



深圳市千目通讯科技有限公司

Shenzhen Qianmu Communication Technology Co., Ltd.

专注天线方案、设计与生产
Focus on antenna scheme,
design and production

客 户 (Customer) :

项 目 (Project) :

日 期 (Date) : 2021.6.15

版 本 (Edition) : A1

射 频 (Radio frequency) : 吴贤坤



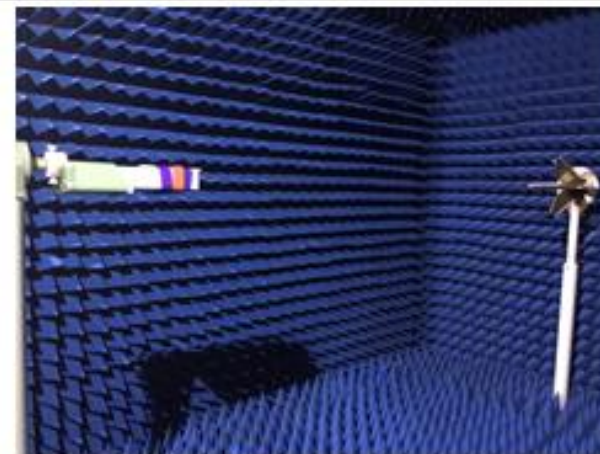
Table of Contents

1. Test environment
2. Description of previous debugging records
3. Description of matching circuit
4. Active test data
5. Conduct test data
6. Call current sound simulation test
7. Environmental Handling Instructions
8. GPS/WIFI/BT passive parameters
9. GPS/WIFI/BT measured results
10. Summary



Test environment

	Test items	Equipment
1. S参数 (Sparameter)	1. 回波损耗 (Return Loss) 2. 电压驻波比 (VSWR)	网络分析仪 (network analyzer) : Agilent E5071B HP 8753D
2. 有源测试 (Active)	1. 发射功率 (TRP) 2. 接收灵敏度 (TIS) 3. 频率误差 (Frequency error) 4. 屏灭、屏亮 (The screen is off and on)	1. 暗室 (chamber) : ETS 7x4x3 m (3D) Chamber ETS 5x3x3 m (3D) Chamber 2. 综合测试仪 (Comprehensive test instrument) : Agilent 8960 E5515B ×2 StarPoint SP6011
3. 无源测试 (Passive)	1. 天线增益 (Gain) 2. 天线效率 (Efficiency)	1. 暗室 (chamber) : ETS 7x4x3 m (3D) Chamber ETS 5x3x3 m (3D) Chamber 2. 网络分析仪 (network analyzer) : Agilent E5071B HP 8753D





Description of previous debugging records

Date	Version	Debugging record description
2021-6-15	A1	Bluetooth cable, test prototype

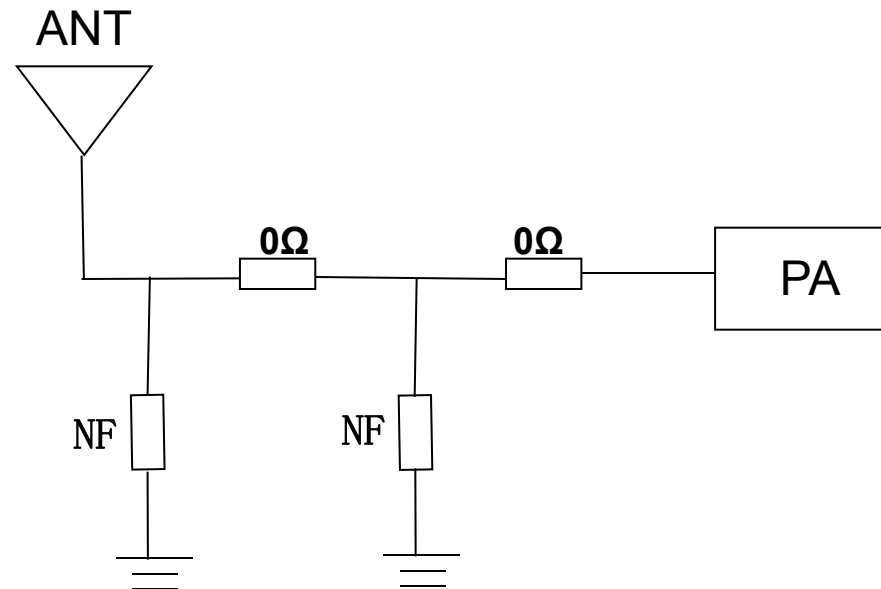


Machine debugging instructions

Model	Bluetooth Watches						
Edition type	Motherboard						
Antenna overview		Antenna status		Antenna status	Antenna form	Design area	Match changes
	Bluetooth antenna	BT	2.4GHz~2.5GHz	Bluetooth cable D:0.6mm L:25mm	Monopole	Bracket	no
Prototype status	Debug machine			Environmental treatment			



Matching circuit-BT antenna



No changes have been made to your original matching circuit

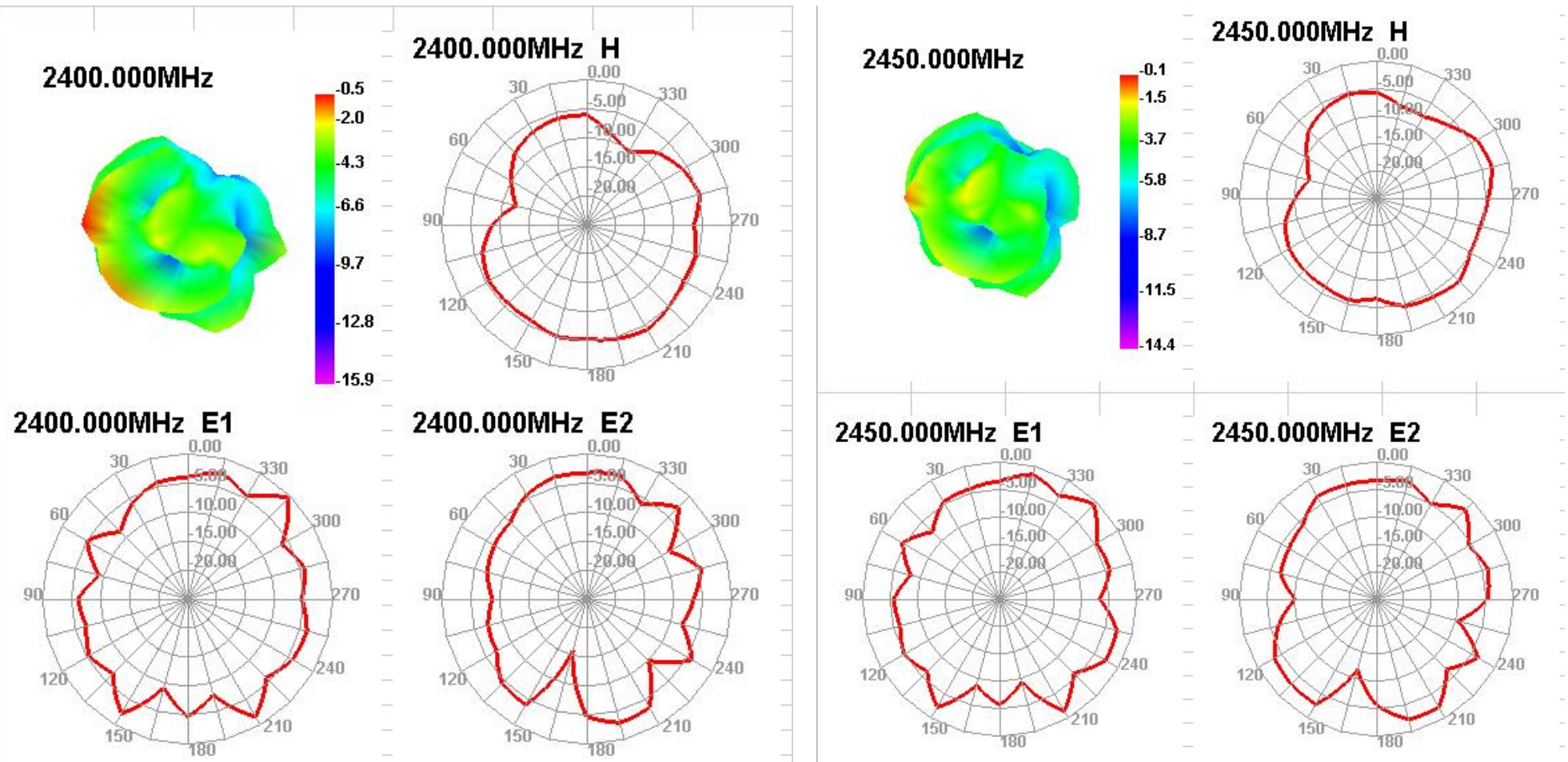


Antenna passive efficiency gain data

Passive Test For 2.4GWIFI										
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHS (%)	Max (dB)	Min (dB)	Attenut Hor	Attenut Ver
2400	28.71	-5.42	-0.45	-2.6	14.607	14.1	-0.45	-15.9	48.51	48.38
2410	30.71	-5.13	-0.36	-2.51	15.678	15.031	-0.36	-16	48.83	48.65
2420	33.02	-4.81	-0.14	-2.29	16.876	16.148	-0.14	-14.62	49.05	49
2430	32.35	-4.9	-0.29	-2.44	16.378	15.967	-0.29	-14.64	49.05	48.89
2440	33.39	-4.76	-0.06	-2.21	16.742	16.651	-0.06	-15.29	49.08	48.97
2450	32.84	-4.84	-0.1	-2.25	16.418	16.419	-0.1	-14.39	49.01	48.85
2460	32.91	-4.83	-0.18	-2.33	16.279	16.628	-0.18	-14.56	48.86	48.7
2470	34.05	-4.68	-0.2	-2.35	16.748	17.306	-0.2	-15.79	48.86	48.78
2480	36.88	-4.33	0.16	-1.99	18.149	18.731	0.16	-15.85	49.29	49.19
2490	39.85	-4	0.47	-1.68	19.589	20.261	0.47	-15.09	49.92	49.75
2500	39.72	-4.01	0.72	-1.43	19.459	20.265	0.72	-15.02	49.95	49.77

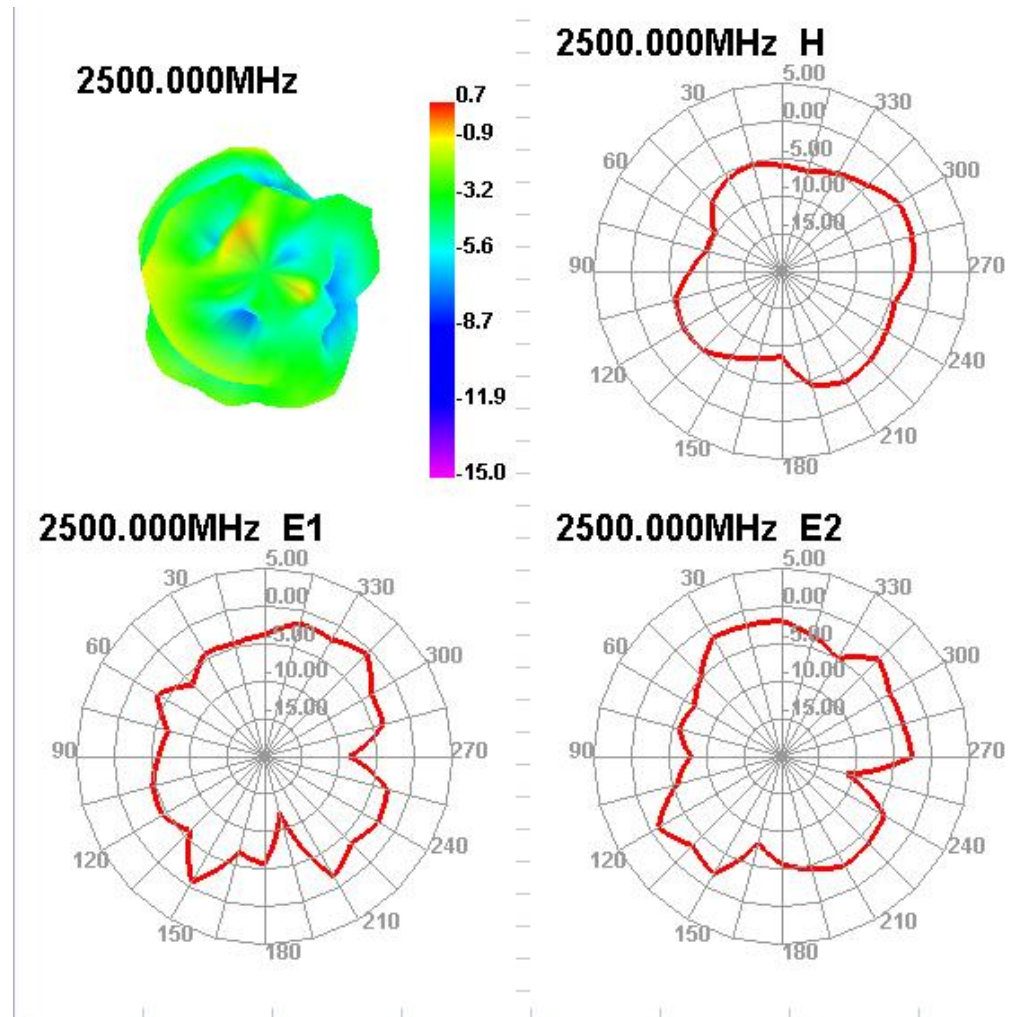


Antenna pattern and apple diagram





Antenna pattern and apple diagram





BT天线实测:



测试软件

BT actual connection APP test:

1. Connect the Android mobile phone to the wristband, and the wristband finds the mobile phone (indoor) to test the straight line distance of about 25 without obstacles.
2. Connect the Android phone to the bracelet, and the bracelet finds the phone (outdoor) to test the straight line distance. About 10 in the case of obstacles.



Prompt description

prompt:

1. This data is only for the data generated by the prototype provided by the customer, and does not represent the final mass production status of the customer;
2. Please carefully confirm the matching circuit modification and environmental handling instructions in our report;
3. Before mass production, please cooperate with us to provide trial production prototypes to our company for second verification; if there is any replacement of materials, update of software and environmental treatment, please inform in advance;
4. If the customer needs a third-party retest, or send it to the customer for testing, please go to our company for verification before sending the prototype; to prevent the difference between the machine and the debugging machine;
- 5: Our company does not accept the machine data and other darkroom test data outside of our debugging, but you can refer to it, except for the certified darkroom. If there is a difference in the data, everything depends on the debugging machine to find the reason.



Thank you!

All the information and copyright contained in this report belong to our company. Please do not disseminate it to third parties without our permission.

Shenzhen Qianmu Communication Technology Co.,Ltd.