



# 深圳合立讯科技有限公司

Shenzhen Helixun Technology  
Co., Ltd

## 承 认 书

SPECIFICATION FOR APPROVAL

|                               |      |                                   |             |
|-------------------------------|------|-----------------------------------|-------------|
| 客户名称<br>Customer Name         | 汇蓝电子 |                                   |             |
| 客户项目名Customer<br>Project Name | ZQ01 | 合立讯项目名<br>Helixun Project<br>Name | ZQ01        |
| 客户编码<br>Customer P/N          |      | 合立讯料号<br>Helixun P/N              | HLX-ZQ01-V3 |
| 频段<br>Band                    |      |                                   |             |
| 版本号<br>Version                |      |                                   |             |
| 设计人信息 / Designer Information  |      |                                   |             |
| 射频工程师<br>RF Engineer          | 黄亚飞  | 电子工程师<br>EE Engineer              |             |
| 结构工程师<br>ME Engineer          | 黄亚飞  |                                   |             |

| 合立讯审批 / Helixun Approval |                   |                  |                   | 客户批准 / Customer Approval |                   |
|--------------------------|-------------------|------------------|-------------------|--------------------------|-------------------|
|                          | 制作<br>Prepared By | 审核<br>Checked By | 批准<br>Approval By | 审核<br>Checked By         | 批准<br>Approval By |
| 签章<br>Signature          | 卓子骥               |                  |                   |                          |                   |
| 日期<br>Date               | 2025-04-21        |                  |                   |                          |                   |

| 修订履历 / Change Log |                            |                         |                   |            |
|-------------------|----------------------------|-------------------------|-------------------|------------|
| 版本<br>Version     | 修订内容<br>Change Description | 责任人<br>Person in Charge | 核准<br>Approval By | 日期<br>Date |
|                   |                            |                         |                   |            |
|                   |                            |                         |                   |            |
|                   |                            |                         |                   |            |

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Address: Room 1004, Jinhuan Yu Building, No. 56, Tiezi Road, Xixiang Street, Bao'an District, Shenzhen

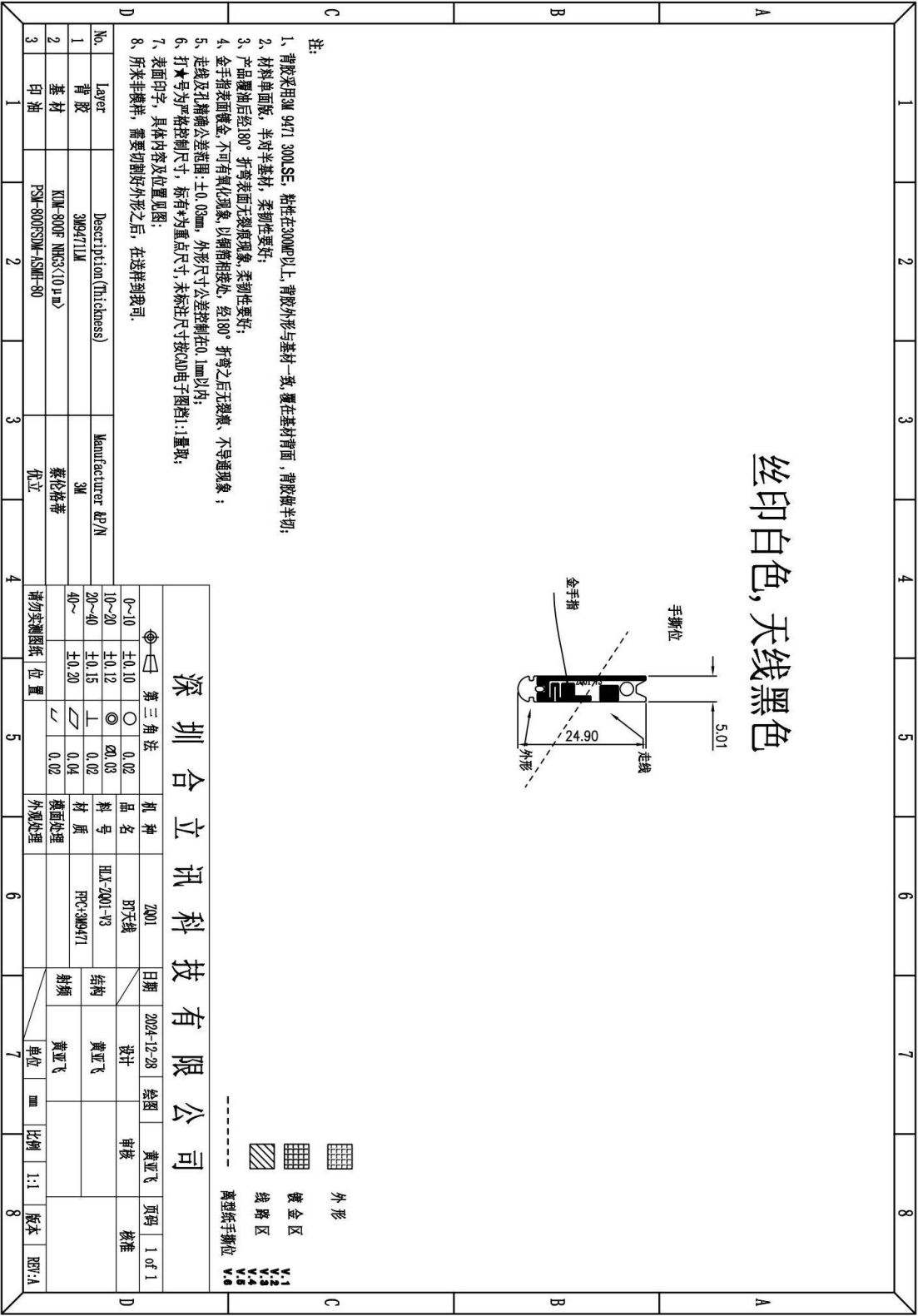
## 目录/Catalogue

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产品图纸或实物图片  
Drawing or Product Image



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## 样品尺寸测量报告

### Sample Dimensions Test Report

|                            |                |                      |                          |                      |             |
|----------------------------|----------------|----------------------|--------------------------|----------------------|-------------|
| 客户名称<br>Customer Name      | 汇蓝电子           | 客户料号<br>Customer P/N |                          | 合立讯料号<br>Helixun P/N | HLX-ZQ01-V3 |
| 测试日期<br>Test Date          | 2025-04-21     | 样品数量<br>Sample Qty.  | 3                        | 测试人<br>Inspector     | 卓子骥         |
| 尺寸编号<br>Dimension No.      | 标准<br>Standard | 样品 1<br>Sample 1     | 样品 2<br>Sample 2         | 样品 3<br>Sample 3     | Pass/NG     |
| ①长度                        | 24.90±0.2mm    | 24.80mm              | 24.90mm                  | 25.00mm              | Pass        |
| ②宽度                        | 5.01±0.2mm     | 5.01mm               | 5.10mm                   | 4.20mm               | Pass        |
| ③厚度                        | 0.2±0.05mm     | 0.2mm                | 0.21mm                   | 0.22mm               | Pass        |
| ④                          |                |                      |                          |                      |             |
| ⑤                          |                |                      |                          |                      |             |
| ⑥                          |                |                      |                          |                      |             |
| ⑦                          |                |                      |                          |                      |             |
|                            |                |                      |                          |                      |             |
| 最终结论<br>Conclusion         |                |                      |                          |                      | PASS        |
| 测试人&日期<br>Inspector & Date | 卓子骥2025-04-21  |                      | 批准&日期<br>Approval & Date |                      |             |

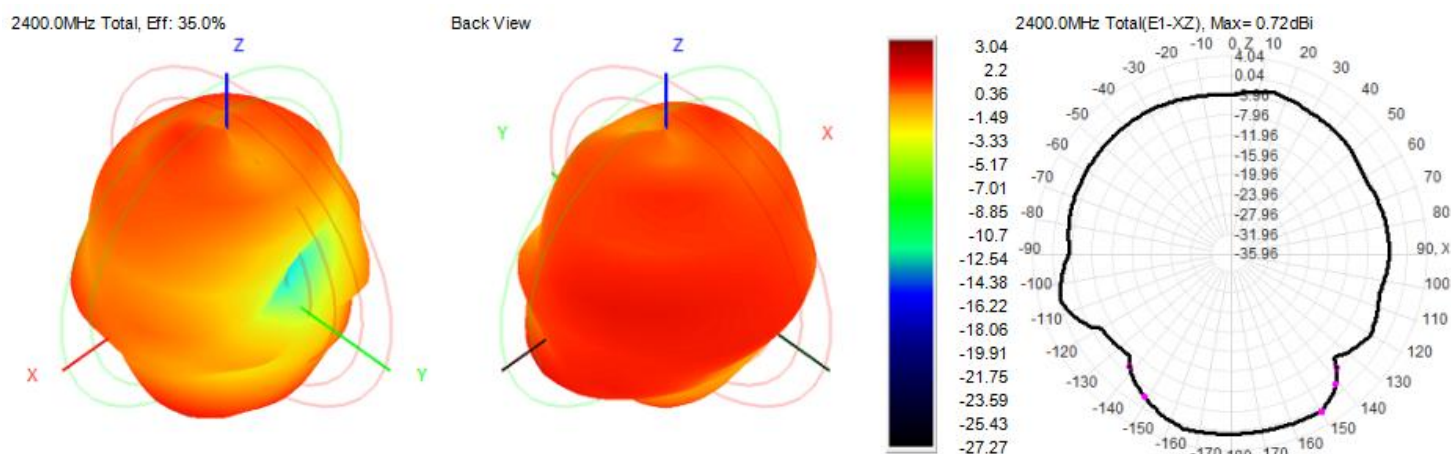
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## Test Result<sub>1</sub> Gain & Efficiency——ANT

| Frequency (MHz) | Efficiency (%) | Peak GAIN (dBi) |
|-----------------|----------------|-----------------|
| 2400            | 34.98          | 3.04            |
| 2410            | 35.51          | 3.30            |
| 2420            | 36.02          | 3.66            |
| 2430            | 36.88          | 4.02            |
| 2440            | 37.87          | 4.37            |
| 2450            | 38.85          | 4.67            |
| 2460            | 39.86          | 4.81            |
| 2470            | 40.97          | 4.76            |
| 2480            | 41.90          | 4.60            |

## Test Result 2D Pattern——BTANT



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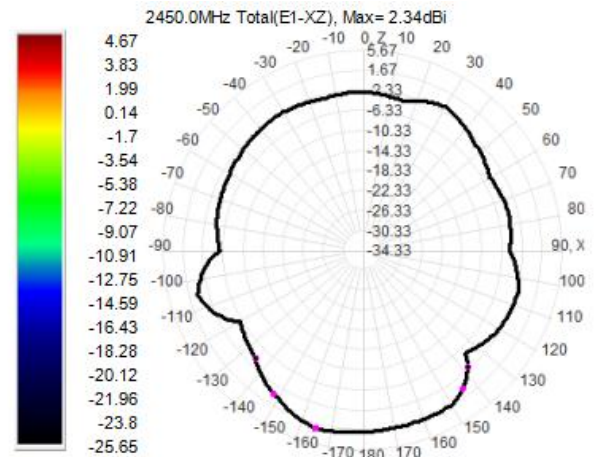
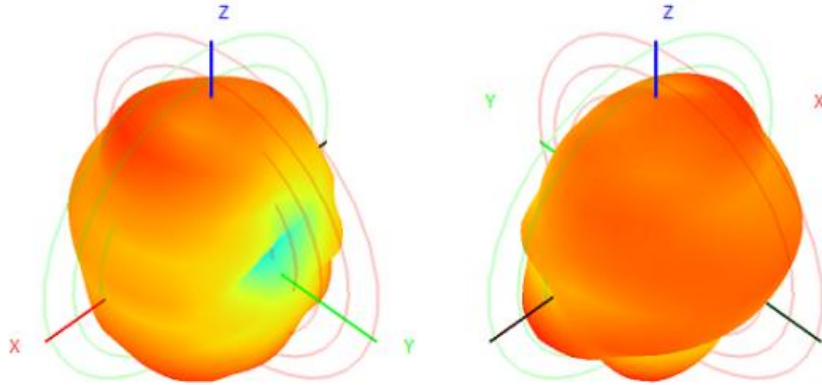
Address: Room 1004, Jinhuan Yu Building, No. 56, Tiezi Road, Xixiang Street, Bao'an District, Shenzhen

## 3.3 Test Result

### 1 2D Pattern——BTANT

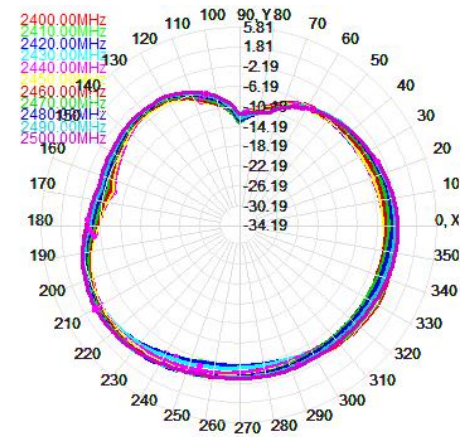
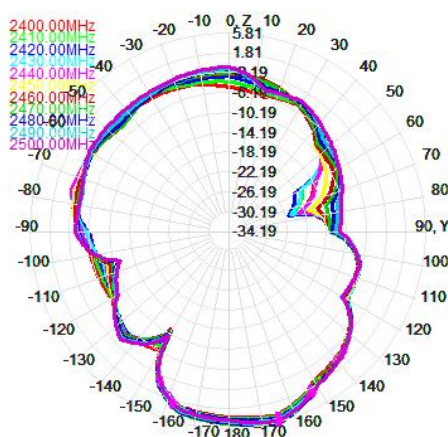
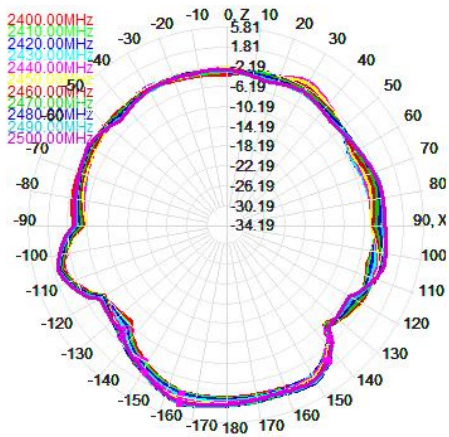
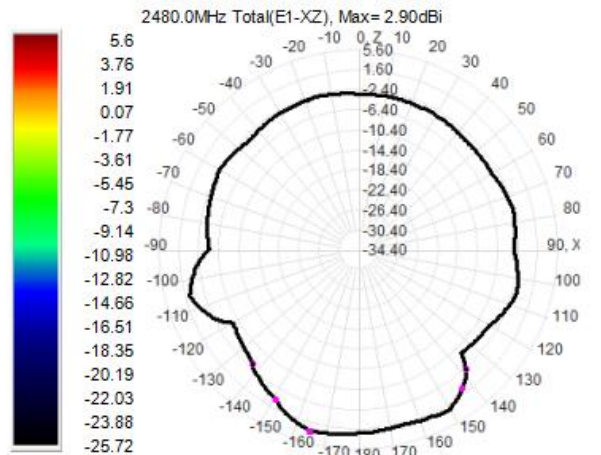
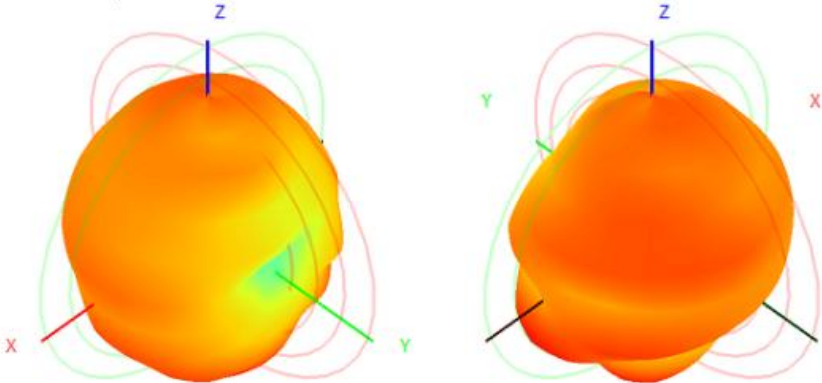
2450.0MHz Total, Eff: 38.9%

Back View



2480.0MHz Total, Eff: 41.9%

Back View



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## 射频性能测量报告

### RF Performance Test Report

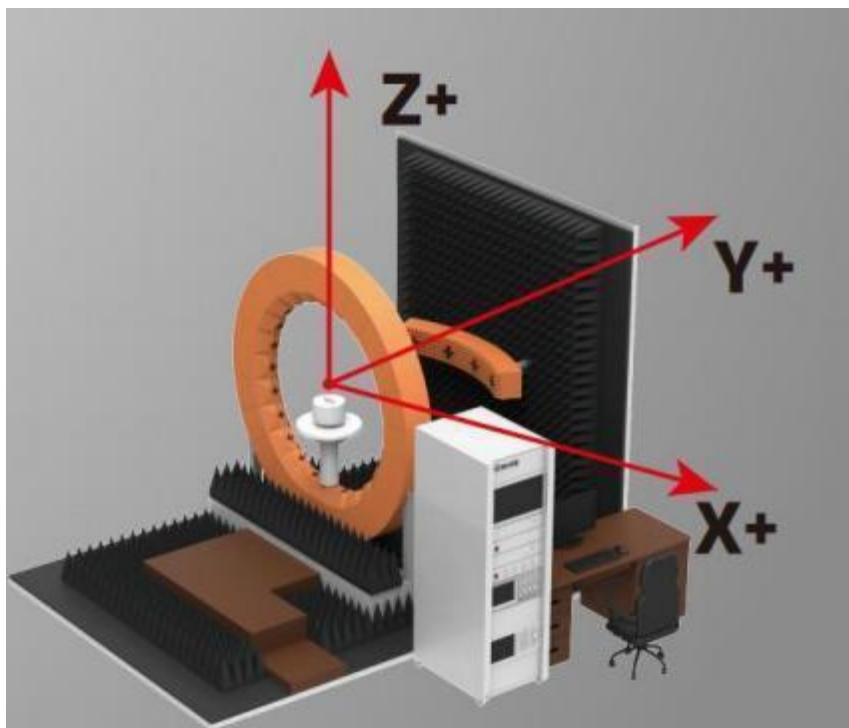
|                       |              |                      |            |                      |             |
|-----------------------|--------------|----------------------|------------|----------------------|-------------|
| 客户名称<br>Customer Name | 汇蓝电子         | 项目名称<br>Project Name | ZQ01       | 合立讯料号<br>Helixun P/N | HLX-ZQ01-V3 |
| 频段<br>Band            | 2400-2500MHz | 测试日期<br>Test Date    | 2025-04-21 | 测试人<br>Inspector     | 卓子骥         |

#### 天线测试设备简介

##### Antenna Test Equipment Introduction

测试天线输入特性使用 **Agilent E5071C and Agilent 5071B** 矢量网络分析仪；辐射特性利用 ETS 三维近场暗室进行测试，并分别使用 CMW500 和 Agilent 5071C 进行了分析。暗房的测试坐标如下：

Test of antenna input characteristics using **Agilent E5071C and Agilent 5071B** vector network analyzer ; The radiation pattern of the antenna are tested using the ETS star lab 3D near field Anechoic Chamber, and the instrument is used to agilent8960 E5515 and Agilent E4438C. The test coordinates of the darkroom are as follows :

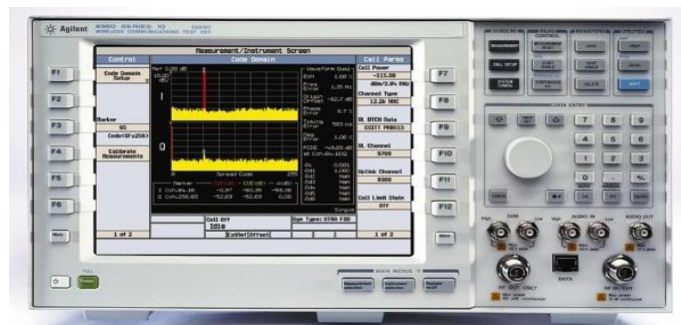


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## Tst S y stem

| Sequence Number   | Test Item         | equipment                     |
|-------------------|-------------------|-------------------------------|
| S parameter       | VSWR              | Agilent 5071C & Agilent 5071B |
| OTA Test          | TRP&TIS           | Agilent 8960 & CMW500 STIMO   |
| Gain & Efficiency | Gain & Efficiency | SATIMO<br>Agilent 5071C       |



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可靠性测试报告

Reliability Test Report

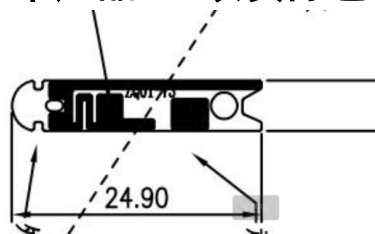
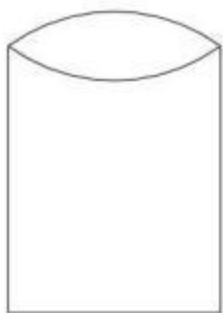
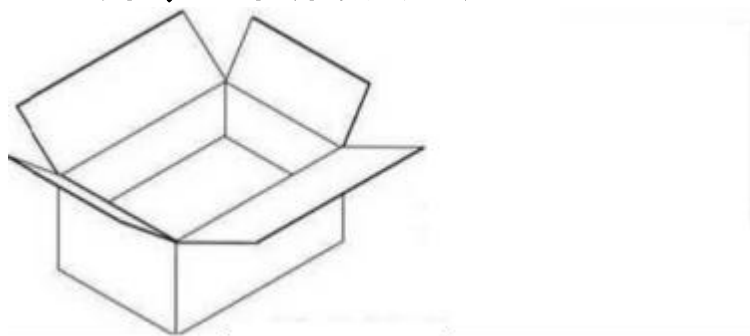
|                             |                                                                                                                          |                           |                          |                      |                  |               |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------|----------------------|------------------|---------------|
| 客户名称<br>Customer Name       | 汇蓝电子                                                                                                                     | 客户料号<br>Customer P/N      |                          | 合立讯料号<br>Helixun P/N | HLX-ZQ01-V3      |               |
| 测试日期<br>Test Date           | 2025-04-21                                                                                                               | 样品数量<br>Sample Qty.       | 3                        | 测试人<br>Inspector     | 卓子骥              |               |
| 测试项目<br>Test Item           | 要求<br>Requirement                                                                                                        | 试验设备<br>testing equipment | 样品 1<br>Sample 1         | 样品 2<br>Sample 2     | 样品 3<br>Sample 3 | 判定<br>PASS/NG |
| 高温存储                        | 在+85℃条件下暴露24H, 恢复 2H 后进行测试                                                                                               | 恒温恒湿箱                     | OK                       | OK                   | OK               | Pass          |
| 低温存储                        | 在-40℃条件下暴露24H, 恢复 2H 后进行测试                                                                                               | 恒温恒湿箱                     | OK                       | OK                   | OK               | Pass          |
| 高温工作                        | 在+60℃条件下通电工作 24H                                                                                                         | 恒温恒湿箱                     | OK                       | OK                   | OK               | Pass          |
| 低温工作                        | 在-20℃条件下通电工作 24H                                                                                                         | 恒温恒湿箱                     | OK                       | OK                   | OK               | Pass          |
| 盐雾试验                        | (5 ± 0. 5)%氯化钠、pH 值为 6. 5~7. 2, 实验箱 温度 (35±2) °C<br><input checked="" type="checkbox"/> 24H <input type="checkbox"/> 48H | 盐雾试验机                     | OK                       | OK                   | OK               | Pass          |
| 连接器铆压 拉拔力                   | 1. 13 线径 ≥10N<br>0. 81 线径 ≥8N<br>RG174 ≥60N<br>RG178 ≥50N                                                                | 推拉力计                      | /                        | /                    | /                | /             |
| 最终结论<br>Conclusion          |                                                                                                                          |                           |                          |                      |                  | Pass          |
| 测试人& 日期<br>Inspector & Date | 卓子骥2025-04-21                                                                                                            |                           | 批准&日期<br>Approval & Date |                      |                  |               |

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**产品包装规范**

PACKING CRITERION

**1、单个产品（以实际包装为准）****2、大PE袋包装（整版/单100pcs）（以实际包装为准）****3、封箱，外箱贴我司生产标签和ROHS标签。（以实际包装为准）**

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## 环保要求

|                |                                                                                                                                                                                   |                              |                              |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------|
| MSDS (材料安全数据表) | <input checked="" type="checkbox"/> 提供                                                                                                                                            | <input type="checkbox"/> 不提供 | <input type="checkbox"/> N/A |
| COC (环保协议)     | <input checked="" type="checkbox"/> 提供                                                                                                                                            | <input type="checkbox"/> 不提供 | <input type="checkbox"/> N/A |
| 环保有害物质云仕技术标准   | <input checked="" type="checkbox"/> 提供                                                                                                                                            | <input type="checkbox"/> 不提供 | <input type="checkbox"/> N/A |
| 具体环保要求         | <input checked="" type="checkbox"/> 符合ROHS2.0 <input checked="" type="checkbox"/> 符合REACH <input checked="" type="checkbox"/> 符合无卤素<br><input checked="" type="checkbox"/> 符合加州65 |                              |                              |

### 安装事宜或其它

Install Wizard or Other

#### 安装过程:

取 1PCS 产品, 用手撕下 FPC 背面的离型纸, 然后将 FPC 定位孔位置与外壳定位孔位置 (定位筋位或定位线) 对齐, 平整的贴附与外壳上, 具体位置如下图所示:

#### 安装过程注意事项:

- ☒ 粘贴天线后保证 FPC 完整贴附于外壳;
- ☒ 定位孔与外壳定位柱位置对齐;
- ☒ FPC 边缘与外壳边缘对齐
- ☐ 带端子天线在将端子扣合到主板 PCBA 端时请首先对其端子, 然后垂直扣合;
- ☐ 拆卸天线端子时需使用工具 (如专用撬棍) 垂直翘起端子, 不可直接拽线拆卸。

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