

## 样品承认书

客户名称 Customer Name: 昊之源 Hollyland

客户料号: Customer P/N: L:5061-(1880-1930)MHz-L ;R: 5061-(1880-1930)MHz-R

项目名称 Project Name: 5601-1.9G

规格描述 Product Spec: FPC 21.74mm\*17.78mm±0.2

版 本 REV: V1.0

日 期 Date: 2023-12-21

|                |              |                                                                                      |
|----------------|--------------|--------------------------------------------------------------------------------------|
| 制 作<br>drawing | 审 核<br>check |  |
|                |              |                                                                                      |

### 客户承认 Customer Approve

|              |                 |                 |
|--------------|-----------------|-----------------|
| 审 核<br>check | 批 准<br>approved | 承 认<br>approval |
|              |                 |                 |

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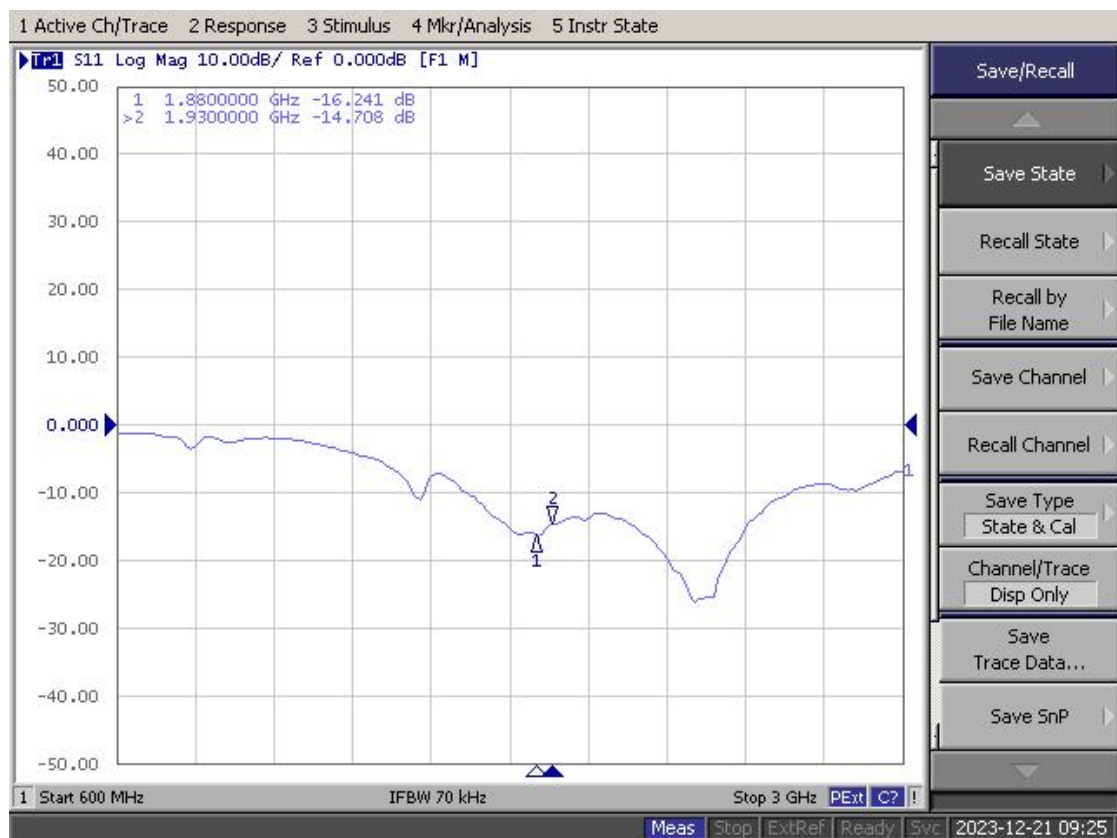
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电性能指标 Electrical Performance Index(NB)

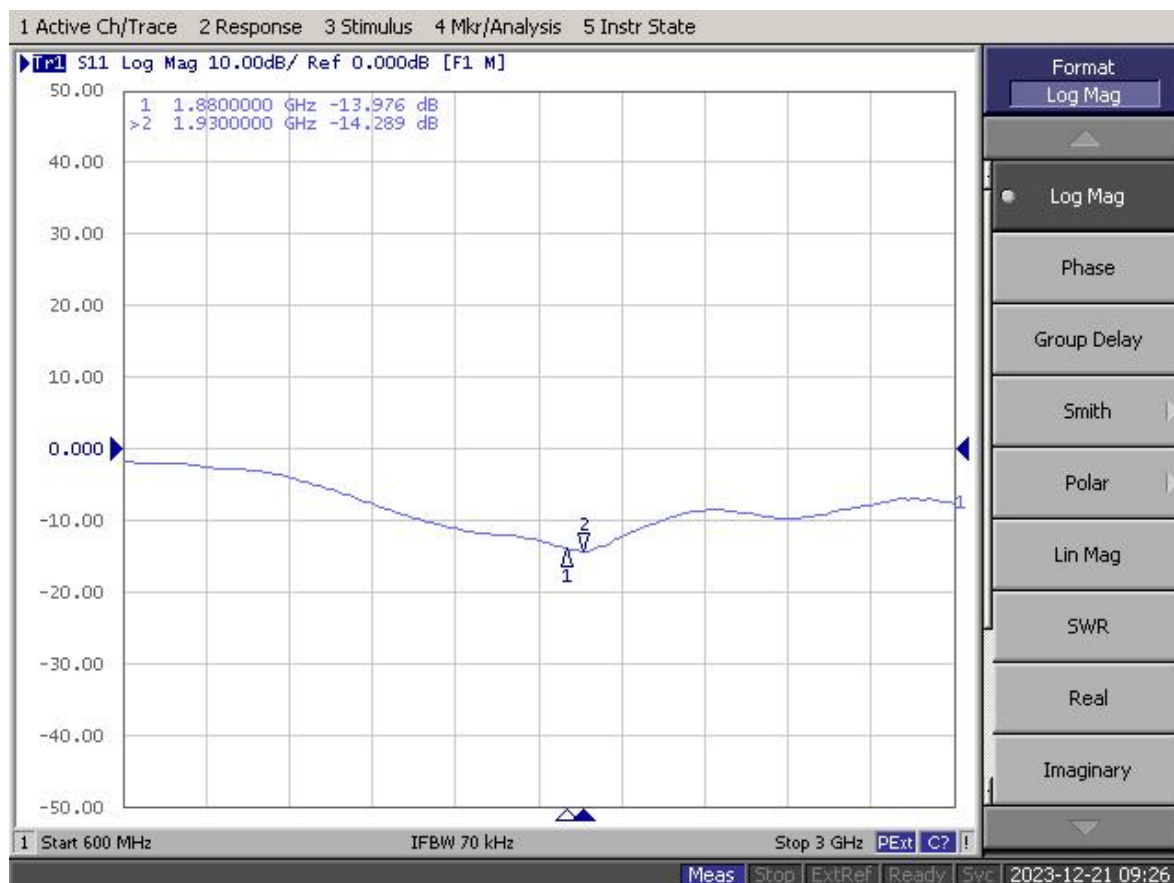
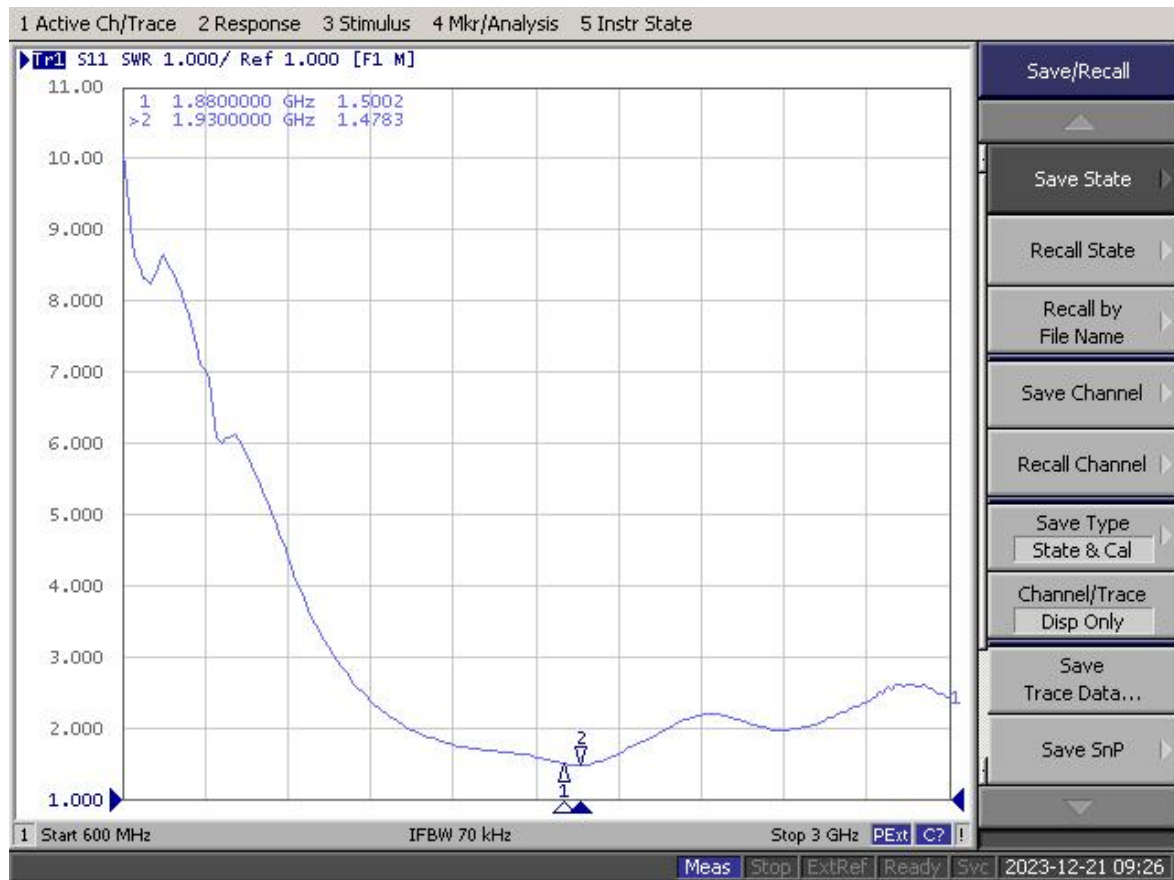
| 电 器 性 能 指 标 |           | Electrical Specifications                                                            |           |
|-------------|-----------|--------------------------------------------------------------------------------------|-----------|
| 频率范围        |           | 1880-1930MHz                                                                         |           |
| 电压驻波比       | ≤2.0      | VSWR                                                                                 | ≤2.0      |
| 辐射方式        | 全向        | Radiation                                                                            | OMNI      |
| 极化方式        | 线极化       | Polarizatin                                                                          | LINEAR    |
| 输入阻抗        | 50 Ω      | Input Impedance                                                                      | 50 Ω      |
| 机 械 性 能 指 标 |           | Mechanical Specifications                                                            |           |
| 接口形式        | 顶针式       | Input connector                                                                      | pintle    |
| 天线材质        | FPC       | Antenna materia                                                                      | FPC       |
| 工作温度        | -30℃~+80℃ | Working Temperature                                                                  | -30℃~+80℃ |
| 工作湿度        | 40~85%    | Working Humidity                                                                     | 40~85%    |
|             |           |  |           |

## 电性能指标 Electrical Performance Index

L(左)



R(右)



电性能指标 Electrical Performance Index

Simulated head data

模拟人头数据：L（左）

| Frequency/MHz | MaxGain/dBi | Efficiency / % |
|---------------|-------------|----------------|
| 1880          | 3.85        | 33.81          |
| 1885          | 3.78        | 34.67          |
| 1890          | 3.84        | 34.83          |
| 1895          | 3.92        | 36.81          |
| 1900          | 3.79        | 34.51          |
| 1905          | 3.62        | 34.83          |
| 1910          | 3.46        | 33.5           |
| 1915          | 3.48        | 33.96          |
| 1920          | 3.34        | 33.04          |
| 1925          | 3.35        | 33.04          |
| 1930          | 3.03        | 32.06          |

R（右）

| Frequency/MHz | MaxGain/dBi | Efficiency / % |
|---------------|-------------|----------------|
| 1880          | 3.03        | 28.18          |
| 1885          | 3.01        | 29.04          |
| 1890          | 3.03        | 28.91          |
| 1895          | 3.16        | 29.44          |
| 1900          | 2.96        | 27.61          |
| 1905          | 3.07        | 27.54          |
| 1910          | 2.58        | 25.53          |
| 1915          | 2.92        | 25.94          |
| 1920          | 2.55        | 25.59          |
| 1925          | 2.85        | 25.47          |
| 1930          | 2.33        | 25.23          |

Free spatial data

自由空间数据：L（左）

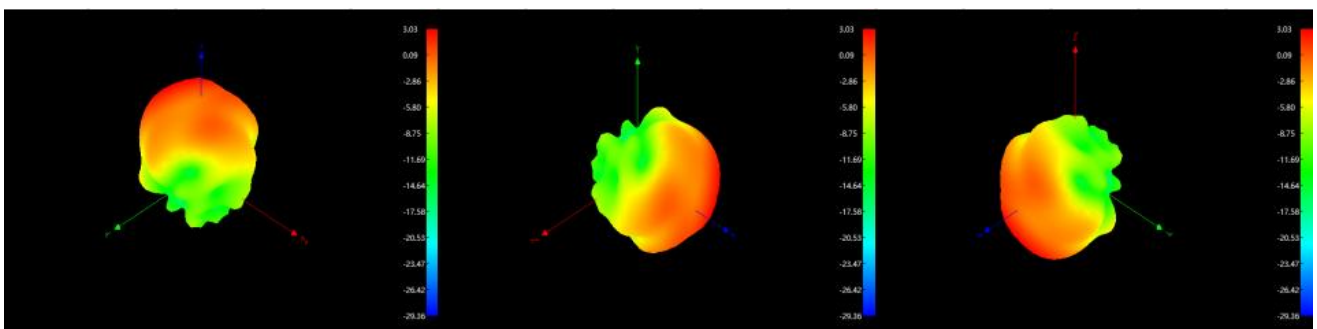
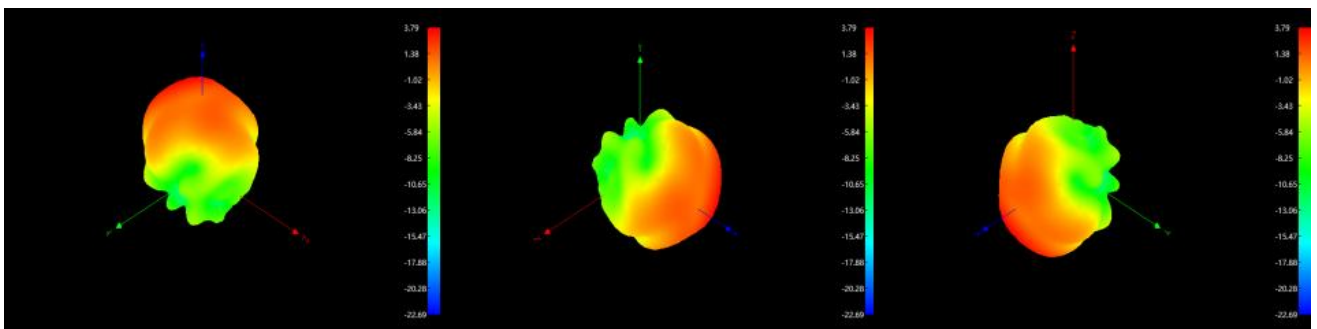
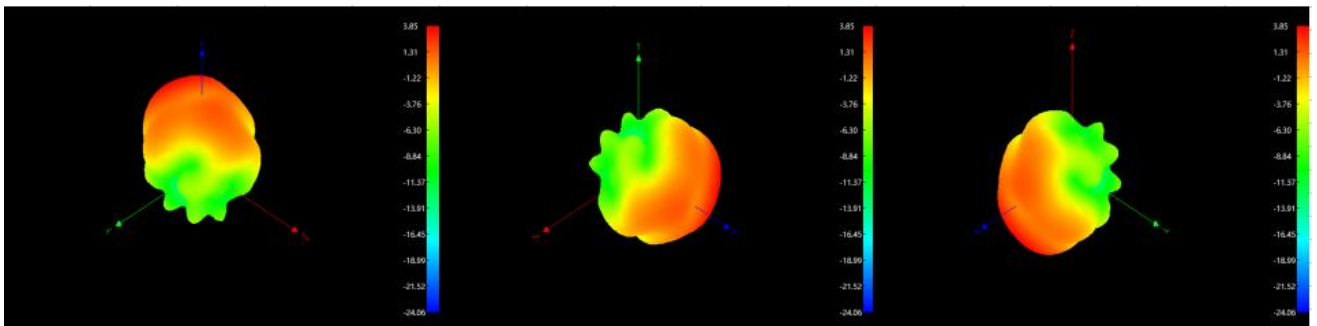
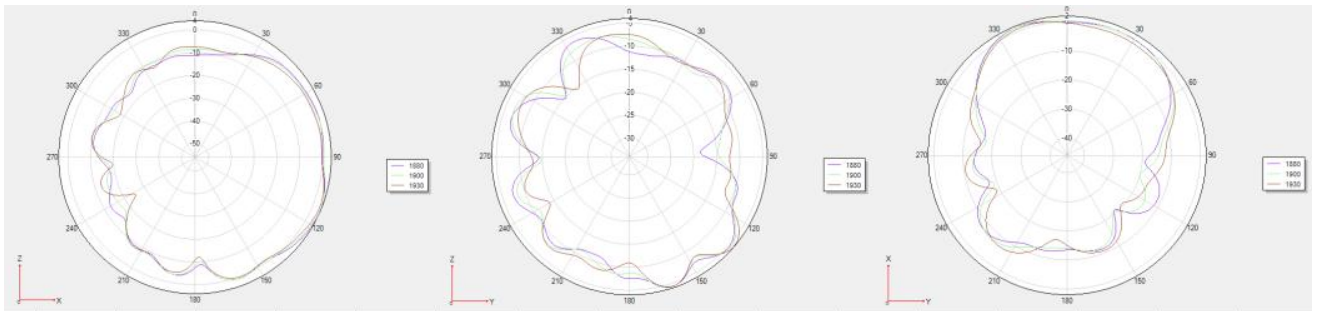
| Frequency/MHz | MaxGain/dBi | Efficiency / % |
|---------------|-------------|----------------|
| 1880          | 3.28        | 59.16          |
| 1885          | 3.12        | 60.53          |
| 1890          | 3.26        | 60.26          |
| 1895          | 3.33        | 63.97          |
| 1900          | 3.09        | 60.12          |
| 1905          | 2.84        | 60.81          |
| 1910          | 2.72        | 59.7           |
| 1915          | 2.72        | 61.8           |
| 1920          | 2.56        | 61.24          |
| 1925          | 2.58        | 63.68          |
| 1930          | 2.26        | 63.68          |

R（右）

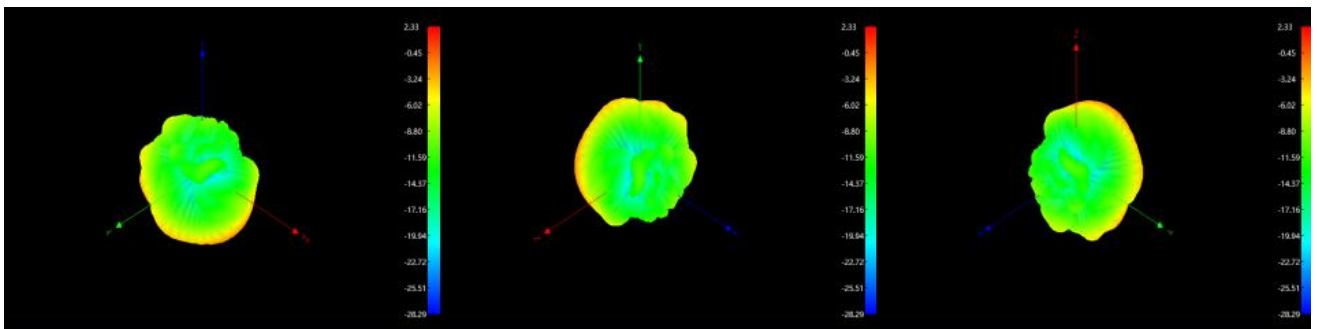
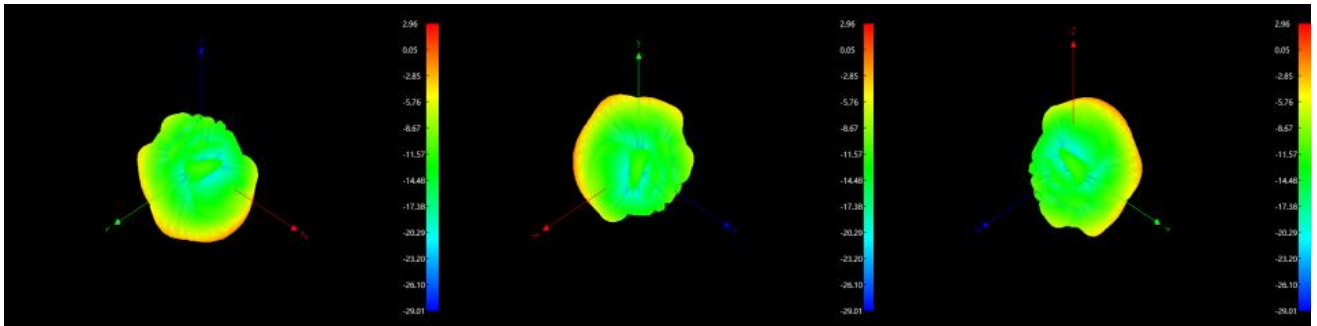
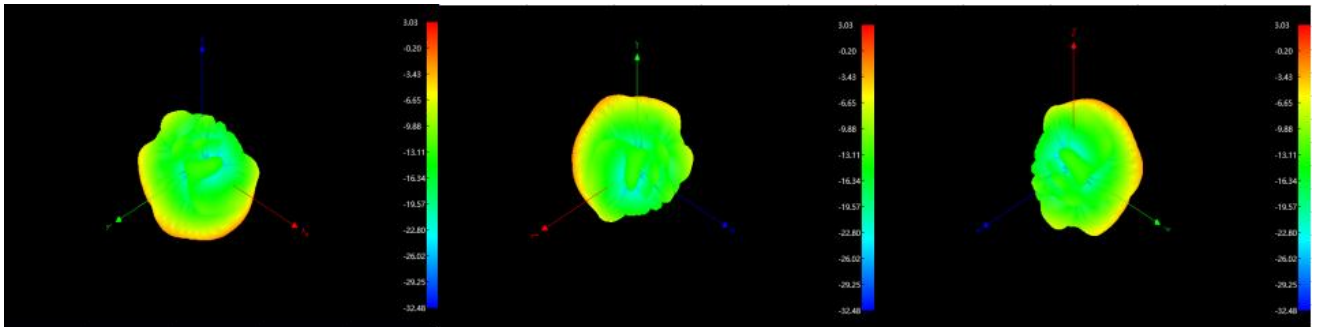
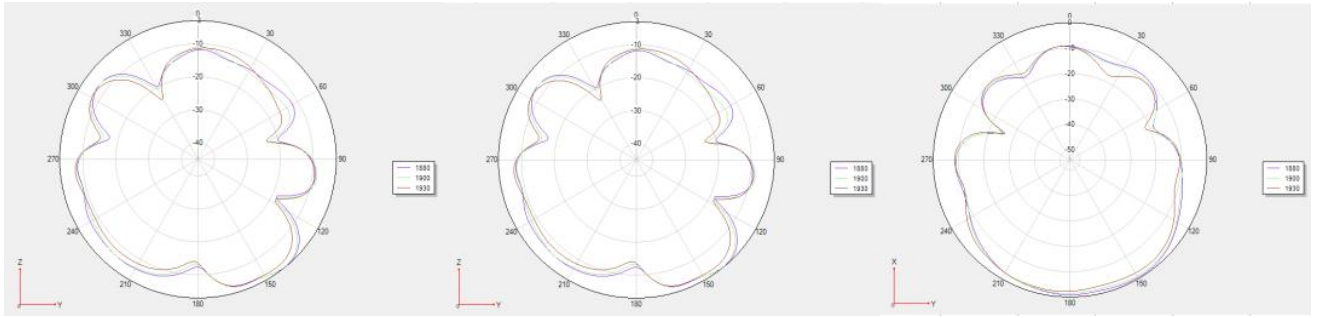
| Frequency/MHz | MaxGain/dBi | Efficiency / % |
|---------------|-------------|----------------|
| 1880          | 2.62        | 59.43          |
| 1885          | 2.86        | 61.24          |
| 1890          | 2.79        | 60.67          |
| 1895          | 3.15        | 64.71          |
| 1900          | 2.76        | 61.09          |
| 1905          | 3           | 61.94          |
| 1910          | 2.73        | 60.53          |
| 1915          | 3.26        | 63.39          |
| 1920          | 2.92        | 62.37          |
| 1925          | 3.33        | 64.12          |
| 1930          | 2.93        | 64.71          |

## 人头测试方向图：Head test directions

2D/3D ( L )

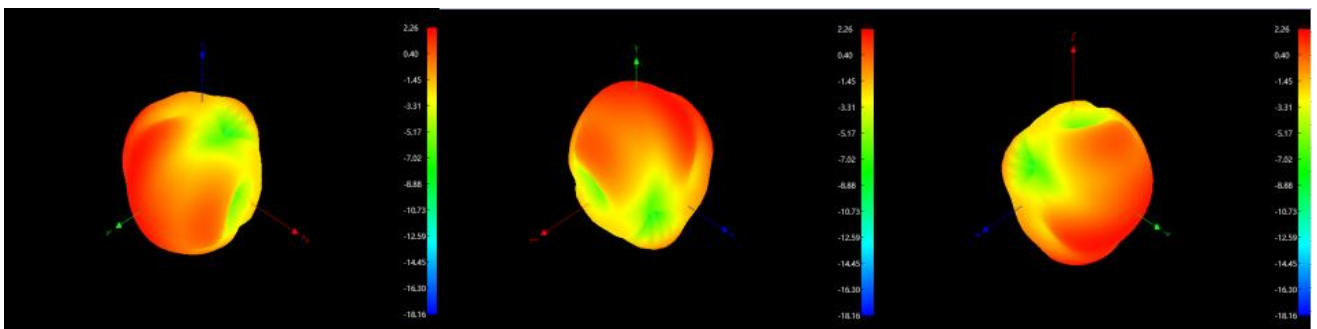
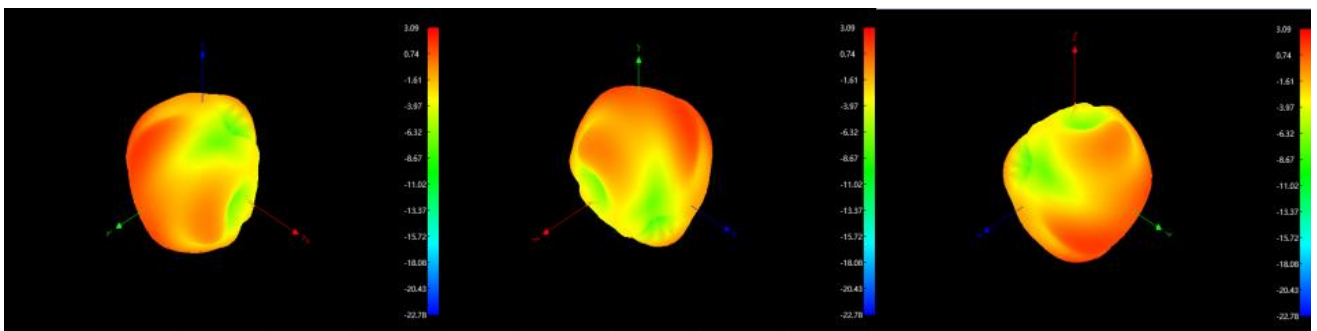
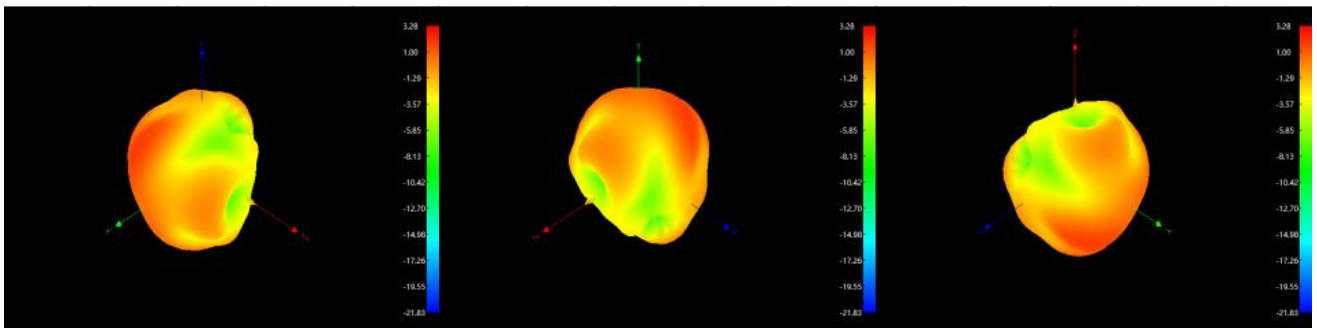
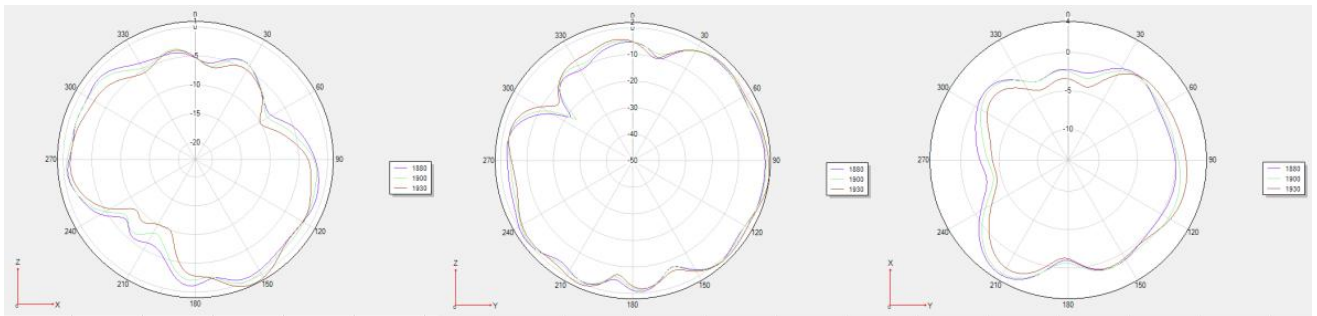


2D/3D ( R )

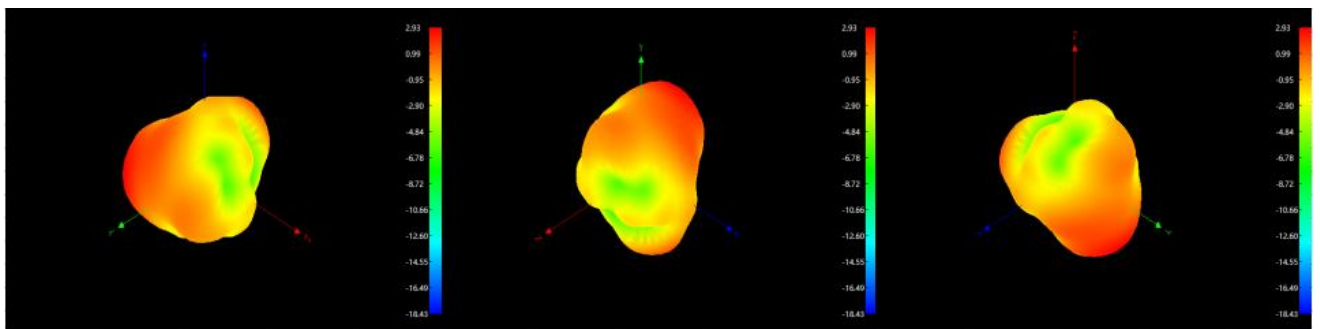
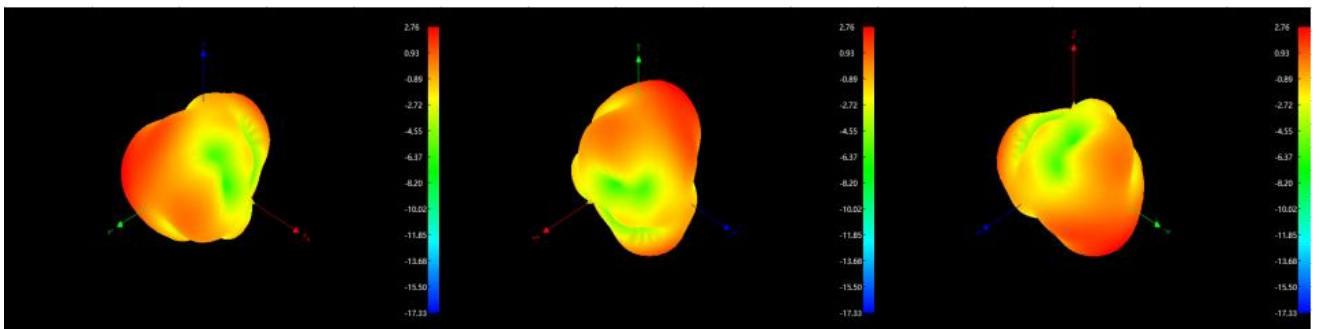
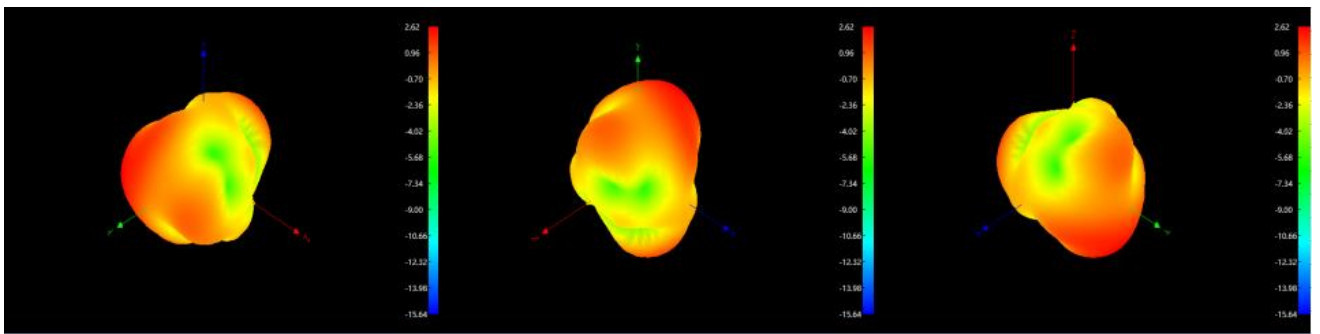
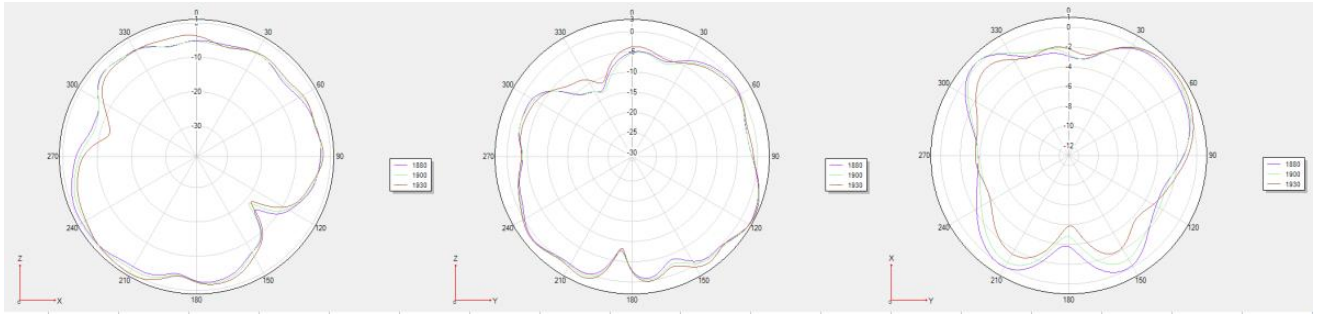


自由空间测试方向图： Free space test direction diagram:

2D/3D ( L )

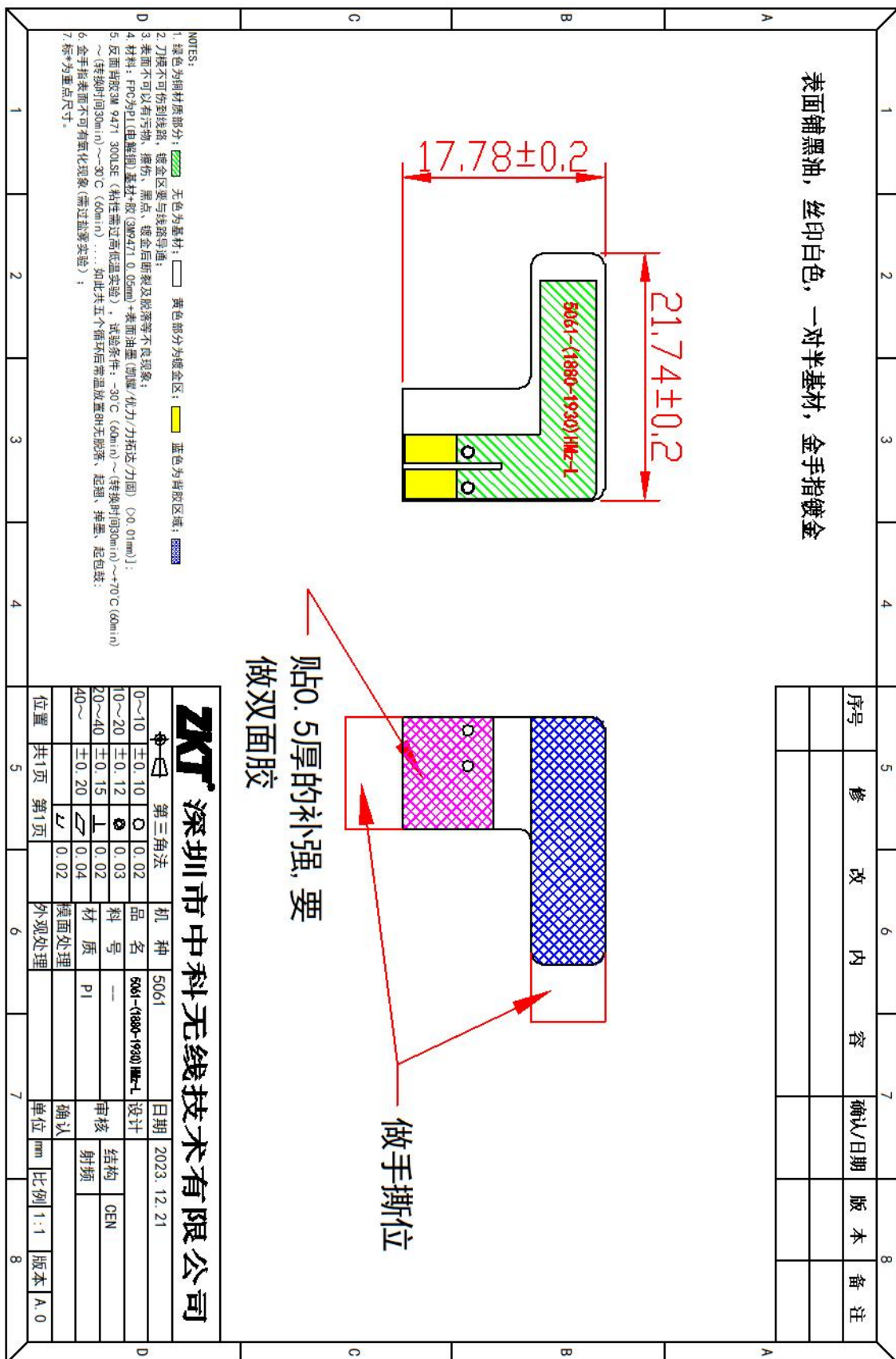


2D/3D ( R )

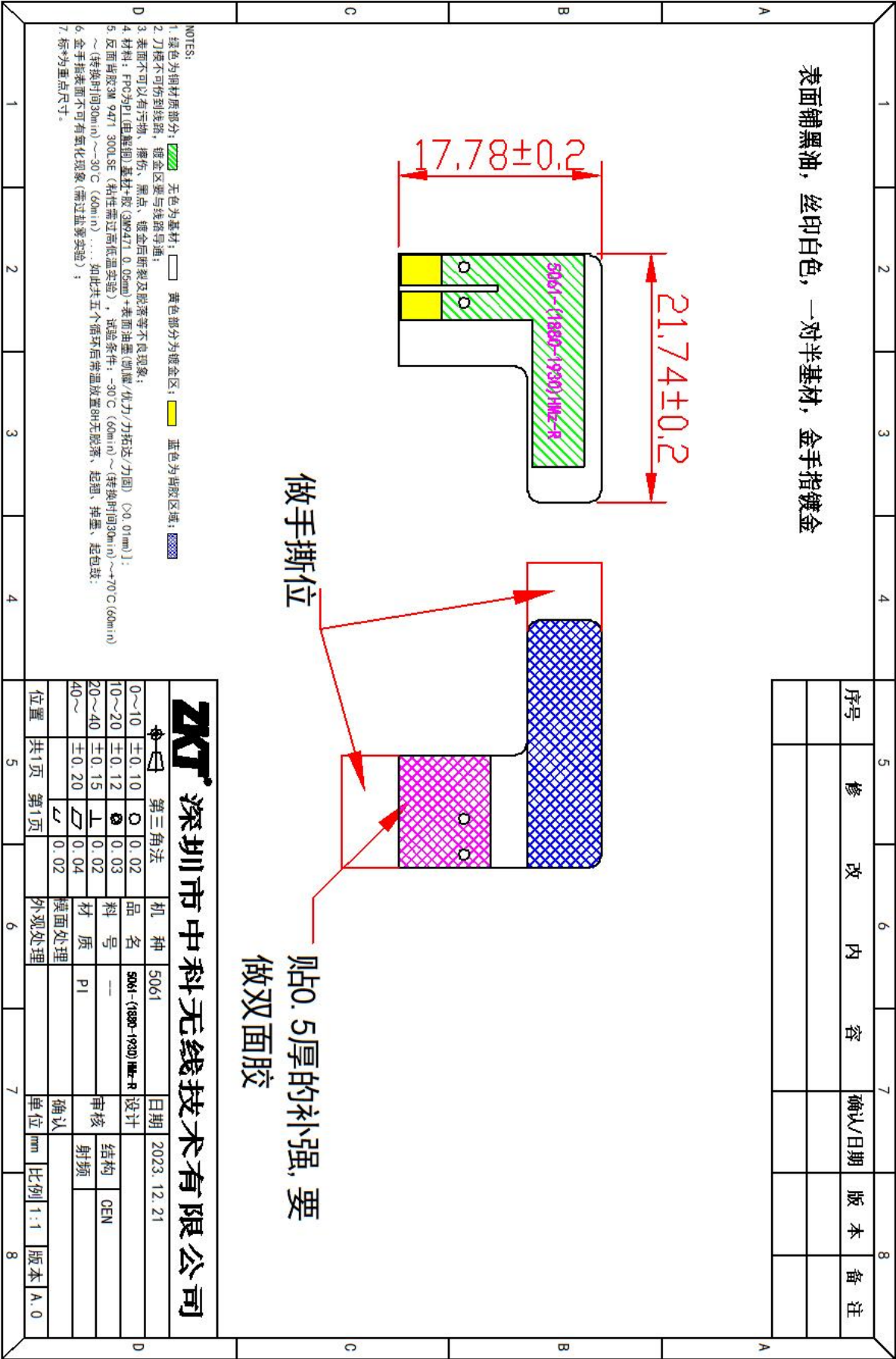


# 工程图纸 Product Drawing

L



R



## 测试设备及原理 Testing Equipment and Principle

### 1. 测试设备:

网络分析仪 Network Analyzers :

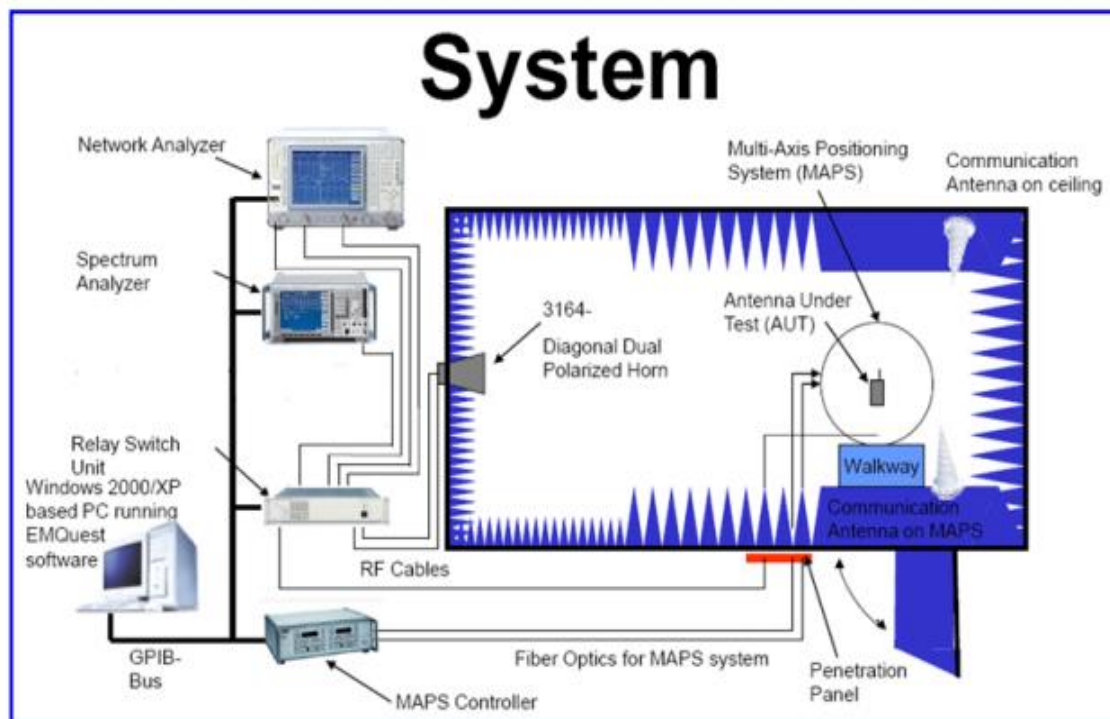
Agilent 8753D 5071B

综合测试仪 Communications Test Set:

Agilent E5515C

3D 暗室测试系统 3D Chamber Test System:

### 2. 测试原理: Test principle



## 可靠性测试报告 Reliability test report

| 测试项目 |                                       | 测试方法                                                                                                                                                   | 要 求                                                                                                 | 结 果  |
|------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------|
| C1   | V. S. W. R. 电 性 驻波比                   | 设计网路分析仪参数进行测试                                                                                                                                          | 符合待测物规范                                                                                             | pass |
| M1   | 天线增益                                  | 设计天线暗室参数进行测试                                                                                                                                           | 符合待测物规范                                                                                             | pass |
| M2   | Vibration 震动                          | GB / T2423. 48-2008<br>Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80to 20 Hz3 directions; 2 hours for each direction 振幅 1.5mm; 频率 20~80~20Hz; 3 个方向各 2H | 1. No Visual Damage<br>2. Frequency Tol. ≤5%<br>无明显外观不良; 频率偏移≤5%                                    | pass |
| M6   | Random Drop 跌落                        | GB / T2423. 8-1995 Single: Height: 1.0 Meter; 3 directions; 1 time for each direction 单支天线, 高 1m; 3 个方向各 1 次                                           | 1. No parts separated 、 fracture<br>2. Frequency Tol. ≤5%<br>产品无脱落、断裂; 频率偏移≤5%                      | pass |
| E3   | Dimension 尺寸                          | Inspection of dimension, color, material, package, surface process. 检查尺寸, 颜色, 材料, 包装, 表面处理                                                             | Directive DUT specification<br>符合待测物规范                                                              | pass |
| E4   | Temperature and Humidity Chamber 恒温恒湿 | GB / T 2423. 3-2006 Temp: 80° C / 12 H; -40° C / 12H RH: ≥ 90%; Time: 24H 温度 80° C 测试 12H 转 -40° C 测试 12H; 湿度 ≥ 90%; 时间 24H                            | After 2 Hours Recovery<br>1. No Visual Damage<br>2. Frequency Tol. ≤5%<br>恢复 2H 后, 无明显外观不良; 频率偏移≤5% | pass |
| E5   | Thermal Shock 冷热冲击                    | GB / T 2423. 22 - 2008 - 40° C (30 minutes) to + 80° C (30 minutes); Cycles: 24 - 40° C 测试 30 分转 80° C 测试 30 分为一个周期; 共 24 周期                           | After 2 Hours Recovery<br>1. No Visual Damage<br>2. Frequency Tol. ≤5%<br>恢复 2H 后, 无明显外观不良; 频率偏移≤5% | pass |
| R1   | Aging test 老化                         | GB / T 2423. 2 - 2008 Temp: 80° C; Time: 24 hours<br>温度 80° C, 测试 24H                                                                                  | After 2 Hours Recovery<br>1. No Visual Damage<br>2. Frequency Tol. ≤5%<br>無明顯外觀不良; 频率偏移≤5%          | pass |
| M1   | RoHS                                  | With Reference to IEC 62321:2008 with flow chart<br>参考 IEC 62321 测试流程                                                                                  | Directive RoHS 2015/863/EU<br>符合 RoHS 2015/863/EU 标准                                                | pass |