

Customer name: Haoqin

Project name: M863P-T7818-8 inch
Manulife plastic case - Emdoor motherboard -
MT8766 master control

date: 2022. 09. 05

Project contact information

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Project Description

1. Project brief

Project Antenna Number	Machine type
3	4G Tablet
Machine shell material: 8 inch Honglitai plastic shell	

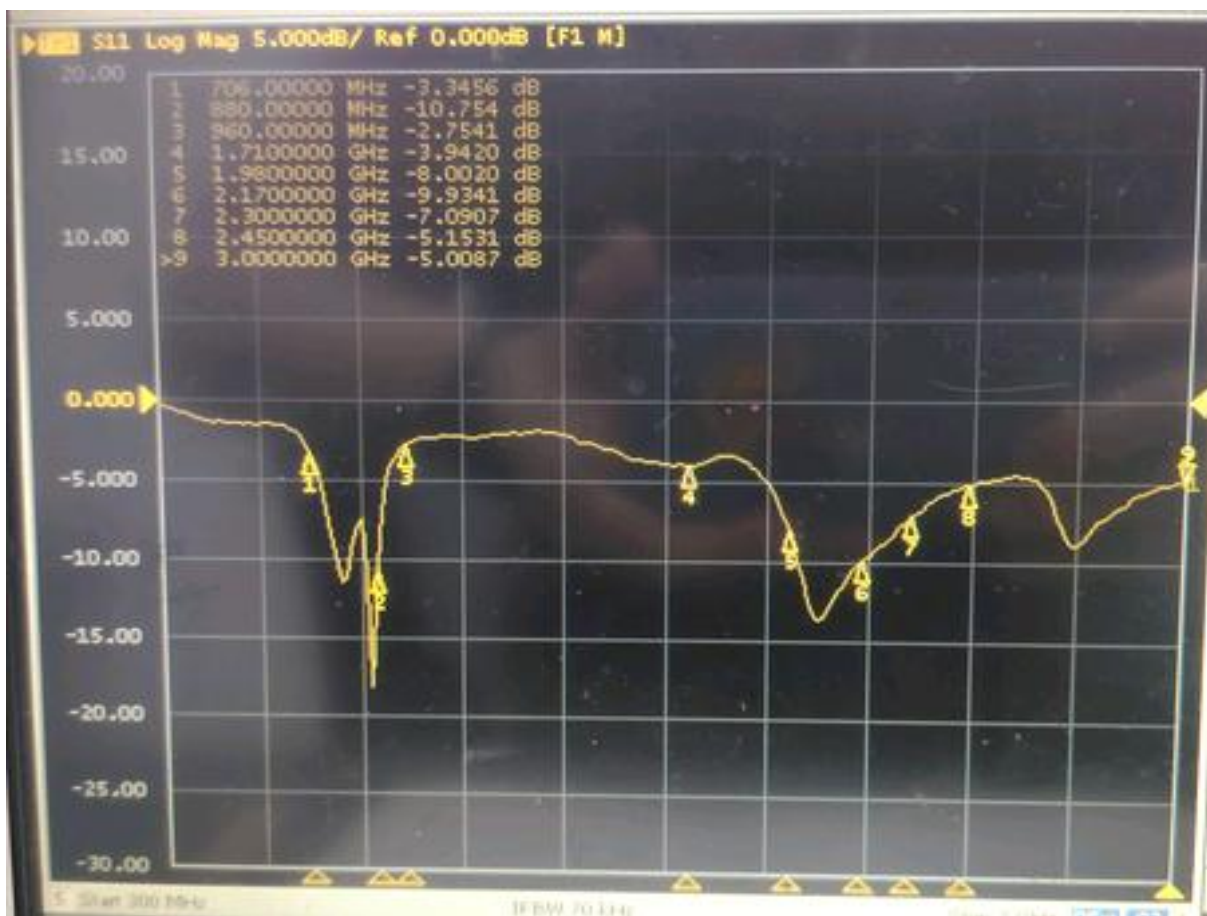
2. Antenna Brief

Antenna number	name	Working frequency/MHZ	Material/Structure
1	4G main ant	GSM 850/900/1800/1900 WCDMA 900/2100 LTE - B1/3/5/28A/40/41	PIFA
2	aux	LTE - B1/3/5/28A/40/41	PIFA
3	WIFI&GPS&BT&5Gwifi	2400MHz/2500MHz&1575MHz&5.8GHz	PIFA

Antenna layout



2G&3G&4G ANT S11



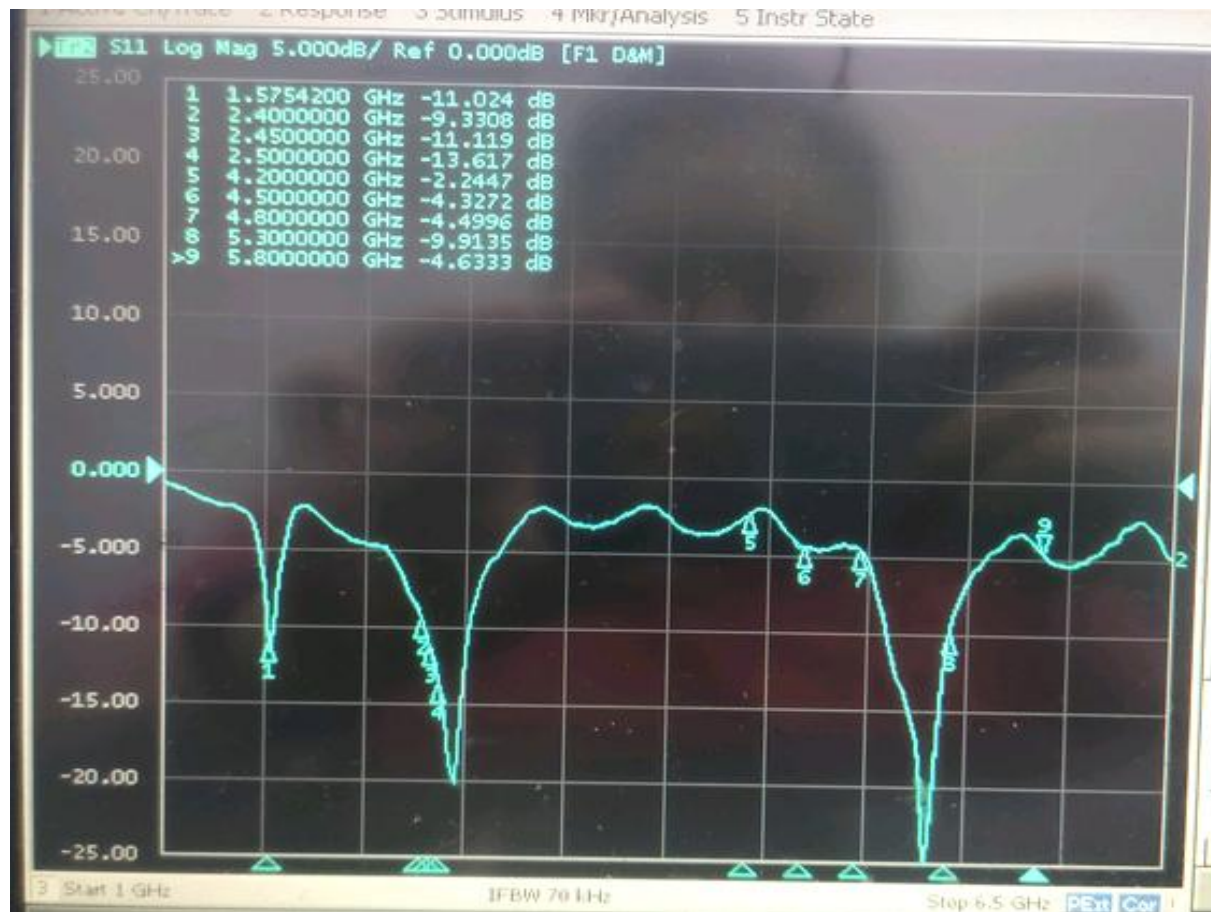
深圳市宝安区西乡街道润东晟工业区13栋4楼A

A, floor 4, building 13, rundongsheng Industrial Zone, Xixiang street, Bao'an District, Shenzhen City, Guangdong Province

2G&3G&4G Antenna Active Data

频段	2G			频段	3G/4G			频段	4G		
	CH	TRP	TIS		CH	TRP	TIS		CH	TRP	TIS
GSM850	128	23.37		WCDMA -2100	10562	19.09		LTE-B1	18050	17.67	
	190	24.84			10700	19.95			18300	18.81	
	251	24.99	-99.15		10838	19.72	-103.8		18550	18.49	-93.82
	Avg				Avg				Avg		
GSM900	1	23.21		WCDMA -900	2937	14.18		LTE-B3	19250	18.7	
	62	23.49			3013	14.71			19575	17.61	
	124	23.17	-98.95		3088	13.93	-98.65		19900	17.55	-94.61
	Avg				Avg				Avg		
GSM1800	512	26.97		LTE-B40	38750	17.08		LTE-B5	20450	14.77	
	698	26.2			39150	18.77			20525	15.14	
	885	25.07	-103.33		39550	19.01	-88.41		20600	15.71	-86.67
	Avg				Avg				Avg		
GSM1900	512	24.74		LTE-B41	40340	18.64		LTE-B28A	27410	9.82	
	661	25.42			40620	18.54			27435	9.12	
	810	26.15	-103.03		41140	17.78	-86.54		27510	11.02	-88.46
	Avg				Avg				Avg		

WIFI&GPS&BT ANT S11



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WIFI Antenna Active Data

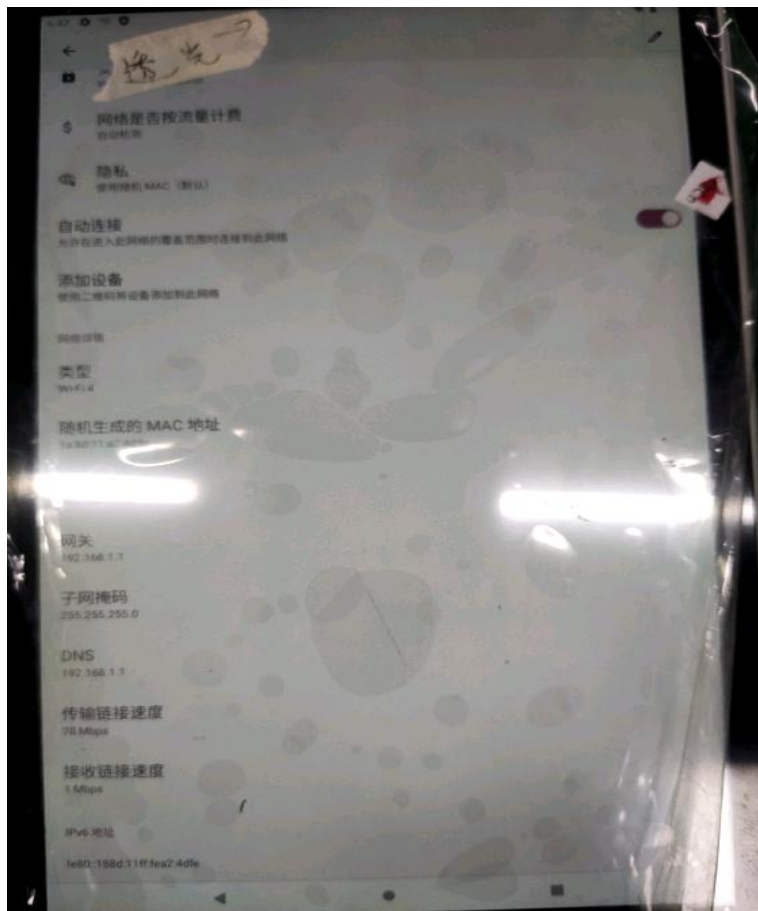
	channel	b (11MHz)		g (54MHz)		n (MCS7)		a (54MHz)	
		TRP	TIS	TRP	TIS	TRP	TIS	TRP	TIS
1	1	10.17	-82.57	9.17	-69.03	10.57	-66.23	NA	NA
	7	9.79	-82.17	8.57	-69.92	10.79	-66.68	NA	NA
	13	11.15	-82.37	9.84	-67.99	11.22	-63.82	NA	NA
	36	NA	NA	NA	NA	10.1	-68.49	9.98	-68.3
	100	NA	NA	NA	NA	8.16	-66.52	7.81	-67.05
	165	NA	NA	NA	NA	5.28	-64.29	3.18	-65.63

WiFi Throughput

Iperf Throughput test						
model	M863P-T7818	模块	MT8766 master	Software version	Magic_Iperf	
Model number	frequency band	distance	test angle	(TX) 1min	(RX) 1min	Remarks (number of dropped packages)
1	2. 4G	2. 4G WIFI (15m)	0°	55 Mbps	57.7 Mbps	0
			90°	49 Mbps	58.9 Mbps	0
			180°	44 Mbps	60.0 Mbps	0
			270°	53 Mbps	60.6 Mbps	0
	5G	-				
		5F WIFI (15m)	0°	214 Mbps	217 Mbps	0
			90°	196 Mbps	213 Mbps	0
			180°	143 Mbps	178 Mbps	0
			270°	151 Mbps	152 Mbps	0

WIFI Antenna Throughput Test

2.4Gwifi (The connection rate is 78/78Mbps) / 5Gwifi (The connection rate is 390/292Mbps)



BT Antenna measured distance

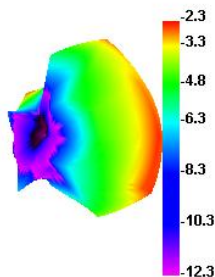
Measured effect	
Model number	1
test environment	Thorward R&D Center
Test Equipment	HUAWEI AM08
test distance	> 10 m

WIFI&BT Antenna efficiency

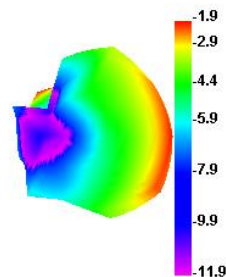
Passive Test For 2.4Gwifi

Freq	Effi	Effi	Gain	Gain	UHS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
2400	27.16	-5.66	-2.3	-2.37	12.438	14.724	-0.22	-16.86
2410	29.28	-5.33	0.15	-2	13.295	15.988	0.15	-15.27
2420	29.13	-5.36	1.25	-2	13.161	15.966	0.15	-14.7
2430	26.18	-5.82	-0.27	-2.42	11.786	14.398	-0.27	-16.02
2440	26.21	-5.81	-0.24	-2.39	11.781	14.431	-0.24	-17
2450	27.66	-5.58	-1.9	-2.08	12.383	15.277	0.07	-17.54
2460	28.57	-5.44	0.29	-1.86	12.722	15.851	0.29	-17.56
2470	28.54	-5.45	0.4	-1.75	12.521	16.018	0.4	-17.18
2480	28.66	-5.43	1.25	-1.61	12.283	16.377	0.54	-16.58
2490	29.13	-5.36	0.72	-1.43	12.087	17.039	0.72	-15.73
2500	28.3	-5.48	-0.4	-1.52	11.334	16.97	0.63	-15.21

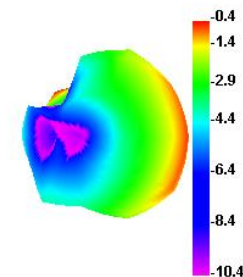
2400.000MHz



2450.000MHz



2500.000MHz

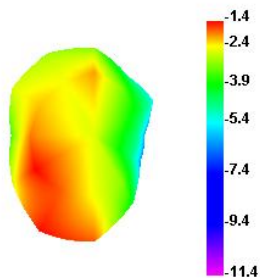


5GWIFI Antenna efficiency

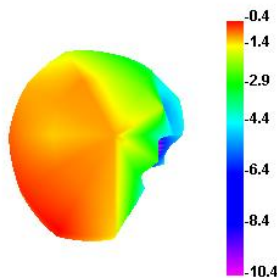
Passive Test For 5Gwifi

Freq	Effi	Effi	Gain	Gain	UHS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
5000	18.43	-7.34	-1.35	-3.5	13.73	4.7	-1.35	-23.3
5100	22.17	-6.54	-0.83	-2.98	16.565	5.601	-0.83	-18.01
5200	29.01	-5.37	-0.05	-2.2	21.121	7.891	-0.05	-19.36
5300	30.77	-5.12	1.25	-2.42	21.723	9.049	-0.27	-18.9
5400	34.77	-4.59	0.04	-2.11	23.696	11.078	0.04	-15.28
5500	30.63	-5.14	-0.38	-2.53	20.425	10.207	-0.38	-20.41
5600	30.56	-5.15	-0.52	-2.67	19.622	10.933	-0.52	-17.97
5700	30.03	-5.22	-0.34	-2.49	19.184	10.849	-0.34	-16.84
5800	27.2	-5.65	1.23	-2.61	17.606	9.591	-0.46	-18.13
5900	17.16	-7.65	-2.34	-4.49	10.676	6.488	-2.34	-17.59
6000	21.8	-6.62	-2.34	-4.49	13.018	8.778	-2.34	-16.76

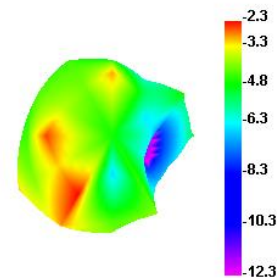
5000.000MHz



5500.000MHz



6000.000MHz



WIFI Antenna signal strength measurement picture



Test Location: Our R&D Office

Test time: 15:00-15:30

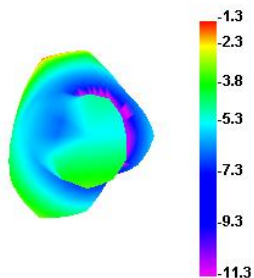
Test distance: 10m-15m

Signal Strength: -48dBm to -37dBm

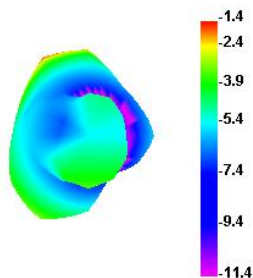
GPSAntenna efficiency

Passive Test For GPS2								
Freq	Effi	Effi	Gain	Gain	UHS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
1570	29.25	-5.34	-1.3	-3.45	10.936	18.312	-1.3	-12.41
1571	29.09	-5.36	-1.35	-3.5	10.891	18.197	-1.35	-12.39
1572	28.99	-5.38	-1.39	-3.54	10.877	18.115	-1.39	-12.41
1573	28.93	-5.39	-1.42	-3.57	10.863	18.066	-1.42	-12.38
1574	28.93	-5.39	-1.44	-3.59	10.883	18.051	-1.44	-12.34
1575	28.97	-5.38	-1.42	-3.57	10.916	18.052	-1.42	-12.31
1576	28.99	-5.38	-1.4	-3.55	10.943	18.05	-1.4	-12.22
1577	29.05	-5.37	-1.38	-3.53	10.986	18.065	-1.38	-12.21
1578	29.07	-5.37	-1.34	-3.49	11.008	18.065	-1.34	-12.2
1579	29.03	-5.37	-1.31	-3.46	11.014	18.02	-1.31	-12.22
1580	29.04	-5.37	-1.28	-3.43	11.037	18.001	-1.28	-12.21

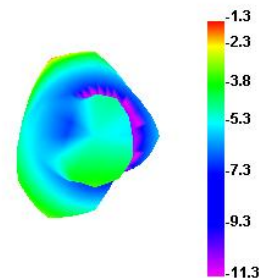
1570.000MHz



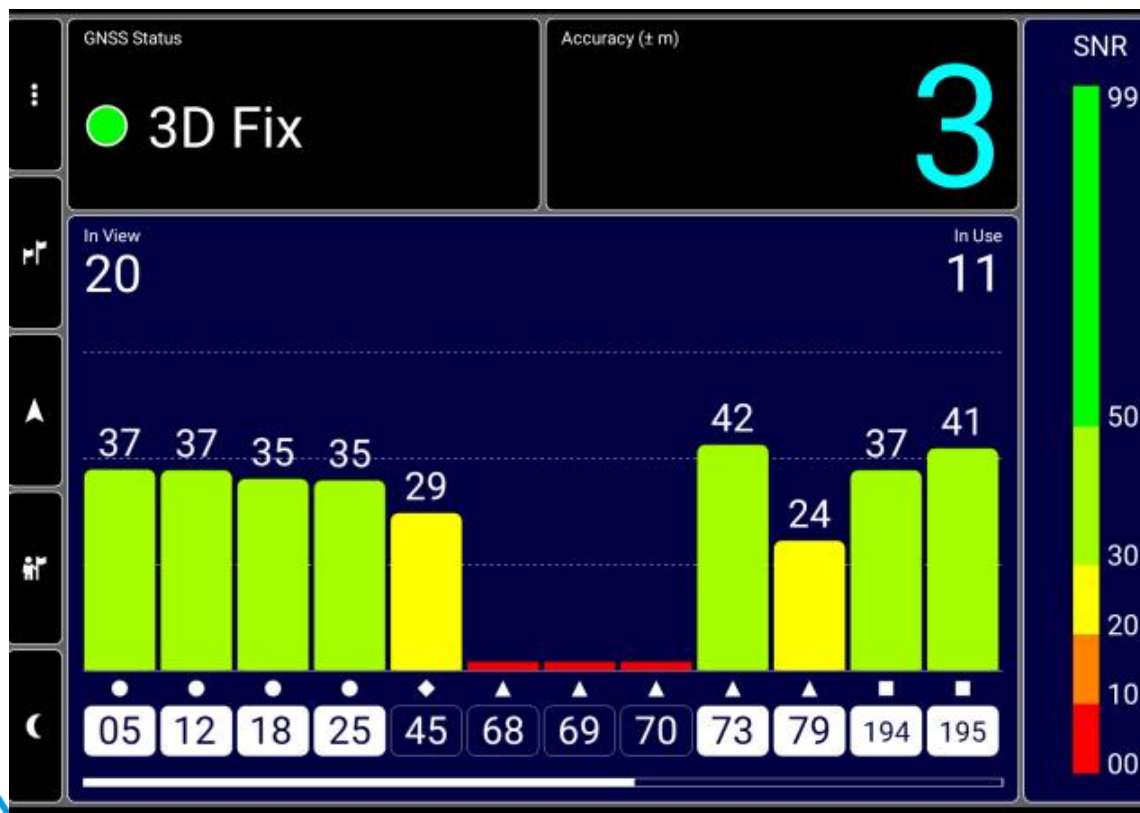
1575.000MHz



1580.000MHz



GPSMeasured pictures



Test location: the roof of our company

Test time: 17:00 to 17:30

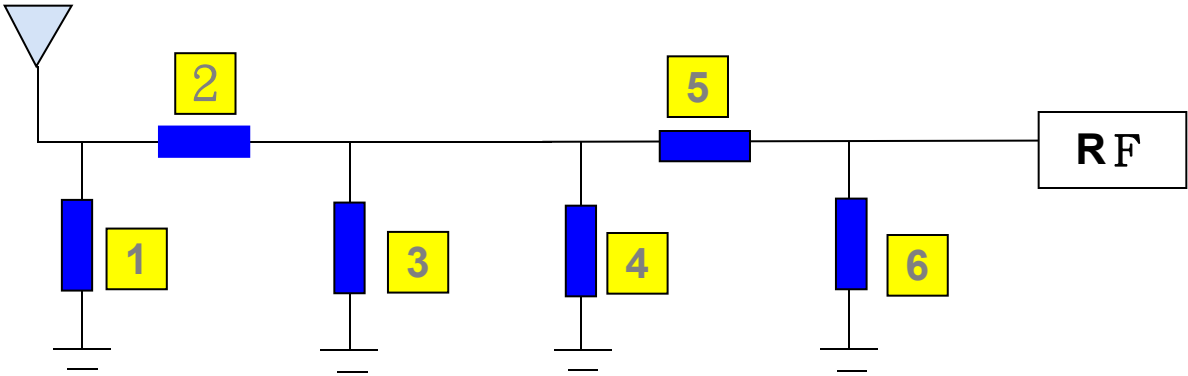
Test direction: east, south, west, north cold start positioning

Time: about 60sec

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Antenna matching



main antenna	1	2	3	4	5	6	备注
original match							
change match							

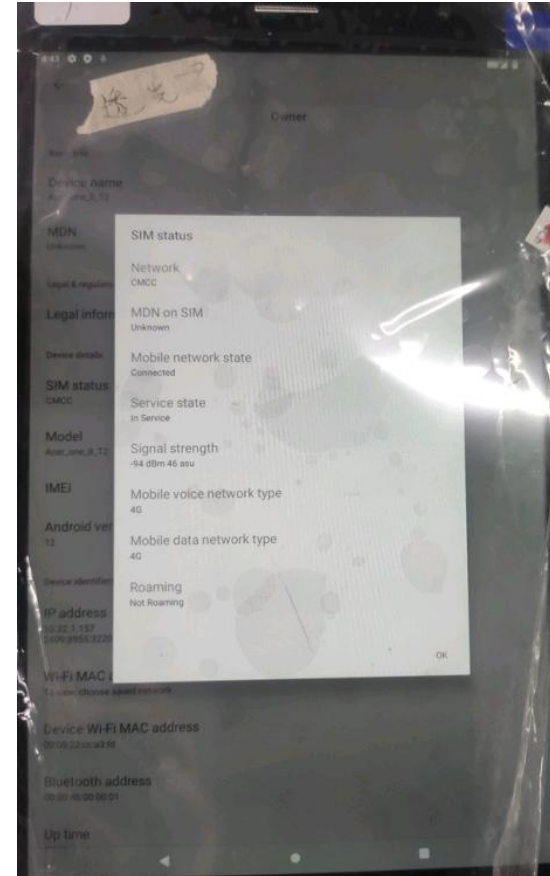
Environmental Handling and Assembly Instructions

Environment handling has not been changed.



Summarize:

The worst of the external antenna 5G test is as follows



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Note: 1. This report is based on the actual debugging and testing of the debugging prototype, including environmental treatment, antenna position and assembly position of each device

cannot be changed at will;

2. If there is any change in the materials used in the prototype, it is necessary to timely feedback to our company for re-verification;

3. List of sensitive components:

TP (material, coating, wiring, etc.)

Screen (amplifying circuit, LED, cable design, etc.)

Shell material (antenna assembly method, structural interference, shell material, antenna position height and area, etc.)

Mainboard (mainboard conduction, RF circuit matching, PA, duplexer, filter, LNA, power circuit, etc.)

Camera, battery, motor, MIC, fingerprint recognition module, etc.

4. Due to the small number of debugging prototypes or only one, some probabilistic problems cannot be completely found. It is recommended to check the problem points in small batches before mass production (such as splash screen, noise from speakers, TP jump, black screen of death, signal diving, etc.)