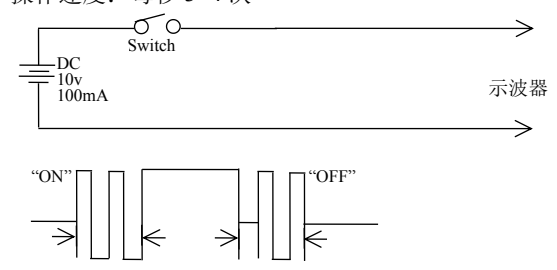


# 承 认 书



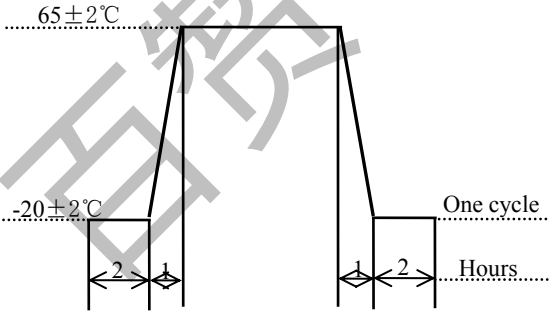
## APPROVAL SHEET

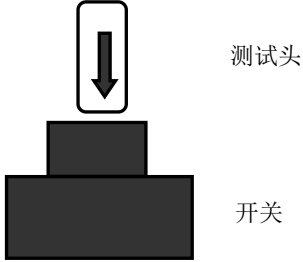
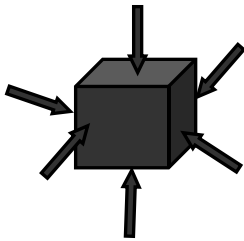
|                                    |                    |
|------------------------------------|--------------------|
| 客 户<br>CUSTOMER                    |                    |
| 客户产品型号/规格<br>PRODUCT SPECIFICATION |                    |
| 品 名<br>PART NAME                   | 轻触开关               |
| 型 号<br>MODEL NO                    |                    |
| 料 号<br>PART NO                     | 2.4*2.8*0.65 200gf |
| 提 出 者<br>DESIGNED BY               |                    |
| 确 认<br>APPROVER                    |                    |
| 提出日期<br>SENDING DATE               |                    |
| 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  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                               |                                                                                                                                             |                                    |

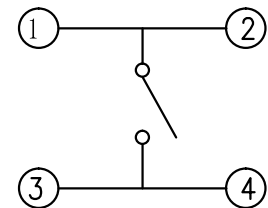
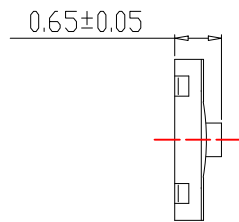
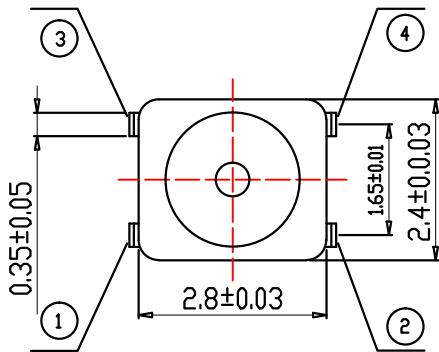
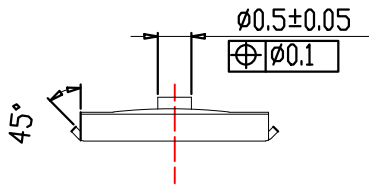
## 2.2 Mechanical Characteristics 机械性能

| 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。                                                                                                                                                                                                                                                     | $200 \pm 50\text{gf}$                                                                                                   |
| 2.2.2       | Travel to closure<br>运作行程   | Push by recommended operating condition<br>$F = (\text{Operations Force}) \times 2$<br>在开关的顶掇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。                                                                                                                                                                                | $0.15 \pm 0.05\text{mm}$                                                                                                |
| 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)<br>力，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: $260 \pm 5^\circ\text{C}$<br>焊接温度: $260 \pm 5^\circ\text{C}$<br>Soldering time: $3 \pm 0.5\text{sec}$<br>焊接时间: $3 \pm 0.5$ 秒                                                                            | No damage(Electrical and mechanical)<br>无异常（电气、机械性能）                                                                    |
| 2.2.6       | Solderbilty<br>可焊性          | After sprated flux<br>涂上助焊剂后<br>Temperature: $245 \pm 5^\circ\text{C}$<br>温度: $245 \pm 5^\circ\text{C}$<br>Soldering time: $3 \pm 0.5\text{sec}$<br>焊接时间: $3 \pm 0.5$ 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 |
|             |                             |                                                                                                                                                                                                                                                                                                                     |                                                                                                                         |

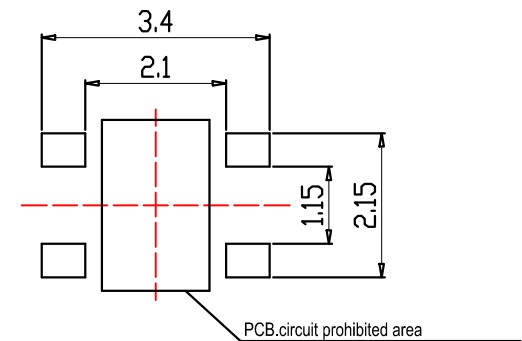
| 2.3 Climatic Characteristics 机械性能 |                                   |                                                                                                                                                                                                                                                                      |                                                                            |
|-----------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 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。 |
| 2.2.6                             | 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<br>Endurance (switching)<br>action<br>耐久特性（开关寿命）    | 1) Operation speed: 20~30times/min<br>动作速度: 20~30 次/分钟<br>3) Push force: Maximum vale of operation force<br>按力: 动作力规格值的上限<br>3) Operation number: 100, 000 times<br>动作次数: 100, 000 次<br>安装示意图<br> | Contact resistance: 200mΩ max<br>接触电阻: 200mΩ以下<br>Bouncing: 10 ms max<br>触点抖动: 10 毫秒以下<br>Insulation resistance: 100MΩ min<br>绝缘电阻: DC 250V, 大于 100MΩ<br>Withstand voltage: No.destruction<br>耐电压: 无绝缘破坏<br>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<br>2.2.2 shall be satisfied<br>满足 2.2.2 项 |
| 2.3.6<br>Withstand K <sub>2</sub> S<br>耐 K <sub>2</sub> S | 1) Density: 3±1ppm<br>浓度: 3±1ppm<br>2) Temperature: 40±2℃<br>温度: 40±2℃<br>3) Relative humidity: 90~95%<br>相对湿度: 90~95%<br>4) Duration of test: 12h<br>持续时间: 12 小时<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。                                                                                                                                                                                                                                                                                        |
| 2.3.7<br>Salt mist<br>盐雾试验                                | At 5% Nacl liquor for 12±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 12±1 小时, 用清水洗干净后并在室温下晾干。                                                                                                                       | No remarkable corrosion shall be recognized in metal part.<br>在金属件上没有腐蚀斑点。                                                                                                                                                                                                                                                                                        |
| 2.3.8<br>Shock<br>耐冲击性                                    | 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<br>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。<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。                                                                                                                                                                                                                                                                                        |
|                                                           |                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                   |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <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                                                  |
| <p>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。</p> <p>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。</p> <p>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。</p> <p>3.2 Design instructions (设计中应注意事项)</p> <p>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。</p> <p>3.3 Note (注意点)</p> <p>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。</p> <p>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。</p> <p>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。</p> |                                                                                             |



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:  $200\pm 50\text{gf}$
7. Travel:  $0.15\pm 0.05\text{mm}$
8. Operating life:  $200\text{gf}$  100,000 Cycle

|    |      |         |    |    |
|----|------|---------|----|----|
| 5  | 按键   | 聚胺树脂    | 1  | 黑色 |
| 4  | 膜    | 聚酰亚胺    | 1  | 黄色 |
| 3  | 弹片   | SUS301  | 2  | 镀银 |
| 2  | 底座   | PPA     | 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 |

|                 |    |                           |         |                |                                                                                       |                  |        |              |              |             |  |
|-----------------|----|---------------------------|---------|----------------|---------------------------------------------------------------------------------------|------------------|--------|--------------|--------------|-------------|--|
| 单 位<br>UNIT     | mm | 一般公差<br>GENERAL TOLERANCE |         | 东莞市百赞电子有限公司    |                                                                                       |                  |        |              |              |             |  |
| 制 图<br>DRAW     |    | .X±0.5                    | ANGLES  | 名 称<br>TITLE   | 轻触开关                                                                                  |                  |        |              |              |             |  |
| 设 计<br>DESIGN   |    | .XX±0.2                   | X.±5 °  |                |                                                                                       |                  |        |              |              |             |  |
|                 |    | .XXX±0.1                  | .X.±2 ° |                |                                                                                       |                  |        |              |              |             |  |
| 审 核<br>CHECKED  |    | 材 质<br>MATERIAL           |         | 型 号<br>MODEL   | 2.4*2.8*0.65H                                                                         | 产品编码<br>MODEL NO |        | TS-03006IM01 |              |             |  |
| 校 准<br>STANDARD |    | 重 量<br>WT.                |         | 图 号<br>DWG NO. |                                                                                       |                  |        |              | 张 数<br>SHEET | 第 1 页 共 1 页 |  |
| 批 准<br>APPROVE  |    | 表面 积<br>SA.               |         | 角 法<br>PROJ.   |  | 比 例<br>SCALE     | 10 : 1 | 版 本<br>REV.  | A0           |             |  |

标 记  
MARK.

ECN 编号/变更内容  
ECN NO/DEFINITION

修 改  
REVISE

核 准  
APPROVE

日 期  
DATE

批 准  
APPROVE