





深圳市韩下电子有限公司

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## 承 认 书

### SPECIFICATION FOR APPROVAL

客 户 Customer:

产品名称 Project:

轻触开关

规格型号 Part No:

HX TS2306A 240GF MSM

#### 贵公司承认印 Approval signatures

| 料 号/Part No. | 签 章/Signatures |
|--------------|----------------|
|              |                |

日期 Date:

|             |     |                                                                                      |
|-------------|-----|--------------------------------------------------------------------------------------|
| 拟制/Drawn    | 李春风 |  |
| 审核/Check    | 钟华华 |                                                                                      |
| 批准/Approved | 罗孝金 |                                                                                      |

## 1.General specification 基本事项

1.1 Switch action 开关种类: Tact Switch 轻触开关

1.2 Switch rating 最大额定值: DC 15 V 20mA

1.3 Operation temperature range 使用温度试验范围: -40℃~+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

Ambient temperature 温度: 5~35℃

Relative humidity 相对湿度: 45~85%

Air pressure 气压: 86~106KPa (860~1060mbar)

However, if doubt arises on the decision based on the measured

Values under the above-mentioned conditions, the following conditions be employed

但是在对判定产生疑义时, 按下述状态实施:

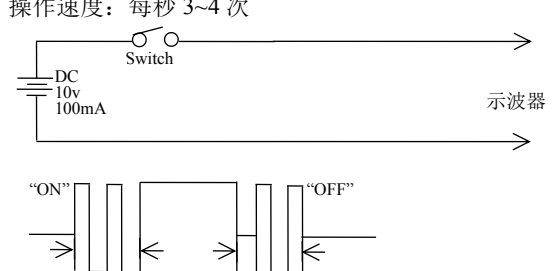
Ambient temperature 温度: 20±2℃

Relative humidity 相对湿度: 65±5%

Air pressure 气压: 86~106KPa (860~1060mbar)

## 2.Performance 性能

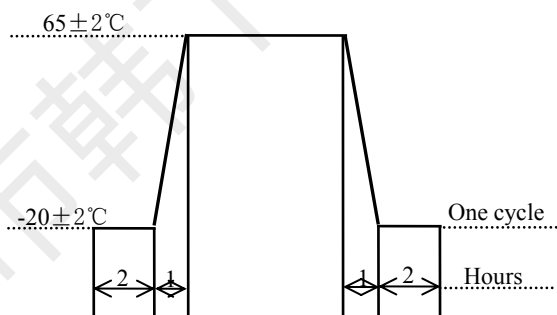
### 2.1 Electrical characteristics 电气性能

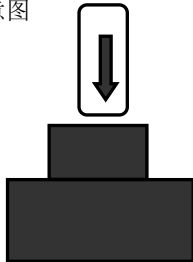
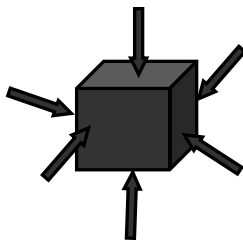
| Item<br>项 目 |                               | Test condition<br>测试条件                                                                                                                      | Performance<br>规 格                 |
|-------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| 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) | 500mΩ Max<br>500 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                                                  | 50MΩ Min<br>50 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。                                                                                                                                                                                                                                             | 240±30gf                                                                                                                |
| 2.2.2       | Travel to closure<br>运作行程   | Push by recommended operating condition<br>F=(Operations Force)x2<br>在开关的顶端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。                                                                                                                                                                                          | 0.13±0.05mm                                                                                                             |
| 2.2.3       | Push strength<br>按压强度       | 30N (3Kgf) for 1 minute<br>在开关驱动器器件顶端中央，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±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。 |
| 2.2.6       | 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: 10, 000 times<br>动作次数: 500,000次<br><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 H <sub>2</sub> S<br>耐 H <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>相对温度: 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><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。                                                                                                                                                                                                                                                                                        |
|                                                           |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                   |



### 3.Precaution 注意事项

#### 3.1 Soldering condition 浸焊条件

| 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                                                  |
|                               |                                                                                             |

1) After switches were soldered, please be careful not to clean switches with solvent.

开关浸焊后, 注意不要用溶剂清洗。

2) In the case of using soldering iron, soldering conditions shall be 280℃ max and 3 sec max.

在使用烙铁的情况下, 焊锡温度应在 280℃ 以下、3 秒以内。

3) Right after switches were soldered; please be careful not to load on the knobs of switches.

浸焊后, 注意不要在手柄顶部施加负荷。

#### 3.2 Design instructions (设计中应注意事项)

1) Follow recommended P.C.B piercing plan in the outside drawing page.

印刷基板的安装孔尺寸参见产品图。

#### 3.3 Note (注意点)

1) Please be cautious not to give excessive static load or shock to switches.

注意不要施加超过负荷的压力或晃动开关。

2) Please be careful not to pile up P.C.B after switches were soldered.

开关焊接以后, 印刷基板注意不要叠放。

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.

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。