

Antenna specification

Antenna Sample Confirmation From

Name of supplier	ShenZhen Aihui Technology Co. , Ltd				
Customer name	Hua Yi				
Sample name	ML1009P				
model					
Sample size	Main antenna; ML1009-4G-AH, size 85.89 * 19.2, line length 182 mm (0.81)4 generations. Three-in-one antenna; ML1009-W/g/B-AH, size 12.95 * 21.5 thimble, diversity antenna; ML1009-DIV-AH, size 15.1 * 10.25 thimble				
Inspection item	Performance test	Visual inspection	Structure	In the news	Test results
Notes					
Quality Audit		Project Audit		Business confirmation	
The following is to be completed by the client					

Shenzhen Aihui Technology Co. , Ltd.

Customer feedback	
Customer signature/seal	date:

Antenna Test Report

Test Unit: Shenzhen Aihui Technology Co. , Ltd.			
Materials	FPC coaxial line		
Antenna type	MonopoleType	Polarization mode	Linear
Application scenario			
Working band	GSM/LTE/WIFI /BT /GPS	VSWR	≤2

Address: 402TEL: 0755-23203435fax: 0755-23203435, Block C, Juxin Science and
Technology Industrial Park, Nanchang community, xixiang, Baoan District, Shenzhen

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Power	Max: 2W	Impedance	50Ω
dBi			
Test Equipment	HPE5071C、Shielding Room、3D automatic turntable		
<p>Antenna Description::</p> <p>1. Grounding processing and picture description: no</p> <p>2. Need to change the motherboard to match: no</p> <ul style="list-style-type: none">● Test voltage: 3.6V, check the antenna contact is good before testing.● The RF cable of the integrated tester is kept in a natural state and can not be curled. <p>Specification:test the specified power level, all indicators must conform to the specifications.</p>			

1. Project Image

2. Test Fixture

3. Antenna matching circuit

4. S11 test

5. Antenna passive efficiency and gain

6. Darkroom test equipment and data

7. Schematic diagram of antenna assembly

8. Antenna environment handling

9. Antenna mass production index

10. Structural drawing

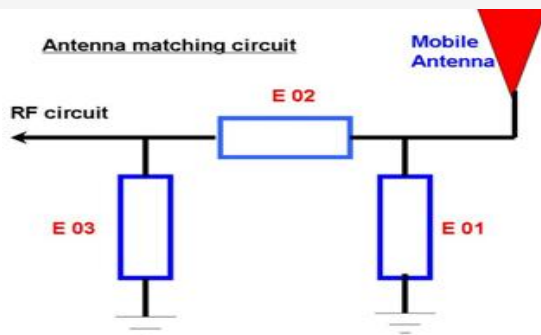
1. Project Image

The final verification antenna performance prototype in our company for at least one year, easy to analyze and solve the problem of antenna mass production, to ensure the quality of antenna shipment

2. Test Fixture

Objective: to test the passive parameters of antenna as accurately as possible. Making Method: the handset is made of a 50 ohm coaxial cable, one end of which is connected to the test point of the back end of the matching circuit of the handset motherboard (front end of the RF test hole) , and the other end is connected to the SMA joint. The diagram is as follows:

3. Antenna matching circuit



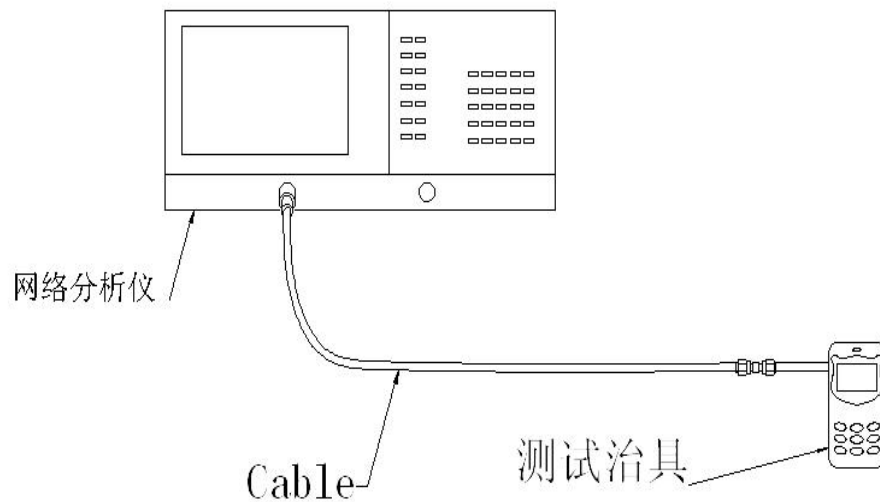
Modify

E01	E02	E03
No	No	No

Note: The match is unmodified.

4.S11 test

4.0 4.0s11 test method description of test equipment: Network Analyzer (E5071C) test method: a 50 ohm CABLE is used to export from the instrument test port. The SMA connector for connecting the handset is calibrated using a calibration piece, record the echo loss and standing wave ratio corresponding to the relevant frequency points. The test schematic is as follows:



5.Darkroom test equipment and data

LTE:

Gain&Efficiency 增益和效率			
frequency 频率(Hz)	gain 增益(dB)	efficiency 效率(dB)	efficiency 效率
680M	-0.39	-4.54	35.18%
700M	0.38	-4.18	38.15%
720M	1.57	-3.38	45.88%
740M	1.31	-3.55	44.17%
760M	0.3	-4.43	36.04%
780M	-0.18	-4.89	32.4%
800M	-0.45	-5.55	27.88%
820M	0.13	-5.26	29.78%
840M	-0.02	-5.4	28.86%
860M	-0.33	-5.67	27.12%
880M	-0.65	-5.82	26.2%
900M	-0.7	-5.4	28.83%
920M	-1.25	-5.61	27.5%
960M	-2.02	-6.25	23.69%
980M	-2.34	-6.25	23.71%

Gain&Efficiency 增益和效率			
frequency 频率(Hz)	gain 增益(dB)	efficiency 效率(dB)	efficiency 效率
1710M	2.94	-4.06	39.24%
1743M	3.2	-4.07	39.16%
1777M	3.55	-3.87	40.99%
1811M	3.66	-4.08	39.1%
1845M	3.81	-4.27	37.38%
1878M	3.86	-3.94	40.34%
1912M	3.73	-3.72	42.45%
1946M	2.73	-3.94	40.38%
1980M	2.5	-3.86	41.08%
2014M	2.64	-3.45	45.19%
2047M	2.76	-3.65	43.18%
2081M	2.76	-3.62	43.49%
2115M	3.2	-3.35	46.28%
2149M	2.49	-3.8	41.72%
2183M	0.77	-4.56	34.98%
2216M	0.36	-4.6	34.68%

2250M	-0.47	-5.12	30.76%
2284M	-0.58	-4.91	32.28%
2318M	-0.16	-4.55	35.07%
2352M	-0.62	-4.75	33.5%
2385M	-1.07	-4.87	32.58%
2419M	-0.39	-4.28	37.35%
2453M	0.23	-4.03	39.57%
2487M	-0.08	-4.33	36.92%
2521M	0.23	-3.95	40.24%
2554M	0.86	-3.9	40.72%
2588M	1.39	-4.13	38.65%
2622M	1.25	-4.23	37.73%
2656M	0.62	-4.31	37.1%
2690M	0.83	-4.65	34.25%

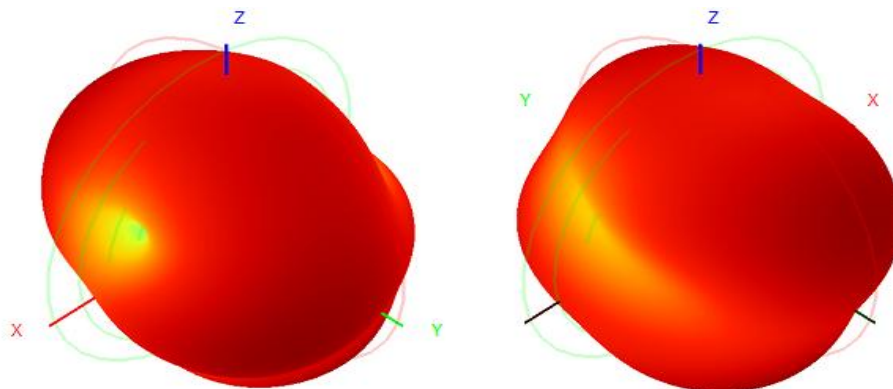
GPS

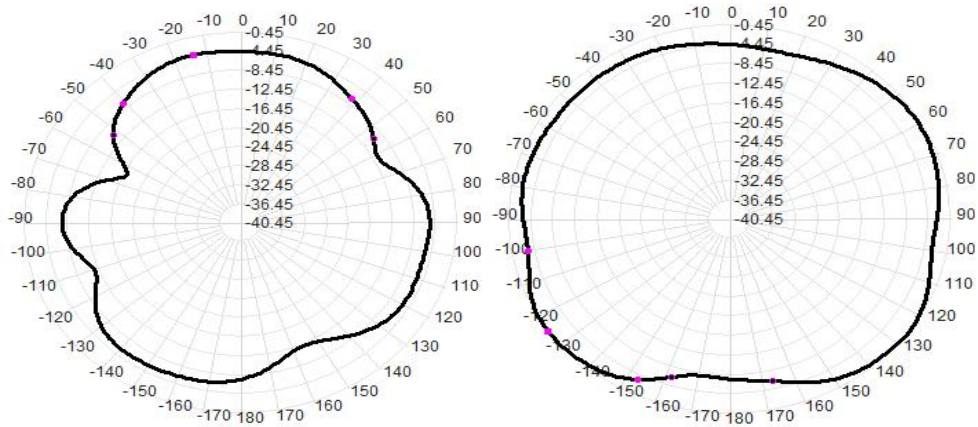
Gain&Efficiency 增益和效率			
frequency 频率(Hz)	gain 增益(dB)	efficiency 效率(dB)	efficiency 效率
1550	1.15	-3.35	33.70%
1555	1.6	-3.35	34.50%
1560	0.95	-3.34	35.60%
1565	0.52	-3.52	36.54%
1570	0.63	-4.30	31.41%
1575	0.25	-0.25	33.50%

WIFI&BT

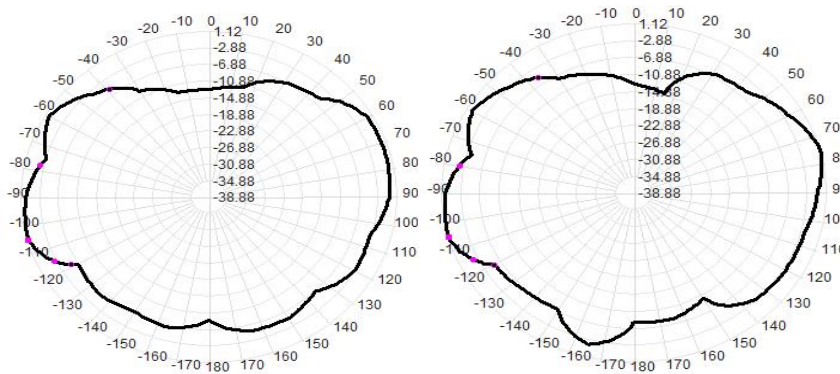
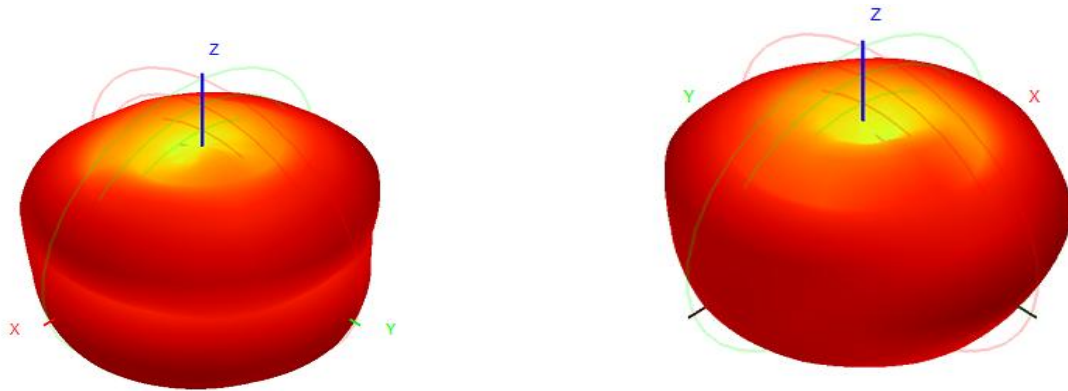
2400	1.14	-3.5	37.90%
2420	1.30	-3	39.60%
2440	1.05	-3.54	39.40%
2460	0.65	-3.41	35.80%
2480	0.24	-3.3	34.68%
2500	0.01	-3.5	34.80%

LTE:



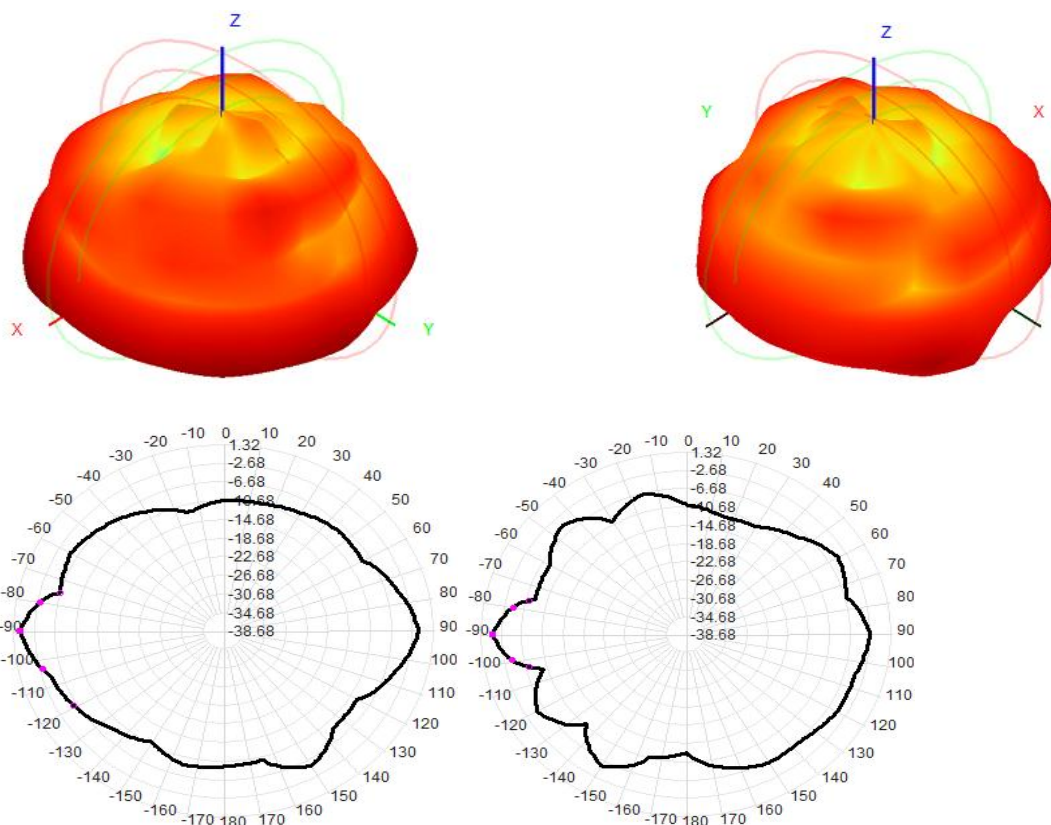


GPS:



WIFI :

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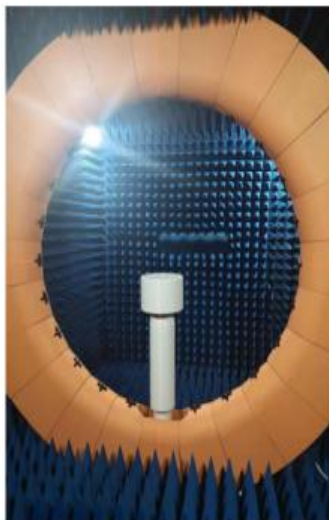
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6.Test Equipment

Test system: shielded darkroom

The temperature was $22^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and the humidity was $50\% \pm 15\%$

Test equipment: when testing passive data, use the Network analyzer AGILENTE5071C
to test active data, use the omnibus CMW500



7.Active antenna test data

Frequency Band	GSM,850			900		
channel	L	M	H	L	M	H
TRP	27.4	27.6	28.2	28.5	28.6	27.3
TIS			-103.1			-102.9
Frequency Band	1800			1900		
channel	L	M	H	L	M	H
TRP	24.5	23.6	23.3	25.2	25.6	25.8
TIS			-102.4			-104.3

Frequency Band	WCDMA 1			WCDMA 2		
channel	L	M	H	L	M	H
TRP	17.5	18.5	17.3	18.5	18.3	17.3
TIS			-103.1			-102.5

Frequency Band	WCDMA 5			WCDMA 8		
channel	L	M	H	L	M	H
TRP	17.8	17.4	17.3	18.5	18.4	17.4
TIS			-103.9			-102.7

Frequency Band	LTE B1			LTE B2		
channel	L	M	H	L	M	H
TRP	17.5	18.5	19.1	18.5	17.6	16.9
TIS			-92.3			-90.5

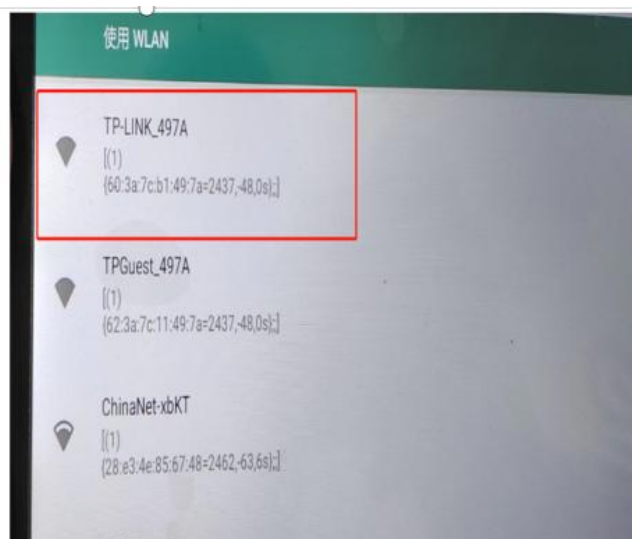
Frequency Band	LTE B3			LTE B5		
channel	L	M	H	L	M	H
TRP	17.7	17.5	18.2	18.9	19.3	18.4
TIS			-91.4			-92.8
Frequency Band	LTE B8			LTE B12		
channel	L	M	H	L	M	H
TRP	18.5	17.7	17.4	15.4	15.6	15.3
TIS			-90.3			-88.3

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Frequency Band	LTE B17			LTE B20		
channel	L	M	H	L	M	H
TRP	14.8	15.2	15.3	17.4	17.2	17.3
TIS			-90.3			-92.1
Frequency Band	LTE B28			LTE B66		
channel	L	M	H	L	M	H
TRP	14.8	15.3	15.2	17.8	18.4	18.3
TIS			-88.7			-90.6

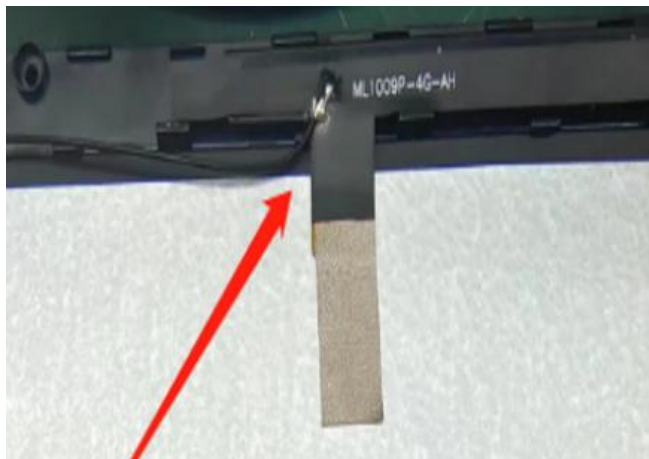
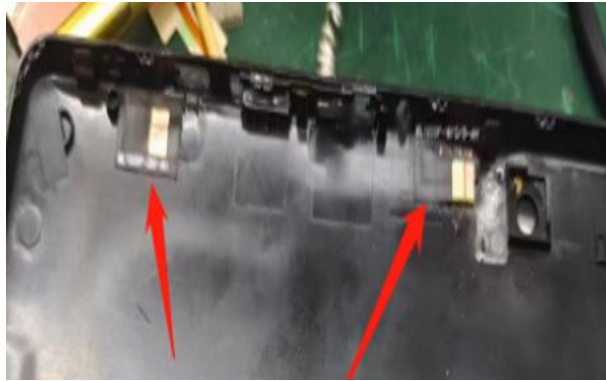
Frequency Band	WIFI-2.4G-B模			WIFI-2.4G-C模		
channel	L	M	H	L	M	H
TRP	10.25	10.31	10.25	9.54	9.25	8.57
TIS			-78.51			-68.41
Frequency Band	WIFI-2.4G-H模					
channel	L	M	H			
TRP	8.54	8.65	8.23			
TIS			-65.31			

7.1 Real-time WiFi results



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8.Schematic diagram of antenna assembly



9.Antenna environment handling

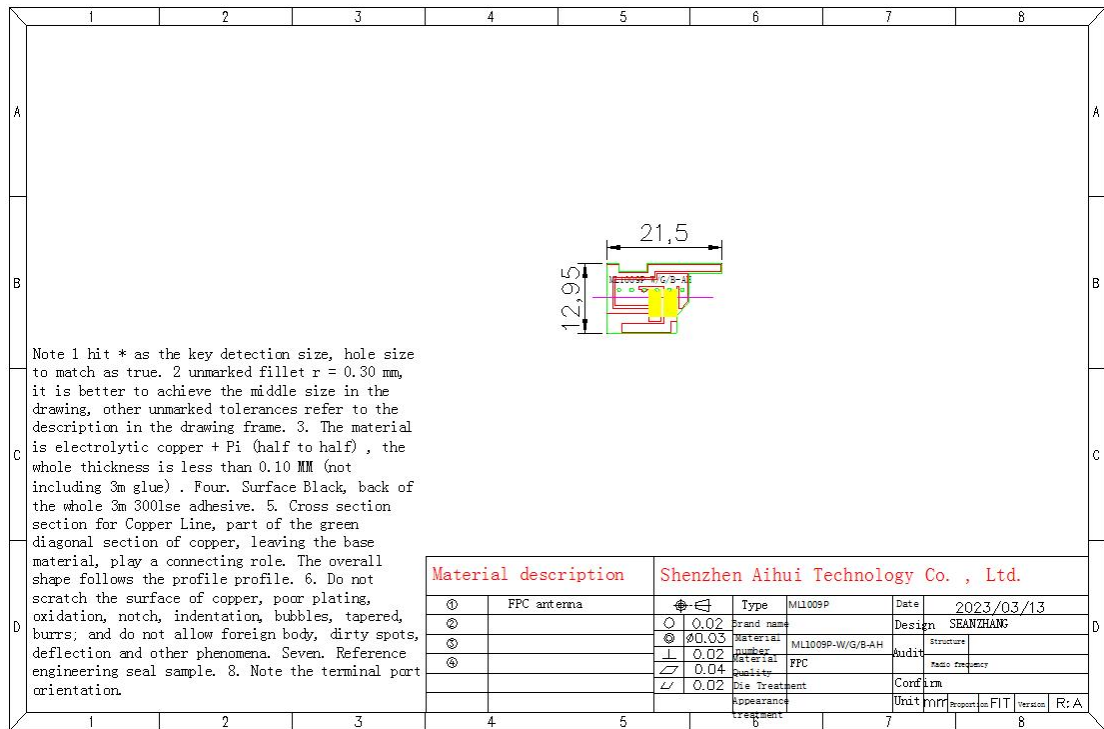
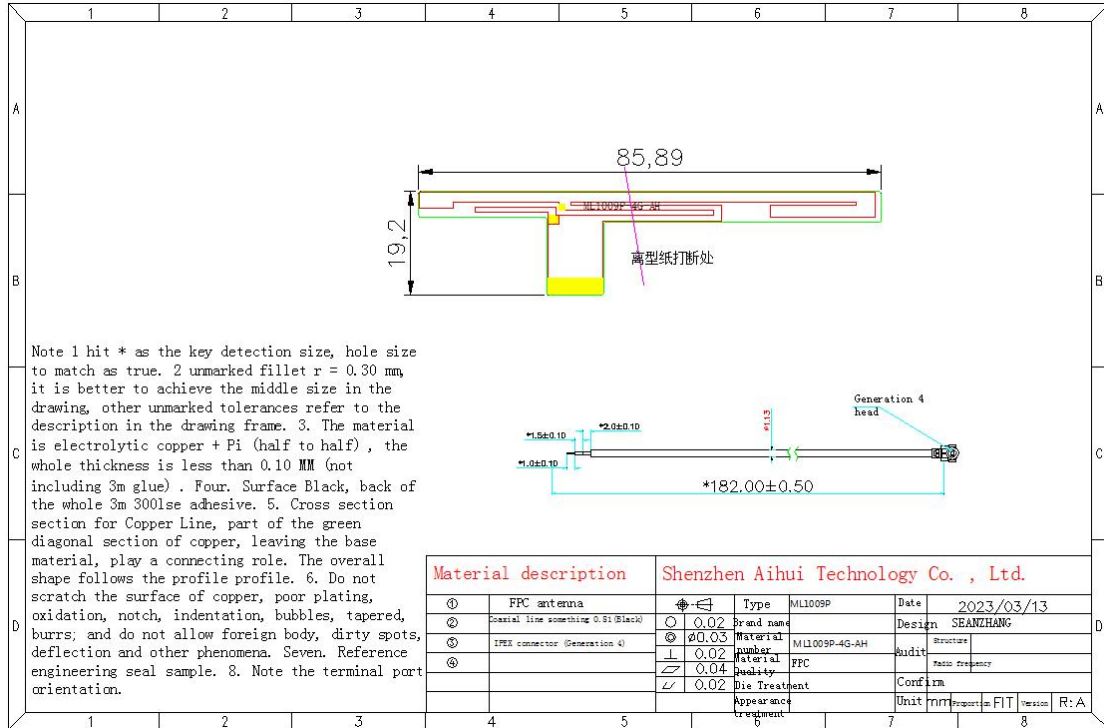


10.Antenna mass production index

<p>When the antenna is mass-produced, the standing wave ratio is taken as the mass-produced test standard. Based on the differences of the project itself, the following criteria are given:</p>	<h2>Standard for volume production</h2>
<p>680MHZ-2700Mhz</p>	<p>VSWR (Mass Production performance) & LT; VSWR(recognition performance) 0.5</p>

10.1 Structural drawings

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