



SHENZHEN Xingyuanchuang TECHNOLOGY CO., LTD

Antenna Test Report

TC: sang ge er

MN: Z30

RF: Guan Wei

MD: Huang Qingqing

MP: 15112592483

Date: 2023. 05. 16.

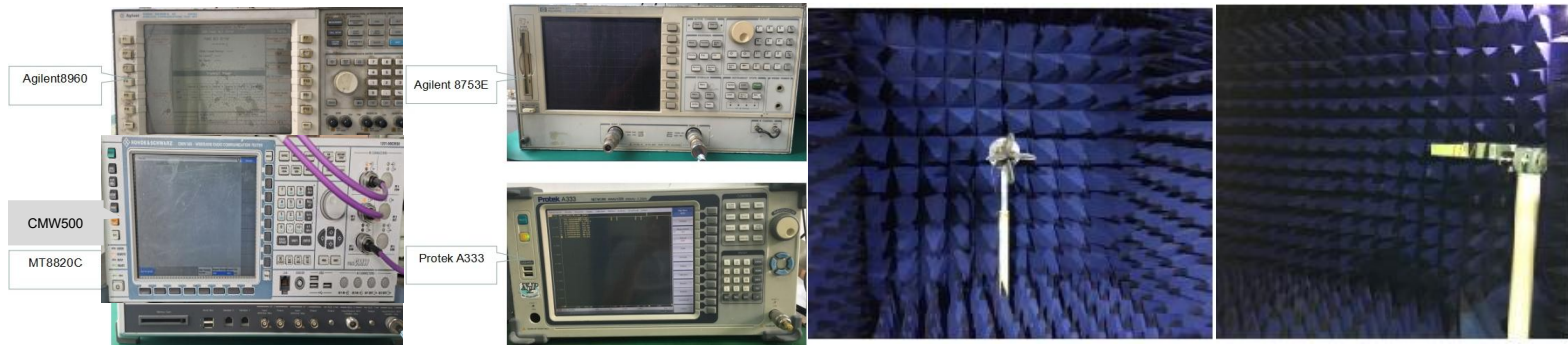
REV :V1. 0

Test information

	Antenna band	Antenna state	Antenna form	Match changes	Note
Main ANT	2G				
	3G	FPC	PIFA	NO	
	4G	2/4/5/7/12/13/14/17/25 /26/66/71			
AUX ANT	BT/WIFI	2.4G/5G	FPC	PIFA	NO
	GPS	1.575G	FPC	PIFA	NO
	DIV		FPC	PIFA	NO

Test environment

	Test Item	Test Equipment
1. S-parameter	<ol style="list-style-type: none"> 1. Voltage standing wave ratio 2. Return Loss 	Network analyzer: Agilent8753ES
2. Active Test	<ol style="list-style-type: none"> 1. Transmitted power (TRP) 2. Receiving sensitivity (TIS) 3. screen is off or on 	<ol style="list-style-type: none"> 1. Dark room: 5*3*3m (3D) Chamber 2. synthesizer: Agilent8960 CMW500
3. Passive Test	<ol style="list-style-type: none"> 1. Antenna gain 2. Antenna efficiency 	<ol style="list-style-type: none"> 1. Dark room: 5*3*3m (3D) Chamber 2. Network analyzer: Agilent 8753ES



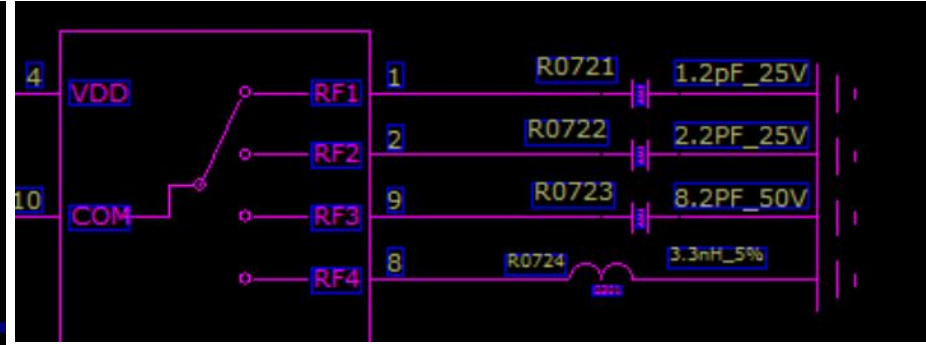
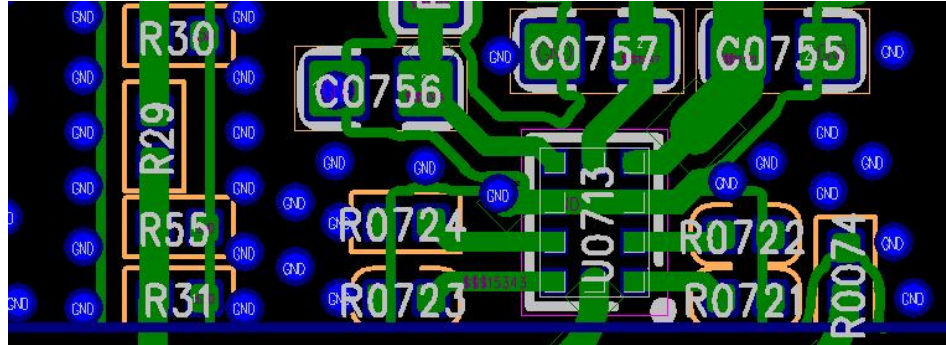
Antenna position



Matching circuit

RF Port	Bit number	value	Applied frequency band
ANT	R30	NC	
	R29	3NH	
	R55	1.5PF	
	R31	15NH	
RF1	R0721	0 Ω	B2/4/25/66
RF2	R0722	18NH	B71
RF3	R0723	0 Ω	B5/7/26/41
RF4	R0724	12NH	B12/13/14/17

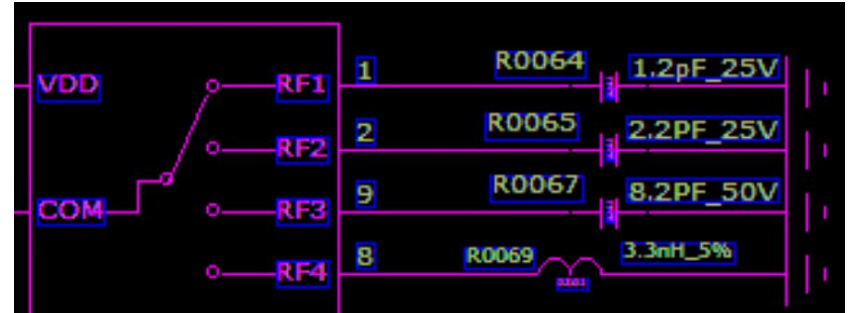
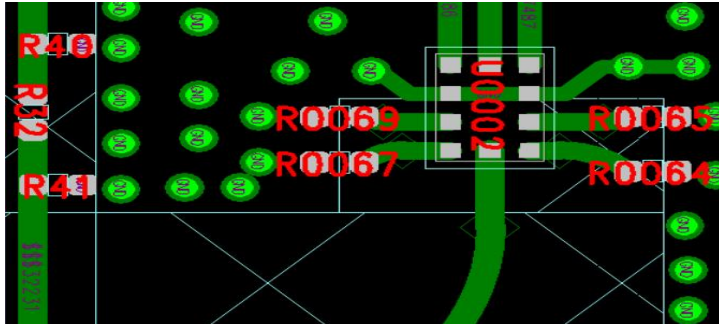
Main antenna matching



Matching circuit

RF Port	Bit number	value	Applied frequency band
ANT	R41	1.5PF	
	R32	5.1NH	
	R40	NC	
RF1	R0064	1.2PF	B2/4/25/66
RF2	R0065	2.2PF	B71
RF3	R0067	8.2PF	B5/7/26/41
RF4	R0069	3.3NH	B12/13/14/17

Diversity antenna matching



OTA test data

1#

2G												
Band	GSM850			GSM900			GSM-1800(DCS)			GSM-1900(PCS)		
Channel	128	192	251	1	62	124	512	698	885	512	660	810
TRP(dBm)												
TIS(LCD OFF)												
TIS(LCD ON)												
4G												
Band	TDD-Band 41(20M)											
Channel	39750	40620	41490									
TRP(dBm)		17.5										
TIS(LCD OFF)		-90.05										
TIS(LCD ON)												
4G(FDD 10M)												
Band	FDD-Band 2			FDD-Band 4			FDD-Band 5			FDD-Band 7		
Channel	18650	18900	19150	20000	20175	23050	20450	20525	20600	20800	21100	21400
TRP(dBm)	20.9	19.35	20.85	21.77	21.99	21.71	22.65	21.38	20.47	16.1	18.31	18.36
TIS(LCD OFF)			-96.62			-95.99			-91.72			-90.11
TIS(LCD ON)												
Band	FDD-Band 12			FDD-Band 13			FDD-Band14			FDD-Band 17		
Channel	23060	23095	23130		23230			23330		23780	23790	23800
TRP(dBm)	20.54	21.49	22.02		16.24			15.83		19.66	20.87	21.48
TIS(LCD OFF)			-89.37		-90.22			-92.48				-89.27
TIS(LCD ON)												
4G(FDD 10M)												
Band	FDD-Band25			FDD-Band 26			FDD-Band66			FDD-Band 71		
Channel	26090	26365	26640	26740	26865	26990	132022	132322	132622	133172	133297	133422
TRP(dBm)	20.22	20.44	20.37	16.31	17.9	18.56	22.06	22.25	22.37	17.21	17.29	17.14
TIS(LCD OFF)			-90.12			-89.26			-95.03			-87
TIS(LCD ON)												

OTA test data

2#

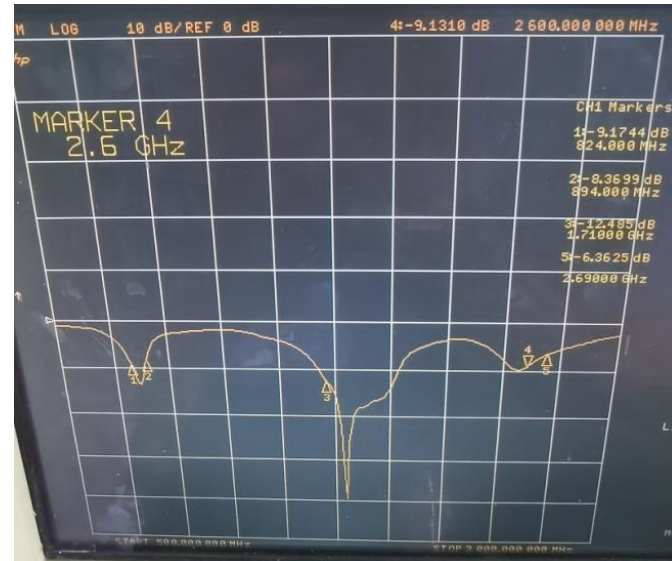
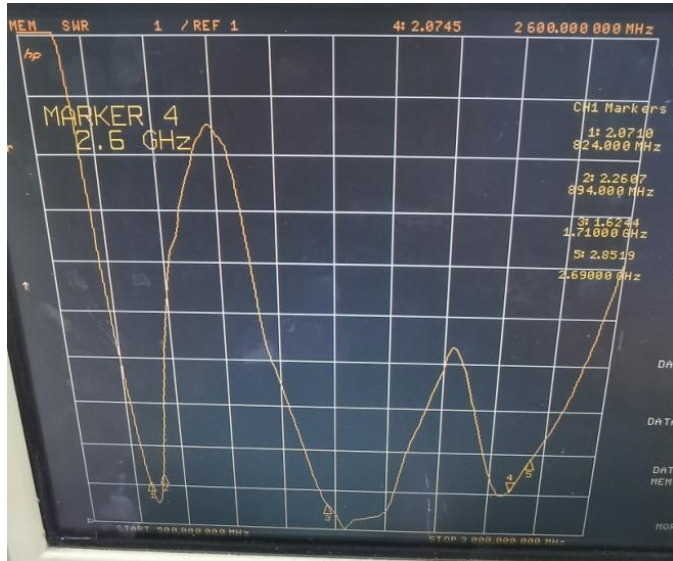
2G												
Band	GSM850			GSM900			GSM-1800(DCS)			GSM-1900(PCS)		
Channel	128	192	251	1	62	124	512	698	885	512	660	810
TRP(dBm)												
TIS(LCD OFF)												
TIS(LCD ON)												
4G												
Band	TDD-Band 41(20M)											
Channel	39750	40620	41490									
TRP(dBm)		17.5										
TIS(LCD OFF)		-90.05										
TIS(LCD ON)												
4G(FDD 10M)												
Band	FDD-Band 2			FDD-Band 4			FDD-Band 5			FDD-Band 7		
Channel	18650	18900	19150	20000	20175	23050	20450	20525	20600	20800	21100	21400
TRP(dBm)	21.19	20.31	20.79	21.97	21.44	20.79	22.3	21.66	21.08	16.1	18.31	18.36
TIS(LCD OFF)			-96.51			-96.21			-91.86			-90.11
TIS(LCD ON)												
Band	FDD-Band 12			FDD-Band 13			FDD-Band14			FDD-Band 17		
Channel	23060	23095	23130		23230			23330		23780	23790	23800
TRP(dBm)	20.63	21.1	21.4		16.24			16.17		19.26	20.28	20.41
TIS(LCD OFF)			-89.59		-90.22			-92.1				-90.02
TIS(LCD ON)												
4G(FDD 10M)												
Band	FDD-Band25			FDD-Band 26			FDD-Band66			FDD-Band 71		
Channel	26090	26365	26640	26740	26865	26990	132022	132322	132622	133172	133297	133422
TRP(dBm)	20.22	20.44	20.37	16.31	17.9	18.56	22.03	21.62	21.59	17.21	17.29	17.14
TIS(LCD OFF)			-90.12			-89.26			-95.18			-87
TIS(LCD ON)												

Active test data

Frequency	TRP		TIS		
	Channel	Value	Channel	Value	
802.11b	2412	CH1 11Mbps	14.68	CH1 11Mbps	-87.23
	2437	CH6 11Mbps	15.56	CH6 11Mbps	-87.09
	2467	CH11 11Mbps	14.64	CH11 11Mbps	-86.54
802.11g	TRP		TIS		
	2412	CH1 6Mbps	14.89	CH1 54Mbps	-73.23
	2437	CH6 6Mbps	14.26	CH6 54Mbps	-72.83
2467	CH11 6Mbps	14.57	CH11 54Mbps	-72.34	
802.11a	TRP		TIS		
	5180	CH36 6Mbps	13.62	CH36 54Mbps	-71.58
	5300	CH60 6Mbps	13.34	CH60 54Mbps	-71.94
5805	CH161 6Mbps	13.05	CH161 54Mbps	-70.27	
802.11g/n	TRP		TIS		
	2412	CH1 MCS7	14.37	CH1 MCS7	-68.79
	2437	CH6 MCS7	14.7	CH6 MCS7	-69.26
2467	CH11 MCS7	14.45	CH11 MCS7	-67.65	

Main ANT Passive test data

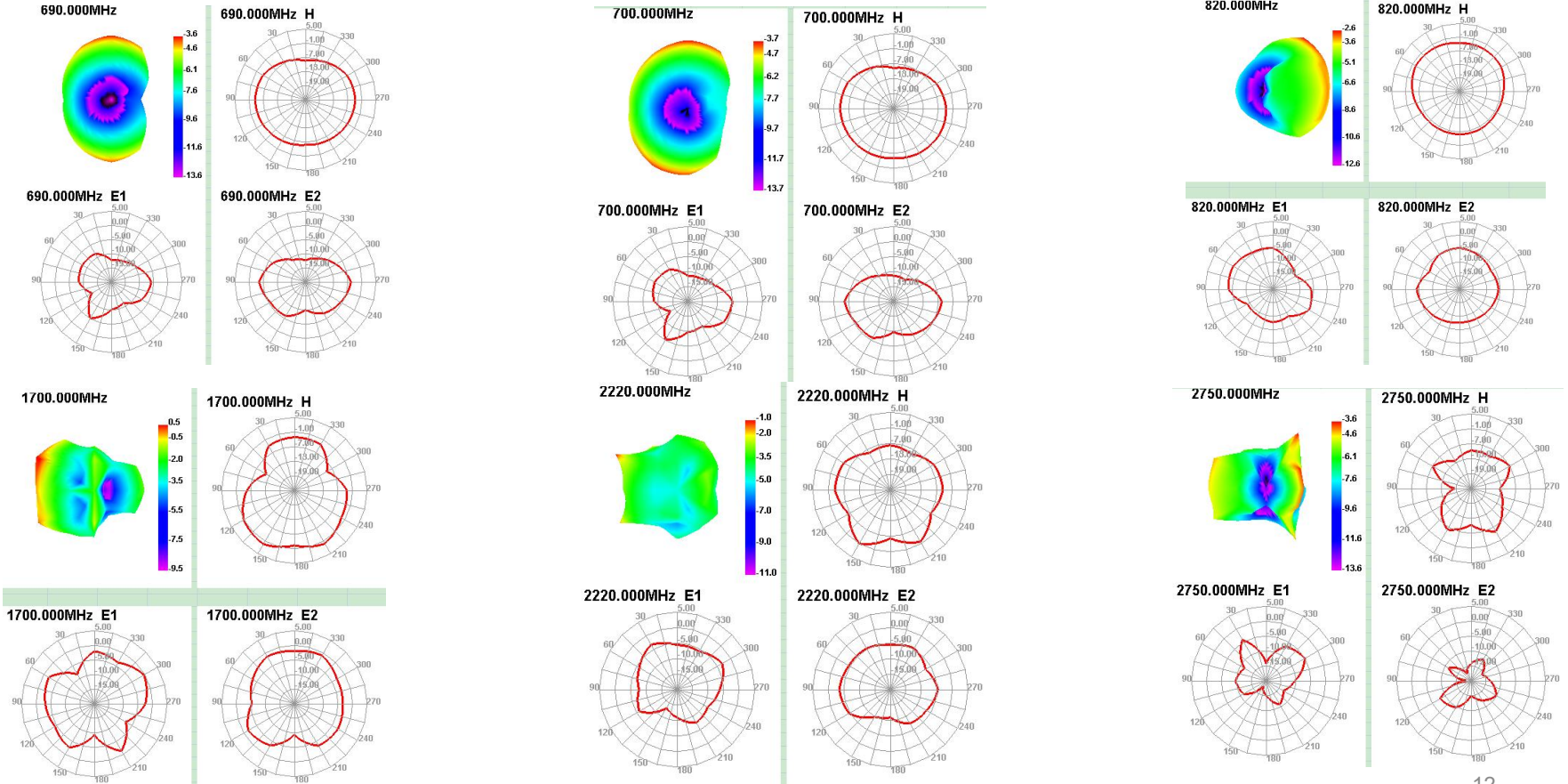
ANT S11-VSWR&Return Loss



Frequency(MHZ)	824	894	1710	2600	2690
VSWR	2.07	2.26	1.62	2.07	2.85
Return Loss(DB)	-9.17	-8.36	-12.48	-9.13	-6.36

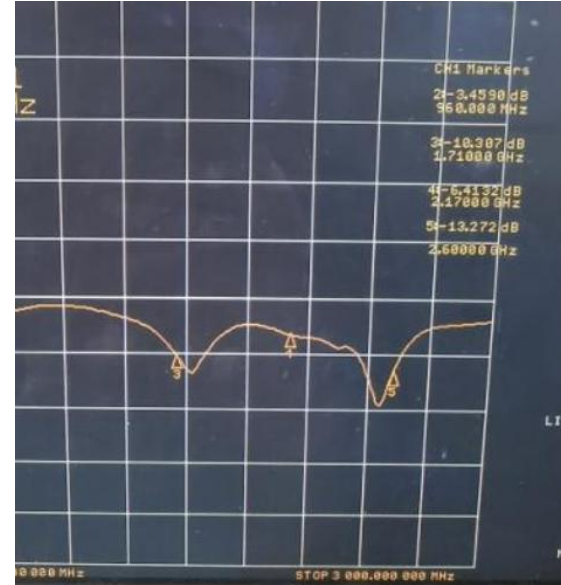
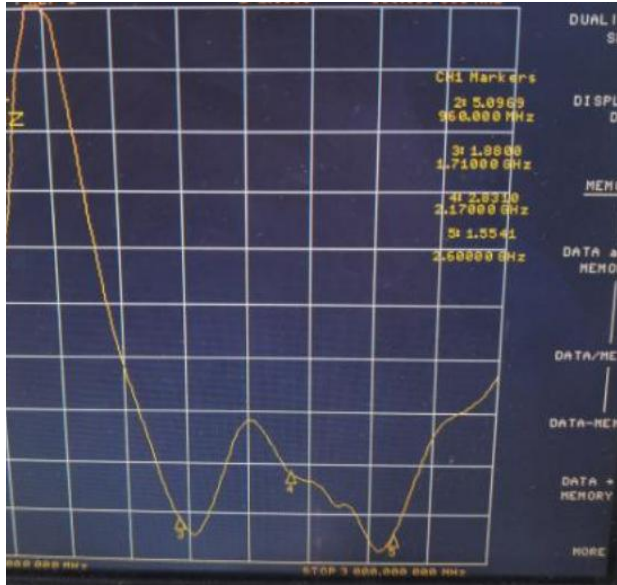
Passive test data

ANT Direction of figure 690-2690MHz



Main ANT Passive test data

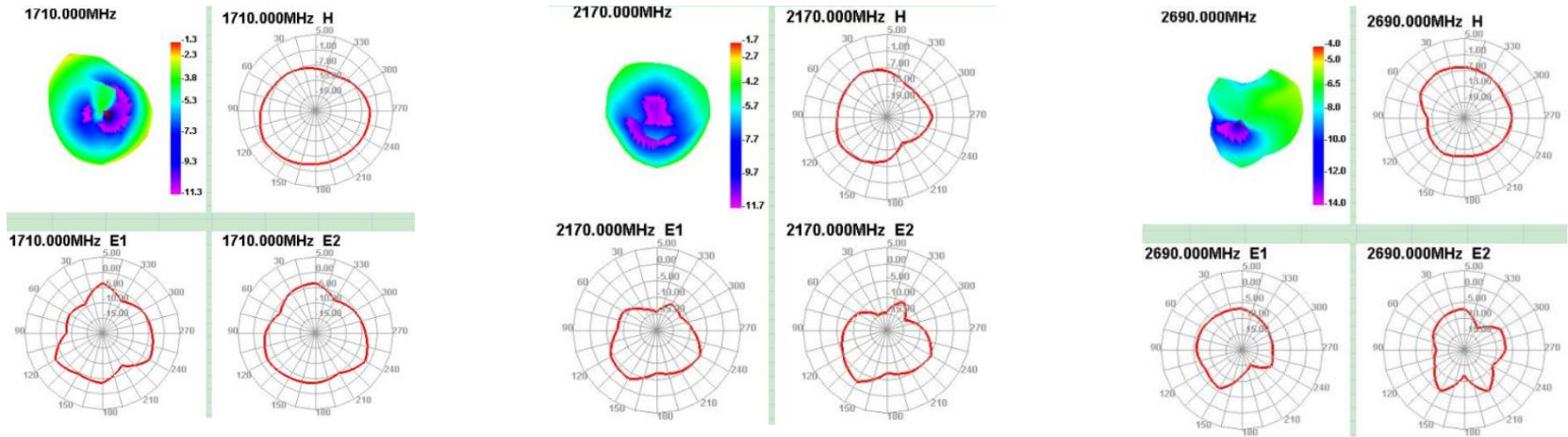
ANT S11-VSWR&Return Loss



Frequency(MHZ)	1710	2170	2600
VSWR	1.88	2.83	1.55
Return Loss(DB)	-10.38	-6.41	-13.27

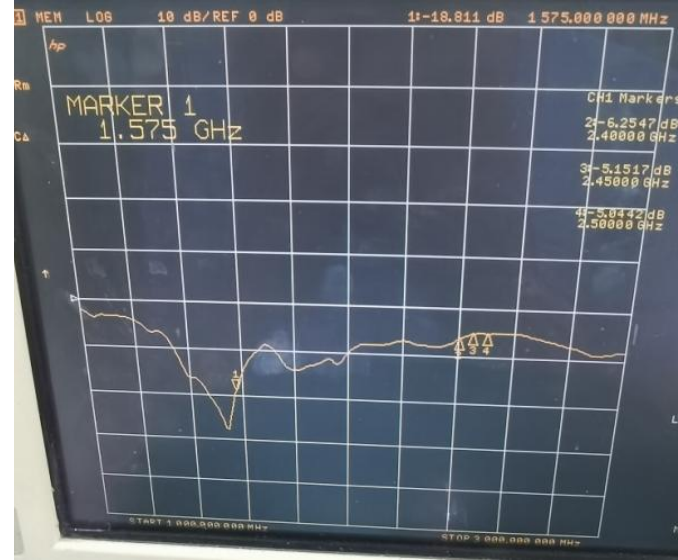
Passive test data

ANT Direction of figure 1700-2690MHz



G ANT Passive test data

ANT S11-VSWR&Return Loss



Frequency(MHZ)	1575
VSWR	1.26
Return Loss(DB)	-18.81



Passive test data

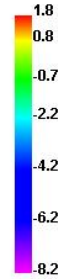
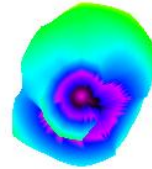
ANT GAIN&Efficiency-GPS 1.575G

1570	32.06	-4.94	1.78	-0.37	9.511	22.548	1.78	-20.08	6.72	90	41.5	41.03
1575	31.86	-4.97	1.8	-0.35	9.358	22.499	1.8	-19.17	6.77	90	41.68	41.23
1580	31.44	-5.03	1.72	-0.43	9.195	22.241	1.72	-19.65	6.75	90	41.78	41.35

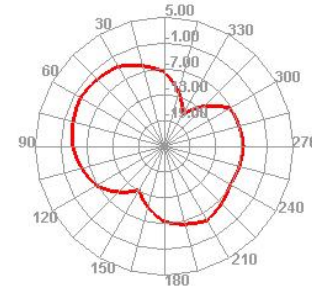
Passive test data

ANT Direction of figure(1.575G)

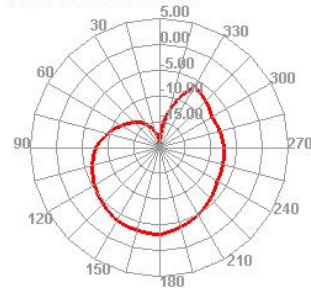
1575.000MHz



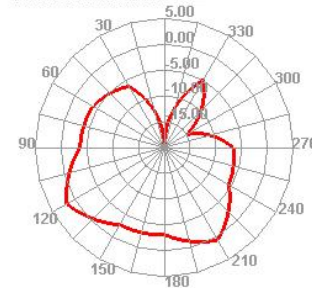
1575.000MHz H



1575.000MHz E1

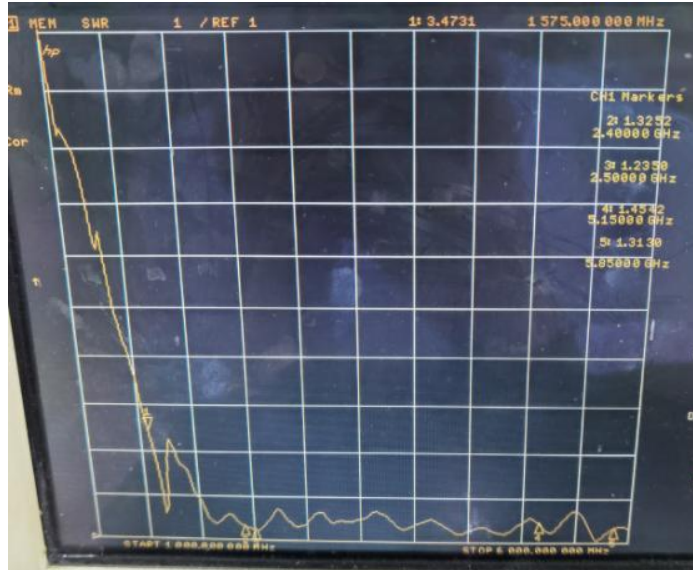


1575.000MHz E2



W/B ANT Passive test data

ANT S11-VSWR&Return Loss



Frequency(MHZ)	2400	2500	5150	5850
VSWR	1.32	1.23	1.45	1.31
Return Loss(DB)	-17.08	-19.56	-14.65	-17.37

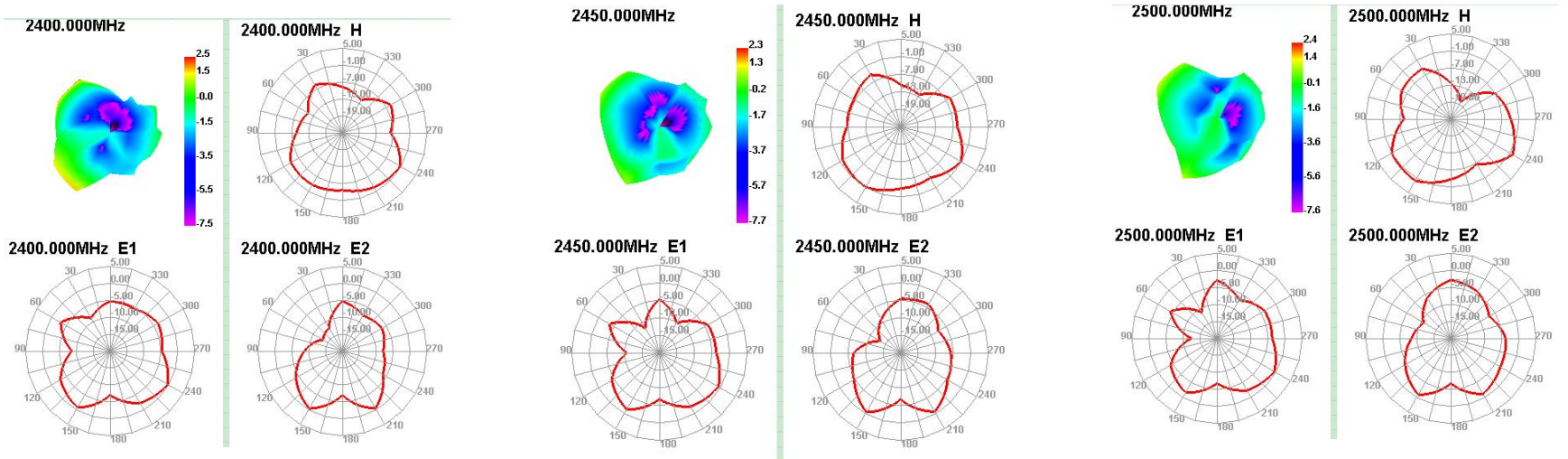
Passive test data

ANT GAIN&Efficiency-WIFI2.4G/BT

2.4G										
Fred (MHz)	Effi (%)	Effi (%)	Gain (dBi)	Gain (dBd)	UHis (%)	DHis (%)	Max (dB)	Min (dB)	Attenut (Hor)	Attenut (Ver)
2400	44.38	-2.79	2.26	0.12	40.28	13.32	2.29	-23.79	48.26	49.33
2410	44.63	-2.46	1.66	-0.48	42.42	13.54	2.46	-21.29	48.66	49.58
2420	44.94	-2.12	1.82	-0.32	40.96	14.77	2.68	-20.97	48.71	49.88
2430	44.27	-2.70	2.40	0.26	43.24	15.23	2.29	-22.77	48.21	49.35
2440	44.75	-2.39	1.79	-0.35	40.71	15.79	2.53	-25.39	48.58	49.56
2450	44.82	-1.83	2.50	0.36	41.19	16.18	3.15	-21.98	49.11	49.99
2460	44.28	-2.63	2.23	0.09	42.39	18.25	2.31	-25.62	48.37	49.22
2470	44.49	-2.34	2.44	0.30	41.78	18.80	2.50	-24.31	48.50	49.54
2480	45.08	-2.23	1.00	-1.14	40.89	19.05	3.14	-23.23	48.98	49.99
2490	44.21	-2.68	2.25	0.11	43.21	19.23	2.35	-21.77	48.24	49.20
2500	44.46	-2.32	1.61	-0.53	40.44	19.62	2.48	-20.30	48.48	49.61

Passive test data

ANT Direction of figure(2.4/BT)



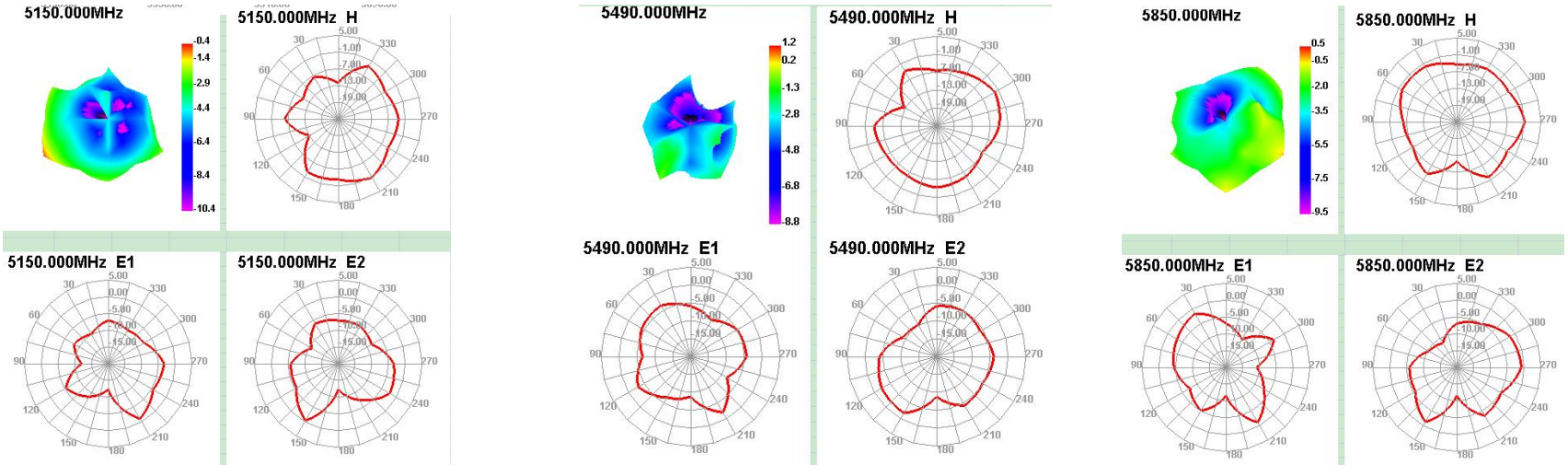
Passive test data

ANT GAIN&Efficiency-WIFI 5G

5G										
Fred (MHz)	Effi (%)	Effi (%)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Attenut (Hor)	Attenut (Ver)
4900	60.30	-0.78	1.23	-0.91	49.26	35.28	3.29	-19.67	63.32	61.32
5000	60.53	-0.44	1.59	-0.55	51.69	37.77	4.68	-22.38	65.59	62.75
5100	60.61	-0.25	1.80	-0.34	52.92	34.93	3.92	-21.31	64.12	64.84
5200	60.27	-0.69	1.34	-0.80	48.24	39.31	3.29	-19.74	63.35	62.37
5300	60.49	-0.35	1.48	-0.66	46.80	30.79	2.76	-18.23	64.73	63.76
5400	60.96	-0.35	1.08	-1.06	50.15	30.89	3.81	-25.32	64.01	60.93
5500	60.30	-0.75	1.31	-0.83	51.34	29.28	4.22	-23.61	66.30	62.24
5600	60.73	-0.58	1.53	-0.61	49.59	26.70	3.76	-16.47	63.78	61.77
5700	60.76	0.16	1.78	-0.36	53.11	26.16	4.78	-17.26	64.16	61.86
5800	60.21	-0.63	1.36	-0.78	45.22	34.40	3.21	-15.65	62.26	63.31
5900	60.47	-0.28	1.41	-0.73	49.45	35.48	3.56	-18.42	63.54	62.65

Passive test data

ANT Direction of figure(5G)



GPS star search test

The measured effect of GPS cold start is as follows:

CN value over 40 6+ pieces

CN value over 35 8+ pieces

31 were actually located

Note;

GPS star search test. It varies by time period and region. The above data are the best data in our test (open area)



Wifi Antenna test

WIFI

Test environment: Open space

Testing tools: Wifi Analytical Assistant

Test distance: 10m

Signal strength: 2.4G :-37dBm 5G:-44dBm

The test results are shown on the right



BT

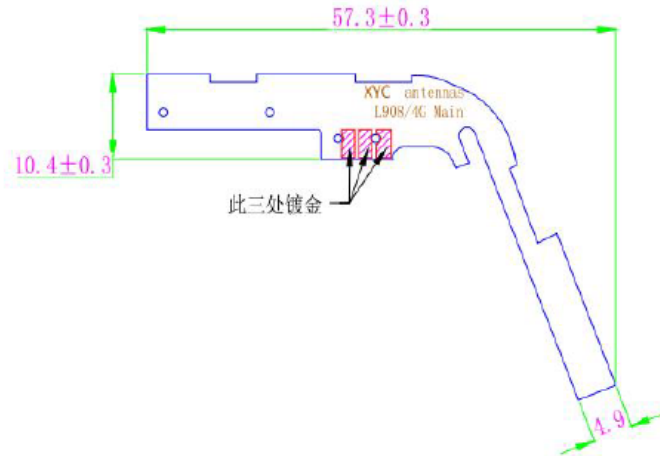
Test environment: Open space (channel)

Test tool: Bluetooth speaker

Test distance: 10m

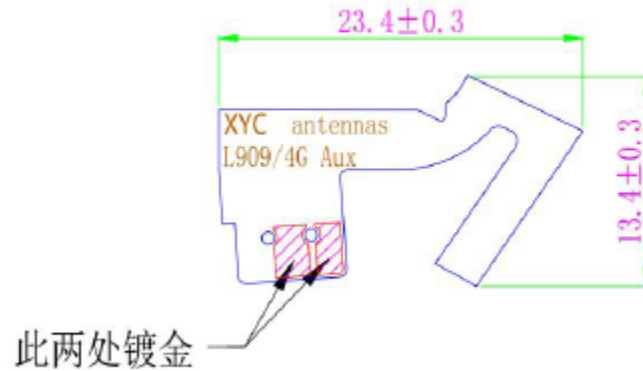
Results: Play music smoothly, no noise.

Antenna size diagram (mm)-4G MAIN



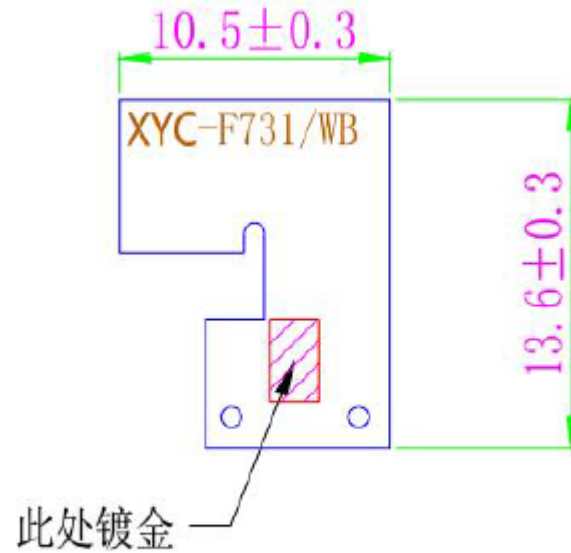
Screen line and IC part paste conductive cloth shielding

Antenna size diagram (mm)-4G AUX



The red box is attached with conductive foam and conductive sponge grounding

Antenna size diagram (mm)-BT&WLAN



Additional instructions

01

Whether the antenna matching circuit is changed or whether the environmental treatment related to the antenna is increased in the report will directly affect the performance of the antenna. Please check it carefully.

02

If your company has the latest trial production or updated products (such as software, ESD, materials, etc.), please provide us as soon as possible for verification, so as to confirm whether the antenna performance is affected by changes.

03

If your company needs to send a third-party testing institution for retest or customer test, please be sure to conduct antenna related test with our company to confirm first. Due to the consistency of motherboard and assembly, as well as differences in antenna assembly and other factors, antenna parameters may be deviated.

Win-win cooperation

