

深圳市艾汇科技有限公司

天线规格书

Antenna Sample Confirmation From

| | | | | | |
|---|---|--------------------------|-----------------|-----------------------|---------------------------|
| 供应商名称 Vendor Name | 深圳市艾汇科技有限公司 ShenZhen Aihui Technology Co., Ltd | | | | |
| 客户名称 Customer Name | 明致 | | | | |
| 样品名称 Sample Name | P8 | | | | |
| 产品型号 Part Number | | | | | |
| 样品规格 Specification | 主天线：180mm 3代端子 导电布5X15 带小板 三合一天线：顶针式 分集天线：68mm 3代端子 | | | | |
| 检验项目 Inspection Item | 性能测试 Performance | 外观检查 Total Appearance | 结构 structure | 其它 Others | 检验结果 Inspection Result |
| | | | | | |
| 备注 Remark | | | | | |
| 品质审核 QA Audit | | 工程审核 Engineer Audit | 陈益初 | 业务确认 Sales Confirm | |
| 以下由客户填写 The following are filled by Customer | | | | | |
| 客户意见 Customer Evaluation | | | | | |
| 客户签字/盖章 Signation/ Chapter by Customer | | | | | |
| 日期/date:2024.07.16 | | | | | |

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Antenna Test Report

| | | | |
|--|--|---------------------------|----------|
| 测试单位: 深圳市艾汇科技有限公司 Test by: Shenzhen Aihui Technology Co., Ltd | | | |
| 材料 Material | FPC+同轴线 | | |
| 天线类型 Antenna Type | Monopole Type | 极化方式 Polarization mode | Linear |
| 应用场景 Application | | | |
| 工作频段 Band | GSM/WCDMA/LTE/ WIFI/GPS/BT | VSWR | ≤ 2 |
| 功率 Power | Max: 2W | 阻抗 Impedance | 50Ω |
| 增益 dBi | $\geq 1 \text{ dBi}$ | | |
| 测试设备 Test Equipment | HPE5071C、Shielding Room、3D automatic turntable | | |

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Antenna Description::

1. Grounding processing and picture description: no

2. Need to change the motherboard to match: no

- Test voltage: 3.6V, check the antenna contact is good before testing.
- The RF cable of the integrated tester is kept in a natural state and can not be curled.

Specification: test the specified power level, all indicators must conform to the specifications.

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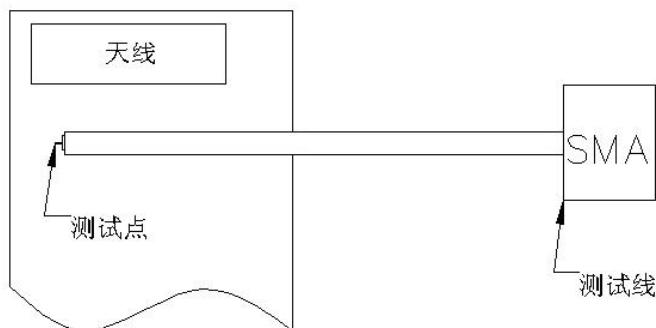
1、项目图片

说明：客户最终验证天线性能样机保留在我司至少一年时间，便于分析解决天线量产中异常情况，确保天线出货品质

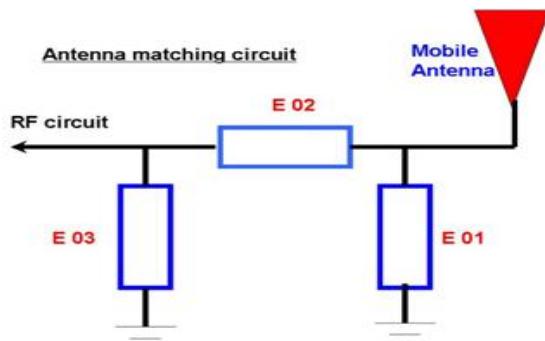
2、测试制具

目的：尽可能准确地测试天线的无源参数。

制作方法：手机制具是用一根 50 欧姆的同轴电缆，一端连在手机主板的匹配电路后端（射频测试孔前端）的测试点上，另一端连接 SMA 接头。示意图如下：



3、天线匹配电路



修改点/Modify

| E01 | E02 | E03 |
|-----|-----|-----|
| No | No | No |

备注：匹配无修改。

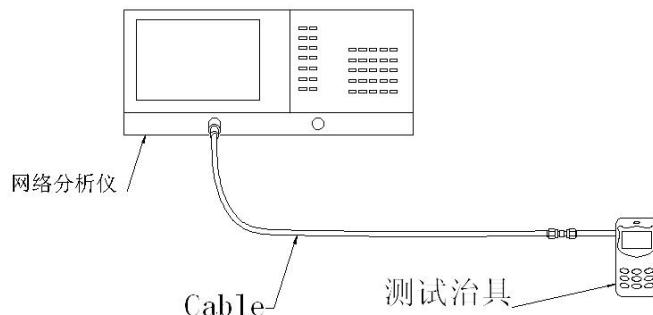
4. S11 测试

4.0 S11 测试方法说明

测试设备：网络分析仪 (E5071C)

测试方法：用一根 50 欧姆 CABLE 电缆从仪器测试端口导出，使用校准件校准后连接手机制具的 SMA 接头，记录相关频点对应的回波损耗和驻波比。

测试示意图如下：



测试示意图

4.1 S11 参数图片

主集天线无源驻波比

5、暗室测试设备和数据

6.0 测试设备

测试系统：屏蔽暗室

测试环境：温度 $22^{\circ}\text{C} \pm 3^{\circ}\text{C}$ ，湿度 $50\% \pm 15\%$

测试设备：测试无源数据时，使用网络分析仪 Agilent E5071C

测试有源数据时，使用综测仪 CMW500



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5. 天线有源测试数据

| Frequency Band | GSM; 850 | | | 900 | | |
|----------------|----------|-------|---------|---------|-------|---------|
| channel | L | M | H | L | M | H |
| TRP | 23.25 | 23.15 | 23.44 | 21.21 | 21.36 | 21.42 |
| TIS | | | -102.12 | | | -101.02 |
| Frequency Band | 1800 | | | 1900 | | |
| channel | L | M | H | L | M | H |
| TRP | 24.42 | 24.13 | 24.36 | 23.63 | 24.56 | 24.15 |
| TIS | | | -102.51 | | | -102.12 |
| Frequency Band | WCDMA 1 | | | WCDMA 2 | | |
| channel | L | M | H | L | M | H |
| TRP | 17.45 | 17.63 | 17.58 | 16.53 | 16.59 | 17.48 |
| TRP | | | -102.55 | | | -102.63 |
| Frequency Band | WCDMA 5 | | | WCDMA 8 | | |
| channel | L | M | H | L | M | H |
| TRP | 15.21 | 15.36 | 15.28 | 14.12 | 14.32 | 14.11 |
| TRP | | | -102.53 | | | -101.42 |
| Frequency Band | WCDMA 4 | | | | | |
| channel | L | M | H | | | |
| TRP | 16.58 | 16.47 | 16.33 | | | |
| TIS | | | -102.33 | | | |
| Frequency Band | LTE B1 | | | LTE B2 | | |
| channel | L | M | H | L | M | H |
| TRP | 17.36 | 17.58 | 17.42 | 16.58 | 16.77 | 17.59 |
| TIS | | | -91.24 | | | -90.12 |
| Frequency Band | LTE B4 | | | LTE B5 | | |
| channel | L | M | H | L | M | H |
| TRP | 16.88 | 16.46 | 16.82 | 15.12 | 15.33 | 15.03 |
| TIS | | | -89.42 | | | -85.16 |
| Frequency Band | LTE B7 | | | LTE B8 | | |
| channel | L | M | H | L | M | H |
| TRP | 17.52 | 17.36 | 17.75 | 13.56 | 13.69 | 13.57 |
| TIS | | | -89.36 | | | -86.88 |
| Frequency Band | LTE B12 | | | LTE B17 | | |
| channel | L | M | H | L | M | H |
| TRP | 13.09 | 13.45 | 13.27 | 13.14 | 13.66 | 13.69 |
| TIS | | | -88.47 | | | -89.22 |

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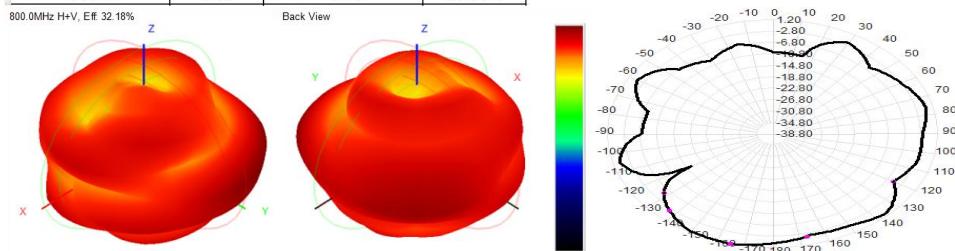
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| Frequency Band | | LTE B28 | | | LTE B66 | | |
|----------------|--|-------------|-------|--------|------------|-------|--------|
| channel | | L | M | H | L | M | H |
| TRP | | 13.66 | 13.89 | 14.26 | 16.89 | 17.48 | 17.23 |
| TIS | | | | -89.37 | | | -90.14 |
| Frequency Band | | LTE B38 | | | LTE B40 | | |
| channel | | L | M | H | L | M | H |
| TRP | | 16.89 | 16.69 | 16.37 | 18.43 | 18.62 | 19.71 |
| TIS | | | | -89.12 | | | -90.12 |
| Frequency Band | | LTE B41 | | | | | |
| channel | | L | M | H | | | |
| TRP | | 16.42 | 16.88 | 16.58 | | | |
| TIS | | | | -89.14 | | | |
| Frequency Band | | 2.4GWIFI-B模 | | | | | |
| channel | | L | M | H | | | |
| TRP | | 11.14 | 12.47 | 11.63 | | | |
| TIS | | | | -79.29 | | | |
| Frequency Band | | 2.4WIFI-G模 | | | 2.4WIFI-N模 | | |
| channel | | L | M | H | L | M | H |
| TRP | | 10.01 | 10.84 | 9.86 | 10.11 | 10.64 | 9.83 |
| TIS | | | | -67.57 | | | -67.63 |

5.2 天线无源测试数据

主天线无源测试数据

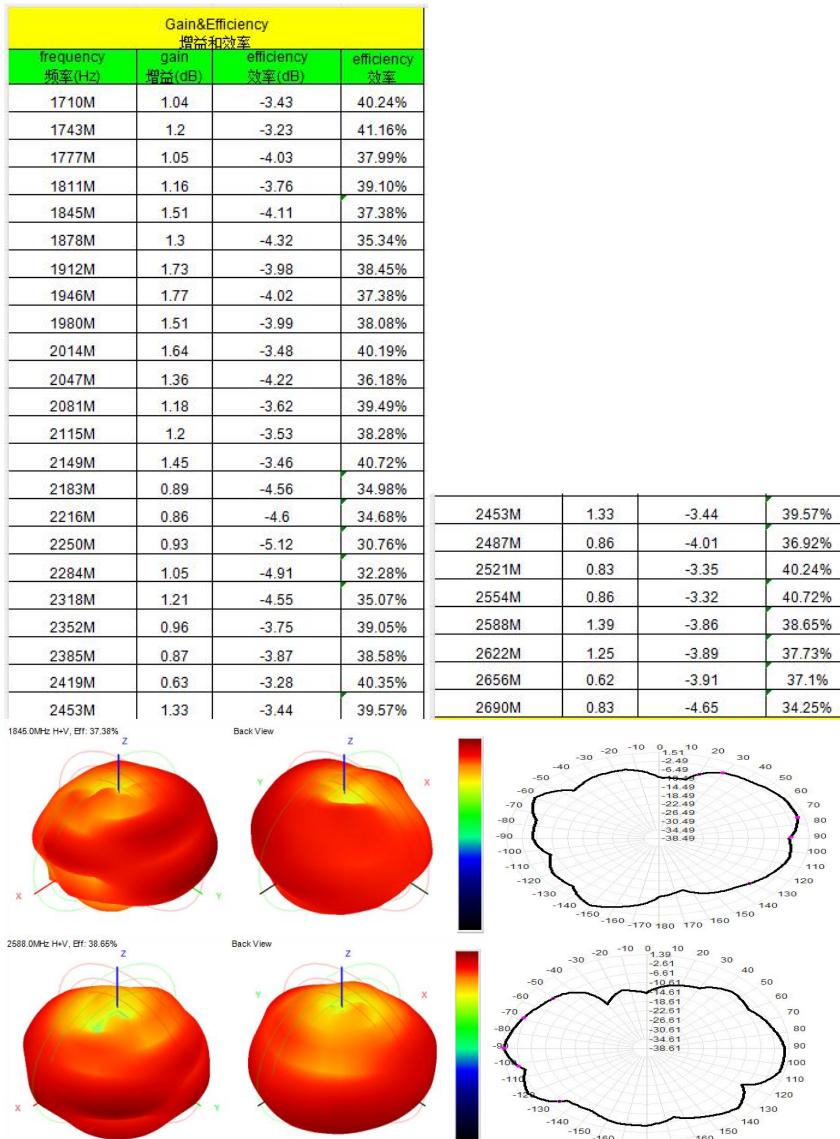
| Gain&Efficiency 增益和效率 | | | |
|--------------------------|----------------|----------------------|------------------|
| frequency 频率(Hz) | gain 增益(dB) | efficiency 效率(dB) | efficiency 效率 |
| 690M | 0.87 | -3.61 | 28.31% |
| 710M | 1.12 | -3.22 | 30.43% |
| 740M | 0.93 | -3.06 | 31.23% |
| 770M | 1.32 | -3.19 | 30.11% |
| 800M | 1.20 | -2.92 | 32.18% |
| 830M | 0.98 | -3.53 | 29.56% |
| 860M | 1.14 | -3.63 | 28.43% |
| 890M | 0.97 | -3.58 | 28.11% |
| 920M | 0.79 | -3.71 | 27.64% |
| 950M | 1.09 | -3.52 | 29.26% |
| 980M | 0.92 | -3.76 | 26.36% |



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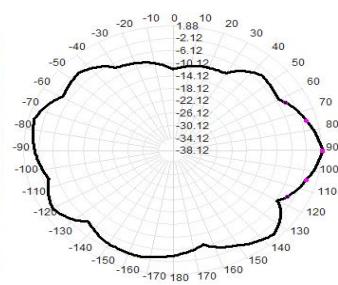
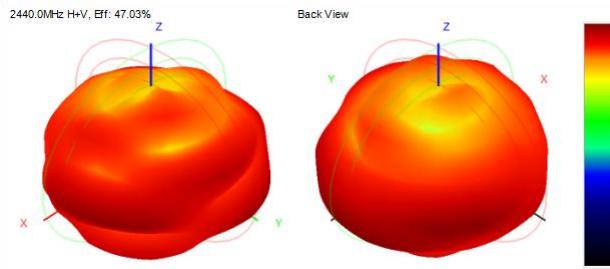
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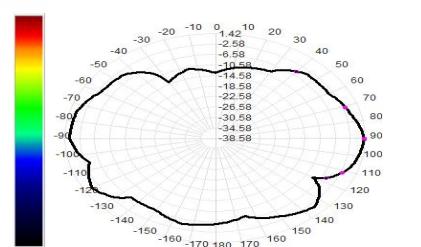
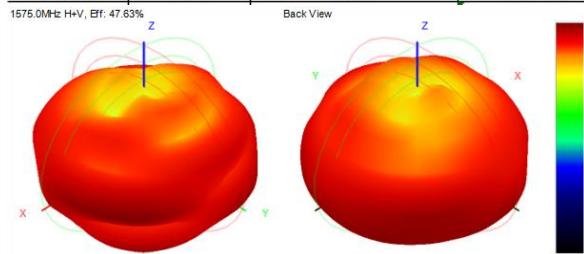
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三合一天线无源测试数据

| Gain&Efficiency 增益和效率 | | | |
|--------------------------|----------------|----------------------|------------------|
| frequency 频率(Hz) | gain 增益(dB) | efficiency 效率(dB) | efficiency 效率 |
| 2400M | 1.14 | -3.96 | 45.36% |
| 2410M | 0.89 | -3.88 | 46.58% |
| 2420M | 1.03 | -3.93 | 43.11% |
| 2430M | 1.31 | -3.97 | 44.21% |
| 2440M | 1.88 | -3.85 | 47.03% |
| 2450M | 1.3 | -3.84 | 46.63% |
| 2460M | 1.15 | -3.96 | 47.28% |
| 2470M | 0.96 | -3.92 | 45.11% |
| 2480M | 1.44 | -3.91 | 42.63% |
| 2490M | 1.23 | -4.25 | 43.85% |
| 2500M | 1.34 | -4.16 | 43.32% |



| Gain&Efficiency 增益和效率 | | | |
|--------------------------|----------------|----------------------|------------------|
| frequency 频率(Hz) | gain 增益(dB) | efficiency 效率(dB) | efficiency 效率 |
| 1555M | 1.13 | -3.86 | 42.62% |
| 1565M | 1.17 | -3.67 | 43.74% |
| 1575M | 1.42 | -3.51 | 47.63% |
| 1585M | 1.26 | -3.87 | 42.27% |



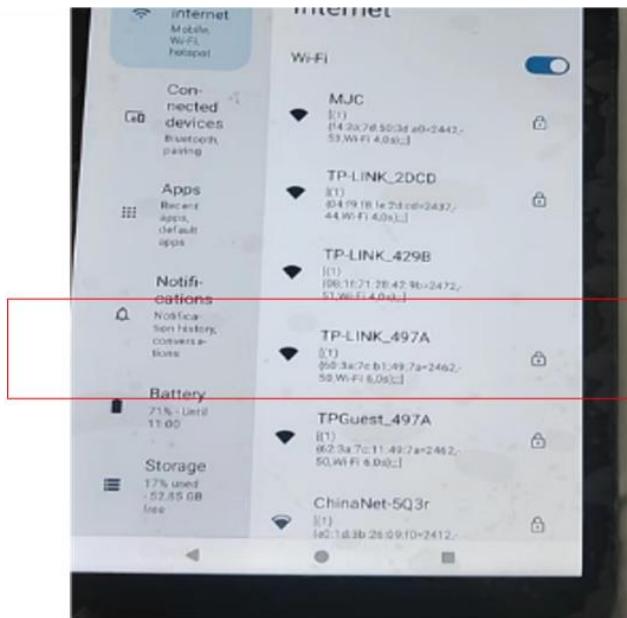
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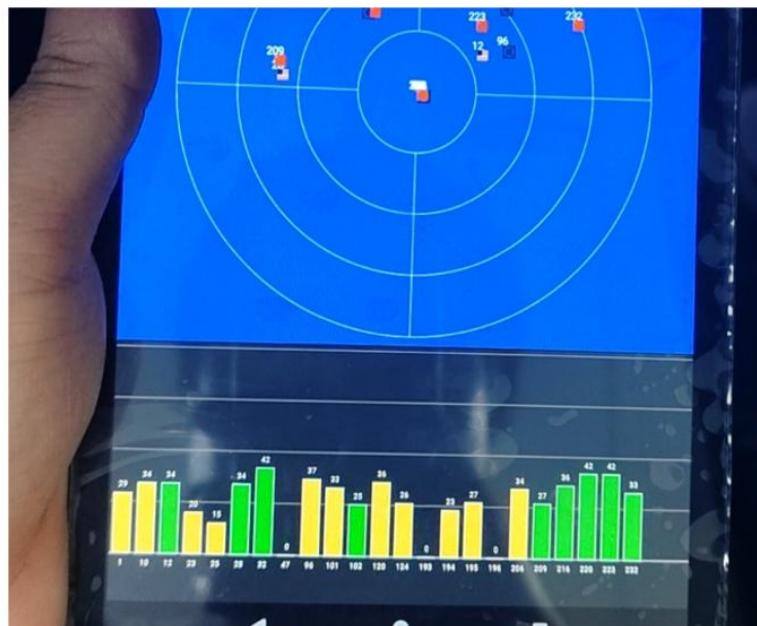
WIFI 实测

距离路由器
10米，信号
满格，上网
正常



Gps 实测

GPS在我司
窗口搜星测试，
星值达
40的有2-3
颗，定位时
间一分钟。
天气阴



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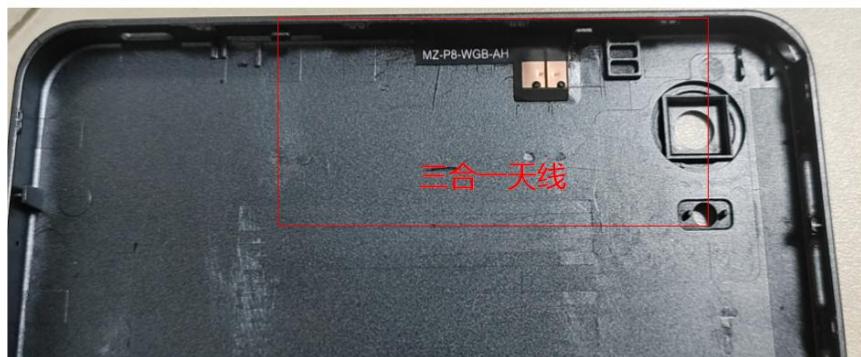
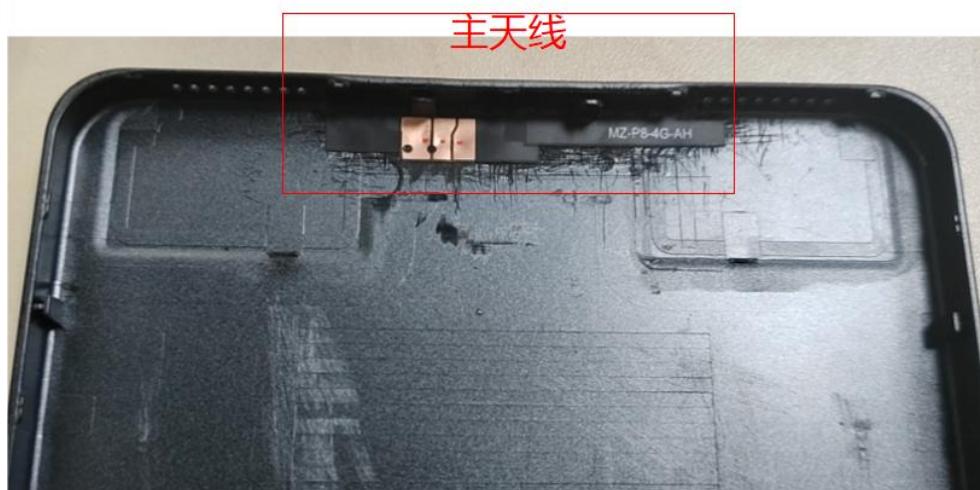
6、天线量产指标

天线量产时，以驻波比作为量产测试标准。

根据项目本身的差异,给出如下标准:

| 频率 | 量产标准 |
|-----------------|------------------------------|
| 690Mhz-960Mhz | VSWR (量产性能) < VSWR(承认性能)+0.5 |
| 1710Mhz-2700Mhz | VSWR (量产性能) < VSWR(承认性能)+0.5 |

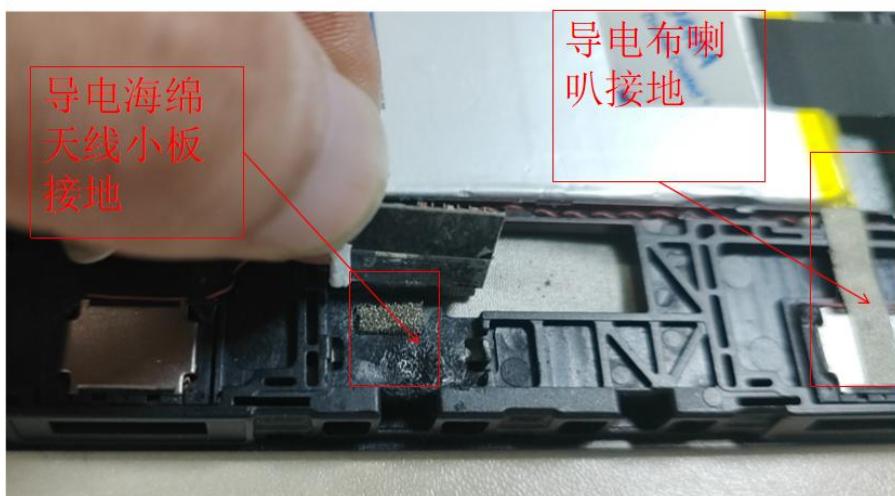
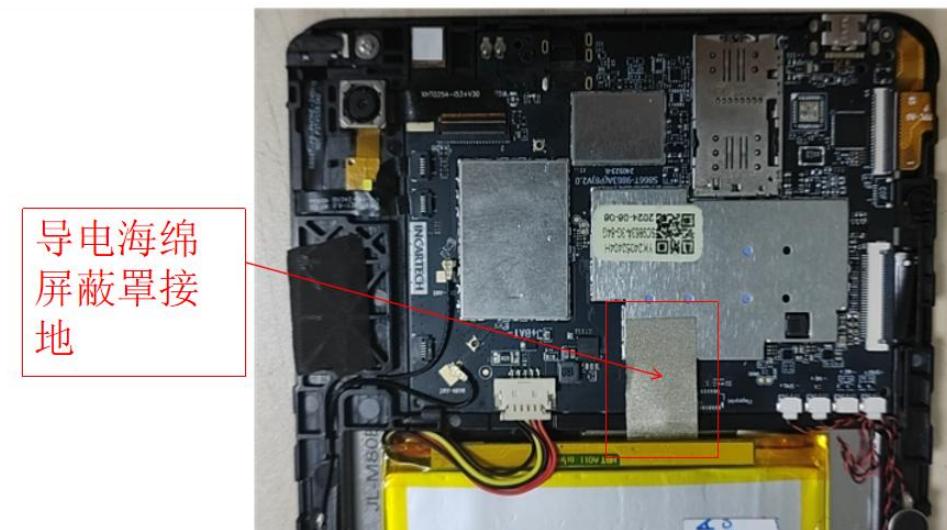
7.天线装配图/环境处理



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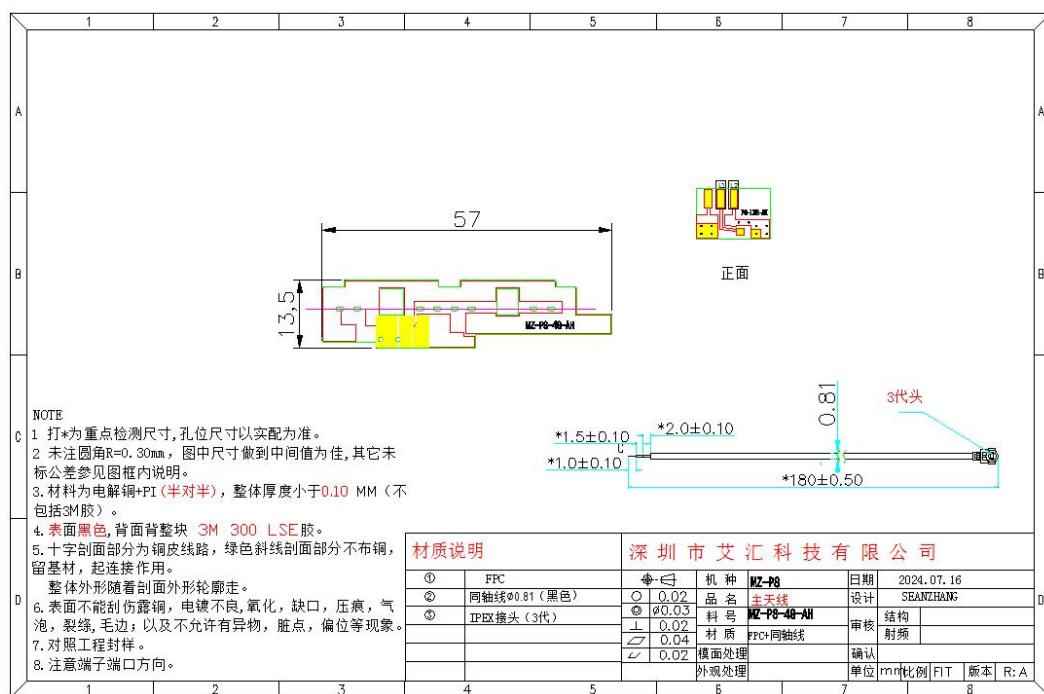
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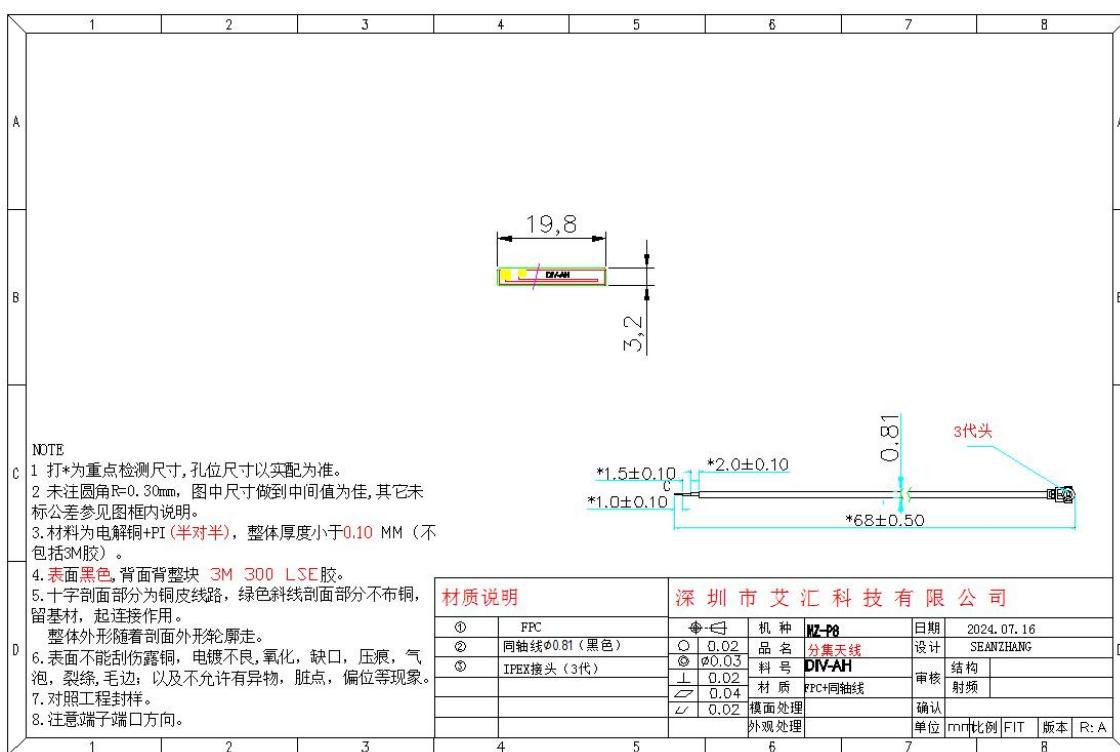
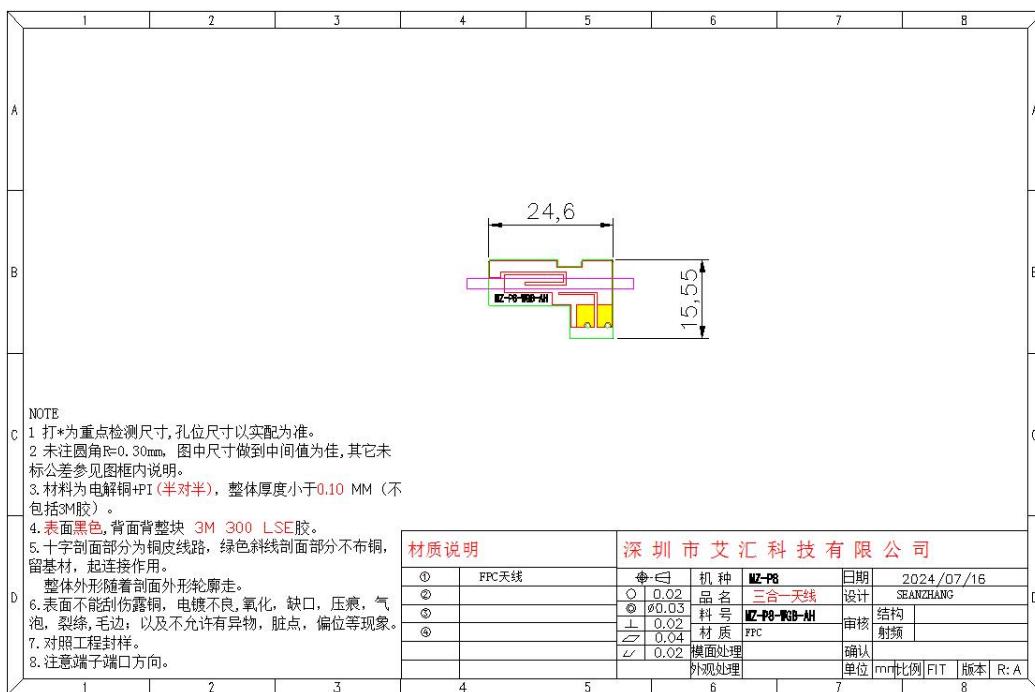
8. 天线结构图纸



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