.2.2 Test the equipment

Agilent 8960 (8753C) Wireless Communication Test Device, Dipole antenna, French Sa t imo Antenna Test System, Printer, etc.



3. summary

The antenna is designed according to the machine samples provided by the customer, and the electrical parameters and result performance of the antenna meet the standard, and we are sure to make you satisfied.

4. Attachment diagram

4.1 Parameter diagram of return loss and voltage standing wave ratio

5. WIFI graphics and test data

5.1.1WIFI field test: Test environment: open environment, 15 meters away from our router. The test is as follows:



5.1.2 WIFI throughput test:

2.2WIFI	吞吐量测试
---------	-------

≡ Iperf2	1.11.11.1.1.1.1.1				ļ
Q -c 192.168.1.100-i 1 -w 1m-t 30		×	Ō	۲	TCP V4
19 JF-20 (L 940	ALUN MEYROS				31.6 MD 05/580
0.0-21.0 sec	4.12 MBytes				34.6 Mbits/sec
11.0-22.0 sec	4.50 MBytes				37.7 Mbits/pec
12.0-23.0 sec	3.88 MBytes				32.5 Mbits/sec
23.0-24.0 sec	3.75 Möytes				31.5 Mbita/sec
24.0-25.0 sec	3.75 MBytes				31.5 Mbits/sec
25.0-26.0 sec	3.58 MBytes				32.5 Mbits/sec
26.0-27.0 sec	4.62 MBytes				38.8 Minta/sec
27.0-28.0 sec	4.00 MBytes				33.6 Mbits/sec
29.0-29.0 680	4.50 MBytes				37.7 Mbits/sec
29.0-30.0 sec	4.62 Milyteni				38.8 Mbits/set
2.4G上传:	35.7M (20		14)		
2.4G 上传; ≡ 1perf2	35.7M (20		IA)		
	35.7M (20		(0	TCP V4
■ Iperf2 Q, -c 192.168.1.100-i1 -w 1m -t 30	35.7M (20				TCP V4
C, -c 192.168.1.100 -i 1 -w 1m -t 30	er u negez				TCP V4
■ tperf2 Q, -c 192.168.1.100 +11 -w 1m +130 INV 200 486 200.021.0 sec	ar o mojeci a r.a temper				TCP V4 a12 Mettaha 297 Mbetaha 288 Mbetaha
tperf2 Q - c192.168.1.100 + 1 -w 1m + 30 into you use 200 51 0 ase 219 22 0 see	av a mayna a' a mayna 35.4 MByres				TCP V4 312 MDR019 297 MbR0/96
tperf2 Q -c192.168.1.100 +1 -w 1m + 30 (10 - 20 - 10 - 10 - 10 - 10 - 10 - 10 -	avia mojeca a.r. a rempera 35.4 MEgens 34.4 MEgens				TCP V4 312 Million 297 Mb/ts/se 268 Mb/ts/se
tperf2 C	a) a respect 35.4 Kelyes 34.4 Meyes 37.2 Meyes				TCP V4 312 MBRS/80 297 MbRs/20 288 MbRs/20 312 MbRs/20 290 MbRs/20
tperf2 c 192.168.1.100-i1-w 1m-t 30 vis/ull asc 20.91.0 asc 20.93.0 asc 20.93.0 asc 20.93.0 asc 20.93.0 asc 20.93.0 asc	a/ a temper 35.4 MBytes 34.4 MBytes 37.2 MBytes 34.6 MBytes				TCP V4 ana werearies 297 Mb/ts/se 268 Mb/ts/se 312 Mb/ts/se
tperf2 cr 192.168.1.100.41 -w 1m + 30 via viau 20.041.0 we 20.041.0 we 20.041.0 we 20.041.0 we 20.040.0 we 20.040	aka moje a a/ a tenjeta 36.4 Miljetes 34.4 Miljetes 37.2 Miljetes 34.6 Miljetes 35.6 Miljetes				TCP Vd ana weekstw 297 Mbits/se 288 Mbits/se 312 Mbits/se 299 Mbits/se 303 Mbits/se
tperf2 Q, -c 192.168.1.100-i1-w 1m -130 00-01-0we 10-02-0we 20-02-0we 20-02-0we	27.2 Mayles 25.4 Milytes 24.4 Milytes 27.2 Milytes 26.6 Milytes 25.6 Milytes 26.1 Milytes				TCP V/ 312 MDRU19 297 MDR0/90 288 MDR0/90 312 MDR0/90 299 MDR0/90 299 MDR0/90 299 MDR0/90
tperf2 c. 192.168.1.100-i1 -w 1m -1.30 via / a / a / a / a / a / a / a / a / a /	Jacob Hocyasa Jafa A Milytea Jafa Milytea Jafa Milytea Jafa Milytea Jafa Milytea Jafa Milytea Jafa Milytea Jafa Milytea				TCP V4 a12 weeksive 297 MbR4/b0 208 MbR4/b0 312 MbR4/b0 299 MbR4/b0 299 MbR4/b0 299 MbR4/b0 299 MbR4/b0
≡ Iperf2	J. J. J. Norginal 35.4 Millyten 34.4 Millyten 37.2 Millyten 34.6 Millyten 35.6 Millyten 36.6 Millyten 36.6 Millyten 34.0 Millyten				TCP V4 and memory 297 Mb/ts/se 312 Mb/ts/se 312 Mb/ts/se 299 Mb/ts/se

5G上传: 293M

2.4G RX 35.7M(20M)

5G RX 293M

Q, -s		×	Ő i	<u>ф</u> т	CP V	e.	
0.0-30.2 sec	206 MBytes			:57	1 Mbitis/	WE .	
0.0-30.1 sec	207 MBytes			.67	6 Mbits/	560	
0.0-30.1 eec	206 MBytee			.67	4 Mpcts/	sec.	
0.0-30.2 sec	202 MBytes			56	2 Mbits/	sec	
0.0-30.2 sec	205 MBytes			57	U Mbits/	sec	
0.0-30.1 and	207 MSytes			57	5 MD/to/	365	
0.0-30,7 sec	209 NBytes			58	0 Mbits2	sec :	
10] Interval Transfer Bandwidtl 5[local 192.168.1.104 port 5001 o 4] local 192.168.1.104 port 5001 o		<mark>试</mark>)					
TCP window size: 3.30 MByte (defau [4] local 192.168.1.104 port 5001 o [ID] Interval Transfer Bandwidti [5] local 192.168.1.104 port 5001 o [4] local 192.168.1.104 port 5001 o	orenected with 192.168.1.100 port 49335 h orenected with 192.168.1.100 port 49339 orenected with 192.168.1.100 port 49343	<mark>试</mark>)					0
TCP window size: 3.30 MByte (dofau [4] local 192:168.1.104 port 5001 o [10] Internal Transfer Bandwith [5] local 192:168.1.104 port 5001 o [4] local 192:168.1.104 port 5001 o [4] local 192:168.1.104 port 5001 o	orenected with 192.168.1.100 port 49335 h orenected with 192.168.1.100 port 49339 orenected with 192.168.1.100 port 49343	<mark>试</mark>)	×	Ō	٢	тср	0
TCP viridov size: 3.30 M8/ste (defau 4) local 192:168.1.104 por 5001 o 1011 frema 1 more in sansware 15) local 192:168.1.104 por 5001 o 4) local 192:168.1.104 por 5001 o 4) local 192:168.1.104 por 5001 o 2.44G	orenected with 192.168.1.100 port 49335 h orenected with 192.168.1.100 port 49339 orenected with 192.168.1.100 port 49343	试)	×	Ō	۲	TCP	O V Abits
TCP window jbis: 3.30 M8yte (defaul 14) Tenero (1) 104 per 3001 (1) 14) Tenero (1) 104 per 3001 (1) 14) Tenero (1) 104 per 3001 (1) 15) Tener 192 (14) 1104 per 3001 (1) 15) Tener 192 (14) 1104 per 3001 (1) 16) Tener 192 (14) 1104 per 3001 (1) 16) Tener 192 (14) 1104 per 3001 (1) 17) Tenero (14) Tenero (14) (14) (14) (14) (14) (14) (14) (14)		试)	×	Ō	٢		Abits
TCP video via: 3.3 bittyle (BANA (Jacobi 12: 14: 1) (Jacobi 12: 1) (Jacobi 12: 1) (Jacobi 12: 14: 1) (Jacobi 12: 1) (Jacobi 12: 1) (Jacobi 12: 14: 1) (Jacobi 12: 1) (Jacobi 12: 1) (Jacobi 12: 1) (Jacobi 12: 1) (Jacobi 12: 1) (Jacobi 12: 1) (Jacobi 12: 1) (Jacobi 12: 1)		试)	×	Ō	٢	311 N	Abits, Abits,
TCP window ize: 3.30 Wines (68Ma) (4 Jacow 122: 641.31 Jacob 2015 001 c 1051 Jacob 2015 001 c 1051 Jacob 2015 101 Jacob 2010 101 2.44G ■ perf2 Q -s 0.0380 9 tec		试)	×	Ō	۲	311 h 314 h	Abits Abits Abits

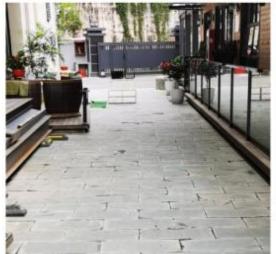
2.4G TX: 58M(20M)

nnected with 192.168.1.100 port 49372 nnected with 192.168.1.100 port 49376 nnected with 192.168.1.100 port 49380 nnected with 192.168.1.100 port 49385 5G \$\$2,168.1.100 port 49385 363,100 port 49385 363,100 port 49385 363,100 port 49385

5G TX 313M

cal 192.168.1.105 port 5001 con terval Transfer Bandwidth

GPS





6.Antenna assembly and processing drawing file



Product Number:TLT5376-M16QF7 Product Name:Mobile Phone Antenna

7. Antenna 2D profile

