



# 承 认 书

## SPECIFICATION FOR APPROVAL

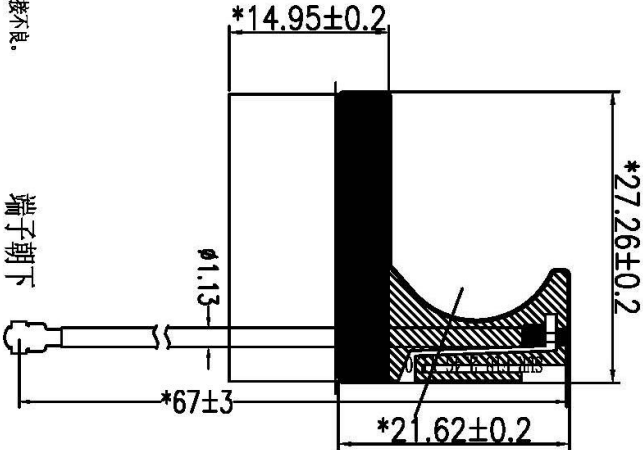
|                                |           |                                    |                |
|--------------------------------|-----------|------------------------------------|----------------|
| 客户名称<br>Customer Name          | 熵基        |                                    |                |
| 客户项目名 Customer<br>Project Name | F180      | 盛邦尔项目名<br>Surbaner Project<br>Name | F180           |
| 客户编码<br>Customer P/N           | A86020082 | 盛邦尔料号<br>Surbaner P/N              | 3160-180-00311 |
| 频段<br>Band                     | 2400MHz   |                                    |                |
| 版本号<br>Version                 | A0        |                                    |                |
| 设计人信息/Designer Information     |           |                                    |                |
| 射频工程师<br>RF Engineer           | 林德良       | 研发主管<br>R&D Director               | 朱瑞平            |
| 结构工程师<br>ME Engineer           | 何尔荣       |                                    |                |

| 盛邦尔审批/Surbaner 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         | 刘胜荣               | 朱瑞平<br>2023-05-25<br>受控技术文件 | 曾炳豪               |                        |                   |
| 日期<br>Date              | 2023. 05. 25      | 5/25                        | 2023. 5. 25       |                        |                   |

| 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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|                                                                         |  |   |  |   |  |   |  |   |  | Rev |  | Description |  | Date              |  | Remark        |  |        |  |        |  |
|                                                                                                                                                            |  |   |  |   |  |   |  |   |  | V01 |  | New drawing |  |                   |  |               |  |        |  |        |  |
| <p>技术要求:</p> <p>1. 注意端子开口朝向, 焊接牢固, 无假焊, 虚焊, 拉尖, 等焊接不良。</p> <p>2. 标“*” 尺寸为重点管控尺寸;</p> <p>3. 未标注尺寸依照图纸;</p> <p>4. 所有部件需符合RoHS 2.0 要求;</p> <p>5. 成品需全检性能。</p> |  |   |  |   |  |   |  |   |  | No. |  | Part No.    |  | Name              |  | Specification |  | Amount |  | Remark |  |
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|                                                                                                                                                            |  |   |  |   |  |   |  |   |  | 89  |  |             |  |                   |  |               |  |        |  |        |  |
|                                                                                                                                                            |  |   |  |   |  |   |  |   |  | 90  |  |             |  |                   |  |               |  |        |  |        |  |
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|                                                                                                                                                            |  |   |  |   |  |   |  |   |  | 95  |  |             |  |                   |  |               |  |        |  |        |  |
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|                                                                                                                                                            |  |   |  |   |  |   |  |   |  | 100 |  |             |  |                   |  |               |  |        |  |        |  |

## 1. Antenna/天线

| No/序号 | Part Name/项目             | SPEC/规格         |
|-------|--------------------------|-----------------|
| 1     | Frequency Range/<br>频率范围 | 2400-2500MHz    |
| 2     | Impendence/阻抗            | 50 ohm nominal  |
| 3     | Gain/增益                  | $\geq 0$ dB     |
| 4     | Polarization/极化          | LINE            |
| 5     | VSWR/驻波比                 | $< 3$           |
| 6     | Efficiency/效率            | $\geq 35\%$ AVG |
| 7     | RF Cable/射频连接线           | 1.13 黑色线 67mm   |
| 8     | RF Connector/连接器         | 1 代端子           |

## 2. Environmental Characteristics/环境特性

| No/序号 | Part Name/项目                   | SPEC/规格  |
|-------|--------------------------------|----------|
| 1     | Operation Humidity<br>/工作湿度    | 5~95%不冷凝 |
| 2     | Operating Temperature/<br>工作温度 | -20~+60℃ |
| 3     | Store Temperatuer/工作<br>储存温度   | -30~+70℃ |
| 4     | Salt Spray Test/<br>盐雾试验       | 24H      |

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FM: SBR-QR-RD-37 REV: A2

# 射频性能测量报告

## RF Performance Test Report

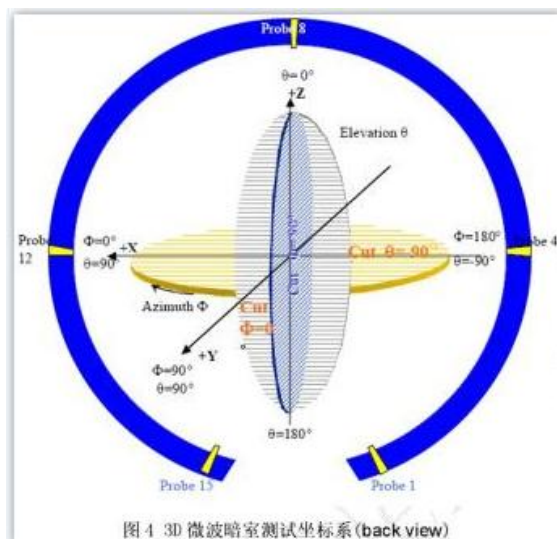
|                       |         |                      |            |                       |                |
|-----------------------|---------|----------------------|------------|-----------------------|----------------|
| 客户名称<br>Customer Name | 熵基      | 项目名称<br>Project Name | F180       | 盛邦尔料号<br>Surbaner P/N | 3160-180-00311 |
| 频段<br>Band            | 2400MHz | 测试日期<br>Test Date    | 2023/05/25 | 测试人<br>Inspector      | 林德友            |

### 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 5062A 矢量网络分析仪；辐射特性利用 Satimo 三维近场暗室进行测试，并分别使用 8960 E5515 和 Agilent E4438C 进行了分析。暗房的测试坐标如下：

Test of antenna input characteristics using Agilent E5071C and Agilent 5062A vector network analyzer; The radiation pattern of the antenna are tested using the Satimo starlab 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:



### 1. S11 参数测量/S11 Parameter-VSWR

使用一根 50 Ω 同轴电缆连接到天线，然后该电缆连接到网络分析仪测量 S11 参数，被测量产品远离金属至少 20 厘米。

Measuring Method is a 50 Ω coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the S11 parameter, Keeping this fixture away from metal at least 20cm.

## S11 Parameter-S11-2.4G



|           |      |      |      |
|-----------|------|------|------|
| Frequency | 2400 | 2450 | 2500 |
| VSWR      | 1.95 | 1.31 | 2.53 |

## 4.Gain & Efficiency-2.4G

| Frequency (MHz) | Efficiency (%) | Peak GAIN (dBi) |
|-----------------|----------------|-----------------|
| 2400            | 42.6           | 0.33            |
| 2410            | 42.8           | 0.54            |
| 2420            | 43.1           | 0.21            |
| 2430            | 43.6           | 0.39            |
| 2440            | 42.8           | 0.48            |
| 2450            | 44.6           | 0.22            |
| 2460            | 42.9           | 0.16            |
| 2470            | 41.8           | 0.35            |
| 2480            | 41.2           | 0.42            |
| 2490            | 40.6           | 0.36            |
| 2500            | 39.9           | 0.29            |

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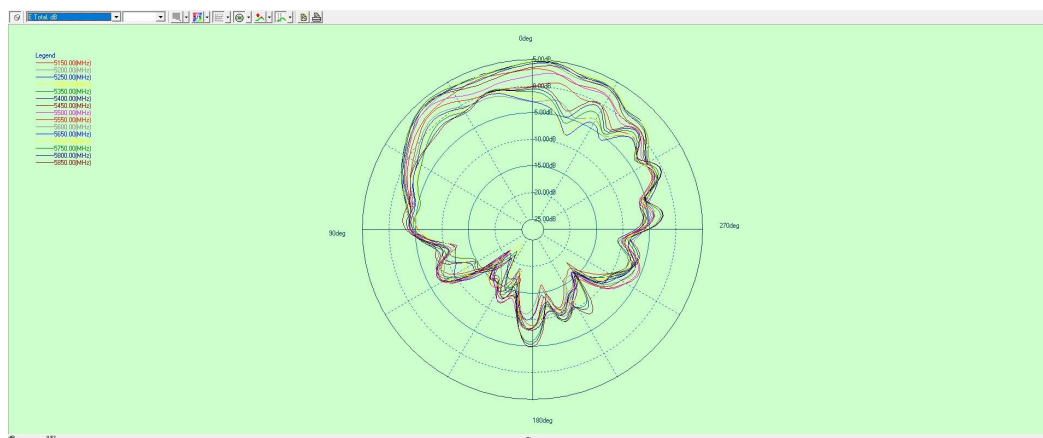
Address: 2/F, Building B25, Hengfeng industrial city, Hezhou community, Xixiang Street, Baoan District, Shenzhen City.

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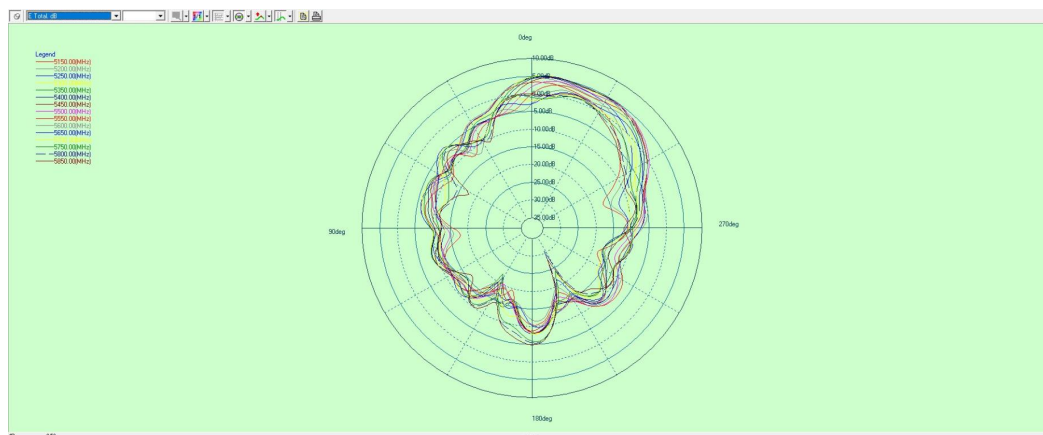
FM: SBR-QR-RD-37 REV: A2

## 2D Pattern--2.4G

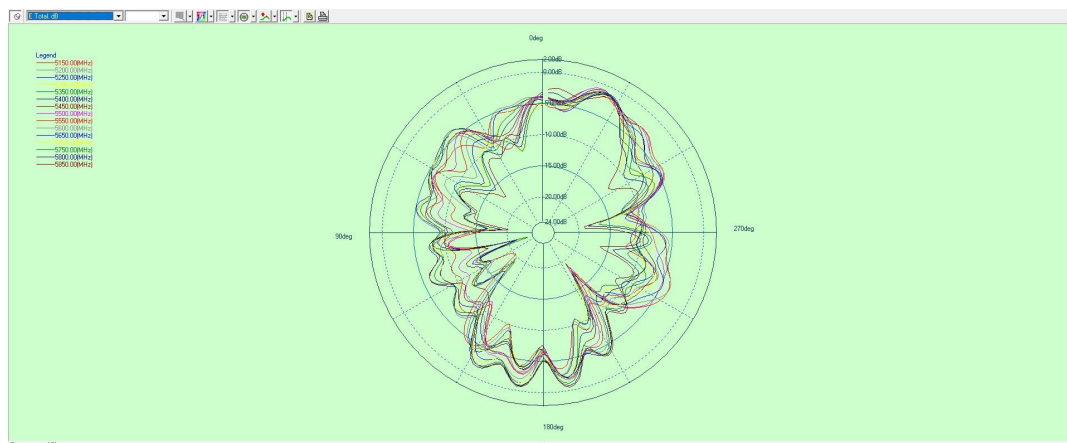
Phi =0



Phi =90



Theta =90



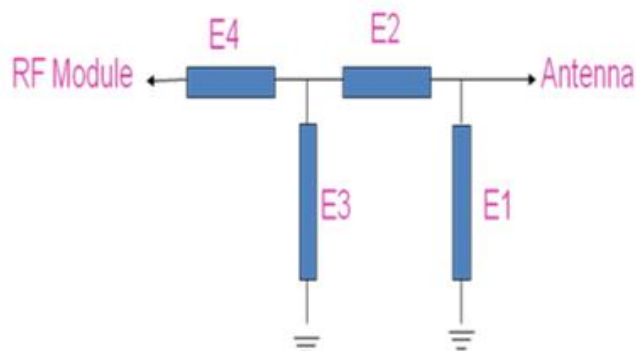
地址：深圳市宝安区西乡街道鹤洲社区恒丰工业城 B25 栋 2 楼 TEL: 0755-82790675 FAX: 0755-82809726

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## 2. 天线匹配网络/Antenna Matching Network



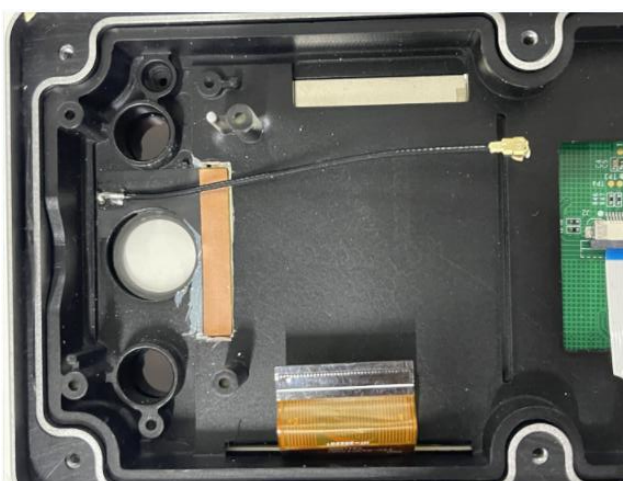
| Element | Capacitor | Inductor |
|---------|-----------|----------|
| E1      | N/A       | N/A      |
| E2      | N/A       | N/A      |
| E3      | N/A       | N/A      |
| E4      | N/A       | N/A      |

PCB板端匹配电路未改动

## 3.OTA

|                 |                   |         |          |          |
|-----------------|-------------------|---------|----------|----------|
| Test Equipment: | R&S CMW270        |         |          |          |
| Test Condition: | 3D chamber        |         |          |          |
| Band            | Wireless Protocol | Channel | TRP(dBm) | TIS(dBm) |
| WIFI            | 802.11 b/11Mbps   | 1       | 11.16    | -76.67   |
|                 |                   | 6       | 10.8     | -75.33   |
|                 |                   | 12      | 9.62     | -77.9    |

## 4.Product Overview & Dimension



## 产品包装规范

### PACKING CRITERION

| 产品包装规范                                                                                                                                                       |       | page: 1 of 1 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------|
| 项目名称:                                                                                                                                                        | 版本: A |              |
| 客户:                                                                                                                                                          | 成品名称: |              |
| <p>一: 成品天线</p> <p>二: 每PE袋装50PCS产品(以实际包装为准)。</p> <p>三: 每10袋装一大袋, (以实际包装为准)。</p> <p>四: 装箱, 每10袋装一箱, 一箱共5000PCS产品(以实际包装为准)。</p> <p>五: 封箱, 外箱贴我司生产标签和ROHS标签。</p> |       |              |

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## 样品尺寸测量报告

## Sample Dimensions Test Report

|                               |                |                      |                            |                  |                |
|-------------------------------|----------------|----------------------|----------------------------|------------------|----------------|
| 客户名称<br>Customer Name         | 熵基             | 客户料号<br>Customer P/N | A86020082                  | 料号<br>P/N        | 3160-180-00311 |
| 测试日期<br>Test Date             | 2023/05/22     | 样品数量<br>Sample Qty.  | 3                          | 测试人<br>Inspector | 曾心荣            |
| 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尺寸 1                         | 27.26±0.2mm    | 27.27                | 27.26                      | 27.25            | Pass           |
| ②尺寸 2                         | 21.62±0.3mm    | 21.63                | 21.62                      | 21.61            | Pass           |
| ③尺寸 3                         | 0.12±0.05mm    | 0.12                 | 0.13                       | 0.12             | Pass           |
| ④尺寸 4                         | 14.95±0.2mm    | 14.97                | 14.95                      | 14.93            | Pass           |
| ⑤尺寸 5                         | 67±3mm         | 68                   | 67                         | 66               | Pass           |
| ⑥                             |                |                      |                            |                  |                |
| ⑦                             |                |                      |                            |                  |                |
| ⑧                             |                |                      |                            |                  |                |
| 最终结论<br>Conclusion            |                |                      |                            |                  | PASS           |
| 测试人&日期<br>Inspector &<br>Date | 曾心荣 2023/05/22 |                      | 批准&日期<br>Approval &<br>ate |                  |                |



## 可靠性测试报告

Reliability Test Report

|                            |                                                                                                                       |                           |                           |                  |                  |               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|------------------|------------------|---------------|
| 客户名称<br>Customer Name      | 熵基                                                                                                                    | 客户料号<br>Customer P/N      | A86020082                 | 料号<br>P/N        | 3160-180-00311   |               |
| 测试日期<br>Test Date          | 2023/05/21                                                                                                            | 样品数量<br>Sample Qty.       | 3                         | 测试人<br>Inspector | 何春辉              |               |
| 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+70℃条件下暴露 24H, 恢复 2H 后进行测试电气性能正常                                                                                     | 恒温恒湿箱                     | OK                        | OK               | OK               | Pass          |
| 低温存储                       | 在-30℃条件下暴露 24H, 恢复 2H 后进行测试电气性能正常                                                                                     | 恒温恒湿箱                     | OK                        | OK               | OK               | Pass          |
| 高温工作                       | 在+60℃条件下通电工作 24H 电气性能正常                                                                                               | 恒温恒湿箱                     | OK                        | OK               | OK               | Pass          |
| 低温工作                       | 在-20℃条件下通电工作 24H 电气性能正常                                                                                               | 恒温恒湿箱                     | OK                        | OK               | OK               | Pass          |
| 连接器<br>盐雾试验                | (5 ± 0. 5)%氯化钠、pH 值为 6. 5~7. 2, 实验箱温度 (35±2)℃<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<br>拔力               | 0. 81 线径 ≥8N<br>1. 13 线径 ≥10N<br>RG174 ≥60N<br>RG178 ≥40N                                                             | 推拉力计                      | 13N                       | 14N              | 14N              | Pass          |
| 最终结论<br>Conclusion         |                                                                                                                       |                           |                           |                  |                  | Pass          |
| 测试人&日期<br>Inspector & Date | 何春辉 2023/05/22                                                                                                        |                           | 批准& 日期<br>Approval & Date |                  |                  |               |

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产品 ROHS 成分宣告表

| 产品名称       | 均匀物质材料 |       | 有害物质含量 ( PPM ) |    |    |      |      |       |      |     |     |      | HS 测试报告编号          | HS 测试报告日期 |
|------------|--------|-------|----------------|----|----|------|------|-------|------|-----|-----|------|--------------------|-----------|
|            |        |       | Pb             | Cd | Hg | Cr6+ | PBBs | PBDEs | DEHP | BBP | DBP | DIBP |                    |           |
| 2.4G<br>天线 | FPC    | 文字油墨  | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | ETR22A01347M01     | 22/10/17  |
|            |        | 3M 胶  | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | SHAEC2217569205    | 23/1/4    |
|            |        | 基材    | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | SHAEC23001049106   | 23/2/15   |
|            |        | 防焊油墨  | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | ETR22705905        | 22/8/5    |
|            |        | 抗氧化剂  | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | SZXEC23000119402   | 23/2/27   |
|            | 导电布    | 导电布   | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | A2220344183101001  | 22/8/11   |
|            | 线材     | 氟化物   | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | NGBMR23000169901   | 23/2/6    |
|            |        | 镀锡铜线  | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | SHAEE22000472905   | 22/8/10   |
|            |        | 黑色色母  | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | HKTEC2202547207    | 22/6/10   |
|            | 端子     | C5210 | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | CANEC2301145810    | 23/2/8    |
|            |        | 塑胶    | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | ETR22800771        | 22/8/10   |
|            |        | 镀金    | ND             | ND | ND | ND   | ND   | ND    | ND   | ND  | ND  | ND   | A2220404860101001C | 22/9/17   |

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 端时请首先对齐端子, 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。