A12M1N-Antenna Test Report

Customer name:Bmorn

Project name: AE1101 (11-inch metal shell - BND-H60 motherboard)

Issue: 2025.05.09

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Project Contact Details

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Soward structure:

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项目简介

1. Project description

Number of antennas	Type of machine
2	WIFI laptop
Overall housing material: 11-inch metal shell (plastic side)	

2. Antenna description

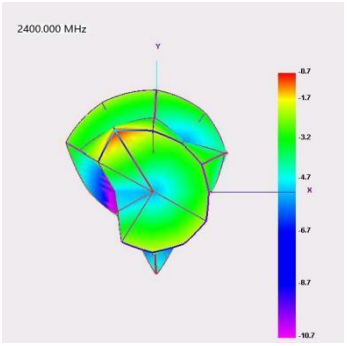
Antenna number	Name	Working frequency/MHZ	Material/structure
1	WIFI&BT&5Gwifi	2400MHz ~ 2500MHz & 5.8GHz	FPC
2	WIFI&BT&5Gwifi	2400MHz ~ 2500MHz & 5.8GHz	FPC

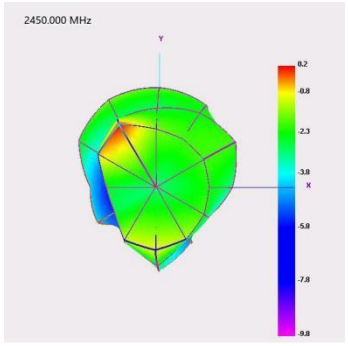
Antenna layout

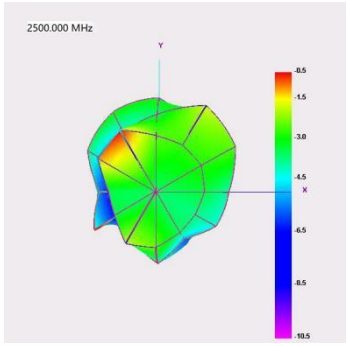
WIFI&BT Antenna S11

WIFI&BT antenna efficiency

Passive Test For 2.4Gwifi								
Freq	Effi	Effi	Gain	Gain	UHIS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
2400	25.35	-5.96	-0.74	-2.89	12.406	8.666	-0.74	-17.08
2410	23.49	-6.29	-0.75	-2.9	12.312	8.421	-0.75	-17.82
2420	25.1	-6	-0.27	-2.42	13.676	9.286	-0.27	-19.23
2430	23.73	-6.25	0.25	-1.9	15.015	10.169	0.25	-19.94
2440	21.07	-6.76	0.58	-1.57	16.022	10.778	0.58	-18.93
2450	20.73	-6.83	0.23	-1.92	14.411	9.463	0.23	-19.15
2460	22.96	-6.39	0.09	-2.06	13.803	8.618	0.09	-19.94
2470	25.18	-5.99	-0.94	-3.09	10.832	6.267	-0.94	-21.57
2480	26.8	-5.72	-1.32	-3.47	9.923	5.421	-1.32	-21.16
2490	23.87	-6.22	-1.22	-3.37	10.125	5.502	-1.22	-19.38
2500	22.42	-6.49	-0.51	-2.66	12.033	6.915	-0.51	-17.94

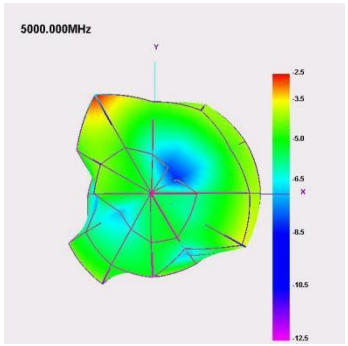


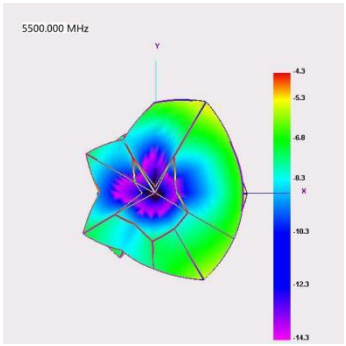


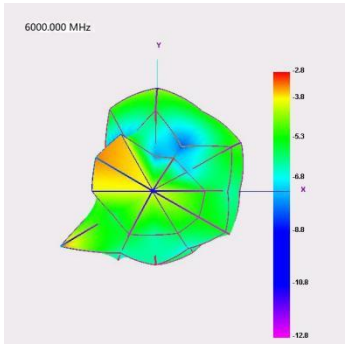


5GWIFI antenna efficiency

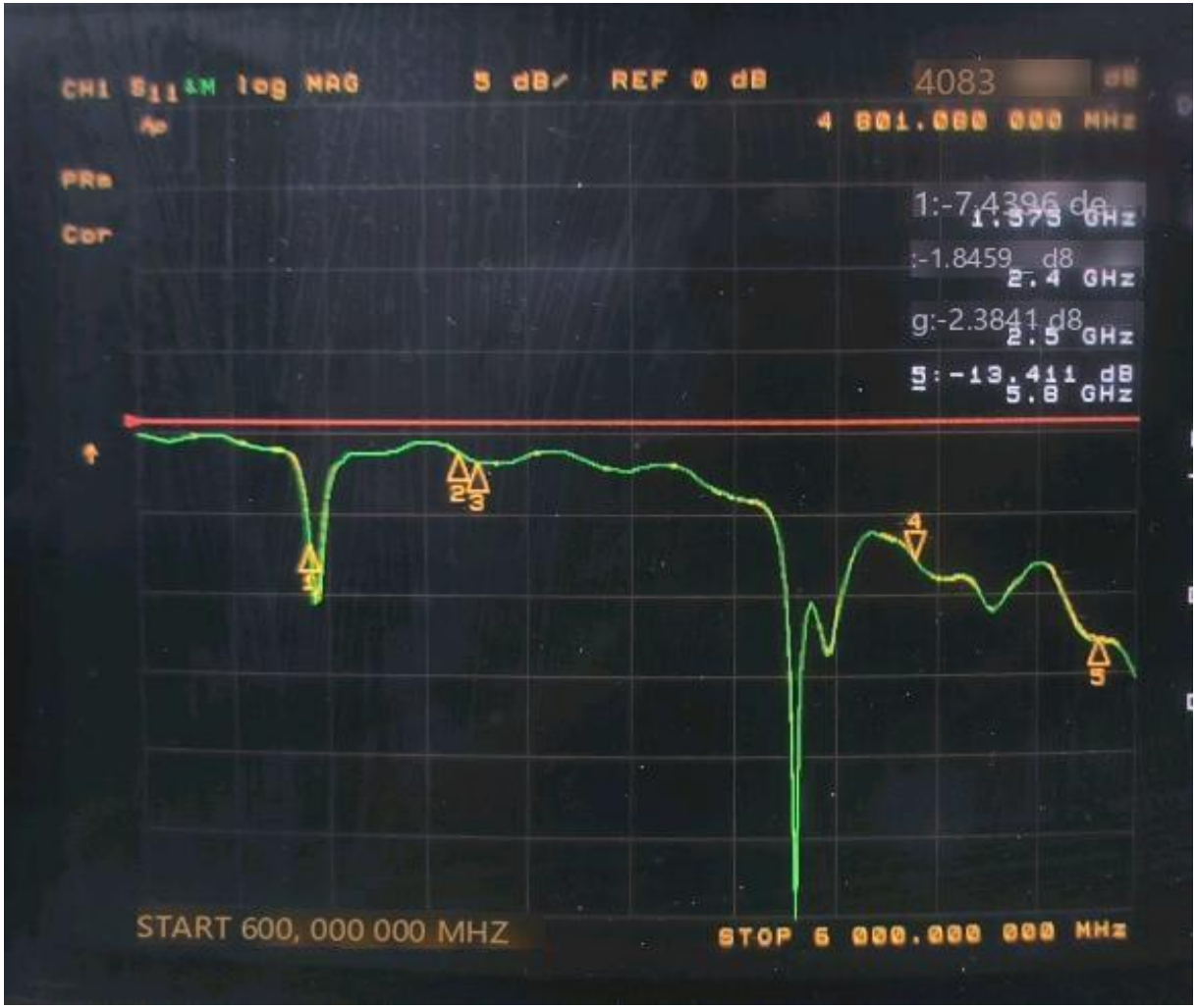
Passive Test For 5Gwifi								
Freq	Effi	Effi	Gain	Gain	UHIS	DHIS	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(%)	(%)	(dB)	(dB)
5000	28.64	-5.43	0.05	-2.1	17.075	11.563	0.05	-14.05
5100	31.35	-5.04	0.33	-1.82	17.745	13.602	0.33	-18.4
5200	23.19	-6.35	-0.79	-2.94	11.611	11.58	-0.79	-14.37
5300	28.84	-5.4	-0.43	-2.58	13.193	15.652	-0.43	-15.85
5400	27.59	-5.59	-0.64	-2.79	12.608	14.981	-0.64	-16.81
5500	25.46	-5.94	0.32	-1.83	12.374	13.091	0.32	-21
5600	24.21	-6.16	-0.09	-2.24	11.822	12.391	-0.09	-16.1
5700	19.24	-7.16	-2.86	-5.01	8.895	10.347	-2.86	-18.18
5800	18.45	-7.34	-1.49	-3.64	8.184	10.27	-1.49	-18
5900	18.88	-7.24	0.08	-2.07	8.293	10.591	0.08	-15.86
6000	21.9	-6.59	-0.55	-2.7	10.799	11.104	-0.55	-17.03





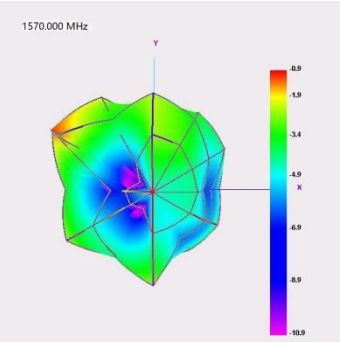


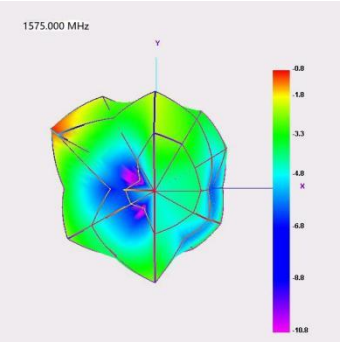
GPS Antenna S11

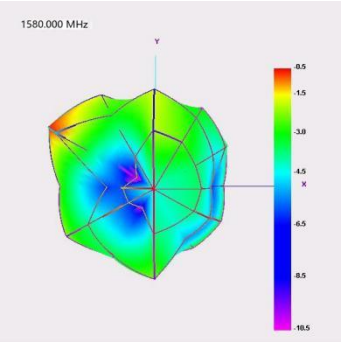


GPS antenna efficiency

Passive Test For GPS2								
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHIS (%)	DHIS (%)	Max (dB)	Min (dB)
1570	31.28	-5.05	-0.88	-3.03	14.376	16.902	-0.88	-15.26
1571	31.67	-4.99	-0.82	-2.97	14.562	17.109	-0.82	-15.32
1572	31.82	-4.97	-0.8	-2.95	14.635	17.181	-0.8	-15.42
1573	31.79	-4.98	-0.81	-2.96	14.627	17.16	-0.81	-15.54
1574	31.71	-4.99	-0.82	-2.97	14.602	17.108	-0.82	-15.66
1575	31.76	-4.98	-0.81	-2.96	14.633	17.125	-0.81	-15.71
1576	31.4	-5.03	-0.87	-3.02	14.476	16.922	-0.87	-15.99
1577	31.36	-5.04	-0.84	-2.99	14.461	16.898	-0.84	-16.13
1578	31.59	-5	-0.77	-2.92	14.582	17.005	-0.77	-16.17
1579	32.13	-4.93	-0.66	-2.81	14.831	17.299	-0.66	-16.23
1580	32.87	-4.83	-0.54	-2.69	15.179	17.687	-0.54	-16.26







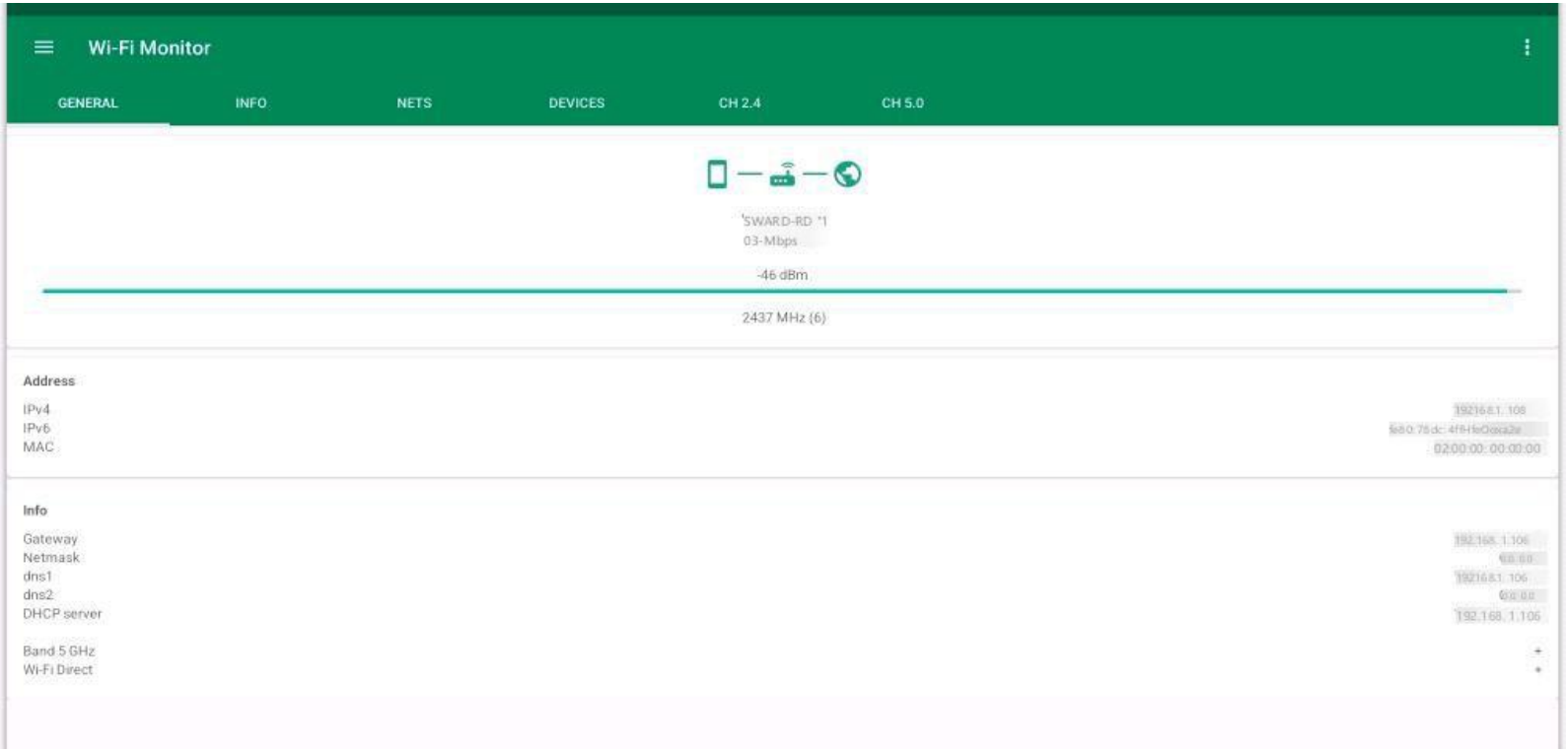
BT antenna measured distance

Test results	
Model number	1
Test environment	Soward R&D center
Test equipment	Huawei AM08
Test distance	> 10 meters

WiFi Throughput

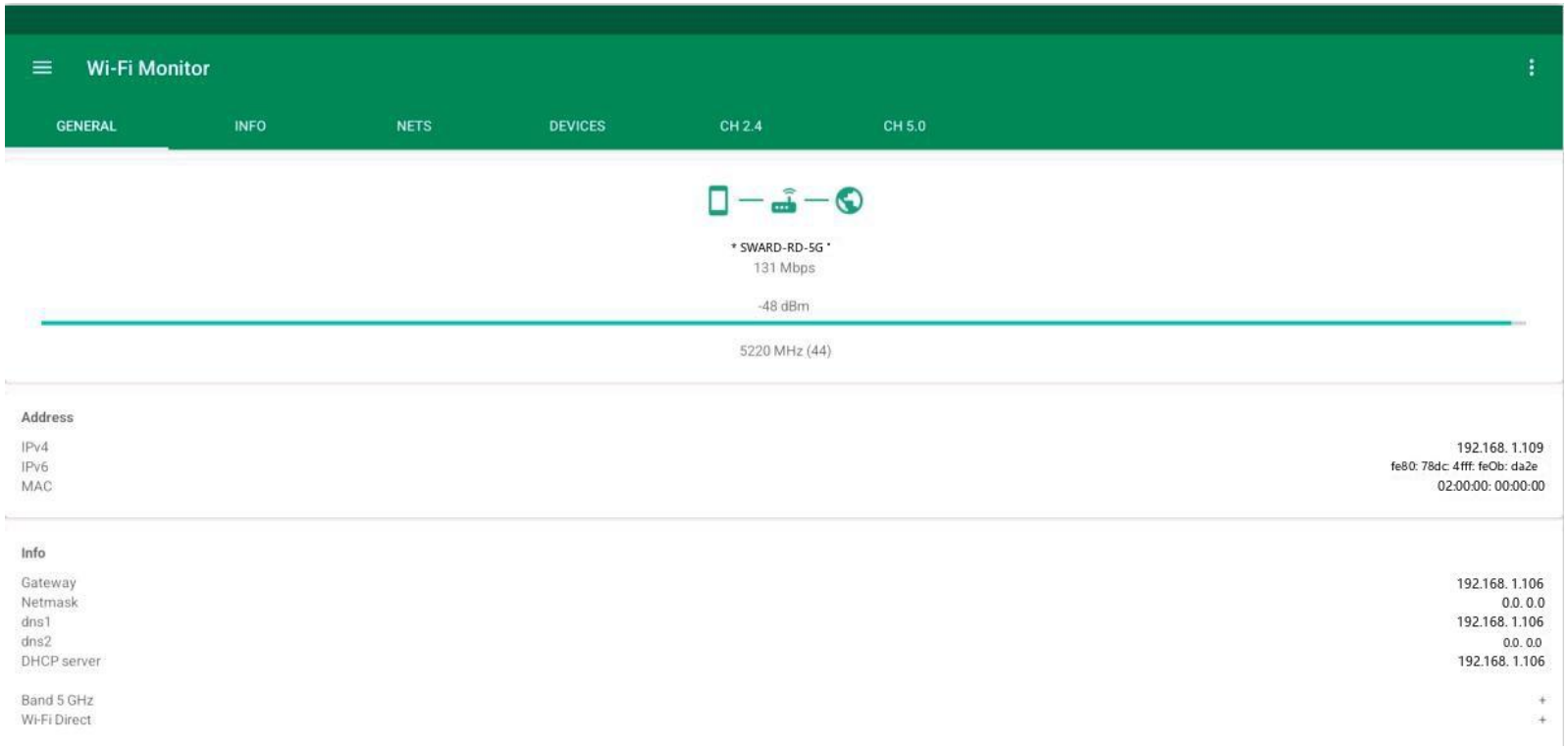
Iperf throughput test						
Model	AE1101 (BND-H60 motherboard)	Module	With motherboard	Software version	iPerf2 for Android	
Model number	Frequency band	Distance	Test angle	Test data (TX) 1min average	Test data (RX) 1min average	Notes (number of packet drops)
1	2.4G	2.4G WIFI (R&D test 15m)	0°	31.5 Mbps	86.3 Mbps	0
			90°	55.4 Mbps	92.9 Mbps	0
			180°	42.5 Mbps	87.1 Mbps	0
			270°	57.5 Mbps	69.5 Mbps	0
		-				
	5G	5F WIFI (R&D test 15m)	0°	234 Mbps	286 Mbps	0
			90°	264 Mbps	286 Mbps	0
			180°	251 Mbps	289 Mbps	0
			270°	268 Mbps	291 Mbps	0

WIFI antenna signal strength measured image (data)



Test location	Our R&D office					
Test group	2.4G/5G-distance 15m		2.4G/5G-distance 10m		2.4G/5G-distance 5m	
Test frequency band	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi
Signal strength	-46 dBm	-48 dBm	-41 dBm	-39 dBm	-36 dBm	-30 dBm

WIFI antenna signal strength measured image (data)



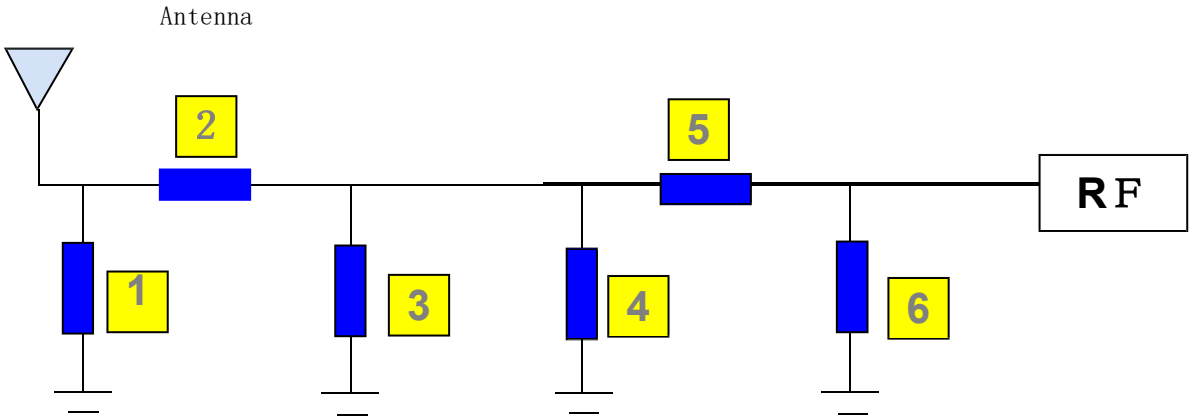
Test location	Our R&D office					
Test group	2.4G/5G-Distance 15 meters		2.4G/5G-Distance 10 meters		2.4G/5G-Distance 5 meters	
Test frequency	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi
Signal strength	-46 dBm	-48 dBm	-41 dBm	-39 dBm	-36 dBm	-30 dBm

GPS measured image (data)

Test location: Our rooftop

Test time: 18:00 to 18:30 Test direction: east, south, west, north Cold start positioning time: < 60sec

Antenna matching



Antenna matching is not changed.

Main antenna	1	2	3	4	5	6	Remarks
Original matching							
Change matching							

Debugging record

1. 2025.03.07, received the prototype (shell version), debugged and optimized according to customer needs, and arranged tr

2. 2025.04.18, received the trial production sample, the whole machine test GPS effect is poor, the screen opening and clo

5. 2025.04.25, the machine was sent to the customer for software upgrade;

6. 2025.04.27, our company received two software upgrade machines (one with a small number of satellite searches and low da

complete machine, arranged for the latest corresponding debugging;

6. 2025.04.29, the GPS effect of the antenna screen is up to standard, the closed screen is abnormal, and the problem is s

Solve the problem, arrange antenna proofing for trial production;

7. 2025.05.07, the motherboard is coordinated and processed, the processing is ok, and the report is finalized;

Note: 1. This report is based on the actual debugging and testing of the debugged prototype. The environmental treatment, antenna position and assembly position of each component cannot be changed at will;

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

3. List of sensitive components: TP (material, coating, routing, etc.)
Screen (amplifier 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, filtering, LNA, power supply 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 conduct a small batch trial production before mass production to check the problem points (such as flashing screen, speaker noise, TP jump point, black screen crash, signal diving, etc.)