

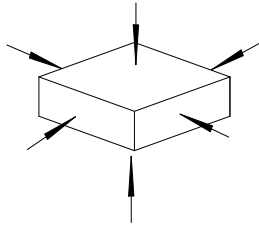
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| 深圳市首韩科技有限公司 | 文件编号 FILE NO. | | 页码 PAGE | 2/7 |
| | 发布日期 DATE OF ISSUE | 2013 年 11 月 12 日 | | |
| PRODUCT SPECIFICATION 产品承认书 | 文件版本 EDITION | 第 A 版第 0 次修订 | | |
| TACT SWITCH 轻触开关 | 产品编码 PART NO | | | |

| <p>1. General Characteristics 一般特性:</p> <p>适用范围:</p> <p>1.1、This specification is applied to the requirements for TACTILE SWITCH (MECHANICAL CONTACT) 此规格书适用于机械式轻触开关的相关要求</p> <p>1.2 Operating Temperature Range: -30°C to 85°C 使用温度范围: -30°C to 85°C</p> <p>1.3 Operating Relative Humidity: ≤85%RH 相对湿度: ≤85%RH</p> <p>1.4 Test Conditions: Unless otherwise specified, the atmospheric conditions for making measurements and tests are as follows: 实验条件: 若没有特别说明, 则试验大气条件如下: Ambient Temperature: 5~35°C, Relative Humidity: 45~85% 环境温度: 5~35°C, 相对湿度: 45~85% Air Pressure: 86~106Kpa (860~1060mbar) 大气压力: 86~106Kpa (860~1060mbar)</p> | | | |
|--|-------------------------------|--|---|
| <p>2. Appearance, Structure and Dimensions 外观, 结构及尺寸:</p> <p>2.1 Appearance: The switch shall have good finishing, and no rust, crack or plating defects. 外观: 产品外观良好, 无锈蚀、裂纹和镀层缺陷。</p> <p>2.2 Structure & Dimensions: Refer to individual product drawing. 结构及尺寸: 参见产品图纸</p> <p>2.3 Markings: Refer to individual product drawing. 标识: 参见产品图纸。</p> | | | |
| 3. Ratings 额定负荷 | | DC12V 50mA | |
| 4. Electrical Characteristics 电气特性 | | | |
| No. | Item 项目 | Criteria 标准 | Test Method 实验方法 |
| 4.1 | Contact Resistance 接触电阻 | 100mΩ Max. | 在以 5V 10mA 的直流电源或不低于 1KHz 的交流电源的电路中, 以一个等于 2 倍按力的静负荷施加于手柄中心 Applying a static load of 2 times operating force to the center of the stem, measurements shall be made by 5V DC 10mA or more than 1KHZ AC small-current contact resistance meter. |
| 4.2 | Resistance Insulation 绝缘电阻 | 100MΩ Min. | Measurement shall be made following application of 100V DC potential, across terminals, and across terminals and cover, for one minute. 在端子之间施加 DC 100V /1min 的条件下, 测量端子之间底座、盖板的电阻值。 |
| 4.3 | Dielectric Voltage 抗电强度 | No dielectric breakdown shall occur. 无击穿现象发生。 | 250VAC (50~60Hz, cut-off current 2mA) is applied between non-connected terminals and between terminals and the metal frame for 60 ±5s. 在相互绝缘的所有接线端子之间 250V (50-60Hz) 交流电, 各接线端子与外壳或非载流金属零件之间加载 250V (50-60Hz) 交流电, 持续时间 60 ± 5S。 |

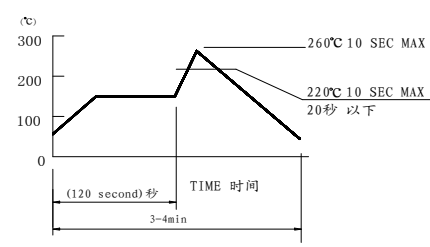
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| 5. Mechanical Characteristics 机械特性 | | | |
|------------------------------------|----------------------------|--|--|
| No. | Item 项目 | Criteria 标准 | Test Method 实验方法 |
| 5.1 | Operating Force 操作力 | 230±50gf | Apply a static load on the midpoint of the actuator (or tip of the shaft) to supply a pressure vertically from its free position to operating position. 在操作元件末端沿操作方向均匀施加静载荷, 使操作元件转换到动作位置。 |
| 5.2 | Return Force 回弹力 | 40 gf Min | The value to which the force in the actuator midpoint (or tip of the shaft) must be reduced to allow the contact to the normal position. 在操作元件末端沿操作方向均匀减少静载荷, 使操作元件从动作位置转换到自由位置。 |
| 5.3 | Operation Position 操作位置 | 0.15±0.05mm | 开关垂直于操作方向放置, 以一个等于 2 倍按力的静负荷施加在开关驱动件顶端中心, 测量顶端移动的距离。 Placing the switch such that the direction of switch operation is vertical and then applying static load of 2times operating force to the center of the stem; the travel distance for the switch to come to a stop shall be measured. |
| 5.5 | Terminal Strength 端子强度 | Shall be free from terminal looseness, damage and insulator breakage. No functional defective occur 端子无松动, 损坏及绝缘层的破裂。无功能性不良 | A static load of 0.5N shall be applied to the tip of terminal in a desired direction for 10 ± 1s. The test shall be done once per terminal. 以 0.5N 作用力沿轴向逐渐施加于接线端末端 10±1s(作用力方向为离开开关向外指向), 每个接线端子测量一次。 |
| 5.6 | Vibration Proof 振动 | After test, Contact resistance: 200 mΩ Max. I No functional defective occur No abnormalities shall be recognized in appearance and construction. 实验后: 接触电阻: 200 mΩ Max. 无功能性不良。 表面及结构无明显变形 | Switch shall be secured to a testing machine by a normal mounting device and method. Switch shall be measured after following test. (1) Vibration frequency range 10~55 Hz (2) Total amplitude 1.5mm (3) Sweep ratio: 10~55~10Hz Approx. 1 min (4) Method of changing the sweep vibration frequency: logarithmic or linear (5) Direction of vibration: Three perpendicular directions including actuating direction. (6) Duration: 2 hours (6 hours in total) 开关采用常规的安装方法牢固地安装在试验设备上, 并在下述参数条件下进行试验: (1) 振频 10-55Hz (2) 振幅 1.5mm (3) 振动变化速率: 10-55-10Hz 大约 1 分钟 (4) 变频方法: 对数或线性型式 (5) 振动方向: 三个相互垂直的方向, 其中一个方向应是促动元件运动的方向。 (6) 时间: 每个方向 2 小时 (共 6 小时)。 |

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| No. | Item 项目 | Criteria 标准 | Test Method 实验方法 |
|-----|------------------------|--|--|
| 5.7 | Mechanical Shock 冲击 | <p>After test, Contactresistance:200mΩMax. No functional defective occur Shall be free from mechanical abnormalities.</p> <p>实验后： 接触电阻：200 mΩMax. 无功能性不良。 表面无变形且操作无异常。</p> | <p>Switch shall be measured after following test:</p> <p>(1) Mounting Method: Normal (2) Acceleration: 490m/s² (50G) (3) Duration: 11ms (4) Test Direction: 6 directions</p>  <p>(5)Number of shocks: 3 times per direction (18 times in total) 试件在下述参数条件下进行试验： (1) 安装方法：常规方法 (2) 加速度：490m/ s² (50G) (3) 时间：11ms (4) 实验方向：图示 6 方向 (5) 冲击次数：每个方向 3 次（总共 18 次）</p> |
| 5.8 | Solder Ability 可焊性 | <p>More than 90% of immersed part shall be covered with solder. 超过 90% 的浸锡面积被焊料所覆盖。</p> | <p>Switch shall be tested according to the following request:</p> <p>1(1) Equipment: Auto-Dip Chamber 2(1) Solder: Normal 3(1) Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution. 4(1) Soldering Temperature: 260 ± 5°C 5(1) Immersing Time: 3 ± 1s 6(1) Immersion Depth: Immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm)</p> <p>开关在下述参数条件下进行试验： (1) 设备：自动焊接机 (2) 焊料：常规 (3) 焊剂：焊剂，质量百分比为 25% 松香，75% 甲醇的无色透明溶液。 (4) 焊接温度：260±5°C (5) 浸渍时间：3±1s (6) 浸渍深度： 接线端应浸到离开关根部 1.6mm 处。。</p> |

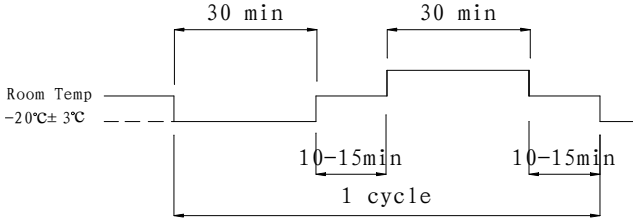
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| No. | Item 项目 | Criteria 标准 | Test Method 实验方法 |
|------|--------------------------------|---|---|
| 5.9 | Solder Heat Resistance 耐焊接热 | No abnormalities shall be observed in appearance and operation. No functional defective occur 无外观及功能损坏。 无功能性不良。 | <p>Please practice according to below condition:</p> <p>(1) Preheat :150°C 90-120s (2) Soldering heat : 260°C Max 10S. (3) Immersion depth: Up to the surface of the board</p> <p>焊接方法: (1) 预热: 150°C 90-120s (2) 最高焊接温度: 260°C Max 5S. (3) 浸渍深度: PCB 表面)</p>  <p>回流焊曲线图</p> |
| 5.10 | Resistance to Flux 抗焊剂能力 | Flux shall not be risen up to contact. The switch shall be free from abnormalities in operation. 焊剂不得上升进入开关内部, 影响接触转换。 试件在操作过程中不应发生变形。 | <p>switch shall be tested according to the following request:</p> <p>(1)switch Equipment: Auto-Dip Chamber (2)Solder: Normal (3)Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution. (4)Soldering Temperature: 260 ± 5°C (5)Immersing Time: 3 ± 1s (6)Immersion Depth: Immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB) 开关在下述参数条件下进行试验: (1) 设备: 自动焊接机 (2) 焊料: 常规 (3) 焊剂: 焊剂, 质量百分比为 25%松香, 75%甲醇的无色透明溶液。 (4) 焊接温度: 260 ± 5°C (5) 浸渍时间: 3 ± 1s (6) 浸渍深度: 接线端应浸到离开开关根部 处。</p> |

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| 6. Durability characteristics | | | | |
|--|-----------------------------|--|--|--|
| No. | Item 项目 | Criteria 标准 | Test Method 实验方法 | |
| 6.1 | Mechanical Life 机械寿命 | After test, Contactresistance:500mΩ Max. Insulation resistance: 100MΩ Min. Tolerance of operating force Disintegration shall be within 30% of specified value No functional defective occur The switch shall be free from abnormalities in appearance construction. | 100,000 cycles of operation shall be performed continuously at a rate of 60 cycles per minute without load. 在不带负荷的条件下, 速度为 60 次/分, 在寿命试 验设备上连续转换 300,000 次。 | |
| 6.2 | Electronics Life 电气寿命 | 实验后: 接触电阻: 500m Ω Max. 绝缘电阻: 100M Ω Min. 操作力衰变应在±30%以内。 无功能性不良。 开关外观及结构应无损坏。 | 100,000 cycles of operation shall be performed continuously at a rate of 60 cycles per minute with load as follow DC6V 50mA 在带以下负荷的条件下, 速度为 60 次/分, 在寿命 试验设备上连续转换 300,000 次。 DC6V 50mA | |
| 7. Weather Proof Characteristics 耐候性能: | | | | |
| No. | Item 项目 | Criteria 标准 | Test Method 实验方法 | |
| 7.1 | Cold Proof 低温 | After test, Contactresistance:200mΩ Max. Insulation resistance: 100MΩ Min. | After testing at $-20 \pm 2^{\circ}\text{C}$ for 48 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件在 $-20 \pm 2^{\circ}\text{C}$ 的温控箱内保持 48 小时, 然后在正 常温度和湿度下恢复 1 小时, 并在此后 1 小时内对 试品进行测量, 水滴应消失。 | |
| 7.2 | Hot Proof 高温 | No functional defective occur The switch shall be free from abnormalities in appearance &construction. 实验后: 接触电阻: 200m Ω Max. 绝缘电阻: 100M Ω Min. 无功能性不良。 | After testing at $70 \pm 2^{\circ}\text{C}$ for 48 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. 试件在 $70 \pm 2^{\circ}\text{C}$ 的温控箱内保持 48 小时, 然后在正 常温度和湿度下恢复 1 小时, 并在此后 1 小时内对 试品进行测量, 水滴应消失。 | |
| 7.3 | Moisture Resistance 恒定湿热 | 开关外观及结构应无损坏。 | After testing at $40 \pm 2^{\circ}\text{C}$,90~95% RH for 48 hours, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件在 $40 \pm 2^{\circ}\text{C}$,90-95%RH 的温控箱内保持 48 小 时, 然后在正常温度和湿度下恢复 1 小时, 并在此 后 1 小时内对试品进行测量, 水滴应消失。 | |

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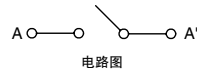
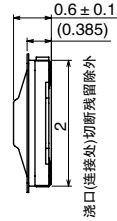
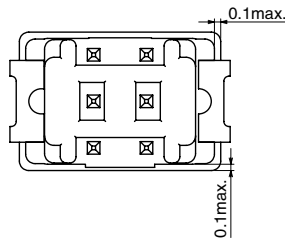
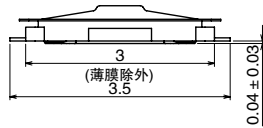
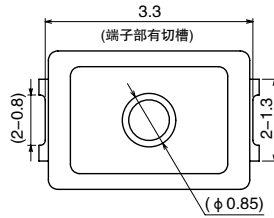
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| No. | Item 项目 | Criteria 标准 | Test Method 实验方法 | |
| 7.4 | Temperature Cycling 温度转换 | After test, Contactresistance:200mΩ Max. Insulation resistance: 10MΩ Min. No functional defective occur The switch shall be free from abnormalities in appearance & construction. 实验后: 接触电阻: 200m Ω Max. 绝缘电阻: 100M Ω Min. 无功能性不良。 开关外观及结构应无损坏。 | After 5 cycles of following conditions, the switch shall be allowed to stand under normal temperature and humidity conditions for 1 hour, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. 试件按下述实验条件试验 5 次, 然后在正常温度和湿度下恢复 1 小时, 并在此后 1 小时内对试品进行测量, 水滴应消失  | |
| 7.5 | Salt Mist 盐雾实验 | No remarkable corrosion shall be recognized in metal part. 在金属件上没有影响开关性能的斑点 | The switch shall be checked after following test: (1) Temperature: 35± 2°C (2) Salt Solution: 5±1% (Solids by mass) (3) Duration: 4±1 hour After test, salt deposit shall be removed by running water. 试件在下述实验后测量: (1) 温度: 35±2°C (2) 盐溶液浓度: 5±1% (质量百分比) (3) 时间: 4±1 小时 实验后的盐沉积物用水冲掉。 | |

■ 外观尺寸 (mm)

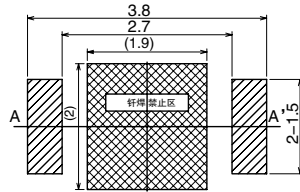


一般尺寸公差: ± 0.05
()尺寸为参考尺寸

*规格有变更的可能



焊锡模板厚度为0.1mm,
开口率为焊盘图案的60%~100%。
(推荐80%)



印刷电路板焊盘参考图

* 焊锡涂层不均会导致封装钎焊失败,
因此请使用推荐焊锡层和焊盘图案。

- :推荐焊盘图案区
- :钎焊禁止区

请勿在 区域配置焊盘图案和过孔。
需配置焊盘图案或过孔时, 为避免金属部分外露,
请进行绝缘涂层和抗蚀剂处理。
金属部分外露, 可能会因焊锡球导致与开关背面
端子部之间短路。
此外, 铜箔厚度和图案布局产生的凹凸差, 会对开关
的倾斜和与焊锡的接合状态、助焊剂渗透造成影响。
因此, 请在使用前进行验证。