



样品规格书

Antenna Part Specification

客户名称: Customer name:	禾苗 Sprocomm
项目名称: Project name:	E6546N
天线类型: Material category:	FPC 天线 FPC antenna
版本: Version:	V1.0
日期: Date:	2023.02.23



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编制/变更日期 Compile / change date	变更理由 Reason for change	变更内容 Changed content	版本 Version



一：无源测试报告

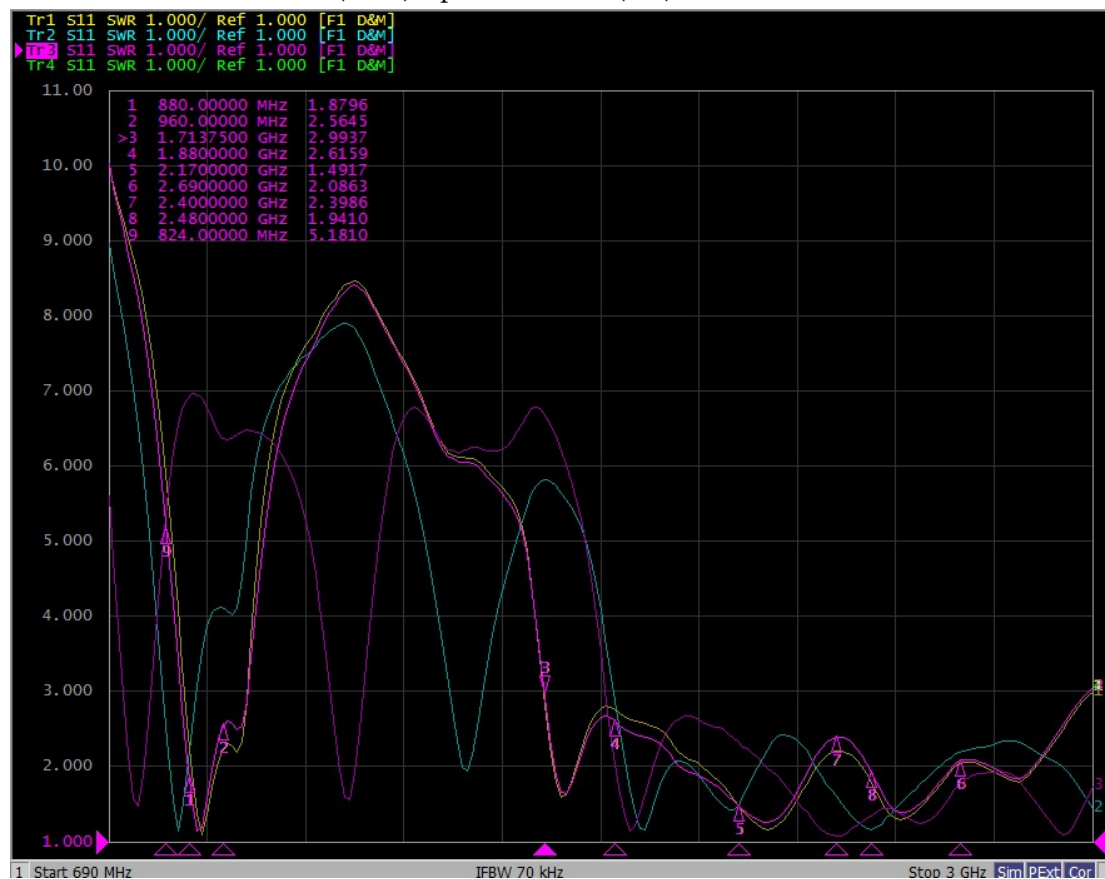
I: The report of passive data



Agilent E5071C

主天线 S 参数(FS)

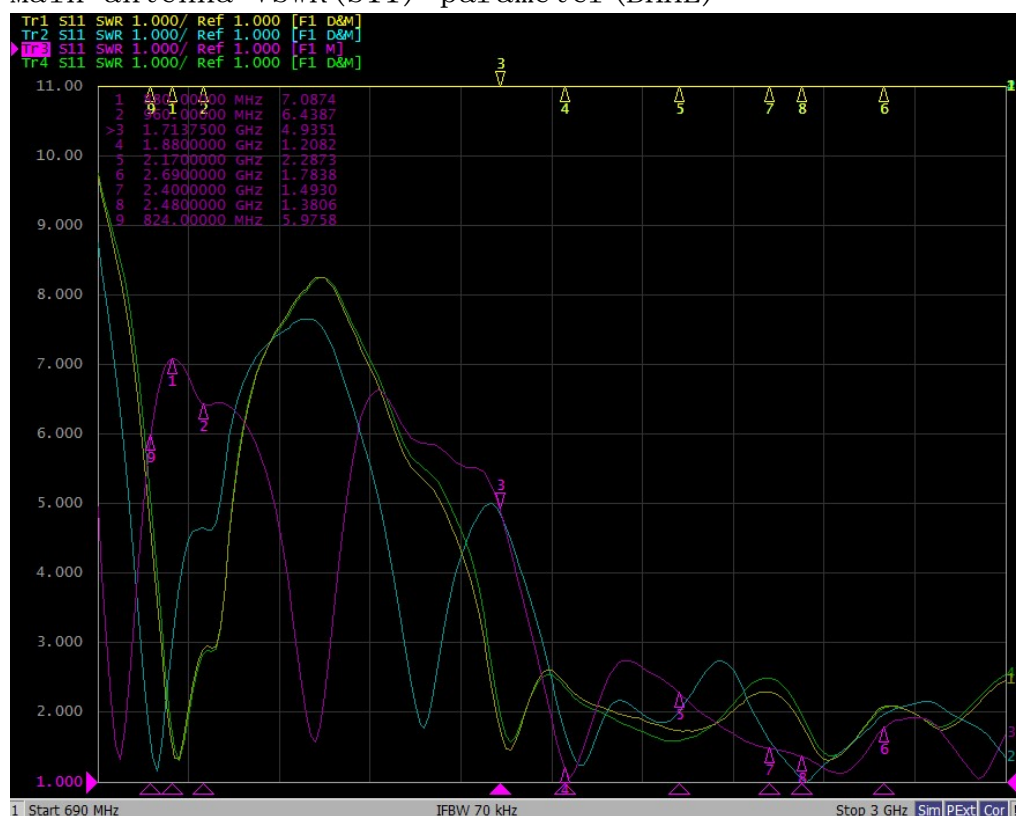
Main antenna VSWR(S11) parameter(FS)





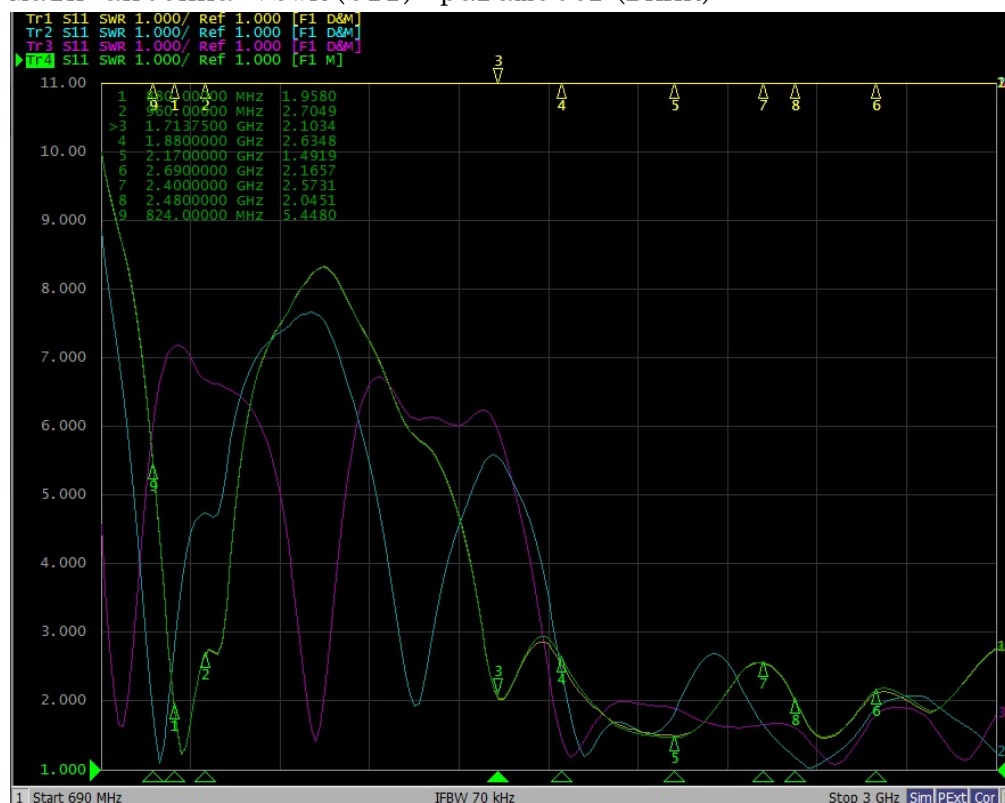
主天线 S 参数(BHHL)

Main antenna VSWR(S11) parameter(BHHL)



主天线 S 参数(BHHR)

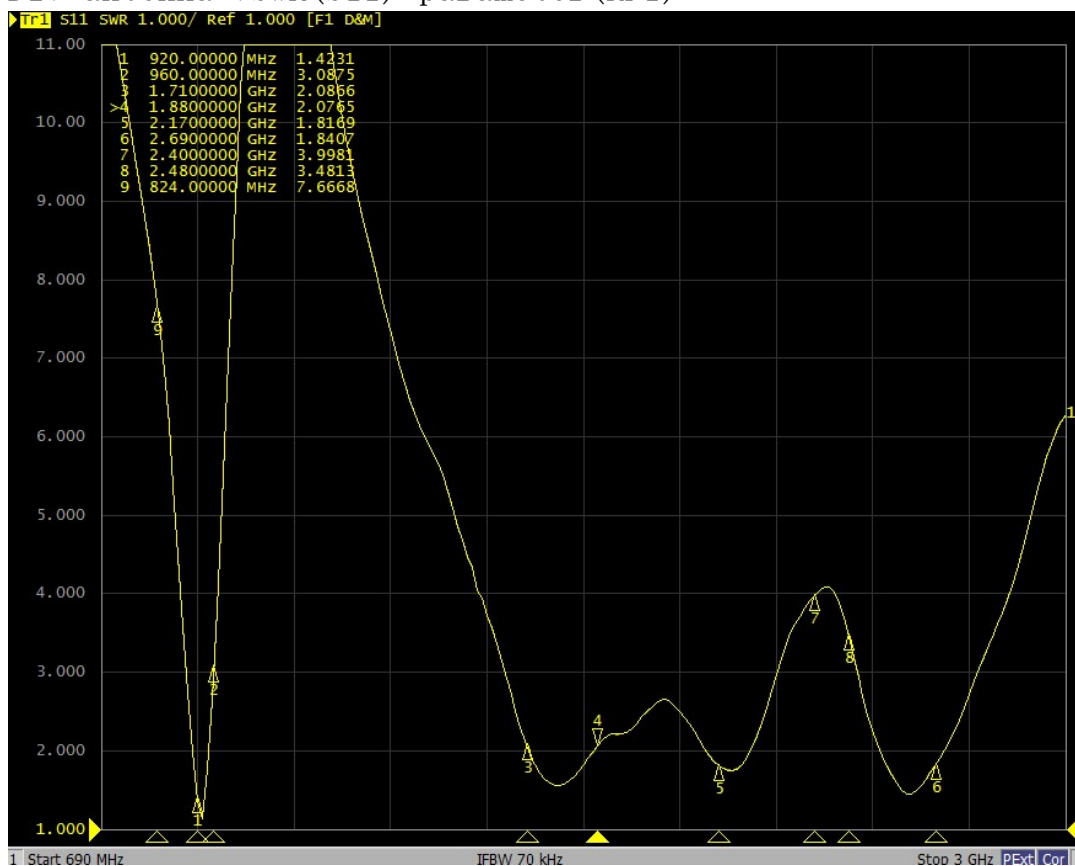
Main antenna VSWR(S11) parameter(BHHR)





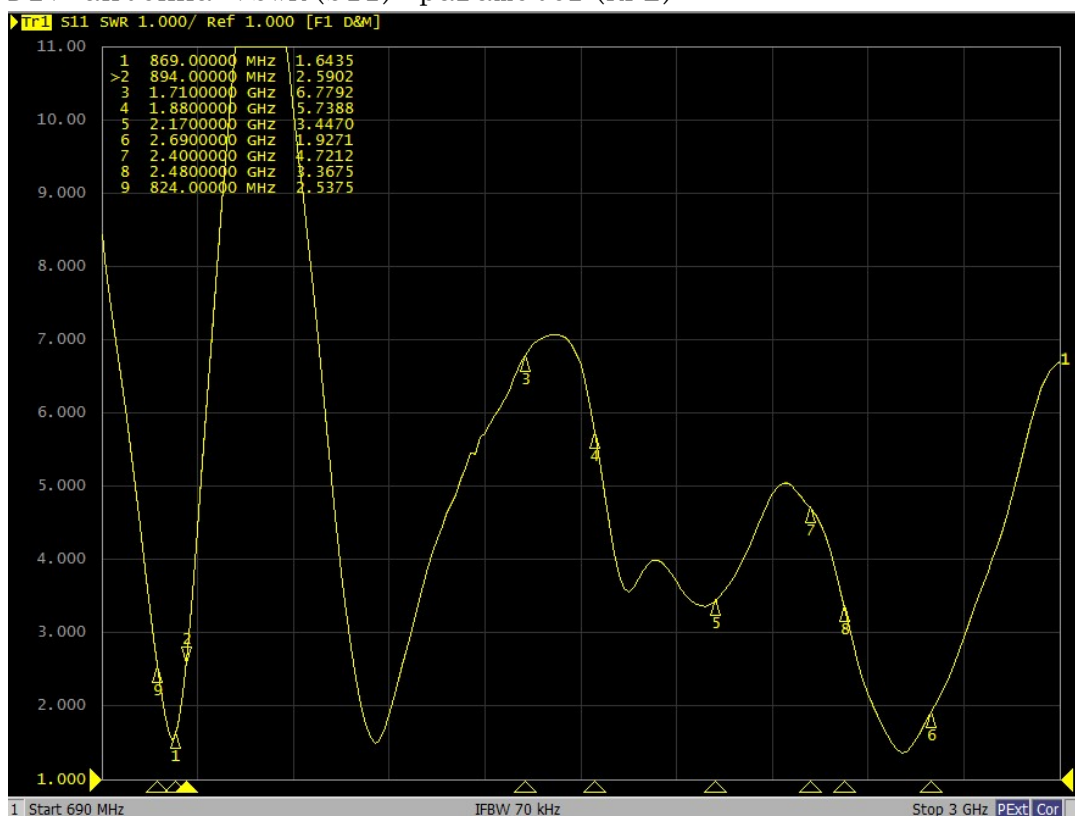
分集天线 S 参数(RF1)

DIV antenna VSWR(S11) parameter(RF1)



分集天线 S 参数(RF2)

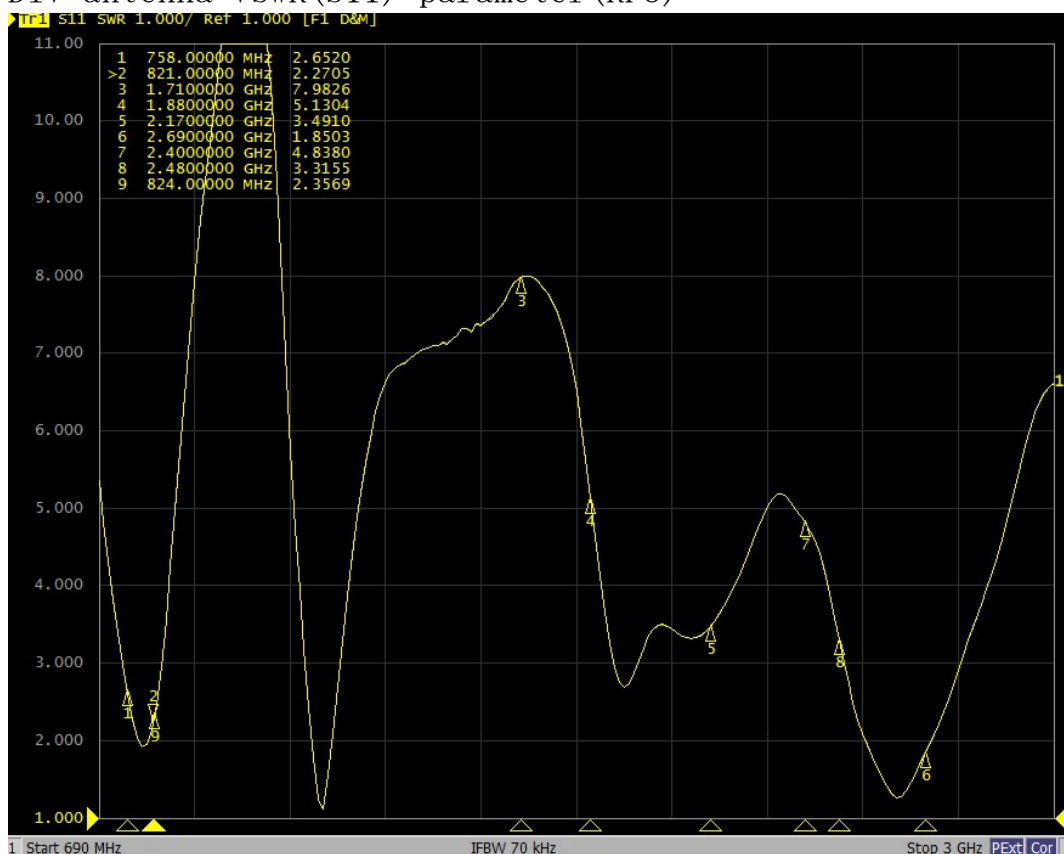
DIV antenna VSWR(S11) parameter(RF2)





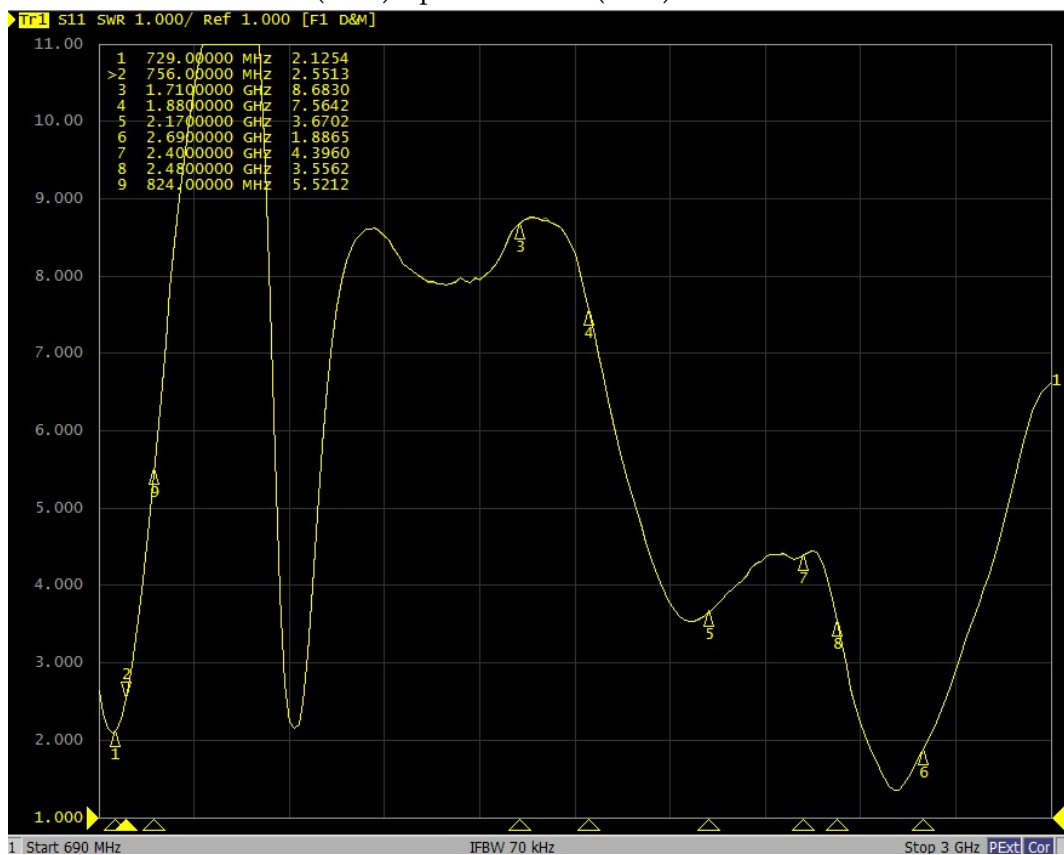
分集天线 S 参数(RF3)

DIV antenna VSWR(S11) parameter(RF3)



分集天线 S 参数(RF4)

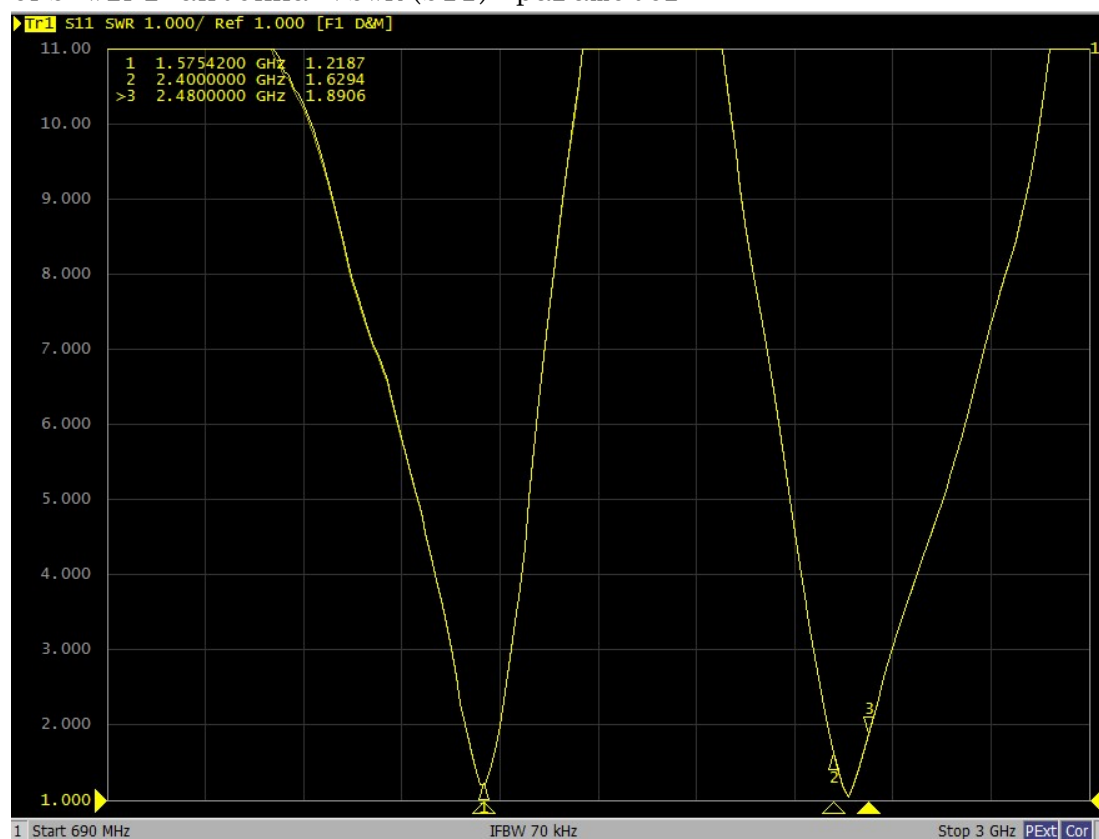
DIV antenna VSWR(S11) parameter(RF4)





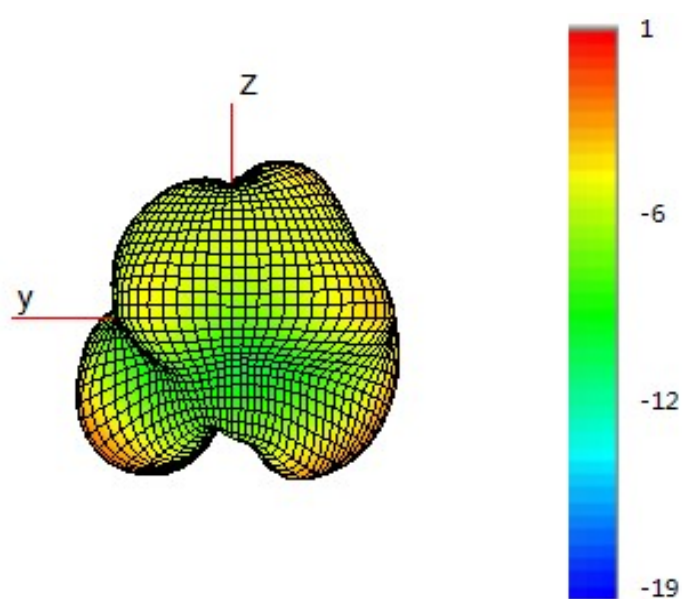
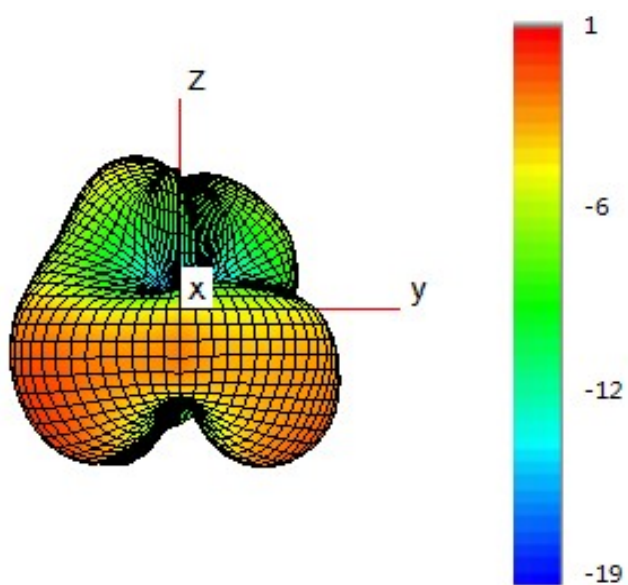
GPS+WIFI 天线 S 参数

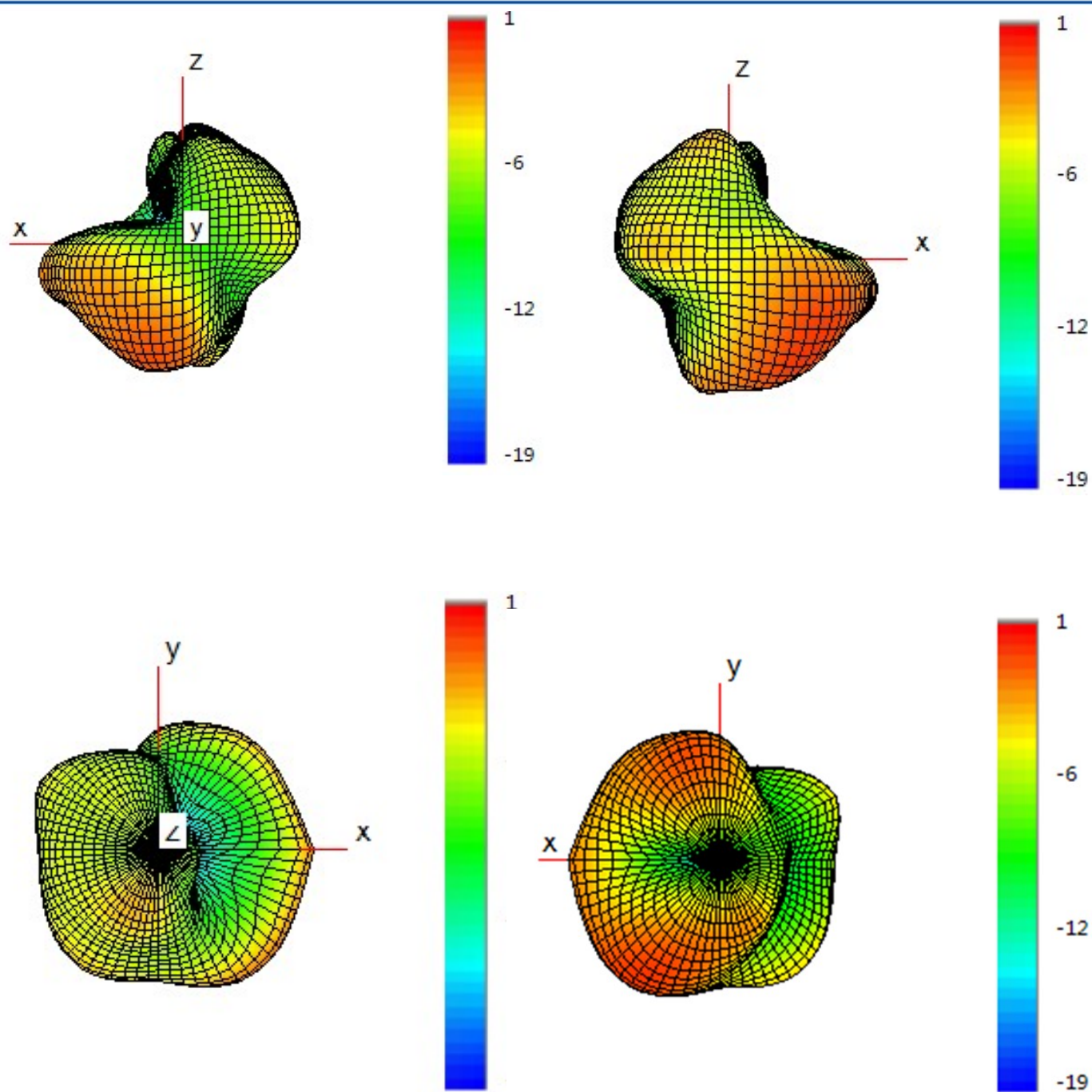
GPS+WIFI antenna VSWR(S11) parameter



3D 方向图(2.4G)

3D direction map(2.4G)

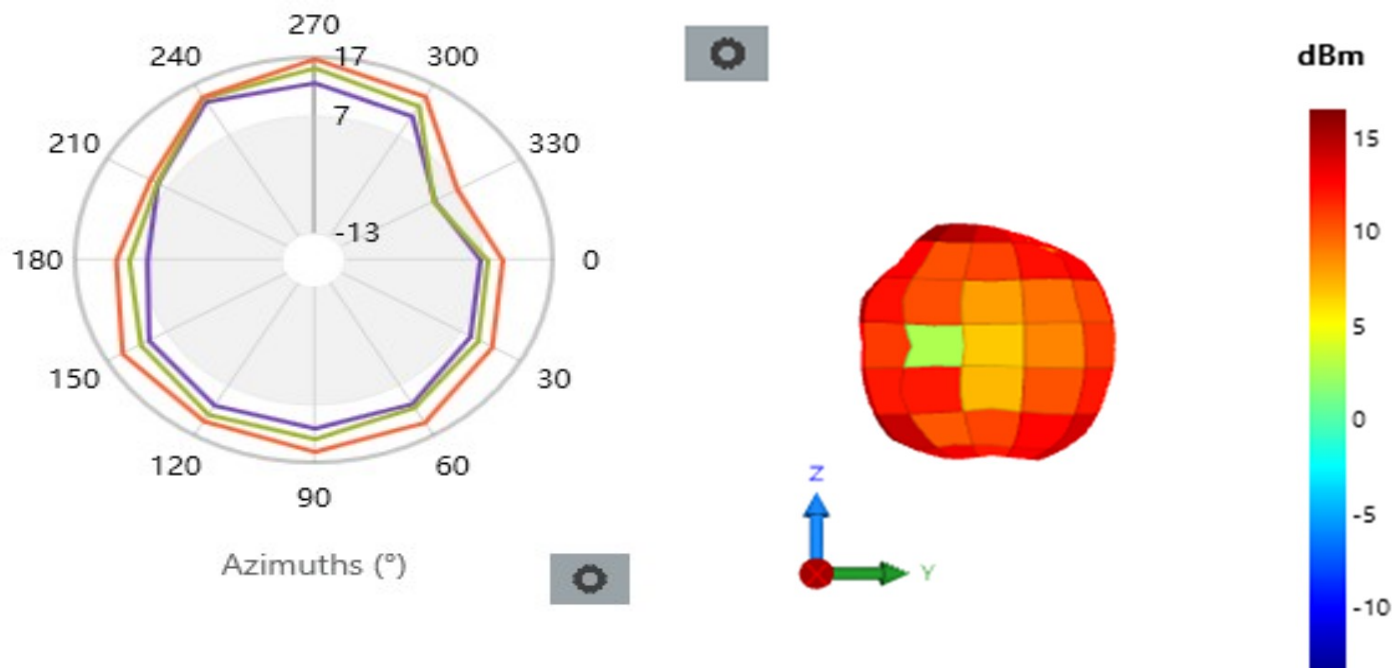






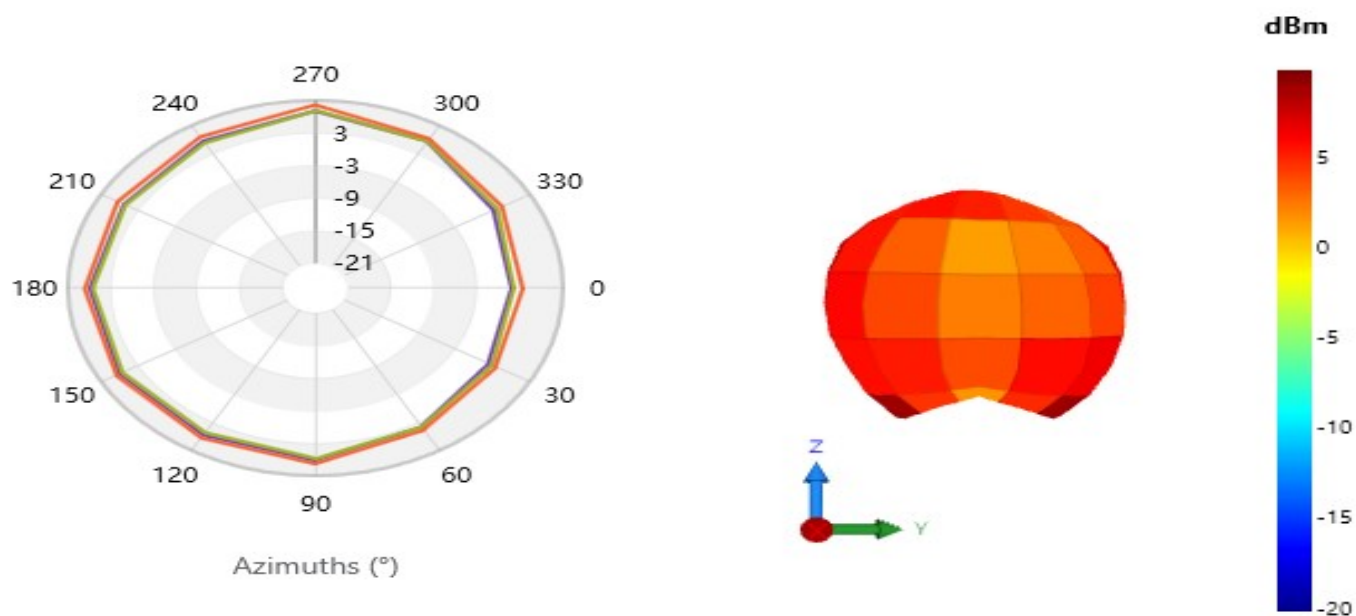
3D 方向图(WIFI 2.4G)

3D direction map(WIFI 2.4G)



3D 方向图(BT)

3D direction map(BT)





主天线无源效率:

Passive efficiency of MAIN antenna

RF1/Fre	效率/dB	效率/%	增益/dBi	RF2/Fre	效率/dB	效率/%	增益/dBi	RF2/Fre	效率/dB	效率/%	增益/dBi	RF2/Fre	效率/dB	效率/%	增益/dBi
880	-5.48	28.34	0.09	790	-5.98	25.23	-1.72	1850	-5.19	30.25	2.20	2490	-5.47	28.36	1.88
890	-5.25	29.88	0.12	800	-5.87	25.90	-1.45	1860	-5.25	29.85	2.08	2510	-5.55	27.89	1.85
900	-5.48	28.31	0.10	810	-5.74	26.64	-1.40	1870	-5.41	28.76	1.90	2530	-5.61	27.49	2.60
910	-5.77	26.50	0.08	820	-5.60	27.56	-1.30	1880	-5.48	28.28	1.95	2550	-5.66	27.17	2.12
920	-5.73	26.70	0.09	830	-5.32	29.41	-1.63	1890	-5.48	28.28	2.02	2570	-5.57	27.76	2.06
930	-6.29	23.48	0.10	840	-5.09	31.00	-1.72	1910	-5.40	28.85	1.89	2590	-5.25	29.83	2.50
940	-6.47	22.54	0.04	850	-4.73	33.66	-1.68	1930	-5.15	30.57	2.27	2610	-5.85	26.03	2.13
950	-6.97	20.09	0.05	860	-4.65	34.26	-1.60	1950	-5.00	31.61	2.38	2630	-5.69	26.95	1.93
960	-7.05	19.72	0.02	870	-5.01	31.54	-1.64	1970	-4.90	32.39	2.54	2650	-5.28	29.64	1.95
1710	-6.05	24.84	1.25	880	-5.00	31.60	-1.63	1990	-4.88	32.48	2.92	2670	-4.87	32.56	1.89
1730	-5.93	25.51	1.18					2010	-4.80	33.13	3.11	2690	-4.71	33.79	1.97
1750	-5.87	25.89	1.38					2030	-4.92	32.22	2.98	2700	-4.59	34.74	1.86
1770	-5.83	26.14	1.46					2050	-5.28	29.61	2.87				
1790	-5.78	26.40	1.34					2070	-5.04	31.32	2.99				
1810	-5.52	28.07	1.86					2090	-5.36	29.13	2.63				
1830	-5.33	29.33	2.15					2110	-5.16	30.49	2.39				
1850	-5.99	25.18	2.12					2130	-4.98	31.77	3.11				
1870	-5.63	27.33	2.22					2150	-4.86	32.68	2.98				
1880	-5.61	27.46	2.20					2170	-4.66	34.17	2.87				
								2190	-4.60	34.70	2.99				
								2210	-4.50	35.49	2.38				
RF3/Fre	效率/dB	效率/%	增益/dBi	RF3/Fre	效率/dB	效率/%	增益/dBi	RF4/Fre	效率/dB	效率/%	增益/dBi				
699	-6.81	20.83	-0.86	2300	-4.46	35.80	1.41	880	-5.57	27.75	0.08				
710	-6.47	22.55	-0.82	2330	-4.73	33.66	1.31	890	-5.44	28.58	0.07				
720	-6.33	23.26	-0.72	2350	-4.92	32.22	1.25	900	-5.60	27.51	0.09				
730	-6.10	24.54	-0.73	2370	-4.91	32.31	1.32	910	-5.83	26.10	0.12				
740	-5.43	28.64	-0.60	2390	-4.60	34.71	1.37	920	-5.88	25.80	0.07				
750	-5.85	26.00	-0.65					930	-6.34	23.23	0.10				
760	-5.88	25.83	-0.53					940	-6.51	22.34	0.05				
770	-5.55	27.86	-0.42					950	-6.97	20.09	0.03				
780	-5.81	26.26	-0.36					960	-7.07	19.63	0.00				
790	-5.60	27.54	-0.37												
800	-5.60	27.54	-0.33												

分集天线无源效率:

Passive efficiency of DIV antenna

RF1/Fre	效率/dB	效率/%	增益/dBi	RF1/Fre	效率/dB	效率/%	增益/dBi	RF2/Fre	效率/dB	效率/%	增益/dBi
923	-6.95	20.20	-2.78	2300	-7.00	19.94	-2.07	869	-7.21	19.03	-3.27
933	-6.07	24.72	-2.10	2310	-6.87	20.57	-1.92	879	-6.62	21.79	-2.85
943	-6.53	22.25	-2.49	2320	-6.52	22.29	-1.72	889	-7.93	16.09	-3.75
953	-6.74	21.21	-2.37	2330	-7.25	18.83	-2.10	899	-8.53	14.02	-4.18
963	-6.93	20.26	-2.69	2340	-7.77	16.73	-2.45	RF3/Fre	效率/dB	效率/%	增益/dBi
1810	-8.61	13.79	-5.43	2350	-7.73	16.87	-2.47	759	-8.83	13.11	-5.35
1830	-8.02	15.78	-4.92	2360	-8.02	15.79	-3.42	769	-8.50	14.12	-4.88
1850	-7.52	17.70	-4.59	2370	-8.24	14.99	-4.03	779	-8.23	15.02	-4.63
1870	-6.84	20.69	-3.91	2380	-7.31	18.57	-4.56	789	-7.83	16.49	-4.29
1890	-6.78	20.97	-3.91	2390	-7.28	18.69	-4.59	799	-7.76	16.76	-4.23
1910	-6.25	23.72	-3.19	2400	-7.25	18.84	-4.63	809	-7.82	16.52	-4.23
1930	-5.87	25.88	-2.81	2490	-6.56	22.10	-1.24	819	-7.94	16.06	-4.42
1950	-5.45	28.51	-2.25	2510	-6.32	23.35	-0.88	829	-8.01	15.80	-3.98
1970	-5.04	31.31	-1.65	2530	-6.06	24.76	-0.63	RF4/Fre	效率/dB	效率/%	增益/dBi
1990	-4.62	34.51	-1.02	2550	-5.82	26.18	-0.32	729	-8.51	14.10	-5.16
2010	-4.21	37.95	-0.57	2570	-5.54	27.93	-0.02	739	-8.24	14.99	-4.82
2030	-4.17	38.26	-0.52	2590	-5.56	27.81	0.06	749	-8.11	15.46	-4.61
2050	-4.06	39.27	-0.46	2610	-5.66	27.16	0.02	759	-8.02	15.79	-4.57
2070	-4.18	38.18	-0.64	2630	-5.86	25.96	-0.15				
2090	-3.97	40.11	-0.31	2650	-6.24	23.78	-0.49				
2110	-3.72	42.51	-0.04	2670	-6.41	22.86	-0.66				
2130	-4.18	38.17	-0.50	2690	-6.74	21.18	-1.01				
2150	-4.77	33.37	-0.72								
2170	-5.38	28.97	-1.13								
2190	-6.66	21.58	-2.21								



GPS+WIFI 天线无源效率:

Passive efficiency of GPS+WIFI antenna

Fre	效率/dB	效率/%	增益/dBi
1570	-3.77	41.98	0.10
1571	-3.76	42.09	0.11
1572	-3.74	42.25	0.13
1573	-3.73	42.36	0.13
1574	-3.72	42.49	0.14
1575	-3.71	42.59	0.15
1576	-3.70	42.69	0.15
1577	-3.69	42.77	0.15
1578	-3.68	42.86	0.16
1579	-3.67	42.97	0.17
1580	-3.66	43.05	0.17

Fre	效率/dB	效率/%	增益/dBi
2400	-4.95	31.99	1.01
2410	-4.77	33.34	1.05
2420	-4.67	34.12	1.10
2430	-4.47	35.73	1.13
2440	-4.56	34.99	1.17
2450	-4.33	36.90	1.20
2460	-4.23	37.76	1.15
2470	-4.66	34.20	1.19
2480	-5.01	31.55	1.02

二：暗室有源测试数据

II: 3D Active test report of antenna

	Channel	TRP (dBm)	TIS (dBm)
GSM 850	CH 128	26.3	
	CH 190	26.5	
	CH 251	27.3	-99.5
PGSM	CH 1	26.4	
	CH 62	26.6	
	CH 124	26.6	-99.7
DCS	CH 512	21.9	
	CH 698	24.2	
	CH 885	23.7	-102.3
PCS	CH 512	21.5	
	CH 661	21.7	
	CH 810	23.0	-103.5
W850	CH4132	19.8	
	CH4183	19.5	
	CH4233	20.1	-103.2
W900	CH 2712	18.7	
	CH 2787	18.9	
	CH 2863	18.7	-100.7
W1700	CH 1312	17.0	
	CH 1412	19.0	
	CH 1513	19.7	-105.4
W1900	CH 9262	15.7	
	CH 9400	16.2	
	CH 9538	17.4	-106.5
W2100	CH 9612	16.6	
	CH 9750	17.3	
	CH 9888	17.5	-105.4

	Channel	TRP (dBm)	TIS (dBm)
FDD B1	CH18050	17.7	
	CH18300	18.1	
	CH18550	18.1	-93.5
FDD B2	CH 18650	16.0	
	CH 18900	17.6	
	CH 19150	18.7	-94.7
FDD (B3)	CH19250	17.4	
	CH19575	17.4	
	CH19900	17.4	-92.7
FDD B4	CH 20000	15.1	
	CH 20175	18.4	
	CH 20350	18.8	-93.8
FDD B5	CH 20450	18.2	
	CH 19525	18.0	
	CH 20600	18.5	-91.4
FDD B7	CH 20850	16.8	
	CH 21100	16.5	
	CH 21350	16.5	-92.6
FDD B8	CH 21500	17.4	
	CH 21625	17.4	
	CH 21750	16.4	-88.7
FDD B12	CH 23035	16.6	
	CH 23095	17.3	
	CH 23155	17.6	-93.3
FDD B13	CH 23230	17.4	
	CH 23230	16.9	
	CH 23230	16.5	-93.1
FDD B17	CH 23780	17.0	
	CH 23790	17.2	
	CH 23800	17.4	-92.9

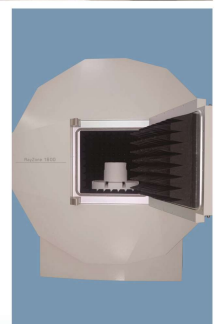
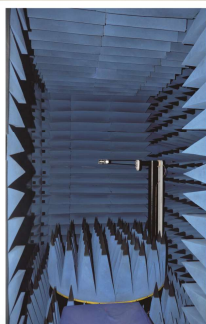
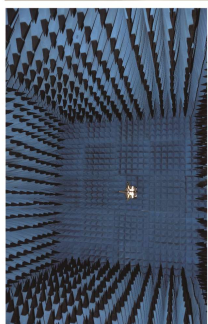


	Channel	TRP (dBm)	TIS (dBm)
FDD B20	CH 24200	18.7	
	CH 24300	19.3	
	CH 24400	19.1	-91.3
FDD B28A	CH27260	16.4	
	CH27360	18.1	
	Ch27460	19.1	-92.6
FDD B28B	CH27405	18.3	
	CH27485	19.2	
	CH27535	19.3	-91.2
LTE (B38)	CH37850	16.9	
	CH38000	17.0	
	CH38150	17.1	-95.7
LTE (B40)	CH38750	19.0	
	CH39150	19.5	
	CH39550	19.6	-93.2
LTE (B41)	CH 40340	16.6	
	CH 40620	16.7	
	CH 41140	15.5	-96.3
FDD B66	CH 132022	15.1	
	CH 132322	18.6	
	CH 132622	18.3	-92.9

GPS+WIFI 天线暗室测试数据:

3D Active test report of GPS+WIFI antenna

Operator	Band	CH	MP Conducted		Antenna EFF FS		FS OTA		FS Space SPEC		Free Space Gap	
			POWER	Sensitivity	TRP	TIS	TRP	TIS	TRP	TIS	TRP	TIS
WIFI	2.4GWIFI 11b(11M)	L	18	-87	-4.72	-4.72	12.6	-83	12.5	-84	0.1	-1
	2.4GWIFI 11g(54M)	L	17	-75	-4.72	-4.72	11.5	-71	11	-71	0.5	0
	2.4GWIFI 11n(65M)	L	16	-74	-4.72	-4.72	10.3	-70.1	11	-71	-0.7	-0.9
AGPS	L1		/	-152.5	/	-3.65	/		/	-148	/	-148
YGPS	L1		/		/		/	-145.45	/		/	145.45

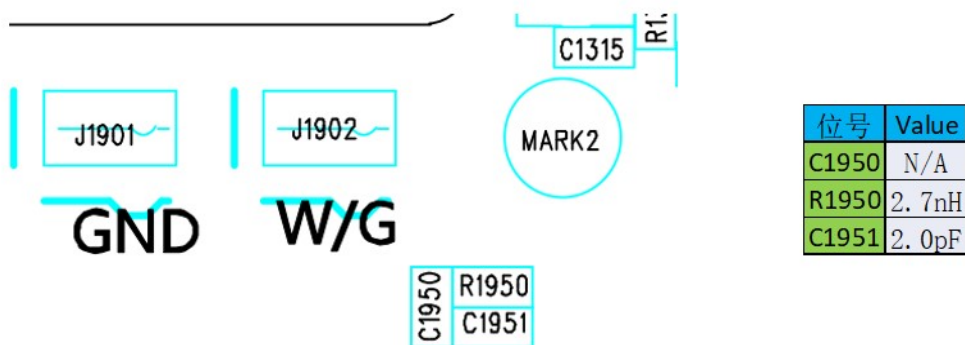


OTA Standard Chamber



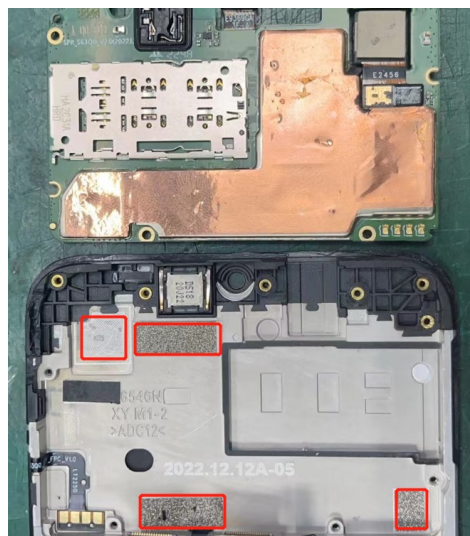
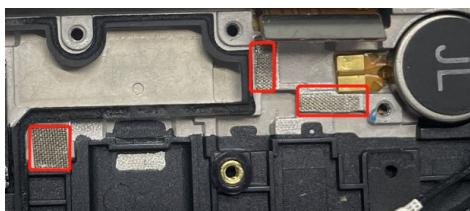
三合一天线匹配电路:

3 in 1 antenna matching circuit



四：环境处理

IV: Environmental treatment



如上图红框所示的接地处理，需要保证与主板和小板的接地稳定性，主板屏蔽罩需要良好接地，目前主板背面为粘贴铜皮进行屏蔽，由于没有焊接，建议更换背胶更好的导电布，器件需要做好屏蔽。

As shown in the red box above, the grounding treatment needs to ensure the grounding stability with the main board and small board. The main board shield needs to be well grounded. At present, the back of the main board is pasted with copper sheet for shielding. Since there is no welding, it is recommended to replace the conductive cloth with better adhesive backing, and the device needs to be properly shielded.



五：结构图档
V: Structure file

