

深圳市索沃德通讯技术有限公司
Shenzhen Suo Ward Communication Technology Co.,Ltd.

索沃德天线调试报告

客户名称：诚丰

项目名称：MQ1055SA

日期：2024. 01. 25

项目联系方式

客户联系人：
手 机：
邮 箱：

索沃德结构：

手 机：

电 话：0755-29985185

邮 箱：yangwende@szsward.com

索沃德射频：杨文德

手 机：176 7457 9060

电 话：0755-29985185

邮 箱：yangwende@szsward.com

项目简介

1. 项目简述

项目天线数目	机子类型
3	平板
整机外壳材质：塑胶壳	

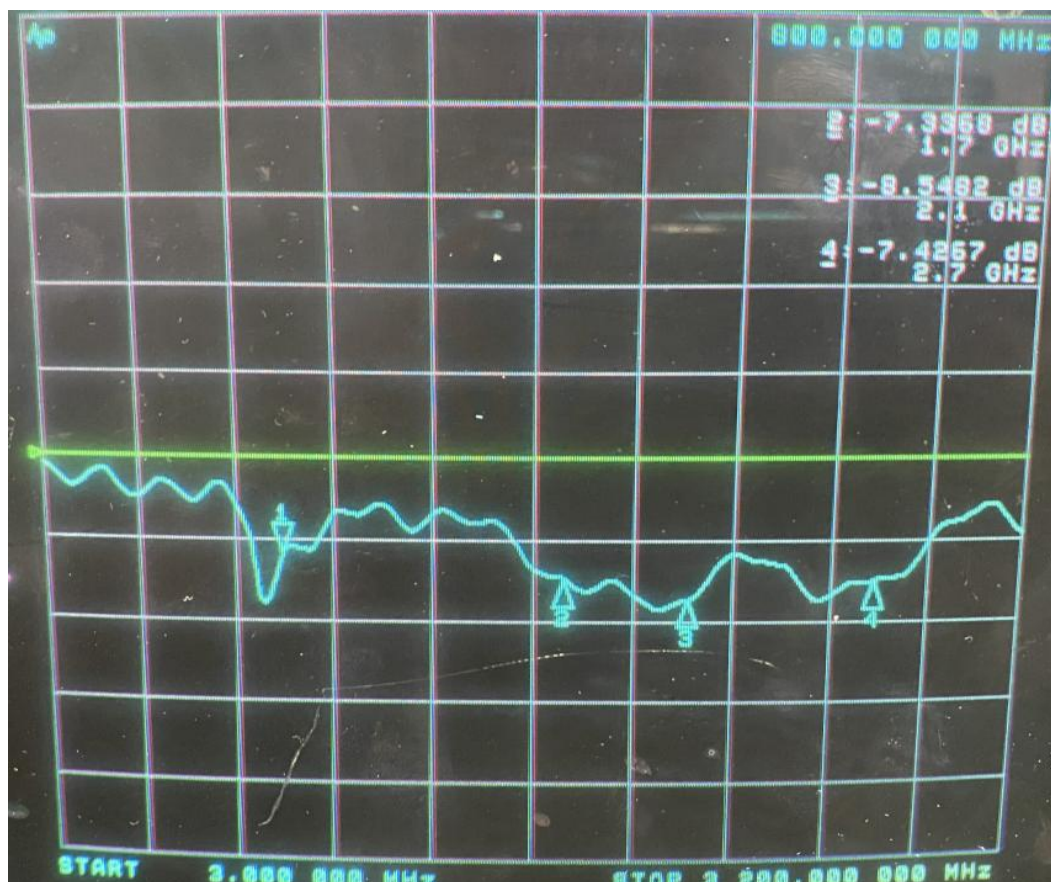
2. 天线简述

天线编号	名称	工作频段/MHZ	材质/结构
1	4G主天线	GSM850/900/1800/1900 WCDMA 1900/1700/850 LTE-B2/4/5/12/13/25/26/41/66/71	FPC
2	分集	LTE-B2/4/5/12/13/25/26/41/66/71	FPC
3	WIFI&GPS&BT&5Gwifi	2400MHz/2500MHz&1575MHz&5.8GHz	FPC

天线布局



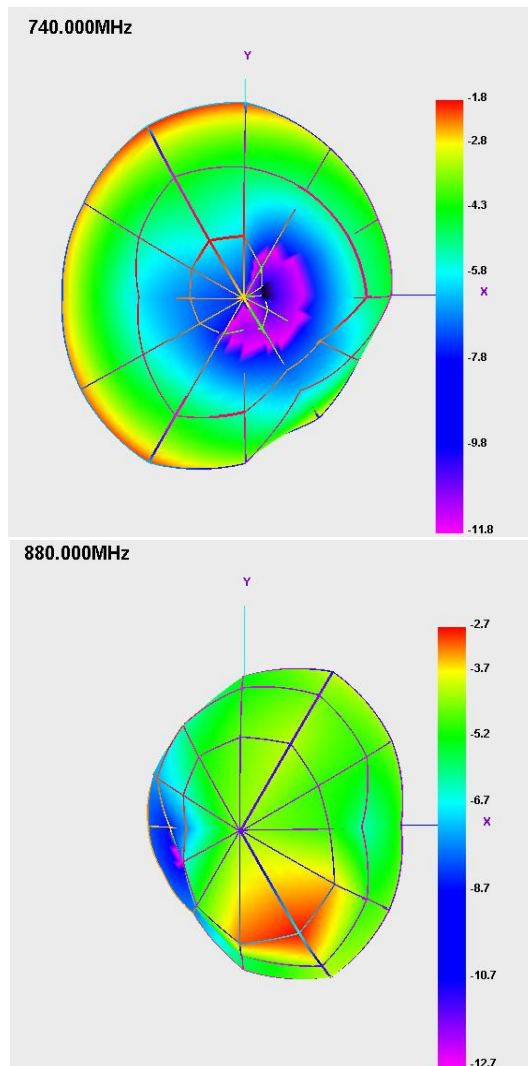
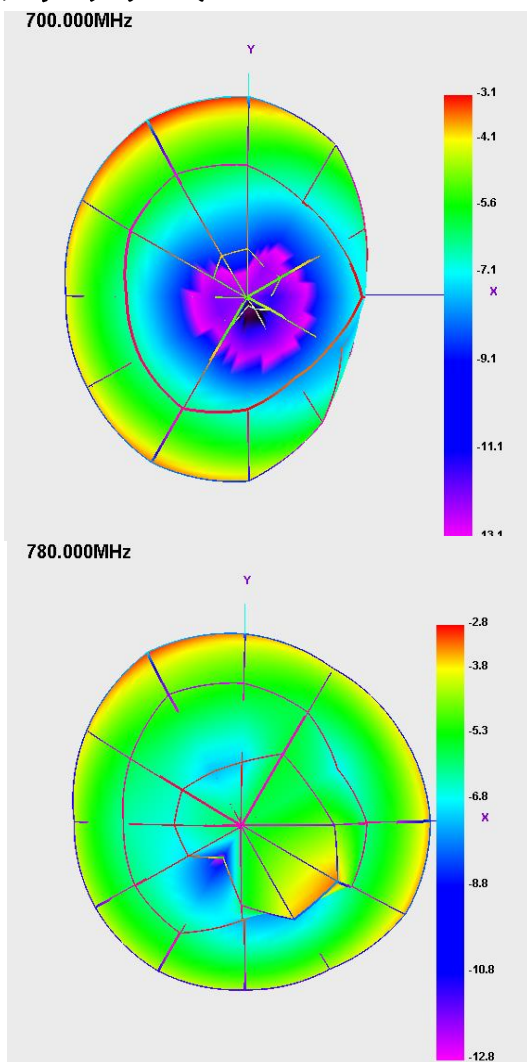
2G&3G&4G天线S11



2G&3G&4G效率测试

Passive Test For LB-600												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
700	17.45	-7.58	-3.09	-5.24	7.719	9.735	-3.09	-18.51	4.49	30	36.87	36.5
720	22.77	-6.43	-2.23	-4.38	9.681	13.092	-2.23	-19.15	4.2	30	37.6	37.55
740	30.48	-5.16	-1.83	-3.98	13.014	17.467	-1.83	-14.4	3.33	30	38.3	37.83
760	31.08	-5.07	-2.02	-4.17	13.862	17.22	-2.02	-14.1	3.06	30	38.27	37.58
780	26.75	-5.73	-2.79	-4.94	12.484	14.267	-2.79	-16.02	2.94	30	38.13	37.93
800	27.23	-5.65	-3.04	-5.19	12.833	14.395	-3.04	-14.64	2.61	0	39.07	39.65
820	25.96	-5.86	-2.71	-4.86	12.901	13.054	-2.71	-16.56	3.14	0	38.8	39.24
840	24.21	-6.16	-3.08	-5.23	12.936	11.276	-3.08	-14.01	3.08	90	39.13	39.27
860	23.15	-6.35	-3.03	-5.18	13.129	10.022	-3.03	-15.59	3.33	90	39.06	39.47
880	19.53	-7.09	-2.65	-4.8	11.575	7.956	-2.65	-15.94	4.44	90	39.15	39.78
900	17.88	-7.48	-2.7	-4.85	10.897	6.982	-2.7	-18.66	4.78	30	39.08	39.5

2G&3G&4G效率测试



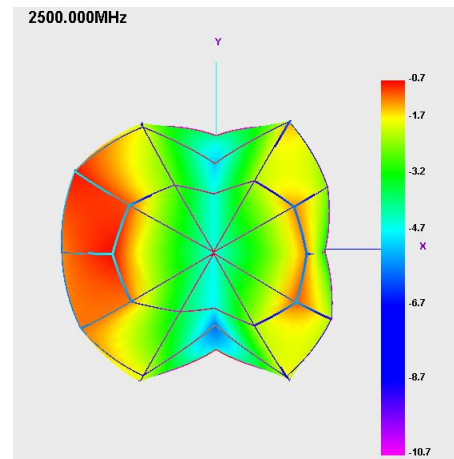
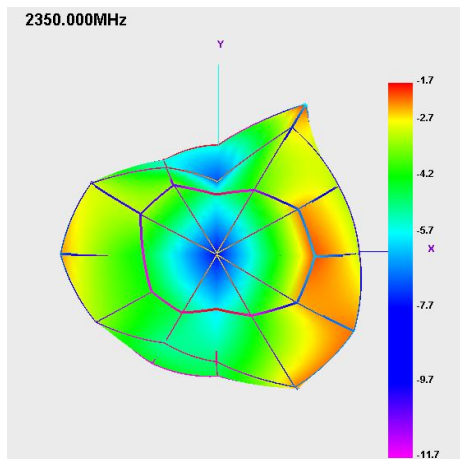
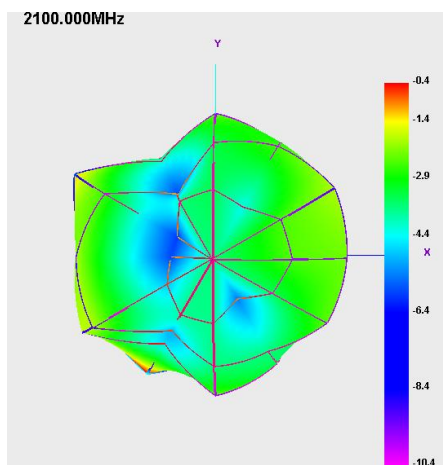
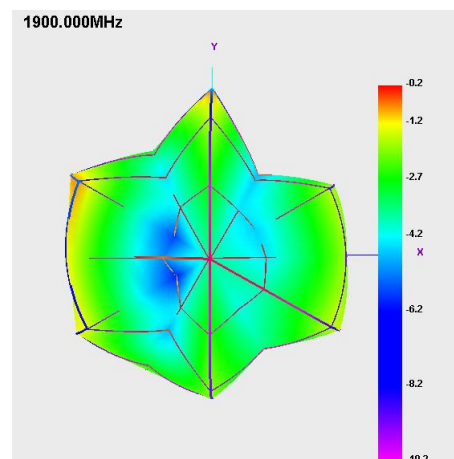
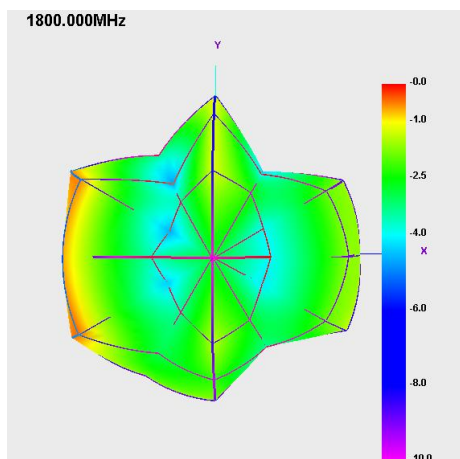
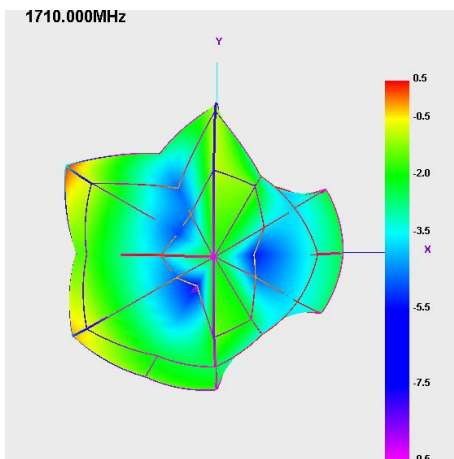
2G&3G&4G效率测试

Passive Test For D3												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Directiv ity (dBi)	Beamwid th (3dB)	AttH (dB)	AttV (dB)
1700	53.4	-2.72	1.05	-1.1	25.745	27.654	1.05	-12.08	3.78	30	45.11	45.29
1740	48.7	-3.12	0.4	-1.75	24.321	24.376	0.4	-12.15	3.53	30	44.5	44.5
1745	48.99	-3.1	0.44	-1.71	24.594	24.396	0.44	-12.1	3.53	30	44.72	44.66
1750	47.72	-3.21	0.36	-1.79	24.064	23.659	0.36	-12.05	3.57	30	44.62	44.57
1780	47.32	-3.25	0.21	-1.94	24.493	22.832	0.21	-13.49	3.46	30	44.87	44.81
1800	44.8	-3.49	-0.01	-2.16	23.16	21.638	-0.01	-15.54	3.47	0	44.2	44.09
1830	40.75	-3.9	-0.26	-2.41	21.046	19.703	-0.26	-14.29	3.64	0	44.22	44.04
1835	41.64	-3.8	-0.14	-2.29	21.516	20.128	-0.14	-14	3.67	0	44.31	44.19
1840	41.94	-3.77	-0.02	-2.17	21.682	20.255	-0.02	-13.62	3.76	0	44.4	44.34
1850	48.59	-3.13	0.58	-1.57	25.214	23.379	0.58	-12.88	3.71	0	44.7	44.66
1880	49.86	-3.02	0.42	-1.73	25.934	23.923	0.42	-14.98	3.44	0	45.25	45.22
1900	42.11	-3.76	-0.17	-2.32	21.43	20.679	-0.17	-14.5	3.59	0	45.07	44.92
1925	44.29	-3.54	0.23	-1.92	22.47	21.823	0.23	-13.03	3.77	30	45.13	44.93
1930	42.59	-3.71	0.06	-2.09	21.671	20.919	0.06	-13.14	3.77	30	45.18	44.96
1940	40.84	-3.89	-0.08	-2.23	20.957	19.885	-0.08	-13.72	3.81	30	45.23	45.2
1950	37.45	-4.27	-0.51	-2.66	19.398	18.054	-0.51	-14.63	3.76	90	45.28	45.29
1960	35.25	-4.53	-0.94	-3.09	18.46	16.795	-0.94	-15.81	3.58	30	45.17	45.2
1970	35.48	-4.5	-1.08	-3.23	18.738	16.738	-1.08	-16.61	3.42	30	45.03	45.06
1980	38.03	-4.2	-0.93	-3.08	20.305	17.722	-0.93	-17.07	3.27	0	45.11	44.92
1990	38.89	-4.1	-0.72	-2.87	20.611	18.274	-0.72	-16.72	3.38	30	45.11	44.96
1995	38.72	-4.12	-0.67	-2.82	20.399	18.326	-0.67	-16.59	3.45	30	45.32	45.13
2000	39.22	-4.06	-0.55	-2.7	20.508	18.716	-0.55	-16.25	3.51	30	45.4	45.26

2G&3G&4G效率测试

Passive Test For D4												
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHIS (%)	Max (dB)	Min (dB)	Directivity (dBi)	Beamwidth (3dB)	AttH (dB)	AttV (dB)
2110	37.7	-4.24	-0.6	-2.75	18.828	18.872	-0.6	-13.29	3.64	30	46.12	45.85
2140	30.17	-5.2	-1.42	-3.57	15.02	15.152	-1.42	-14.16	3.78	30	45.9	45.78
2150	31.49	-5.02	-1.33	-3.48	15.783	15.707	-1.33	-14.16	3.69	30	45.98	45.91
2160	36.38	-4.39	-0.81	-2.96	18.366	18.017	-0.81	-13.45	3.58	30	46.36	46.36
2170	38.87	-4.1	-0.57	-2.72	19.754	19.12	-0.57	-13.17	3.53	30	46.3	46.35
2180	39.29	-4.06	-0.51	-2.66	20.108	19.185	-0.51	-13.28	3.54	30	46.39	46.42
2190	38.57	-4.14	-0.52	-2.67	19.795	18.77	-0.52	-13.63	3.62	30	46.32	46.41
2200	33.55	-4.74	-1.07	-3.22	17.265	16.287	-1.07	-14.43	3.67	30	46.4	46.4
2210	35.73	-4.47	-0.77	-2.92	18.391	17.344	-0.77	-13.88	3.7	30	46.61	46.65
2290	30.65	-5.14	-0.96	-3.11	17.002	13.644	-0.96	-13.12	4.18	0	46.97	46.81
2400	25.53	-5.93	-1.72	-3.87	16.77	8.756	-1.72	-15.15	4.21	30	47.81	47.38
2500	25.17	-5.99	-0.73	-2.88	18.605	6.567	-0.73	-24.56	5.26	30	48.95	48.74
2510	25.76	-5.89	-0.58	-2.73	18.404	7.355	-0.58	-22.19	5.31	30	48.1	48.03
2520	27.29	-5.64	-0.13	-2.28	18.776	8.514	-0.13	-18.28	5.51	30	48.33	48.17
2530	29.44	-5.31	0.26	-1.89	19.394	10.05	0.26	-16.73	5.57	30	48.16	48.05
2540	31.04	-5.08	0.36	-1.79	19.53	11.514	0.36	-21.79	5.44	30	47.96	47.94
2550	32.93	-4.82	0.39	-1.76	19.832	13.099	0.39	-21.76	5.21	30	48.06	48.03
2560	29.51	-5.3	-0.42	-2.57	17.13	12.378	-0.42	-17.11	4.88	30	48.2	48.19
2570	29.73	-5.27	-0.75	-2.9	16.792	12.934	-0.75	-15.42	4.52	30	48.23	48.28
2580	29.26	-5.34	-1.09	-3.24	16.237	13.019	-1.09	-14.99	4.25	30	48.03	48.14
2590	29.37	-5.32	-1.29	-3.44	16.102	13.266	-1.29	-13.53	4.03	30	47.71	47.8

2G&3G&4G效率测试



2G&3G&4G天线有源数据

LTE2 TRP			LTE2 TIS
18650	18900	19150	1150
19.45	19.86	19.83	-93.52
LTE4 TRP			LTE4 TIS
20000	20175	20350	2350
19.73	19.45	19.86	-92.16
LTE5 TRP			LTE5 TIS
20450	20525	20600	2600
18.3	17.68	16.89	-93.47
LTE12 TRP			LTE12 TIS
23060	23095	23130	5130
17.75	17.73	17.75	-92.58

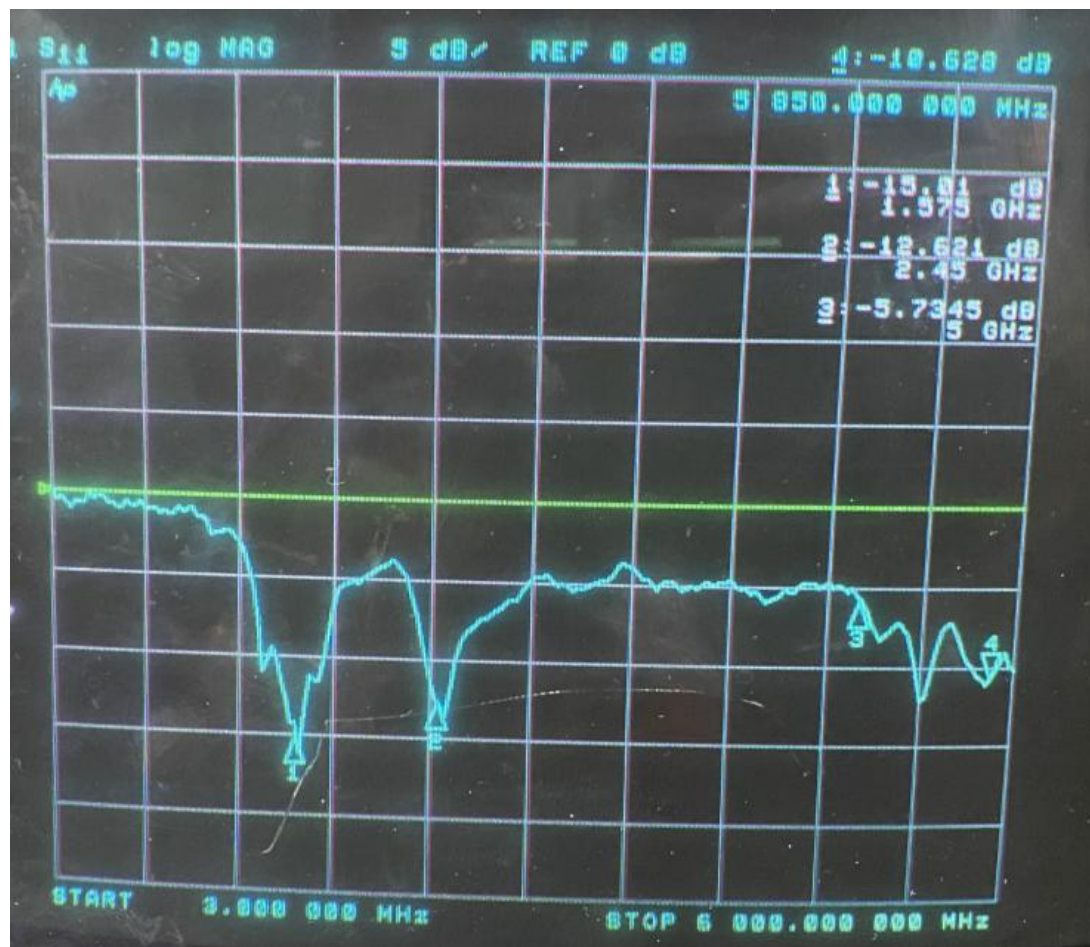
LTE25 TRP			LTE25 TIS
26090	26365	26640	8640
19.74	19.21	19.81	-96.91
LTE26 TRP			LTE26 TIS
26740	26865	26990	8990
18.02	17.16	16.06	-91.97
LTE41 TRP			LTE41 TIS
40340	40620	41140	41140
19.29	18.46	16.4	-86.18
LTE66 TRP			LTE66 TIS
132022	132322	132622	67086
19.97	19.84	19.45	-93.44
LTE71 TRP			LTE71 TIS
133172	133297	133422	68886
16.85	16.57	17.3	-88.14

2G&3G&4G天线有源数据

WCDMA_II TRP			WCDMA_II TIS
9262	9400	9538	9938
19.64	19.24	19.78	-103.91
WCDMA_IV TRP			WCDMA_IV TIS
1312	1413	1513	1738
19.71	19.46	19.17	-103.91
WCDMA_V TRP			WCDMA_V TIS
4132	4185	4233	4458
17.98	17.2	16.77	-102.9

GSM850 TRP			GSM850 TIS
128	190	251	251
25.67	26.27	26.24	-103.49
EGSM TRP			EGSM TIS
1	62	124	124
24.79	23.82	23.55	-100.19
DCS TRP			DCS TIS
512	698	885	885
24.71	23.74	23.42	-103.96
PCS TRP			PCS TIS
512	661	810	810
25.35	23.59	25.8	-102.18

WIFI&GPS&BT天线S11



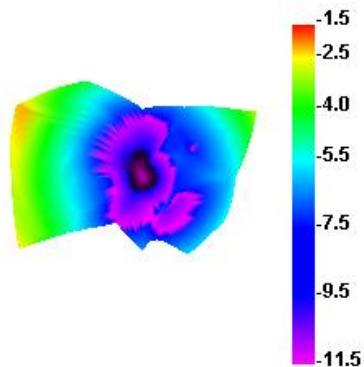
BT天线实测距离

实测效果	
机型编号	1
测试环境	索沃德研发中心
测试设备	华为AM08
测试距离	10米 $\geq$

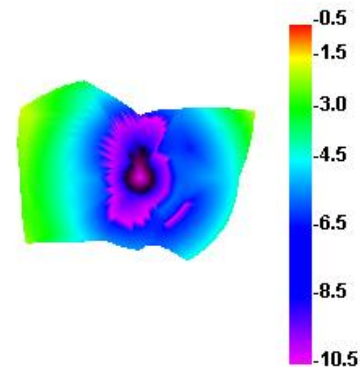
WIFI&BT天线效率

Passive Test For 2.4G			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
2400	22.44	-6.49	-1.54
2410	18.9	-7.24	-1.99
2420	21.06	-6.77	-1.27
2430	21.78	-6.62	-1.04
2440	23.13	-6.36	-0.83
2450	24.8	-6.06	-0.46
2460	22.05	-6.57	-0.77
2470	18.81	-7.26	-1.36
2480	17.73	-7.51	-1.56
2490	20.45	-6.89	-0.96
2500	22.06	-6.56	-0.54

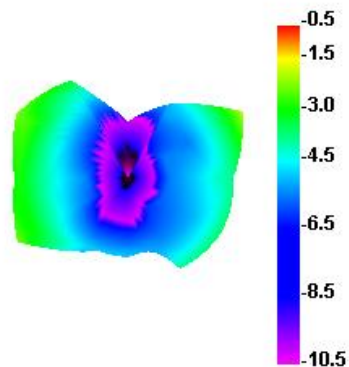
2400.000MHz



2450.000MHz



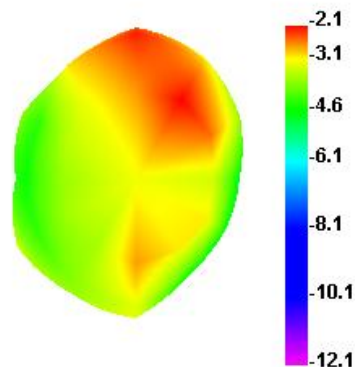
2500.000MHz



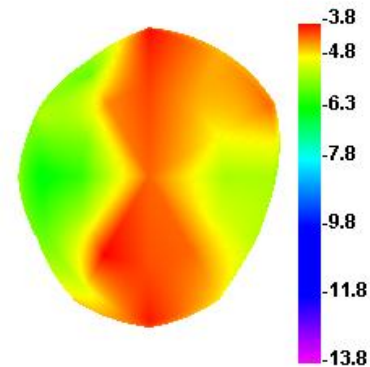
5GWIFI天线效率

Passive Test For 5G-WIFI			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
5000	24.98	-6.02	-2.12
5100	22.63	-6.45	-2.24
5200	27.02	-5.68	-1.61
5300	30.16	-5.21	-1.11
5400	26.17	-5.82	-2.04
5500	18.88	-7.24	-3.76
5600	11.44	-9.41	-4.87
5700	20.43	-6.9	-1.98
5800	24.25	-6.15	-0.8
5900	34.26	-4.65	0.13
6000	37	-4.32	0.65

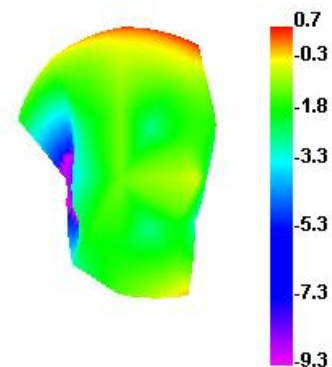
5000.000MHz



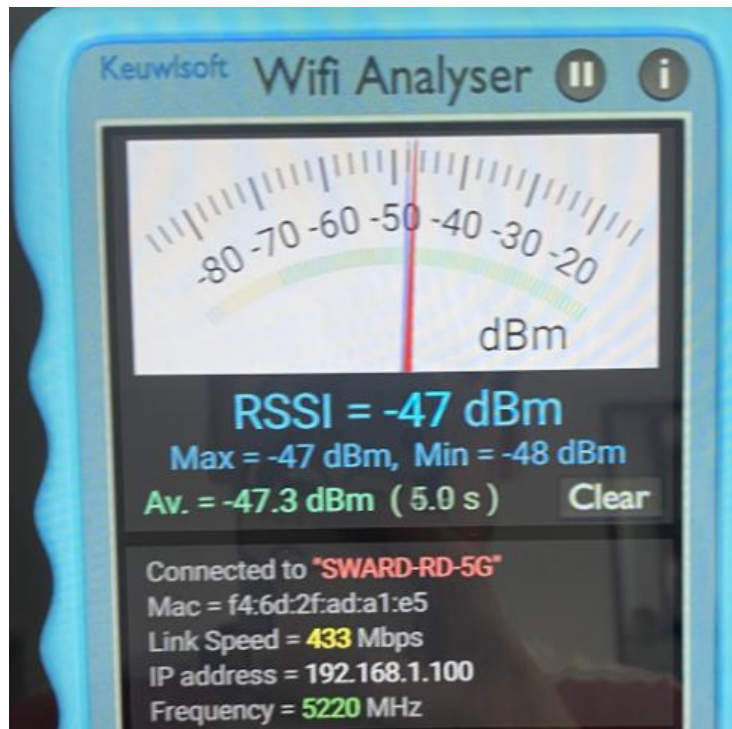
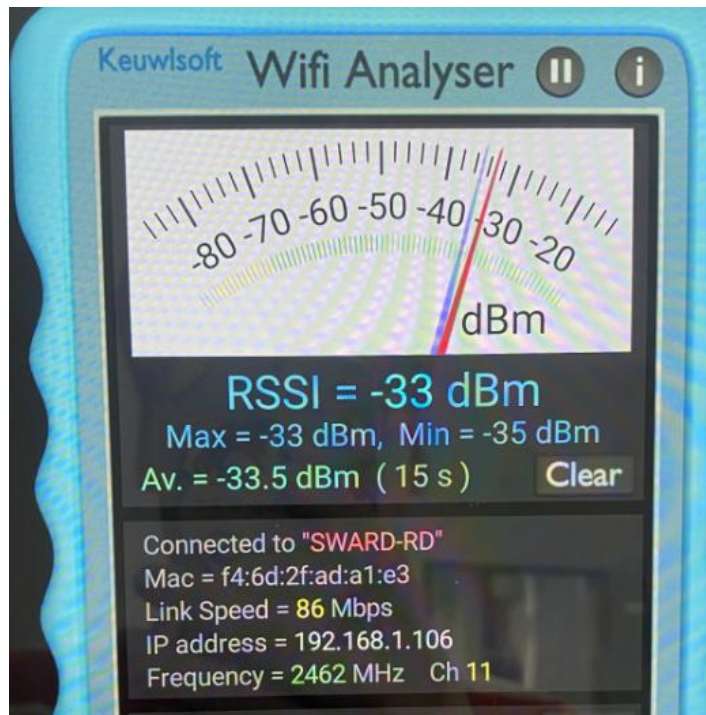
5500.000MHz



6000.000MHz



WIFI天线信号强度实测图片（数据）



测试地点：我司研发办公室

测试时间：14点-14点30

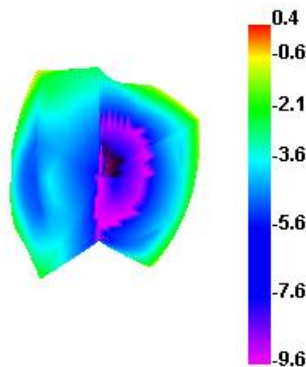
测试距离：10米-15米

信号强度：-50dBm至-35dBm

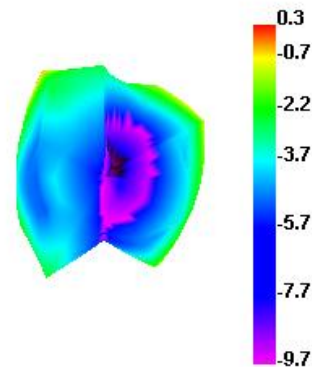
GPS天线效率

Passive Test For GPS			
Freq	Effi	Effi	Gain
(MHz)	(%)	(dB)	(dBi)
1570	33.04	-4.81	0.43
1571	32.81	-4.84	0.42
1572	32.59	-4.87	0.39
1573	32.37	-4.9	0.37
1574	32.18	-4.92	0.36
1575	32.03	-4.94	0.34
1576	31.73	-4.98	0.29
1577	31.45	-5.02	0.23
1578	31.17	-5.06	0.18
1579	30.86	-5.11	0.12
1580	30.49	-5.16	0.06

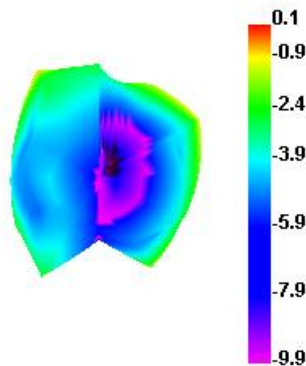
1570.000MHz



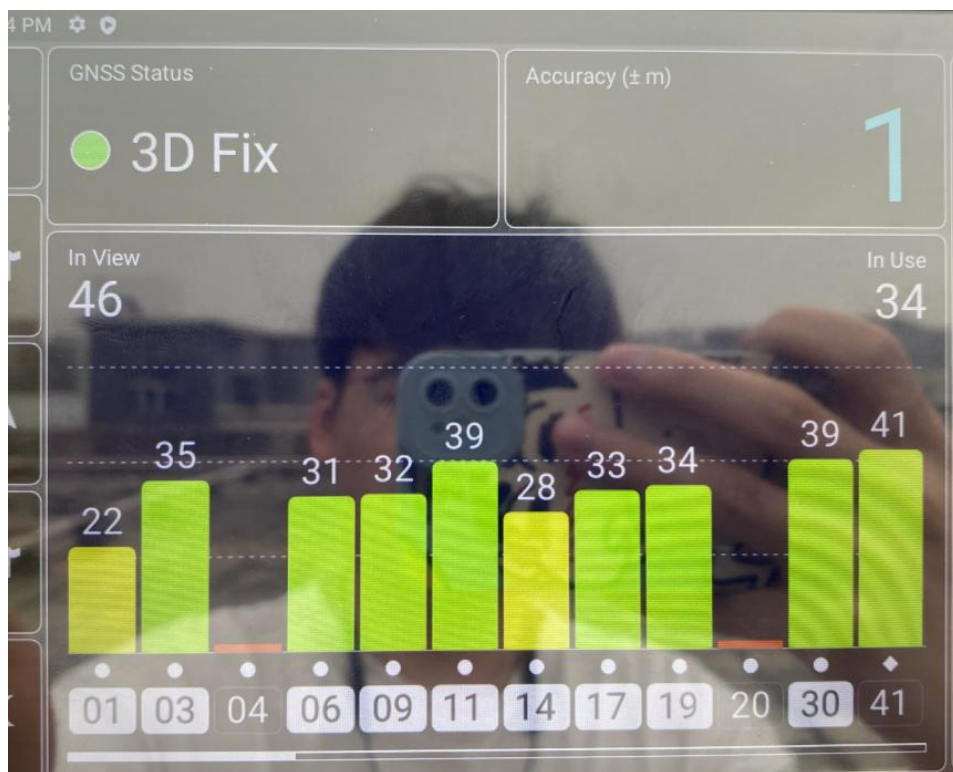
1575.000MHz



1580.000MHz



GPS实测图片（数据）



测试地点：我司楼顶

测试时间：15点至15点30分

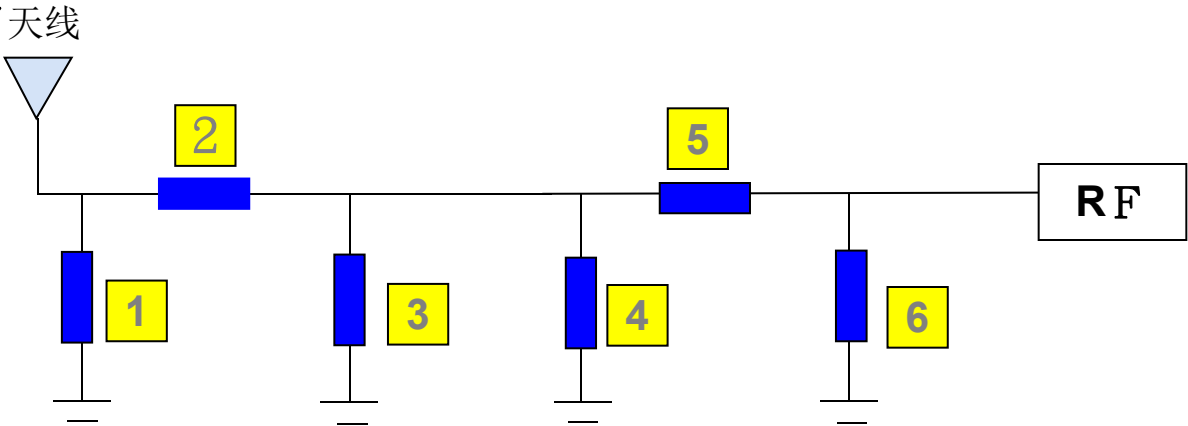
测试方向：东、南、西、北

冷启动定位时间：60sec

深圳市宝安区西乡街道润东晟工业区13栋4楼A

A, floor 4, building 13, rundongsheng Industrial Zone, Xixiang street, Bao'an District, Shenzhen City, Guangdong Province

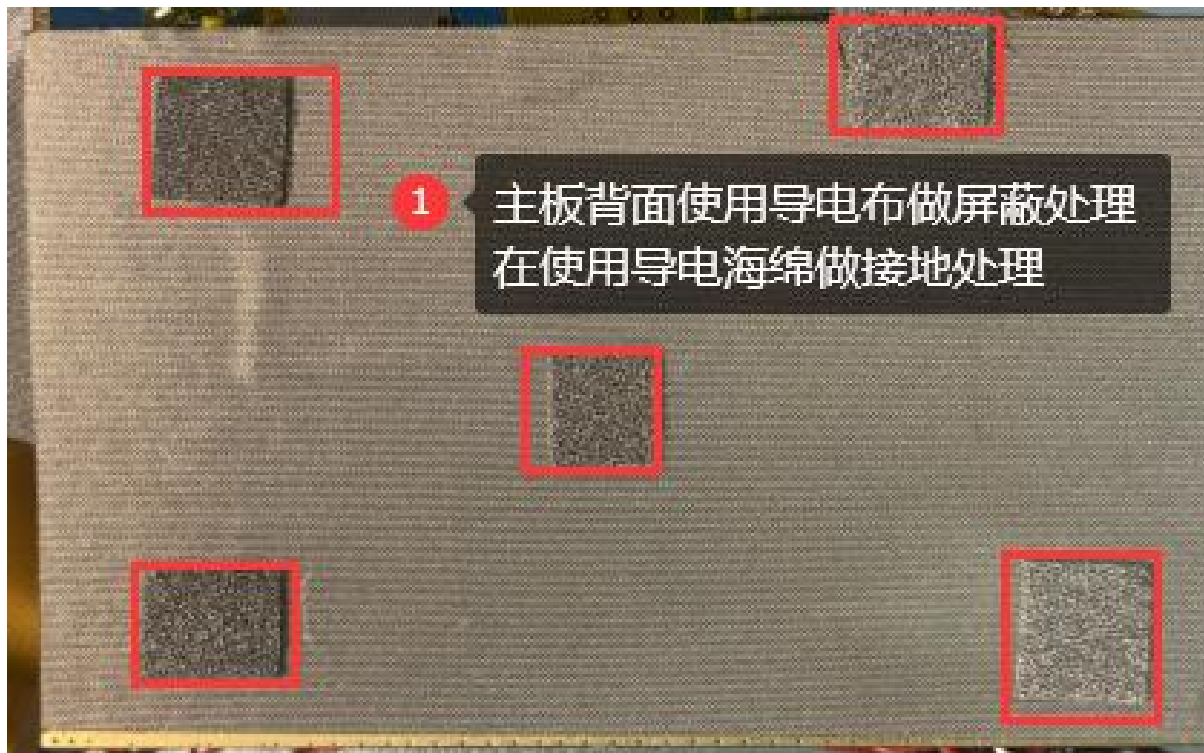
天线匹配



主天线	1	2	3	4	5	6	备注
原始匹配							
变更匹配							

未改动匹配

环境处理及装配说明



- 注：1. 此份报告依据调试样机实际调试及测试情况所得，其中环境处理、天线位置以及各器件装配位置不可随意更改；
2. 样机所使用物料若有变动，需及时反馈我司做再次验证；
3. 敏感器件清单：
- TP（材质，涂层，走线等）
- 屏（放大电路，LED，排线设计等）
- 壳料（天线装配方式，结构干涉，壳料材质，天线位置高度及面积等）
- 主板（主板传导，射频电路匹配、PA、双功器、滤波、LNA，电源电路等）
- 摄像头、电池、马达、MIC、指纹识别模块等
4. 因调试样机数量少或仅有一台，部分概率性问题不能完全找出，建议量产前先小批试产排查问题点（如闪屏花屏，喇叭杂音，TP跳点，黑屏死机，信号跳水等）