



深圳市星源创科技有限公司

SHENZHEN Xingyuanchuang TECHNOLOGY CO., LTD

天线测试报告

Antenna Test Report

TC: 忆博通

MN: T825-P3

RF: 关巍

MD: 黄清清

MP: 15112592483

Date: 2023. 08. 10

REV :V1. 0



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深圳市星源创科技有限公司

SHENZHEN Xingyuanchuang TECHNOLOGY CO., LTD

测试信息

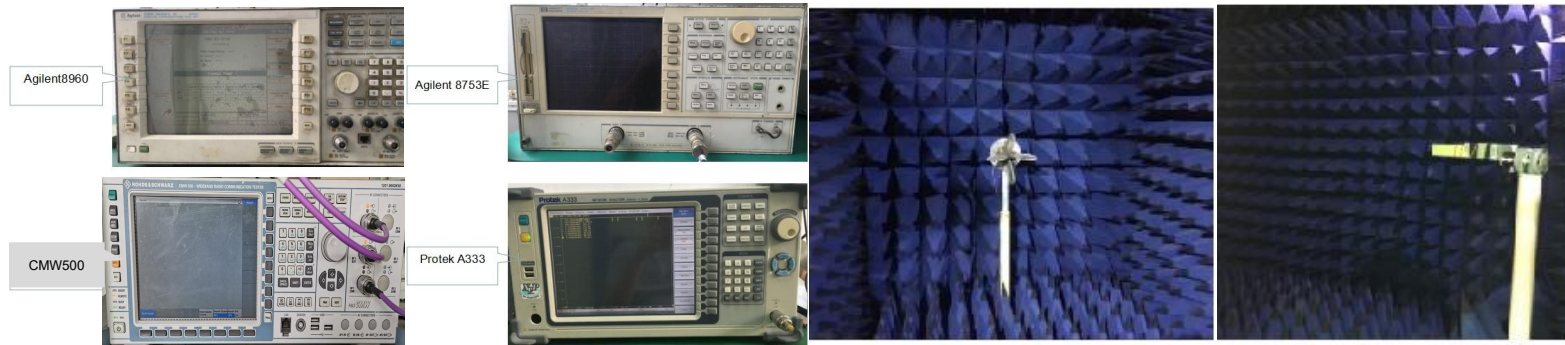
Test information

	Antenna band		Antenna state	Antenna form	Match changes	Note
Main ANT	2G	850/900/1800/1900				
	3G	2/4/5	FPC	PIFA	NO	
	4G	2/4/5/12/17/66/71/41				
AUX ANT	BT/WIFI	2.4/5.8G	FPC	PIFA	NO	
	GPS	1.575G	FPC	PIFA	NO	
	DIV		FPC	PIFA	NO	

测试环境

Test environment

	测试项目	测试设备
S参数 (S-parameter)	1. 电压驻波比 (VSWR) 2. 回波损耗 (Rrtun Loss)	网络分析仪: Agilent8753ES
2. 有源测试 (Active)	1. 发射功率 (TRP) 2. 接收灵敏度 (TIS) 3. 屏灭/屏亮	1. 暗室: 5*3*3m (3D) Chamber 2. 综测仪: Agilent8960 CMW500
3. 无源测试 (Passive)	1. 天线增益 (Gain) 2. 天线效率 (Efficiency)	1. 暗室: 5*3*3m (3D) Chamber 2. 网络分析仪: Agilent 8753ES





天线位置

Antenna position



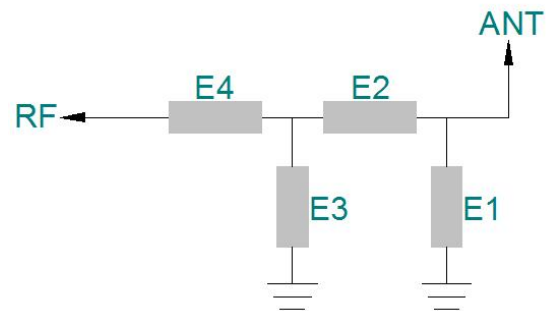


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匹配电路
Matching circuit



匹配电路原理图&位号图

	电容 (PF)	电感 (NH)
E1(0402)		
E2(0402)		
E3(0402)		
E4(0402)		



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主板传导数据
Conduction data

2G/3G									
Band	GSM850	GSM900	DCS1800	PCS1900	WCDMA1	WCDMA2	WCDMA4	WCDMA5	WCDMA8
TX(dBm)	30.4	30.2	28.4	28.2		22.1	22.1	22.4	
RX(dBm)	-108	-108	-108	-108		-108	-108	-108	
4G FDD/TDD									
Band	B1	B2	B3	B4	B5	B7	B8	B12	B17
TX(dBm)		21.5		21.4	21.5			21.8	22
RX(dBm)		-97		-96	-95			-95	-95
Band	B28	B18	B66	B71	B34	B38	B39	B40	B41
TX(dBm)			21.5	21.8					24
RX(dBm)			-97	-97					-92.5



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有源测试数据
Active test data

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)	25.17	25.55	26.27	26.36	25.82	25.32	25.14	25.57	25.12	26.39	26.31	25.32
TIS(LCD OFF)	-103.23	-103.42	-103.52	104.22	-104.31	-104.46	-104.63	-105.24	-105.47	-104.55	-105.31	-105.36
TIS(LCD ON)												
3G												
Band	WCDMA-1			WCDMA-4			WCDMA-2			WCDMA-5		
Channel	10562	10700	10838	1537	1675	1738	9662	9800	9938	4357	4400	4458
TRP(dBm)				19.26	19.23	19.2	18.57	18.47	18.53	17.24	16.57	16.22
TIS(LCD OFF)				-104.56	-105.33	-105.55	-105.42	-105.47	-105.8	-103.53	-102.66	-102.36
TIS(LCD ON)												
4G(FDD 10M)												
Band	FDD-Band 2			FDD-Band 4			FDD-Band 5			FDD-Band 12		
Channel	18650	18900	19150	20000	20175	23050	20450	20525	20600	23060	23095	23130
TRP(dBm)	18.57	18.53	18.33	18.42	18.48	18.67	17.72	17.67	17.74	17.38	17.52	17.43
TIS(LCD OFF)	-92.33	-92.24	-92.45	-92.43	-92.36	-92.31	-89.55	-89.64	-90.1	-90.53	-90.67	-91.64
TIS(LCD ON)												
Band	FDD-Band 17			FDD-Band 66			FDD-Band 71					
Channel	23780	23790	23800	132022	132322	132622	133172	133297	133422			
TRP(dBm)	16.76	17.15	17.47	19.3	19.48	19.35	17.43	17.57	17.68			
TIS(LCD OFF)	-90.44	-90.51	-91.65	-91.42	-91.63	-92.22	-88.11	-88.14	-88.16			
TIS(LCD ON)												
4G(TDD 20M)												
Band	FDD-Band 38			FDD-Band 39			FDD-Band 40			FDD-Band 41		
Channel	37850	38000	38150	38350	38450	38550	38750	39150	39550	39750	40620	41490
TRP(dBm)										21.61	21.87	19.57
TIS(LCD OFF)										-90.1	-90.23	-90.32
TIS(LCD ON)												



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GPS搜星测试 GPS star search test

GPS冷启动实测效果以下：
CN值40以上3颗
CN值35以上10颗
实际定位14颗

备注：
GPS搜星测试。会因时间段
及地域而存在差异. 以上数
据为我司测试（空旷地带）
最佳数据



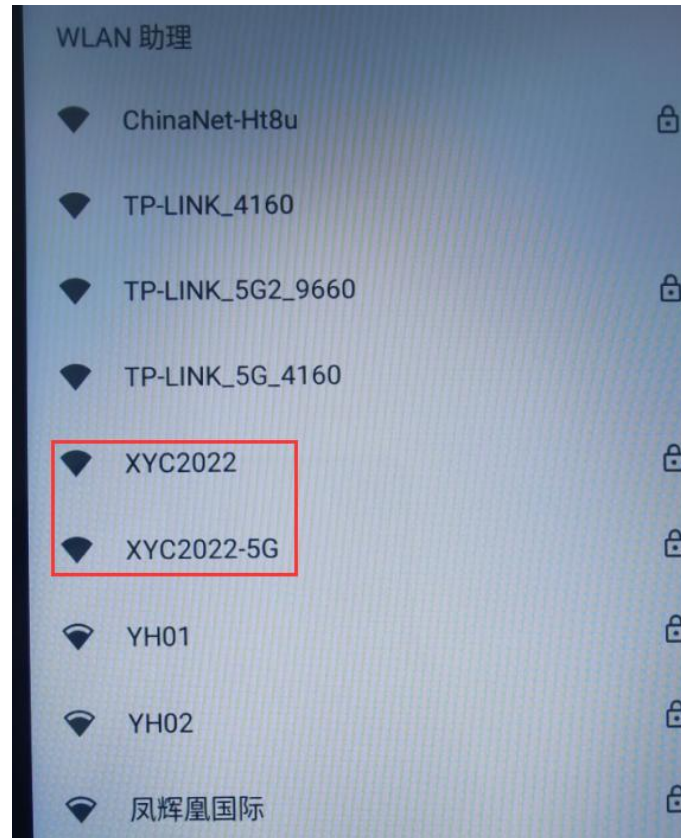
Wifi天线实测

Wifi Antenna test

测试环境：开放空间

测试距离：10m

测试结果如右图





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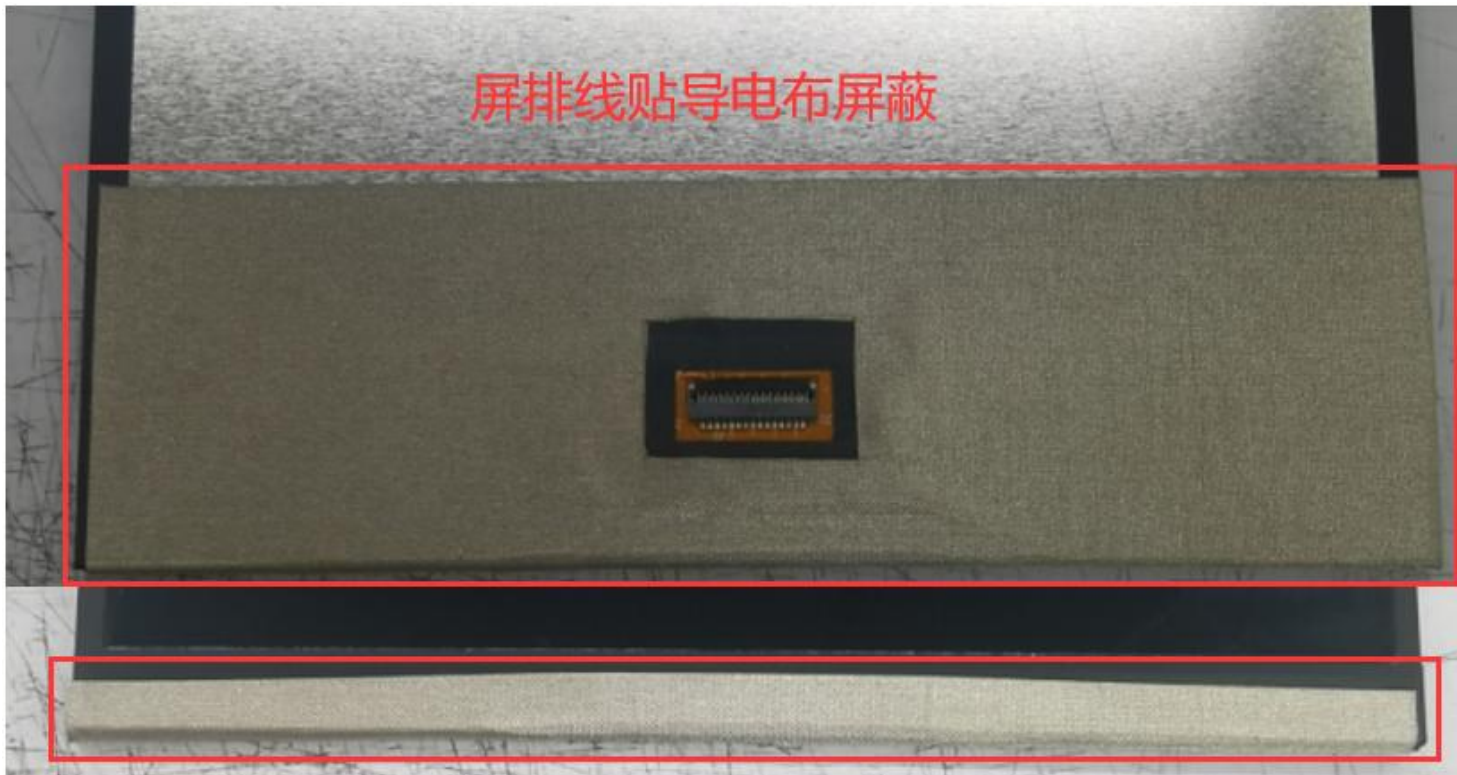
环境处理

Environmental treatment



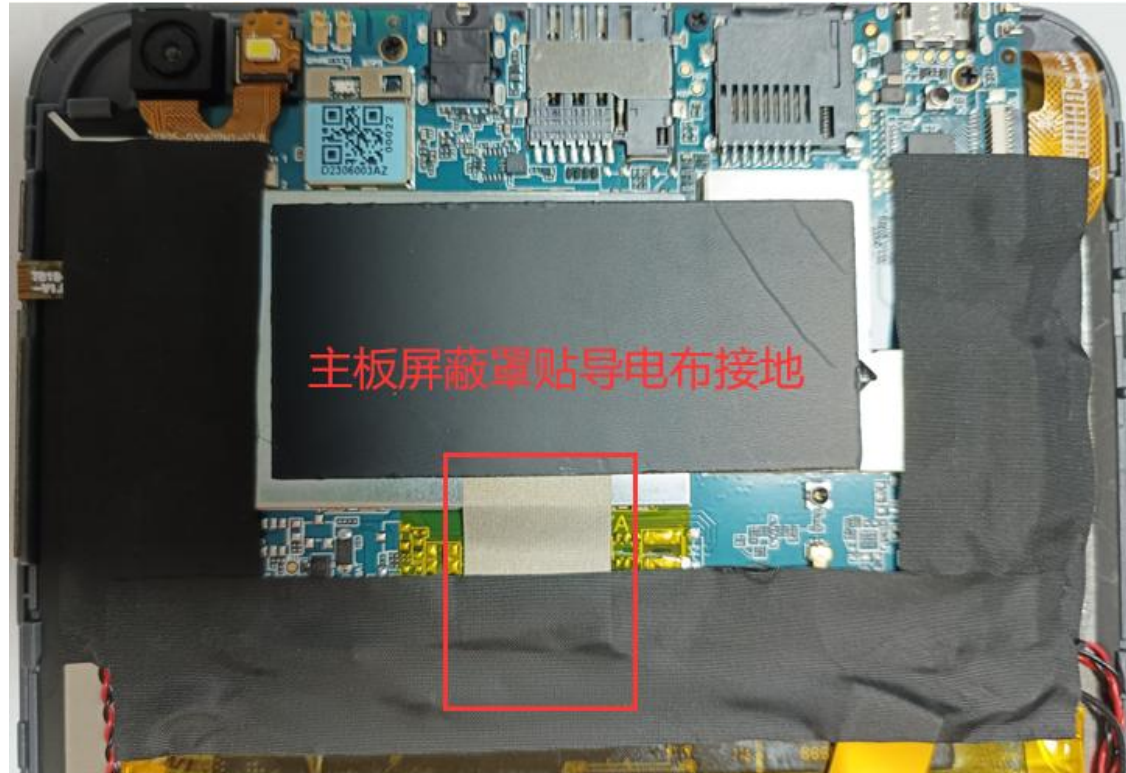
环境处理

Environmental treatment



环境处理

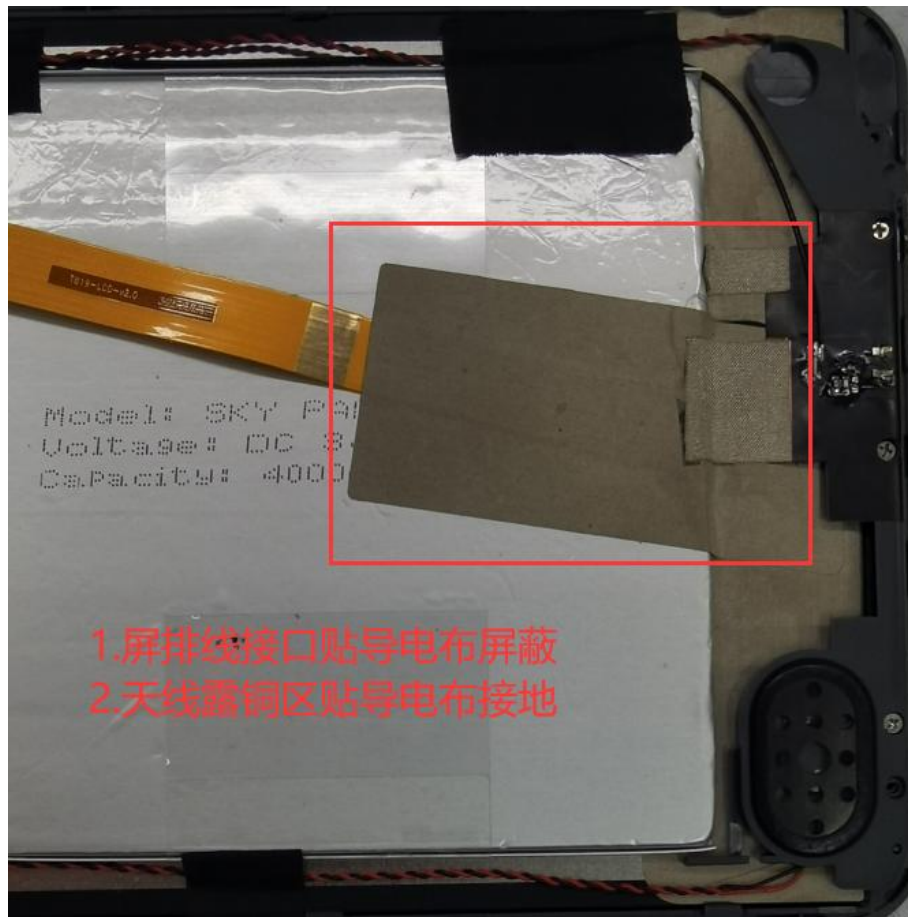
Environmental treatment





环境处理

Environmental treatment



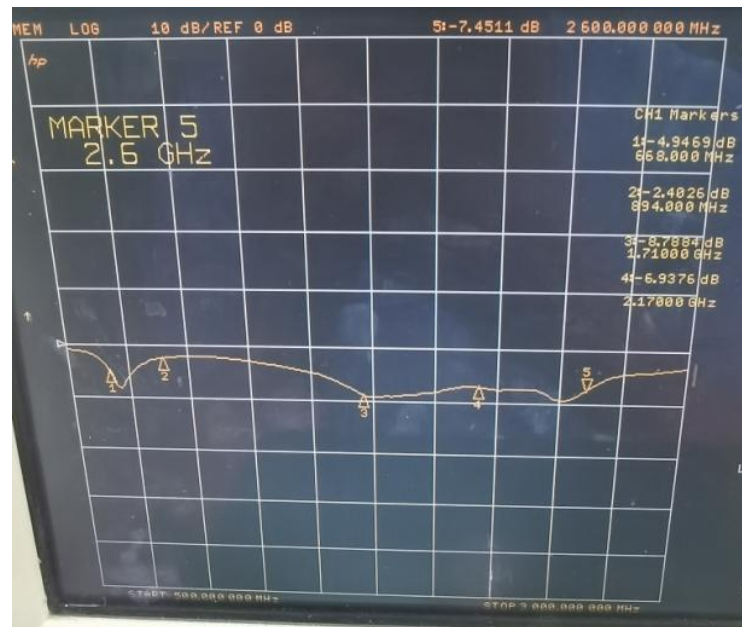
- 1.屏排线接口贴导电布屏蔽
- 2.天线露铜区贴导电布接地



Main ANT 无源测试数据

Main ANT Passive test data

ANT S11-VSWR&Return Loss



Frequency(MHZ)	668	894	1710	2170	2600
VSWR	3.65	7.28	2.14	2.63	2.47
Return Loss(DB)	-4.94	-2.40	-8.78	-6.93	-7.45



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无源测试数据

Passive test data

ANT Direction of figure 690-2690MHz

Passive Test For L												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
650	26.02	-5.85	-2.51	-4.66	13.695	12.321	-2.51	-12.83	3.34	60	39.51	39.08
660	28.29	-5.48	-2.64	-4.79	14.859	13.434	-2.64	-13.22	2.84	60	39.76	39.23
670	28.06	-5.52	-2.25	-4.4	14.495	13.564	-2.25	-12.39	3.27	60	39.56	38.96
680	27.88	-5.55	-2.27	-4.42	14.116	13.761	-2.27	-13.13	3.28	60	38.97	38.54

Passive Test For 低頻												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Irectivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
690	22.28	-6.52	-3.46	-5.61	10.147	12.13	-3.46	-12.63	3.06	0	38.39	38.05
700	23.76	-6.24	-3.37	-5.52	10.789	12.978	-3.37	-13.83	2.87	30	37.95	37.71
710	27.76	-5.57	-2.64	-4.79	12.951	14.813	-2.64	-14.15	2.92	30	38.33	38.1
720	31.28	-5.05	-2.23	-4.38	15.201	16.08	-2.23	-12.74	2.82	60	38.12	37.78
730	31.61	-5	-2.01	-4.16	15.542	16.067	-2.01	-11.29	2.99	60	37.65	37.31
740	28.65	-5.43	-2.34	-4.49	13.944	14.711	-2.34	-10.8	3.09	60	37.21	36.99
750	29.14	-5.36	-2.31	-4.46	14.201	14.937	-2.31	-10.44	3.05	60	37.03	36.95
760	27.99	-5.53	-2.64	-4.79	13.639	14.35	-2.64	-10.92	2.89	60	36.73	36.72
770	22.11	-6.55	-3.68	-5.83	10.63	11.481	-3.68	-12.58	2.88	30	35.81	35.92
780	20.48	-6.89	-4.02	-6.17	9.738	10.744	-4.02	-13.18	2.87	60	35.67	35.88
790	20.48	-6.89	-4	-6.15	9.972	10.507	-4	-12.41	2.88	60	35.94	36.19
800	26.36	-5.79	-2.85	-5	13.532	12.829	-2.85	-9.94	2.94	90	36.77	36.98
810	26.91	-5.7	-2.52	-4.67	14.313	12.6	-2.52	-9.48	3.18	90	36.63	36.88
820	23.24	-6.34	-3.08	-5.23	12.603	10.639	-3.08	-10.4	3.26	90	36.69	36.92
830	22.15	-6.55	-3.2	-5.35	12.408	9.742	-3.2	-11.58	3.34	90	36.46	36.76
840	22.44	-6.49	-3.19	-5.34	13.038	9.405	-3.19	-12.4	3.3	90	36.63	37.05
850	23.42	-6.31	-3.1	-5.25	13.846	9.569	-3.1	-12.91	3.2	90	36.69	37.16
860	23.93	-6.21	-3.02	-5.17	14.027	9.898	-3.02	-12.57	3.19	90	36.82	37.25
870	20.56	-6.87	-3.67	-5.82	11.895	8.662	-3.67	-13.59	3.2	90	36.68	37.07
880	19.14	-7.18	-4.03	-6.18	11.252	7.892	-4.03	-14.74	3.15	30	36.82	37.19
890	19.67	-7.06	-3.34	-5.49	11.976	7.693	-3.34	-15.77	3.72	60	37	37.41
900	17.1	-7.67	-3.59	-5.74	10.853	6.249	-3.59	-18.22	4.07	60	37.06	37.58

Passive Test For 高频												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	irectivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
1710	42.65	-3.7	0.18	-1.97	21.593	21.059	0.18	-12.59	3.88	30	42.52	42.01
1720	40.99	-3.87	0.17	-1.98	21.089	19.906	0.17	-12.39	4.04	30	42.4	41.88
1730	44.78	-3.49	0.63	-1.52	23.299	21.48	0.63	-11.85	4.12	30	42.83	42.29
1740	50.15	-3	0.99	-1.16	26.187	23.963	0.99	-11.07	3.99	30	42.89	42.17
1750	49.26	-3.08	0.59	-1.56	25.393	23.865	0.59	-10.65	3.66	0	42.92	42.22
1760	43.8	-3.58	0.04	-2.11	22.492	21.312	0.04	-11.09	3.63	30	43.13	42.41
1770	51.01	-2.92	0.68	-1.47	26.151	24.861	0.68	-10.58	3.61	30	43.26	42.64
1780	57.75	-2.38	1.24	-0.91	29.819	27.93	1.24	-10.32	3.63	30	43.6	43.04
1790	52.44	-2.8	0.86	-1.29	27.037	25.402	0.86	-10.34	3.66	30	43.12	42.67
1800	49.06	-3.09	0.56	-1.59	25.318	23.742	0.56	-10.45	3.66	30	42.97	42.55
1810	47.84	-3.2	0.47	-1.68	24.842	22.994	0.47	-10.8	3.67	0	42.94	42.49
1820	54.6	-2.63	1.11	-1.04	28.644	25.961	1.11	-9.8	3.73	0	43.24	42.77
1830	50.94	-2.93	0.84	-1.31	26.855	24.08	0.84	-10.35	3.77	0	43.09	42.62
1840	50.96	-2.93	0.95	-1.2	26.605	24.359	0.95	-9.88	3.88	0	43.08	42.67
1850	58.85	-2.3	1.46	-0.69	30.485	28.364	1.46	-9.32	3.76	0	43.4	43.05
1860	55.61	-2.55	1.05	-1.1	29.139	26.473	1.05	-10.04	3.59	0	43.4	43.07
1870	49.76	-3.03	0.57	-1.58	26.211	23.548	0.57	-10.56	3.61	0	43.15	42.96
1880	53.48	-2.72	0.85	-1.3	28.231	25.248	0.85	-10.05	3.57	0	43.26	43.08
1890	50.86	-2.94	0.55	-1.6	26.589	24.273	0.55	-10.09	3.49	0	42.84	42.68
1900	46.54	-3.32	0.19	-1.96	24.469	22.071	0.19	-10.96	3.51	0	42.94	42.77
1910	44.47	-3.52	0.07	-2.08	23.346	21.12	0.07	-11.34	3.59	0	42.87	42.69
1920	48.37	-3.15	0.56	-1.59	25.447	22.924	0.56	-10.82	3.71	0	42.9	42.78
1930	49.57	-3.05	0.65	-1.5	25.832	23.737	0.65	-10.21	3.7	0	43.03	42.87
1940	44.62	-3.5	0.29	-1.86	23.084	21.533	0.29	-10.53	3.79	0	42.93	42.71
1950	43.36	-3.63	0.29	-1.86	22.554	20.807	0.29	-11.11	3.92	0	42.85	42.64
1960	40.23	-3.95	0.11	-2.04	21.069	19.164	0.11	-12.02	4.07	0	42.95	42.68
1970	38.64	-4.13	0.07	-2.08	20.2	18.441	0.07	-12.04	4.2	0	42.9	42.76
1980	42.47	-3.72	0.64	-1.51	21.835	20.633	0.64	-11.15	4.36	0	43.15	43.1
1990	38.05	-4.2	0.39	-1.76	19.133	18.918	0.39	-11.81	4.59	0	43.17	43.1
2000	37.38	-4.27	0.38	-1.77	18.687	18.692	0.38	-12.27	4.66	0	43.48	43.38
2010	38.81	-4.11	0.53	-1.62	19.465	19.348	0.53	-12.34	4.64	0	43.5	43.33
2020	38.04	-4.2	0.26	-1.89	19.271	18.772	0.26	-12.4	4.45	0	43.39	43.21
2030	35.8	-4.46	-0.05	-2.2	17.951	17.85	-0.05	-12.31	4.41	0	43.28	43.09
2040	33.09	-4.8	-0.36	-2.51	16.406	16.686	-0.36	-12.36	4.44	0	43.43	43.26
2050	38.95	-4.1	0.18	-1.97	19.814	19.131	0.18	-11.52	4.27	0	43.79	43.65
2060	37.87	-4.22	-0.22	-2.37	19.836	18.036	-0.22	-11.62	3.99	0	43.67	43.53
2070	34.63	-4.61	-0.72	-2.87	18.309	16.324	-0.72	-11.89	3.89	0	43.99	43.83
2080	38.82	-4.11	-0.15	-2.3	20.207	18.611	-0.15	-11.16	3.96	0	44.24	44.1
2090	45.19	-3.45	0.55	-1.6	23.362	21.831	0.55	-11.15	4	0	44.64	44.47
2100	43.96	-3.57	0.4	-1.75	23.119	20.84	0.4	-12.51	3.97	120	44.77	44.61
2110	37.81	-4.22	-0.07	-2.22	19.754	18.056	-0.07	-13.38	4.15	120	44.45	44.27



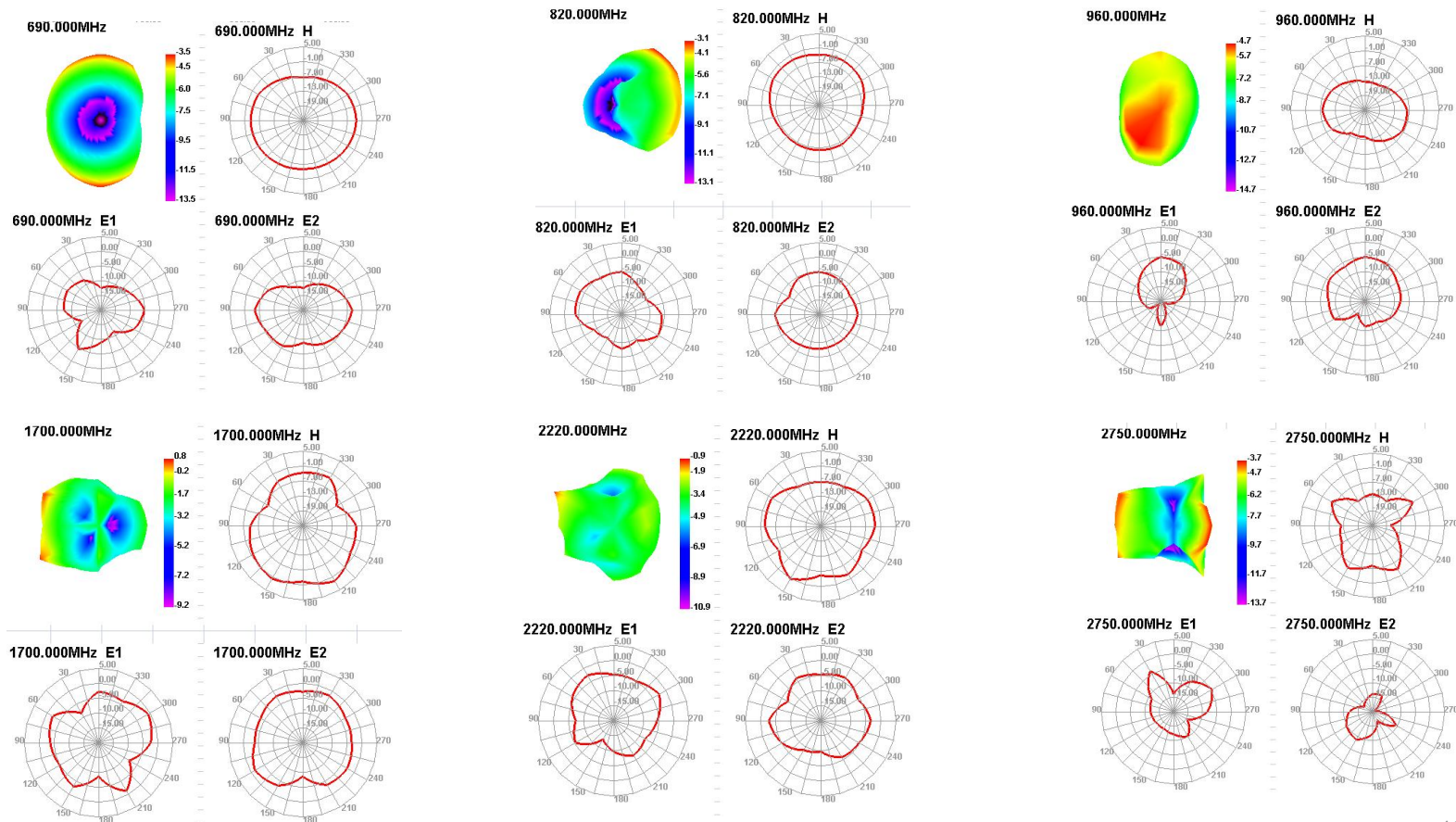
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无源测试数据
Passive test data

ANT Direction of figure 690-2690MHz

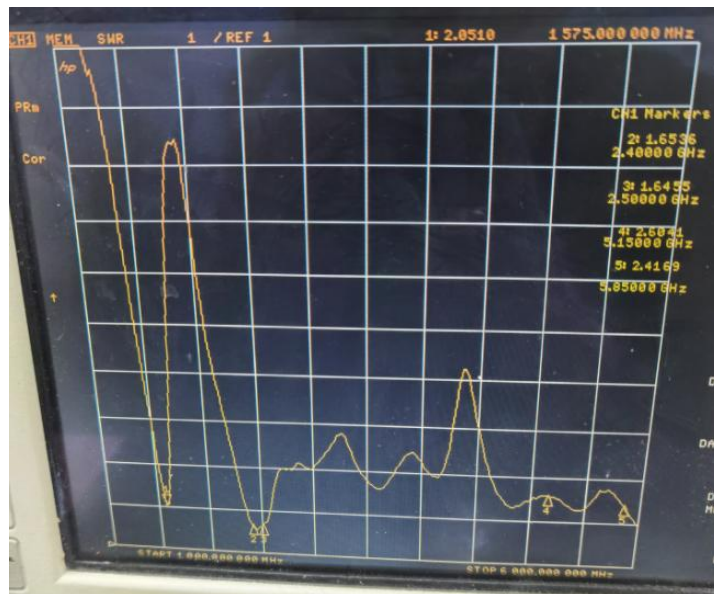




无源测试数据

Passive test data

ANT1 S11-VSWR&Return Loss



Frequency(MHZ)	1575	2400	2500	5150	5850
VSWR	2.05	1.65	1.64	2.60	2.41
Return Loss(DB)	-9.25	-12.17	-12.25	-7.83	-7.64



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无源测试数据

Passive test data

ANT1 GAIN&Efficiency-GPS

1570	24.58	-6.09	-2.59	-4.74	10.92	13.663	-2.59	-16.86	3.51	90	41.5	41.03
1575	24.18	-6.17	-2.61	-4.76	10.74	13.44	-2.61	-17.19	3.55	90	41.68	41.23
1580	24.91	-6.04	-2.44	-4.59	11.084	13.829	-2.44	-18.49	3.59	90	41.78	41.35



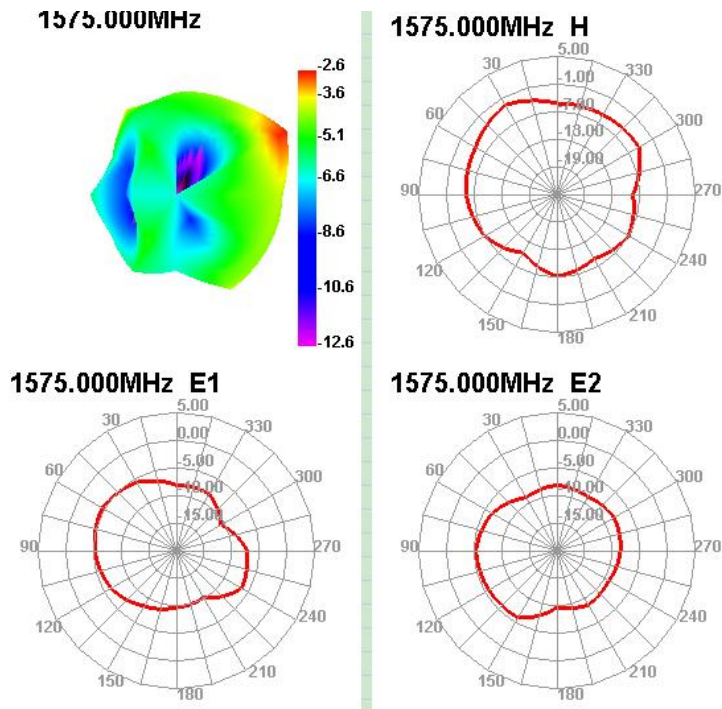
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无源测试数据
Passive test data

ANT1 Direction of figure (GPS)





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无源测试数据

Passive test data

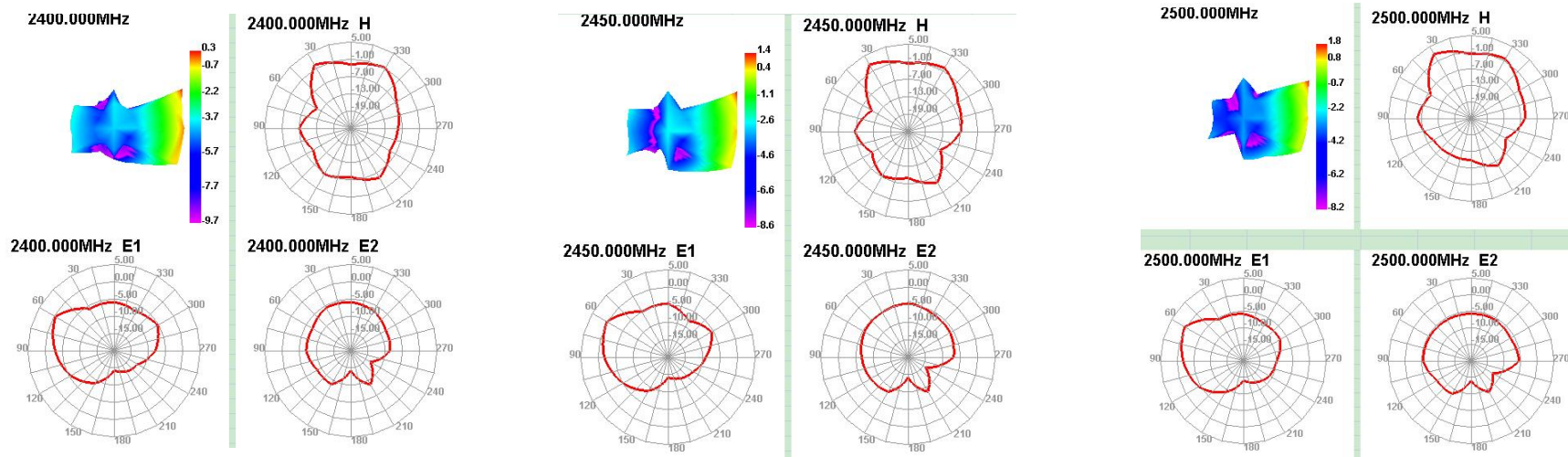
ANT1 GAIN&Efficiency-WIFI2.4G/BT

Passive Test For WIFI2.4

Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
2400	24.44	-6.12	0.3	-1.85	14.262	10.176	0.3	-14.34	6.42	30	45.78	46.01
2410	24.89	-6.04	0.44	-1.71	14.686	10.202	0.44	-14.75	6.48	30	46.01	46.29
2420	25.66	-5.91	0.65	-1.5	15.278	10.384	0.65	-14.76	6.56	30	45.73	46.01
2430	25.08	-6.01	0.64	-1.51	14.926	10.149	0.64	-15.32	6.65	30	46.01	46.36
2440	26.1	-5.83	0.9	-1.25	15.237	10.86	0.9	-14.97	6.73	30	46.12	46.48
2450	28.43	-5.46	1.42	-0.73	16.36	12.071	1.42	-14.3	6.88	30	46.12	46.54
2460	28.76	-5.41	1.55	-0.6	16.397	12.359	1.55	-14.23	6.96	30	46.14	46.52
2470	27.54	-5.6	1.49	-0.66	15.652	11.889	1.49	-14.23	7.09	30	46.4	46.8
2480	29.45	-5.31	1.8	-0.35	16.601	12.85	1.8	-13.68	7.11	30	46.26	46.64
2490	32.01	-4.95	2.16	0.01	17.887	14.121	2.16	-13.54	7.1	30	46.51	46.91
2500	29.12	-5.36	1.8	-0.35	16.327	12.793	1.8	-14.12	7.16	30	46.47	46.86

无源测试数据 Passive test data

ANT1 Direction of figure (2.4/BT)





ANTENNA

深圳市星源创科技有限公司

SHENZHEN Xingyuanchuang TECHNOLOGY CO.,LTD

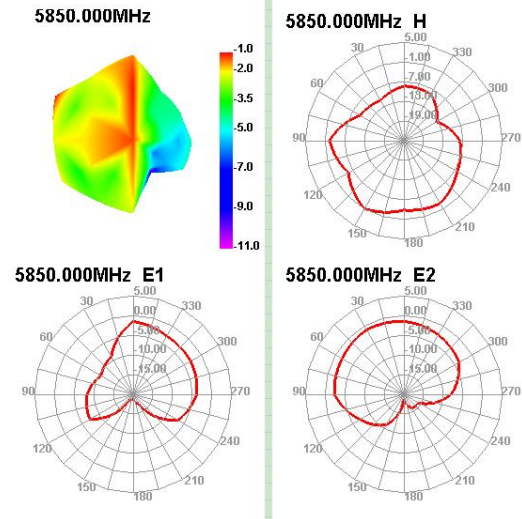
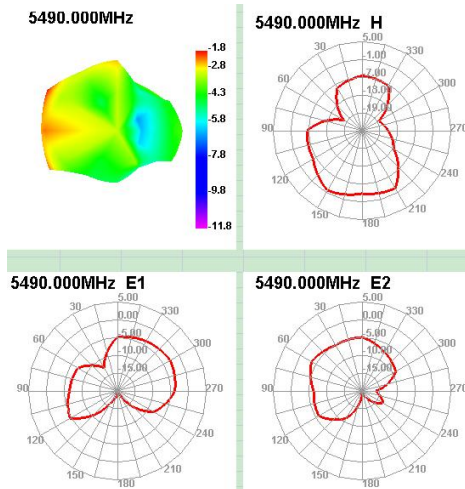
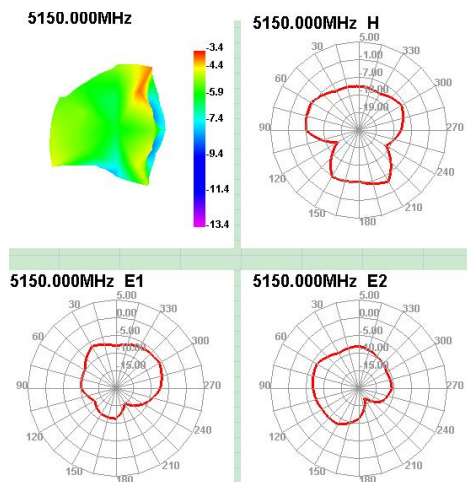
无源测试数据
Passive test data

ANT1 GAIN&Efficiency-WIFI 5G

Passive Test For WIFI5G												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
5150	15.04	-8.23	-3.38	-5.53	8.949	6.091	-3.38	-20.62	4.84	120	49.82	49.4
5170	13.29	-8.76	-4.03	-6.18	7.793	5.498	-4.03	-22.49	4.73	120	50.13	49.77
5190	15.52	-8.09	-3.65	-5.8	9.014	6.504	-3.65	-22.05	4.44	60	50.42	49.95
5210	15.16	-8.19	-3.7	-5.85	8.55	6.614	-3.7	-21.88	4.49	60	50.88	50.49
5230	15.61	-8.06	-3.24	-5.39	8.538	7.077	-3.24	-20	4.82	60	50.42	50.08
5250	17.45	-7.58	-2.78	-4.93	9.466	7.98	-2.78	-21.1	4.8	60	51.02	50.72
5270	17.86	-7.48	-2.28	-4.43	9.684	8.178	-2.28	-20.69	5.2	60	50.85	50.6
5290	19.38	-7.13	-2.12	-4.27	10.42	8.96	-2.12	-21.16	5	60	51.34	51.12
5310	16.33	-7.87	-2.71	-4.86	8.73	7.603	-2.71	-21.11	5.16	60	50.44	50.36
5330	17.89	-7.47	-1.95	-4.1	9.59	8.301	-1.95	-20.34	5.52	90	51.08	51.01
5350	16.96	-7.71	-2.06	-4.21	9.143	7.814	-2.06	-21.12	5.65	90	51.02	51.01
5370	18.14	-7.41	-2.04	-4.19	9.794	8.35	-2.04	-20.56	5.37	90	50.91	50.95
5390	14.58	-8.36	-3.32	-5.47	7.912	6.663	-3.32	-24.06	5.04	90	50.46	50.43
5410	19.63	-7.07	-1.88	-4.03	10.75	8.876	-1.88	-22.71	5.19	90	51.18	51.09
5430	14.95	-8.25	-2.94	-5.09	8.259	6.688	-2.94	-22.81	5.32	90	50.69	50.7
5450	18.8	-7.26	-2.17	-4.32	10.481	8.314	-2.17	-24.31	5.09	90	50.71	50.85
5470	16.19	-7.91	-2.57	-4.72	9.086	7.099	-2.57	-26.5	5.34	90	50.93	50.83
5490	18.86	-7.24	-1.78	-3.93	10.699	8.163	-1.78	-25.89	5.46	90	50.92	50.79
5510	18.26	-7.39	-2.12	-4.27	10.535	7.722	-2.12	-23.53	5.27	90	51.18	51.16
5530	20.22	-6.94	-1.83	-3.98	11.938	8.286	-1.83	-24.28	5.11	90	51.44	51.3
5550	20.64	-6.85	-1.62	-3.77	12.171	8.465	-1.62	-24.93	5.23	90	51.89	51.76
5570	21.24	-6.73	-1.5	-3.65	12.546	8.693	-1.5	-22.96	5.23	90	51.42	51.33
5590	23.43	-6.3	-0.96	-3.11	14.087	9.339	-0.96	-22.77	5.34	90	51.71	51.76
5610	22.68	-6.44	-0.86	-3.01	13.868	8.816	-0.86	-23.02	5.58	90	51.17	51.22
5630	25.26	-5.98	-0.31	-2.46	15.538	9.717	-0.31	-21.81	5.67	90	51.78	51.77
5650	21.83	-6.61	-1.09	-3.24	13.482	8.348	-1.09	-22.58	5.52	90	51.47	51.55
5670	26.58	-5.75	-0.24	-2.39	16.613	9.965	-0.24	-20.75	5.52	90	52.12	52.28
5690	23.3	-6.33	-0.7	-2.85	14.787	8.511	-0.7	-21.15	5.63	90	52.12	52.25
5710	27.02	-5.68	-0.1	-2.25	17.169	9.85	-0.1	-20.38	5.58	90	51.95	52.05
5730	24.81	-6.05	-0.39	-2.54	15.765	9.046	-0.39	-23.87	5.66	90	51.59	51.69
5750	25.31	-5.97	-0.21	-2.36	16.17	9.135	-0.21	-25.2	5.76	90	51.12	51.15
5770	24.3	-6.14	-0.52	-2.67	15.72	8.583	-0.52	-22.29	5.62	90	51.02	51.06
5790	23.77	-6.24	-0.67	-2.82	15.468	8.3	-0.67	-21.99	5.57	90	51.08	51.16
5810	23.03	-6.38	-0.82	-2.97	14.942	8.087	-0.82	-26.4	5.56	90	51.36	51.43
5830	23.66	-6.26	-0.75	-2.9	15.381	8.284	-0.75	-28.13	5.51	90	51.65	51.66
5850	22.69	-6.44	-1.04	-3.19	14.787	7.904	-1.04	-22.01	5.4	90	51.88	52.05

无源测试数据
Passive test data

ANT1 Direction of figure(5G)





附加说明

Additional instructions

01

报告中天线匹配电路是否改动，天线有关的环境处理是否增加，将直接影响天线性能，请仔细确认查看。

02

贵司如有最新试产或更新产品（如软件，**ESD**，物料等）请尽快提供我司进行验证，以确认天线性能是否有变化影响。

03

倘若贵司需要送第三方检测机构复测或客户测试，请务必先与我司进行天线相关测试确认，因主板•装配的一致性，以及天线组装的差异等因素，均可能导致天线参数的偏差。

合作共赢

