# 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

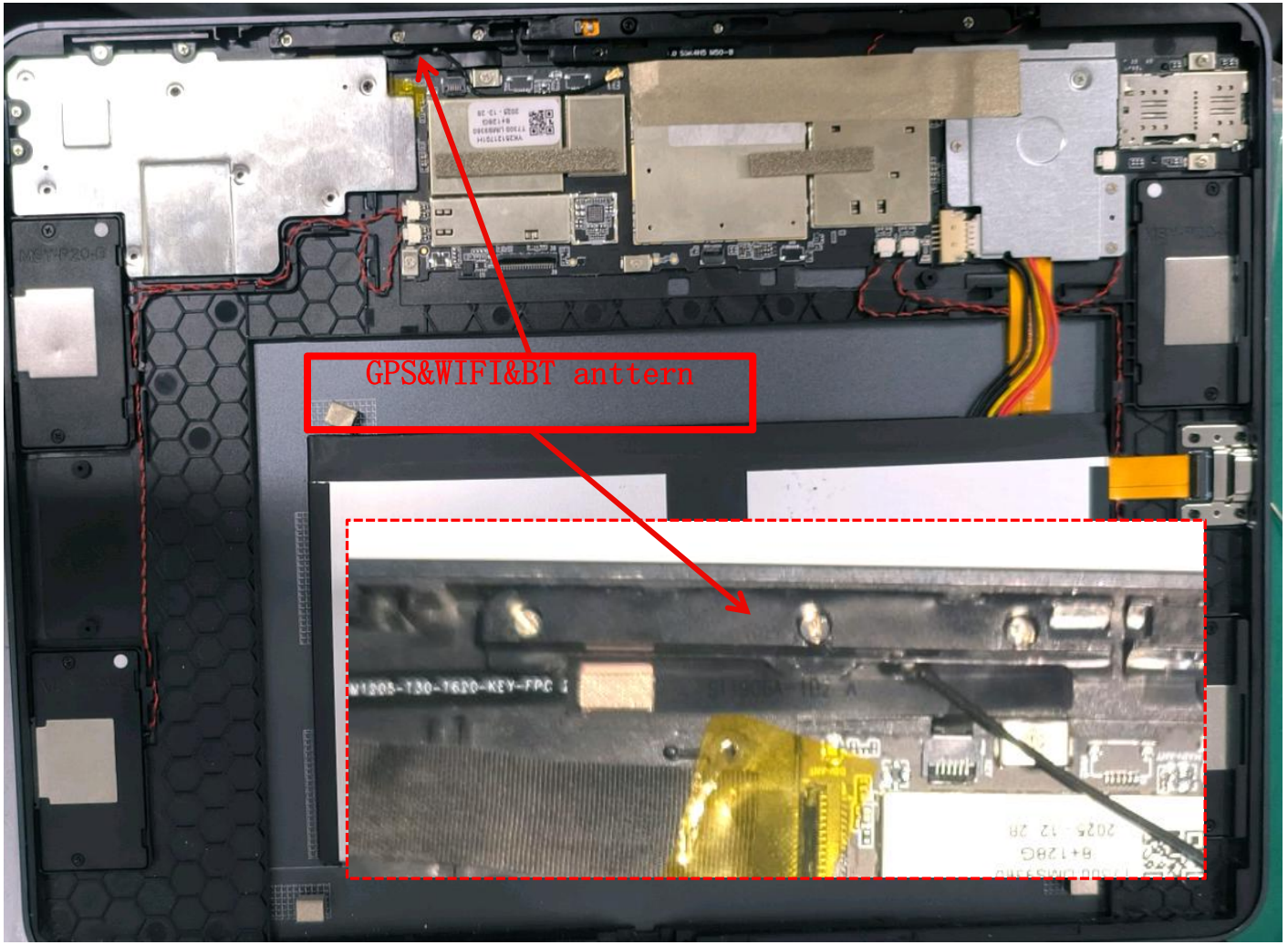
## 1.Project Brief

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

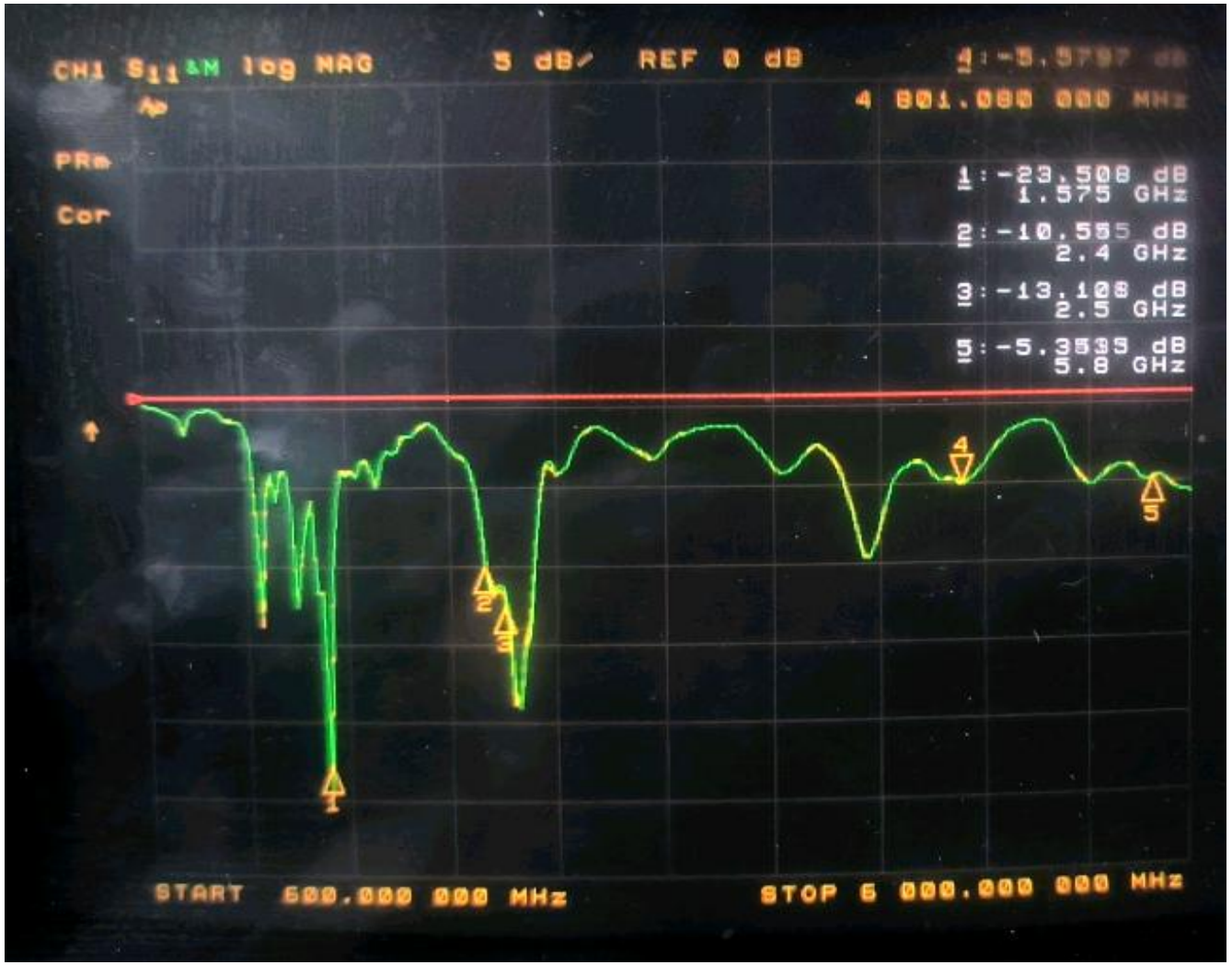
## 2.Antenna Overview

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

# Antenna layout



# WIFI&GPS&BT antenna S11

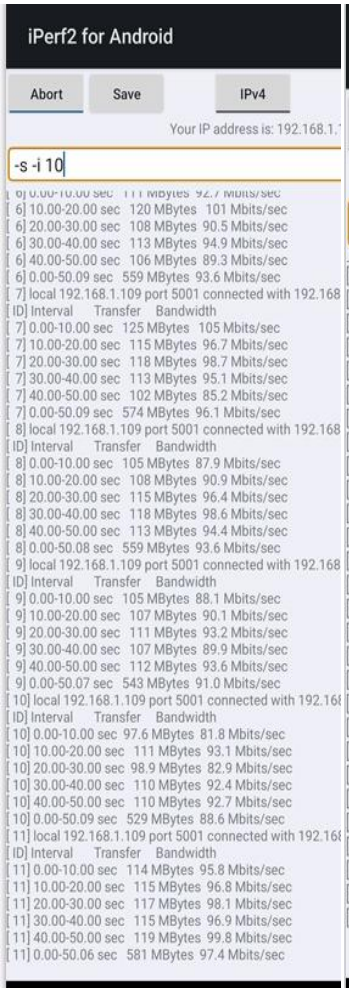


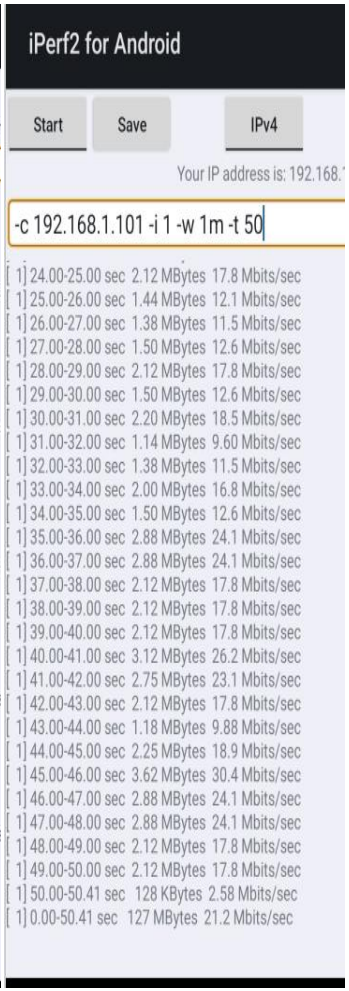
# WiFi throughput

| Iperf throughput test | | | | | | |
|---|---|---|---|---|---|---|
| model | M50-B -English card T30 motherboard - T7300 main control | module | Accompanying 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 Mpbs | 21.2 Mpbs | 0 |
| | | | 90° | 96.1 Mpbs | 21.8 Mpbs | 0 |
| | | | 180° | 93.6 Mpbs | 19.3 Mpbs | 0 |
| | | | 270° | 97.4 Mpbs | 19.1 Mpbs | 0 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | 5G | 5F WIFI (Research and development 15m) | 0° | 293 Mpbs | 235 Mpbs | 0 |
| | | | 90° | 295 Mpbs | 238 Mpbs | 0 |
| | | | 180° | 301 Mpbs | 225 Mpbs | 0 |
| | | | 270° | 300 Mpbs | 228 Mpbs | 0 |

# WIFI antenna throughput test (test image)

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

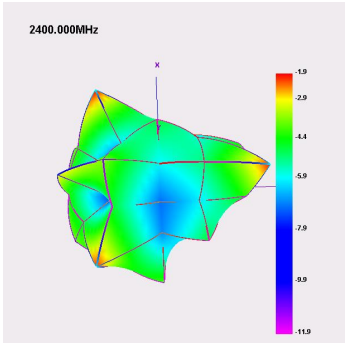


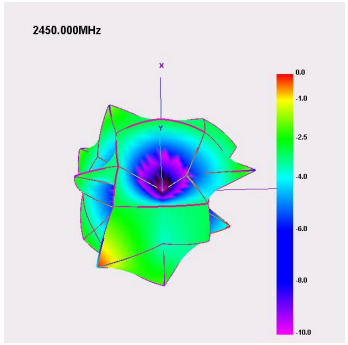
# BT antenna measured distance

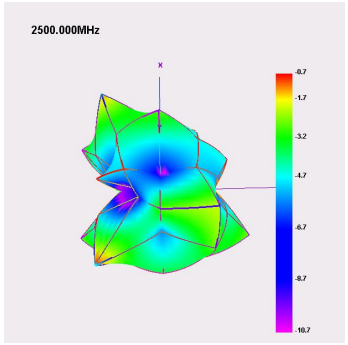
| Actual test effect | |
|---|---|
| Model Number | 1 |
| test environment | Soward R&D Center |
| test equipment | Huawei AM08 |
| test distance | > 10 m |

# WIFI&BTantenna efficiency

| Passive Test For 2.4Gwifi | | | | | | |
|---|---|---|---|---|---|---|
| Freq (MHz) | Effi (%) | Effi (dB) | Gain (dBi) | Gain (dBd) | Max (dB) | Min (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 |

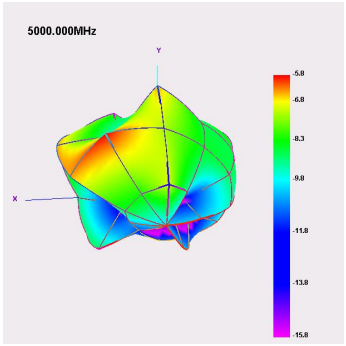


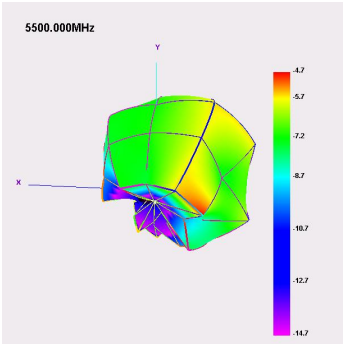



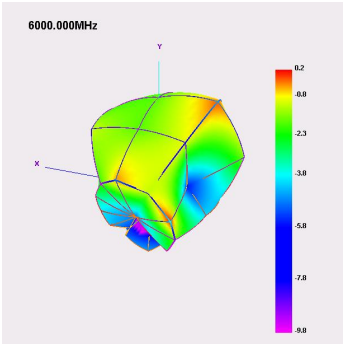



# 5GWIFIantenna efficiency

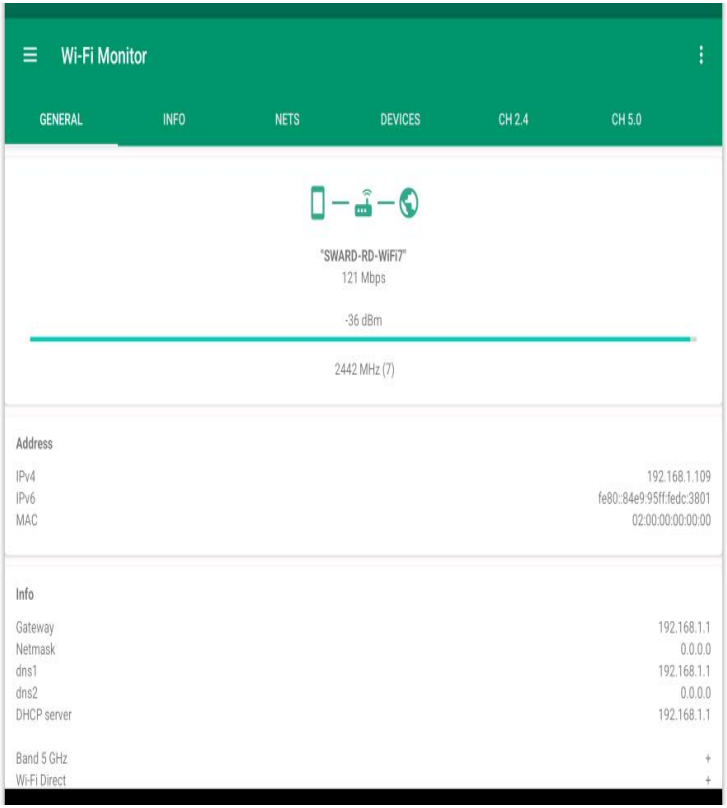
| Passive Test For 5Gwifi | | | | | | |
|---|---|---|---|---|---|---|
| Freq (MHz) | Effi (%) | Effi (dB) | Gain (dBi) | Gain (dBd) | Max (dB) | Min (dB) |
| 5000 | 7.01 | -11.55 | 3.32 | 1.17 | 3.32 | -21.86 |
| 5100 | 8.91 | -10.5 | 3.27 | 1.12 | 3.27 | -22.57 |
| 5200 | 12.02 | -9.2 | 1.95 | -0.2 | 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 |

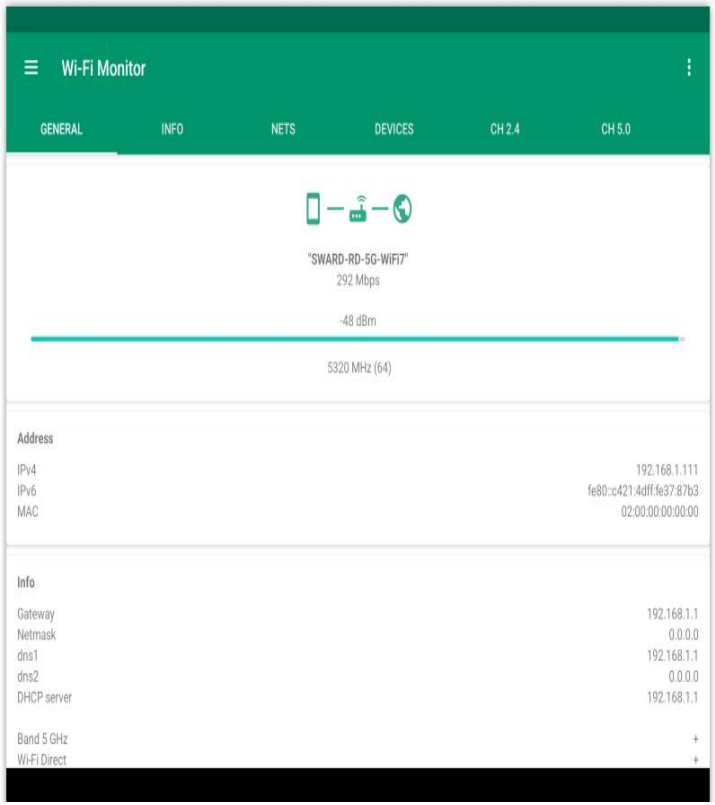


# WIFI antenna signal strength measurement picture (data)

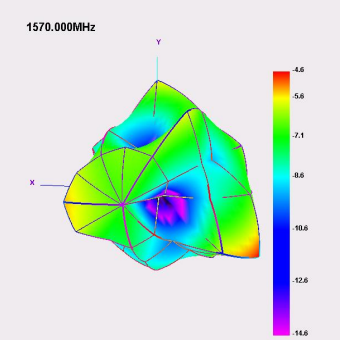


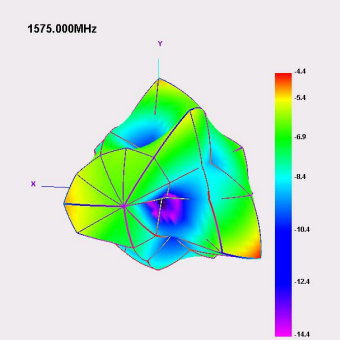



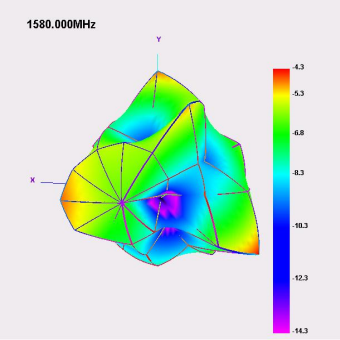

Test location: Our R&D office
Test time: 14:00-14:30
Test distance: 10-15 meters
Signal strength: -51dBm to -40dBm

# GPSantenna efficiency

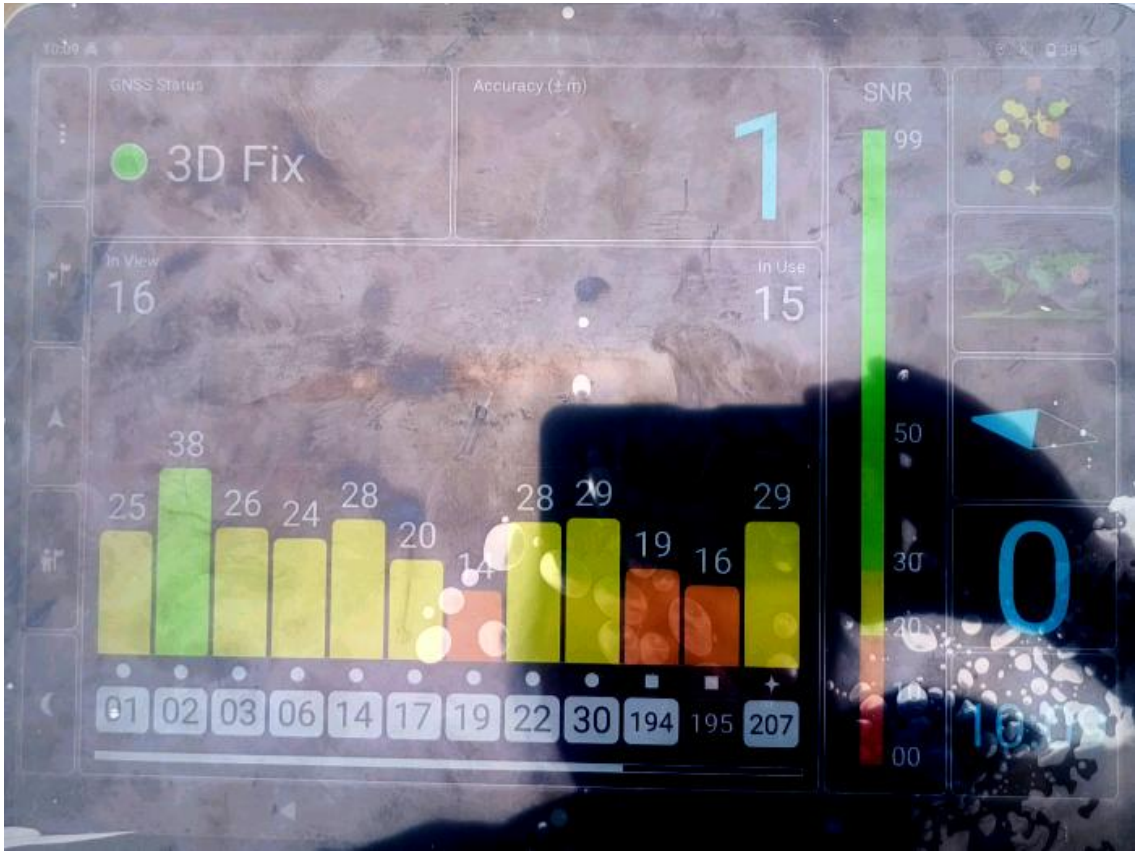
| Passive Test For GPS2 | | | | | | |
|---|---|---|---|---|---|---|
| Freq (MHz) | Effi (%) | Effi (dB) | Gain (dBi) | Gain (dBd) | Max (dB) | Min (dB) |
| 1570 | 10.02 | -9.99 | -4.62 | -6.77 | -4.62 | -22.66 |
| 1571 | 10.15 | -9.94 | -4.55 | -6.7 | -4.55 | -22.6 |
| 1572 | 10.31 | -9.87 | -4.5 | -6.65 | -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 |



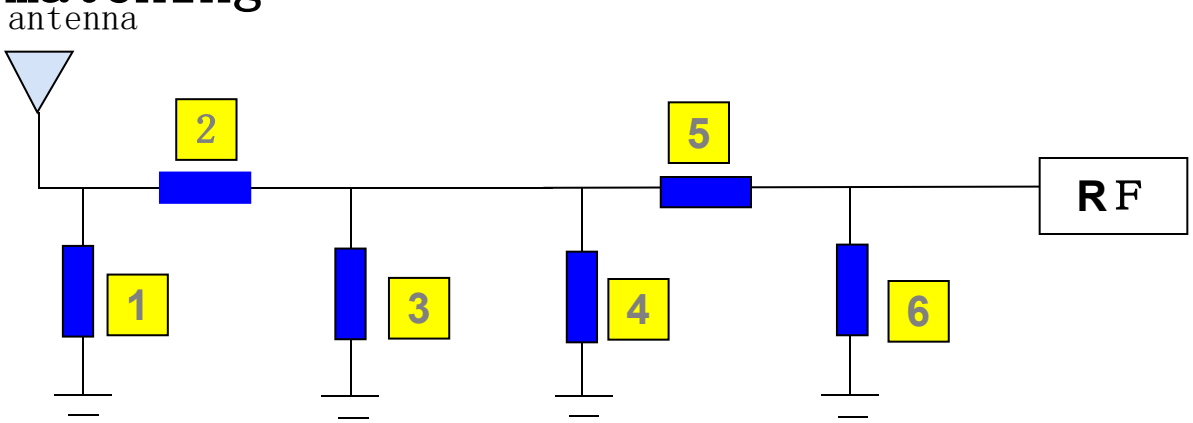



# GPS measured images (data)




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

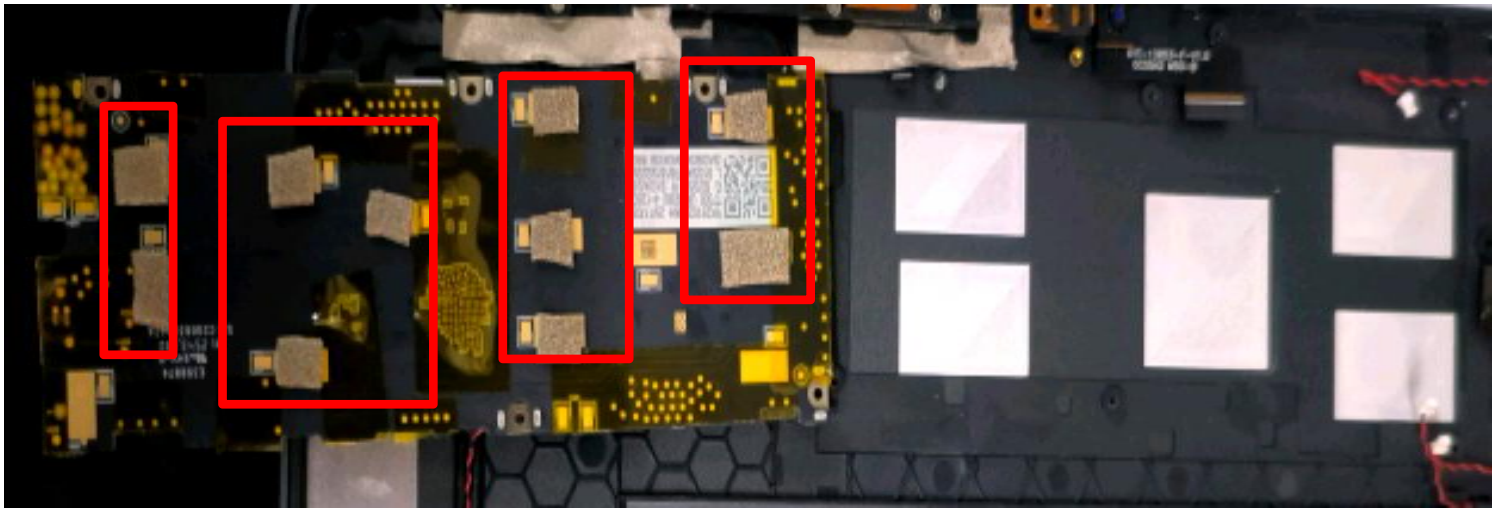
# Antenna matching




**No antenna matching has been changed。**

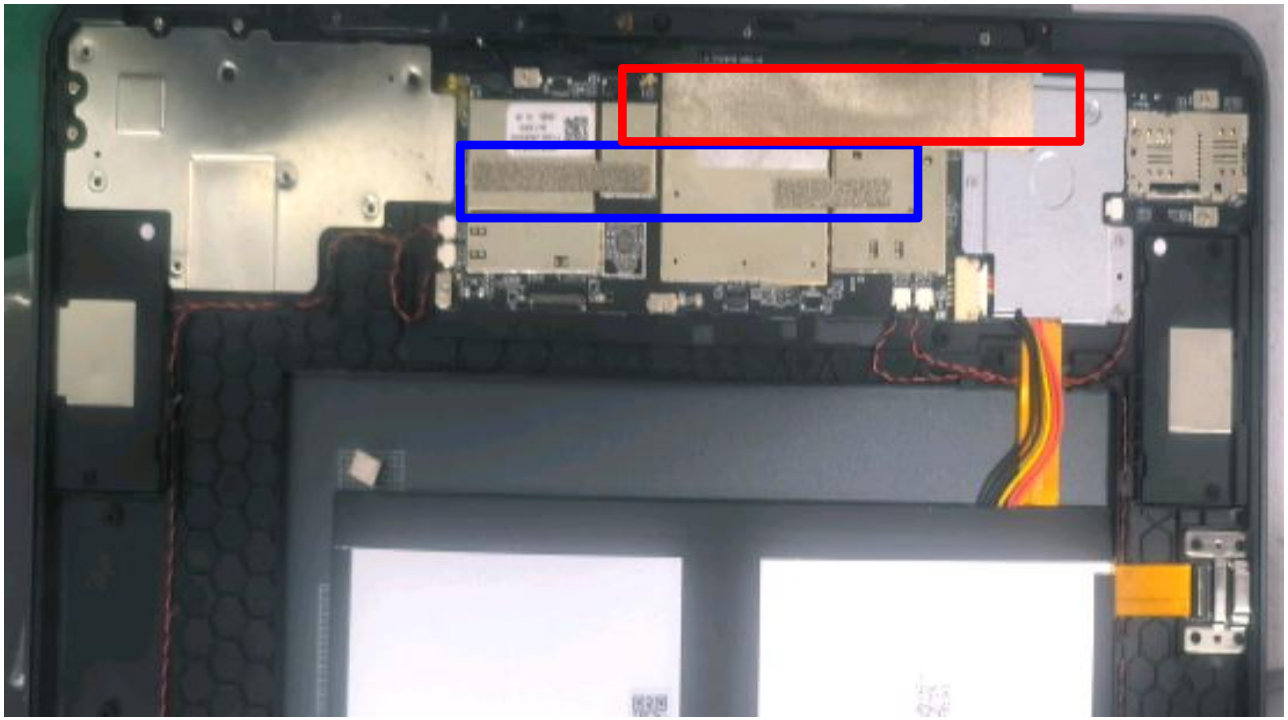
| Main antenna | 1 | 2 | 3 | 4 | 5 | 6 | remark |
|---|---|---|---|---|---|---|---|
| Original Match | | | | | | | |
| Change Matching | | | | | | | |

# Environmental treatment and assembly instructions



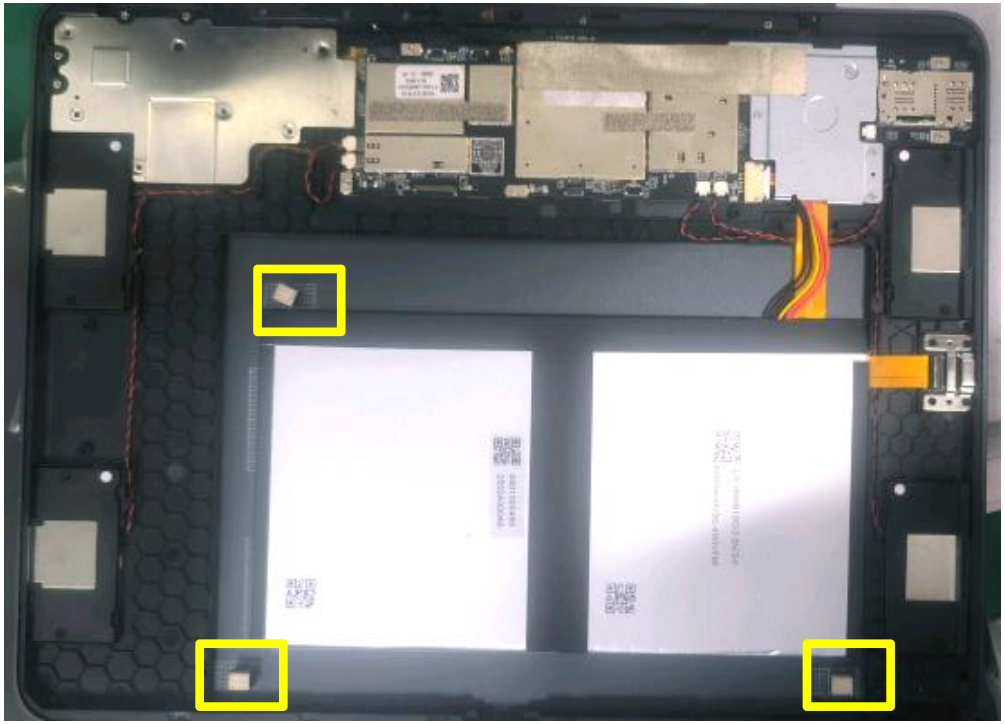
**1. At the red frame, a conductive sponge is attached below the motherboard to ensure sufficient grounding between the motherboard and the screen;**

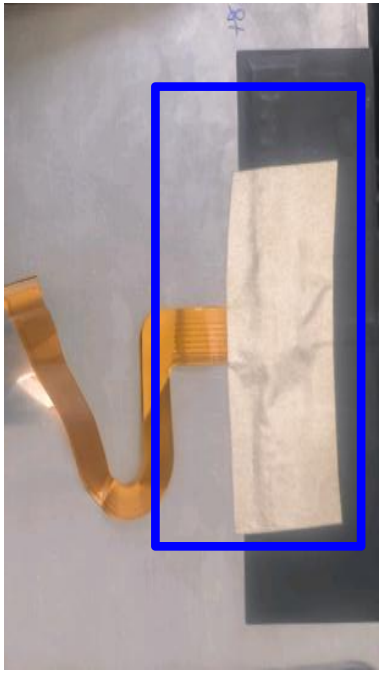
# Environmental treatment and assembly instructions



**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.)