

# 规格承认书

## SPECIFICATION FOR APPROVAL

日期  
**DATE:** 2021. 12. 29

版本  
**REV.:** V01

客 户  
**CUSTOMER:** 德明通讯（上海）有限公司

客户料号  
**CUSTOMER P/N:**

品 名  
**PART NAME:** PCT910 (BT)

供方料号  
**SUPPLIER P/N:** W01-0582-ROA

送样日期 **Date:** 送样数量 **Q'TY:** 5 Pcs

| 客户确认 <b>CUSTOMER APPROVED BY</b> |                |             |
|----------------------------------|----------------|-------------|
| 工程研发部                            | 生产采购部          | 承认          |
| ENGINEER R&D DEPT                | BUSSINESS DEPT | APPROVED BY |
|                                  |                |             |

| 供方确认 <b>SUPPLIER SIGNATURE</b> |                   |          |
|--------------------------------|-------------------|----------|
| 研发部                            | 工程部               | 批准       |
| ENGINEER R&D DEPT              | ENGINEER R&D DEPT | APPROVAL |
|                                |                   |          |

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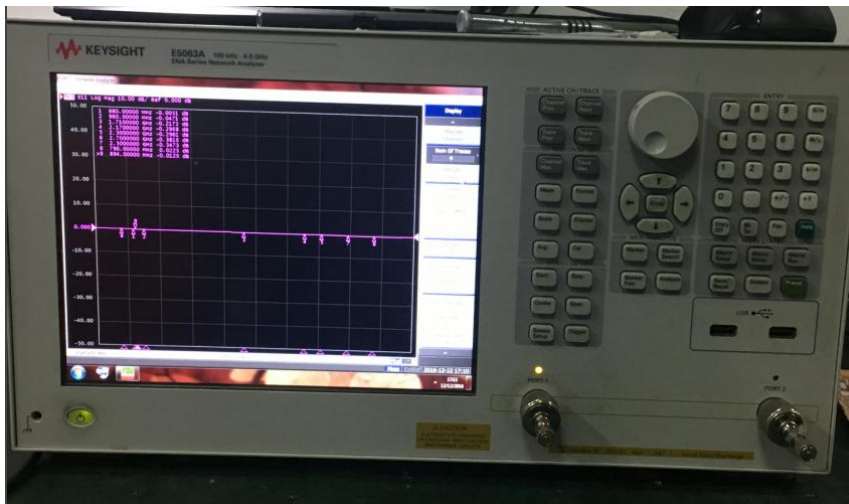
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## 1. RF Fixture Experiment

### 1.1 Test Setup

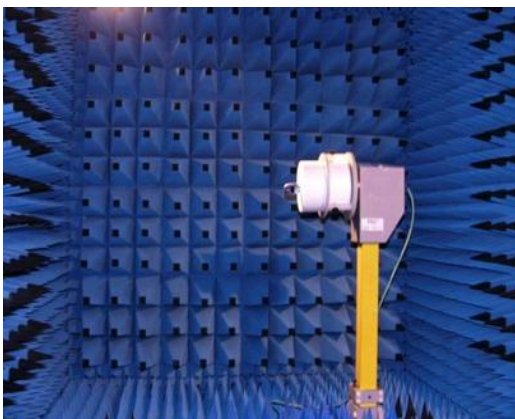
#### 1.1.1 VNA Test Setup

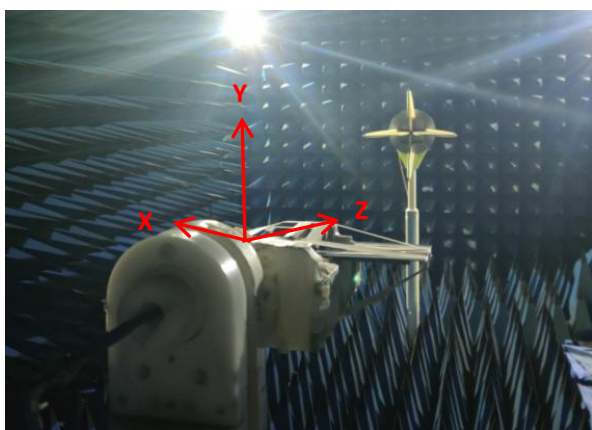
VSWR and Return Loss measurements (S11) were performed using an Keysight E5071C Network Analyzer. The isolation between antennas is also tested. The testing was performed with apparatus in free space.



#### 1.1.2 Anechoic Chamber Test Setup

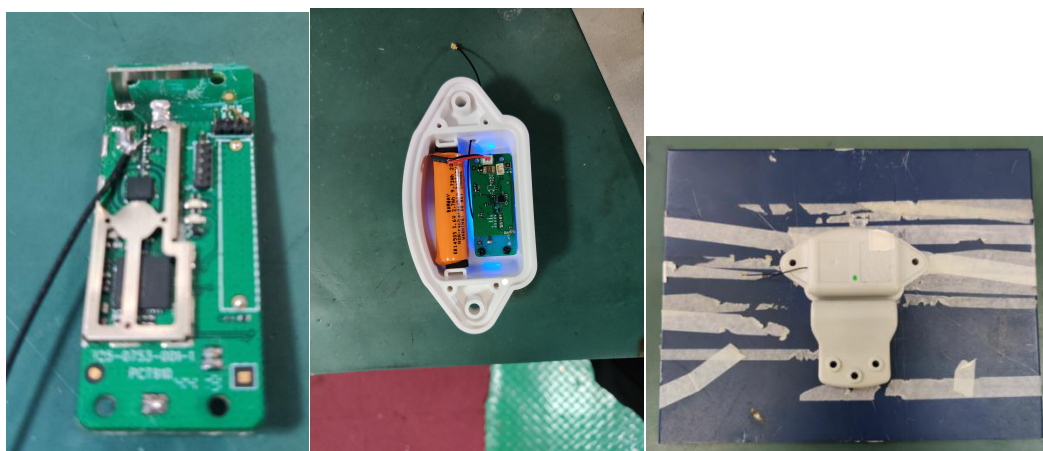
When we test Gain and Efficiency of the antenna, we will use the ETS 3D chamber. The chamber provides test frequency from 400MHz to 6GHz. The real test environment is showing as following picture





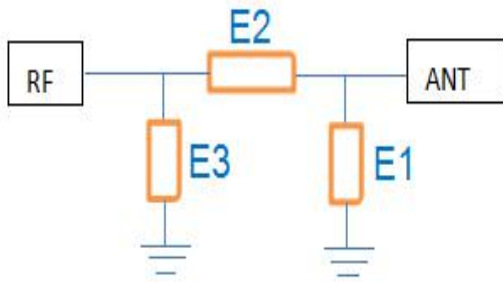
## 1.2 UE configuration

### 1.2.1 Antenna location picture



## 1.2.2 RF matching for different antennas

### LTE

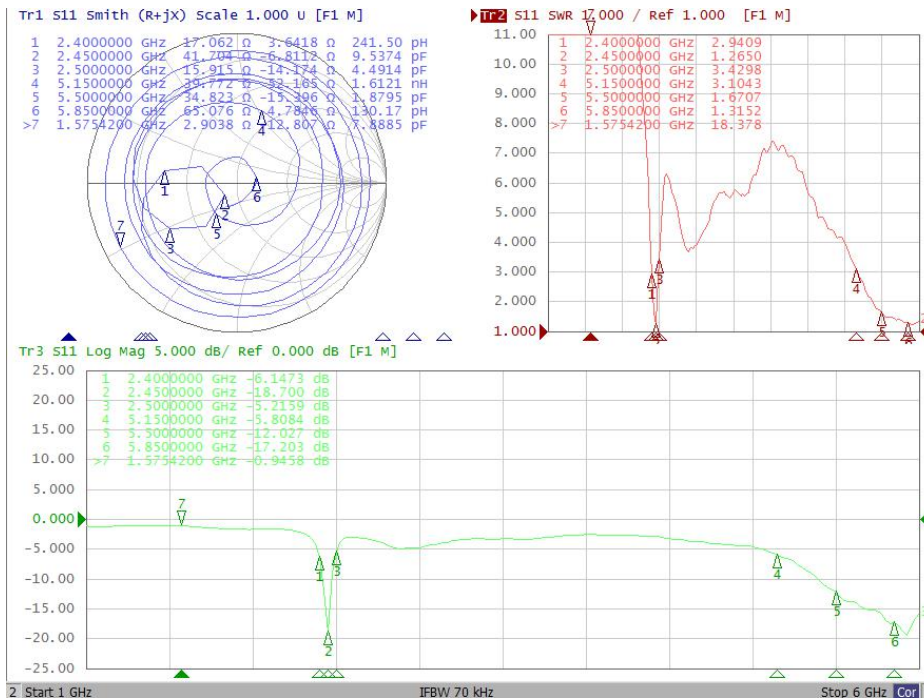


|          |       |
|----------|-------|
| E1(0201) | 3.3pF |
| E2(0201) | 1.8nH |
| E3(0201) | NA    |

## 2. Test Result

### 2.2 Passive Test Result(S parameters)

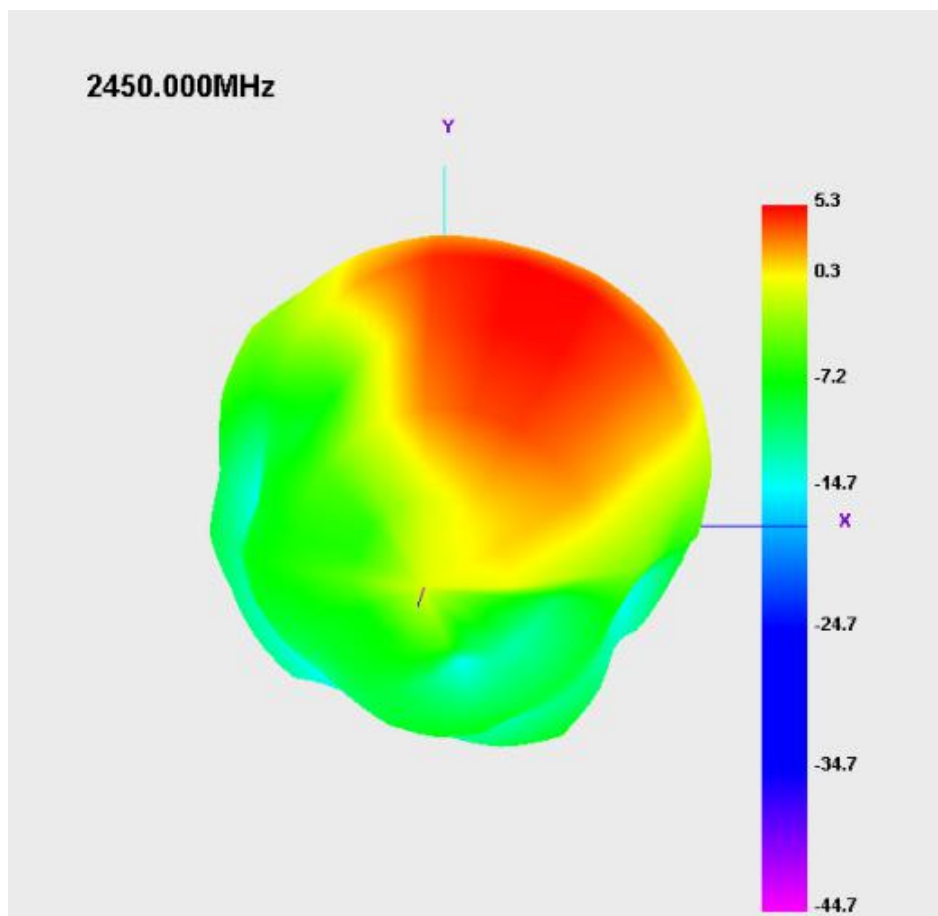
#### BT Antenna-S11



**BT Antenna Effi**

| Freq  | Effi  | Gain  |
|-------|-------|-------|
| (MHz) | (%)   | (dBi) |
| 2400  | 21.93 | 4.05  |
| 2410  | 23.51 | 5.01  |
| 2420  | 25.84 | 5.29  |
| 2430  | 26.44 | 5.43  |
| 2440  | 25.9  | 5.48  |
| 2450  | 23.82 | 5.33  |
| 2460  | 24.39 | 5.27  |
| 2470  | 23.48 | 5.08  |
| 2480  | 23.13 | 4.8   |
| 2490  | 22.65 | 3.83  |
| 2500  | 20.81 | 3.76  |

### Ant 3D Patterns





报告日期: 2021年12月27日

报告编号: 202101227-001

|               |              |                  |              |
|---------------|--------------|------------------|--------------|
| 产品名称          | PCT910       | 料号               | W01-0582-R0A |
| BT铜片天线        |              | CUSTOMER P/N     |              |
| 客户            | 德明           | 试验数量             | 5pcs         |
| CUSTOMER      |              | CHECK QTY        |              |
| 测试标准          | GB/T 2423.17 | 测试时间             | 2021.12.26   |
| TEST STANDARD |              | THE TEST OF TIME | 2021.12.27   |

**一. 试验条件/方法**

| 测试条件Test Conditions        | 要求标准criteria                  | 实际数值Actual value            |
|----------------------------|-------------------------------|-----------------------------|
| 盐水成份Salt ingredients       | (5±1)%/NaCl                   | 5%                          |
| 饱和温度Saturation temperature | 47±2℃                         | 47.8℃                       |
| 盐水PH值Salt PH               | 6.5-7.2                       | 6.8                         |
| 喷雾方式Spray method           | 连续喷雾Continuous spray          | 连续喷雾Continuous spray        |
| 测试时间Testing time           | 24H                           | 24H                         |
| 压缩空气节压力                    | (1±0.1)kg/cm <sup>2</sup>     | 1kg/cm <sup>2</sup>         |
| 盐雾湿度Salt spray humidity    | >85%                          | 85.5%                       |
| 沉降量                        | (1~2) ml/80cm <sup>2</sup> .h | 1.53ml/80cm <sup>2</sup> .h |
| 盐水温度                       | 35±2℃                         | 36℃                         |

盐雾沉降量收集数据如下:

| 收集日期       | 试验箱温度 | 盐雾收集量 (ml) | 收集时间 | 沉降量 (ml/80cm <sup>2</sup> .h) |
|------------|-------|------------|------|-------------------------------|
| 2021-12-25 | 35.4  | 36         | 13   | 1.54                          |
| 2021-12-26 | 35.7  | 37         | 13   | 1.53                          |
|            |       |            |      |                               |

**二. 判定标准**

试验后, 天线应满足如下要求, 即为合格:

1. 天线整体外观良好, 铜片表面没有变色, 表面无氧化, 生锈;

**三. 试验结果**




检验结果描述

- 1) 天线整体外观良好, 铜片表面没有变色, 端子无氧化;

|                      |  |                  |  |
|----------------------|--|------------------|--|
| 最终判定<br>FINAL RESULT | <input checked="" type="checkbox"/> 合格<br>PASS |                  | <input type="checkbox"/> 不合格<br>REJECT |
| 检验员<br>INSPECTOR     | 严金花  | 审核<br>CHECKED BY | 朱建勇                                    |

表单编号: WI-QC-036/B01/A0



| 四. 试验照片   |       |  |              |              |
|---|-------|--|--------------|--------------|
| 1. 试验前样品  |       | 2. 设备照片 (设备参数设置界面)   |              |              |
|    |       |  |              |              |
| 3. 试验后样品图示  |       |  |              |              |
|  |       |  |              |              |
| 五. 试验涉及设备信息   |       |  |              |              |
| 序号  | 设备名称  | 规格型号   | 校准日期         | 下次校准时间       |
| 1   | 盐雾试验箱 | Model:LX-60A   | 2021. 10. 11 | 2022. 10. 10 |
|   |       |  |              |              |
|   |       |  |              |              |

报告完结

# 深圳得自在科技有限公司

## 产品全尺寸测量报告

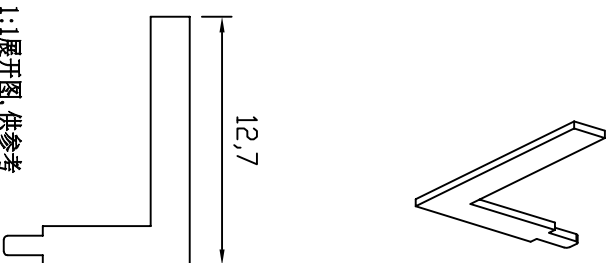
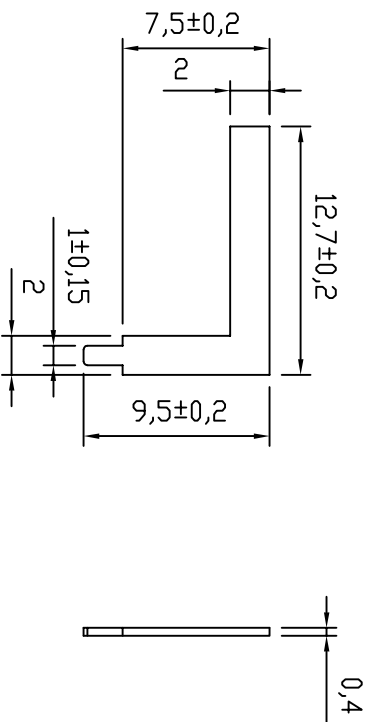
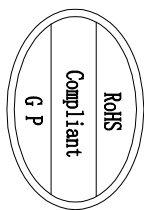
版本: 1

| Vendor(供应商) |           | 材质名称         |        | SUS430钢片                 |       | Part NO (料号)     |          | W01-0582-R0A |          | Tool Number (模号) |          | Cav. Number (穴数) |          | Inspectio(受测类型)  |       |             |         |         | Unit(单位)  |       |            |        |          | 测量者                  |           | 沈凤桥                 |        |  |  |  |
|-------------|-----------|--------------|--------|--------------------------|-------|------------------|----------|--------------|----------|------------------|----------|------------------|----------|--|-------|-------------|---------|---------|---|-------|------------|--------|----------|----------------------|-----------|---------------------|--------|--|--|--|
| 得自在         |           | 材质牌号         |        | N.A.                     |       | Part Name (零件名称) |          | PCT910       |          | Rev(版本)          |          | 1                |          | <input type="checkbox"/> New Tool (新) <input type="checkbox"/> EC (设变)<br><input type="checkbox"/> Repair (修模) <input type="checkbox"/> other (其他) |       |             |         |         | <input checked="" type="checkbox"/> MilliMeiter |       |            |        |          | 确认者                  |           | 严金花                 |        |  |  |  |
| 日期          |           | 2021.12.27   |        | MEASURED DIMENSION(实测尺寸) |       |                  |          |              |          |                  |          |                  |          | % TOLERANCE USED (公差使用百分比)   |       | DISPOSITION |         |         |   |       |            |        |          |                      |           | ACCEPTABLE VARIANCE |        |  |  |  |
| DM. #       | DIMENSION | DRAWING ZONE | + TOL. | - TOL.                   | NOTE  | SAMPLE 1         | SAMPLE 2 | SAMPLE 3     | SAMPLE 4 | SAMPLE 5         | SAMPLE 6 | SAMPLE 7         | SAMPLE 8 | UPPER  | LOWER | 0%-25%      | 25%-50% | 50%-75% | 75%-100%  | 100%+ | Re-Measure | Accept | Fix Tool | Accept With Variance | DIMENSION | + TOL.              | - TOL. |  |  |  |
| 1           | 12.7      | 12.90        | 0.200  | 0.200                    | 12.50 | 12.74            | 12.75    | 12.75        | 12.72    | 12.73            | 12.76    | 12.74            | 12.75    | 30%  | 0%    |             | X       |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 2           | 7.5       | 7.70         | 0.200  | 0.200                    | 7.30  | 7.52             | 7.55     | 7.54         | 7.53     | 7.54             | 7.53     | 7.55             | 7.52     | 25%  | 0%    | X           |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 3           | 2         | 2.20         | 0.200  | 0.200                    | 1.80  | 2.01             | 2.03     | 2.04         | 2.04     | 2.05             | 2.03     | 2.05             | 2.04     | 25%  | 0%    | X           |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 4           | 9.5       | 9.70         | 0.200  | 0.200                    | 9.30  | 9.55             | 9.54     | 9.54         | 9.56     | 9.53             | 9.55     | 9.56             | 9.54     | 30%  | 0%    |             | X       |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 5           | 1         | 1.15         | 0.150  | 0.150                    | 0.85  | 1.02             | 1.03     | 1.05         | 1.02     | 1.04             | 1.05     | 1.05             | 1.03     | 33%  | 0%    |             | X       |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 6           | 2         | 2.20         | 0.200  | 0.200                    | 1.80  | 2.01             | 2.02     | 2.02         | 2.03     | 2.04             | 2.05     | 2.04             | 2.05     | 25%  | 0%    | X           |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 7           | 0.4       | 0.50         | 0.100  | 0.100                    | 0.30  | 0.42             | 0.43     | 0.41         | 0.45     | 0.44             | 0.45     | 0.43             | 0.44     | 50%  | 0%    |             | X       |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 8           |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 9           |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 10          |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 11          |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 12          |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 13          |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 14          |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 15          |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 16          |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 17          |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |
| 最终判定: 合格    |           |              |        |                          |       |                  |          |              |          |                  |          |                  |          |  |       |             |         |         |   |       |            |        |          |                      |           |                     |        |  |  |  |

制作: 沈凤桥

检查: 严金花

批准: 朱建勇



1:1展开图,供参考

备注:

1. 材料:SUS430 镀镍, T=0.4; 字体和标识为钢印
- . 安规要求: ROHS
- . 品质要求按照南斗星《IQC进料检验规范》执行

| Rev | Description | Date | Remark |
|-----|-------------|------|--------|
| 1   | New drawing |      |        |

|  |                          |                       |              |                    |  |
|--|--------------------------|-----------------------|--------------|--------------------|--|
| 深 圳 得 自 在 科 技 有 限 公 司<br>SHEN ZHEN Be Comfortable CO., LTD           |                          | Project<br>PCT910     |              | Date<br>2019.12.30 |  |
| Third Angle<br>0.02  | Part Name<br>BT钢片天线      | Designed by<br>MD 尹增平 |              |                    |  |
| 0~10 ±0.05<br>10~18 ±0.10<br>18~30 ±0.12<br>30~40 ±0.15<br>40~ ±0.20 | Part No.<br>W01-0582-R0A | Checked by<br>RF 毛惠涛  |              |                    |  |
| Angle<br>±0.5°   | Material<br>SUS430       | Approved by<br>RF 毛惠涛 |              |                    |  |
| Location<br>N/A  | DWG No.<br>W01-0582-R0A  | Unit<br>mm            | Scale<br>1:1 | Rev<br>A           |  |

由 Autodesk 教育版产品制作  
产品包装规范

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日期: 2019. 12. 31

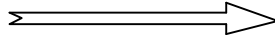
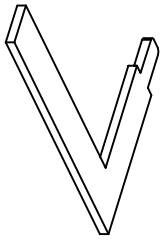
page: 1 of 1

成品名称 :PCT910 BT钢片

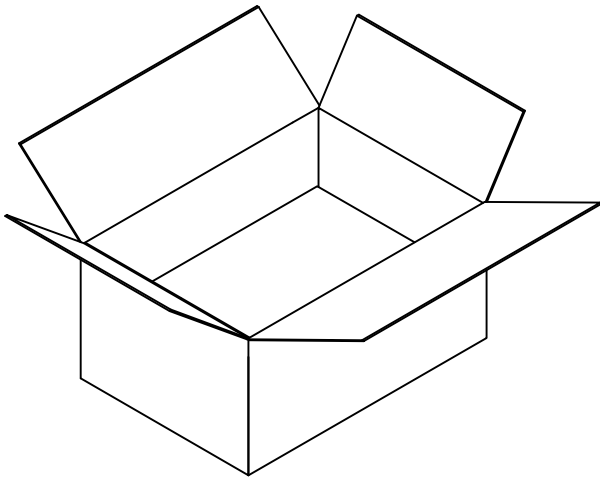
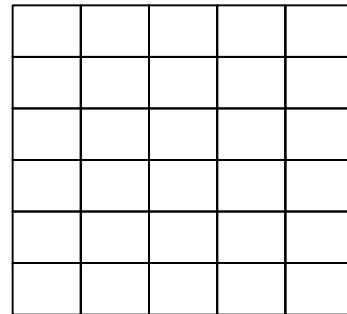
版本: A

客户: 德明

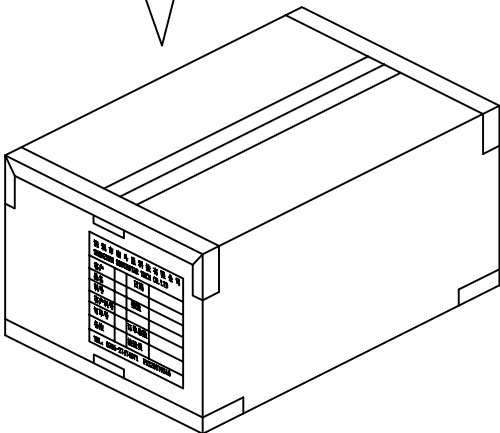
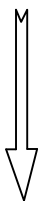
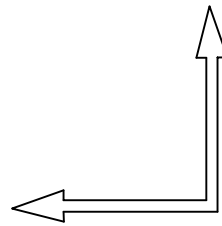
一: 成品天线



二: 用吸盘包装



三: 装一箱, 以实际包装为准



四: 封箱, 外箱贴我司生产标签和 ROHS 标签.

批准: \_\_\_\_\_

确认: 毛惠涛 拟制: \_\_\_\_\_

尹增平