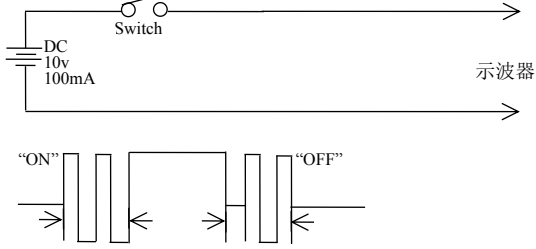


# 承 认 书



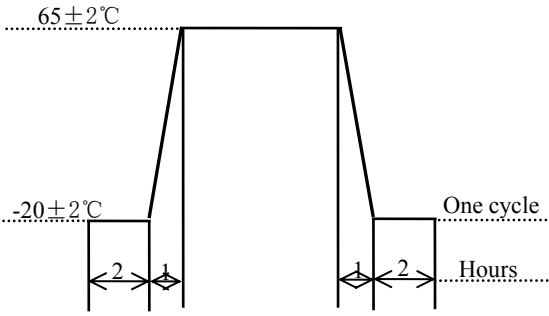
## APPROVAL SHEET

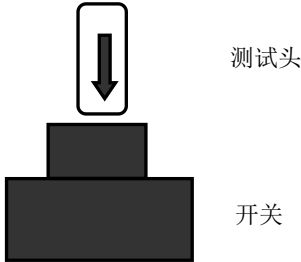
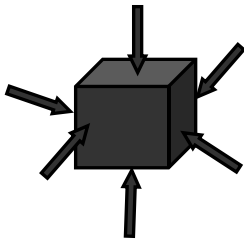
|                                    |                    |
|------------------------------------|--------------------|
| 客 户<br>CUSTOMER                    |                    |
| 客户产品型号/规格<br>PRODUCT SPECIFICATION |                    |
| 品 名<br>PART NAME                   | 轻触开关               |
| 型 号<br>MODEL NO                    | TS37AA             |
| 料 号<br>PART NO                     | 3.7*3.7*0.35 250gf |
| 提 出 者<br>DESIGNED BY               | WLL                |
| 确 认<br>APPROVER                    | YJF                |
| 提出日期<br>SENDING DATE               | 2013-12-12         |
| 客户确认签印栏<br>APPROVED BY CUSTOMER    |                    |

|   |                               |   |                                    |
|---|-------------------------------|---|------------------------------------|
| <b>1.General specification 基本事项</b>   |                               |   |                                    |
| 1.1 Switch action 开关种类: Tact Switch 轻触开关  |                               |   |                                    |
| 1.2 Switch rating 最大额定值: DC 12V, 50mA   |                               |   |                                    |
| 1.3 Operation temperature range 使用温度试验范围: -25℃~+85℃   |                               |   |                                    |
| 1.4 Preservative temperature range 保存温度范围: -40℃~+85℃  |                               |   |                                    |
| 1.5 Appearance and dimensions: See outside drawing page 外形尺寸: 见外形尺寸图  |                               |   |                                    |
| 1.6 Standard condition: Unless otherwise specified, the test and measurements shall be carried out as follows: 试验、测定状态<br>Ambient temperature 温度: 5~35℃<br>Relative humidity 相对湿度: 45~85%<br>Air pressure 气压: 86~106KPa (860~1060mbar)<br>However, if doubt arises on the decision based on the measured<br>Values under the above-mentioned conditions, the following conditions be employed<br>但是在对判定产生疑义时, 按下述状态实施:<br>Ambient temperature 温度: 20±2℃<br>Relative humidity 相对湿度: 65±5%<br>Air pressure 气压: 86~106KPa (860~1060mbar) |                               |   |                                    |
| <b>2.Performance 性能</b>   |                               |   |                                    |
| <b>2.1 Electrical characteristics 电气性能</b>  |                               |   |                                    |
| Item<br>项 目   |                               | Test condition<br>测试条件  | Performance<br>规 格                 |
| 2.1.1   | Contact Resistance<br>接触电阻    | Push force: (Operation force)x2<br>测定时的负荷: 操作方向动作力基准值的 2 倍<br>Measurement tool: Contact resistance meter<br>测定器: 微电流接触电阻计 (1KHz,20V,5~50mA) | 100mΩ Max<br>100 毫欧以下              |
| 2.1.2   | Insulation Resistance<br>绝缘电阻 | DC 250V(Between terminals) frame for 1 minute<br>不相接的两端子间、端子与塑胶间施加 DC250V 电压,<br>持续 1 分钟测量  | 100MΩ Min<br>100 兆欧以上              |
| 2.1.3   | Withstand Voltage<br>耐电压      | AC 250V(Between terminals) frame for 1 minute<br>不相接的两端子间、端子与塑胶间施加 AC250V 电压,<br>持续 1 分钟测量  | No insulation destruction<br>无绝缘破坏 |
| 2.1.4   | Bouncing<br>触点抖动              | Operation speed:3~4times/s<br>操作速度: 每秒 3~4 次<br>        | ON: 5ms max 以下<br>OFF: 5ms max 以下  |
|   |                               |   |                                    |

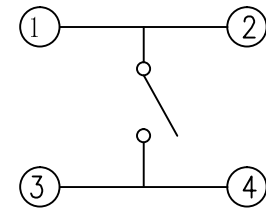
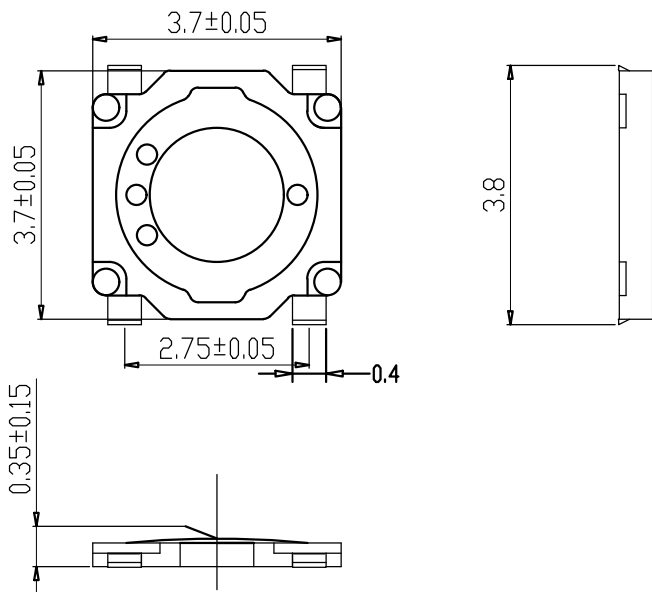
## 2.2 Mechanical Characteristics 机械性能

| Item<br>项 目 |                             | Test condition<br>测试条件  | Performance<br>规 格  |
|-------------|-----------------------------|---|---|
| 2.2.1       | Operations Force<br>动作力     | Push by recommended operating condition<br>测量时，轻触开关动作方向均匀施加静负荷。   | 250±50gf  |
| 2.2.2       | Travel to closure<br>运作行程   | Push by recommended operating condition<br>F=(Operations Force)x2<br>在开关的顶掣的面中央沿开关动作方向施加 2 倍操作力<br>测量行程，测量仪器的顶端应平。  | 0.15±0.05mm   |
| 2.2.3       | Push strength<br>按压强度       | 30N (3Kgf) for 1 minute<br>在开关驱动器件顶端中央，在垂直方向加 30N (3Kgf)力，<br>作用 60 秒   | No damage(Electrical and mechanical)<br>无异常（电气、机械性能）  |
| 2.2.4       | Vibration test<br>耐振性       | 1)Amplitude 全振幅：1.5mm<br>2)Sweep rate: 10-55-10Hz for 1 minute<br>扫描速度：10-55-10Hz 1 分钟<br>3) Sweep method: Logarithmic frequency sweep rate<br>扫描方式：对数频率扫描速度<br>4) Vibration direction: X、Y、Z（3 directions）<br>振动方向：X、Y、Z（3 方向）<br>5) Time: Each direction 2 hours(Total 6 hours)<br>时间：每个方向 2 个小时（共 6 个小时） | No.2.1 and 2.2.1 to 2.2.2 shall be satisfied<br>满足 2.1 项和 2.2.1 至 2.2.2 项。  |
| 2.2.5       | Soldering heat test<br>耐焊接热 | Soldering area: t/2 of P.W.B thickness<br>(P.C.B: T=1.6mm)<br>焊接面积：印刷基板的 1/2 厚度处<br>Soldering temperature: 260±5℃<br>焊接温度：260±5℃<br>Soldering time: 3±0.5sec<br>焊接时间：3±0.5 秒  | No damage(Electrical and mechanical)<br>无异常（电气、机械性能）  |
| 2.2.6       | Solderbility<br>可焊性         | After sprated flux<br>涂上助焊剂后<br>Temperature: 245±5℃<br>温度：245±5℃<br>Soldering time: 3±0.5sec<br>焊接时间：3±0.5 秒  | 90% or more of surface area of the<br>portion immersed in solder shall be<br>covered by new solder<br>90%或更多的浸焊面积能被焊锡覆盖 |
|             |                             |   |   |

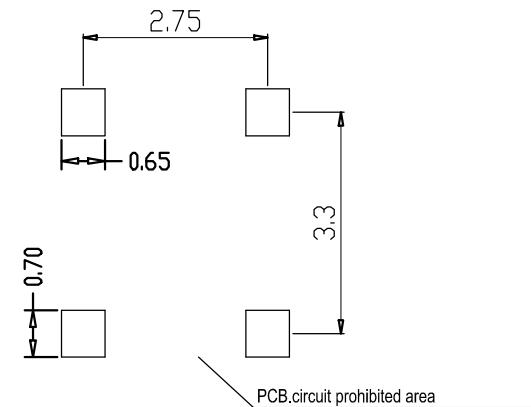
| 2.3 Climatic Characteristics 机械性能 |                                   |  |  |
|-----------------------------------|-----------------------------------|--|--|
| Item<br>项 目                       |                                   | Test condition<br>测试条件   | Performance<br>规 格   |
| 2.3.1                             | Cold test<br>耐寒性                  | 1) Temperature: $-20\pm 2^{\circ}\text{C}$<br>温度: $-20\pm 2^{\circ}\text{C}$<br>2) Duration of test: 48h<br>持续时间: 48 小时<br>3) Take off a drop water<br>去掉水珠<br>4) Standard conditions after test: 1h<br>试验后的放置条件: 1 小时   | No.2.1 and 2.2.1 to 2.2.2 shall be satisfied<br>满足 2.1 项和 2.2.1 至 2.2.2 项。 |
| 2.3.2                             | Heat test<br>耐热性                  | 1) Temperature: $70\pm 2^{\circ}\text{C}$<br>温度: $70\pm 2^{\circ}\text{C}$<br>2) Duration of test: 48h<br>持续时间: 48 小时<br>3) Standard conditions after test: 1h<br>试验后的放置条件: 1 小时   | No.2.1 and 2.2.1 to 2.2.2 shall be satisfied<br>满足 2.1 项和 2.2.1 至 2.2.2 项。 |
| 2.3.3                             | Temperature cyclig test<br>温度并变试验 | According to following figure, after 5cycles, test after<br>Keeping in normal condition for 30min.<br>如图环境所示, 循环 5 次后, 放置在正常环境中, 1 小时<br>后进行测量。<br>                              | No.2.1 and 2.2.1 to 2.2.2 shall be satisfied<br>满足 2.1 项和 2.2.1 至 2.2.2 项。 |
| 2.3.4                             | Humidity test<br>耐湿性              | 1) Temperature: $40\pm 2^{\circ}\text{C}$<br>温度: $40\pm 2^{\circ}\text{C}$<br>2) Relative humidity: 90~95%<br>相对湿度: 90~95%<br>3) Duration of test: 48h<br>持续时间: 48 小时<br>4) Take off a drop water<br>去掉水珠<br>5) Standard conditions after test: 1h<br>试验后的放置条件: 1 小时 | No.2.1 and 2.2.1 to 2.2.2 shall be satisfied<br>满足 2.1 项和 2.2.1 至 2.2.2 项。 |
|                                   |                                   |  |  |

| Item<br>项 目 |  | Test condition<br>测试条件  | Performance<br>规 格   |
|-------------|--|---|--|
| 2.3.5       | Endurance (switching)<br>action<br>耐久特性（开关寿命）    | <p>1) Operation speed: 20~30times/min<br/>动作速度: 20~30 次/分钟</p> <p>3) Push force: Maximum vale of operation force<br/>按力: 动作力规格值的上限</p> <p>3) Operation number: 80, 000 times<br/>动作次数: 80, 000 次</p> <p>安装示意图</p>  | <p>Contact resistance: 200mΩ max<br/>接触电阻: 200mΩ以下</p> <p>Bouncing: 10 ms max<br/>触点抖动: 10 毫秒以下</p> <p>Insulation resistance: 100MΩ min<br/>绝缘电阻: DC 250V, 大于 100MΩ</p> <p>Withstand voltage: No.destruction<br/>耐电压: 无绝缘破坏</p> <p>Variations rate of operation force shall be within ±30% to the value be fore testing<br/>动作力的变化范围在初始值的±30%以内</p> <p>2.2.2 shall be satisfied<br/>满足 2.2.2 项</p> |
| 2.3.6       | Withstand K <sub>2</sub> S<br>耐 K <sub>2</sub> S | <p>1) Density: 3±1ppm<br/>浓度: 3±1ppm</p> <p>2) Temperature: 40±2℃<br/>温度: 40±2℃</p> <p>3) Relative humidity: 90~95%<br/>相对湿度: 90~95%</p> <p>4) Duration of test: 12h<br/>持续时间: 12 小时</p> <p>5) Standard conditions after test: 1h<br/>试验后的放置条件: 1 小时</p>  | <p>No.2.1 and 2.2.1 to 2.2.2 shall be satisfied<br/>满足 2.1 项和 2.2.1 至 2.2.2 项。</p>   |
| 2.3.7       | Salt mist<br>盐雾试验                                | <p>At 5% Nacl liquor for 8±1 hours depend on 35℃, after washing, keep in normal condition.<br/>5%的 Nacl 溶液, PH 值: 6.5~7.2, 在 35℃的条件下喷雾 8±1 小时, 用清水洗干净后并在室温下晾干。</p>  | <p>No remarkable corrosion shall be recognized in metal part.<br/>在金属件上没有腐蚀斑点。</p>   |
| 2.3.8       | Shock<br>耐冲击性                                    | <p>Peak acceleration: 490m/S<sup>2</sup>      Duration of test: 11ms<br/>冲击加速度: 490m/S<sup>2</sup>      持续时间: 11ms</p> <p>Test time-6direction, each 3 times total 18 times<br/>测试次数-6 个方向, 各 3 次共计 18 次。</p>    | <p>No.2.1 and 2.2.1 to 2.2.2 shall be satisfied<br/>满足 2.1 项和 2.2.1 至 2.2.2 项。</p>   |
|             |  |   |  |

|   |   |
|---|---|
| <b>3.Precaution 注意事项</b>  |   |
| <b>3.1 Soldering condition 浸焊条件</b>   |   |
| Item 项目   | Condition 测试条件  |
| Preheat temperature<br>预热温度   | 110℃ max (Embilomental temperature of soldering surface of P.C.B)<br>110℃ 以下 (印刷基板焊锡周围的温度)  |
| Preheat time<br>预热时间  | 60 sec, max<br>60 秒以内   |
| Area of flux<br>助焊剂面积   | 1/2 max of P.C.B thickness<br>印刷基板厚度的 1/2 以内  |
| Temperature of solder<br>焊锡温度   | 260±5℃ max<br>260±5℃ 以下   |
| Times of immersion<br>浸焊时间  | Within 5 sec<br>5 秒以内   |
| Soldering number<br>浸焊次数  | Within 2 times(But should bring down heat of the first soldering)<br>2 次以内 (但应把第一次焊锡的温度降下来) |
| Printed wiring board<br>印刷基板  | Single sided copper-clad laminates<br>单面铜箔  |
|   |   |
| <div>1) After switches were soldered, please be careful not to clean switches with solvent.<br/>开关浸焊后, 注意不要用溶剂清洗。</div> <div>2) In the case of using soldering iron, soldering conditions shall be 280℃ max and 3 sec max.<br/>在使用烙铁的情况下, 焊锡温度应在 280℃ 以下、3 秒以内。</div> <div>3) Right after switches were soldered; please be careful not to load on the knobs of switches.<br/>浸焊后, 注意不要在手柄顶部施加负荷。</div> <div>3.2 Design instructions (设计中应注意事项)</div> <div>1) Follow recommended P.C.B piercing plan in the outside drawing page.<br/>印刷基板的安装孔尺寸参见产品图。</div> <div>3.3 Note (注意点)</div> <div>1) Please be cautious not to give excessive static load or shock to switches.<br/>注意不要施加超过负荷的压力或晃动开关。</div> <div>2) Please be careful not to pile up P.C.B after switches were soldered.<br/>开关焊接以后, 印刷基板注意不要叠放。</div> <div>3) Preservation under high temperature and high humidity or corrosive gas should be avoided especially. When you need to preserve for a long Period, do not open the carton.<br/>保管时尤其应注意避开高湿高温和有腐蚀性气体的环境, 如需长时间保存, 请不要打开包装箱。</div> |   |




开关示意图



### SPECIFICATIONS

- 1.Operating temperature range:  $-30^{\circ}\text{C}$  to  $85^{\circ}\text{C}$
- 2.Rating: DC12V 50mA
- 3.Insulation resistance:  $100\text{M}\Omega$  min 100V DC
- 4.Dielectric strength: 250V AC for 1min.
- 5.Contact resistance:  $100\text{m}\Omega$  Max
- 6.Operating force:  $250\pm 50\text{gf}$
- 7.Travel:  $0.15\pm 0.05\text{mm}$
- 8.Operating life: 250gf 80,000 Cycle

|    |      |         |    |    |
|----|------|---------|----|----|
| 4  | 膜    | 聚酰亚胺    | 1  | 黄色 |
| 3  | 弹片   | SUS301  | 1  | 镀银 |
| 2  | 底座   | LCP     | 1  | 黑色 |
| 1  | 端子   | 磷铜C5191 | 1  | 镀银 |
| 编号 | 部件名称 | 材料名称    | 数量 | 备注 |

|                                      |                                 |  |  |               |                 |             |                           |         |                |              |                  |   |              |        |            |    |  |
|--------------------------------------|---------------------------------|--|--|---------------|-----------------|-------------|---------------------------|---------|----------------|--------------|------------------|---|--------------|--------|------------|----|--|
| 8.Operating life: 250gf 80,000 Cycle |                                 |  |  |               | 单 位<br>UNIT     | mm          | 一般公差<br>GENERAL TOLERANCE |         |                |              |                  |   |              |        |            |    |  |
|                                      |                                 |  |  |               | 制 图<br>DRAW     | 裴 滔         | .X±0.5                    | ANGLES  |                |              |                  |   |              |        |            |    |  |
|                                      |                                 |  |  |               |                 |             | .XX±0.2                   | X.±5 °  |                |              |                  |   |              |        |            |    |  |
|                                      |                                 |  |  |               |                 |             | .XXX±0.1                  | .X.±2 ° |                |              |                  |   |              |        |            |    |  |
|                                      |                                 |  |  |               | 设 计<br>DESIGN   | 吴新生         |                           |         | 名 称<br>TITLE   | 轻触开关         |                  |   |              |        |            |    |  |
|                                      |                                 |  |  |               | 审 核<br>CHECKED  | 简小波         | 材 质<br>MATERIAL           |         | 型 号<br>MODEL   | 3.7*3.7*0.35 | 产品编码<br>MODEL NO |   |              |        |            |    |  |
|                                      |                                 |  |  |               | 校准化<br>STANDARD | 潘传彬         | 重 量<br>WT.                |         | 图 号<br>DWG NO. |              |                  |   | 张 数<br>SHEET | 第1页共1页 |            |    |  |
| 标 记<br>MARK.                         | ECN编号/变更内容<br>ECN NO/DEFINITION |  |  | 修 改<br>REVISE | 核 准<br>APPROVE  | 日 期<br>DATE | 批 准<br>APPROVE            | 杨建飞     | 表面<br>SA.      |              | 角 法<br>PROJ.     |  | 比 例<br>SCALE | 10 : 1 | 版本<br>REV. | A0 |  |