SWARD Antenna Debugging Report

Customer Name: Bmorn

Project name: N15LPG-8821 WIFI module

Date: 2025.08.07

Project Contact Information

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Project Introduction

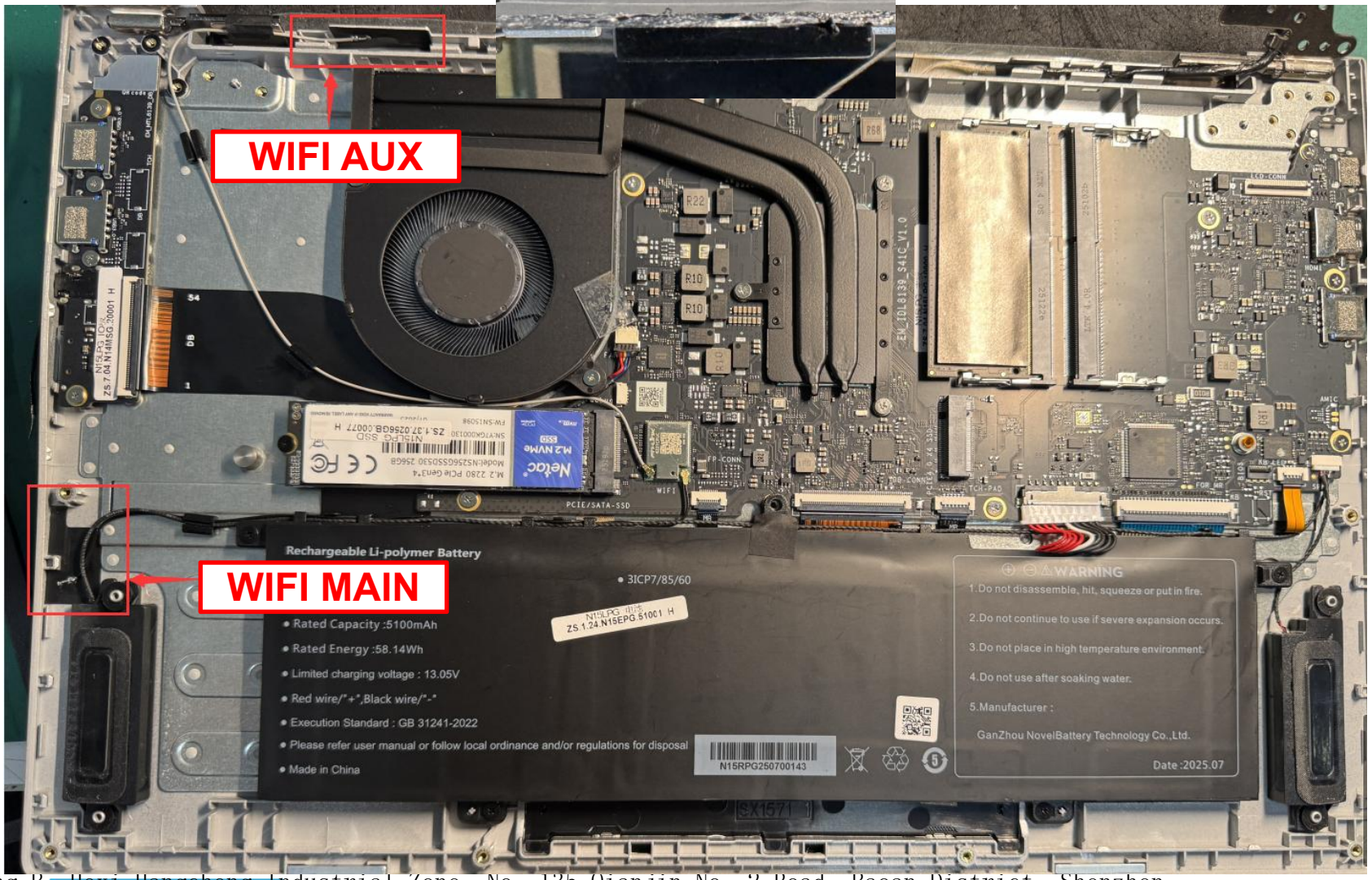
1.Project Overview

Number of antennas	Machine type
2	Notebook computer
Shell material: 15 inch plastic shell	

2.Antenna Overview

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

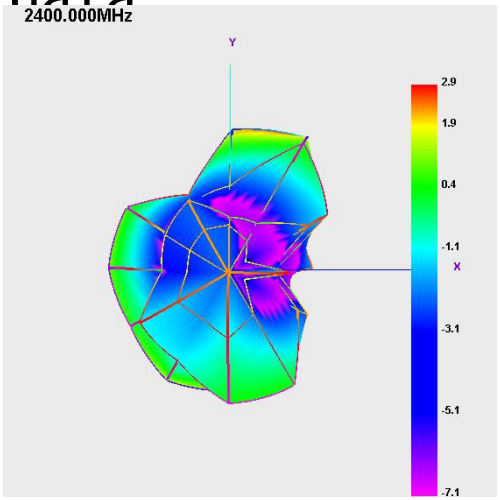
Antenna position

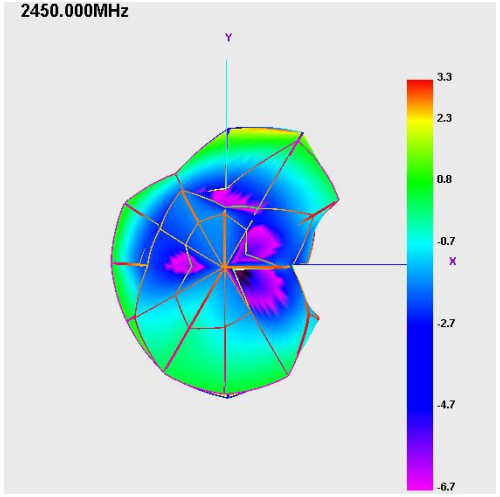


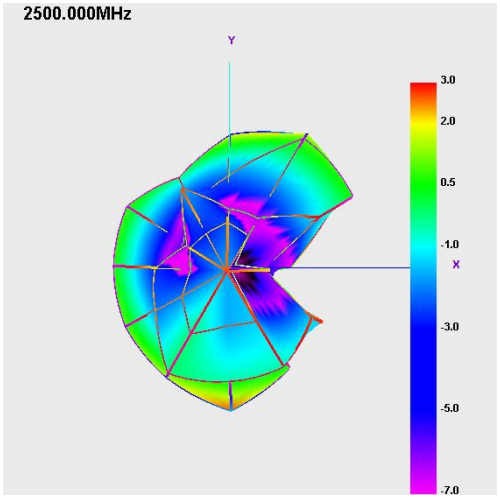
WIFI&BT MAIN S11

WIFI&BT MAIN Passive data

Passive Test For 2.4G			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	40.05	-3.97	2.9
2410	40.88	-3.89	3.02
2420	43.07	-3.66	3.25
2430	47.08	-3.27	3.63
2440	48.14	-3.18	3.88
2450	43.39	-3.63	3.33
2460	42.51	-3.71	3.33
2470	37.16	-4.3	2.56
2480	39.21	-4.07	2.68
2490	41.58	-3.81	2.84
2500	45.88	-3.38	3.02

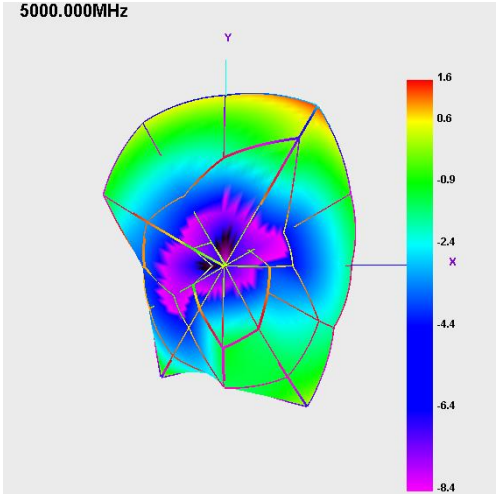


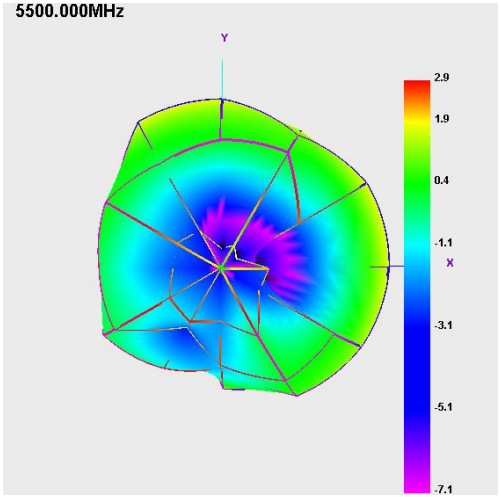


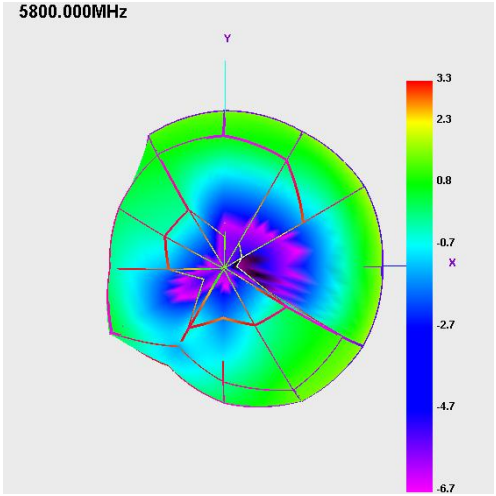


5GWIFI MAIN Passive data

Passive Test For 5G-WIFI			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
5000	37.91	-4.21	1.56
5100	40.61	-3.91	2.22
5200	38.78	-4.11	2.3
5300	42.11	-3.76	1.37
5400	50.91	-2.93	2.68
5500	43.82	-3.58	2.87
5600	45.54	-3.42	3.08
5700	46.51	-3.32	2.11
5800	57.71	-2.39	3.25
5900	41.71	-3.8	1.98
6000	50.22	-2.99	1.63



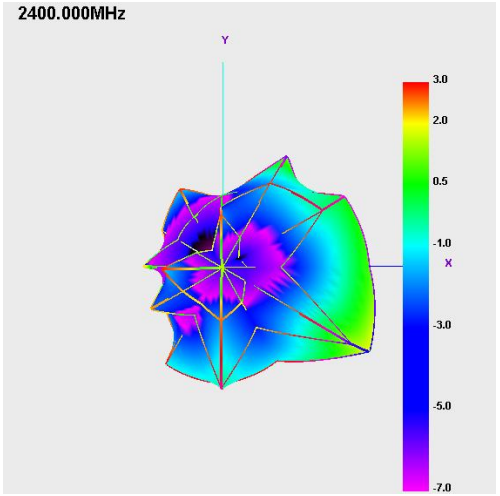


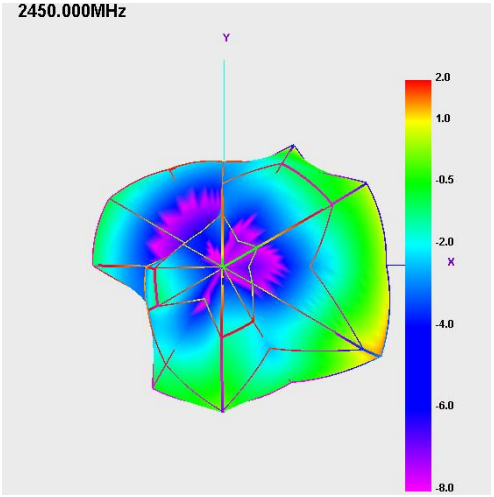


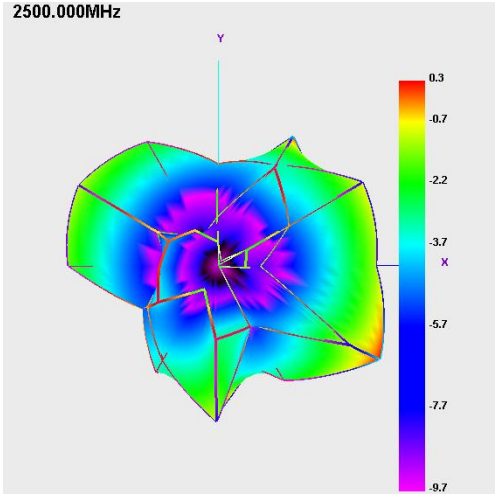
WIFI&BT AUX S11

WIFI&BT AUX Passive data

Passive Test For 2.4G			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	36.42	-4.39	2.98
2410	37.95	-4.21	2.93
2420	38.2	-4.18	2.7
2430	39.87	-3.99	2.62
2440	39.94	-3.99	2.2
2450	43.05	-3.66	2
2460	44.45	-3.52	1.51
2470	41.39	-3.83	0.99
2480	38.74	-4.12	0.57
2490	39.2	-4.07	0.36
2500	41.65	-3.8	0.32

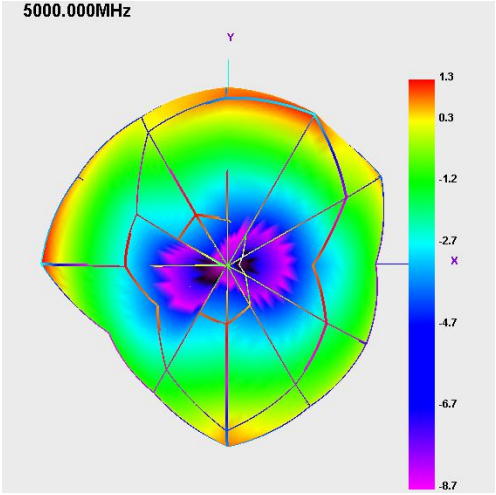


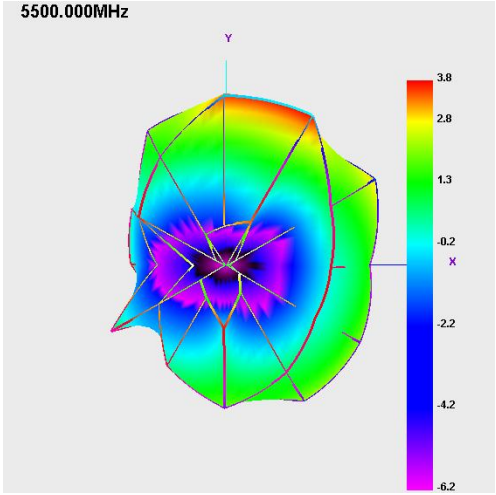


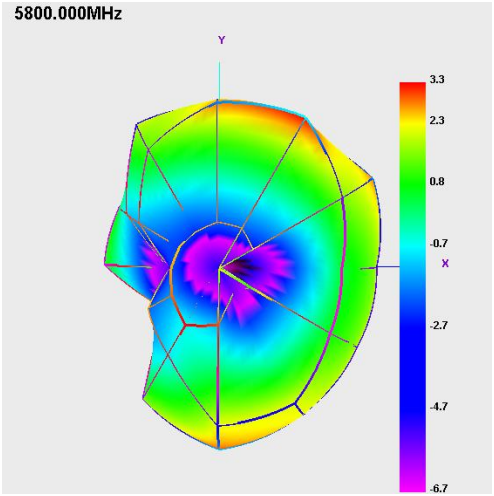


5GWIFI AUX Passive data

Passive Test For 5G-WIFI			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
5000	50.33	-2.98	1.33
5100	53.6	-2.71	2.04
5200	51.51	-2.88	1.61
5300	60.02	-2.22	2.68
5400	57.86	-2.38	3.59
5500	59.95	-2.22	3.77
5600	47.41	-3.24	2.76
5700	54.46	-2.64	3.31
5800	55.35	-2.57	3.35
5900	51.42	-2.89	2.52
6000	48.18	-3.17	1.76





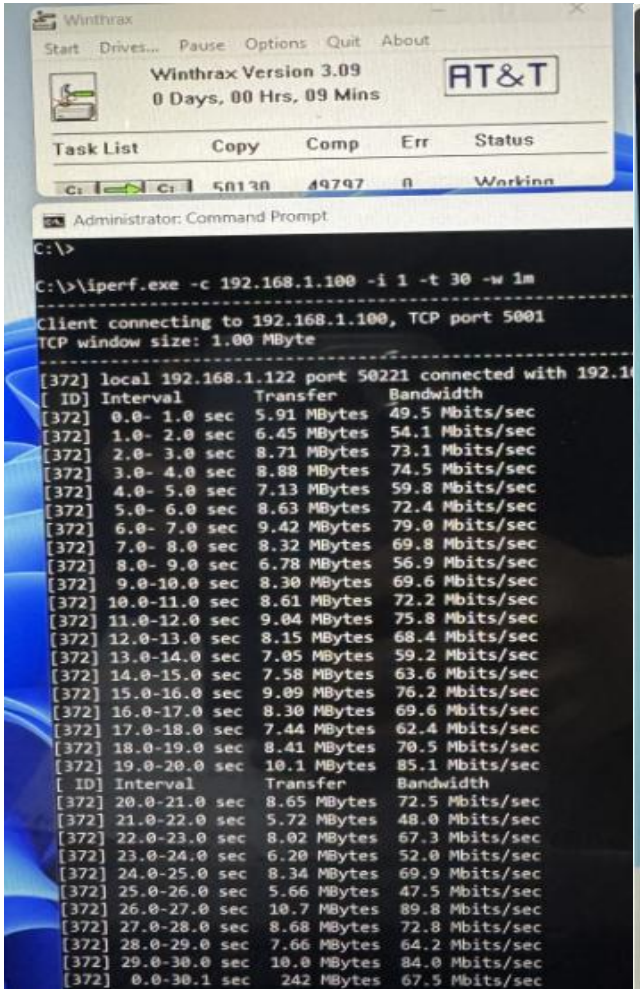


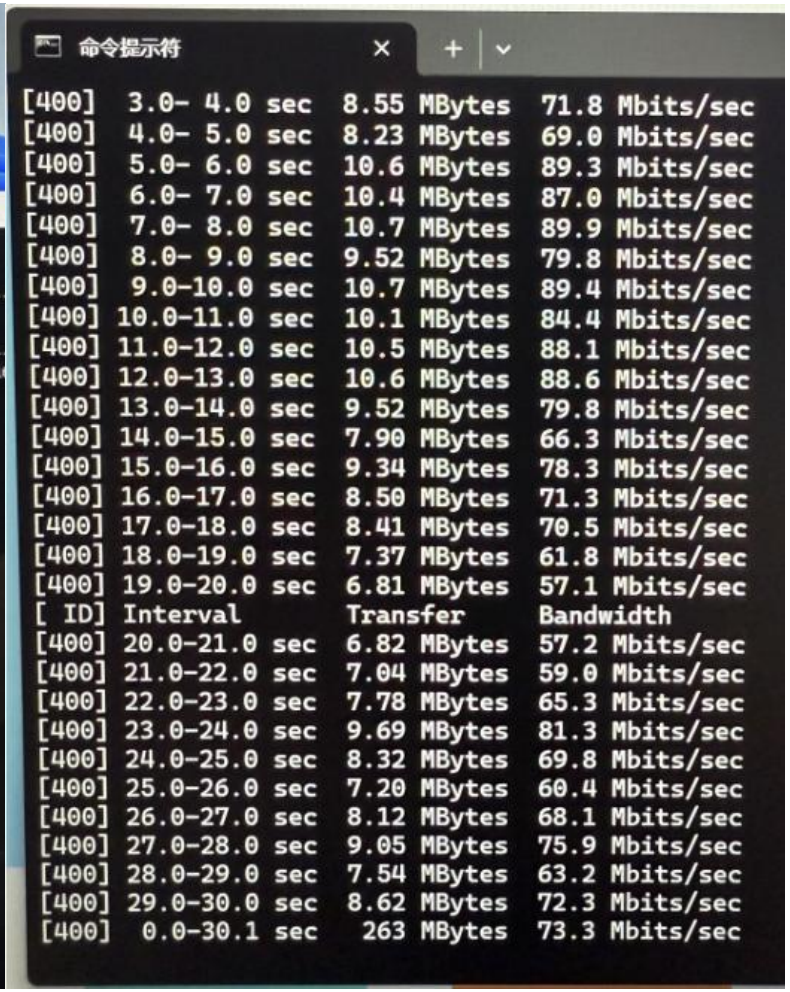
WIFI Throughput testing

Iperf Throughput testing						
Model		WIFI module	8821	Software version		
Model number	Channel	Distance	Test angle	（TX）1min mean value	（RX）1min mean value	Number of packet drops
2.4GWIFI		15 meters	0°	56.7 Mbps	75.9 Mbps	0
			90°	61.9 Mbps	71.7 Mbps	0
			180°	64.1 Mbps	75.9 Mbps	0
			270°	57.4 Mbps	72.3 Mbps	0
5GWIFI		15 meters	0°	230 Mbps	351 Mbps	0
			90°	224 Mbps	349 Mbps	0
			180°	215 Mbps	348 Mbps	0
			270°	221 Mbps	346 Mbps	0

WIFI Throughput testing（Test image）

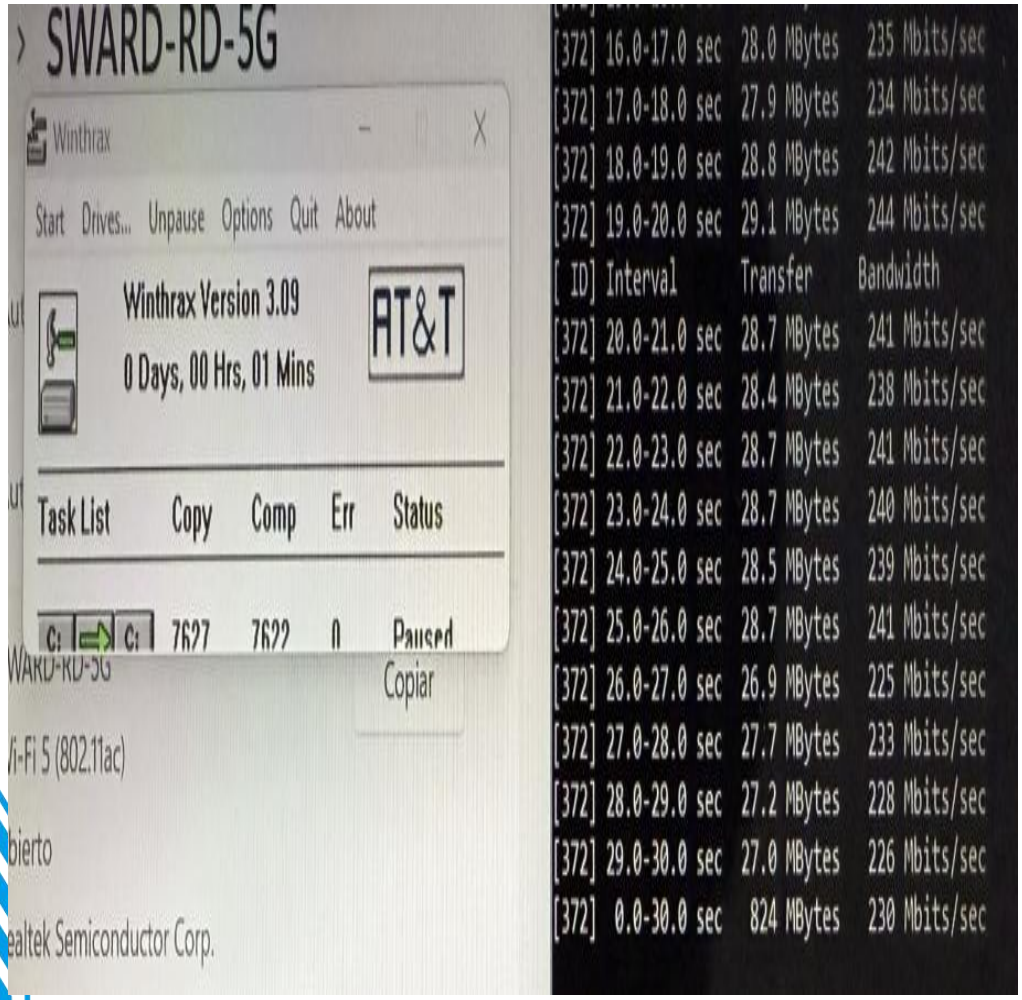
2.4Gwifi Upload/Download

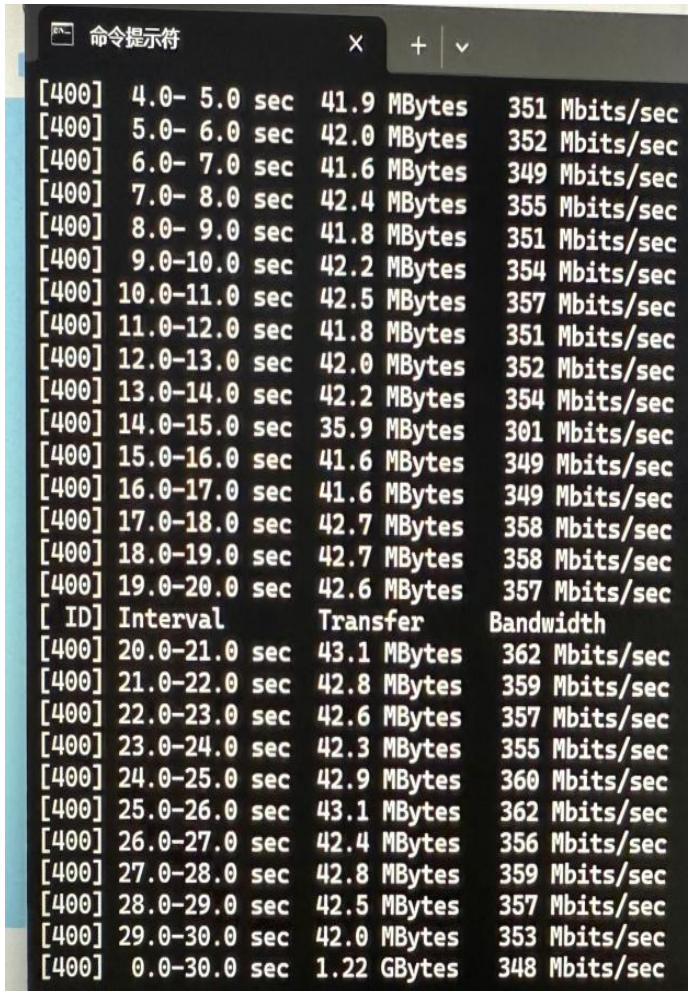




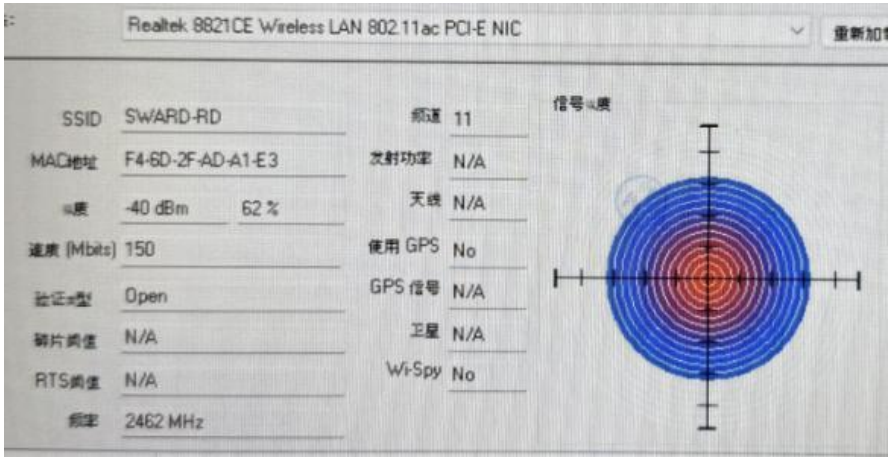
WIFI Throughput testing（Test image）

5Gwifi Upload/Download





WIFI Actual measurement image of signal strength

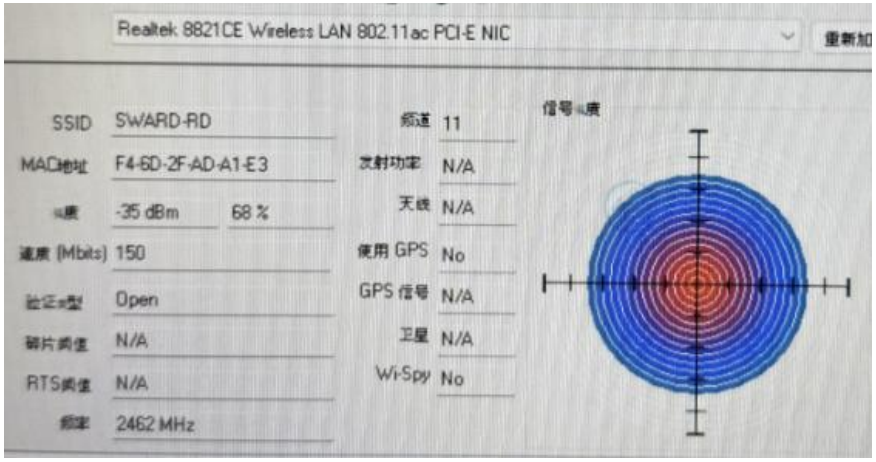


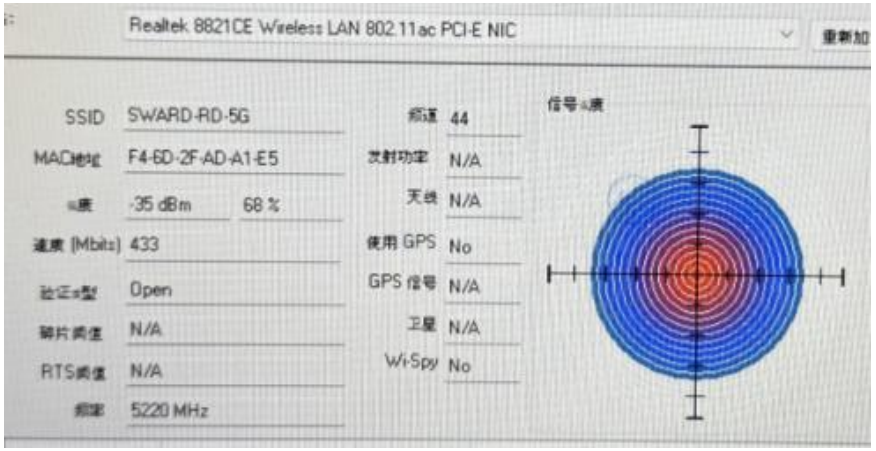
Testing location: SWARD R&D Center
Test time: 14:00-14:30
Test distance: 15 meters
Signal strength: -50dBm~-41dBm

WIFI Actual measurement image of signal strength

Testing location: SWARD R&D Center
Test time: 14:00-14:30
Test distance: 10 meters
Signal strength: -42dBm~-38dBm

WIFI Actual measurement image of signal strength





Testing location: SWARD R&D Center
Test time: 14:00-14:30
Test distance: 5 meters
Signal strength: -35dBm~-33dBm

Bluetooth test

Actual test effect	
Machine No	1
Testing environment	SWARD R&D Center
Test equipment	AM08/HUAWEI
Test distance	⩾10 meters

Note:

1. This report is based on the actual debugging and testing of the prototype, including environmental treatment, antenna position, and assembly position of each component Cannot be changed arbitrarily;
2. If there are any changes in the materials used in the prototype, please promptly provide feedback to our company for further verification;
3. List of sensitive components:
TP (Material, Coating, Wiring, etc.)
Screen (amplifier 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, filtering, LNA, power circuit, etc.)
Camera, battery, motor MIC、 Fingerprint recognition module, etc
4. Due to the small number or only one sample testing machine, some probabilistic issues cannot be fully identified. It is recommended to conduct a small batch trial production before mass production to investigate the problem points (such as flashing screens, speaker noise, TP jump points, black screen crashes, signal drops, etc.)