

SWARD Antenna Debugging Report

Customer Name: Bmorn

Project name: N14JP7-8821 WIFI module

Date: 2025. 08. 21

Project Contact Information

Customer contact:
Phone number:
Email:

Sward structure:
Phone number:
Landline number: 0755-29985185
Email: yangwende@szsward.com

Sward RF: Yangwende
Phone number: 176 7457 9060
Landline number: 0755-29985185
Email: yangwende@szsward.com

Project Introduction

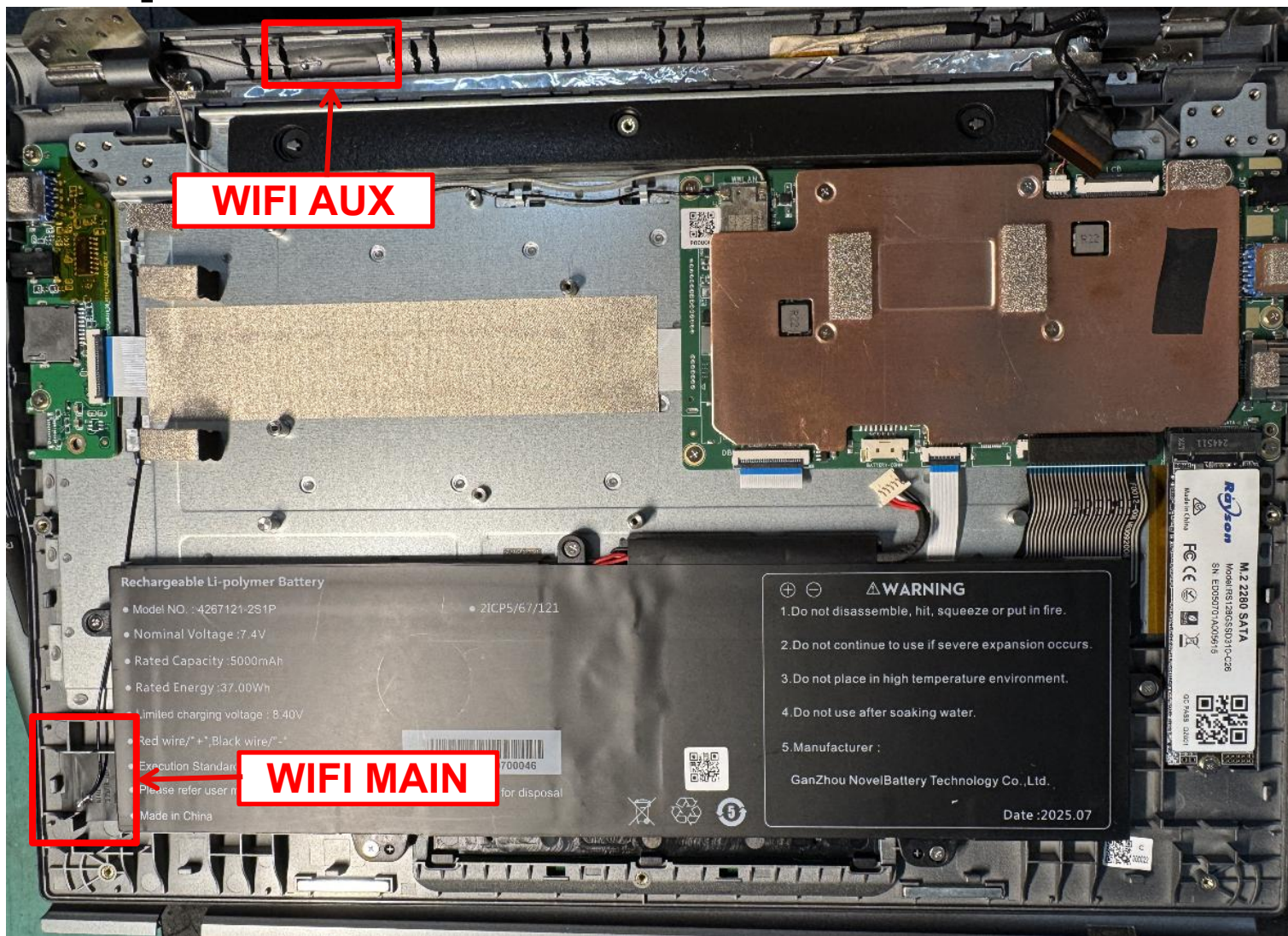
1. Project Overview

Number of antennas	Machine type
2	Notebook computer
Shell material: 14 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

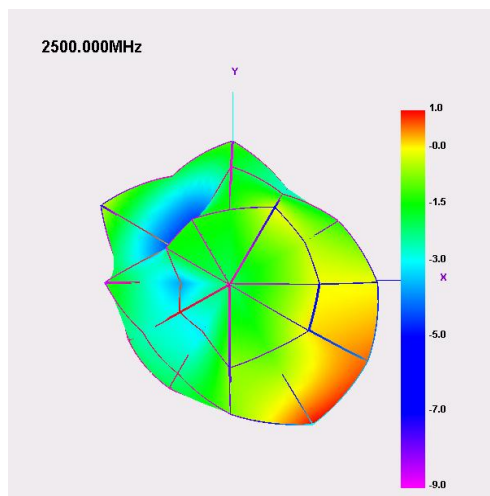
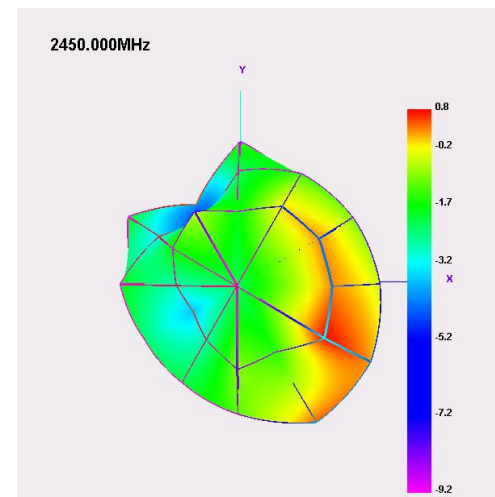
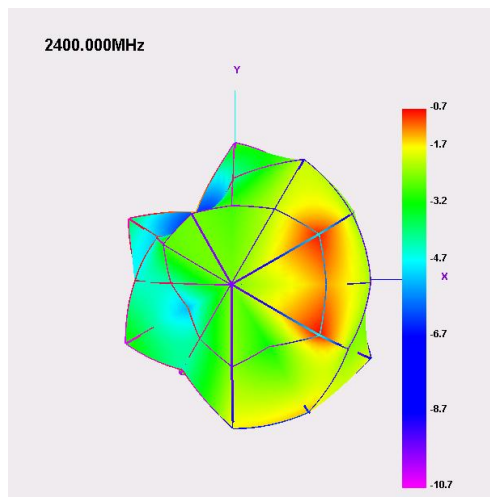


WIFI&BT MAIN S11



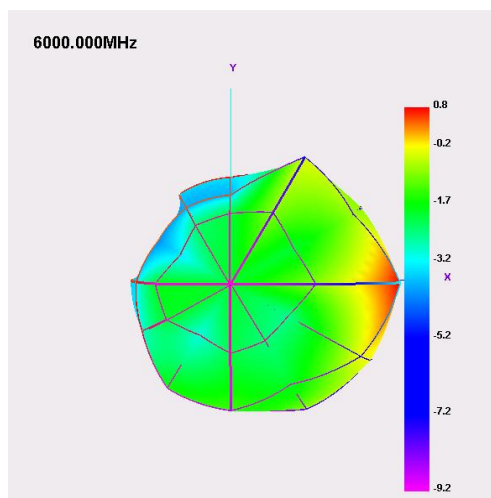
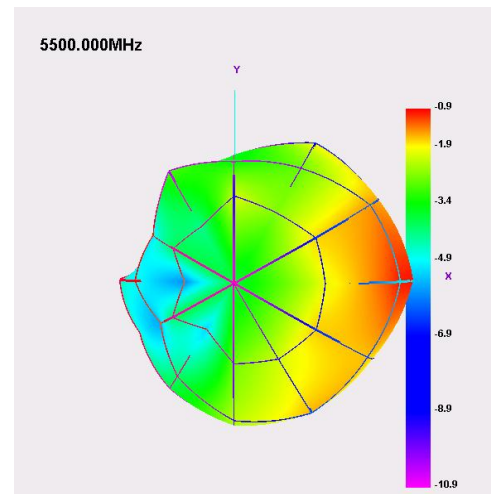
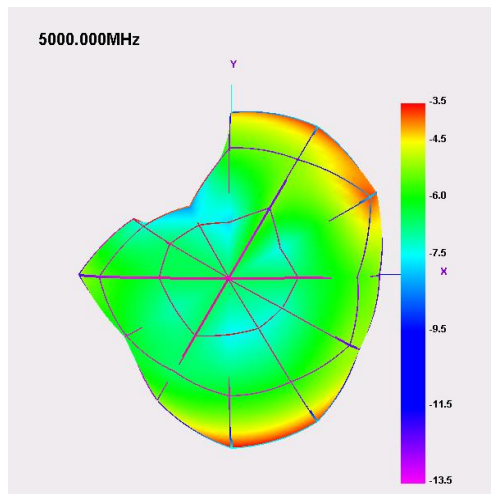
WIFI&BT **MAIN** Passive data

Passive Test For 2.4G			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
2400	33.74	-4.72	-0.67
2410	34.62	-4.61	-0.43
2420	39.52	-4.03	0.26
2430	44.54	-3.51	0.85
2440	46.91	-3.29	1.11
2450	44.09	-3.56	0.76
2460	45.97	-3.38	0.7
2470	44.11	-3.55	0.31
2480	46.31	-3.34	0.76
2490	48.46	-3.15	0.91
2500	48.26	-3.16	0.96



5GWIFI MAIN Passive data

Passive Test For 5G-WIFI			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
5000	14.62	-8.35	-3.52
5100	20.48	-6.89	-2.43
5200	24.98	-6.02	-1.26
5300	30.96	-5.09	-0.81
5400	32.32	-4.91	0.16
5500	25.82	-5.88	-0.85
5600	27.58	-5.59	-0.6
5700	28.43	-5.46	-0.44
5800	25.76	-5.89	0.67
5900	28.07	-5.52	-0.35
6000	27.77	-5.56	0.84

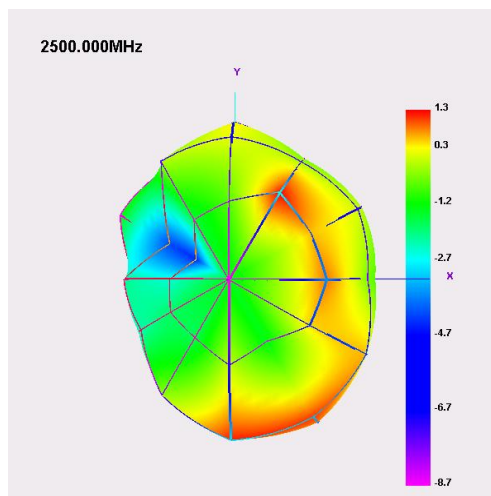
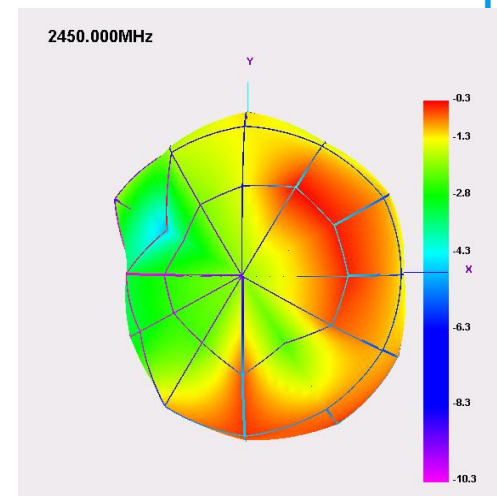
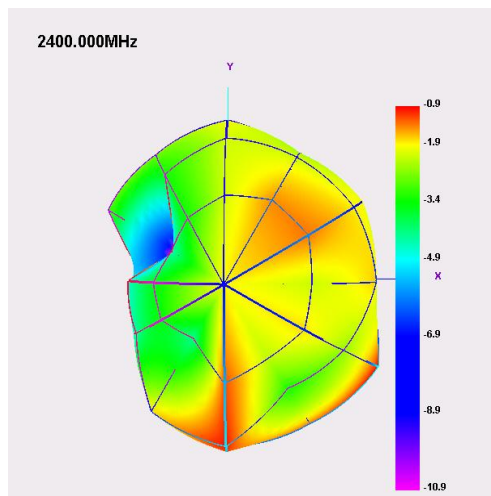


WIFI&BT AUX S11



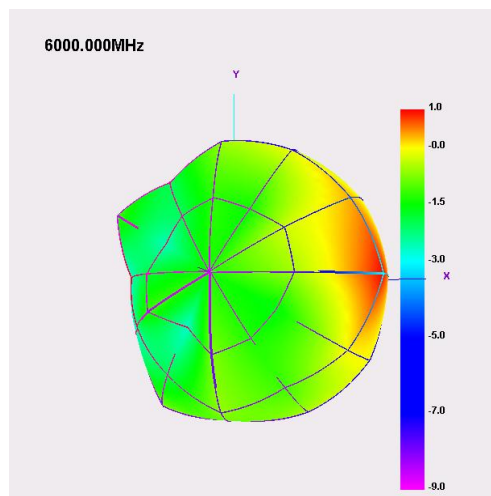
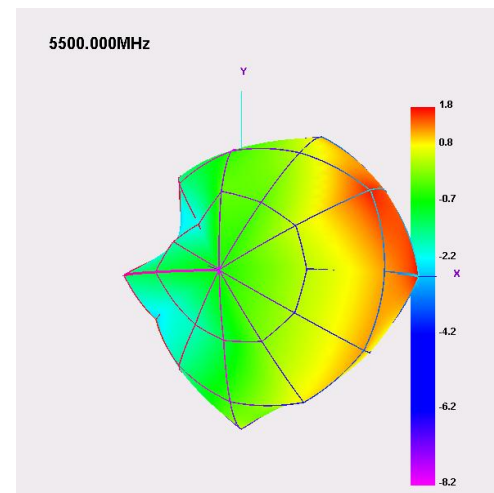
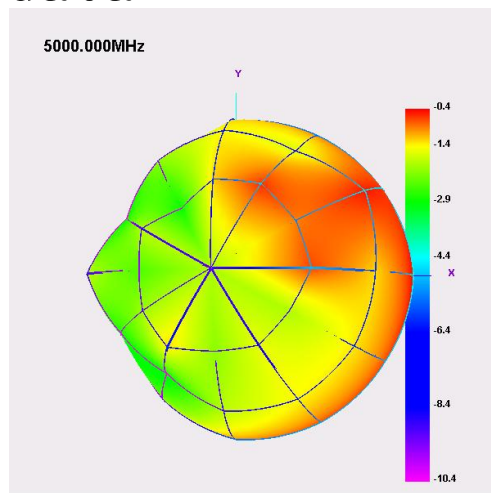
WIFI&BT **AUX** Passive data

Passive Test For 2.4G			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
2400	32.92	-4.82	-0.86
2410	41.31	-3.84	-0.83
2420	37.72	-4.23	-0.05
2430	39.78	-4	-0.09
2440	33.94	-4.69	0.11
2450	33.35	-4.77	-0.29
2460	34.04	-4.68	0.14
2470	42.42	-3.72	0.1
2480	44.55	-3.51	0.5
2490	47.17	-3.26	0.93
2500	42.02	-3.77	1.28



5GWIFI AUX Passive data

Passive Test For 5G-WIFI			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
5000	36.45	-4.38	-0.43
5100	29.21	-5.35	-0.76
5200	33.19	-4.79	-0.12
5300	37.89	-4.21	0.99
5400	50.34	-2.98	2.77
5500	42.5	-3.72	1.82
5600	35.45	-4.5	0.52
5700	36.47	-4.38	0.72
5800	34.68	-4.6	0.93
5900	33.35	-4.77	0.94
6000	34.02	-4.68	1

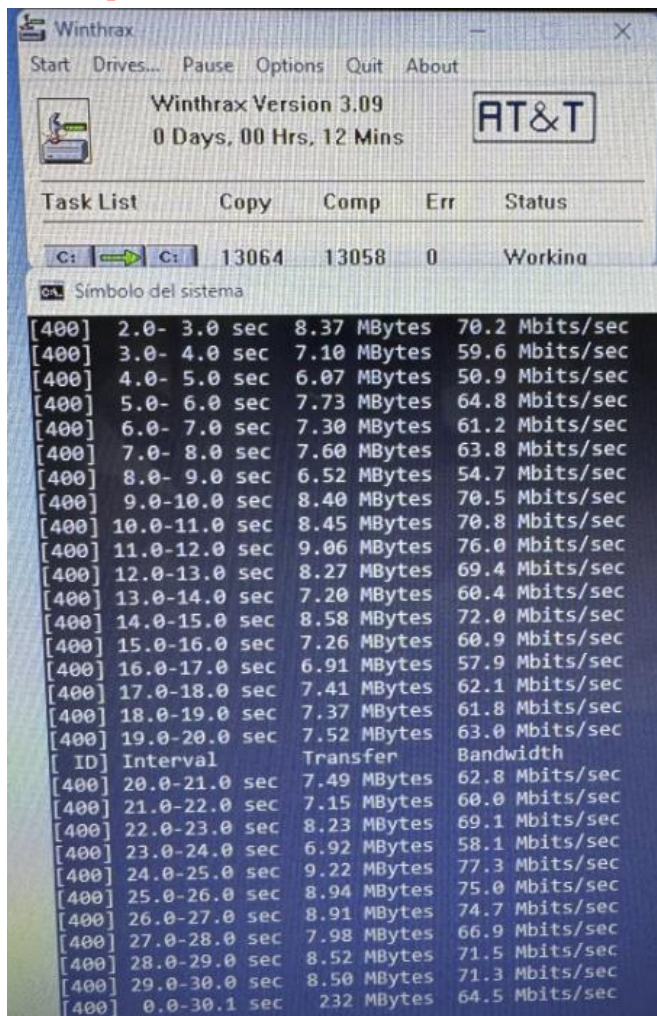


WIFI Throughput testing

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°	64.5 Mbps	93.1 Mbps	0
			90°	63.8 Mbps	95.6 Mbps	0
			180°	66.7 Mbps	96.4 Mbps	0
			270°	62.9 Mbps	97.2 Mbps	0
5GWIFI		15 meters	0°	238 Mbps	304 Mbps	0
			90°	244 Mbps	311 Mbps	0
			180°	251 Mbps	305 Mbps	0
			270°	240 Mbps	308 Mbps	0

WIFI Throughput testing (Test image)

2.4Gwifi Upload/Download



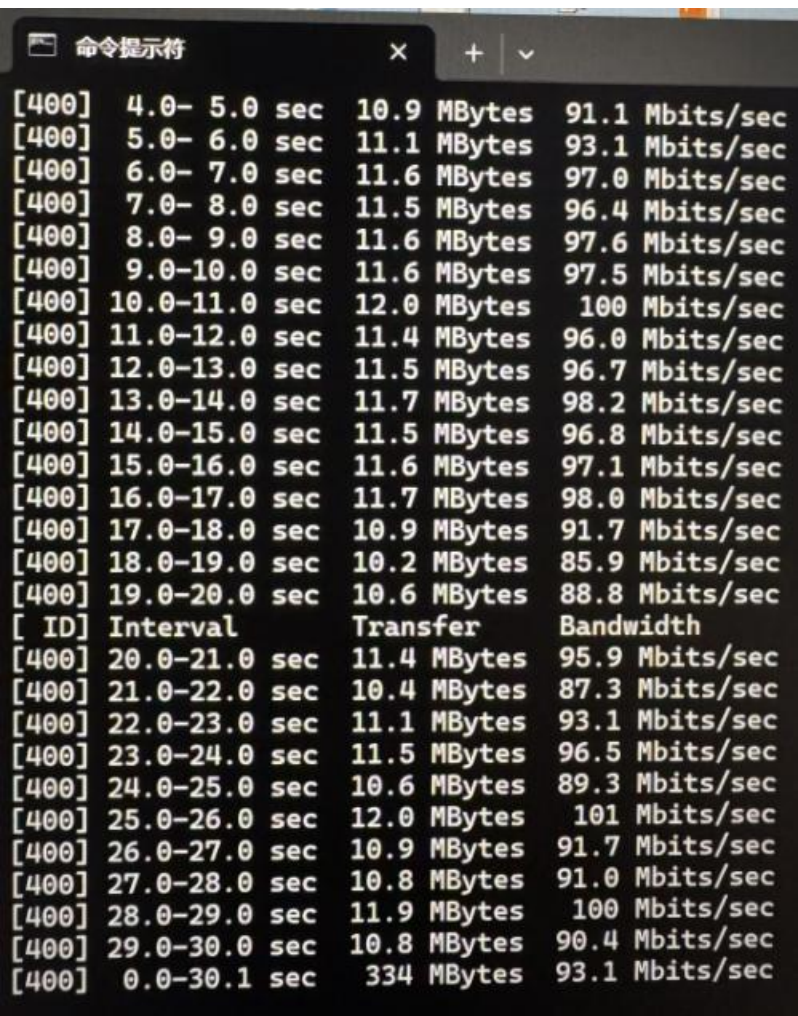
Wintrax Version 3.09
0 Days, 00 Hrs, 12 Mins

Task List

Copy	Comp	Err	Status
C: → C:	13064	13058	0 Working

Símbolo del sistema

Interval	Transfer	Bandwidth
[400] 2.0- 3.0 sec	8.37 MBytes	70.2 Mb/s
[400] 3.0- 4.0 sec	7.10 MBytes	59.6 Mb/s
[400] 4.0- 5.0 sec	6.07 MBytes	50.9 Mb/s
[400] 5.0- 6.0 sec	7.73 MBytes	64.8 Mb/s
[400] 6.0- 7.0 sec	7.30 MBytes	61.2 Mb/s
[400] 7.0- 8.0 sec	7.60 MBytes	63.8 Mb/s
[400] 8.0- 9.0 sec	6.52 MBytes	54.7 Mb/s
[400] 9.0-10.0 sec	8.40 MBytes	70.5 Mb/s
[400] 10.0-11.0 sec	8.45 MBytes	70.8 Mb/s
[400] 11.0-12.0 sec	9.06 MBytes	76.0 Mb/s
[400] 12.0-13.0 sec	8.27 MBytes	69.4 Mb/s
[400] 13.0-14.0 sec	7.20 MBytes	60.4 Mb/s
[400] 14.0-15.0 sec	8.58 MBytes	72.0 Mb/s
[400] 15.0-16.0 sec	7.26 MBytes	60.9 Mb/s
[400] 16.0-17.0 sec	6.91 MBytes	57.9 Mb/s
[400] 17.0-18.0 sec	7.41 MBytes	62.1 Mb/s
[400] 18.0-19.0 sec	7.37 MBytes	61.8 Mb/s
[400] 19.0-20.0 sec	7.52 MBytes	63.0 Mb/s
[ID] Interval	Transfer	Bandwidth
[400] 20.0-21.0 sec	7.49 MBytes	62.8 Mb/s
[400] 21.0-22.0 sec	7.15 MBytes	60.0 Mb/s
[400] 22.0-23.0 sec	8.23 MBytes	69.1 Mb/s
[400] 23.0-24.0 sec	6.92 MBytes	58.1 Mb/s
[400] 24.0-25.0 sec	9.22 MBytes	77.3 Mb/s
[400] 25.0-26.0 sec	8.94 MBytes	75.0 Mb/s
[400] 26.0-27.0 sec	8.91 MBytes	74.7 Mb/s
[400] 27.0-28.0 sec	7.98 MBytes	66.9 Mb/s
[400] 28.0-29.0 sec	8.52 MBytes	71.5 Mb/s
[400] 29.0-30.0 sec	8.50 MBytes	71.3 Mb/s
[400] 0.0-30.1 sec	232 MBytes	64.5 Mb/s

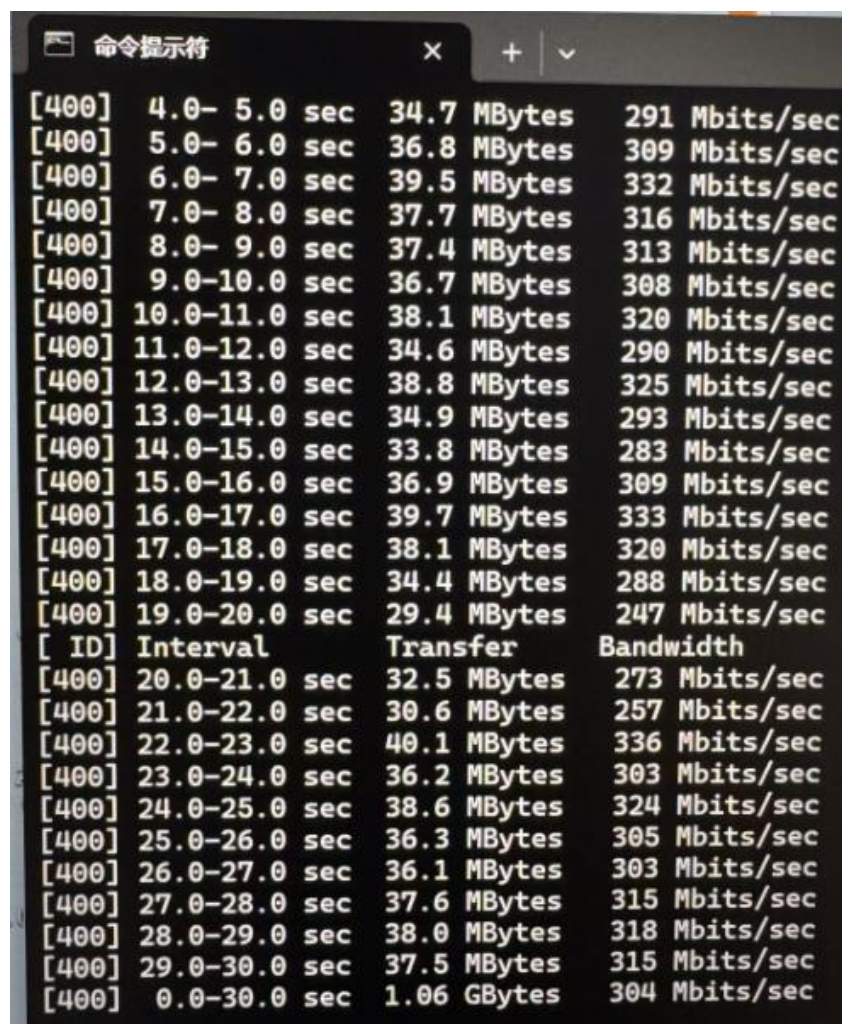


Interval	Transfer	Bandwidth
[400] 4.0- 5.0 sec	10.9 MBytes	91.1 Mb/s
[400] 5.0- 6.0 sec	11.1 MBytes	93.1 Mb/s
[400] 6.0- 7.0 sec	11.6 MBytes	97.0 Mb/s
[400] 7.0- 8.0 sec	11.5 MBytes	96.4 Mb/s
[400] 8.0- 9.0 sec	11.6 MBytes	97.6 Mb/s
[400] 9.0-10.0 sec	11.6 MBytes	97.5 Mb/s
[400] 10.0-11.0 sec	12.0 MBytes	100 Mb/s
[400] 11.0-12.0 sec	11.4 MBytes	96.0 Mb/s
[400] 12.0-13.0 sec	11.5 MBytes	96.7 Mb/s
[400] 13.0-14.0 sec	11.7 MBytes	98.2 Mb/s
[400] 14.0-15.0 sec	11.5 MBytes	96.8 Mb/s
[400] 15.0-16.0 sec	11.6 MBytes	97.1 Mb/s
[400] 16.0-17.0 sec	11.7 MBytes	98.0 Mb/s
[400] 17.0-18.0 sec	10.9 MBytes	91.7 Mb/s
[400] 18.0-19.0 sec	10.2 MBytes	85.9 Mb/s
[400] 19.0-20.0 sec	10.6 MBytes	88.8 Mb/s
[ID] Interval	Transfer	Bandwidth
[400] 20.0-21.0 sec	11.4 MBytes	95.9 Mb/s
[400] 21.0-22.0 sec	10.4 MBytes	87.3 Mb/s
[400] 22.0-23.0 sec	11.1 MBytes	93.1 Mb/s
[400] 23.0-24.0 sec	11.5 MBytes	96.5 Mb/s
[400] 24.0-25.0 sec	10.6 MBytes	89.3 Mb/s
[400] 25.0-26.0 sec	12.0 MBytes	101 Mb/s
[400] 26.0-27.0 sec	10.9 MBytes	91.7 Mb/s
[400] 27.0-28.0 sec	10.8 MBytes	91.0 Mb/s
[400] 28.0-29.0 sec	11.9 MBytes	100 Mb/s
[400] 29.0-30.0 sec	10.8 MBytes	90.4 Mb/s
[400] 0.0-30.1 sec	334 MBytes	93.1 Mb/s

WIFI Throughput testing (Test image)

5Gwifi Upload/Download

The image shows a screenshot of the Winthrax software interface. At the top, there is a title bar with the text "Winthrax" and a standard Windows-style menu bar with "Start", "Drives...", "Pause", "Options", "Quit", and "About". Below the menu bar, the version "Winthrax Version 3.09" and the time "0 Days, 00 Hrs, 04 Mins" are displayed. On the right side, there is a logo for "AT&T". The main window is divided into two sections. The top section, titled "Task List", contains a table with columns "Copy", "Comp", "Err", and "Status". It shows a single task: "C:\ → C:\" with values "4334", "4329", "0", and "Working". The bottom section, titled "Simbolo del sistema", displays a table of throughput test results. The table has four columns: "[400]", "Interval", "Transfer", and "Bandwidth". It lists 30 test intervals, each with its corresponding transfer size in MBytes and bandwidth in Mbts/sec. The final row shows the overall average: "0.0-30.0 sec", "850 MBytes", and "238 Mbts/sec".



命令提示符

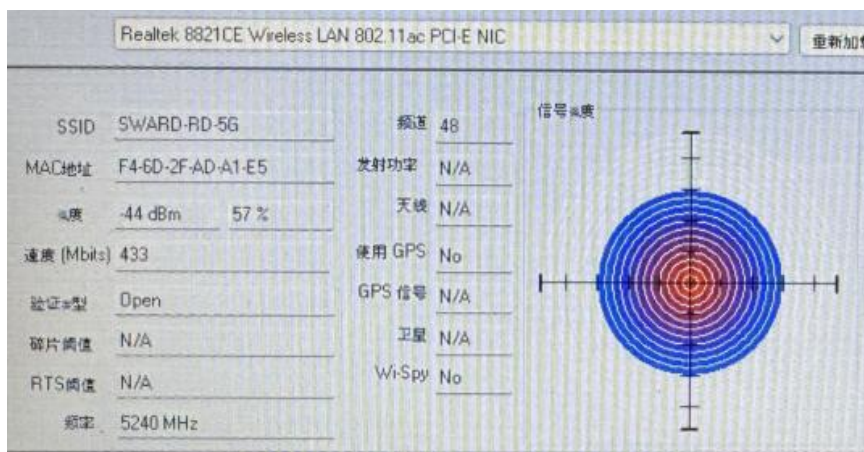
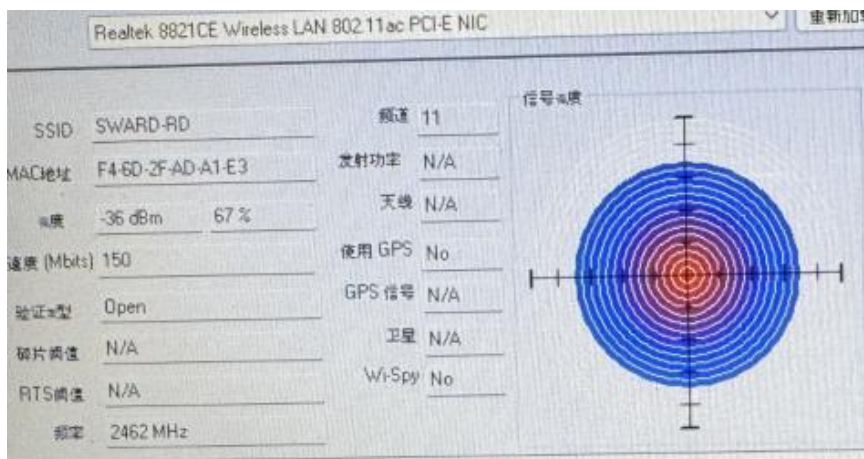
[400]	Interval	Transfer	Bandwidth
[400]	4.0- 5.0 sec	34.7 MBytes	291 Mbts/sec
[400]	5.0- 6.0 sec	36.8 MBytes	309 Mbts/sec
[400]	6.0- 7.0 sec	39.5 MBytes	332 Mbts/sec
[400]	7.0- 8.0 sec	37.7 MBytes	316 Mbts/sec
[400]	8.0- 9.0 sec	37.4 MBytes	313 Mbts/sec
[400]	9.0-10.0 sec	36.7 MBytes	308 Mbts/sec
[400]	10.0-11.0 sec	38.1 MBytes	320 Mbts/sec
[400]	11.0-12.0 sec	34.6 MBytes	290 Mbts/sec
[400]	12.0-13.0 sec	38.8 MBytes	325 Mbts/sec
[400]	13.0-14.0 sec	34.9 MBytes	293 Mbts/sec
[400]	14.0-15.0 sec	33.8 MBytes	283 Mbts/sec
[400]	15.0-16.0 sec	36.9 MBytes	309 Mbts/sec
[400]	16.0-17.0 sec	39.7 MBytes	333 Mbts/sec
[400]	17.0-18.0 sec	38.1 MBytes	320 Mbts/sec
[400]	18.0-19.0 sec	34.4 MBytes	288 Mbts/sec
[400]	19.0-20.0 sec	29.4 MBytes	247 Mbts/sec
[ID]	Interval	Transfer	Bandwidth
[400]	20.0-21.0 sec	32.5 MBytes	273 Mbts/sec
[400]	21.0-22.0 sec	30.6 MBytes	257 Mbts/sec
[400]	22.0-23.0 sec	40.1 MBytes	336 Mbts/sec
[400]	23.0-24.0 sec	36.2 MBytes	303 Mbts/sec
[400]	24.0-25.0 sec	38.6 MBytes	324 Mbts/sec
[400]	25.0-26.0 sec	36.3 MBytes	305 Mbts/sec
[400]	26.0-27.0 sec	36.1 MBytes	303 Mbts/sec
[400]	27.0-28.0 sec	37.6 MBytes	315 Mbts/sec
[400]	28.0-29.0 sec	38.0 MBytes	318 Mbts/sec
[400]	29.0-30.0 sec	37.5 MBytes	315 Mbts/sec
[400]	0.0-30.0 sec	1.06 GBytes	304 Mbts/sec

WIFI Actual measurement image of signal strength



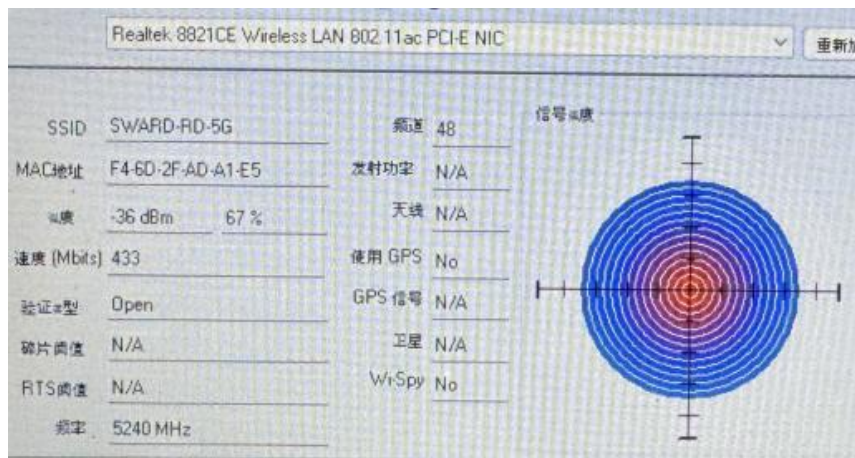
Testing location: SWARD R&D Center
Test time: 14:00-14:30
Test distance: 15 meters
Signal strength: -50dBm~-41dBm

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: -39dBm~-36dBm

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: -33dBm~-30dBm

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.)