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| Self Lock switch | PB22H08131 | A/01 | | 3/10 |

1、概述 GENERAL

1.1 适用范围 APPLICATION

此规格书适用于机械式自锁类开关的相关要求

This specification is applied to the requirements for SELF LOCK switch (mechanical contact)

1.2 工作温度范围 Operating Temperature Range

-25℃~85℃(在标准大气压、标准湿度条件下)

-25℃~85℃(Normal humidity, normal air pressure)

1.3 贮藏温度范围 Storage Temperature Range

-30℃~85℃(在标准大气压、标准湿度条件下)

-30℃~85℃(Normal humidity, normal air pressure)

1.4 测试条件 Test Conditions

在没有其它特定的条件下，应该在以下的条件下进行测试和测量：

Unless otherwise specified, tests and measurement shall be made in the following standard conditions:

常温.....5℃~35℃

Normal temperature.....5℃~35℃

标准湿度.....相对湿度 25%~85%

Normal humidity.....relative humidity 25%~85%

标准大气压.....86Kpa~106Kpa

Normal air pressure.....86Kpa~106Kpa

在制造过程中，测试和测量应该在以下的条件下进行：

If any doubt arise from the judgment, tests shall be conducted at the following conditions:

温度.....20℃±2℃

Temperature.....20℃±2℃

相对湿度.....65%±5%

Relative humidity.....65%±5%

环境气压.....86Kpa~106Kpa

Air pressure.....86Kpa~106Kpa

1.5 存储方法 Storage method

1. 使用前确保包装完整无破损，无浸湿。

Ensure that the product without package breaking or wetting before use.

2. 存储条件 Storage conditions:

储存温度 Storage temperature: -5 ~ 35 ℃;

储存湿度 Storage humidity: 25% ~80%;

未开封状态：12 个月内使用完毕（从发货日开始计算）；超过 12 个月后再使用的，使用前请先验证：端脚无氧化、无发黑、塑料件无吸湿起泡，确保焊接的适宜性；

Unopened status: Use up the product as soon as possible before 6 months. (calculated from shipment date). Over 6 months, please make sure below ;

before use it: terminal without oxidation or blackening, plastic parts without moisture absorption or bubble, ensure solderability.

已开封状态：1 个月内使用完毕；

Opened status: use up within 1 month;

储存注意事项：避开高湿高温和有腐蚀性气体的环境及阳光直射；

Storage precautions: Please avoid the following environment: with high humidity, high temperature , corrosive gases and direct sunlight.

3. 请勿超重叠放。

Do not stack too many switches.

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2、 详细说明

Detailed specification

2.1 外观：应无影响、降低产品性能的缺陷；

Appearance: There should be no defects that affect the serviceability of product.

2.2 结构尺寸和安装尺寸：应符合装配图要求；

Style and dimension: shall conform to the assemble drawings.

2.3 操作形式：有触觉反应的操作

Type of actuating: Tactile feedback.

2.4 开关结构：单回路单输出(具体的触点结构在装配图中已绘出)；

Contact arrangement: 1 pole, 1 throw

(Details of contact arrangement are given in the assembly drawings.)

2.5 开关工作额定值：DC 12V 2.5A（最大值）

Ratings: DC 12V 2.5A (Max)

3. 电气性能：

ELECTRICAL SPECIFICATION

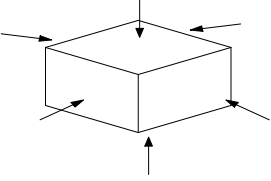
| 项 目 ITEM | | 试 验 条 件 TEST CONDITIONS | 要 求 REQUIREMENTS |
|-------------|------------------------------------|--|---|
| 3.1 | 接触电阻 Contact Resistance | 在以 5V 10mA 的直流电源或不低于 1KHz 的交流电源的电路中，以一个等于 1.5 倍按力的静负荷施加于手柄中心 Applying a static load of 1.5 times operating force to the center of the stem, measurements shall be made by 5V DC 10mA or more than 1KHz AC small-current contact resistance meter. | $\leq 100m\Omega$ |
| 3.2 | 绝缘电阻 Insulation Resistance | 输入 500V DC 电压 1 分钟，按以下接触方法测试： Apply a voltage of 500V DC shall be applied for 1 min. After which measurement be made: (1) 不接触的端子脚之间 Between conductors not to be contact (2) 端子脚与盖板之间 Between individual terminals and frame | $\geq 100M\Omega$ |
| 3.3 | 耐 压 Dielectric voltage proof | 输入 AC 500V (50-60HZ) 电压, 1 分钟, 感应电流为 0.5mA, 按以下接触方法测试： AC 500V rms (50-60Hz) For 1 MIN , trip current:0.5mA (1) 不接触的端子脚之间 Between conductors not to be contact (2) 端子脚与盖板之间 Between individual terminals and frame | 无击穿、无飞弧 There should be no breakdown and flashover |

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4. 机械性能:

MECHANICAL SPECIFICATION

| 项目 ITEM | 试验条件 TEST CONDITIONS | 要求 REQUIREMENTS |
|--|--|--|
| 4.1 按力 Operating Force | <p>开关垂直于操作方向放置，在开关驱动件顶端中心逐渐施力，测量开关导通所需的最大力度。</p> <p>Placing the switch such that the direction of switch operation is vertical and then gradually increasing the load applied to the center of the stem, the maximum load required for the switch to come to a stop shall be measured.</p> | 250±100 gf |
| 4.2 全行程 Full Travel | <p>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，测量顶端移动的最大距离。</p> <p>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.</p> | 2.6±0.2mm |
| 4.3 锁定行程 LOCK Travel | <p>开关处于锁定状态时与开关初始（断开状态）状态时的高度差，即为开关的锁定行程。</p> <p>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.</p> | 1.5±0.2mm |
| 4.4 操作部位强度 Operating part strength | <p>在操作部位施加以下负载，时间 15 s。</p> <p>Apply following load on the tip of of operating part 15 s.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 操作方向 Operation direction ... 80N <input checked="" type="checkbox"/> 引伸方向 Drawing direction ... 20N <input checked="" type="checkbox"/> 操作方向垂直方向 Right direction against operating direction ... 10N | <p>柄部无严重变形, 可以正常工作.</p> <p>The lever shall have no serious deformation and function is normally.</p> |

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| 项目 ITEM | 试验条件 TEST CONDITIONS | | | 要求 REQUIREMENTS |
| 4.5 | 端子强度 Terminal Strength | 在端子脚前端任意一个方向加 5N 力度测试, 时间为 10 秒 A static load of 500gf shall be applied to the Terminal for 15 Sec. in any direction. | | 端子脚没有裂开、松动异常, 满足于机械, 电器性能 Electrical characteristics shall be satisfied without damage or excessive looseness of terminals |
| 4.6 | 锁紧强度 Locking Strength | 在锁紧状态下对引伸方向施加 5N 的力 10 秒(本标准适用于开关锁紧机构) Apply force 5N to drawing direction for 10s at locking condition of switch. (This standard applies to switch lock mechanism.) | | 开关锁定功能正常。 No abnormalities shall occur in appearance and function. |
| 4.7 | 跌落测试 Drop Impact Strength | 开关由 0.8 米的高度自由下落到测试板上 (3cm 厚的橡木板), 自由下落 6 次 After the switch is subjected do dropping 0.8 m height into a wooden Testing board(3 cm thick oak) 6 times; | | Item 3 Item4.1 Item4.2 Item4.3 |
| 4.8 | 振动 Vibration | 根据以下给定条件进行测试: Measurement shall be made following the test set forth below: (1) 振动频率范围: 10~55~10Hz Vibration frequency range: 10 to 55 to 10Hz (2) 振幅 (峰-峰): 1.52mm Amplitude: 1.52mm (3) 振动方向: 包括手柄行程方向在内的三个相互垂直的方向 Direction of vibration: Three mutually perpendicular direction including the direction of stem travel (4) 测试时间: 每次 2 小时 Duration: Each 2 hours. | | Item 3 Item4.1 Item4.2 Item4.3 |
| 4.9 | 冲击 Shock | 根据下列条件进行冲击试验 Test by following conditions (1)安装方法: 正常安装 (1)installation method: normal (2)加速度: 490m/s ² (2)Acceleration: 490m/s ² (3)作用时间: 11ms (3)Acting time: 11ms (4)测试方向: 6 个方向 冲击次数: 每个方向 3 次, 共计 18 次 (4)Test direction: 6 directions Times: 3 times/direction ,total 18 times | |  Item3 Item4.1 Item4.2 Item4.3 |

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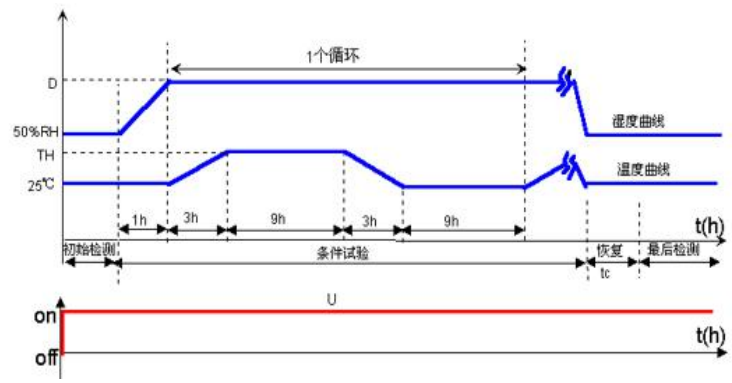
5、环境耐久性：

ENVIRONMENTAL SPECIFICATION

| 项目 ITEM | 试验条件 TEST CONDITIONS | 要求 REQUIREMENTS |
|--|--|---|
| 5.1 低温测试 Resistance to low temperature | <p>样品应按照以下实验条件进行测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试： Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made:</p> <p>(1) 温度：-30±2℃ Temperature : -30±2℃ (2) 时间：48h Time: 48h</p> | Item3 Item4.1 Item4.2 Item4.3 |
| 5.2 高温测试 Heat resistance | <p>样品应按照以下实验条件进行测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试： Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made:</p> <p>(1) 温度：85±2℃ temperature:85±2℃ (2) 时间：48h time: 48h</p> | Item3 Item4.1 Item4.2 Item4.3 |
| 5.3 温度变化测试 Change of temperature | <p>根据下面的测试要求进行 5 次循环的温度周期性测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试。测试期间样品应保持干燥。 After 5 cycles of following conditions, the sample shall be allowed to stand under normal temperature and humidity conditions for 1 h. and measurements shall be made. During the test water drops shall be removed.</p> <div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p style="text-align: center;">温度 (°C)</p> <p style="text-align: center;">0°C</p> <p style="text-align: center;">时间 (hour)</p> </div> <div style="flex: 1; padding-left: 20px;"> <p>A: +80±2℃ B: -30±2℃ C: 2 小时 D: 1 小时 E: 2 小时 F: 1 小时</p> </div> </div> | Item3 Item4.1 Item4.2 Item4.3 |
| 5.4 恒定湿热测试 Moisture resistance | <p>样品应按照以下实验条件进行测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试： Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made:</p> <p>(1) 温度：50±5℃ temperature: 50±5℃ (2) 相对湿度：95±3% relative humidity:95±3% (3) 时间：96h time: 96h</p> | 接触电阻：≤500mΩ Contact resistance≤500mΩ 绝缘电阻：≥10MΩ Insulation Resistance≥10MΩ Item3.3 Item4.1 Item4.2 Item4.3 |

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**5、环境耐久性：
ENVIRONMENTAL SPECIFICATION**

| 项目 ITEM | 试验条件 TEST CONDITIONS | 要求 REQUIREMENTS |
|--|--|---|
| <p>5.5</p> <p style="text-align: center;">高温高湿 High temperaturee High humidity</p> | <p>样品应按照以下实验条件进行测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试： Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made:</p> <p>(4) 温度：85±2℃ temperature: 85±2℃ (5) 相对湿度：85±3% relative humidity:85±3% (6) 时间：1000h time: 1000h</p> | <p>接触电阻：≤500mΩ Contact resistance≤500mΩ 绝缘电阻：≥10MΩ Insulation Resistance≥10MΩ Item3.3 Item4.1 Item4.2 Item4.3</p> |
| <p>5.6</p> <p style="text-align: center;">交变湿热测试 Change of resistance</p> | <p>样品应按照以下实验条件进行 2 个循环测试，实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试：</p> <p>(1) 温度：+25℃~55℃ temperature: +25℃~55℃ (2) 相对湿度：95±2% relative humidity:95±2% (3) 循环次数：2 次 Times: 2 times</p> <div style="text-align: center;">  <p>The graph illustrates the test cycle for alternating wet heat testing. It shows two curves: a temperature curve (温度曲线) and a humidity curve (湿度曲线). The temperature starts at 25°C, rises to a peak (TH), and then returns to 25°C. The humidity starts at 50%RH and rises to a peak (D). The cycle is repeated twice. The time intervals are: 1h (initial detection), 3h (conditioning), 9h (test), 3h (recovery), and 9h (final detection). The total time for one cycle is 25h. The graph also shows a red line for 'on' and 'off' states, and a blue line for 'U' (voltage).</p> </div> | <p>接触电阻：≤500mΩ Contact resistance≤500mΩ 绝缘电阻：≥10MΩ Insulation Resistance≥10MΩ Item3.3 Item4.1 Item4.2 Item4.3</p> |

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| 项目 ITEM | 试验条件 TEST CONDITIONS | | | 要求 REQUIREMENTS |
| 5.7 | 盐雾试验 Salt Mist | 在以下设定条件下进行测量: The switch shall be checked after following test: (1) 温度: 35°C±2°C temperature: 35°C±2°C (2) 盐溶液浓度: 5±1% (质量百分比) salt solution : 5±1%(solids by mass) (3) 时间: 8±1h Time: 8±1h 实验后的盐沉积物后水冲掉 After test, salt deposit shall be removed by running water. | | 金属件上没有腐蚀斑点 No remarkable corrosion shall be recognized in metal part. |
| 5.8 | 硫化试验 Sulfuration resistance | 样品应按照以下实验条件进行测试, 实验后样品应放在常温及标准湿度的环境中 1 小时后做性能测试: Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 h before measurements are made: (1) H ₂ S 气体浓度: 3ppm±1ppm H ₂ S gas concentration: 3ppm±1ppm (2) 时间: 96h Time: 96h (3) 温度: 40±2°C (90~95%RH) temperature: 40±2°C (90~95%RH) | | 接触电阻: ≤500mΩ Contact resistance≤500mΩ Item3.3 Item4.1 Item4.2 Item4.3 |
| 6.1 | 寿命 Operation life | 根据下面的测试要求进行测试: Measurement shall be made following the test set forth below: (1) DC 12V, 2.5A 带负载 DC 12V, 2.5A resistive load (2) 按动速率: 10 次/分钟 Rate of operation: 10 times/min (3) 按力: 按力的 1.5 倍 Operating Force: 1.5 times as much as Operating Force (4) 电气寿命 (负载): 5,000 次 Life(resistive load):5,000cycles (5) 机械寿命 (无负载): 10000 次 Life(No resistive load): 10000cycles | | 接触电阻≤2Ω Contact resistance≤2Ω 绝缘电阻≥10MΩ Insulation Resistance≥10MΩ Item3.3 Item4.1 Item4.2 Item4.3 |
| 7.1 | 可焊性 Solderability | 在以下设定条件下进行测量: Measurements shall be made following the test set forth below: (1) 焊接温度:245±5°C Solder temperature : 245±5°C (2) 浸入时间:3s±0.5s Immersion time: 3s±0.5s | | 除边缘外涂层应均匀覆盖 95%以上 Except for the edge, the coating should cover a minimum 95% |

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8. 焊接条件:

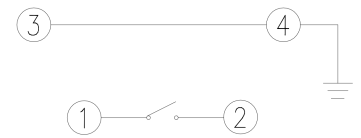
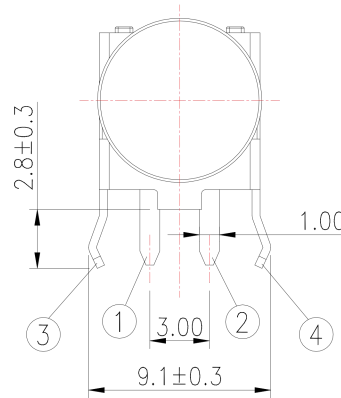
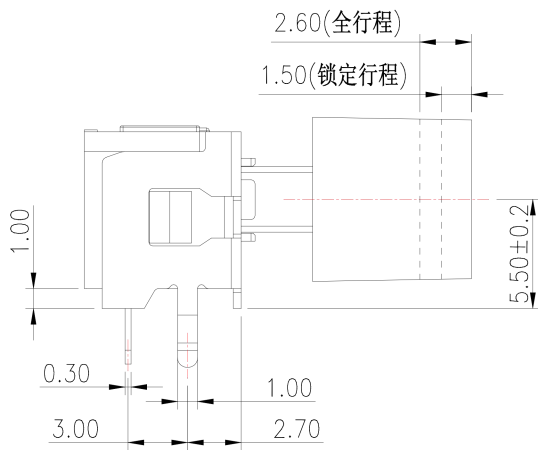
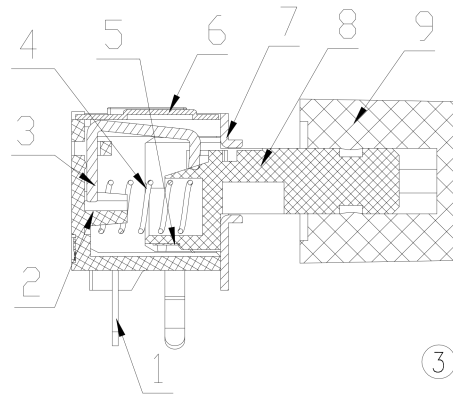
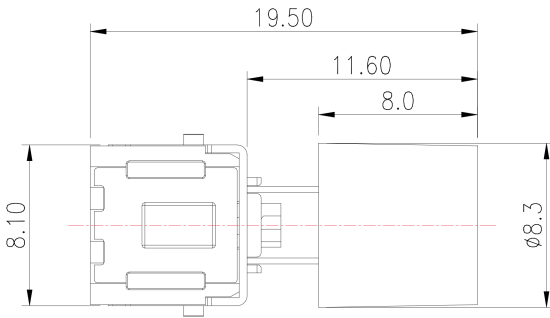
SOLDERING CONDITIONS:

| | 项目 ITEM | 推荐条件 Recommended conditions | |
|-----|------------------------------------|---|---|
| 8.1 | 手工焊接 Hand soldering | 请按以下条件进行焊接: (1) 焊锡温度: $\leq 400^{\circ}\text{C}$ (2) 连续焊接时间: $\leq 5\text{ s}$ Please practice according to below conditions: (1) Soldering temperature: $\leq 400^{\circ}\text{C}$ (2) Continuous soldering time: $\leq 5\text{ s}$ | |
| 8.2 | 自动浸焊 Conditions for Auto-dip | 助焊剂附着量 Flux built-up | 不附着于零部件贴装面的程度 Mounting surface should not be coated with flux |
| | | 预热温度 Preheating temperature | 印刷电路板焊接面的周围温度 100°C max. Ambient temperature of the soldered surface of PC board. 100°C max. |
| | | 预热温度时间 Preheating time | 60s max. |
| | | 焊接温度 Soldering temperature | 265°C max. |
| | | 焊接浸渍时间 Continuous dipping time | 10s max. |
| | | 焊接次数 Number of soldering | 最多三次 3 times max. |

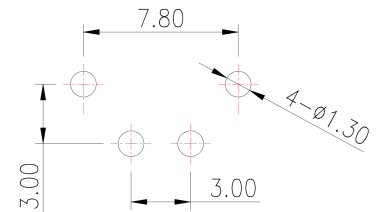
注意事项(Notes):

- a、防止助焊剂从开关的顶端渗入
Prevent flux penetration from the top of the switch
- b、开关浸焊后, 注意不要用溶剂或类似品清洗开关。
After switches were soldered, please be careful not to clean switches with solvent or other similar products.
- c、浸焊后, 注意不要在顶部施加负荷。
Right after switches were soldered; please be careful not to load to on the knobs of switches.
- d、注意不要施加超负荷的压力或晃动开关。
Please be cautions not to give excessive static load or shock to switches.
- e、开关浸焊后, 印刷基板注意不要叠放。
Please be careful not to pile up P.W.B. after switches were soldered

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电气原理图



PCB板尺寸图

General tolerance: $\pm 0.2\text{mm}$

| 序号 | 零件名称 | 材料 | 用量 | 表面处理 |
|----|------|-------|----|-----------------------------------|
| 1 | 接线片 | H62 | 1 | 镀银 ($\geq 0.3 \mu\text{m}$) |
| 2 | 底座 | PA66 | 1 | 黑色 |
| 3 | 钩针 | SUS | 1 | 研磨 |
| 4 | 弹簧 | SUS | 1 | NA |
| 5 | 簧片 | C5210 | 1 | 单面履银 |
| 6 | 上盖 | 不锈钢 | 1 | 清洗 |
| 7 | 支架 | SPCC | 1 | 镀镍 ($1.2 \sim 3.0 \mu\text{m}$) |
| 8 | 推柄 | PA66 | 1 | 黑色 |
| 9 | 键帽 | ABS | 1 | 白色 |