

# Soward Antenna Debugging Report

Customer Name: bmorn

project name: AF1013-T30A537 motherboard

Date: 2025. 05. 23

## Project Contact Information

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# Project Introduction

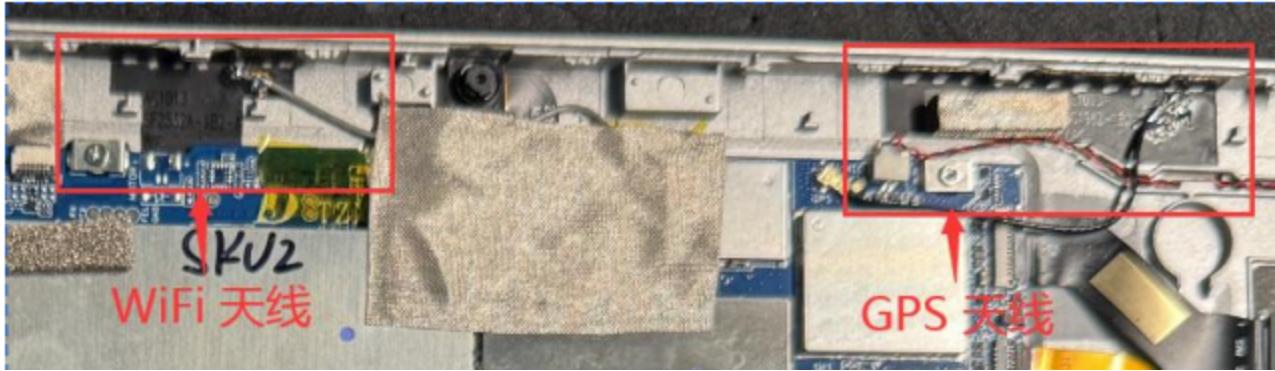
## 1. Project Overview

Number of project antennas	Machine type
2	tablet
Material of the whole machine shell: 10.95 inch metal shell	

## 2. Antenna Overview

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

## Antenna layout



## WIFI&amp;GPS&amp;BT antennaS11



## WIFI antenna throughput test

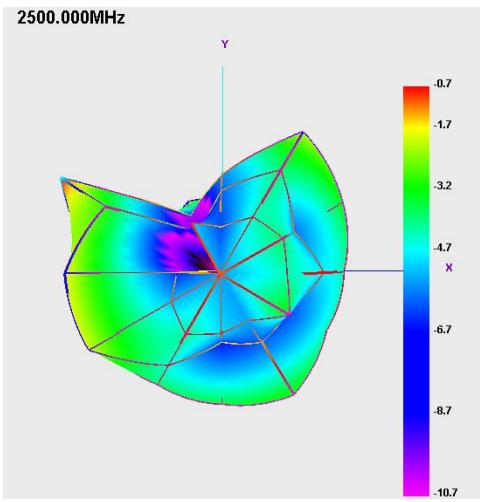
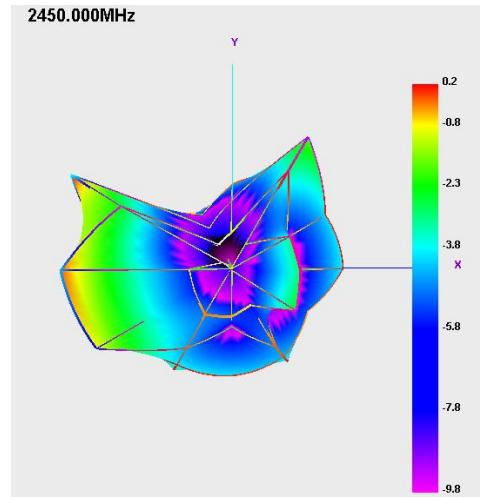
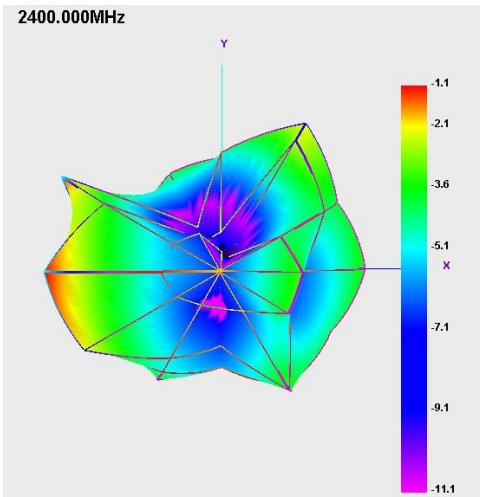
iperfThroughput testing						
model		module		Software version		
Model number	channel	distance	Test angle	Test data (TX) 1-minute mean	Test data (RX) 1-minute mean	Remarks (number of packet drops)
2.4GWIFI		15米	0°	53.9M/S	96.8M/S	0
			90°	52.6M/S	92.6M/S	
			180°	58.3M/S	93.4M/S	
			270°	55.2M/S	94.1M/S	
			0°	252M/S	252M/S	0
5GWIFI		15米	90°	233M/S	269M/S	
			180°	241M/S	275M/S	
			270°	245M/S	273M/S	

## BT antenna measured distance

Actual test effect	
Model number	1
testing environment	Soward R&D Center
Test equipment	Huawei AM08
test distance	10m $\geq$

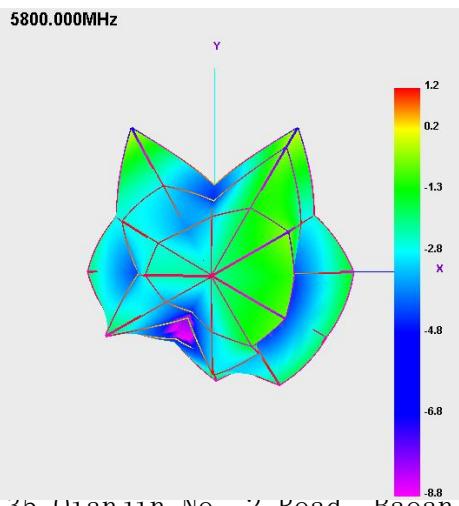
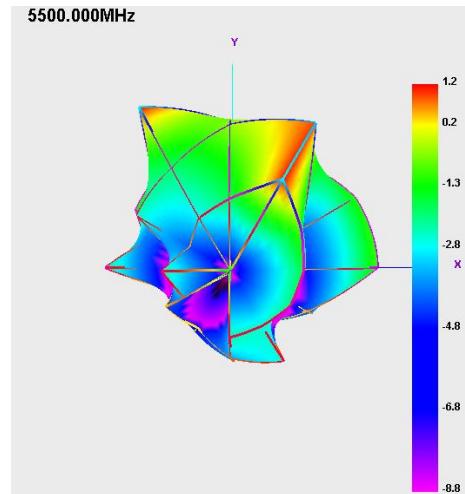
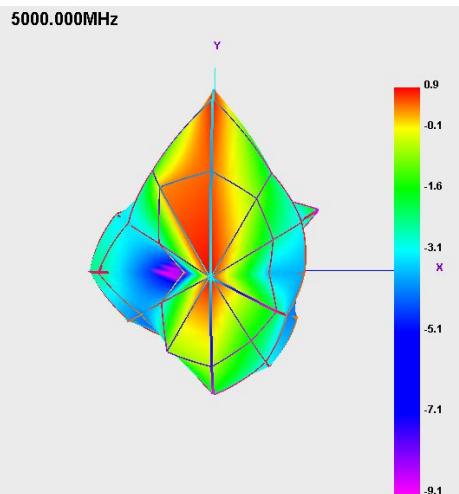
## WIFI&amp;BT Antenna efficiency

Passive Test For 2.4G			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	32.65	-4.86	-1.06
2410	33.27	-4.78	-0.67
2420	33.31	-4.77	-0.38
2430	35.97	-4.44	0.05
2440	36.22	-4.41	0.08
2450	36.46	-4.38	0.16
2460	35.84	-4.46	0.01
2470	30.92	-5.1	-0.73
2480	28.95	-5.38	-1.14
2490	29.46	-5.31	-1.05
2500	31.52	-5.01	-0.71

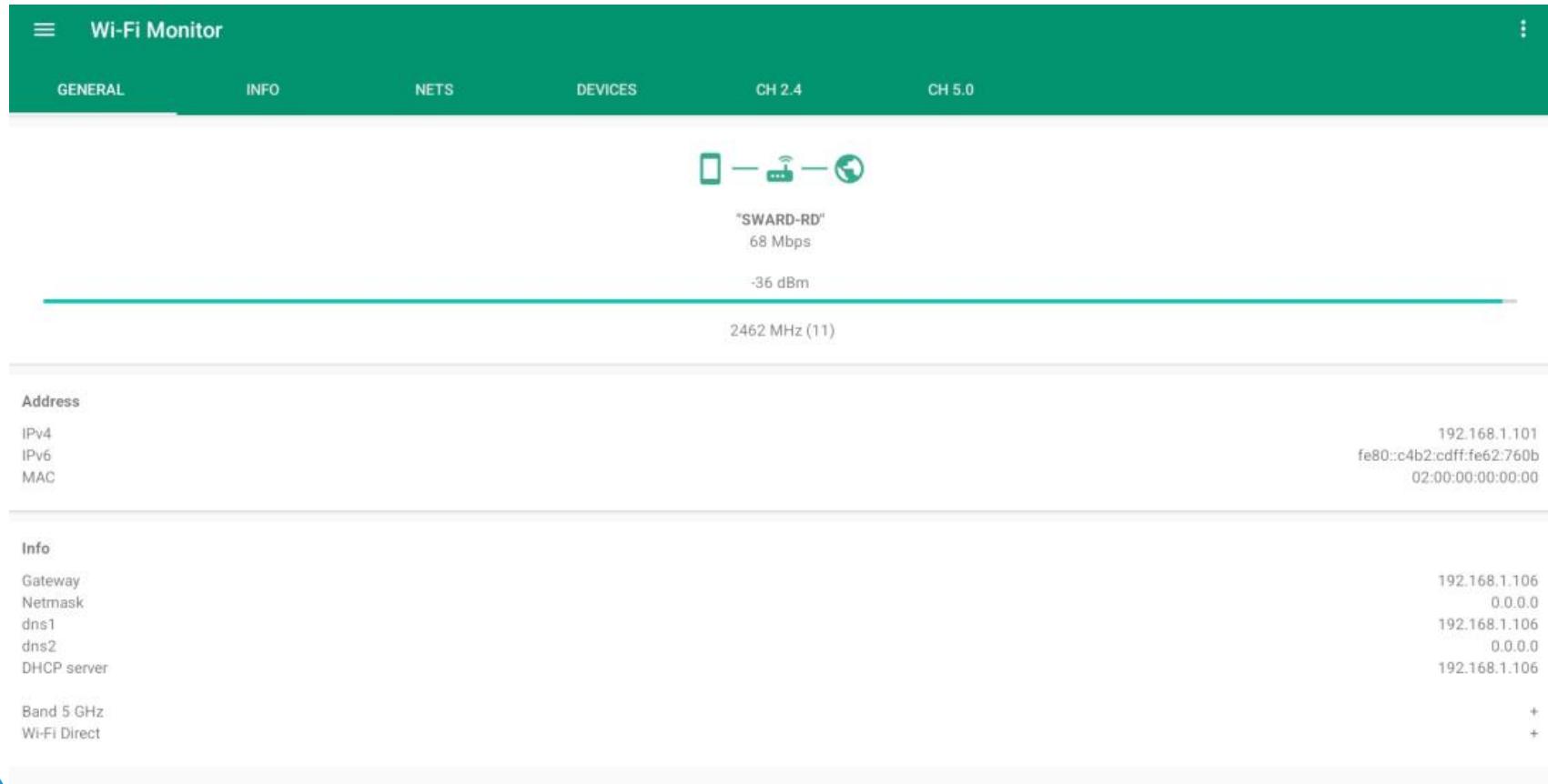


## 5GWIFI Antenna efficiency

Passive Test For 5G-WIFI			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
5000	29.3	-5.33	0.89
5100	35.6	-4.49	3.04
5200	28.66	-5.43	1.28
5300	35.35	-4.52	0.97
5400	43.57	-3.61	1.99
5500	36.96	-4.32	1.17
5600	30.48	-5.16	0.33
5700	27.54	-5.6	-1.27
5800	25.52	-5.93	1.21
5900	19.93	-7.01	-1.46
6000	22.52	-6.47	-1.35

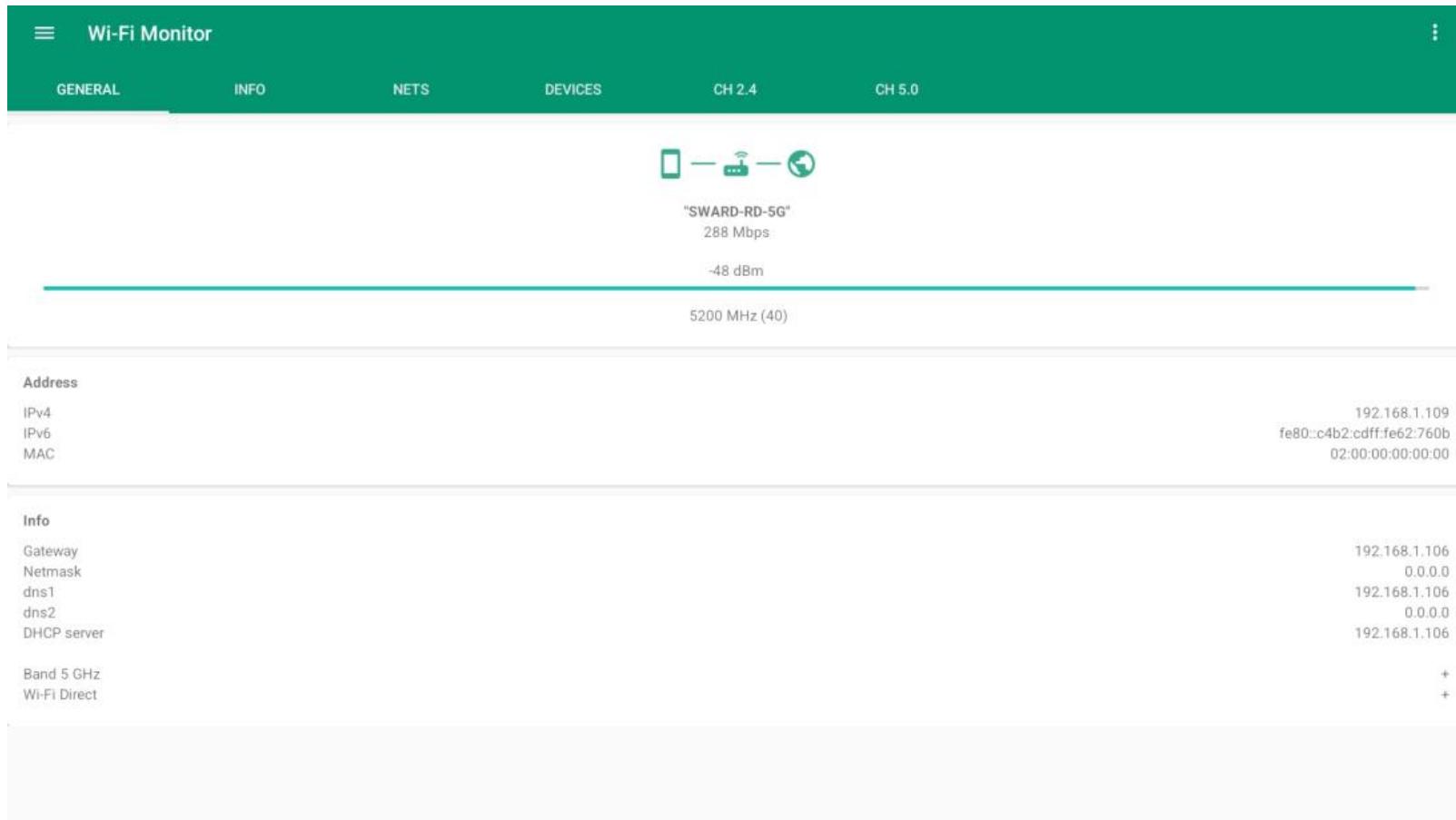


## WIFI Actual measurement image of antenna signal strength (data)



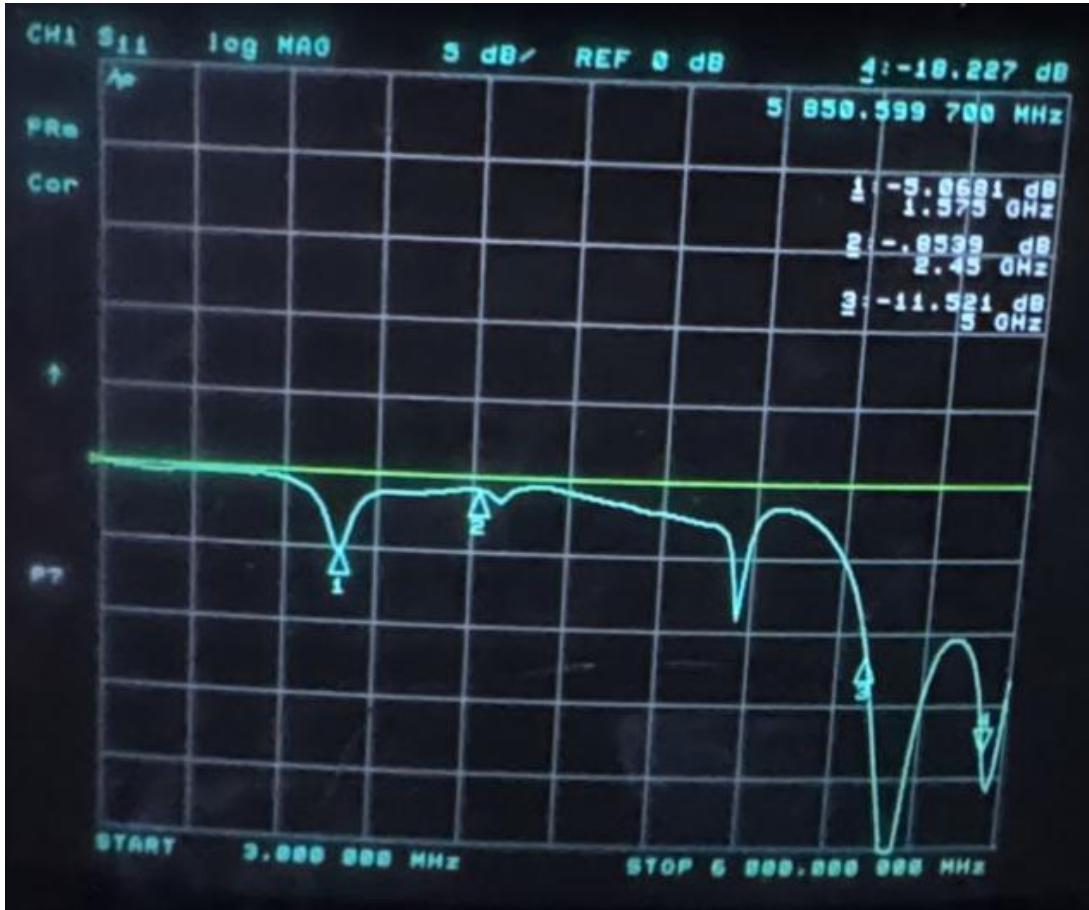
Test location: Our R&D office  
Test time: 14:00-14:30  
Test distance: 10-15 meters  
Signal strength: -49dBm to -40dBm

## WIFIActual measurement image of antenna signal strength (data)



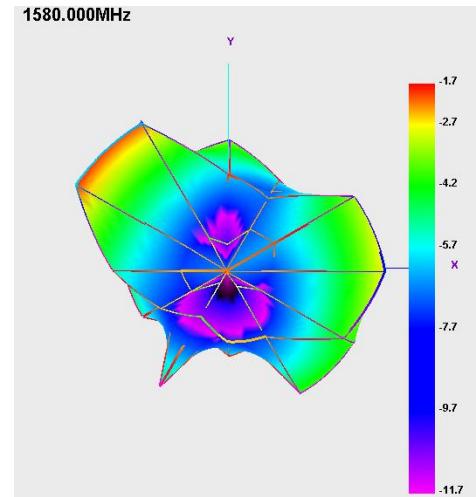
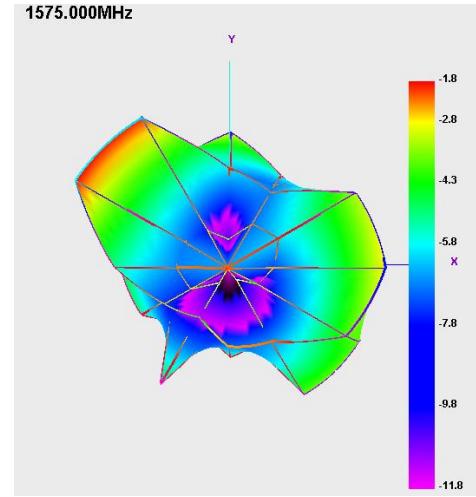
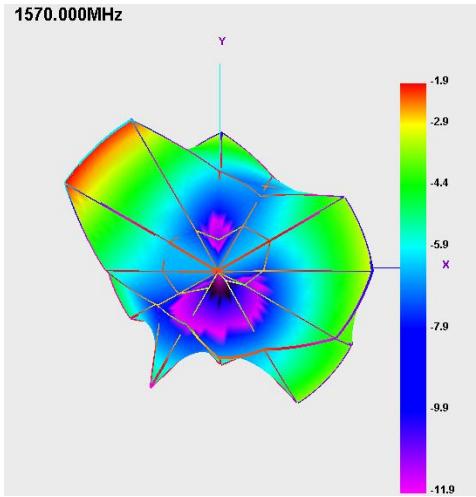
Test location: Our R&D office  
Test time: 14:00-14:30  
Test distance: 10-15 meters  
Signal strength: -49dBm to -40dBm

## GPS antennaS11

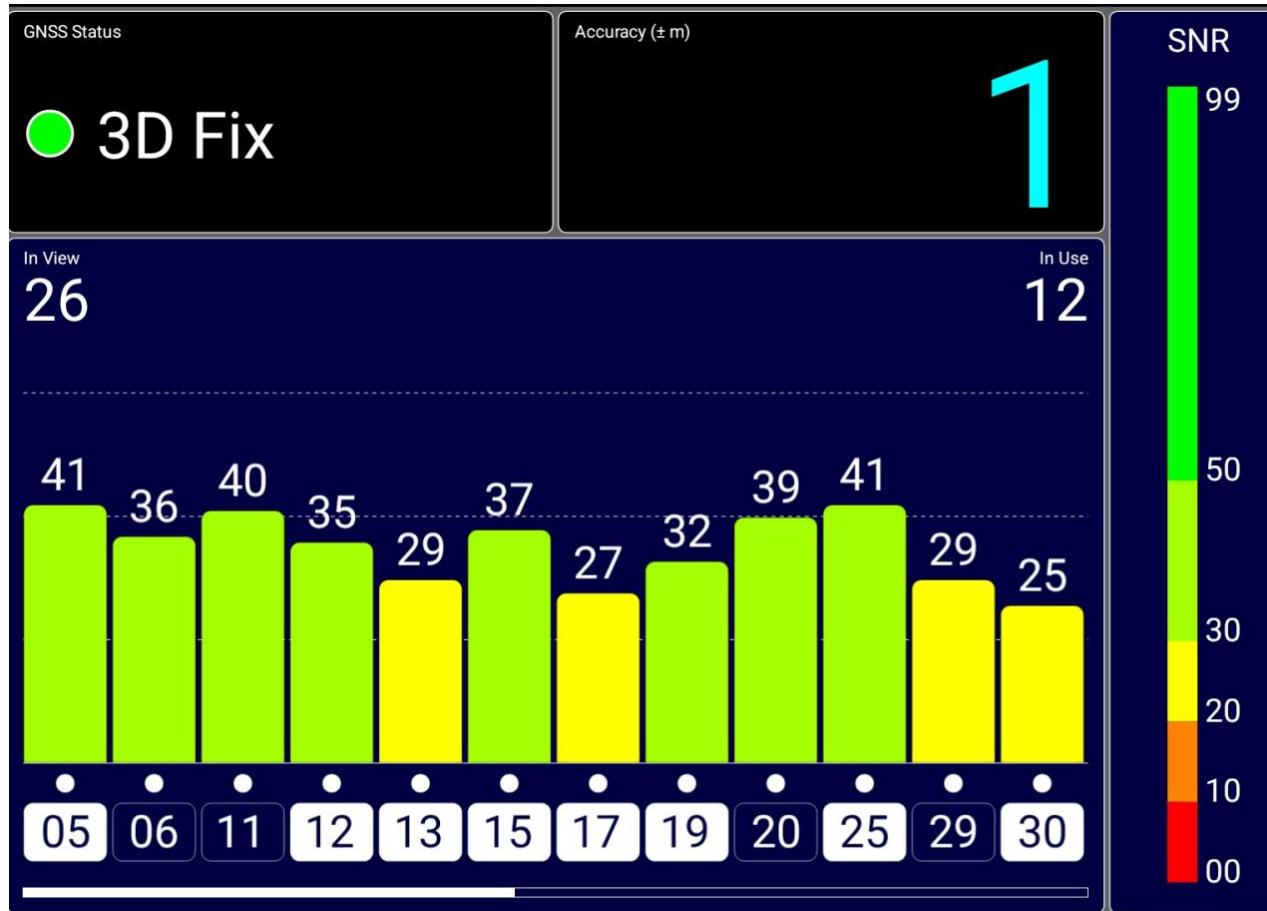


## GPS Antenna efficiency

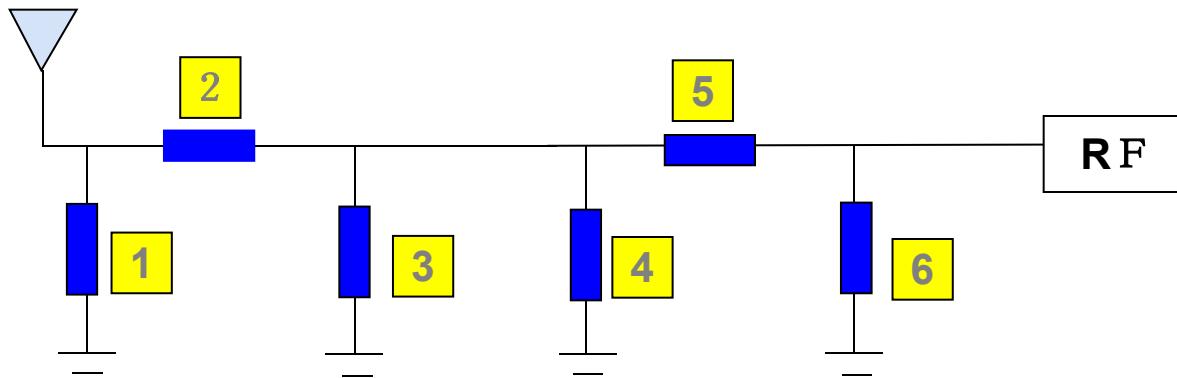
Passive Test For GPS			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1570	36. 57	-4. 37	-1. 92
1571	36. 61	-4. 36	-1. 9
1572	36. 71	-4. 35	-1. 91
1573	36. 89	-4. 33	-1. 85
1574	37. 14	-4. 3	-1. 83
1575	37. 4	-4. 27	-1. 78
1576	37. 42	-4. 27	-1. 77
1577	37. 35	-4. 28	-1. 74
1578	37. 23	-4. 29	-1. 72
1579	36. 98	-4. 32	-1. 72
1580	36. 66	-4. 36	-1. 72



## GPSActual measured images (data)



Test location: Our company's rooftop  
Test time: 16:00 to 16:30  
Test direction: East, South, West, North  
Cold start positioning time: 60 seconds

antenna matching  
antenna

main	1	2	3	4	5	6	notes
Original matching							
Change Matching							

No antenna matching has been changed

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.)