

W212X-V Project

Antenna RF System Development Report

RF: Dragon.long

Edition : 20260902 V3

Catalogue

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Project Development

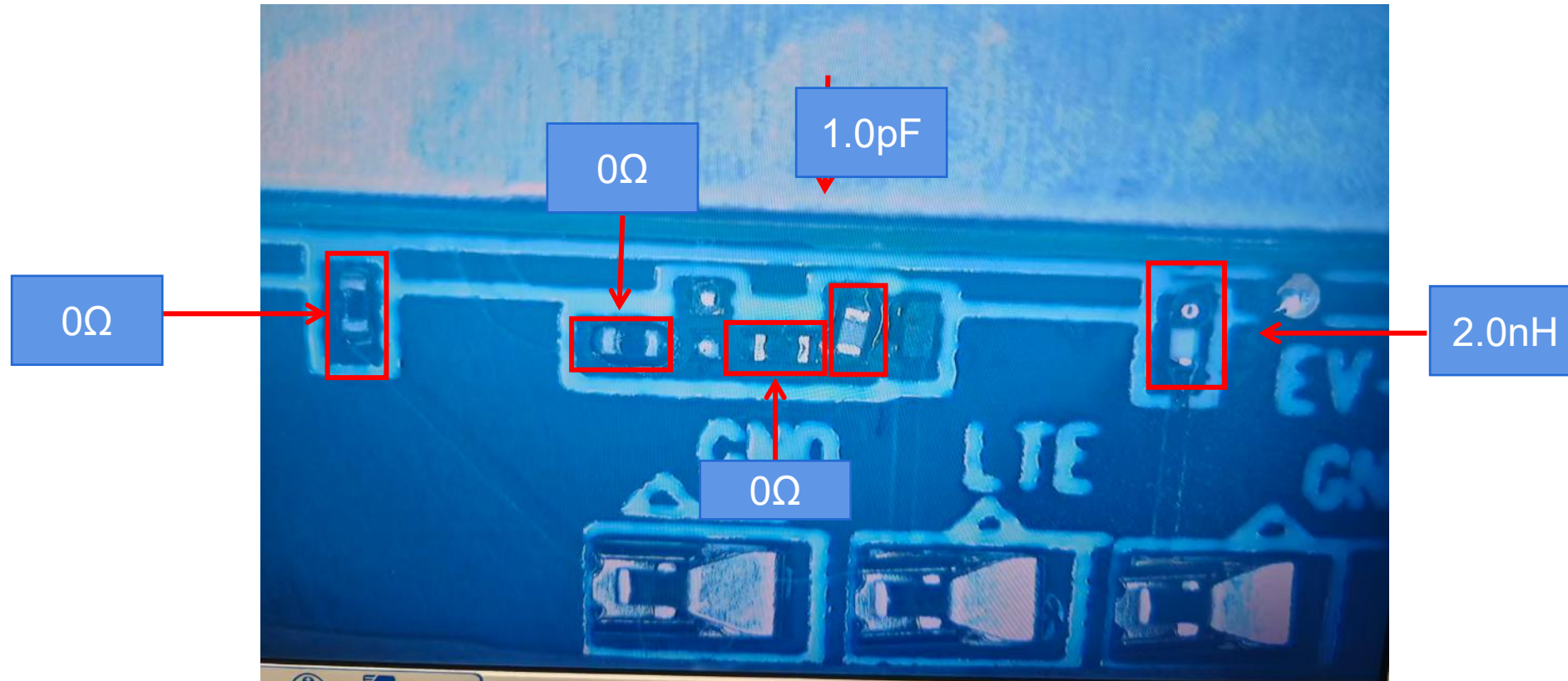
Introduction

Main Antenna	frequency band		天线状态	天线形式	设计区域	匹配改动
	4G	LTE B4/13	LDS antenna	PIFA	LDS upper shell	Yes
Other antennas	GPS	1560-1605MHz	LDS antenna fine-tuning	PIFA	LDS upper shell	No
	BT/WIFI	2.4GHz	LDS antenna fine-tuning	Monopole	LDS upper shell	Yes
Prototype status	Mold prototype		Environmental treatment	There are environmental treatment measures in place		

Summary of Report Version

Version	Date	Content Overview
V1	20260725	Feedback on mold prototype antenna debugging data
V2	20260813	Verify the test data of the latest encapsulated gradient antenna samples
V3	20260902	Feedback on the latest prototype antenna test data

Main antenna matching circuit

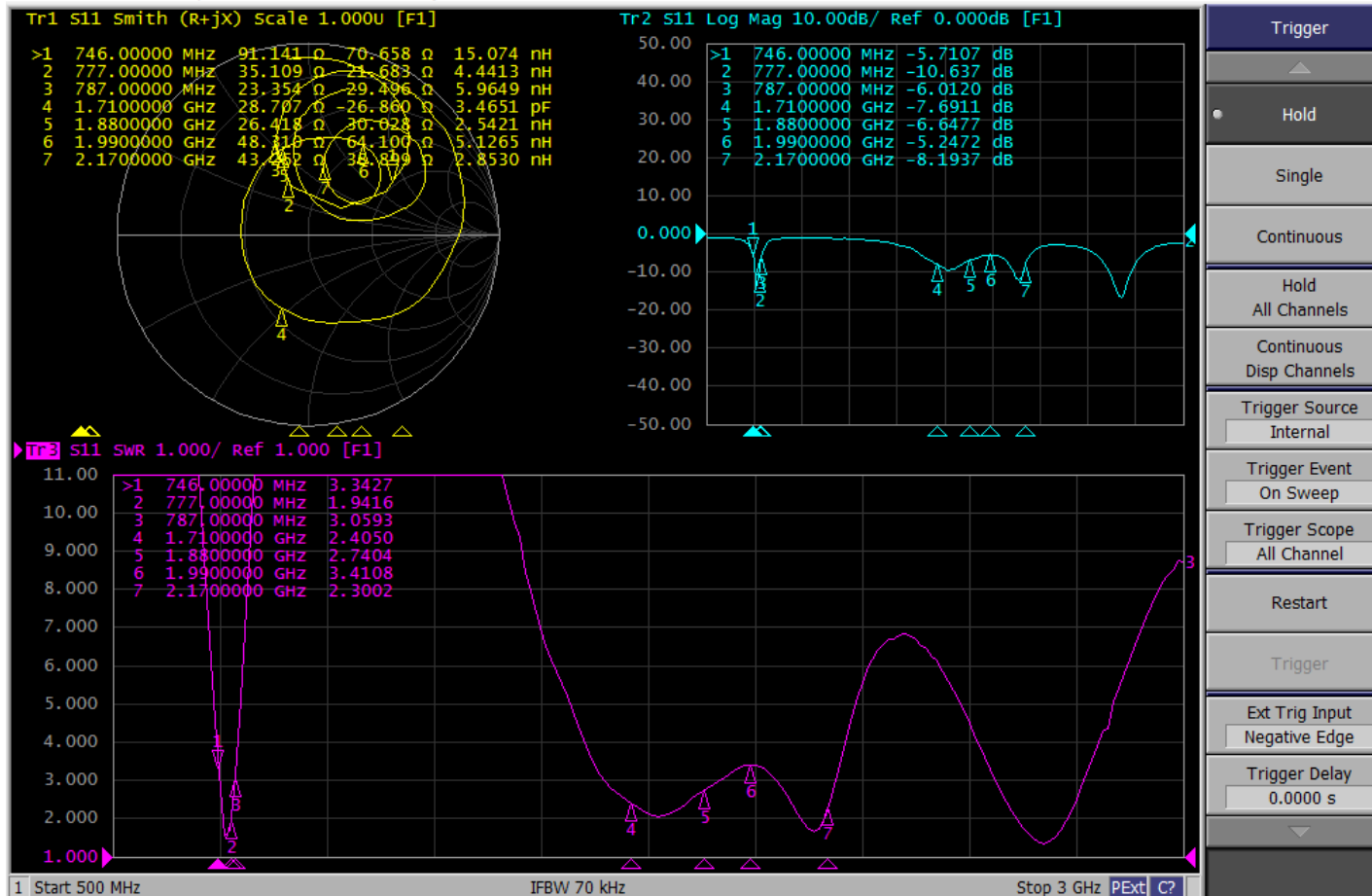


Main antenna S parameters

E5071C Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

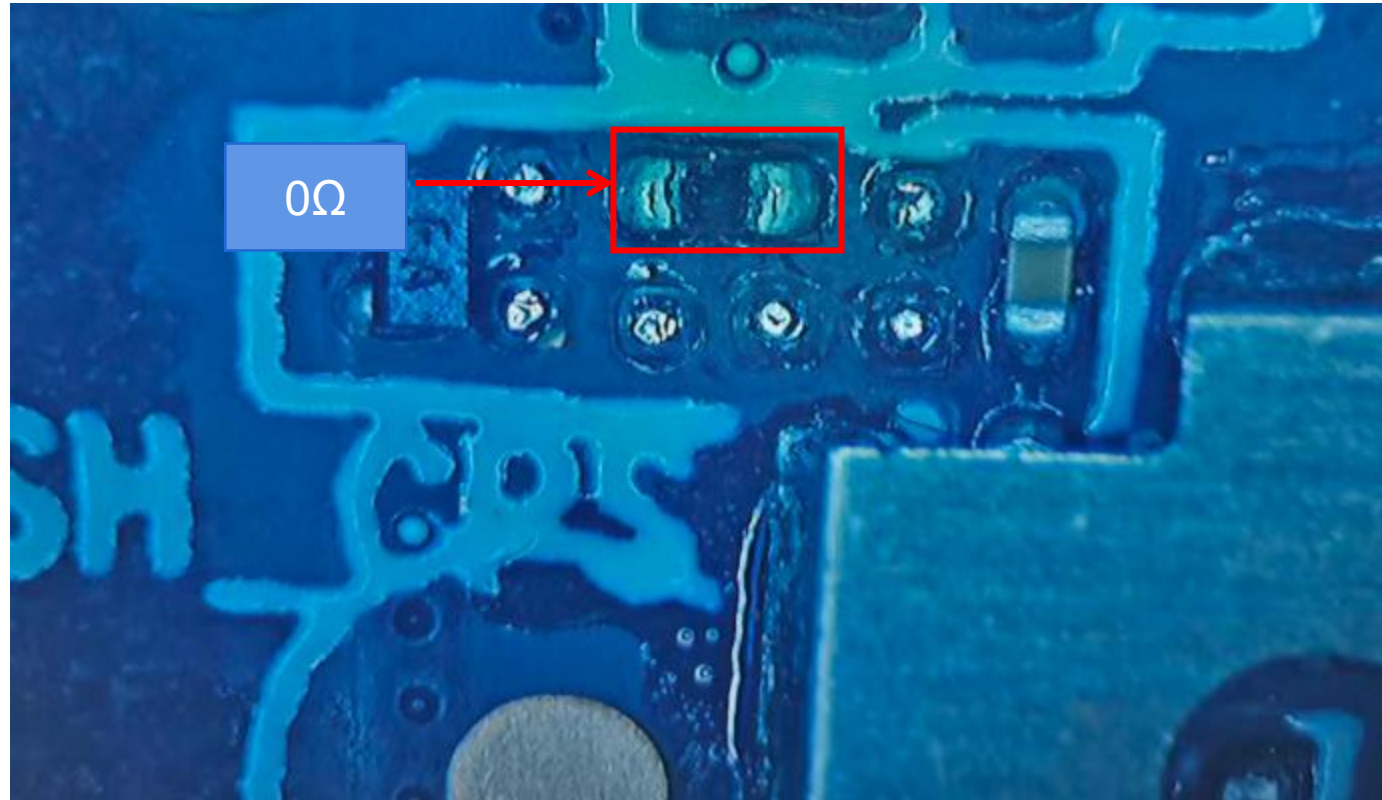
Resize



Passive efficiency of main antenna

Main Antenna							
Arm model				Arm model			
Frequency (MHz)	Efficiency (dB)	Gain (dBi)	Efficiency (%)	Frequency (MHz)	Efficiency (dB)	Gain (dBi)	Efficiency (%)
1710	-8.4	-4.7	14.4	740	-12.0	-5.3	6.3
1730	-8.4	-4.7	14.6	750	-11.7	-5.2	6.7
1750	-8.2	-4.4	15.0	760	-11.4	-4.8	7.3
1770	-8.3	-4.6	14.7	770	-11.4	-4.9	7.2
1790	-8.6	-4.9	13.8	780	-11.7	-5.2	6.8
1810	-8.7	-5.2	13.4	790	-11.9	-5.2	6.5
1830	-8.9	-5.5	12.9	Average	-11.7	-5.1	6.8
1850	-8.9	-5.3	12.9				
1870	-8.9	-5.1	12.8				
1890	-9.0	-5.0	12.5				
1910	-9.0	-4.8	12.5				
1930	-9.3	-4.9	11.7				
1950	-9.3	-4.8	11.9				
1970	-9.2	-4.6	11.9				
1990	-9.1	-4.5	12.4				
2010	-9.0	-4.4	12.7				
2030	-8.6	-4.0	13.9				
2050	-8.4	-3.5	14.5				
2070	-8.3	-3.3	15.0				
2090	-8.1	-3.0	15.5				
2110	-8.1	-2.5	15.5				
2130	-8.1	-2.5	15.7				
2150	-8.4	-2.5	14.5				
2170	-8.6	-2.6	13.7				
Average	-8.7	-4.2	13.7				

GPS antenna matching circuit



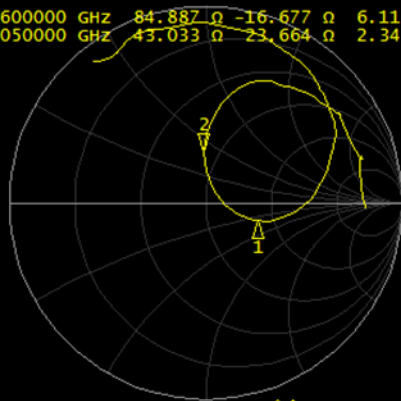
GPS antenna S parameters

E5071C Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

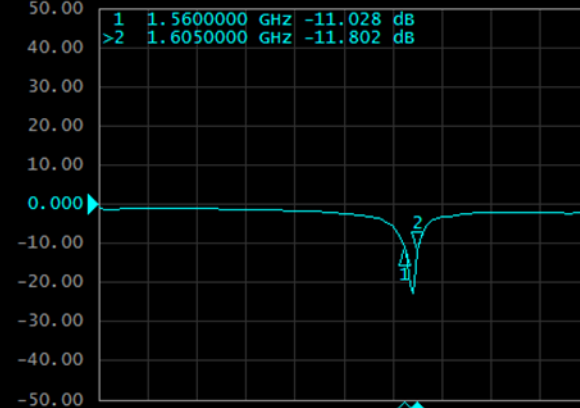
Tr1 S11 Smith (R+jX) Scale 1.000U [F1]

1	1.5600000 GHz	84.887 Ω	-16.677 Ω	6.1174 pF
>2	1.6050000 GHz	43.033 Ω	-23.664 Ω	2.3465 nH



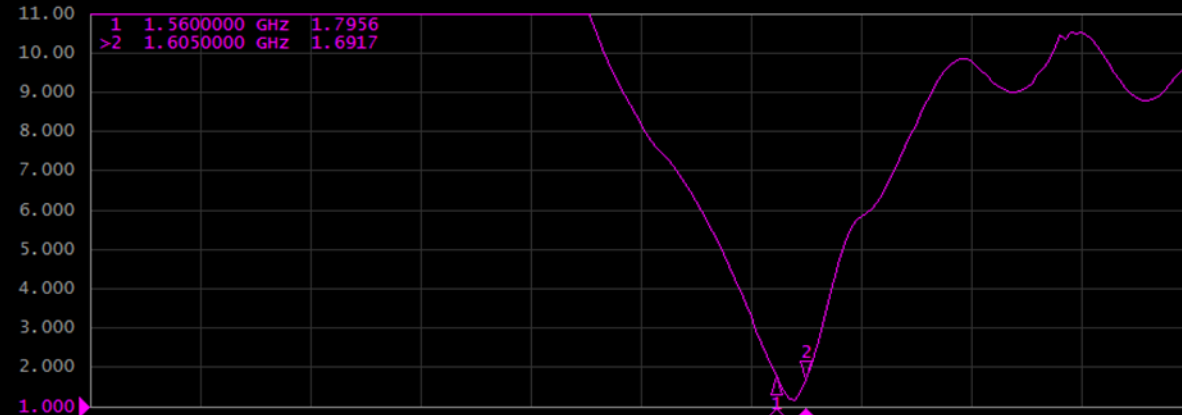
Tr2 S11 Log Mag 10.00dB/ Ref 0.000dB [F1]

1	1.5600000 GHz	-11.028 dB
>2	1.6050000 GHz	-11.802 dB



Tr3 S11 SWR 1.000/ Ref 1.000 [F1]

1	1.5600000 GHz	1.7956
>2	1.6050000 GHz	1.6917



1 Start 500 MHz

IFBW 70 kHz

Stop 2.2 GHz PExt Cl

Resize

Trigger

Hold

Single

Continuous

Hold

All Channels

Continuous

Disp Channels

Trigger Source

Internal

Trigger Event

On Sweep

Trigger Scope

All Channel

Restart

Trigger

Ext Trig Input

Negative Edge

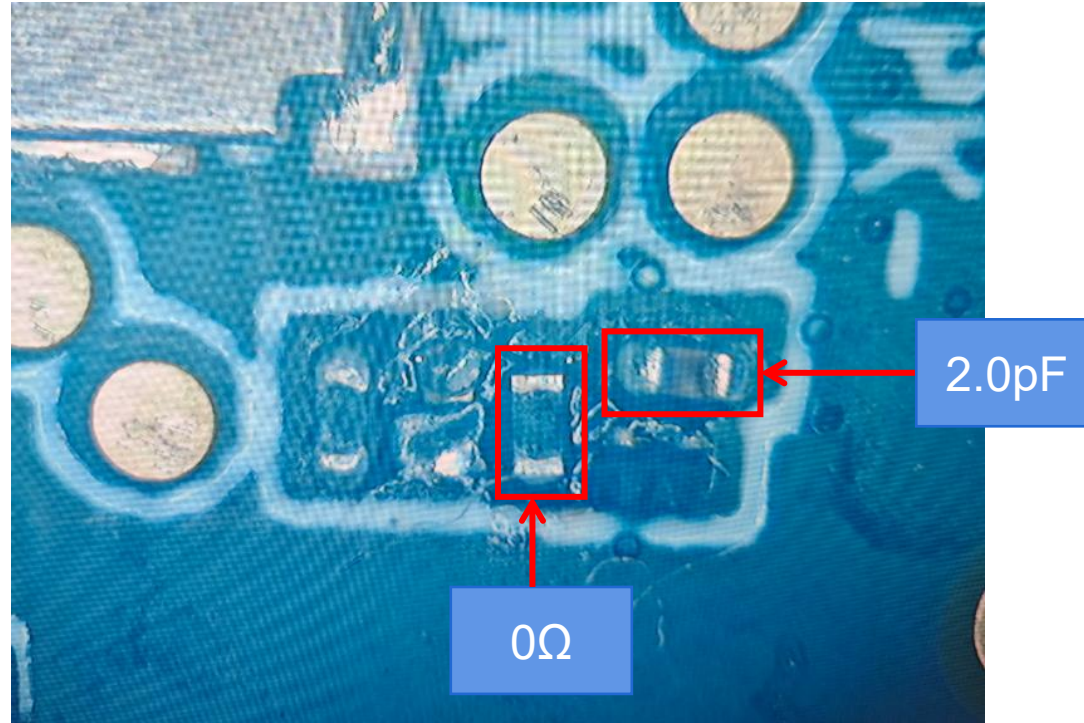
Trigger Delay

0.0000 s

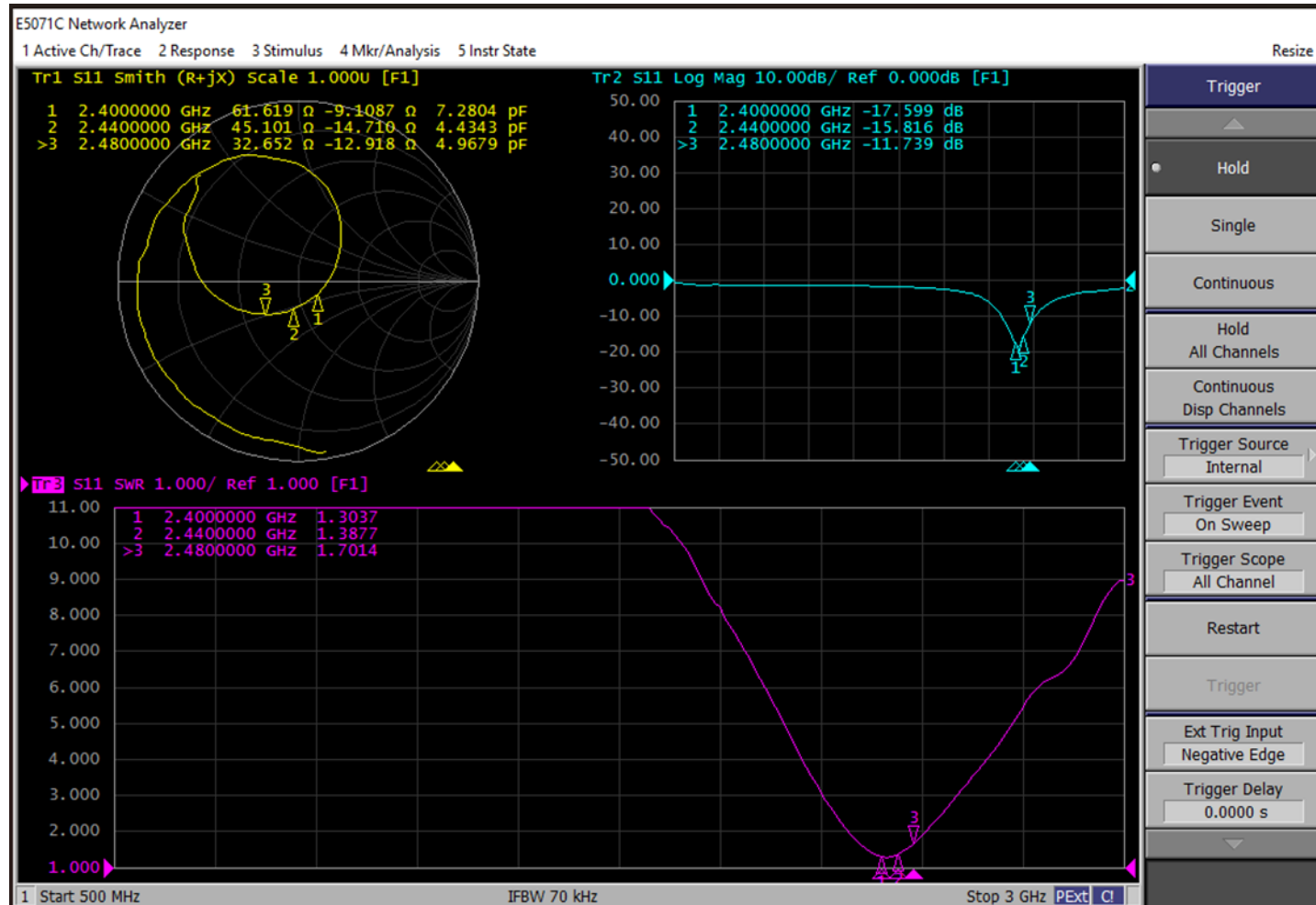
Passive efficiency of GPS antenna

GPS Arm model 0Ω			
Frequency (MHz)	Efficiency (dB)	Gain (dBi)	Efficiency (%)
1560	-10.2	-4.9	9.5
1565	-10.0	-4.7	9.9
1570	-9.9	-4.7	10.2
1575	-9.8	-4.5	10.5
1580	-9.7	-4.5	10.8
1585	-9.6	-4.5	10.9
1590	-9.6	-4.6	11.0
1595	-9.6	-4.7	10.9
1600	-9.7	-4.9	10.8
1605	-9.7	-5.0	10.6
Average	-9.8	-4.7	10.5

BTWIFI antenna matching circuit



BT/WIFI antenna S parameters



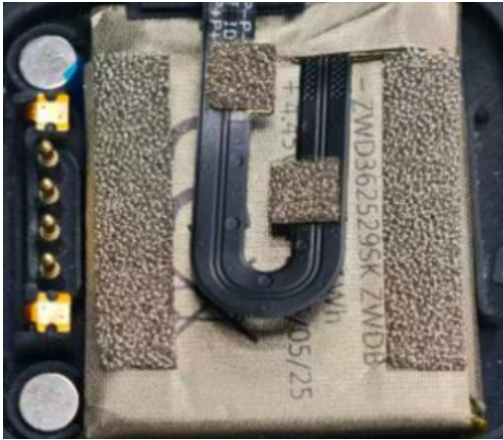
Passive efficiency of BT/WIFI antenna

BT/WIFI Arm model 2.0pF			
Frequency (MHz)	Efficiency (dB)	Gain (dBi)	Efficiency (%)
2400	-8.2	-4.4	15.3
2410	-8.0	-4.1	15.9
2420	-8.0	-3.8	15.9
2430	-8.0	-3.5	16.0
2440	-8.0	-3.2	16.0
2450	-8.0	-3.0	15.9
2460	-8.1	-2.9	15.6
2470	-8.1	-2.8	15.4
2480	-8.2	-2.6	15.2
Average	-8.1	-3.4	15.7

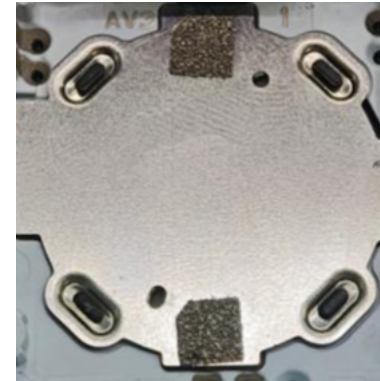
Main antenna active OTA data

Arm model	Channel	TRP (dBm)	TIS (dBm)
FDD B4	CH 20000	12.8	
	CH 20175	13.1	
	CH 20350	13.2	-88.5
FDD B13	CH 23230	10.5	-83.7

Environmental treatment



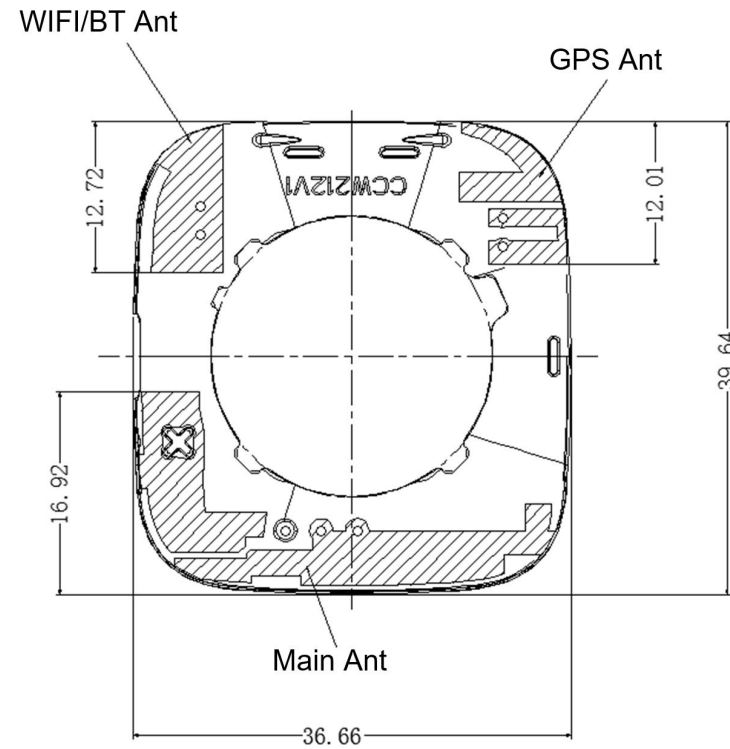
The battery is wrapped in conductive cloth, and conductive foam and motherboard shielding cover are grounded on both sides. The exposed copper area of the FPC cable is grounded with conductive foam and motherboard shielding cover.



Both sides of the SOS steel sheet are covered with conductive foam and grounded with the main board shielding cover.

Summary

The antenna data for this verification is basically okay.



Additional notes

1. Please carefully confirm whether the matching circuit mentioned in the report has been modified and whether the environmental treatment has been imported, as this will directly affect the antenna performance.
2. The parameters provided in the report are only the parameters provided by the customer to our company for testing the prototype, and do not represent the final mass production status of your company's final project.
3. If your company has the latest prototype for trial production or updated status (replacement of materials, software, environmental treatment, etc.), please submit it to our company for verification as soon as possible to confirm whether the antenna performance is affected.
4. If your company needs to send the machine for third-party retesting or customer testing, please be sure to hand it over to our company for testing and confirmation, as factors such as motherboard consistency, assembly consistency, and differences in antenna assembly may lead to deviations in antenna parameters.