

SWARD Antenna Debugging Report

Customer Nam: Vastking

Project Name: M50-B-12.7" Metal

Enclosure - English Keyboard T30 Motherboard - T7300
Main Controller

Date: 2026. 01. 28

Project Contact Information

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Project Introduction

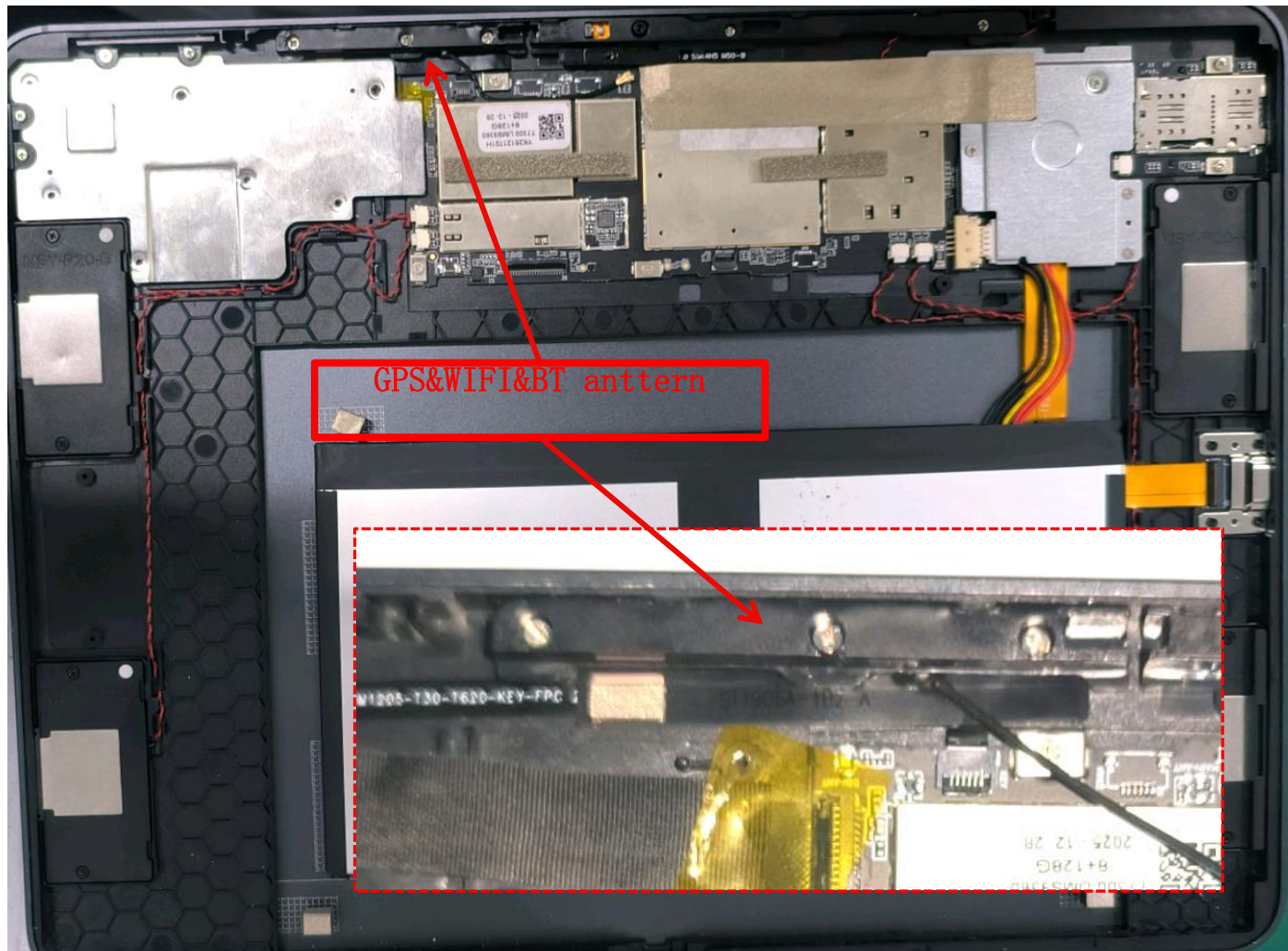
1. Project Brief

Number of project antennas	Machine type
1	tablet
Whole machine casing material: 12.7-inch metal shell	

2. Antenna Overview

Antenna number	name	Working frequency band/MHz	Material/Struct ure
1	WIFI&GPS&BT&5Gwifi	2400MHz/2500MHz & 1575MHz & 5.8GHz	FPC

Antenna layout



WIFI&GPS&BT antenna S11



WiFi throughput

Iperf throughput test						
model	M50-B -English card T30 motherboard - T7300 main control	module	Accompanyin g the motherboard	software version	IPerf2 for Android	
Model Number	frequency band	distance	Test angle	test data (TX) 1-minute mean	test data (RX) 1-minute mean	remark (Number of packet drops)
1	2. 4G	2. 4G WIFI (Research and development 15m)	0°	93. 6 Mbps	21. 2 Mbps	0
			90°	96. 1 Mbps	21. 8 Mbps	0
			180°	93. 6 Mbps	19. 3 Mbps	0
			270°	97. 4 Mbps	19. 1 Mbps	0
	5G	5F WIFI (Research and development 15m)	0°	293 Mbps	235 Mbps	0
			90°	295 Mbps	238 Mbps	0
			180°	301 Mbps	225 Mbps	0
			270°	300 Mbps	228 Mbps	0

WIFI antenna throughput test (test image)

Test data uploaded via 2.4GHz WiFi (corresponding to a connection speed of 162Mbps)

网络详情	
类型	Wi-Fi 4
随机生成的 MAC 地址	
ee:ca:4b:5c:53:df	
IP 地址	
192.168.1.109	
网关	
192.168.1.1	
子网掩码	
255.255.255.0	
DNS	
192.168.1.1	
传输链接速度	
40 Mbps	
接收链接速度	
135 Mbps	
IPv6 地址	
随机生成的 MAC 地址	
8e:a0:a1:db:10:e9	
IP 地址	
192.168.1.100	
网关	
192.168.1.1	
子网掩码	
255.255.255.0	
DNS	
192.168.1.1	
传输链接速度	
263 Mbps	
接收链接速度	
390 Mbps	
IPv6 地址	
fe80::3ca0:a1ff:fedb:10e9	

iPerf2 for Android	
Abort	Save
IPv4	
Your IP address is: 192.168.1.109	
-s -i 10	
[D] Interval Transfer Bandwidth	
[1] 0.00-10.00 sec 111 MBytes 92.7 Mbits/sec	
[6] 10.00-20.00 sec 120 MBytes 101 Mbits/sec	
[6] 20.00-30.00 sec 108 MBytes 90.5 Mbits/sec	
[6] 30.00-40.00 sec 113 MBytes 94.9 Mbits/sec	
[6] 40.00-50.00 sec 106 MBytes 89.3 Mbits/sec	
[6] 0.00-50.09 sec 559 MBytes 93.6 Mbits/sec	
[7] local 192.168.1.109 port 5001 connected with 192.168.1.100	
[D] Interval Transfer Bandwidth	
[7] 0.00-10.00 sec 125 MBytes 105 Mbits/sec	
[7] 10.00-20.00 sec 115 MBytes 96.7 Mbits/sec	
[7] 20.00-30.00 sec 118 MBytes 98.7 Mbits/sec	
[7] 30.00-40.00 sec 113 MBytes 95.1 Mbits/sec	
[7] 40.00-50.00 sec 102 MBytes 85.2 Mbits/sec	
[7] 0.00-50.09 sec 574 MBytes 96.1 Mbits/sec	
[8] local 192.168.1.109 port 5001 connected with 192.168.1.100	
[D] Interval Transfer Bandwidth	
[8] 0.00-10.00 sec 105 MBytes 87.9 Mbits/sec	
[8] 10.00-20.00 sec 108 MBytes 90.9 Mbits/sec	
[8] 20.00-30.00 sec 115 MBytes 96.4 Mbits/sec	
[8] 30.00-40.00 sec 118 MBytes 98.6 Mbits/sec	
[8] 40.00-50.00 sec 113 MBytes 94.4 Mbits/sec	
[8] 0.00-50.08 sec 559 MBytes 93.6 Mbits/sec	
[9] local 192.168.1.109 port 5001 connected with 192.168.1.100	
[D] Interval Transfer Bandwidth	
[9] 0.00-10.00 sec 105 MBytes 88.1 Mbits/sec	
[9] 10.00-20.00 sec 107 MBytes 90.1 Mbits/sec	
[9] 20.00-30.00 sec 111 MBytes 93.2 Mbits/sec	
[9] 30.00-40.00 sec 107 MBytes 89.9 Mbits/sec	
[9] 40.00-50.00 sec 112 MBytes 93.6 Mbits/sec	
[9] 0.00-50.07 sec 543 MBytes 91.0 Mbits/sec	
[10] local 192.168.1.109 port 5001 connected with 192.168.1.100	
[D] Interval Transfer Bandwidth	
[10] 0.00-10.00 sec 97.6 MBytes 81.8 Mbits/sec	
[10] 10.00-20.00 sec 111 MBytes 93.1 Mbits/sec	
[10] 20.00-30.00 sec 98.9 MBytes 82.9 Mbits/sec	
[10] 30.00-40.00 sec 110 MBytes 92.4 Mbits/sec	
[10] 40.00-50.00 sec 110 MBytes 92.7 Mbits/sec	
[10] 0.00-50.09 sec 529 MBytes 88.6 Mbits/sec	
[11] local 192.168.1.109 port 5001 connected with 192.168.1.100	
[D] Interval Transfer Bandwidth	
[11] 0.00-10.00 sec 114 MBytes 95.8 Mbits/sec	
[11] 10.00-20.00 sec 115 MBytes 96.8 Mbits/sec	
[11] 20.00-30.00 sec 117 MBytes 98.1 Mbits/sec	
[11] 30.00-40.00 sec 115 MBytes 96.9 Mbits/sec	
[11] 40.00-50.00 sec 119 MBytes 99.8 Mbits/sec	
[11] 0.00-50.06 sec 581 MBytes 97.4 Mbits/sec	

iPerf2 for Android	
Start	Save
IPv4	
Your IP address is: 192.168.1.109	
-c 192.168.1.101 -i -w 1m -t 50	
[1] 24.00-25.00 sec 2.12 MBytes 17.8 Mbits/sec	
[1] 25.00-26.00 sec 1.44 MBytes 12.1 Mbits/sec	
[1] 26.00-27.00 sec 1.38 MBytes 11.5 Mbits/sec	
[1] 27.00-28.00 sec 1.50 MBytes 12.6 Mbits/sec	
[1] 28.00-29.00 sec 2.12 MBytes 17.8 Mbits/sec	
[1] 29.00-30.00 sec 1.50 MBytes 12.6 Mbits/sec	
[1] 30.00-31.00 sec 2.20 MBytes 18.5 Mbits/sec	
[1] 31.00-32.00 sec 1.14 MBytes 9.60 Mbits/sec	
[1] 32.00-33.00 sec 1.38 MBytes 11.5 Mbits/sec	
[1] 33.00-34.00 sec 2.00 MBytes 16.8 Mbits/sec	
[1] 34.00-35.00 sec 1.50 MBytes 12.6 Mbits/sec	
[1] 35.00-36.00 sec 2.88 MBytes 24.1 Mbits/sec	
[1] 36.00-37.00 sec 2.88 MBytes 24.1 Mbits/sec	
[1] 37.00-38.00 sec 2.12 MBytes 17.8 Mbits/sec	
[1] 38.00-39.00 sec 2.12 MBytes 17.8 Mbits/sec	
[1] 39.00-40.00 sec 2.12 MBytes 17.8 Mbits/sec	
[1] 40.00-41.00 sec 3.12 MBytes 26.2 Mbits/sec	
[1] 41.00-42.00 sec 2.75 MBytes 23.1 Mbits/sec	
[1] 42.00-43.00 sec 2.12 MBytes 17.8 Mbits/sec	
[1] 43.00-44.00 sec 1.18 MBytes 9.88 Mbits/sec	
[1] 44.00-45.00 sec 2.25 MBytes 18.9 Mbits/sec	
[1] 45.00-46.00 sec 3.62 MBytes 30.4 Mbits/sec	
[1] 46.00-47.00 sec 2.88 MBytes 24.1 Mbits/sec	
[1] 47.00-48.00 sec 2.88 MBytes 24.1 Mbits/sec	
[1] 48.00-49.00 sec 2.12 MBytes 17.8 Mbits/sec	
[1] 49.00-50.00 sec 2.12 MBytes 17.8 Mbits/sec	
[1] 50.00-50.41 sec 128 KBytes 2.58 Mbits/sec	
[1] 0.00-50.41 sec 127 MBytes 21.2 Mbits/sec	

iPerf2 for Android	
Abort	Save
IPv4	
Your IP address is: 192.168.1.109	
-s -i 10	
[1] 0.00-50.06 sec 1.31 GBytes 225 Mbits/sec	
Server listening on TCP port 5001	
TCP window size: 1.00 MByte (default)	
[1] local 192.168.1.111 port 5001 connected with 192.168.1.109	
[D] Interval Transfer Bandwidth	
[1] 0.00-10.00 sec 304 MBytes 255 Mbits/sec	
[1] 10.00-20.00 sec 361 MBytes 303 Mbits/sec	
[1] 20.00-30.00 sec 362 MBytes 304 Mbits/sec	
[1] 30.00-40.00 sec 358 MBytes 301 Mbits/sec	
[1] 40.00-50.00 sec 362 MBytes 304 Mbits/sec	
[1] 0.00-50.04 sec 1.71 GBytes 293 Mbits/sec	
[2] local 192.168.1.111 port 5001 connected with 192.168.1.109	
[D] Interval Transfer Bandwidth	
[2] 0.00-10.00 sec 347 MBytes 291 Mbits/sec	
[2] 10.00-20.00 sec 353 MBytes 296 Mbits/sec	
[2] 20.00-30.00 sec 356 MBytes 298 Mbits/sec	
[2] 30.00-40.00 sec 354 MBytes 297 Mbits/sec	
[2] 40.00-50.00 sec 348 MBytes 292 Mbits/sec	
[2] 0.00-50.02 sec 1.72 GBytes 295 Mbits/sec	
[3] local 192.168.1.111 port 5001 connected with 192.168.1.109	
[D] Interval Transfer Bandwidth	
[3] 0.00-10.00 sec 355 MBytes 298 Mbits/sec	
[3] 10.00-20.00 sec 362 MBytes 304 Mbits/sec	
[3] 20.00-30.00 sec 360 MBytes 302 Mbits/sec	
[3] 30.00-40.00 sec 360 MBytes 302 Mbits/sec	
[3] 40.00-50.00 sec 355 MBytes 298 Mbits/sec	
[3] 0.00-50.00 sec 1.75 GBytes 301 Mbits/sec	
[4] local 192.168.1.111 port 5001 connected with 192.168.1.109	
[D] Interval Transfer Bandwidth	
[4] 0.00-10.00 sec 359 MBytes 301 Mbits/sec	
[4] 10.00-20.00 sec 347 MBytes 291 Mbits/sec	
[4] 20.00-30.00 sec 350 MBytes 293 Mbits/sec	
[4] 30.00-40.00 sec 359 MBytes 301 Mbits/sec	
[4] 40.00-50.00 sec 349 MBytes 293 Mbits/sec	
[4] 0.00-50.02 sec 1.72 GBytes 296 Mbits/sec	
[5] local 192.168.1.111 port 5001 connected with 192.168.1.109	
[D] Interval Transfer Bandwidth	
[5] 0.00-10.00 sec 353 MBytes 296 Mbits/sec	
[5] 10.00-20.00 sec 365 MBytes 306 Mbits/sec	
[5] 20.00-30.00 sec 362 MBytes 304 Mbits/sec	
[5] 30.00-40.00 sec 349 MBytes 292 Mbits/sec	
[5] 40.00-50.00 sec 358 MBytes 300 Mbits/sec	
[5] 0.00-50.02 sec 1.75 GBytes 300 Mbits/sec	

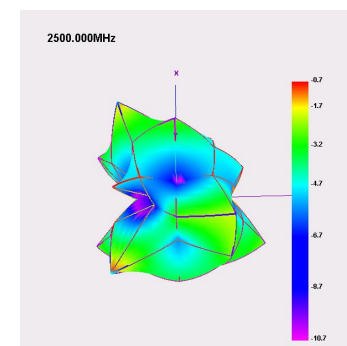
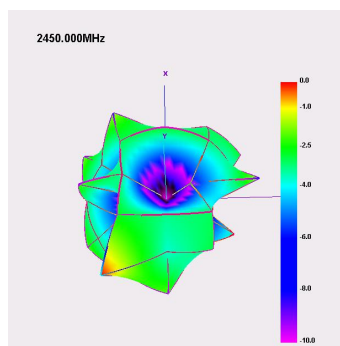
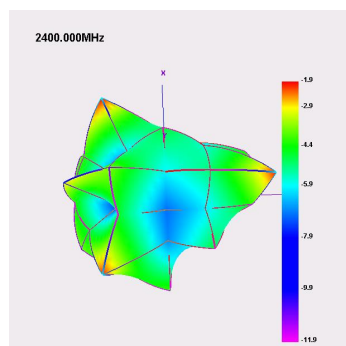
iPerf2 for Android	
Start	Save
IPv4	
Your IP address is: 192.168.1.109	
-c 192.168.1.101 -i -w 1m -t 50	
[1] 23.00-24.00 sec 29.6 MBytes 249 Mbits/sec	
[1] 24.00-25.00 sec 28.6 MBytes 240 Mbits/sec	
[1] 25.00-26.00 sec 27.8 MBytes 233 Mbits/sec	
[1] 26.00-27.00 sec 28.9 MBytes 242 Mbits/sec	
[1] 27.00-28.00 sec 29.0 MBytes 243 Mbits/sec	
[1] 28.00-29.00 sec 29.5 MBytes 247 Mbits/sec	
[1] 29.00-30.00 sec 30.1 MBytes 253 Mbits/sec	
[1] 30.00-31.00 sec 28.6 MBytes 240 Mbits/sec	
[1] 31.00-32.00 sec 28.5 MBytes 239 Mbits/sec	
[1] 32.00-33.00 sec 29.8 MBytes 250 Mbits/sec	
[1] 33.00-34.00 sec 29.6 MBytes 249 Mbits/sec	
[1] 34.00-35.00 sec 26.6 MBytes 223 Mbits/sec	
[1] 35.00-36.00 sec 27.4 MBytes 230 Mbits/sec	
[1] 36.00-37.00 sec 29.5 MBytes 247 Mbits/sec	
[1] 37.00-38.00 sec 29.2 MBytes 245 Mbits/sec	
[1] 38.00-39.00 sec 29.4 MBytes 246 Mbits/sec	
[1] 39.00-40.00 sec 29.4 MBytes 246 Mbits/sec	
[1] 40.00-41.00 sec 29.1 MBytes 244 Mbits/sec	
[1] 41.00-42.00 sec 29.4 MBytes 246 Mbits/sec	
[1] 42.00-43.00 sec 29.5 MBytes 247 Mbits/sec	
[1] 43.00-44.00 sec 29.1 MBytes 244 Mbits/sec	
[1] 44.00-45.00 sec 28.1 MBytes 236 Mbits/sec	
[1] 45.00-46.00 sec 28.5 MBytes 239 Mbits/sec	
[1] 46.00-47.00 sec 28.8 MBytes 241 Mbits/sec	
[1] 47.00-48.00 sec 28.4 MBytes 238 Mbits/sec	
[1] 48.00-49.00 sec 28.5 MBytes 239 Mbits/sec	
[1] 49.00-50.00 sec 29.0 MBytes 243 Mbits/sec	
[1] 0.00-50.04 sec 1.37 GBytes 235 Mbits/sec	

BT antenna measured distance

Actual test effect	
Model Number	1
test environment	Soward R&D Center
test equipment	Huawei AM08
test distance	> 10 m

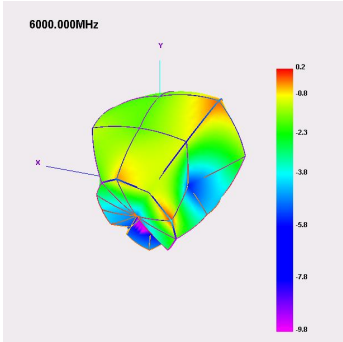
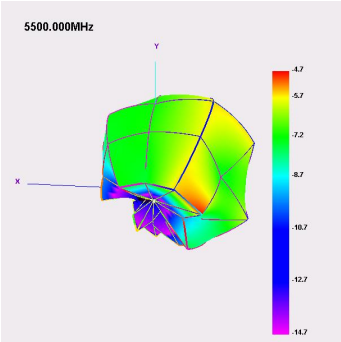
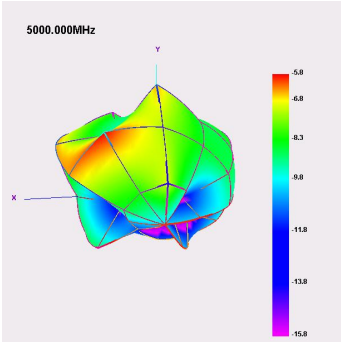
WIFI&BTantenna efficiency

Passive Test For 2.4Gwifi						
Freq	Effi	Effi	Gain	Gain	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(dB)	(dB)
2400	15.3	-8.15	-1.91	-4.06	-1.91	-18.06
2410	16.02	-7.95	-1.63	-3.78	-1.63	-17.37
2420	16.93	-7.71	-1.06	-3.21	-1.06	-17.2
2430	16.96	-7.71	-0.67	-2.82	-0.67	-17.35
2440	16.77	-7.76	-0.36	-2.51	-0.36	-18.3
2450	17.79	-7.5	0.04	-2.11	0.04	-19.33
2460	17.24	-7.64	-0.05	-2.2	-0.05	-21.88
2470	17.33	-7.61	0	-2.15	0	-20.61
2480	16.84	-7.74	0	-2.15	0	-21.04
2490	16.61	-7.8	0.05	-2.1	0.05	-23.6
2500	14.33	-8.44	-0.71	-2.86	-0.71	-22.03

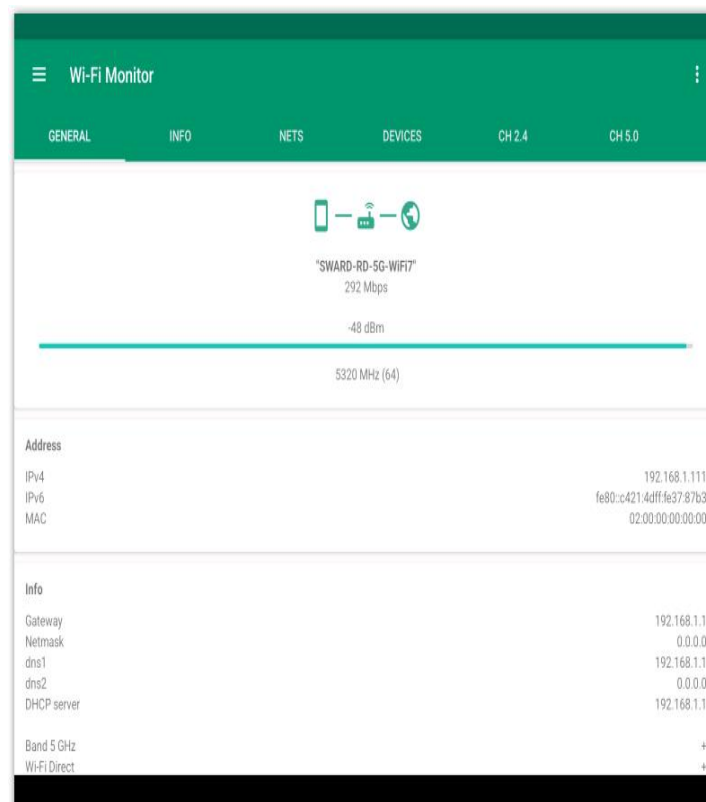
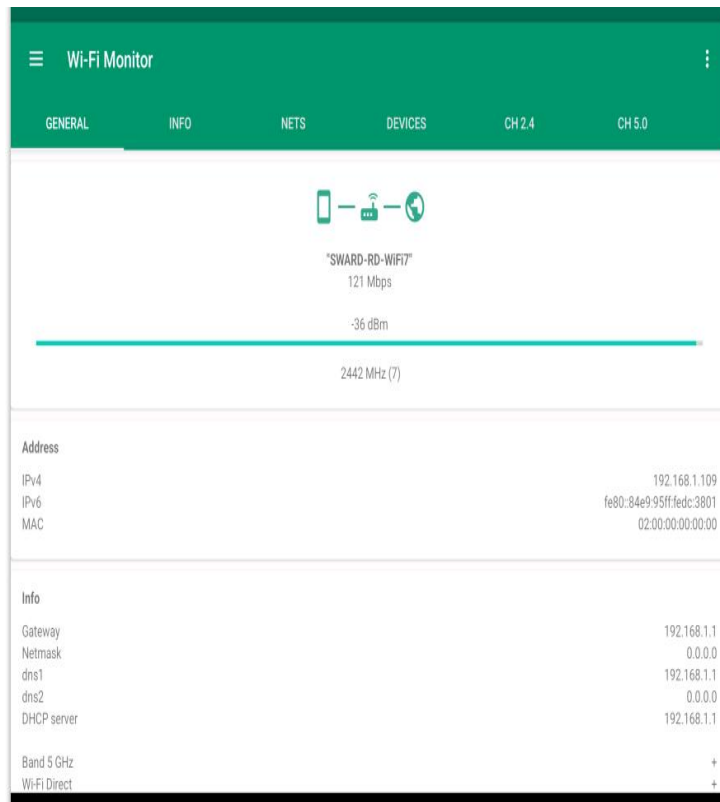


5GWIFIantenna efficiency

Passive Test For 5Gwifi						
Freq	Effi	Effi	Gain	Gain	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(dB)	(dB)
5000	7.01	-11.55	3.32	1.17	3.32	-21.86
5100	8.91	-10.5	3.27	1.12	3.27	-22.57
5200	12.02	-9.2	1.95	-0.2	1.95	-21.48
5300	16.75	-7.76	2.04	-0.11	2.04	-15.64
5400	17.59	-7.55	2.13	-0.02	2.13	-14.63
5500	17.89	-7.47	1.09	-1.06	1.09	-14.24
5600	19.72	-7.05	2.17	0.02	2.17	-15.13
5700	23.45	-6.3	2.13	-0.02	2.13	-18.21
5800	20.68	-6.85	1.91	-0.24	1.91	-13.87
5900	20.49	-6.88	3.1	0.95	3.1	-11.65
6000	19.67	-7.06	2.35	0.2	2.35	-10.89



WIFI antenna signal strength measurement picture (data)

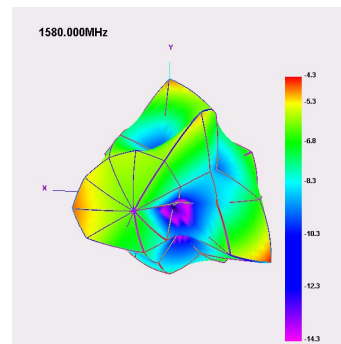
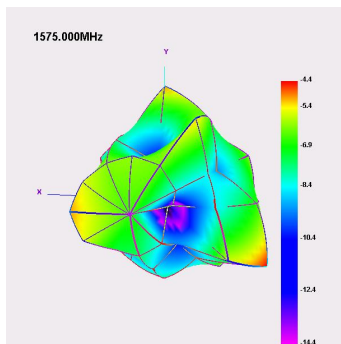
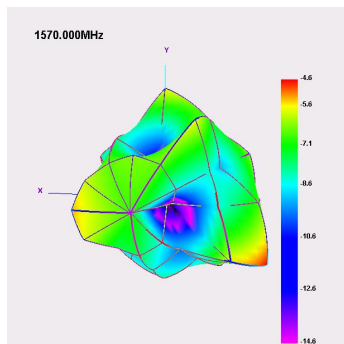


Test location: Our R&D office
Test time: 14:00-14:30
Test distance: 10-15 meters
Signal strength: -51dBm to -40dBm

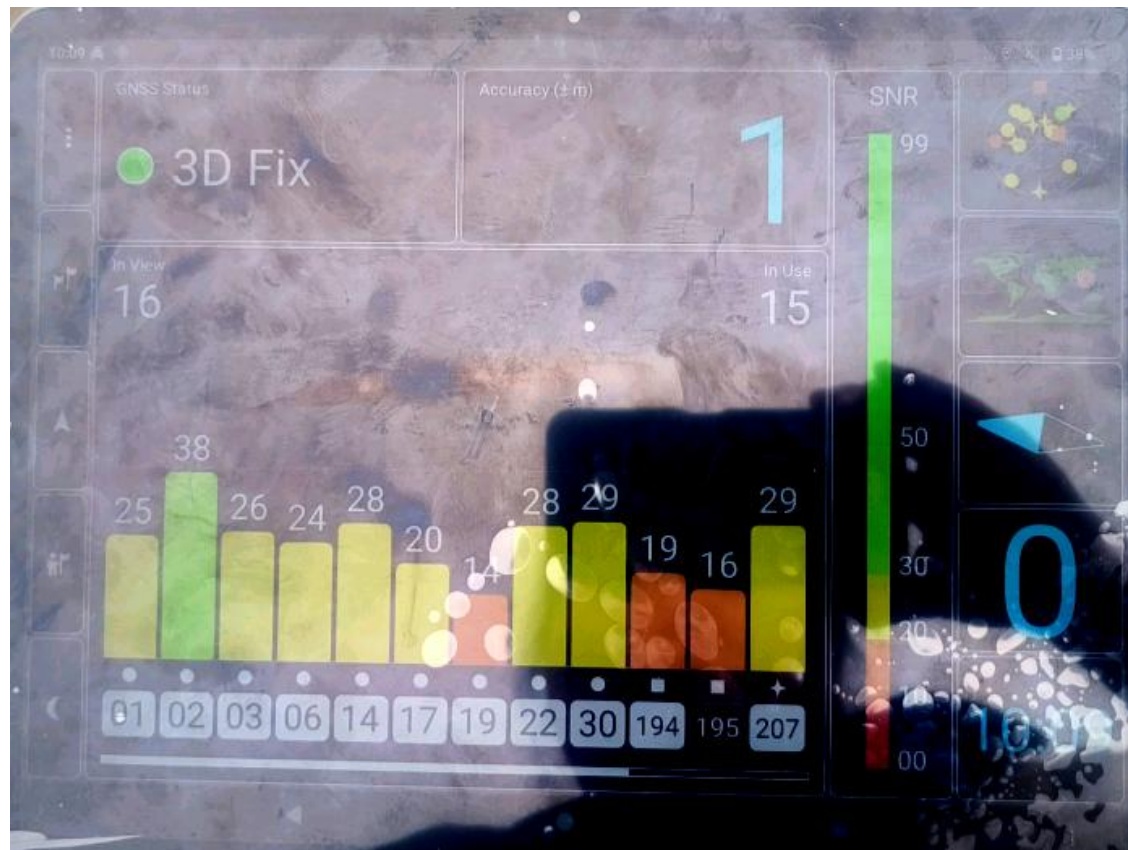
Building B, Hexi Hangcheng Industrial Zone, No. 135 Qianjin No. 2 Road, Baoan District, Shenzhen

GPS antenna efficiency

Passive Test For GPS2						
Freq	Effi	Effi	Gain	Gain	Max	Min
(MHz)	(%)	(dB)	(dBi)	(dBd)	(dB)	(dB)
1570	10.02	-9.99	-4.62	-6.77	-4.62	-22.66
1571	10.15	-9.94	-4.55	-6.7	-4.55	-22.6
1572	10.31	-9.87	-4.5	-6.65	-4.5	-22.47
1573	10.51	-9.78	-4.45	-6.6	-4.45	-22.47
1574	10.66	-9.72	-4.41	-6.56	-4.41	-22.38
1575	10.83	-9.65	-4.38	-6.53	-4.38	-22.27
1576	10.99	-9.59	-4.4	-6.55	-4.4	-22.24
1577	11.11	-9.54	-4.38	-6.53	-4.38	-22.26
1578	11.17	-9.52	-4.37	-6.52	-4.37	-22.15
1579	11.3	-9.47	-4.34	-6.49	-4.34	-22.01
1580	11.39	-9.43	-4.3	-6.45	-4.3	-21.79

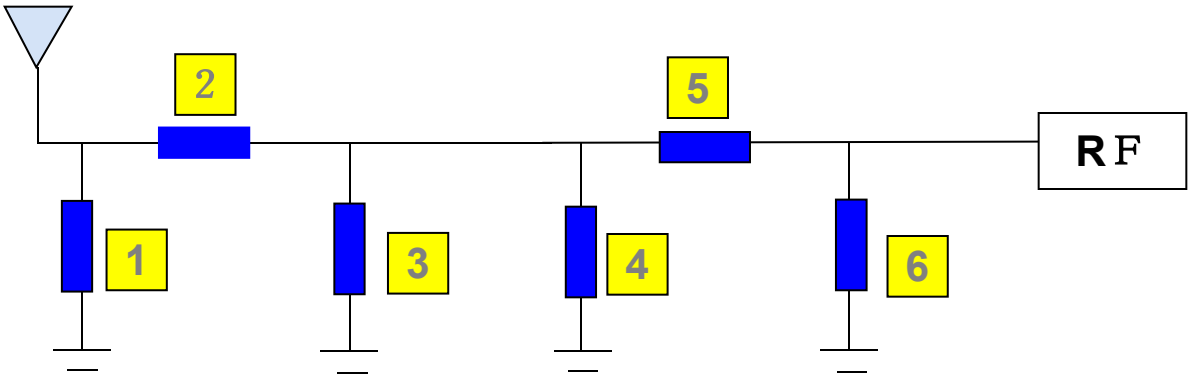


GPS measured images (data)



Test location: Our company's rooftop
Test time: 10:00 to 10:30
Test direction: East, South, West, North
Cold start positioning time: 60 seconds

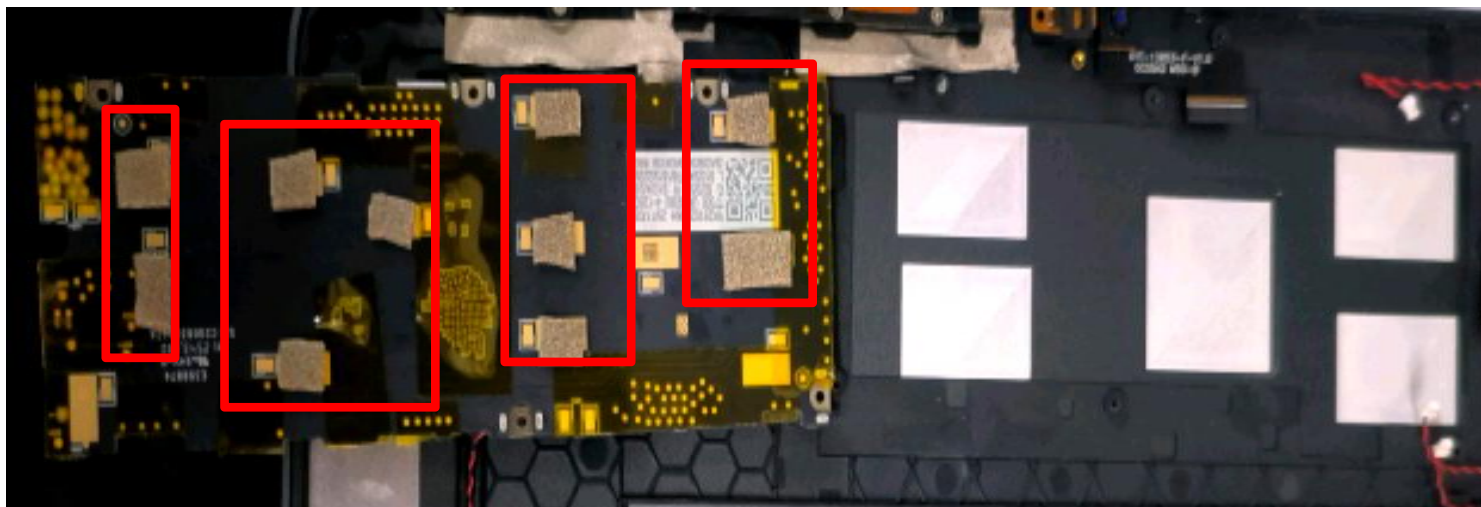
Antenna matching



No antenna matching has been changed.

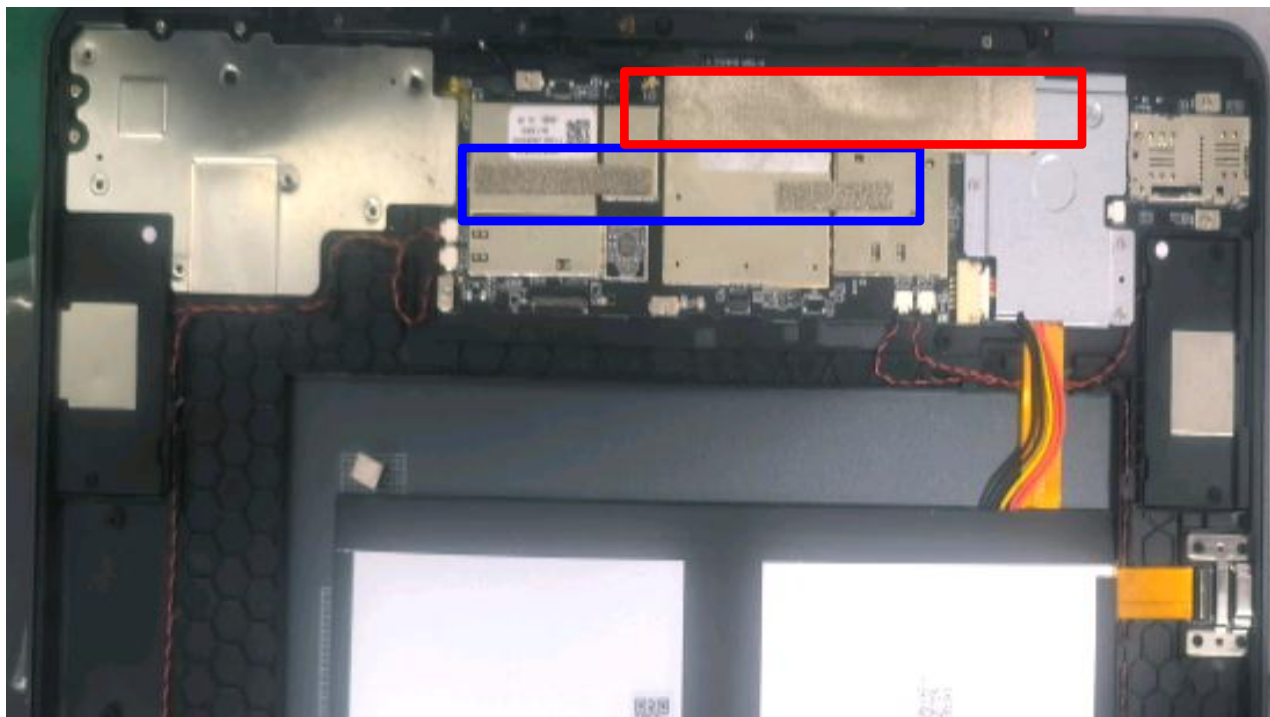
Main antenna	1	2	3	4	5	6	remark
Original Match							
Change Matching							

Environmental treatment and assembly instructions



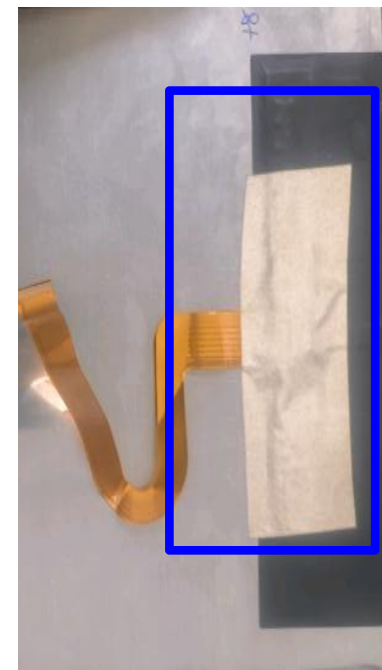
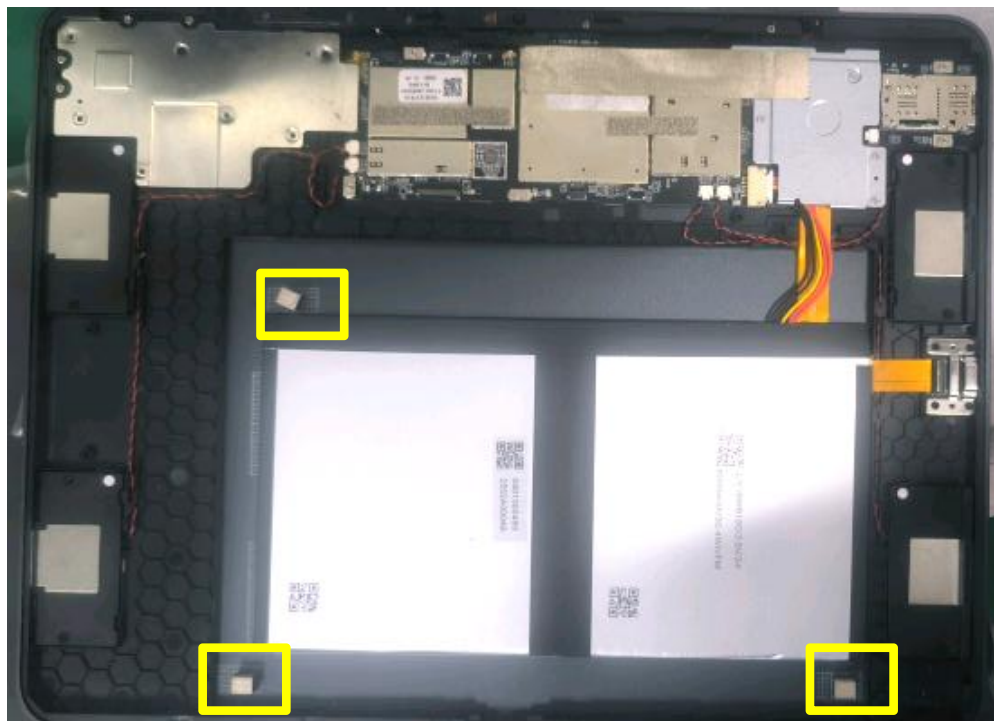
1. At the red frame, a conductive sponge is attached below the motherboard to ensure sufficient grounding between the motherboard and the screen;

Environmental treatment and assembly instructions



2. At the red box, paste conductive cloth to shield some of the circuit on the motherboard at the corresponding position
(Attach conductive cloth from the right side of the RF socket to the metal shielding cover on the right side, first insulate and then shield);
3. At the blue frame, a 2mm conductive sponge is attached to the front shielding cover of the motherboard and connected to the screen ground;

Environmental treatment and assembly instructions



4. At the yellow frame, paste conductive foam at the corresponding position on the motherboard to connect the metal shell to the screen ground;
5. At the blue frame, a conductive cloth should be placed at the screen position for shielding (insulation first and then shielding).

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;

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, etc.)

LNA, Power supply 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.)