务实 合作 共赢

深圳市博屹电子有限公司

Shenzhen Boyi Electronics Co., LTD

项　目：BY960
日　期：2023-12-19
射　频：ZHANG LI

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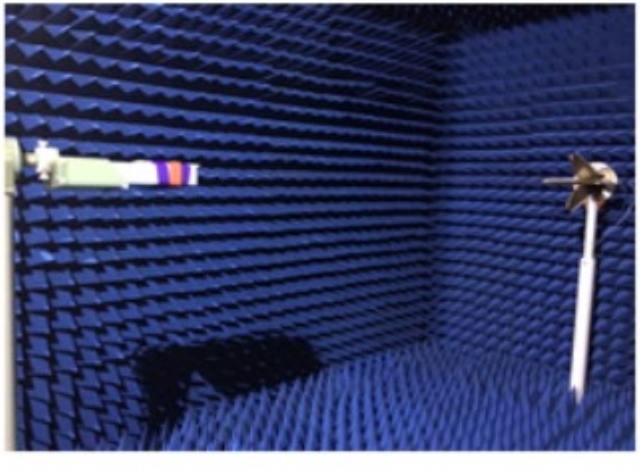
测试环境

	测试项目	设备
1. S参数 （S-parameter）	1. 回波损耗 （Return Loss） 2. 电压驻波比（VSWR）	网络分析仪：Agilent E5071B ×2 HP 8753D PROTEK A338
2. 有源测试 （Active ）	1. 发射功率 （TRP） 2. 接收灵敏度（TIS） 3. 频率误差 4. 屏灭、屏亮	1. 暗室：飞图 7x4x3 m（24探头 3D）Chamber ETS 5x3x3 m（3D）Chamber 2.综合测试仪：Agilent 8960 ×2 CMW500 ×3/CMU200
3. 无源测试 （Passive）	1.天线增益 （Gain） 2.天线效率 （Efficiency）	1. 暗室：飞图 7x4x3 m（24探头 3D）Chamber ETS 5x3x3 m（3D）Chamber 2. 网络分析仪：Agilent E5071B



历次调试记录说明

日期	版本	调试记录说明
2023-12-05	T:A	FPC样品，调试机器

整机调试说明

<table>
<tr><td>机型</td><td colspan="7">BY960</td></tr>
<tr><td>版型</td><td colspan="7">主板</td></tr>
<tr><td rowspan="5">天线概况</td><td rowspan="2">WIFI天线</td><td colspan="2">天线状态</td><td>天线状态</td><td>天线形式</td><td>设计区域</td><td>匹配改动</td></tr>
<tr><td colspan="2">2400~2500MHz
5000~5800MHz</td><td>FPC样品</td><td>IFA</td><td>壳料</td><td>无</td></tr>
<tr><td rowspan="3">其它天线</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>样机状态</td><td colspan="3">调试样机</td><td>环境处理</td><td colspan="3">无</td></tr>
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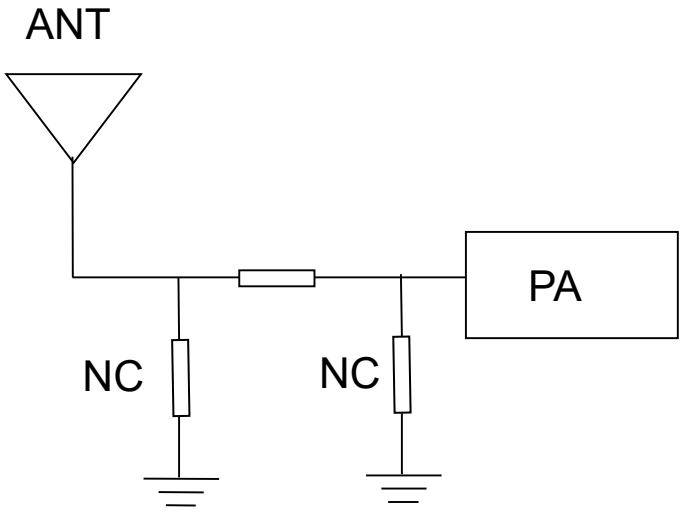
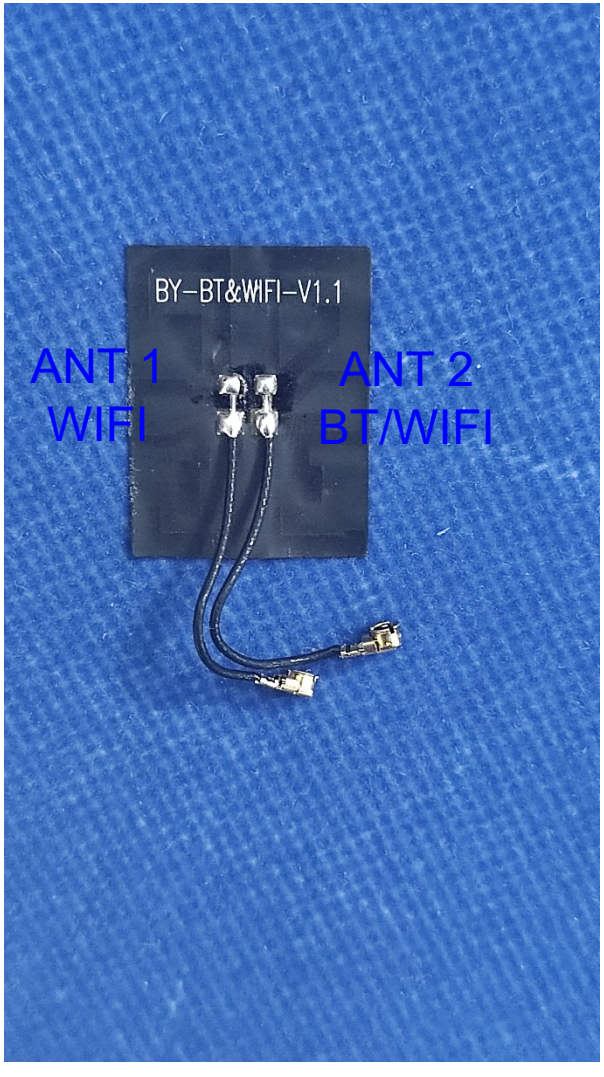
匹配电路-WIFI天线



原始匹配电路未做任何更改

WIFI天线：


BY-BT&WIFI-V1.1
ANT 1
WIFI
ANT 2
BT/WIFI

mm
25.81
mm
OFF
ON
ZERO

mm
19.92
mm
OFF
ON
ZERO

WiFi天线效率与增益：

WIFI 1

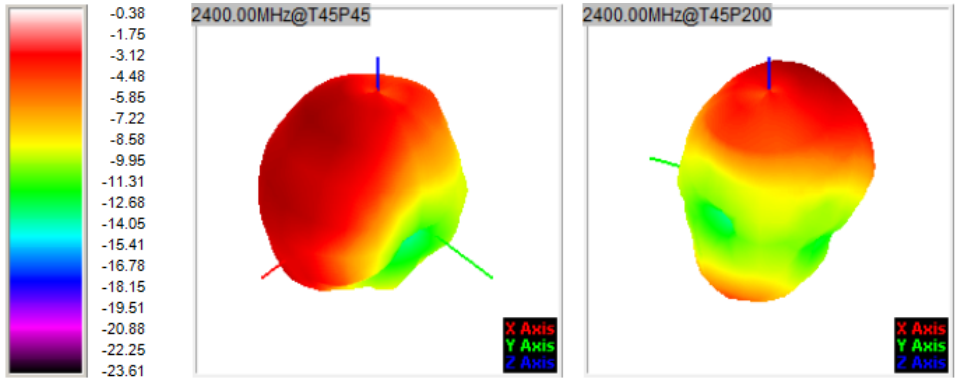
Frequency ID	1	2	3	4	5	6	7	8	9	10
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0
Point Values										
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot. Rad. Pwr. (dBm)	-5.94	-5.87	-5.65	-5.37	-5.29	-5.02	-5.01	-5.20	-5.11	-4.89
Peak EIRP (dBm)	-0.38	-0.36	-0.16	0.15	0.28	0.48	0.37	0.17	0.36	0.62
Directivity (dBi)	5.55	5.51	5.49	5.52	5.56	5.50	5.38	5.37	5.47	5.52
Efficiency (dB)	-5.94	-5.87	-5.65	-5.37	-5.29	-5.02	-5.01	-5.20	-5.11	-4.89
Efficiency (%)	25.50	25.90	27.20	29.00	29.60	31.50	31.50	30.20	30.80	32.40
Gain (dBi)	-0.38	-0.36	-0.16	0.15	0.28	0.48	0.37	0.17	0.36	0.62
NHPRP ±Pi/4 (dBm)	-7.98	-7.87	-7.59	-7.28	-7.18	-6.89	-6.88	-7.07	-6.99	-6.78
NHPRP ±Pi/6 (dBm)	-9.61	-9.47	-9.18	-8.87	-8.78	-8.48	-8.46	-8.65	-8.59	-8.38
NHPRP ±Pi/8 (dBm)	-10.86	-10.70	-10.39	-10.07	-9.97	-9.65	-9.62	-9.80	-9.74	-9.54
Upper Hem. PRP (dBm)	-7.79	-7.73	-7.49	-7.21	-7.11	-6.83	-6.84	-7.03	-6.95	-6.72
Lower Hem. PRP (dBm)	-10.52	-10.47	-10.25	-10.00	-9.94	-9.67	-9.66	-9.83	-9.74	-9.53
Upper Hem. PRP (%)	16.62	16.87	17.80	19.01	19.47	20.73	20.72	19.80	20.18	21.27
Lower Hem. PRP (%)	8.87	8.98	9.44	10.01	10.14	10.78	10.81	10.41	10.62	11.13

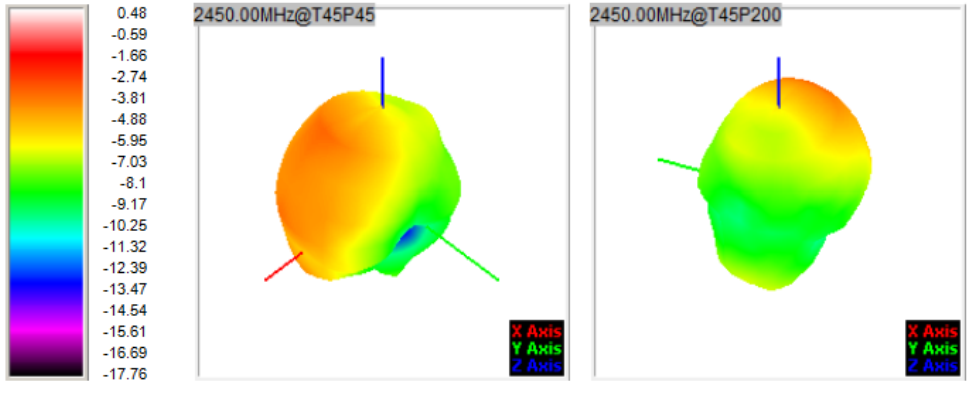
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
2500.0	5150.0	5200.0	5250.0	5300.0	5350.0	5400.0	5450.0	5500.0	5550.0	5600.0	5650.0	5700.0	5750.0	5800.0	5850.0
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-4.71	-4.50	-5.13	-4.75	-4.71	-5.21	-4.65	-4.58	-4.86	-4.62	-4.46	-4.60	-4.26	-4.48	-5.04	-4.71
2.14	2.53	2.05	3.07	3.53	3.42	3.80	3.44	2.12	2.53	3.04	3.10	3.77	3.67	3.15	2.14
6.85	7.03	7.18	7.82	8.23	8.63	8.45	8.02	6.98	7.14	7.50	7.71	8.02	8.15	8.19	6.85
-4.71	-4.50	-5.13	-4.75	-4.71	-5.21	-4.65	-4.58	-4.86	-4.62	-4.46	-4.60	-4.26	-4.48	-5.04	-4.71
33.80	35.50	30.70	33.50	33.80	30.10	34.20	34.80	32.70	34.60	35.80	34.70	37.50	35.70	31.30	33.80
2.14	2.53	2.05	3.07	3.53	3.42	3.80	3.44	2.12	2.53	3.04	3.10	3.77	3.67	3.15	2.14
-6.06	-5.77	-6.43	-5.93	-5.79	-6.28	-5.60	-5.48	-5.84	-5.54	-5.42	-5.62	-5.32	-5.65	-6.39	-6.06
-7.57	-7.28	-8.04	-7.51	-7.34	-7.89	-7.08	-6.83	-7.18	-6.82	-6.74	-7.00	-6.71	-7.13	-8.04	-7.57
-8.82	-8.56	-9.40	-8.84	-8.70	-9.29	-8.37	-7.99	-8.31	-7.88	-7.86	-8.15	-7.86	-8.37	-9.41	-8.82
-10.05	-10.00	-11.13	-11.00	-10.73	-11.22	-10.24	-9.24	-9.22	-9.38	-9.56	-10.26	-10.17	-10.27	-10.83	-10.05
-6.21	-5.94	-6.39	-5.93	-5.95	-6.47	-6.06	-6.40	-6.85	-6.38	-6.07	-5.98	-5.54	-5.81	-6.37	-6.21
9.90	10.01	7.71	7.95	8.45	7.55	9.45	11.91	11.98	11.54	11.07	9.42	9.62	9.41	8.26	9.90
23.94	25.49	22.96	25.55	25.38	22.55	24.79	22.88	20.68	23.01	24.75	25.23	27.89	26.26	23.04	23.94

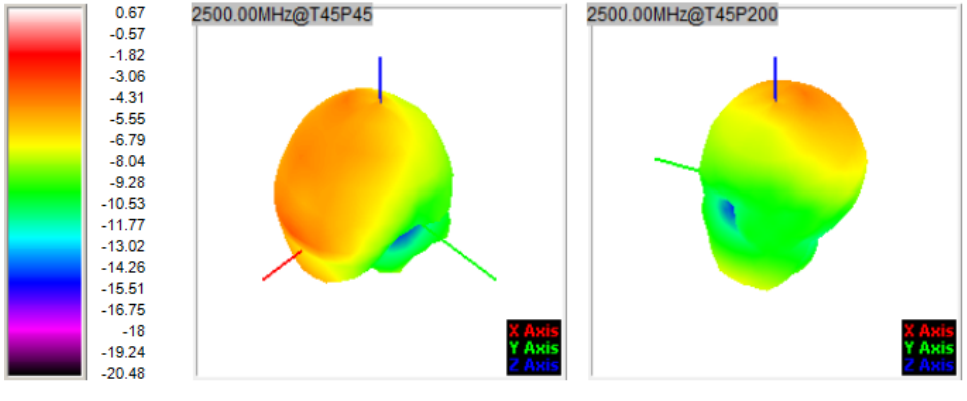
A15WiFi天线方向图：

WIFI 1

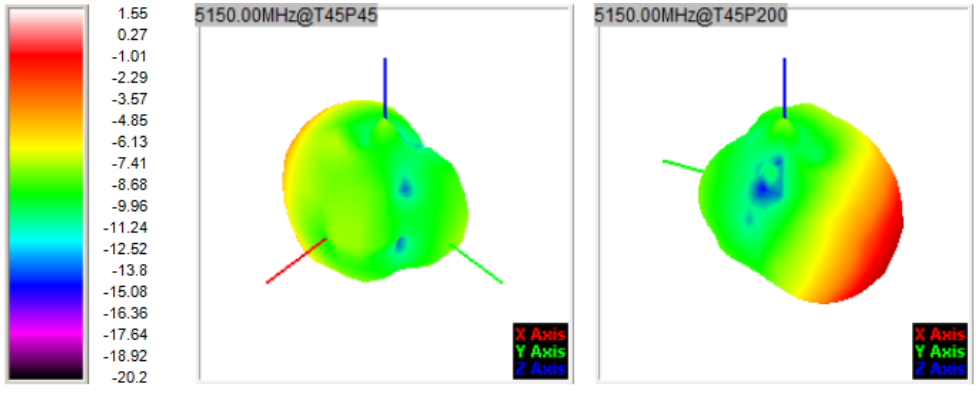
WIFI 2.4G

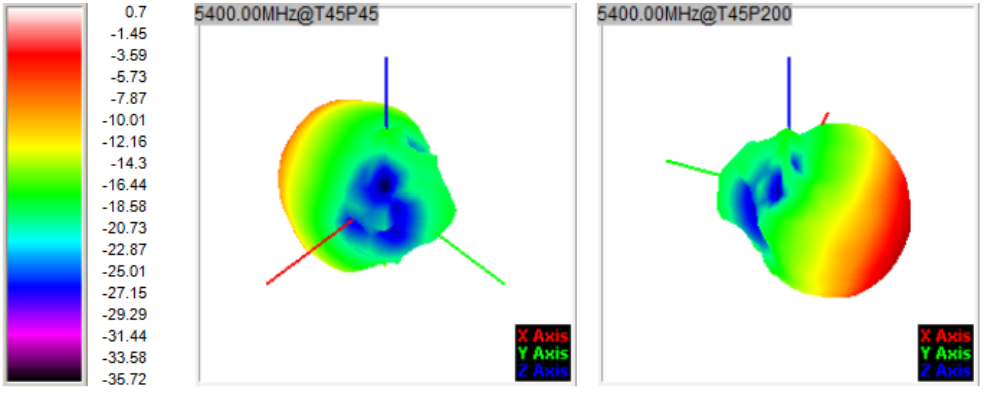


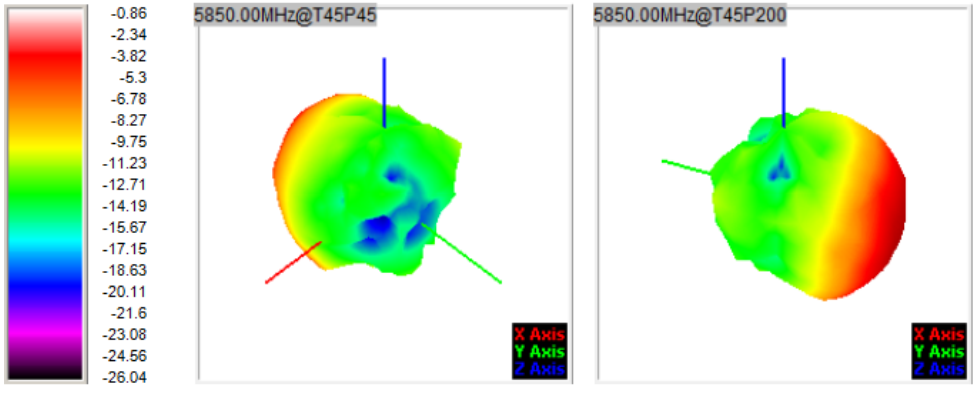




WIFI 5.8G







BT WiFi天线效率与增益：

BT
WIFI 2

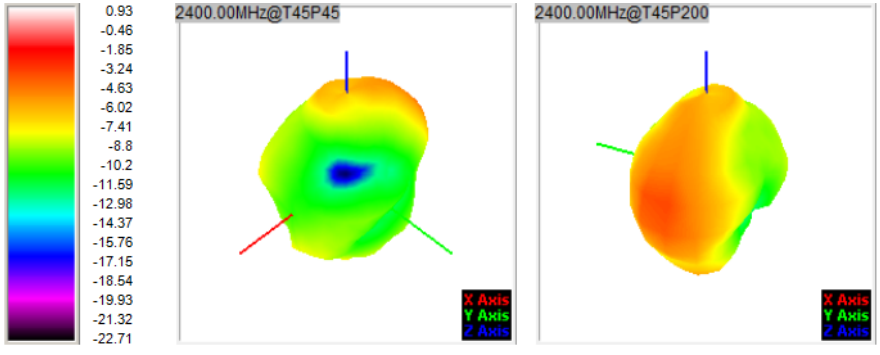
FEITUKEJI										
Frequency ID	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Frequency (MHz)	**2400.0**	**2410.0**	**2420.0**	**2430.0**	**2440.0**	**2450.0**	**2460.0**	**2470.0**	**2480.0**	**2490.0**
Point Values										
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tot. Rad. Pwr. (dBm)	**-4.76**	**-4.81**	**-4.83**	**-4.64**	**-4.72**	**-4.49**	**-4.66**	**-4.91**	**-4.95**	**-4.80**
Peak EIRP (dBm)	**0.93**	**0.80**	**0.69**	**0.79**	**0.65**	**0.96**	**0.92**	**0.69**	**0.64**	**0.78**
Directivity (dBi)	5.69	5.61	5.52	5.43	5.36	5.45	5.58	5.60	5.59	5.59
Efficiency (dB)	**-4.76**	**-4.81**	**-4.83**	**-4.64**	**-4.72**	**-4.49**	**-4.66**	**-4.91**	**-4.95**	**-4.80**
Efficiency (%)	**33.40**	**33.00**	**32.90**	**34.40**	**33.80**	**35.50**	**34.20**	**32.30**	**32.00**	**33.10**
Gain (dBi)	0.93	0.80	0.69	0.79	0.65	0.96	0.92	0.69	0.64	0.78
NHPRP ±Pi/4 (dBm)	-6.53	-6.60	-6.65	-6.48	-6.56	-6.33	-6.45	-6.65	-6.63	-6.43
NHPRP ±Pi/6 (dBm)	-8.08	-8.18	-8.24	-8.06	-8.14	-7.88	-7.98	-8.17	-8.13	-7.89
NHPRP ±Pi/8 (dBm)	-9.29	-9.39	-9.44	-9.26	-9.31	-9.00	-9.06	-9.25	-9.23	-8.98
Upper Hem. PRP (dBm)	-7.28	-7.32	-7.36	-7.20	-7.29	-7.09	-7.30	-7.59	-7.66	-7.56
Lower Hem. PRP (dBm)	-8.32	-8.39	-8.37	-8.15	-8.22	-7.96	-8.07	-8.28	-8.28	-8.09
Upper Hem. PRP (%)	18.73	18.55	18.35	19.04	18.68	19.54	18.62	17.42	17.16	17.55
Lower Hem. PRP (%)	14.71	14.50	14.56	15.33	15.08	16.01	15.60	14.88	14.87	15.54

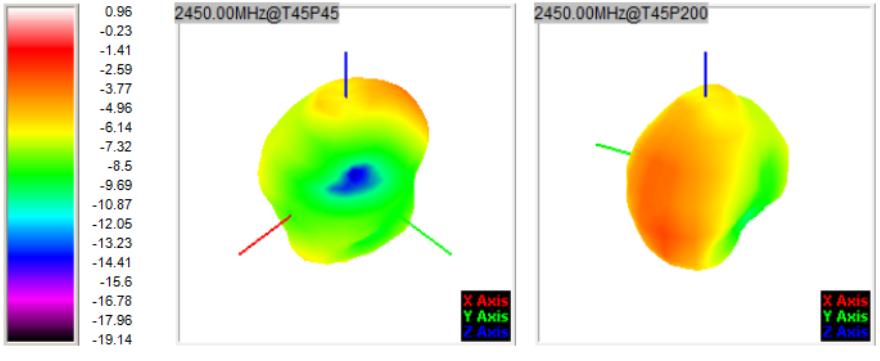
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
2500.0	**5150.0**	**5200.0**	**5250.0**	**5300.0**	**5350.0**	**5400.0**	**5450.0**	**5500.0**	**5550.0**	**5600.0**	**5650.0**	**5700.0**	**5750.0**	**5800.0**	**5850.0**
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-6.53	**-6.71**	**-7.24**	**-6.12**	**-5.98**	**-6.36**	**-6.00**	**-5.58**	**-5.45**	**-4.36**	**-3.90**	**-3.76**	**-3.57**	**-4.05**	**-5.09**	**-6.53**
-0.32	**-0.38**	**-0.46**	**0.77**	**0.53**	**-0.50**	**-0.23**	**0.04**	**0.21**	**1.45**	**1.47**	**1.71**	**1.64**	**0.95**	**0.96**	**-0.32**
6.21	6.33	6.79	6.89	6.51	5.86	5.77	5.62	5.66	5.81	5.36	5.47	5.21	5.00	6.05	6.21
-6.53	**-6.71**	**-7.24**	**-6.12**	**-5.98**	**-6.36**	**-6.00**	**-5.58**	**-5.45**	**-4.36**	**-3.90**	**-3.76**	**-3.57**	**-4.05**	**-5.09**	**-6.53**
22.20	**21.30**	**18.90**	**24.40**	**25.20**	**23.10**	**25.10**	**27.70**	**28.50**	**36.60**	**40.80**	**42.10**	**43.90**	**39.30**	**31.00**	**22.20**
-0.32	-0.38	-0.46	0.77	0.53	-0.50	-0.23	0.04	0.21	1.45	1.47	1.71	1.64	0.95	0.96	-0.32
-7.38	-7.61	-8.21	-7.14	-7.14	-7.80	-7.26	-6.76	-6.69	-5.56	-5.16	-5.03	-4.82	-5.34	-6.45	-7.38
-8.44	-8.71	-9.38	-8.28	-8.31	-9.17	-8.57	-8.05	-8.03	-6.87	-6.50	-6.42	-6.26	-6.95	-8.17	-8.44
-9.31	-9.63	-10.34	-9.17	-9.20	-10.14	-9.53	-9.04	-9.11	-7.93	-7.62	-7.59	-7.43	-8.26	-9.51	-9.31
-11.30	-11.65	-12.38	-11.22	-10.69	-10.78	-10.80	-10.46	-10.28	-9.14	-8.43	-8.24	-8.02	-8.41	-9.42	-11.30
-8.29	-8.39	-8.83	-7.72	-7.78	-8.31	-7.74	-7.28	-7.19	-6.12	-5.78	-5.67	-5.51	-6.04	-7.09	-8.29
7.41	6.84	5.78	7.54	8.53	8.35	8.32	8.99	9.38	12.19	14.36	15.01	15.79	14.44	11.42	7.41
14.82	14.47	13.08	16.89	16.69	14.77	16.83	18.69	19.12	24.45	26.42	27.12	28.12	24.90	19.56	14.82

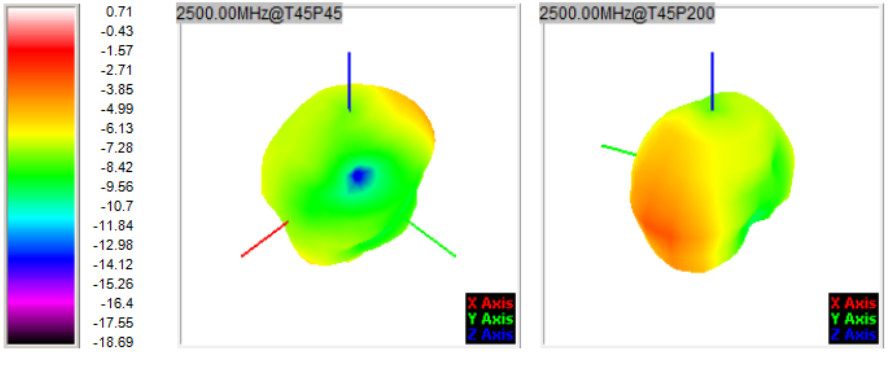
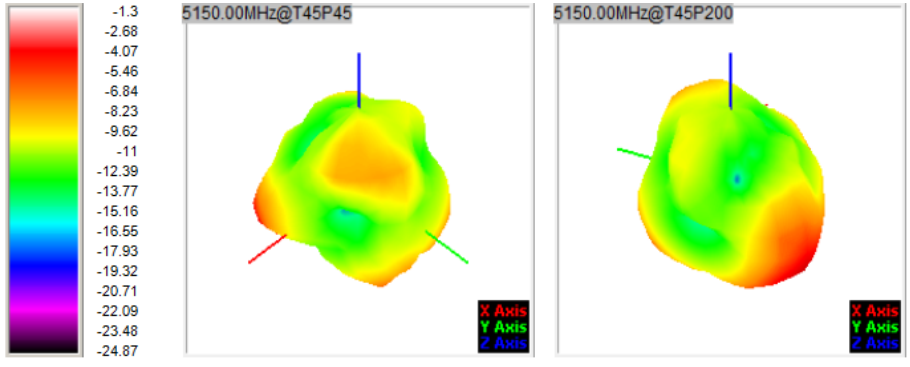
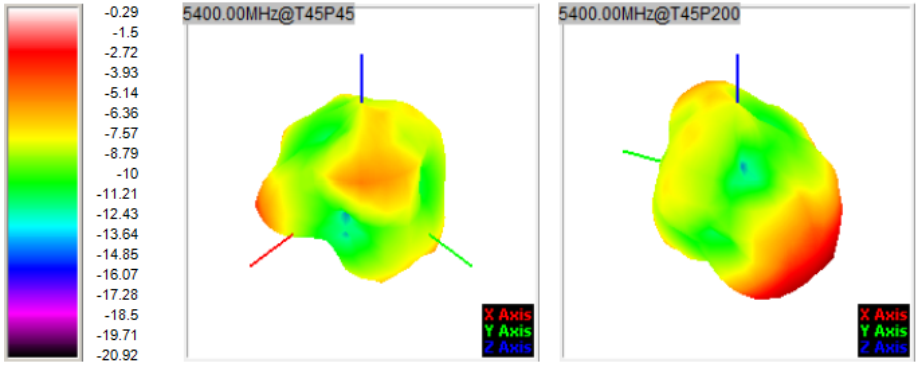
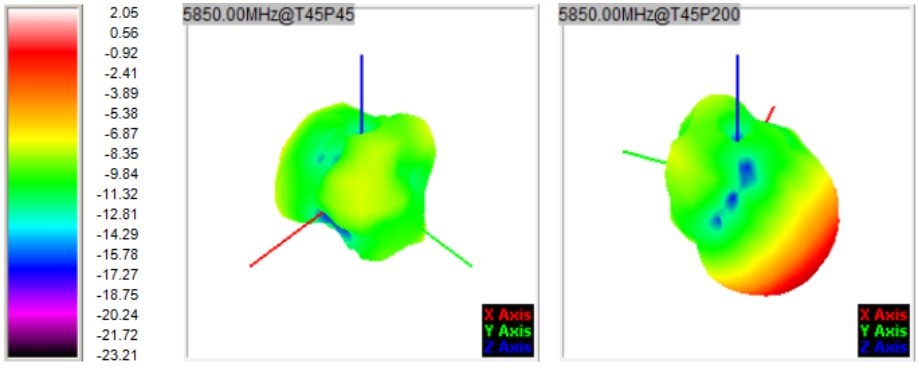
WiFi天线方向图：

WIFI 2

WIFI 2.4G







WIFI 5.8G