

TIANLUTONG Antenna Test Report

Customer: 阳华
Project : M17T11
VERSIONS:

Testing Date: 2025-8-14

Shenzhen TIANLUTONG Technology Co., Ltd.

1. The Equipment of Active Test

1. ETS Chamber 7×4×3 (m)

2. 8960/8820C

3. Network analyzer-R&S ZVL



2. Antenna test data

2/3G	Channel	TRP	TIS		Channel	TRP	TIS
GSM900	975	24.61	-102	DCS1800	512	24.93	-102
	37	24.58	-102		698	24.63	-101
	124	23.16	-101		885	23.49	-101
GSM850	128	24.34	-102	PCS1900	512	24.13	-100
	190	24.41	-102		660	23.10	-101
	251	25.32	-102		810	23.19	-100
W850	4357	15.36	-103	W900	2937	16.43	-102
	4407	15.44	-103		3012	15.25	-102
	4458	15.94	-104		3088	15.77	-101
W1900	9662	16.41	-103				
	9800	16.87	-102				
	9938	17.19	-103				

4G	Channel	TRP	TIS		Channel	TRP	TIS
LTE-B3	19250	18.97	-93	LTE-B7	20800	20.50	-90
	19570	20.27	-92		21100	19.07	-89
	19900	20.36	-93		21400	19.72	-89
LTE-B4-AWS	153972	14.77	-88				
	156122	15.68	-88				
	158272	15.79	-89				

3.WIFI&GPS graphs and test data:

3.1: WIFI field test: Test environment: open environment, 15 meters away from our company's router, test as follows:



3.2: WIFI throughput test:

```
[ 3] 0.0-30.2 sec 121 MBytes 33.7 Mbits/sec
~/data/user/0/com.nextdoordeveloper.miperf.miperf/files/iperf: ig
Client connecting to 192.168.1.2, TCP port 5001
TCP window size: 2.00 MByte (WARNING: requested 1.00 MByte)
[ 3] local 192.168.1.3 port 48712 connected with 192.168.1.2 po
[ID] Interval Transfer Bandwidth
[ 3] 0.0- 1.0 sec 4.88 MBytes 40.9 Mbits/sec
[ 3] 1.0- 2.0 sec 4.12 MBytes 34.6 Mbits/sec
[ 3] 2.0- 3.0 sec 3.62 MBytes 30.4 Mbits/sec
[ 3] 3.0- 4.0 sec 4.12 MBytes 34.6 Mbits/sec
[ 3] 4.0- 5.0 sec 3.50 MBytes 29.4 Mbits/sec
[ 3] 5.0- 6.0 sec 4.75 MBytes 39.8 Mbits/sec
[ 3] 6.0- 7.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 7.0- 8.0 sec 4.88 MBytes 40.9 Mbits/sec
[ 3] 8.0- 9.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 9.0-10.0 sec 4.12 MBytes 34.6 Mbits/sec
[ 3] 10.0-11.0 sec 2.88 MBytes 24.1 Mbits/sec
[ 3] 11.0-12.0 sec 4.88 MBytes 40.9 Mbits/sec
[ 3] 12.0-13.0 sec 3.50 MBytes 29.4 Mbits/sec
[ 3] 13.0-14.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 14.0-15.0 sec 5.00 MBytes 41.9 Mbits/sec
[ 3] 15.0-16.0 sec 3.62 MBytes 30.4 Mbits/sec
[ 3] 16.0-17.0 sec 3.38 MBytes 28.3 Mbits/sec
[ 3] 17.0-18.0 sec 3.38 MBytes 28.3 Mbits/sec
[ 3] 18.0-19.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 19.0-20.0 sec 4.88 MBytes 40.9 Mbits/sec
[ 3] 20.0-21.0 sec 4.38 MBytes 36.7 Mbits/sec
[ 3] 21.0-22.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 22.0-23.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 23.0-24.0 sec 3.62 MBytes 30.4 Mbits/sec
[ 3] 24.0-25.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 25.0-26.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 26.0-27.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 27.0-28.0 sec 5.00 MBytes 41.9 Mbits/sec
[ 3] 28.0-29.0 sec 2.88 MBytes 24.1 Mbits/sec
[ 3] 29.0-30.0 sec 4.25 MBytes 35.7 Mbits/sec
[ 3] 0.0-30.1 sec 124 MBytes 34.6 Mbits/sec
```

2.4G TX:34.6M

```
Server listening on TCP port 5001
TCP window size: 1.00 MByte (default)
[ 4] local 192.168.1.2 port 5001 connected with 192.168.1.3 port 49232
[ID] Interval Transfer Bandwidth
[ 4] 0.0-30.2 sec 168 MBytes 46.8 Mbits/sec
[ 5] local 192.168.1.2 port 5001 connected with 192.168.1.3 port 49237
[ 5] 0.0-30.2 sec 165 MBytes 45.8 Mbits/sec
[ 4] local 192.168.1.2 port 5001 connected with 192.168.1.3 port 49241
[ 4] 0.0-30.2 sec 165 MBytes 45.9 Mbits/sec
[ 5] local 192.168.1.2 port 5001 connected with 192.168.1.3 port 49245
[ 5] 0.0-30.3 sec 168 MBytes 46.6 Mbits/sec
[ 4] local 192.168.1.2 port 5001 connected with 192.168.1.3 port 49250
[ 4] 0.0-30.2 sec 168 MBytes 46.5 Mbits/sec
[ 5] local 192.168.1.2 port 5001 connected with 192.168.1.3 port 49254
[ 5] 0.0-30.2 sec 167 MBytes 46.4 Mbits/sec
```

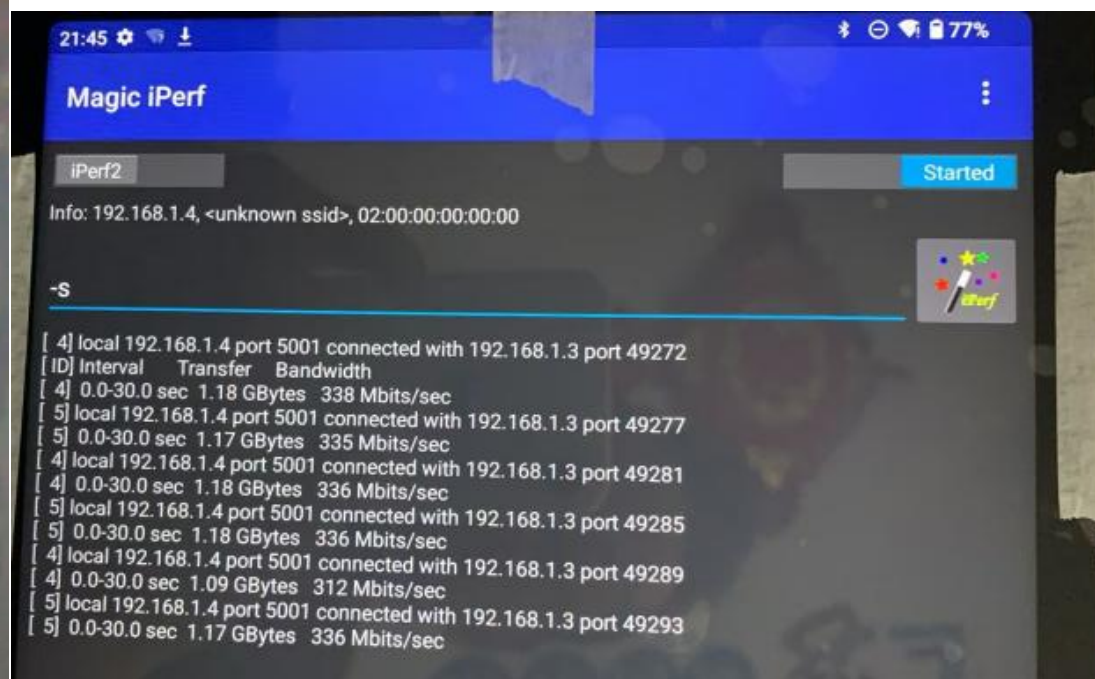
2.4G RX:46.4M

```

/data/user/0/com.nextdoordeveloper.miperf.miperf/files/ipperf: ignoring e
Client connecting to 192.168.1.3, TCP port 5001
TCP window size: 2.00 MByte (WARNING: requested 1.00 MByte)

[ 3] local 192.168.1.4 port 44108 connected with 192.168.1.3 port 5001
[ID] Interval  Transfer  Bandwidth
[ 3] 0.0- 1.0 sec 30.4 MBytes 255 Mb/s/sec
[ 3] 1.0- 2.0 sec 31.1 MBytes 261 Mb/s/sec
[ 3] 2.0- 3.0 sec 30.0 MBytes 252 Mb/s/sec
[ 3] 3.0- 4.0 sec 30.5 MBytes 256 Mb/s/sec
[ 3] 4.0- 5.0 sec 31.2 MBytes 262 Mb/s/sec
[ 3] 5.0- 6.0 sec 30.8 MBytes 258 Mb/s/sec
[ 3] 6.0- 7.0 sec 30.4 MBytes 255 Mb/s/sec
[ 3] 7.0- 8.0 sec 30.0 MBytes 252 Mb/s/sec
[ 3] 8.0- 9.0 sec 30.1 MBytes 253 Mb/s/sec
[ 3] 9.0-10.0 sec 32.4 MBytes 272 Mb/s/sec
[ 3] 10.0-11.0 sec 31.5 MBytes 264 Mb/s/sec
[ 3] 11.0-12.0 sec 30.9 MBytes 259 Mb/s/sec
[ 3] 12.0-13.0 sec 30.8 MBytes 258 Mb/s/sec
[ 3] 13.0-14.0 sec 30.6 MBytes 257 Mb/s/sec
[ 3] 14.0-15.0 sec 30.5 MBytes 256 Mb/s/sec
[ 3] 15.0-16.0 sec 31.0 MBytes 260 Mb/s/sec
[ 3] 16.0-17.0 sec 30.9 MBytes 259 Mb/s/sec
[ 3] 17.0-18.0 sec 29.9 MBytes 251 Mb/s/sec
[ 3] 18.0-19.0 sec 30.1 MBytes 253 Mb/s/sec
[ 3] 19.0-20.0 sec 30.4 MBytes 255 Mb/s/sec
[ 3] 20.0-21.0 sec 31.4 MBytes 263 Mb/s/sec
[ 3] 21.0-22.0 sec 31.6 MBytes 265 Mb/s/sec
[ 3] 22.0-23.0 sec 30.9 MBytes 259 Mb/s/sec
[ 3] 23.0-24.0 sec 30.8 MBytes 258 Mb/s/sec
[ 3] 24.0-25.0 sec 29.1 MBytes 244 Mb/s/sec
[ 3] 25.0-26.0 sec 31.0 MBytes 260 Mb/s/sec
[ 3] 26.0-27.0 sec 31.0 MBytes 260 Mb/s/sec
[ 3] 27.0-28.0 sec 29.1 MBytes 244 Mb/s/sec
[ 3] 28.0-29.0 sec 30.8 MBytes 258 Mb/s/sec
[ 3] 29.0-30.0 sec 31.5 MBytes 264 Mb/s/sec
[ 3] 0.0-30.0 sec 921 MBytes 257 Mb/s/sec
    
```

5G TX:257M



```

21:45 77%
Magic iPerf
iPerf2 Started
Info: 192.168.1.4, <unknown ssid>, 02:00:00:00:00:00
-S
[ 4] local 192.168.1.4 port 5001 connected with 192.168.1.3 port 49272
[ID] Interval  Transfer  Bandwidth
[ 4] 0.0-30.0 sec 1.18 GBytes 338 Mb/s/sec
[ 5] local 192.168.1.4 port 5001 connected with 192.168.1.3 port 49277
[ 5] 0.0-30.0 sec 1.17 GBytes 335 Mb/s/sec
[ 4] local 192.168.1.4 port 5001 connected with 192.168.1.3 port 49281
[ 4] 0.0-30.0 sec 1.18 GBytes 336 Mb/s/sec
[ 5] local 192.168.1.4 port 5001 connected with 192.168.1.3 port 49285
[ 5] 0.0-30.0 sec 1.18 GBytes 336 Mb/s/sec
[ 4] local 192.168.1.4 port 5001 connected with 192.168.1.3 port 49289
[ 4] 0.0-30.0 sec 1.09 GBytes 312 Mb/s/sec
[ 5] local 192.168.1.4 port 5001 connected with 192.168.1.3 port 49293
[ 5] 0.0-30.0 sec 1.17 GBytes 336 Mb/s/sec
    
```

5G RX:336M

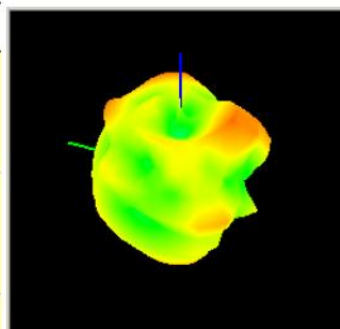
3.3: WIFI OTA test data

WIFI 2.4G RF Testing		11B(11Mbps)		
Channel		TCH 1	TCH 6	TCH 11
Frequency(Mhz)		2412	2437	2462
	TRP(dBm)	11. 89	12.77	12.97
	TIS(dBm)	-74	-73	-73

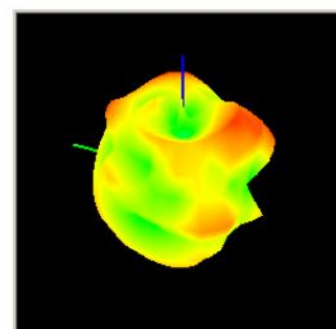
WIFI 5G RF Testing		11A(6Mbps)		
Channel		TCH 36	TCH 100	TCH 157
Frequency(Mhz)		5180	5500	5785
	TRP(dBm)	10. 25	11.78	11.97
	TIS(dBm)	-82	-82	-83

3.4: WIFI efficiency and gain

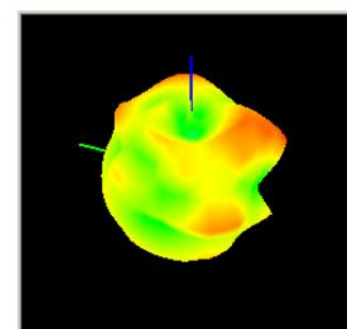
Test Point ID	Freq. (MHz)	TRP (dBm)	Gain (dBi)	Directivity (dBi)	Efficiency (%)	Efficiency (dB)
1	2400.0	2400.00	0.67	4.85	38.2%	-4.18
2	2405.0	2405.00	0.10	4.81	39.8%	-4.01
3	2410.0	2410.00	1.09	4.74	43.2%	-3.64
4	2415.0	2415.00	0.96	4.75	41.8%	-3.79
5	2420.0	2420.00	0.11	4.77	34.2%	-4.66
6	2425.0	2425.00	0.47	4.69	37.9%	-4.22
7	2430.0	2430.00	1.25	4.67	45.4%	-3.43
8	2435.0	2435.00	0.79	4.72	40.5%	-3.93
9	2440.0	2440.00	-0.01	4.74	33.5%	-4.75
10	2445.0	2445.00	-0.15	4.74	32.4%	-4.89
11	2450.0	2450.00	-0.40	4.76	45.5%	-3.36
12	2455.0	2455.00	0.58	4.83	37.6%	-4.25
13	2460.0	2460.00	1.78	4.85	49.4%	-3.07
14	2465.0	2465.00	0.39	4.83	36.0%	-4.44
15	2470.0	2470.00	-0.61	4.86	38.4%	-4.27
16	2475.0	2475.00	0.20	4.92	33.7%	-4.72
17	2480.0	2480.00	1.02	4.98	40.2%	-3.96
18	2485.0	2485.00	1.03	4.96	40.5%	-3.93
19	2490.0	2490.00	0.94	4.96	39.6%	-4.03
20	2495.0	2495.00	1.19	5.00	41.6%	-3.81
21	2500.0	2500.00	1.18	5.12	40.4%	-3.93
22	5150.0	5150.00	0.35	4.68	36.9%	-4.33
23	5200.0	5200.00	0.96	4.92	40.1%	-3.97
24	5250.0	5250.00	-1.34	5.43	41.1%	-3.77
25	5300.0	5300.00	0.59	5.06	35.7%	-4.47
26	5350.0	5350.00	-2.07	4.58	41.6%	-3.82
27	5400.0	5400.00	1.36	5.00	43.2%	-3.64
28	5450.0	5450.00	0.42	5.67	39.9%	-4.25
29	5500.0	5500.00	-0.43	5.84	37.6%	-4.30
30	5550.0	5550.00	1.34	5.60	37.5%	-4.26
31	5600.0	5600.00	0.02	5.38	39.1%	-4.36
32	5650.0	5650.00	0.75	5.84	31.0%	-5.09
33	5700.0	5700.00	0.67	6.03	39.1%	-4.36
34	5750.0	5750.00	-0.06	5.87	35.5%	-4.93
35	5800.0	5800.00	0.63	5.08	35.9%	-4.45



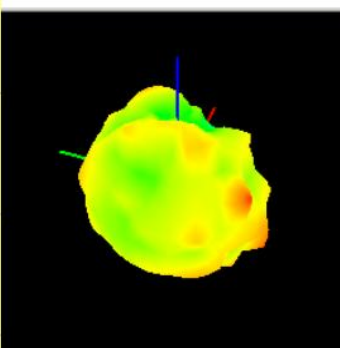
2.4G



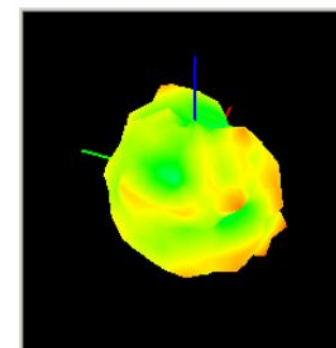
2.45G



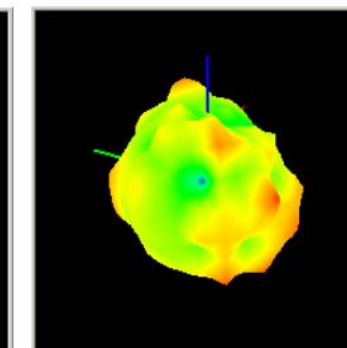
2.48G



5.2G



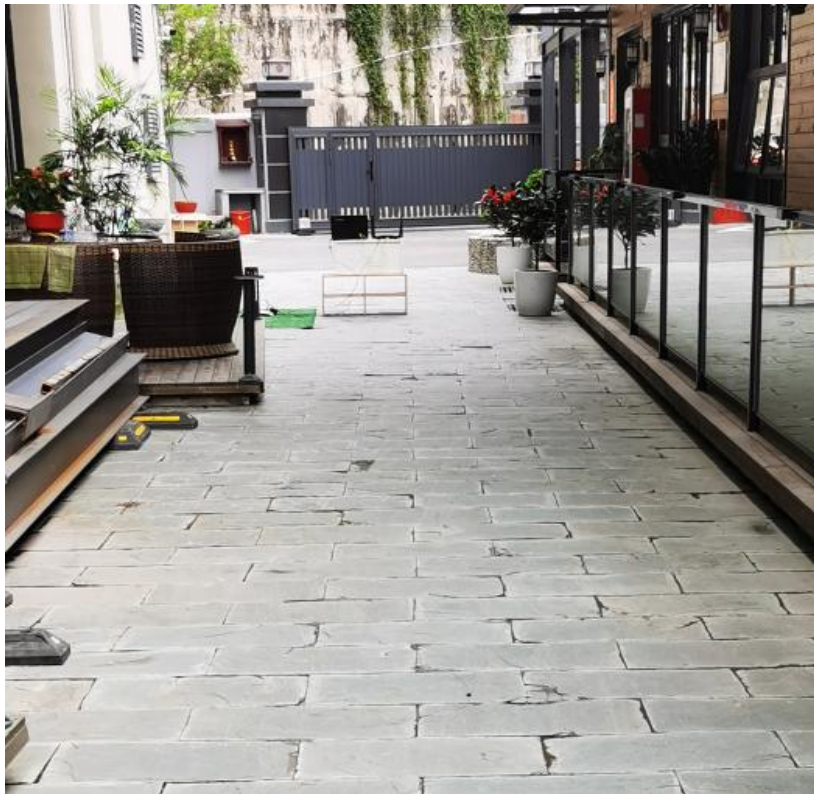
5.5G



5.8G

3.5: GPS field test:

Test environment: on the first floor of our industrial park, use GPS test to test as follows:



4. Antenna assembly and processing drawing documents:

