

SHENZHEN TLT COMMUNICATION CO.,LTD

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M17QF27A antenna
The Product Recognition Letter

The Customer	yanghua	Band range	2/3/4G
Model	M17QF27A	Version	Latest version
Project code name	TLT 5424	Antenna type	PIFA
RF Designer	Mao Hangzhou	RD Designer	Tang Chunzheng
Date of this	2025-7-9	Date of this	2025-7-9
Customer Information:			

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 Voltage standing wave ratio test

2.1.1 test connection

2.1.2 voltage standing to wave ratio

2.2 Gain and power tests

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

5.2/3/4G antenna test data:

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,An antenna designed by TLT.

Electrical parameters

1.1.1 Electrical Performance Assessment

The band range of the antenna is 824MHz~960MHz and 1710MHz~2600MHz. below are the basic parameters of the electrical performance of the antenna.

900M Frequency Range						
Frequency Range	Frequency (MHz)	VSWR	Gain (dBi)	Frequency (MHz)	VSWR	Gain (dBi)
	TX		Free Space	RX		Free Space
	880	≤3	≥0dBi±0.5dBi	960	≤3	≥0dBi±0.5dBi

1800M Frequency Range						
Frequency Range	Frequency (MHz)	VSWR	Gain (dBi)	Frequency (MHz)	VSWR	Gain(dBi)
	TX		Free Space	RX		Free Space
	1710	≤3	≥-2.5dBi±0.5dBi	1850	≤3	≥-2.5dBi±0.5dBi

850M Frequency Range						
Frequency Range	Frequency (MHz)	VSWR	Gain (dBi)	Frequency (MHz)	VSWR	Gain (dBi)
	TX		Free Space	RX		Free Space
	824	≤3	≥≥0dBi±0.5dBi	894	≤3	≥≥0dBi±0.5dBi

1900M Frequency Range						
Frequency Range	Frequency (MHz)	VSWR	Gain (dBi)	Frequency (MHz)	VSWR	Gain(dBi)
	TX		Free Space	RX		Free Space
	1850	≤3	≥-2.5dBi±0.5dBi	1990	≤3	≥-2.5dBi±0.5dBi

2100M Frequency Range						
Frequency Range	Frequency (MHz)	VSWR	Gain (dBi)	Frequency (MHz)	VSWR	Gain (dBi)
	TX		Free Space	RX		Free Space
	1920	≤3	≥0dBi ±0.5dBi	2170	≤3	≥0dBi± 0.5dBi

2600M Frequency Range						
Frequency Range	Frequency (MHz)	VSWR	Gain (dBi)	Frequency (MHz)	VSWR	Gain(dBi)
	TX		Free Space	RX		Free Space
	2500	≤3	≥-2.5dBi ±0.5dBi	2690	≤3	≥-2.5dBi± 0.5dBi

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 FPC and coaxial line.

1.2.2 can test the requirements

Test item	description	Acceptance criteria
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	5 ± 0.1% salt mist PH-value: 6.5-7.2 temperature: 35±1℃ Time: 24 hours	1.No color was changed 2.There are no obvious cracks in the appearance
4. environmental adaptability test	Total value of Pb, Hg, Cr+6, Cd in packing materials is smaller than 50PPM Pb, Hg, Cr+6, PBBs, PBDEs in components are smaller than 500PPM, Cd is smaller than 50PPM	

2.The test

Antenna are installed in a customer provided phone for testing. Antenna installation in the terminal for electrical performance testing

2.1The VSWR test

Test the connection

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

2.1.2 VSWR

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	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

GAIN TO EFFCIENCY

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

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

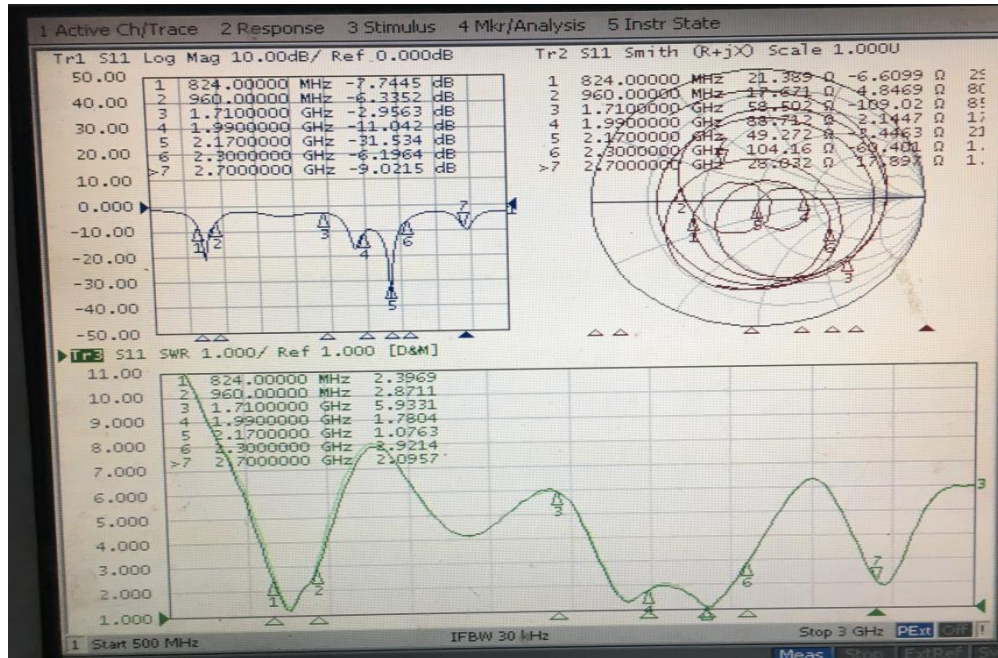
Agilent 8960 ((5515C) Wireless Communication Test Device, Dipole antenna, French Sa t imo Antenna Test System, Printer, etc.

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



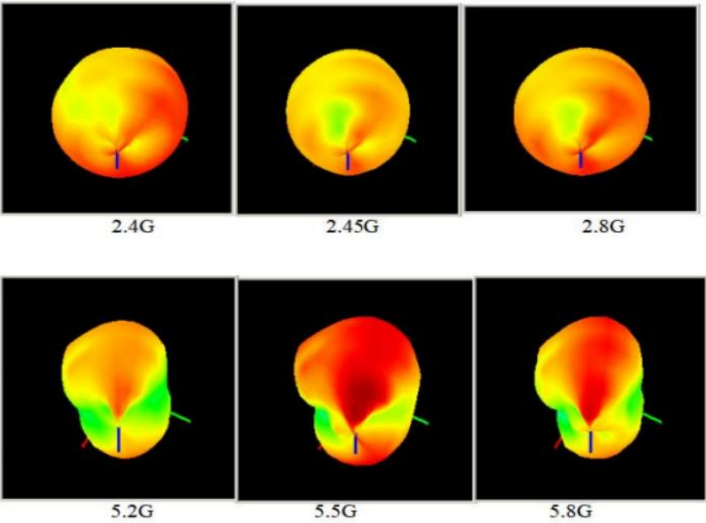
4.1

4G Gain and efficiency

Test Point ID	Freq. (MHz)	TRP (dBm)	Gain (dBi)	Directivity y (dBi)	Efficiency y (%)	Test Point ID	Freq. (MHz)	TRP (dBm)	Gain (dBi)	Directivity y (dBi)	Efficiency y (%)	Test Point ID	Freq. (MHz)	TRP (dBm)	Gain (dBi)	Directivity y (dBi)	Efficiency y (%)
1	700.0	700.00	-12.01	4.14	2.4%	32	1700.0	1700.00	-0.90	4.80	26.9%	59	2240.0	2240.00	1.86	4.66	52.5%
2	710.0	710.00	-11.69	4.25	2.5%	33	1720.0	1720.00	-1.25	4.96	23.9%	60	2260.0	2260.00	0.23	4.79	35.0%
3	720.0	720.00	-11.35	4.37	2.7%	34	1740.0	1740.00	-0.75	5.04	26.4%	61	2280.0	2280.00	-0.76	4.96	26.8%
4	730.0	730.00	-11.49	4.33	2.6%	35	1760.0	1760.00	-1.03	5.02	24.8%	62	2300.0	2300.00	-1.06	4.88	25.5%
5	740.0	740.00	-10.81	4.23	3.1%	36	1780.0	1780.00	0.40	5.13	33.7%	63	2320.0	2320.00	-1.55	4.61	24.2%
6	750.0	750.00	-11.48	4.08	2.8%	37	1800.0	1800.00	0.65	5.06	36.2%	64	2340.0	2340.00	0.13	4.59	35.8%
7	760.0	760.00	-10.81	3.90	3.4%	38	1820.0	1820.00	1.24	5.01	50.5%	65	2360.0	2360.00	0.24	4.56	37.0%
8	770.0	770.00	-10.13	3.54	4.3%	39	1840.0	1840.00	1.24	4.90	43.0%	66	2380.0	2380.00	1.65	4.32	54.1%
9	780.0	780.00	-10.29	3.83	3.9%	40	1860.0	1860.00	1.18	4.83	43.2%	67	2400.0	2400.00	0.02	4.09	39.2%
10	790.0	790.00	-6.61	4.17	8.4%	41	1880.0	1880.00	1.50	4.80	46.8%	68	2420.0	2420.00	-1.86	4.21	24.7%
11	800.0	800.00	-7.90	4.33	6.0%	42	1900.0	1900.00	2.08	4.91	52.1%	69	2440.0	2440.00	-4.21	4.31	14.0%
12	810.0	810.00	-4.80	4.26	12.4%	43	1920.0	1920.00	1.71	4.94	47.5%	70	2460.0	2460.00	-3.82	4.54	14.6%
13	820.0	820.00	-3.92	4.01	16.1%	44	1940.0	1940.00	1.14	5.04	40.8%	71	2480.0	2480.00	-3.62	4.76	14.5%
14	830.0	830.00	-3.80	3.91	17.0%	45	1960.0	1960.00	0.38	5.13	33.5%	72	2500.0	2500.00	-1.79	4.59	23.0%
15	840.0	840.00	-2.09	3.83	25.6%	46	1980.0	1980.00	-0.81	5.11	25.6%	73	2520.0	2520.00	-1.09	4.40	28.2%
16	850.0	850.00	-2.13	3.80	25.5%	47	2000.0	2000.00	-0.16	5.06	30.1%	74	2540.0	2540.00	-1.27	4.26	28.0%
17	860.0	860.00	-0.96	3.78	33.6%	48	2020.0	2020.00	1.15	5.05	40.7%	75	2560.0	2560.00	-2.39	4.15	22.2%
18	870.0	870.00	-0.68	4.05	33.7%	49	2040.0	2040.00	1.87	4.99	48.7%	76	2580.0	2580.00	-3.80	4.16	16.0%
19	880.0	880.00	-1.59	4.17	26.5%	50	2060.0	2060.00	2.14	4.83	53.8%	77	2600.0	2600.00	-5.31	4.07	11.5%
20	890.0	890.00	-0.82	4.05	32.6%	51	2080.0	2080.00	1.03	4.84	41.7%	78	2620.0	2620.00	-4.21	4.19	14.4%
21	900.0	900.00	-0.55	3.98	35.3%	52	2100.0	2100.00	1.02	4.81	41.8%	79	2640.0	2640.00	-3.55	4.46	15.8%
22	910.0	910.00	-1.33	4.19	28.1%	53	2120.0	2120.00	-0.42	4.77	30.3%	80	2660.0	2660.00	-1.01	4.37	28.9%
23	920.0	920.00	-1.55	4.28	26.2%	54	2140.0	2140.00	-1.48	4.68	24.2%	81	2680.0	2680.00	-0.83	4.19	31.5%
24	930.0	930.00	-1.86	4.36	23.9%	55	2160.0	2160.00	-1.13	4.68	26.2%	82	2700.0	2700.00	-1.57	4.06	27.4%
25	940.0	940.00	-1.06	5.17	23.8%	56	2180.0	2180.00	0.77	4.61	41.2%						
26	950.0	950.00	-1.25	5.33	22.0%	57	2200.0	2200.00	0.85	4.31	45.0%						
27	960.0	960.00	-2.36	5.38	16.8%	58	2220.0	2220.00	1.83	4.39	55.4%						

Wifi Gain and efficiency

Test Point ID	Freq. (MHz)	TRP (dBm)	Gain (dB)	Efficiency (%)	Efficiency (dB)
1	2400.0	2400.00	0.17	34.7%	-4.60
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
7	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
12	2455.0	2455.00	0.00	31.6%	-5.00
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
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
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
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



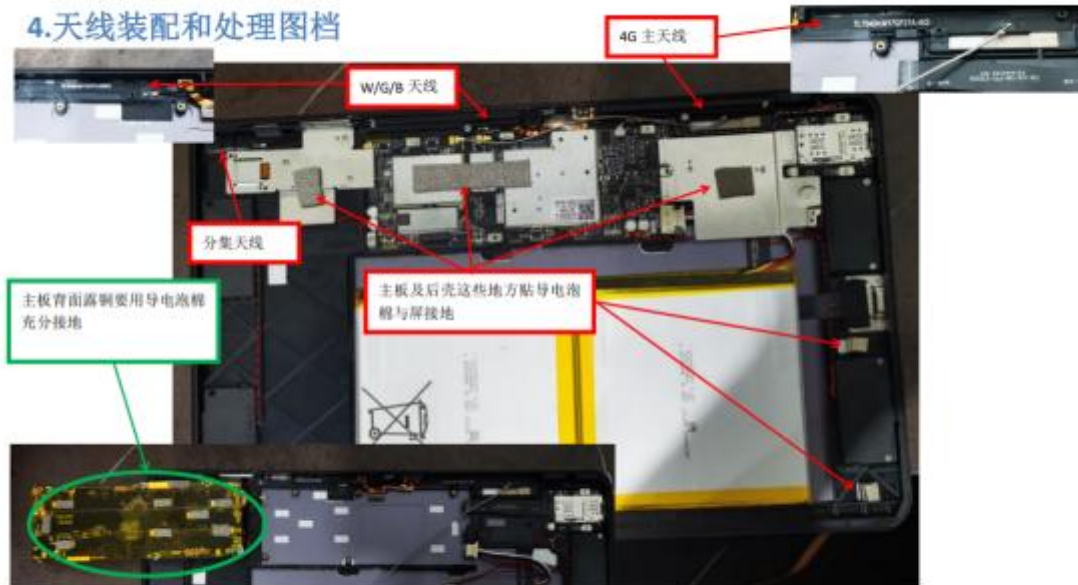
5. 2/3/4G antenna test data:

5.1 Antenna OTA data

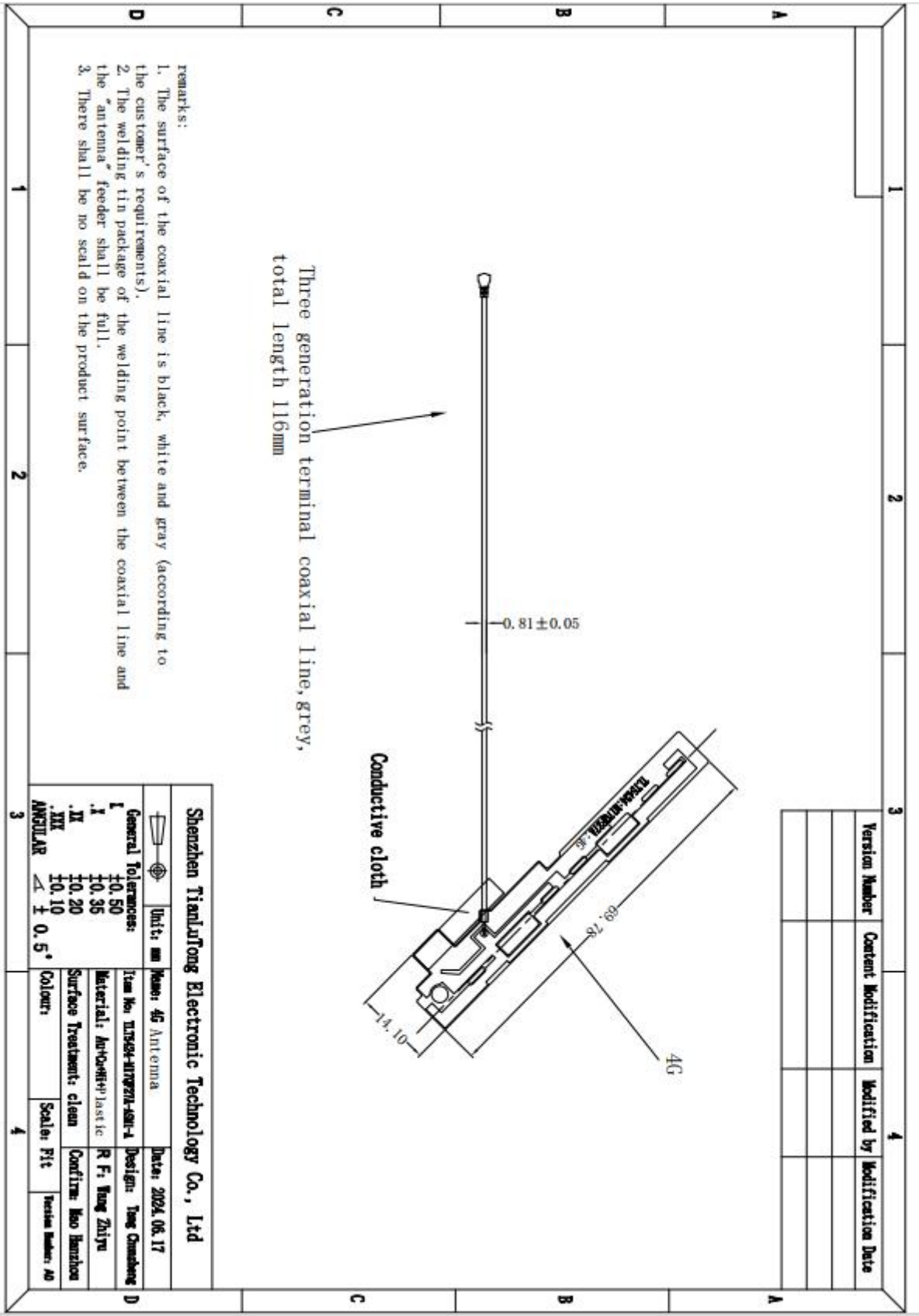
2G 频段	信道	TRP	TIS	频段	信道	TRP	TIS
GSM850	128	23.2	-101	GSM1900	512	22.1	-100
	190	22.7	-100		660	22.8	-101
	251	21.9	-99		810	23.2	-101
W850	4357	15.4	-101	W1900	9662	14.6	-103
	4407	14.2	-100		9800	14.7	-104
	4458	13.7	-99		9938	15.0	-103

4G 频段	信道	TRP	TIS	频段	信道	TRP	TIS
LTE-B2	18650	16.0	-87	LTE-B4	20000	14.3	-87
	18900	15.4	-88		20175	14.3	-90
	19150	15.0	-89		20350	15.6	89
LTE-B5	20450	15.2	-87	LTE-B7	20800	17.6	-87
	20525	14.5	-86		21100	16.7	-86
	20600	13.4	-86		21400	17.7	-86
LTE-B12	23260	14.5	-92	LTE-B13	23180	19.3	-92
	23095	15.8	-93		23230	18.4	-93
	23130	15.8	-93		23279	19.3	-92
LTE-B17	23730	14.8	-92	LTE-B66	132022	15.4	-89
	23790	15.9	-93		132322	15.5	-90
	23849	15.7	-93		132622	16.8	-90
LTE-B40	38750	14.6	-87	LTE-B41	40340	17.1	-87
	39150	14.1	-88		40620	16.3	-87
	39550	14.3	-87		41140	15.2	-86

6.Antenna assembly and processing drawing file



7. Antenna 2D profile



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