Debugging Report of Soward Antenna

Customer name: Lanchen

Project name: t10nm1 (10.1 inch Dongshengtai metal shell -Microstep Motherboard-AX201 Module)

Day Issue: 2025.07.07

Project Contact Details

Customer contact:

Hand mail

Machine:
box:

Soward structure:

Flas hlig ht Mail

Machine:

Phone: 0755-29985185

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Soward RF: Xiao Chunyan

Fl as h1

Machine:

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Box:swdrd005@szsward.com

PROJECT INTRO DUCTION

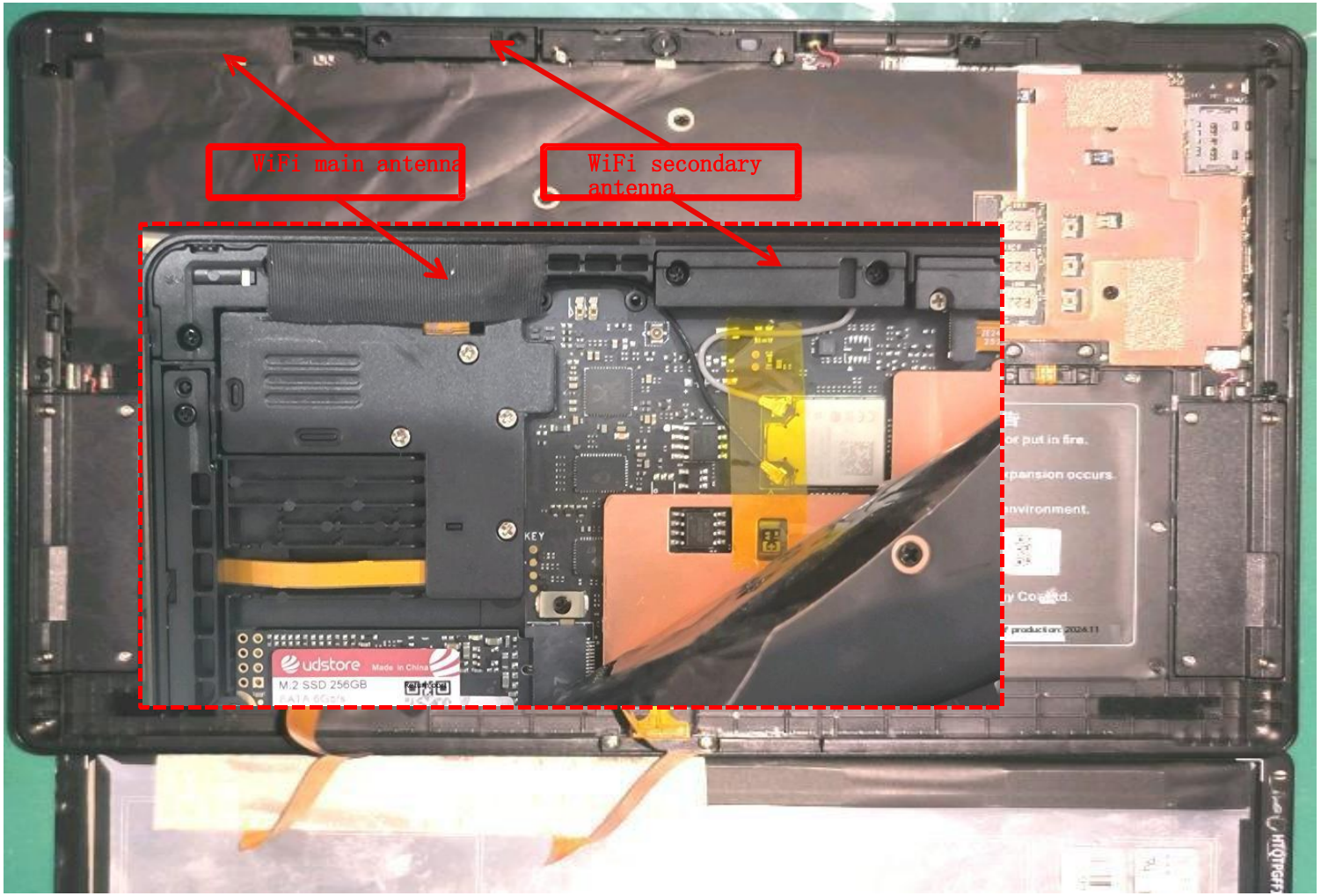
1. Project description

Number of antennas	Machine type
2	WIFI TABLET
Machine shell material: 10.1 inch Dongshengtai metal shell	

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

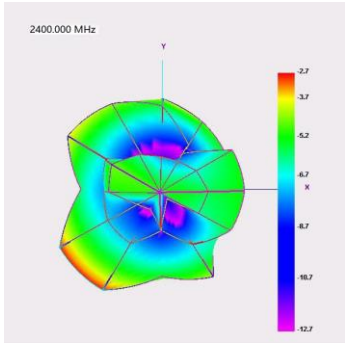
Antenna layout

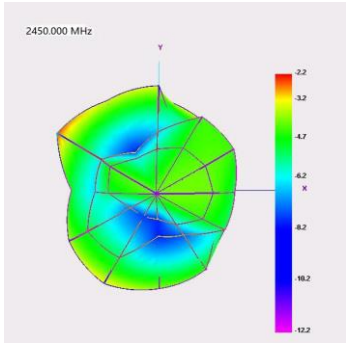


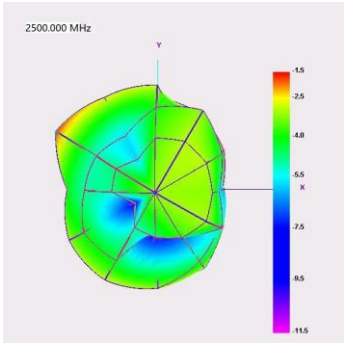
WIFI MAIN ANTENNA S11

Wifi & BT antenna efficiency - main antenna

Passive Test For 2.4Gwifi						
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	Max (dB)	Min (dB)
2400	23.16	-6.35	-2.65	-4.8	-2.65	-16.01
2410	20.94	-6.79	-3.24	-5.39	-3.24	-17.11
2420	22.91	-6.4	-2.74	-4.89	-2.74	-17.32
2430	25.45	-5.94	-2.14	-4.29	-2.14	-17.36
2440	28.24	-5.49	-1.54	-3.69	-1.54	-17.69
2450	23.72	-6.25	-2.21	-4.36	-2.21	-19.11
2460	22.92	-6.4	-2.35	-4.5	-2.35	-19.99
2470	21.28	-6.72	-3.35	-5.5	-3.35	-20.83
2480	21.8	-6.62	-3.37	-5.52	-3.37	-20.91
2490	20.55	-6.87	-2.95	-5.1	-2.95	-20.78
2500	27.29	-5.64	-1.52	-3.67	-1.52	-20.39

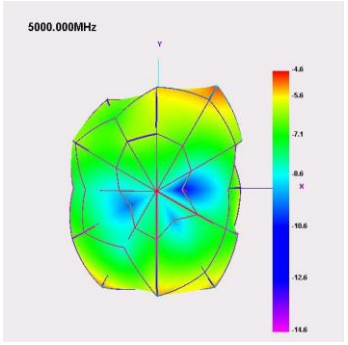


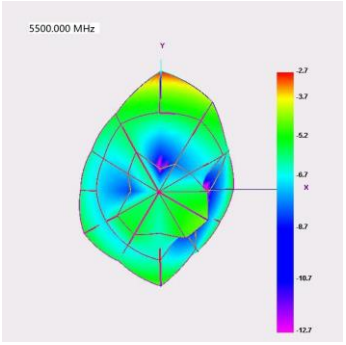


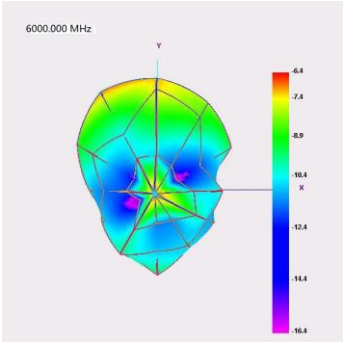


5GWIFI ANTENNA EFFICIENCY - MAIN ANTENNA

Passive Test For 5Gwifi						
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	Max (dB)	Min (dB)
5000	12.57	-9.01	-4.57	-6.72	-4.57	-30.08
5100	12.24	-9.12	-4.2	-6.35	-4.2	-26.06
5200	13.05	-8.84	-4.03	-6.18	-4.03	-21.05
5300	17.73	-7.51	-3.15	-5.3	-3.15	-17.62
5400	13.19	-8.8	-3.5	-5.65	-3.5	-17.15
5500	13.68	-8.64	-2.73	-4.88	-2.73	-19.83
5600	12.29	-9.1	-3.71	-5.86	-3.71	-20.68
5700	11.82	-9.28	-5.19	-7.34	-5.19	-22.04
5800	12.36	-9.08	-7.61	-9.76	-7.61	-22.55
5900	12.5	-9.03	-6.87	-9.02	-6.87	-20.82
6000	12.94	-8.88	-6.39	-8.54	-6.39	-25.04



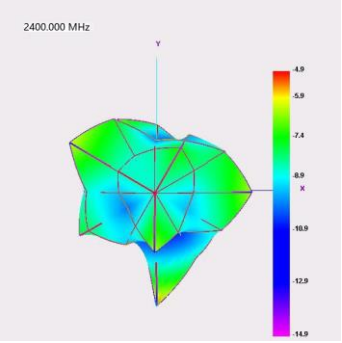


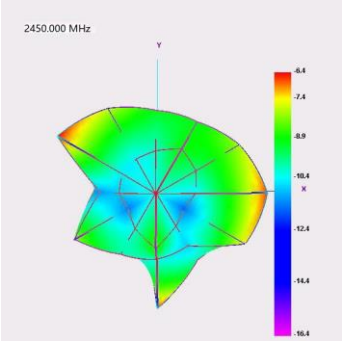


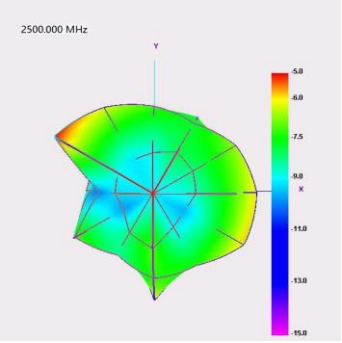
WIFI SECONDARY ANTENNA S11

Wifi & BT antenna efficiency - secondary antenna

Passive Test For 2.4Gwifi						
Freq (MHz)	Effective (%)	Effective (dB)	Gain (dBi)	Gain (dBd)	Max (dB)	Min (dB)
2400	16.08	-7.94	-4.93	-7.08	-4.93	-17.66
2410	20.61	-6.86	-5.91	-8.06	-5.91	-18.66
2420	19.88	-7.02	-5.41	-7.56	-5.41	-19.31
2430	18.46	-7.34	-5.34	-7.49	-5.34	-19.63
2440	17.23	-7.64	-5.03	-7.18	-5.03	-19.12
2450	16.91	-7.72	-6.42	-8.57	-6.42	-21.29
2460	18.13	-7.42	-6.66	-8.81	-6.66	-21.91
2470	20.05	-6.98	-7.65	-9.8	-7.65	-22.55
2480	22.44	-6.49	-7.08	-9.23	-7.08	-24.82
2490	19.61	-7.08	-6.54	-8.69	-6.54	-26.92
2500	18.66	-7.29	-5.04	-7.19	-5.04	-26.98

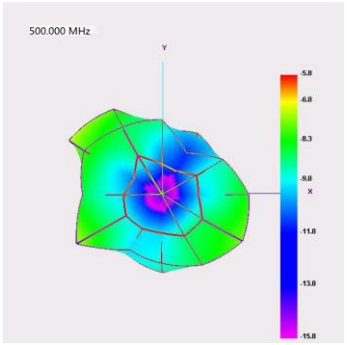


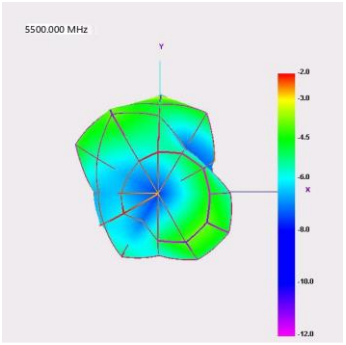


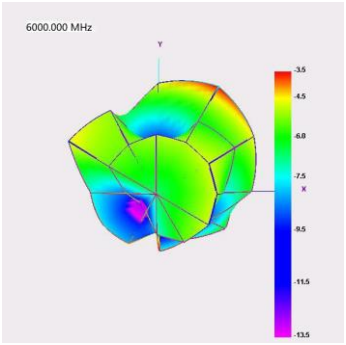


5GWIFI ANTENNA EFFICIENCY - SECONDARY ANTENNA

Passive Test For 5Gwifi						
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	Max (dB)	Min (dB)
5000	10.38	-9.84	-5.82	-7.97	-5.82	-21.56
5100	11.07	-9.56	-9.77	-11.92	-9.77	-20.27
5200	10.28	-9.88	-8.09	-10.24	-8.09	-22.31
5300	12.65	-8.98	-5.75	-7.9	-5.75	-20.8
5400	11.4	-9.43	-4.29	-6.44	-4.29	-19.57
5500	12.13	-9.16	-1.97	-4.12	-1.97	-22.26
5600	15.06	-8.22	-1.93	-4.08	-1.93	-19.11
5700	11.52	-9.39	-3.85	-6	-3.85	-25.28
5800	13.15	-8.81	-2.98	-5.13	-2.98	-18.5
5900	13.71	-8.63	-2.83	-4.98	-2.83	-18.5
6000	14.05	-8.52	-3.45	-5.6	-3.45	-20.7



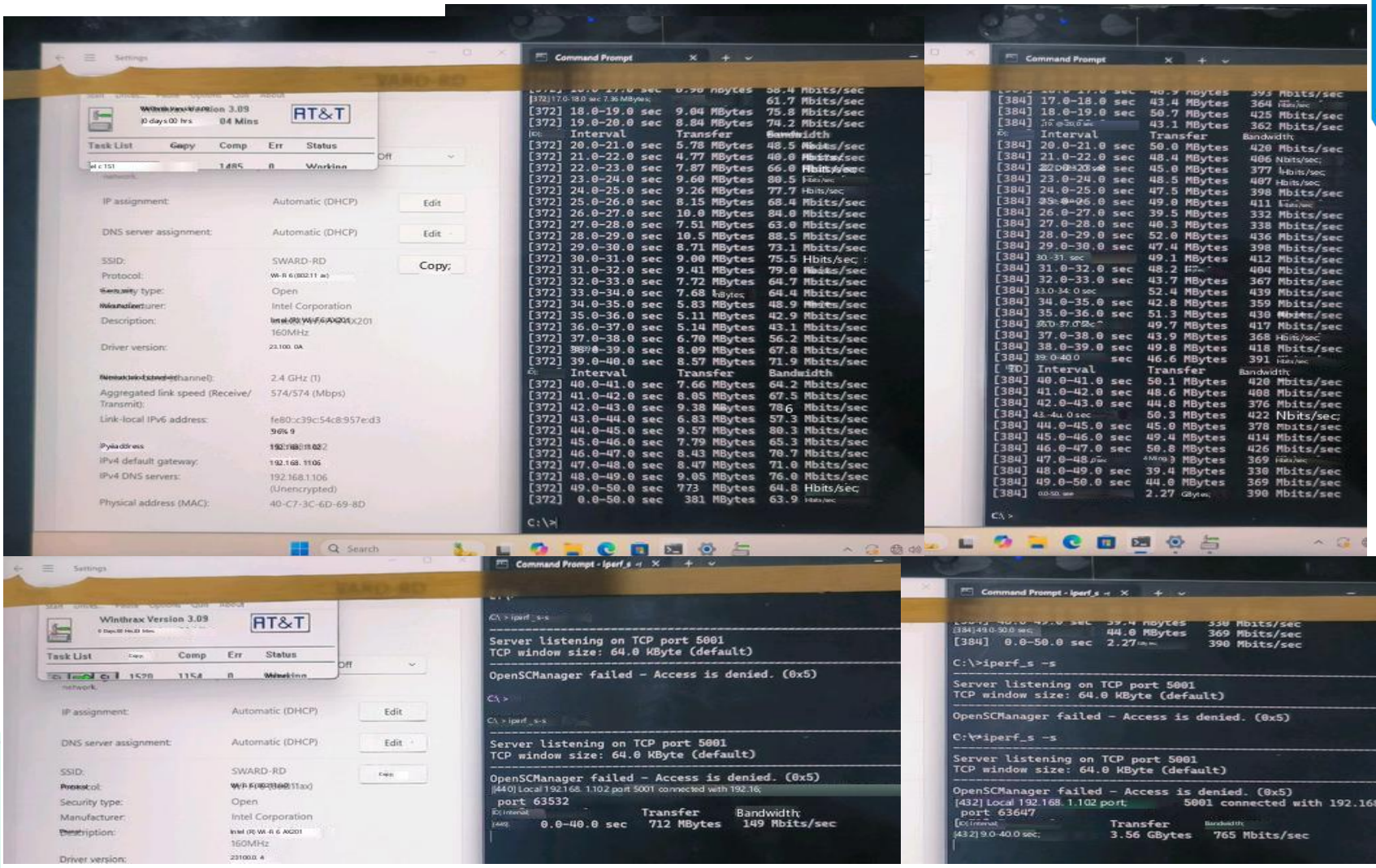




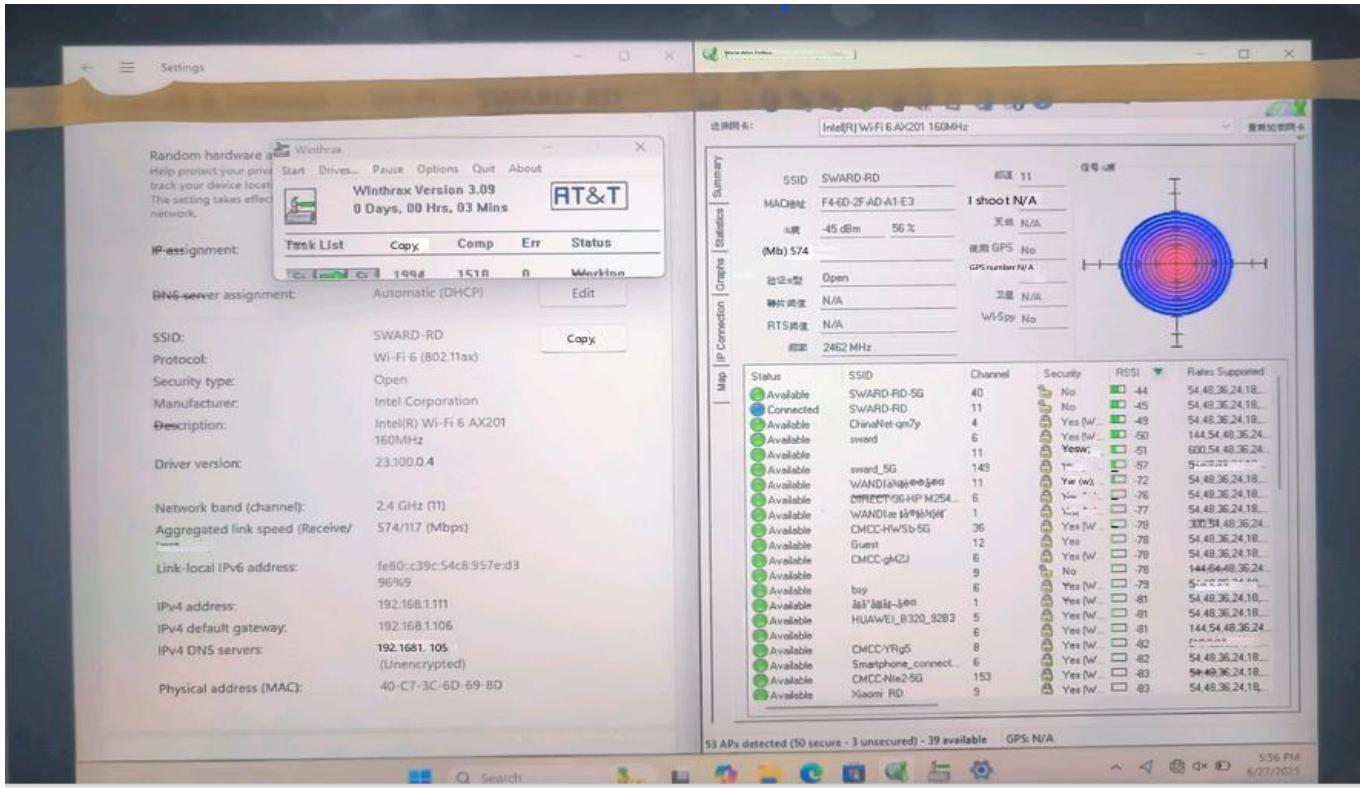
BT antenna measured distance

Test results	
Model number	1
Test environment	Soward R&D center
Test equipment	Huawei am08
Test distance	> 10 meters

WiFi Throughput

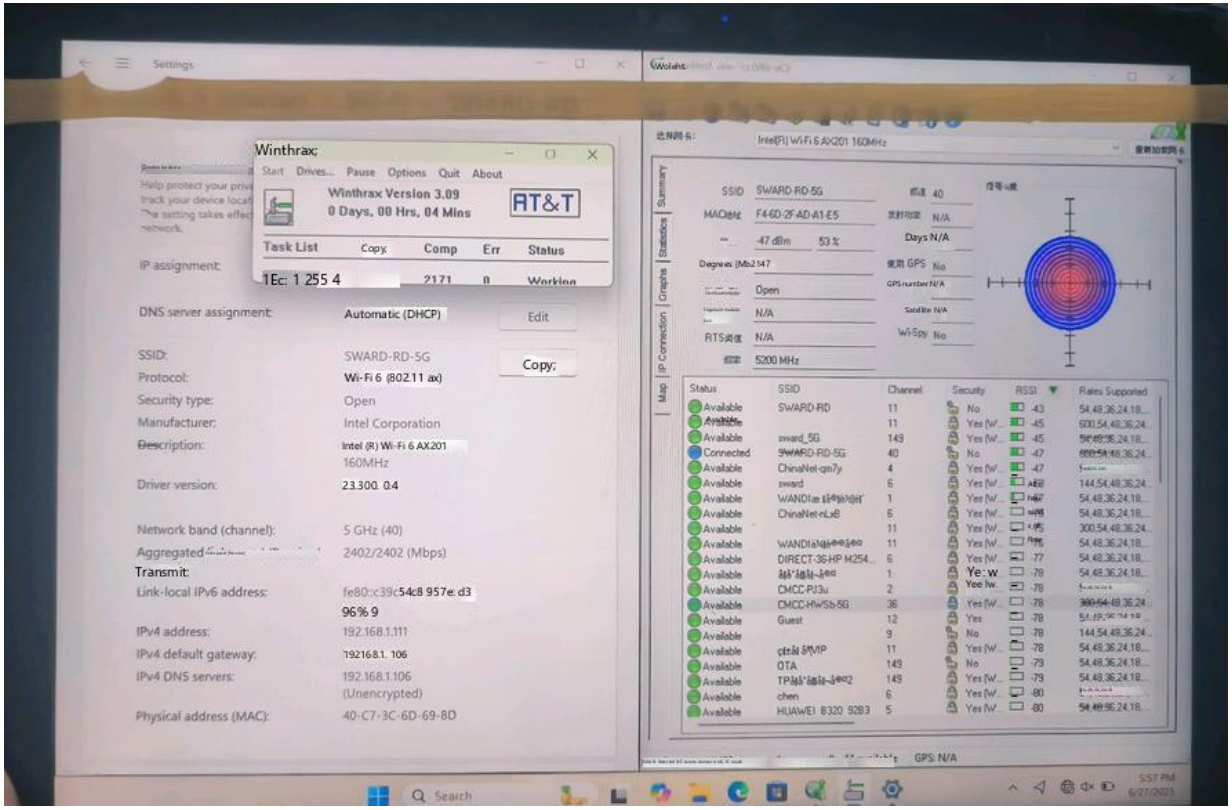


Wi-Fi antenna signal strength measurement picture (data)



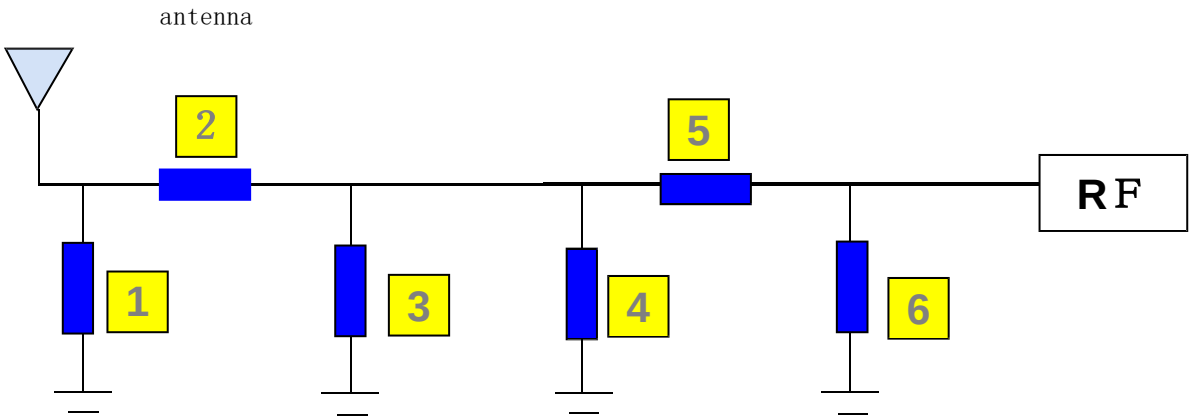
Test location	Our R&D office					
Test group	2.4G/5G-DISTANCE 15 METERS		2.4G/5G-DISTANCE 10 METERS		2.4G/5G-DISTANCE 5 METERS	
Test frequency	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi	2.4Gwifi	5Gwifi
Signal strength	-45 dBm	-47 dBm	-35dBm	-41 dBm	-32 dBm	-30 dBm

Wi-Fi antenna signal strength measurement picture (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	-45 dBm	-47 dBm	-35dBm	-41 dBm	-32 dBm	-30 dBm

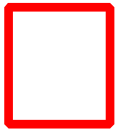
Antenna matching



The antenna matching has not been changed.

Main	1	2	3	4	5	6	remark
Raw match							
Change matching							

Environmental Handling and Assembly Instructions



1. In the red frame, the front shielding cover of the mainboard is connected to the screen ground with a 2mm conductive sponge;
2. At the blue frame, the interface of the screen cable is shielded with conductive cloth (insulated first and then shielded)

Note: The above labeling environment is not processed, and the test effect is also within the standard requirements.

Debugging record

1. 2025.06.30, received the prototype, debugged and tested according to customer requirements;

2. 2025.07.01, the debugging is basically completed, the machine is returned as required, and the report is sent on the 7t

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 (amplification circuit, LED, cable design, etc.)
Shell material (antenna assembly method, structural interference, shell material, antenna position height and area, etc.)
Motherboard (motherboard conduction, RF circuit matching, PA, dual-power device, 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 machine, some probabilistic problems cannot be completely found, it is recommended to try to solve problems in small batches before mass production (such as splash screen, horn noise, TP jump point, black screen of death, signal diving, etc.)