

深圳市博屹电子有限公司  
Shenzhen Boyi Electronics Co., LTD

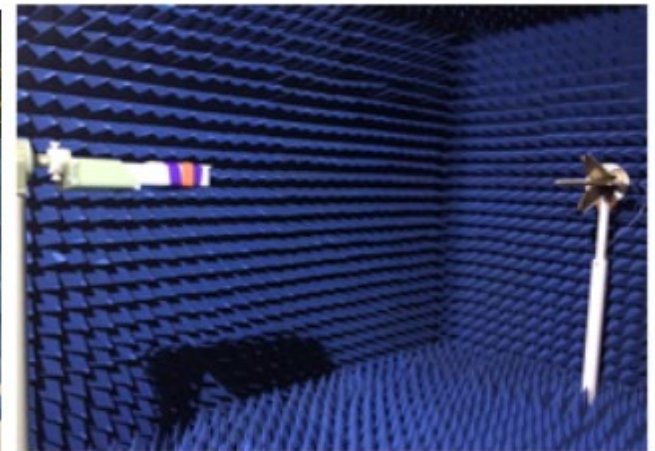
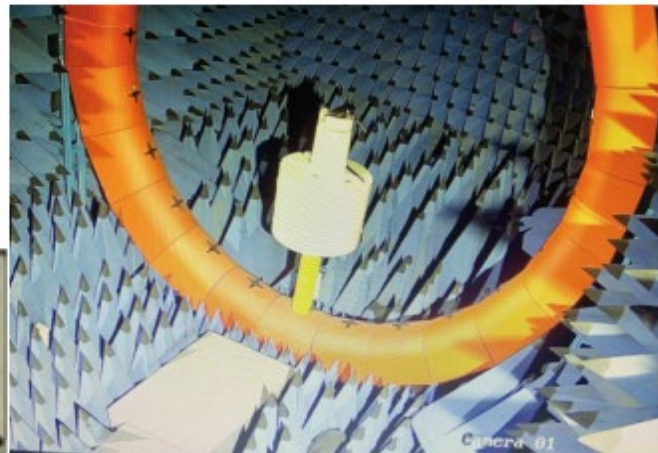
项 目：BY960  
日 期：2023-12-19  
射 频：ZHANG LI

# 目 录

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# 测试环境

	测试项目	设备
1. S参数 (S-parameter)	<ol style="list-style-type: none"> <li>1. 回波损耗 (Return Loss)</li> <li>2. 电压驻波比 (VSWR)</li> </ol>	网络分析仪: Agilent E5071B ×2 HP 8753D PROTEK A338
2. 有源测试 (Active)	<ol style="list-style-type: none"> <li>1. 发射功率 (TRP)</li> <li>2. 接收灵敏度 (TIS)</li> <li>3. 频率误差</li> <li>4. 屏灭、屏亮</li> </ol>	<ol style="list-style-type: none"> <li>1. 暗室: 飞图 7x4x3 m (24探头 3D) Chamber ETS 5x3x3 m (3D) Chamber</li> <li>2. 综合测试仪: Agilent 8960 ×2 CMW500 ×3/CMU200</li> </ol>
3. 无源测试 (Passive)	<ol style="list-style-type: none"> <li>1. 天线增益 (Gain)</li> <li>2. 天线效率 (Efficiency)</li> </ol>	<ol style="list-style-type: none"> <li>1. 暗室: 飞图 7x4x3 m (24探头 3D) Chamber ETS 5x3x3 m (3D) Chamber</li> <li>2. 网络分析仪: Agilent E5071B</li> </ol>



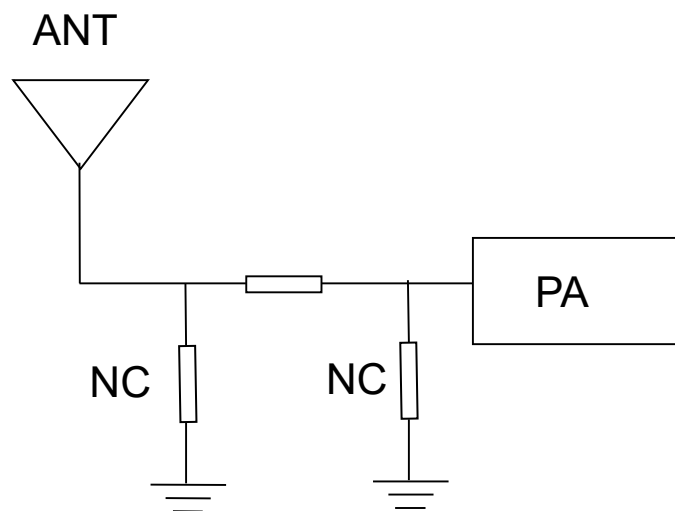
# 历次调试记录说明

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

机型	BY960						
版型	主板						
天线概况	WIFI天线	天线状态		天线状态	天线形式	设计区域	匹配改动
		2400~2500MHz 5000~5800MHz		FPC样品	IFA	壳料	无
	其它天线						
样机状态	调试样机			环境处理	无		

# 匹配电路-WIFI天线



原始匹配电路未做任何更改



# WIFI天线:



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

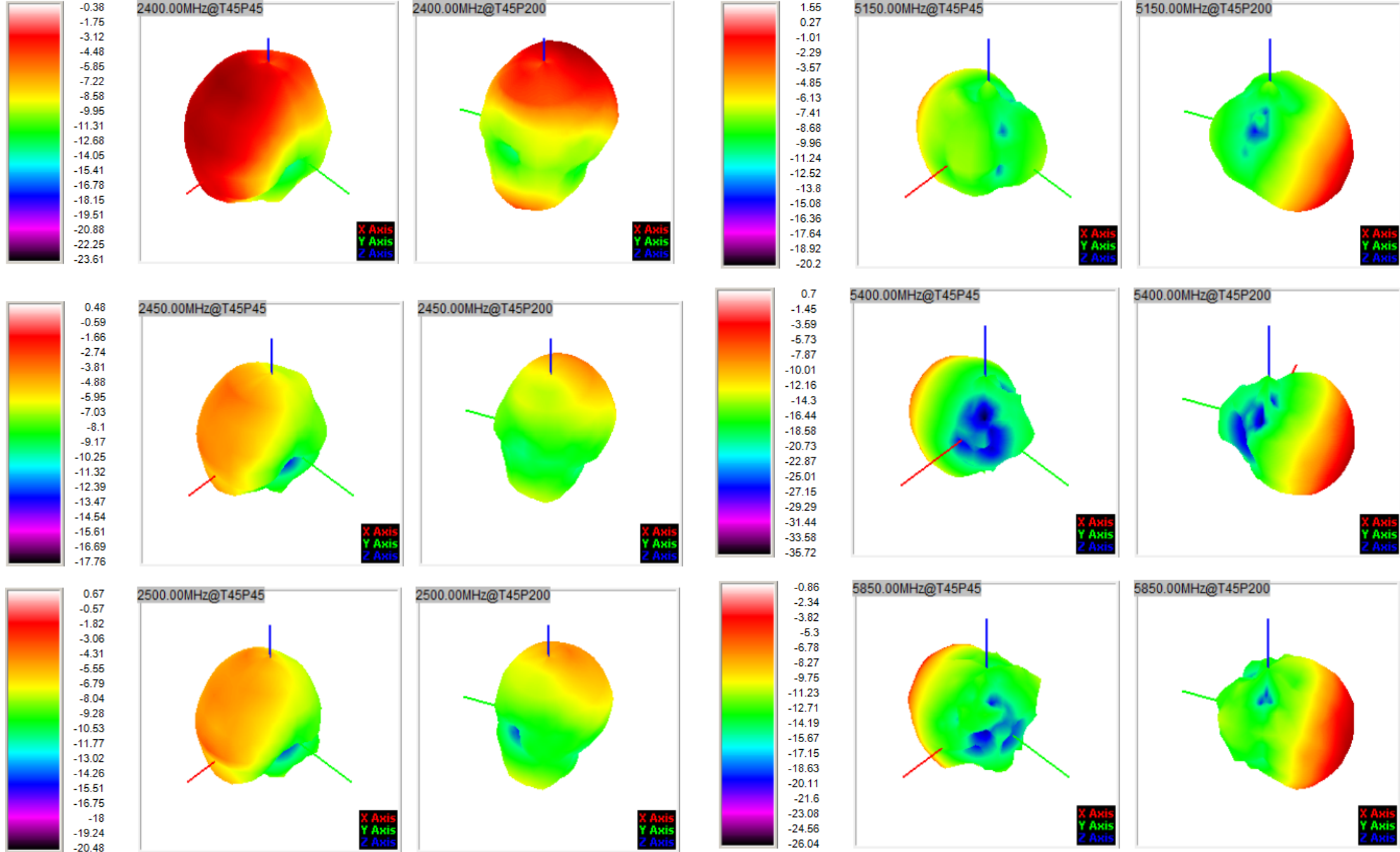


# A15WiFi天线方向图:

## WIFI 1

### WIFI 2.4G

### WIFI 5.8G



BT WiFi天线  
效率与增益:

BT  
WIFI 2

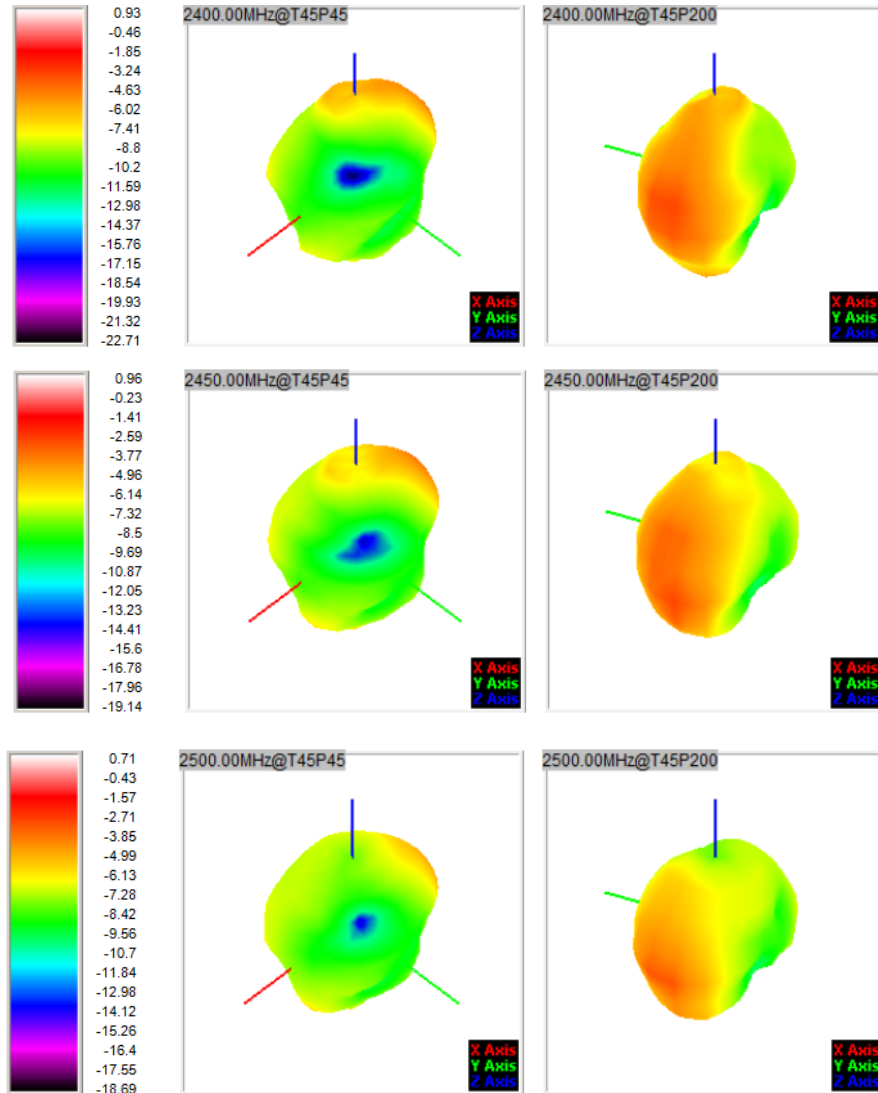
<b>FEITUKEJI</b>										
Frequency ID	1	2	3	4	5	6	7	8	9	10
Frequency (MHz)	2400.0	2410.0	2420.0	2430.0	2440.0	2450.0	2460.0	2470.0	2480.0	2490.0
Point Values										
Ant. Port Input Pwr. (dBm)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Tot. Rad. Pwr. (dBm)</b>	<b>-4.76</b>	<b>-4.81</b>	<b>-4.83</b>	<b>-4.64</b>	<b>-4.72</b>	<b>-4.49</b>	<b>-4.66</b>	<b>-4.91</b>	<b>-4.95</b>	<b>-4.80</b>
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)	<b>-4.76</b>	<b>-4.81</b>	<b>-4.83</b>	<b>-4.64</b>	<b>-4.72</b>	<b>-4.49</b>	<b>-4.66</b>	<b>-4.91</b>	<b>-4.95</b>	<b>-4.80</b>
Efficiency (%)	<b>33.40</b>	<b>33.00</b>	<b>32.90</b>	<b>34.40</b>	<b>33.80</b>	<b>35.50</b>	<b>34.20</b>	<b>32.30</b>	<b>32.00</b>	<b>33.10</b>
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
<b>-6.53</b>	<b>-6.71</b>	<b>-7.24</b>	<b>-6.12</b>	<b>-5.98</b>	<b>-6.36</b>	<b>-6.00</b>	<b>-5.58</b>	<b>-5.45</b>	<b>-4.36</b>	<b>-3.90</b>	<b>-3.76</b>	<b>-3.57</b>	<b>-4.05</b>	<b>-5.09</b>	<b>-6.53</b>
<b>-0.32</b>	<b>-0.38</b>	<b>-0.46</b>	<b>0.77</b>	<b>0.53</b>	<b>-0.50</b>	<b>-0.23</b>	<b>0.04</b>	<b>0.21</b>	<b>1.45</b>	<b>1.47</b>	<b>1.71</b>	<b>1.64</b>	<b>0.95</b>	<b>0.96</b>	<b>-0.32</b>
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
<b>-6.53</b>	<b>-6.71</b>	<b>-7.24</b>	<b>-6.12</b>	<b>-5.98</b>	<b>-6.36</b>	<b>-6.00</b>	<b>-5.58</b>	<b>-5.45</b>	<b>-4.36</b>	<b>-3.90</b>	<b>-3.76</b>	<b>-3.57</b>	<b>-4.05</b>	<b>-5.09</b>	<b>-6.53</b>
<b>22.20</b>	<b>21.30</b>	<b>18.90</b>	<b>24.40</b>	<b>25.20</b>	<b>23.10</b>	<b>25.10</b>	<b>27.70</b>	<b>28.50</b>	<b>36.60</b>	<b>40.80</b>	<b>42.10</b>	<b>43.90</b>	<b>39.30</b>	<b>31.00</b>	<b>22.20</b>
-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

