



Shenzhen cape deep communication technology co., LTD

Antenna test report

customer: Le Dai
project : S2
RF: Yao Gong
Date : 2024.07.24
Version: 02

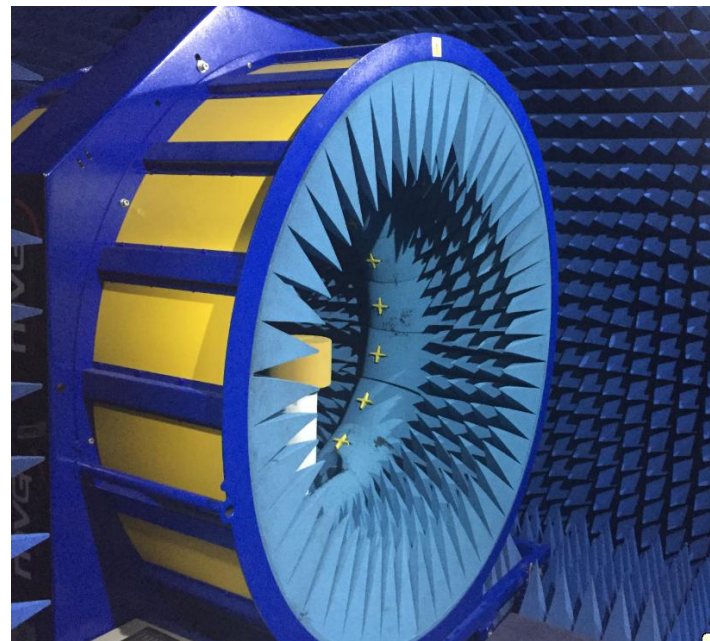


Change Record Explanation

time	Version Description
2024. 07. 24	V. 02



Laboratory testing environment and equipment



Test items	Test equipment
S11、S12、VSWR、LOSS	network analyzer E5071B、E5062A
Efficiency、Gain 3D Radiation Pattern	Satimo SG16 darkroom、GP7*4*3 darkroom 、E5071B
TRP、TIS	Satimo SG16 darkroom、GP7*4*3 darkroom、8960、CMW500、MT8820C、 E4438C、

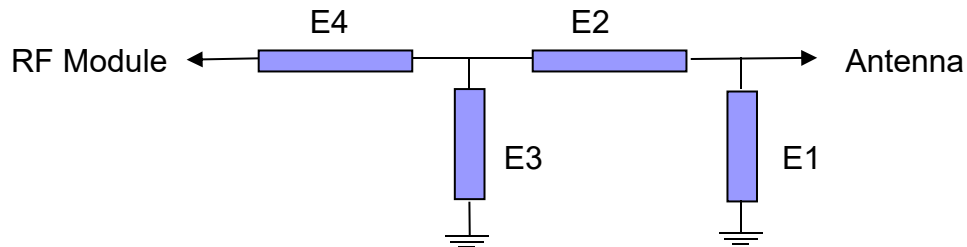


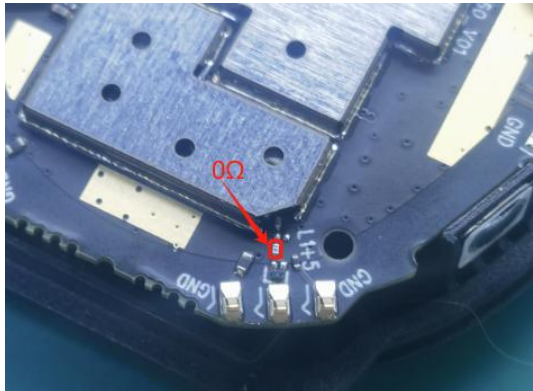
A Brief Introduction to debugging the project

Machine type	Wrist watch		
		Frequency band information	Antenna form
Antenna type and frequency band information	antenna	GPS L1+L5 BT	Double level
Antenna material	FPC		



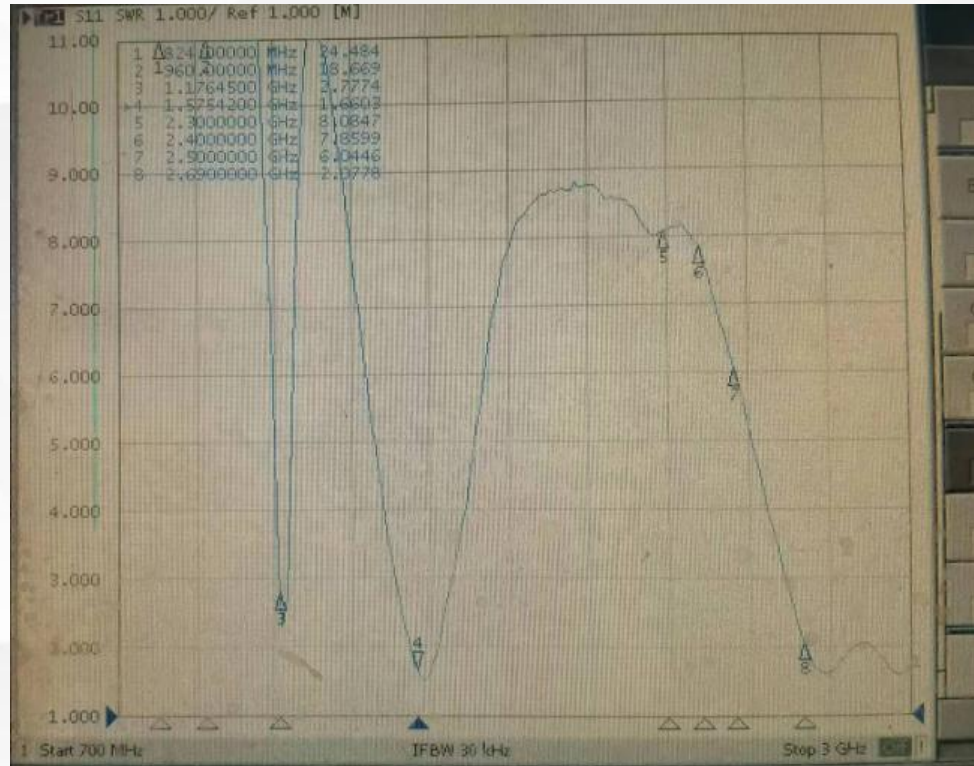
GPS antenna matching circuit



GPS antenna	Element	Value	Attached image description
	E1(0201)	N/A	
	E2(0201)	0Ω	
	E3(0201)	N/A	



GPS antenna passive standing wave





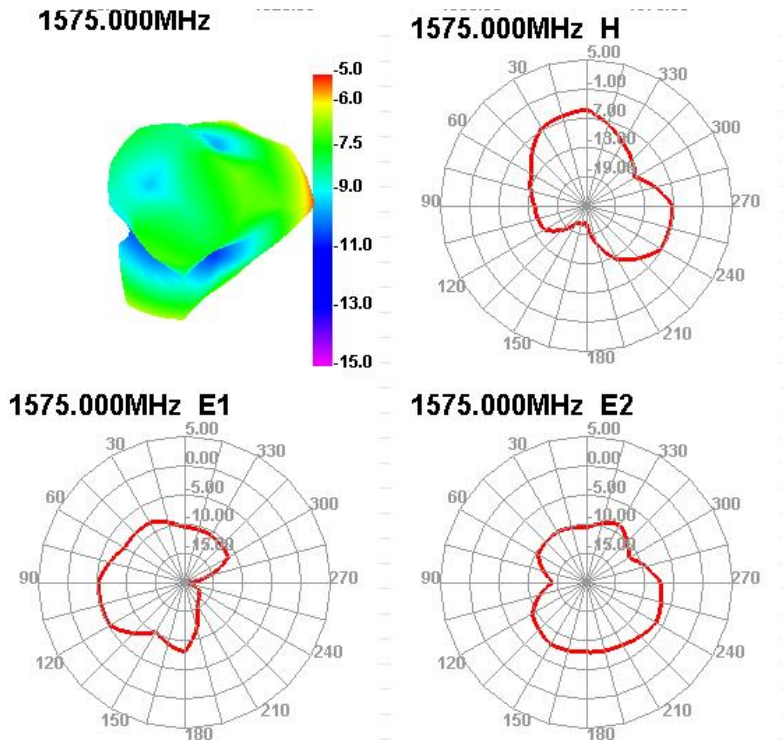
Passive efficiency of GPS antenna

Passive Test For GPS			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1500	12.04	-9.19	-5.42
1505	11.57	-9.37	-5.65
1510	10.35	-9.85	-6.09
1515	10.58	-9.76	-5.81
1520	11.53	-9.38	-5.34
1525	11.79	-9.28	-5.06
1530	10.96	-9.6	-5.27
1535	10.24	-9.9	-5.41
1540	11.32	-9.46	-4.99
1545	10.93	-9.61	-5.12
1550	10.76	-9.68	-5.14
1555	10.08	-9.97	-5.36
1560	10.72	-9.7	-5.16
1565	10.74	-9.69	-5.19
1570	11.2	-9.51	-5.01
1575	11.2	-9.51	-4.97
1580	11.44	-9.42	-5.05
1585	11.21	-9.5	-5.22
1590	10.62	-9.74	-5.34
1595	11.09	-9.55	-5.06
1600	10.91	-9.62	-5.19

Frequency/Mhz	Efficiency/ dB	Efficiency/ %	Gain/dBi
1150	-16.72	2.13	-11.64
1155	-17.17	1.92	-11.47
1160	-15.51	2.81	-10.76
1165	-15.38	2.9	-10.56
1170	-14.55	3.51	-11.36
1175	-13.90	4.07	-9.92
1180	-14.13	3.86	-10.93
1185	-15.13	3.07	-11.04
1190	-16.38	2.3	-9.87
1195	-16.23	2.38	-11.11
1200	-17.54	1.76	-11.87

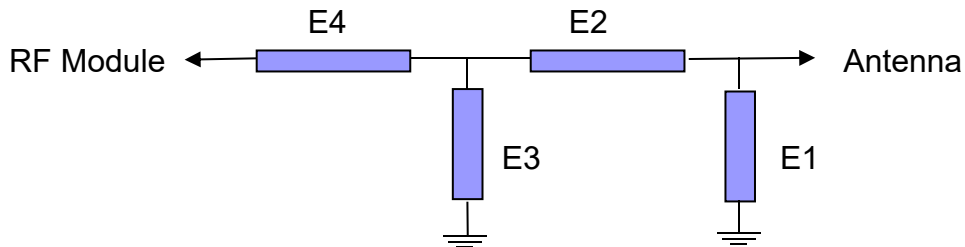


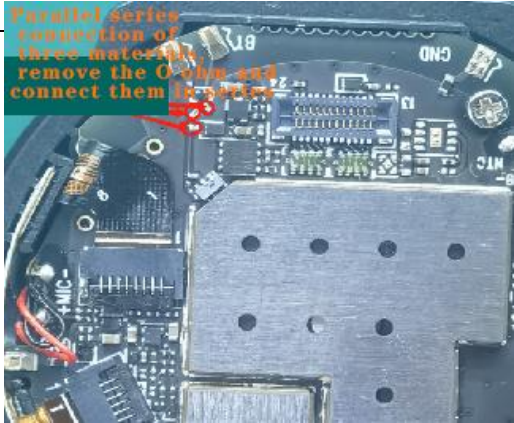
GPS antenna passive directional pattern





BT antenna matching circuit



BT antenna	Element	Value	
	E1(0201)	N/A	
	E2(0201)	0Ω	
	E3(0201)	N/A	



BT antenna passive standing wave





Passive efficiency of BT antenna

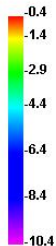
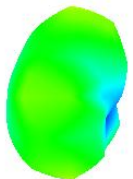
Passive Test For BT			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2400	39.34	-4.05	-0.35
2410	35.58	-4.49	-0.98
2420	35.15	-4.54	-1.05
2430	33.09	-4.8	-1.34
2440	34.01	-4.68	-1.2
2450	31.16	-5.06	-1.8
2460	27.13	-5.67	-2.48
2470	24.41	-6.12	-2.54
2480	25.11	-6	-2.07
2490	25.73	-5.89	-1.65
2500	26.44	-5.78	-1.35



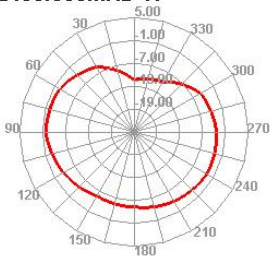


Passive directional pattern of BT antenna

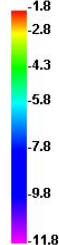
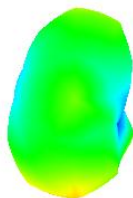
2400.000MHz



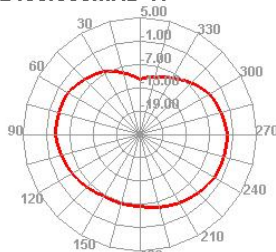
2400.000MHz H



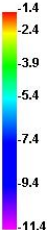
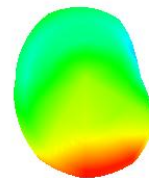
2450.000MHz



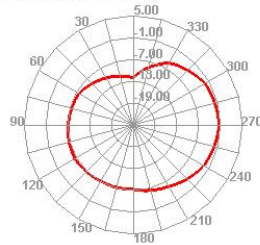
2450.000MHz H



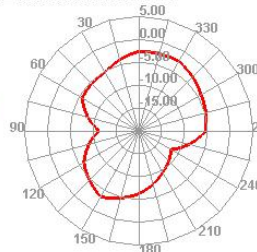
2500.000MHz



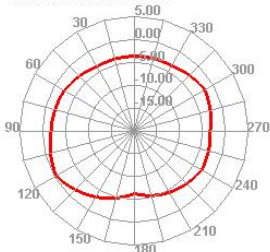
2500.000MHz H



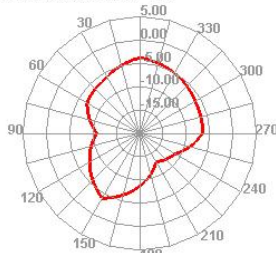
2400.000MHz E1



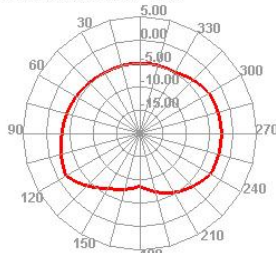
2400.000MHz E2



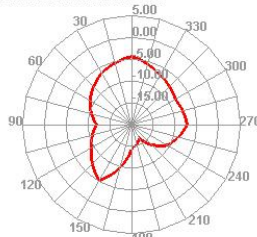
2450.000MHz E1



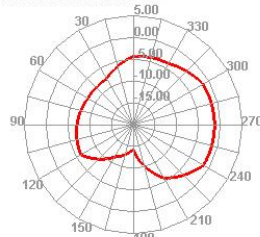
2450.000MHz E2



2500.000MHz E1

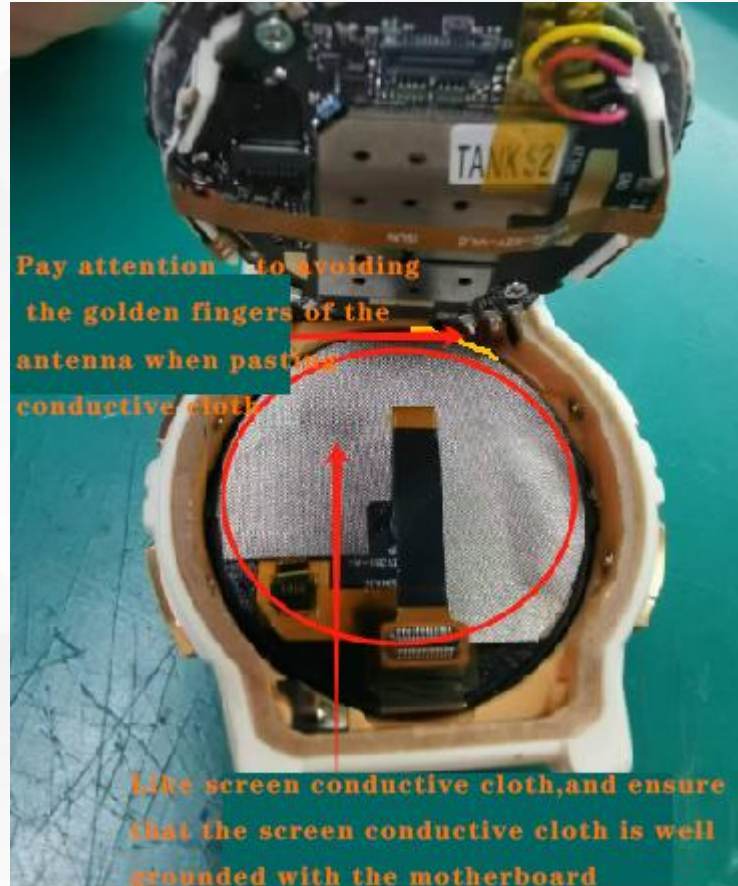


2500.000MHz E2





Environmental treatment





GPS measurement





BT Actual testing

Tested Pull Distance between Wearing a Watch and Connecting to Huawei Phone via Bluetooth:

Listening to music/talking for 15m without lagging (360 degree turn around test)



Summary

The above data is the test result of V0.4 version antenna with modified matching (GPS actual measurement for star search OK).

Suggestion: Add a positioning column in the middle of the shell antenna shrapnel to control the differences in antenna mounting!



contact information

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THE END

**Thank you for your
valuable feedback!**