



深圳市星源创科技有限公司

SHENZHEN Xingyuanchuang TECHNOLOGY CO., LTD

ANTENNA

Room 1506, Tangwei Stock Business Building, Tangwei
Community, Fuhai Street, Bao'an District, Shenzhen, China

天线测试报告

Antenna Test Report

TC: 美迪飞

MN: DT20

RF: 刘磊确

MD: 黄清清

MP: 13005478517

Date: 2023. 7. 3

REV :V1. 0



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测试信息

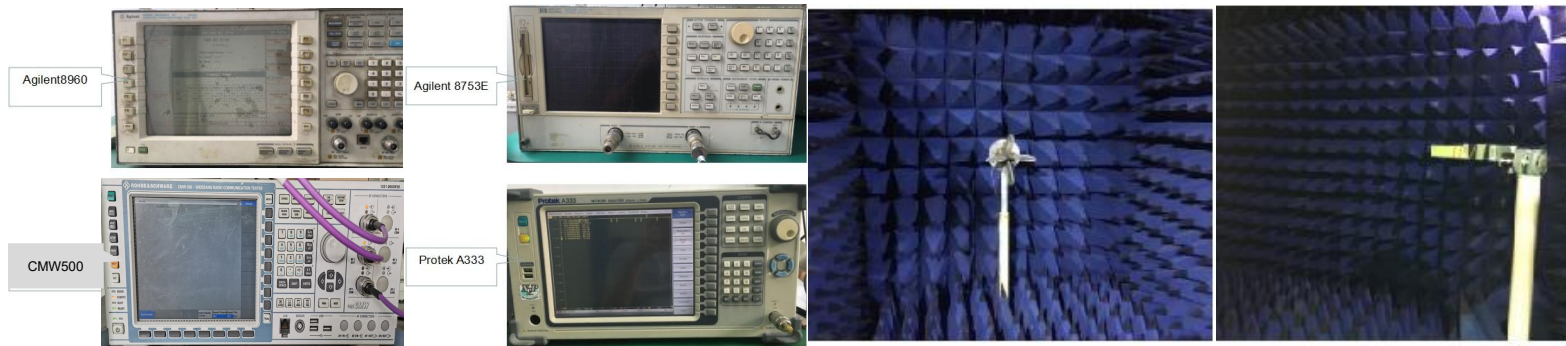
Test information

	Antenna band	Antenna state	Antenna form	Match changes	Note
Main ANT	2G				
	3G			NO	
	4G				
AUX ANT	BT/WIFI	2.4/5G	FPC	PIFA	NO
	GPS	1.575G	FPC	PIFA	NO
	DIV				NO

测试环境

Test environment

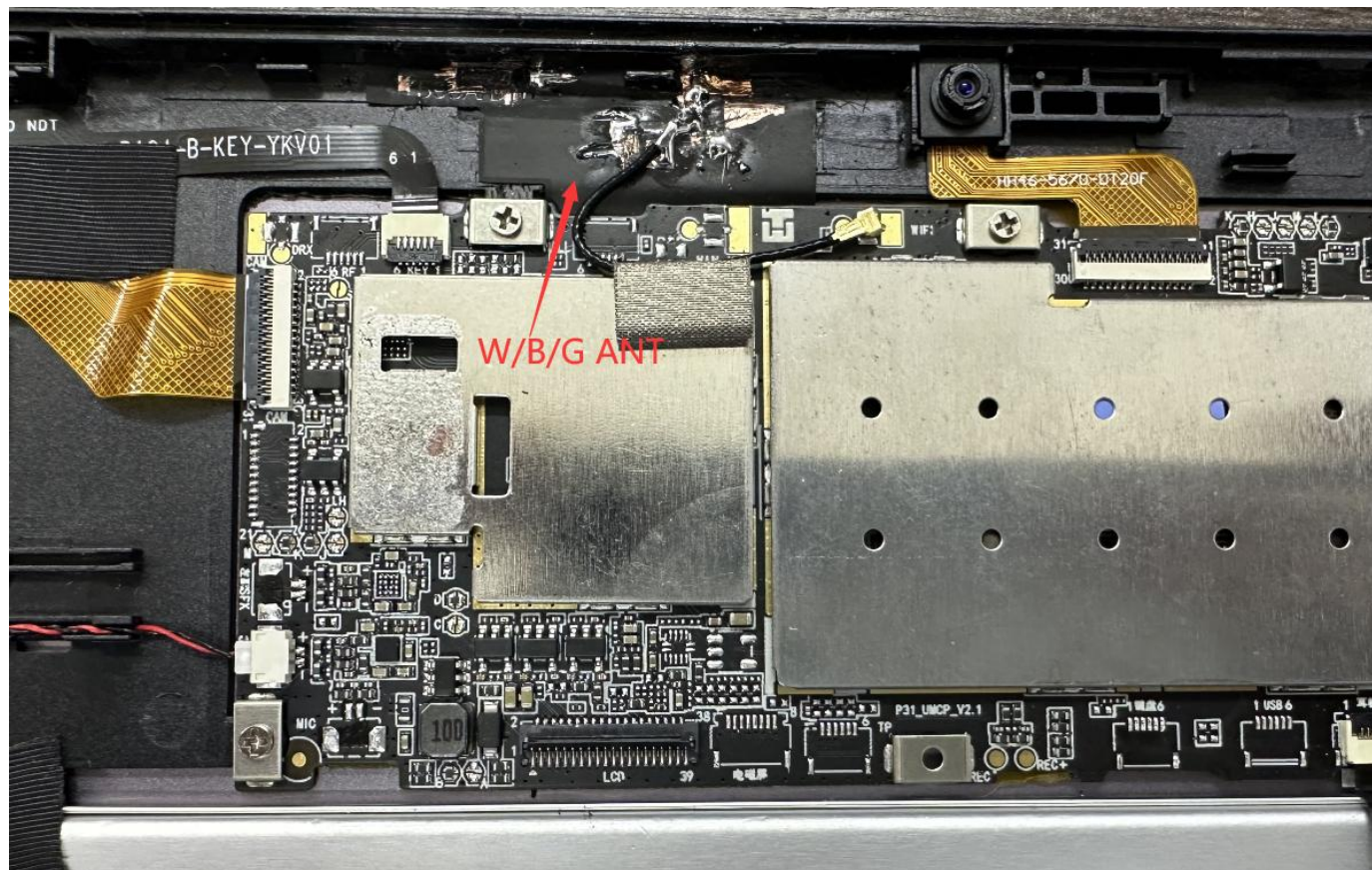
	测试项目	测试设备
S参数 (S-parameter)	1. 电压驻波比 (VSWR) 2. 回波损耗 (Rrtun Loss)	网络分析仪: Agilent8753ES
2. 有源测试 (Active)	1. 发射功率 (TRP) 2. 接收灵敏度 (TIS) 3. 屏灭/屏亮	1. 暗室: 5*3*3m (3D) Chamber 2. 综测仪: Agilent8960 CMW500
3. 无源测试 (Passive)	1. 天线增益 (Gain) 2. 天线效率 (Efficiency)	1. 暗室: 5*3*3m (3D) Chamber 2. 网络分析仪: Agilent 8753ES





天线位置

Antenna position



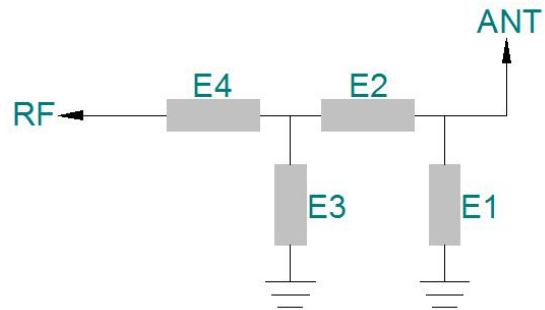


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匹配电路
Matching circuit



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

匹配电路原理图&位号图



有源测试数据 Active test data

	Frequency	TRP		TIS	
	802.11b	2412	CH1 11Mbps	12.89	CH1 11Mbps
	2437	CH6 11Mbps	12.92	CH6 11Mbps	-80.5
	2467	CH11 11Mbps	12.54	CH11 11Mbps	-80.64
802.11a		TRP		TIS	
	5180	CH36 6Mbps	10.48	CH36 54Mbps	-69.78
	5300	CH60 6Mbps	10.4	CH60 54Mbps	-69.95
	5805	CH161 6Mbps	10.95	CH161 54Mbps	-68.59

GPS搜星测试 GPS star search test

GPS冷启动实测效果以下：
CN值40以上2+颗
CN值35以上7+颗
实际定位7+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/BT天线实测

Wifi Antenna test

WIFI

测试环境：开放空间

测试工具：Wifi Analytical Assistant

测试距离：10m

信号强度：2.4G :-46dBm 5G:-52dBm

测试结果如右图

BT

测试环境：开放空间(通道)

测试工具：蓝牙音响

测试距离：15m

结果：播放音乐流畅，无杂音。



吞吐量测试 Throughput test

2.4G wifi 吞吐量测试			
上行	53.2M	下行	48.7M
图片	<pre>[3] 13.0-14.0 sec 3.62 MBytes 30.4 Mbits/sec [3] 14.0-15.0 sec 5.50 MBytes 46.1 Mbits/sec [3] 15.0-16.0 sec 6.25 MBytes 52.4 Mbits/sec [3] 16.0-17.0 sec 6.62 MBytes 55.6 Mbits/sec [3] 17.0-18.0 sec 6.62 MBytes 55.6 Mbits/sec [3] 18.0-19.0 sec 6.25 MBytes 52.4 Mbits/sec [3] 19.0-20.0 sec 6.50 MBytes 54.5 Mbits/sec [3] 20.0-21.0 sec 6.88 MBytes 57.7 Mbits/sec [3] 21.0-22.0 sec 6.50 MBytes 54.5 Mbits/sec [3] 22.0-23.0 sec 5.38 MBytes 45.1 Mbits/sec [3] 23.0-24.0 sec 6.62 MBytes 55.6 Mbits/sec [3] 24.0-25.0 sec 6.25 MBytes 52.4 Mbits/sec [3] 25.0-26.0 sec 5.50 MBytes 46.1 Mbits/sec [3] 26.0-27.0 sec 6.88 MBytes 57.7 Mbits/sec [3] 27.0-28.0 sec 6.38 MBytes 53.5 Mbits/sec [3] 28.0-29.0 sec 7.00 MBytes 58.7 Mbits/sec [3] 29.0-30.0 sec 6.50 MBytes 54.5 Mbits/sec [3] 0.0-30.0 sec 190 MBytes 53.2 Mbits/sec</pre>	图片	<pre>[ID] Interval Transfer Bandwidth [320] 18.0-19.0 sec 6.22 MBytes 52.2 Mbits/sec [ID] Interval Transfer Bandwidth [320] 19.0-20.0 sec 5.74 MBytes 48.2 Mbits/sec [ID] Interval Transfer Bandwidth [320] 20.0-21.0 sec 6.44 MBytes 54.0 Mbits/sec [ID] Interval Transfer Bandwidth [320] 21.0-22.0 sec 5.98 MBytes 50.2 Mbits/sec [ID] Interval Transfer Bandwidth [320] 22.0-23.0 sec 6.35 MBytes 53.3 Mbits/sec [ID] Interval Transfer Bandwidth [320] 23.0-24.0 sec 5.98 MBytes 50.1 Mbits/sec [ID] Interval Transfer Bandwidth [320] 24.0-25.0 sec 5.33 MBytes 44.7 Mbits/sec [ID] Interval Transfer Bandwidth [320] 25.0-26.0 sec 5.73 MBytes 48.0 Mbits/sec [ID] Interval Transfer Bandwidth [320] 26.0-27.0 sec 5.96 MBytes 50.0 Mbits/sec [ID] Interval Transfer Bandwidth [320] 27.0-28.0 sec 6.05 MBytes 50.8 Mbits/sec [ID] Interval Transfer Bandwidth [320] 28.0-29.0 sec 5.68 MBytes 47.6 Mbits/sec [ID] Interval Transfer Bandwidth [320] 29.0-30.0 sec 5.75 MBytes 48.2 Mbits/sec [ID] Interval Transfer Bandwidth [320] 0.0-30.0 sec 174 MBytes 48.7 Mbits/sec</pre>
备注			

吞吐量测试 Throughput test

5G wifi 吞吐量测试			
上行	299M	下行	301M
图片	<pre>[3] 10.0-11.0 sec 35.4 MBytes 297 Mbits/sec [3] 11.0-12.0 sec 35.8 MBytes 300 Mbits/sec [3] 12.0-13.0 sec 36.0 MBytes 302 Mbits/sec [3] 13.0-14.0 sec 32.6 MBytes 274 Mbits/sec [3] 14.0-15.0 sec 35.9 MBytes 301 Mbits/sec [3] 15.0-16.0 sec 36.8 MBytes 308 Mbits/sec [3] 16.0-17.0 sec 37.2 MBytes 312 Mbits/sec [3] 17.0-18.0 sec 35.5 MBytes 298 Mbits/sec [3] 18.0-19.0 sec 36.2 MBytes 304 Mbits/sec [3] 19.0-20.0 sec 34.9 MBytes 293 Mbits/sec [3] 20.0-21.0 sec 36.6 MBytes 307 Mbits/sec [3] 21.0-22.0 sec 33.9 MBytes 284 Mbits/sec [3] 22.0-23.0 sec 33.9 MBytes 284 Mbits/sec [3] 23.0-24.0 sec 35.0 MBytes 294 Mbits/sec [3] 24.0-25.0 sec 34.1 MBytes 286 Mbits/sec [3] 25.0-26.0 sec 34.6 MBytes 290 Mbits/sec [3] 26.0-27.0 sec 34.9 MBytes 293 Mbits/sec [3] 27.0-28.0 sec 38.1 MBytes 320 Mbits/sec [3] 28.0-29.0 sec 36.5 MBytes 306 Mbits/sec [3] 29.0-30.0 sec 38.0 MBytes 319 Mbits/sec [3] 0.0-30.0 sec 1.04 GBytes 299 Mbits/sec</pre>	图片	<pre>[ID] Interval Transfer Bandwidth [324] 18.0-19.0 sec 36.0 MBytes 302 Mbits/sec [ID] Interval Transfer Bandwidth [324] 19.0-20.0 sec 35.7 MBytes 300 Mbits/sec [ID] Interval Transfer Bandwidth [324] 20.0-21.0 sec 35.7 MBytes 299 Mbits/sec [ID] Interval Transfer Bandwidth [324] 21.0-22.0 sec 35.9 MBytes 301 Mbits/sec [ID] Interval Transfer Bandwidth [324] 22.0-23.0 sec 36.4 MBytes 305 Mbits/sec [ID] Interval Transfer Bandwidth [324] 23.0-24.0 sec 35.4 MBytes 297 Mbits/sec [ID] Interval Transfer Bandwidth [324] 24.0-25.0 sec 36.0 MBytes 302 Mbits/sec [ID] Interval Transfer Bandwidth [324] 25.0-26.0 sec 35.5 MBytes 298 Mbits/sec [ID] Interval Transfer Bandwidth [324] 26.0-27.0 sec 35.8 MBytes 300 Mbits/sec [ID] Interval Transfer Bandwidth [324] 27.0-28.0 sec 36.0 MBytes 302 Mbits/sec [ID] Interval Transfer Bandwidth [324] 28.0-29.0 sec 35.3 MBytes 296 Mbits/sec [ID] Interval Transfer Bandwidth [324] 29.0-30.0 sec 35.7 MBytes 300 Mbits/sec [ID] Interval Transfer Bandwidth [324] 0.0-30.0 sec 1.05 GBytes 301 Mbits/sec</pre>
备注			

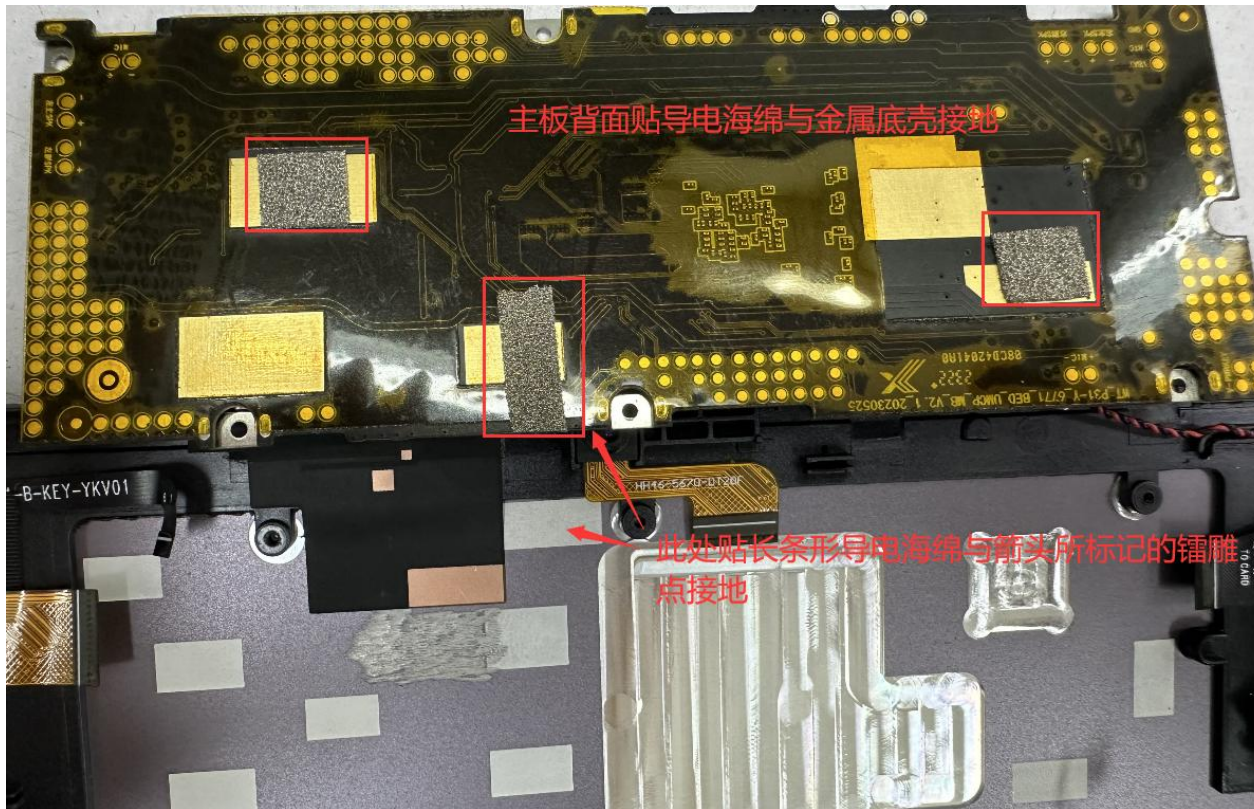
环境处理

Environmental treatment



环境处理

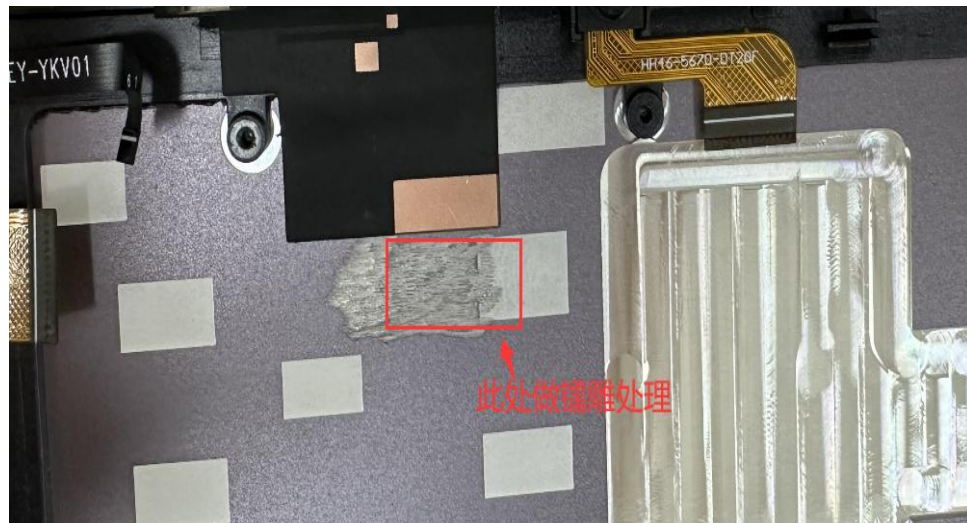
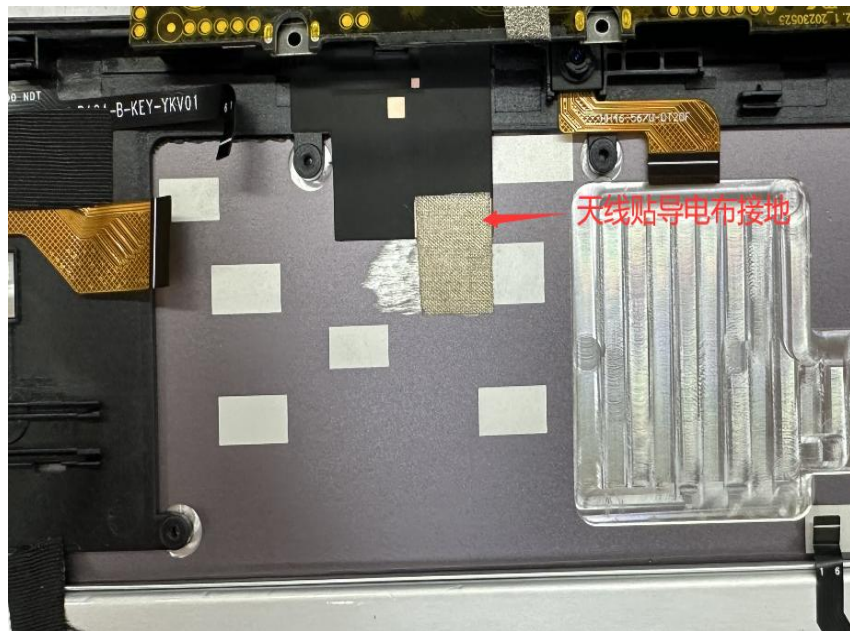
Environmental treatment





环境处理

Environmental treatment

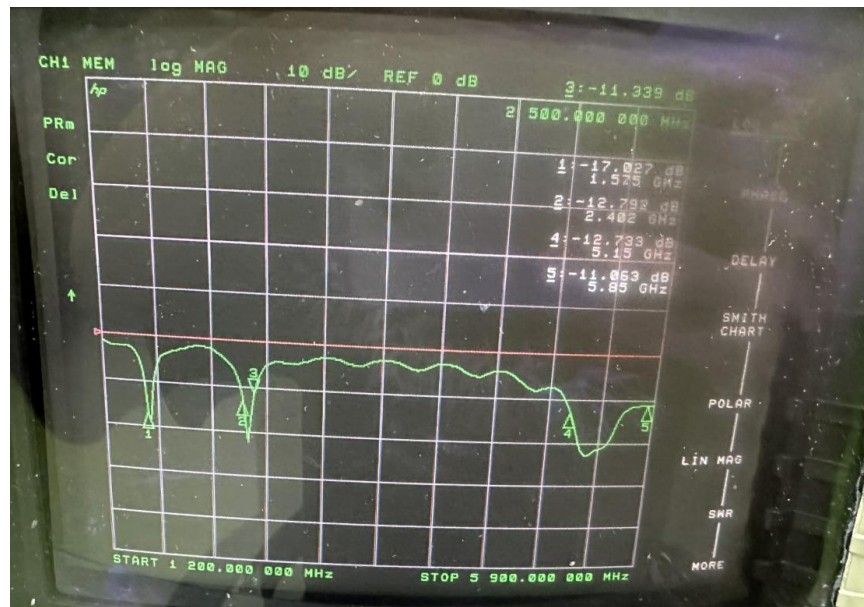




无源测试数据

Passive test data

ANT1 S11-VSWR&Return Loss



Frequency (MHZ)	1575	2400	2500	5150	5850
VSWR	1.33	1.61	1.76	1.6	1.77
Return Loss (DB)	-17.02	-12.79	-11.33	-12.73	-11.06



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无源测试数据
Passive test data

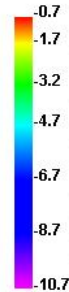
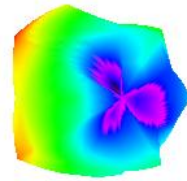
ANT1 GAIN&Efficiency-GPS

Passive Test For GPS								
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)
1560	28.55	-5.44	-0.97	-3.12	13.202	15.343	-0.97	-13.87
1565	28.64	-5.43	-0.94	-3.09	13.209	15.429	-0.94	-14.24
1570	30.17	-5.2	-0.86	-3.01	13.932	16.237	-0.86	-14.21
1575	32.05	-4.94	-0.72	-2.87	14.8	17.253	-0.72	-13.9
1580	32.81	-4.84	-0.72	-2.87	15.097	17.713	-0.72	-13.34
1585	33.43	-4.76	-0.54	-2.69	15.367	18.059	-0.54	-12.61
1590	33.83	-4.71	-0.64	-2.79	15.491	18.336	-0.64	-12.28

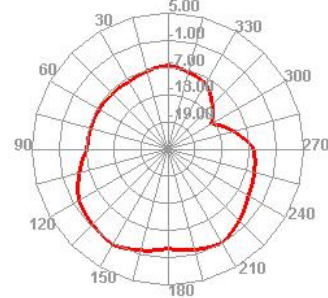
无源测试数据
Passive test data

ANT1 Direction of figure(GPS)

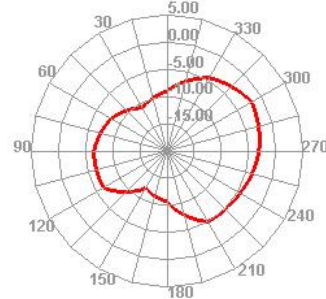
1575.000MHz



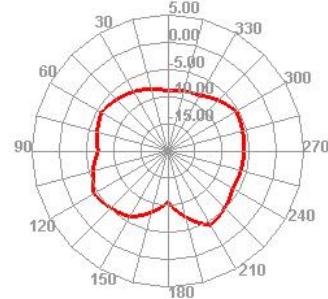
1575.000MHz H



1575.000MHz E1



1575.000MHz E2





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无源测试数据

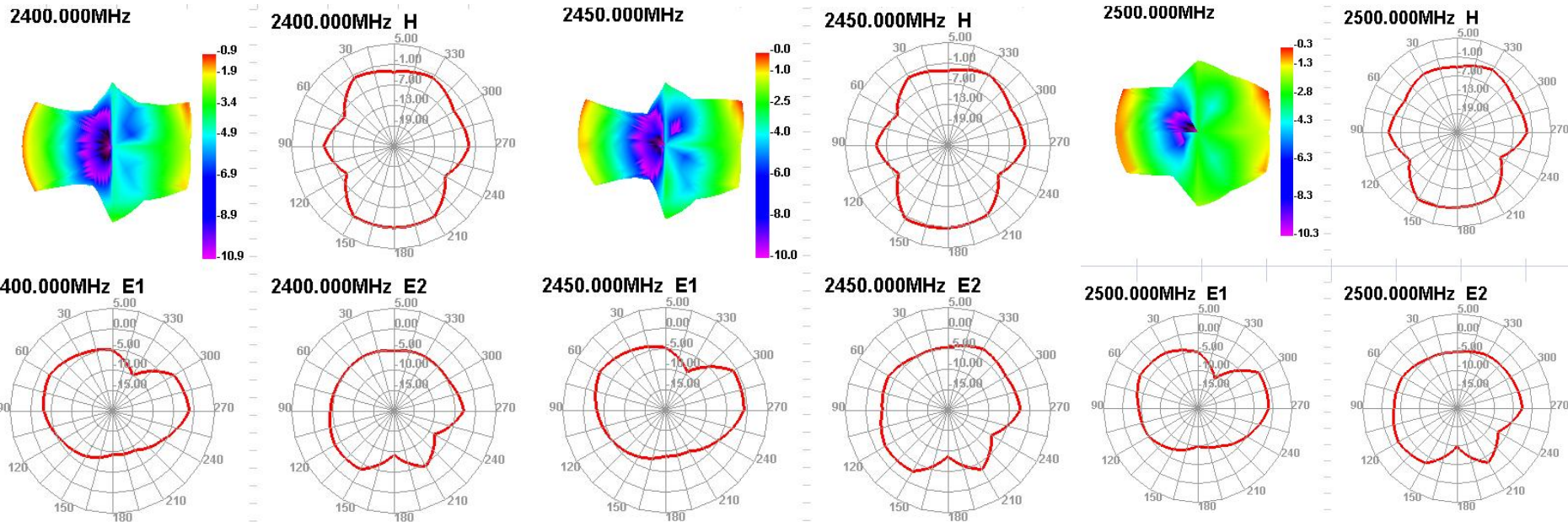
Passive test data

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)
2400	35.02	-4.56	-0.88	-3.03	17.685	17.335	-0.88	-12.27
2410	33.83	-4.71	-1.04	-3.19	17.232	16.598	-1.04	-11.73
2420	38.09	-4.19	-0.5	-2.65	19.374	18.715	-0.5	-11.05
2430	40.26	-3.95	-0.14	-2.29	20.784	19.477	-0.14	-10.71
2440	40.71	-3.9	-0.04	-2.19	21.164	19.542	-0.04	-11.06
2450	42.03	-3.76	-0.01	-2.16	21.803	20.227	-0.01	-11.54
2460	43.45	-3.62	0.06	-2.09	22.378	21.076	0.06	-12.35
2470	42.43	-3.72	0.04	-2.11	21.662	20.764	0.04	-13.57
2480	43.71	-3.59	0.16	-1.99	22.464	21.251	0.16	-14.6
2490	45.23	-3.45	0.22	-1.93	23.403	21.829	0.22	-15.75
2500	40.27	-3.95	-0.32	-2.47	20.948	19.324	-0.32	-17.98

无源测试数据
Passive test data

ANT1 Direction of figure (2.4/BT)



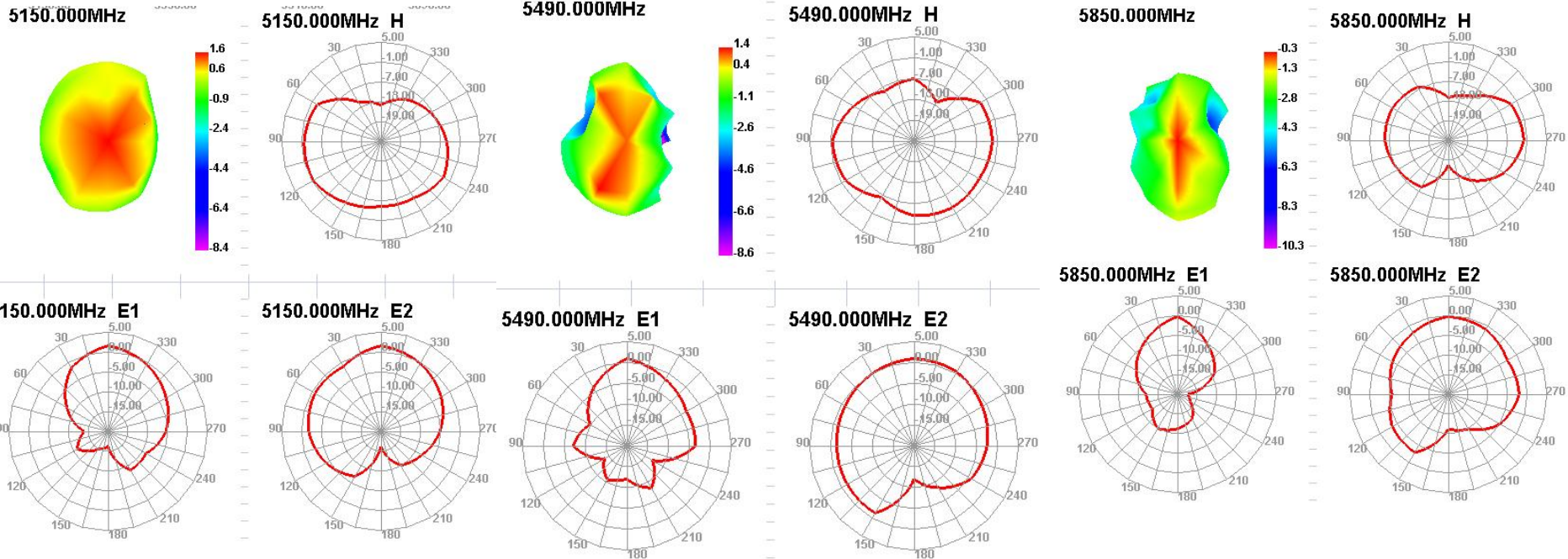
无源测试数据 Passive test data

ANT1 GAIN&Efficiency-WIFI 5G

Passive Test For WIFI5G								
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBD)	UHS (%)	DHIS (%)	Max (dB)	Min (dB)
5150	37.3	-4.28	1.55	-0.6	27.02	10.279	1.55	-22.28
5170	36.36	-4.39	1.56	-0.59	26.177	10.186	1.56	-18.57
5190	38.92	-4.1	1.82	-0.33	27.906	11.01	1.82	-20.5
5210	40.32	-3.94	1.9	-0.25	28.811	11.51	1.9	-21.34
5230	40.99	-3.87	1.79	-0.36	28.954	12.04	1.79	-22.46
5250	42.92	-3.67	2.06	-0.09	30.062	12.859	2.06	-16.57
5270	45.75	-3.4	1.91	-0.24	31.909	13.84	1.91	-16.83
5290	45.51	-3.42	1.6	-0.55	31.794	13.716	1.6	-17.4
5310	43.04	-3.66	1.19	-0.96	29.87	13.171	1.19	-18.05
5330	44.1	-3.56	1.29	-0.86	30.252	13.852	1.29	-13.61
5350	45.9	-3.38	1.73	-0.42	31.318	14.58	1.73	-15.01
5370	44.19	-3.55	1.96	-0.19	30.057	14.129	1.96	-15.91
5390	39.02	-4.09	1.54	-0.61	26.438	12.579	1.54	-14.56
5410	46.07	-3.37	2.27	0.12	30.953	15.117	2.27	-13.32
5430	40.23	-3.95	1.8	-0.35	26.876	13.356	1.8	-15.38
5450	44.13	-3.55	2.35	0.2	29.545	14.582	2.35	-15.98
5470	39.04	-4.08	1.8	-0.35	26.064	12.976	1.8	-15.67
5490	39.91	-3.99	1.43	-0.72	26.427	13.484	1.43	-14.43
5510	39.35	-4.05	1.14	-1.01	25.824	13.527	1.14	-15.93
5530	40.7	-3.9	1.2	-0.95	26.563	14.137	1.2	-15.42
5550	40.13	-3.97	1.24	-0.91	26.242	13.888	1.24	-16.2
5570	38.13	-4.19	0.91	-1.24	24.819	13.307	0.91	-15.46
5590	39.94	-3.99	1.11	-1.04	25.777	14.159	1.11	-14.33
5610	38.51	-4.14	0.79	-1.36	24.707	13.802	0.79	-13.94
5630	37.44	-4.27	0.51	-1.64	23.906	13.535	0.51	-15.22
5650	35.06	-4.55	0	-2.15	22.205	12.857	0	-15.46
5670	34.35	-4.64	-0.34	-2.49	21.529	12.817	-0.34	-15.39
5690	35.21	-4.53	-0.22	-2.37	21.791	13.42	-0.22	-16.23
5710	32.79	-4.84	-0.6	-2.75	20.121	12.671	-0.6	-16.12
5730	33.97	-4.69	-0.02	-2.17	20.712	13.259	-0.02	-16.12
5750	29.63	-5.28	-0.1	-2.25	17.892	11.739	-0.1	-17.87
5770	30.23	-5.2	-0.02	-2.17	18.21	12.015	-0.02	-17.56
5790	27.51	-5.61	-0.19	-2.34	16.538	10.972	-0.19	-16.35
5810	27.5	-5.61	-0.1	-2.25	16.418	11.083	-0.1	-15.02
5830	25.31	-5.97	-0.25	-2.4	15.057	10.253	-0.25	-15.8
5850	25.78	-5.89	-0.33	-2.48	15.269	10.509	-0.33	-17.48

无源测试数据
Passive test data

ANT1 Direction of figure (5G)



合作 共赢

