

厦门宏端电子科技有限公司

SPECIFICATION

规格说明书

Model 型号: Tacting Switch TSLW-3SWL

Spec No. 规格号: TSLW-3SWL

Dsg'd 设计

Chk'd 审核

App'd 批准

Sales 业务员

专业轻触开关制造商

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轻触开关规格说明

Part No 规格品号:

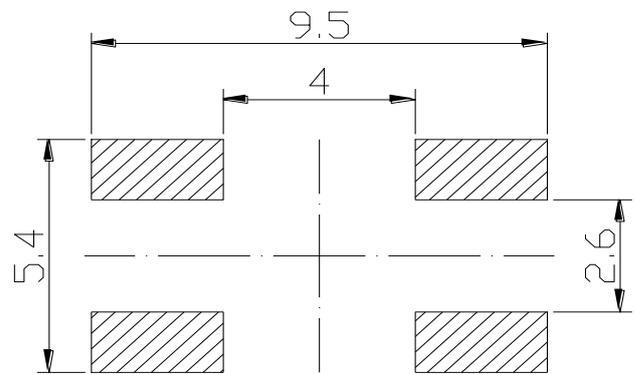
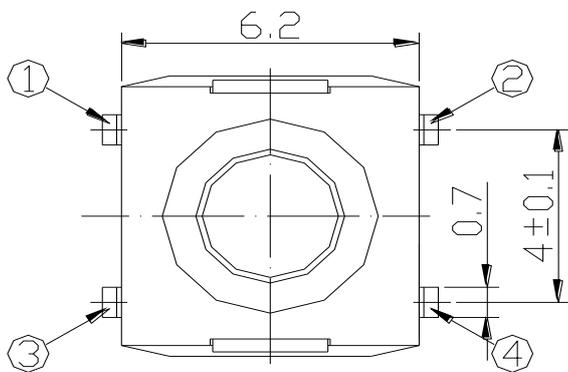
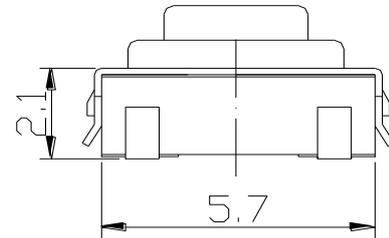
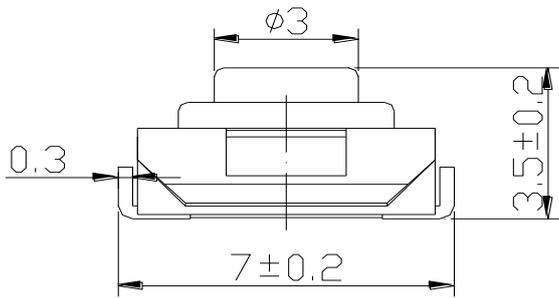
TSLW-3SWL

Date 发布日期:

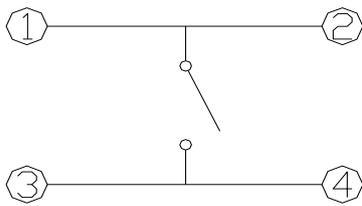
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P.C.B. mounting hole dimension



Circuit diagram

The length	Tolerance range
$L \leq 10$	± 0.3
$10 < L \leq 100$	± 0.5
$100 < L$	± 0.6

unit: mm

Model 型号	Actuating Force(gf) 动作力	Return Force(gf) 回复力	Stem Color 推柄颜色
TSLW-3SWL	260 ± 70	50gf Min.	Red

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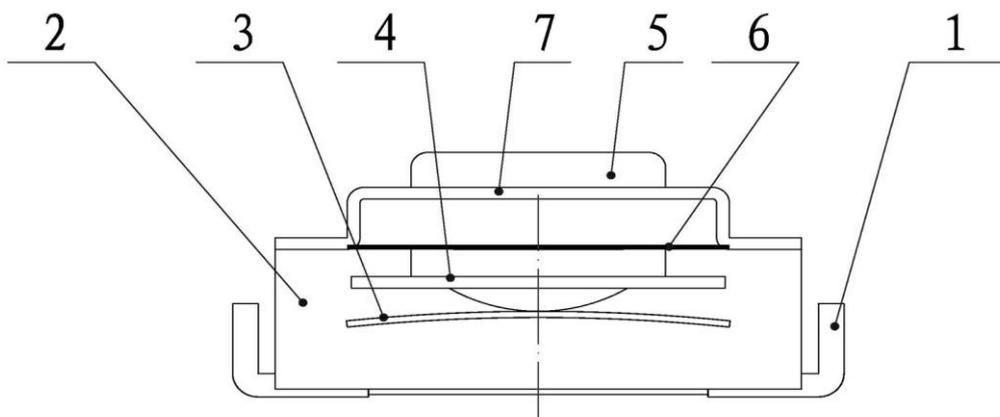
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Item 项目	Components 零件部分	Material Article 材料
1	Terminal 端子	Brass (Silver plating) 黄铜镀银
2	Housing 本体	PA6T
3	Dome 簧片	SUS (Contact side silver plating) 不锈钢镀银
4	Inner stem 内推柄	FR52
5	Outer stem 外推柄	FR52
6	Tape 防尘垫	Polyimide tape 聚酰亚胺胶带
7	Cover 盖板	Stainless steel 不锈钢

Remark:

This product doesn't contain the banned substances that is mentioned on the rules of "ROHS about environment-related substances to be controlled".

本产品均符合“ROHS环境物质管制标准”。

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1. General 概要

1.1 Scope 范围: This specification covers the requirements for single key switches include have no cover.

(Tact Switches: Mechanical Contact).

此份规格说明适用于所有无帽盖的同类简单按键开关。(触点动作: 机械接触)

1.2 Operating Temperature Range 操作温度范围

-20 to 70 °C (normal humidity, normal press 常湿, 常压.)

1.3 Storage Temperature Range 储存温度范围

-30 to 80 °C (normal humidity, normal press 常湿, 常压)

The environment of stock place can't exist an acid ,alkali and any corrosiveness gas.

储存环境中不得有酸、碱或其它腐蚀性气体

1.4 Test Conditions 测试条件

Tests and measurements shall be made in the following standard conditions unless otherwise specified:

无特殊要求,测试与测量均须在以下标准条件中进行:

Normal temperature 正常温度(temperature 温度 5 to 35 °C)

Normal humidity 正常湿度(relative humidity 相对湿度 45 to 85%)

Normal pressure 正常压力(pressure 压力 86 to 106 KPA)

In case any question arises from the judgment made, tests shall be conducted in the following conditions:

为保证在调试过程中不出现问题,必须符合以下测试条件:

Temperature 温度 (20±2 °C)

Relative humidity 相对湿度 (65±5%)

Pressure 压力 (86 to 106 KPA)

2. Appearance, Style, And Dimensions 外观、类型及尺寸

2.1 Appearance 外观:

There shall be no defects that affect the serviceability of the product.

无影响产品使用性能的不良现象存在。

2.2 Style And Dimensions 类型和尺寸:

Shall be conform to the assembly drawings.

必须符合组装图面。

3. Type Of Actuation 规格种类

Tactile feedback 轻触反应

4. Contact Arrangement 接触形式: 1 Poles 1 Throws(单极单投);

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

(详细的接触方式依据组装图面所规定)

5. Maximum Ratings 最大规格 DC 12 V 50 mA

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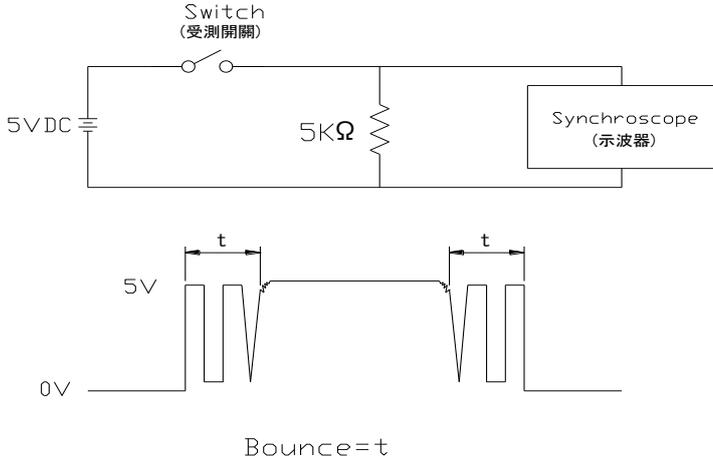
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6. Performance 性能

6.1 Electrical 电性方面

Item 项目	Test Conditions 测试条件	Requirements 要求
6.1.1. Contact Resistance 接触电阻	Applying a static load twice the actuating force to the center of the stem, measurements shall be made with a 1kHz small current contact resistance meter. 推柄在2倍的静动作力下，使用1kHz小电流接触电阻仪测量	Initial contact resistance(初始值): 100 mΩ Max. After Life Test(寿命测试后): 200mΩ Max. After Environmental Test(环境测试后): 200mΩ Max.
6.1.2. Insulation Resistance 绝缘电阻	Measurements shall be made following application of DC 100 V potential across terminals or across terminals and frame for one minute. 在端子的一端到另一端子或盖板及框架，使用DC100V的电压量测1分钟。	Initial insulation Resistance(初始值): 100 MΩ Min. After Environmental Test(环境测试后): 10M Ω Min. After Life Test(寿命测试后): 10MΩ Min.
6.1.3. Dielectric With- Standing Voltage 绝缘电压	AC 250 V (50Hz or 60Hz) shall be applied across terminals and frame for one minute. 在端子与盖板或框架间使用AC250V (50Hz或60Hz)量测1分钟。	The voltage can't through test part and don't show any electric arc in outside. 无击穿和飞弧现象
6.1.4. Bounce 触点跳动	Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per sec.), bounce shall be tested at "ON" and "OFF". 依照正常方式轻按推柄中央（每秒3-4次），测试开关“ON”与“OFF”的瞬间抖动情况。。 	Bounce Initial Bounce (初始值):5 mSec Max. After Life Test(寿命测试后): 10 mSec Max.

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6.2 Mechanical 机械性能

Item 项目	Test Conditions 测试条件	Requirements 要求
6.2.1. Actuating Force 动作力	Placing the switch such that the direction of switch operation is vertical and then gradually increasing the load applied to the center directions of the stem,the maximum load required for the stem to come to a stop shall be measured. 开关的动作方向为垂直放置开关,向推柄中心逐渐的增加负荷直到推柄停止时所测量的最大负荷	According to Page 1/9 Actuating Force(gf) 依照本规格书中1/9页动作力所示
6.2.2. Travel 行程	Placing the switch such that the direction of switch operation is vertical and then Applying astatic load twice the actuating force to the center directions of the stem,the traveledistance for the stem to come to a stop shall be measured. 开关的动作方向为垂直放置开关,并以双倍动作力的静负荷作用推柄中心,测量推柄从开始到停止的行程距离	Push on: 0.25 +0.2/-0.1 mm
6.2.3. Return Force 回复力	The sample switch is installed such that the direction of switch operation is vertical and , upon depression of the stem in its center directions the whole travel distance ,the force off the stem to return to its free position shall be measured . 开关的动作方向为垂直放置开关,在已有行程之推柄中心向上减小压力,推柄回复到自由位置时所量测到的力	According to Page 1/9 Return Force(gf) 依照本规格书中1/9页回复力所示
6.2.4. Stop Strength 静止强度	Placing the switch such that the direction of switch operation is vertical, a static load of 1 kgf shall be applied in the direction of stem operation for a period of 15 seconds. 固定开关,使开关与操作方向垂直,向按钮的操作方向加3Kgf的静负荷,时间为15秒。	There shall be no sign of damage mechanically and electrically. 开关无机械损伤,并能正常动作。
6.2.5. Solderability 可焊性	Test temperature:245±5℃ Test time: 3sec During test, the stick detect temperature in the oven. Then switch terminal soak in the oven. It put 2min under normal temperature after testing. 试验温度:245±5℃,试验时间:3s;试验时,以测温棒检测锡炉温度;开关端子浸入与焊锡接触,在规定时间内取出;测试后在常温下静置2分钟	The area must be reach 90% on the surface of switch terminal. 开关端子上锡面积应达到90%以上
6.2.6. Stem Strength 推柄强度	Placing the switch such that the direction of switch operation is vertical, the maximum force to withstand a pull applied opposite to the direction of stem operation shall be measured. 固定开关,使开关与操作方向垂直,以推柄动作方向反方向施加拉力所测量到的最大承受力	1 Kgf Min.

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6.3 Environmental 环境实验

Item 项目	Test Conditions 测试条件	Requirements 要求
6.3.1. Resistance To Low Temperatures 抗低温性	<p>Following the test set forth below the sample shall be set in normal temperature and humidity conditions for one hour before measurements are made:</p> <p>以下的试验必须要先将样品放置于下列实验要求内, 然后将其放置于常温常湿的环境下1小时后进行测试:</p> <p>(1)Temperature温度: $-30\pm 2\text{ }^{\circ}\text{C}$</p> <p>(2)Time时间: 96 hours</p> <p>(3)Water drops shall be removed 必须将水滴排除.</p>	<p>According to 6.1, 6.2.1, 6.2.2</p> <p>符合项目 6.1, 6.2.1, 6.2.2</p>
6.3.2. Heat Resistance 抗高温性	<p>Following the test set forth below the sample shall be set in normal temperature and humidity conditions for one hour before measurements are made:</p> <p>以下的试验必须要先将样品放置于下列实验要求内, 然后将其放置于常温常湿的环境下1小时后进行测试:</p> <p>(1)Temperature温度: $80\pm 2\text{ }^{\circ}\text{C}$</p> <p>(2) Time时间: 96 hours</p>	<p>According to 6.1, 6.2.1, 6.2.2</p> <p>符合项目 6.1, 6.2.1, 6.2.2</p>
6.3.3. Moisture Resistance 抗湿性	<p>Following the test set forth below the sample shall be set in normal temperature and humidity conditions for one hour before measurements are made:</p> <p>以下的试验必须要先将样品放置于下列实验要求内, 然后将其放置于常温常湿的环境下1小时后进行测试:</p> <p>(1)Temperature温度: $60\pm 2\text{ }^{\circ}\text{C}$</p> <p>(2)Relative humidity相关湿度: 90 to 95%</p> <p>(3)Time时间: 96 hours</p> <p>(4)Water drops shall be removed 必须将水滴排除.</p>	<p>According to 6.1 ; 6.2.1 ; 6.2.2</p> <p>符合项目 6.1 ; 6.2.1 ; 6.2.2</p>
6.3.4. Temperature Cycling 环测温度	<p>Following cycles of the temperature cycling test set forth below the sample shall be set in normal temperature and humidity conditions for one hour before measurements are made:</p> <p>以下步骤的温度循环测试必须要先将样品放置于下列实验要求内, 然后将其放置在常温常湿的环境下1小时后进行测试:</p> <p>During this test, water drops shall be removed.</p> <p>试验过程中, 必须将水滴排除.</p> <p>Per cycle 每一个循环</p> <ul style="list-style-type: none"> - 10°C----- 2h - $10^{\circ}\text{C} \sim +60^{\circ}\text{C}$--- 1h + 60°C----- 2h + $60^{\circ}\text{C} \sim - 10^{\circ}\text{C}$--- 1h <p>Cycle Times : 3 Cycles</p> <p>循环次数: 3次</p> <div data-bbox="574 1545 1037 1792" style="text-align: center;"> </div>	<p>According to 6.1 ; 6.2.1 ; 6.2.2</p> <p>符合项目 6.1 ; 6.2.1 ; 6.2.2</p>

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Item 项目	Test Conditions 测试条件	Requirements 要求
6.4.1. Operating Life 动作寿命	Measurements shall be made following the test set forth below: 测量必须依以下的测试安排进行: (1)DC 12V 5mA resistive load; 直流电 12V 5mA的电阻; (2)Rate of operation: 2~3 operations per second; 动作速度: 每秒2~3次; (3)Depression Force(按压力): Operating force multiplied by 1.5 times (4)Cycle of operation(寿命次数): 100,000 cycles	(1) Contact resistance(接触电阻): 200 mΩ Max (2) Insulation resistance(绝缘电阻): 10 MΩ Min. (3) Actuating Force(动作力): ±30% of initial force (初始值的±30%) (4) According to 6.1 , 6.2.1 , 6.2.2 符合项目 6.1 , 6.2.1 , 6.2.2
6.4.2. Vibration Resistance 耐振动	Measurements shall be made following the test set forth below: 测量必须依以下的测试安排进行: (1)Range of oscillation振动频率: 10 to 55 Hz; (2)Amplitude振幅:pk-to-pk:1.5 mm; (3)Cycle of sweep: 10 -55 -10 Hz in one minute,approx; 振动频率:大约1分钟之内10 -55 -10 Hz; (4)Mode of sweep: Logarithmically sweep or uniform sweep; 振动模式: 对数振动或一致性振动; (5)Direction of oscillation: Three mutually perpendicular; directions, including the direction of stem travel; 振动方向:三个互相垂直的方向, 包括推柄移动的距离; (6)Duration of testing: 2 hours each, for a total of 6 hours; 试验时间2小时一个周期, 共计6小时;	According to 6.1, 6.2.1, 6.2.2. 符合项目 6.1 ; 6.2.1 ; 6.2.2

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7. Switch Handling Precautions 开关使用预防措施

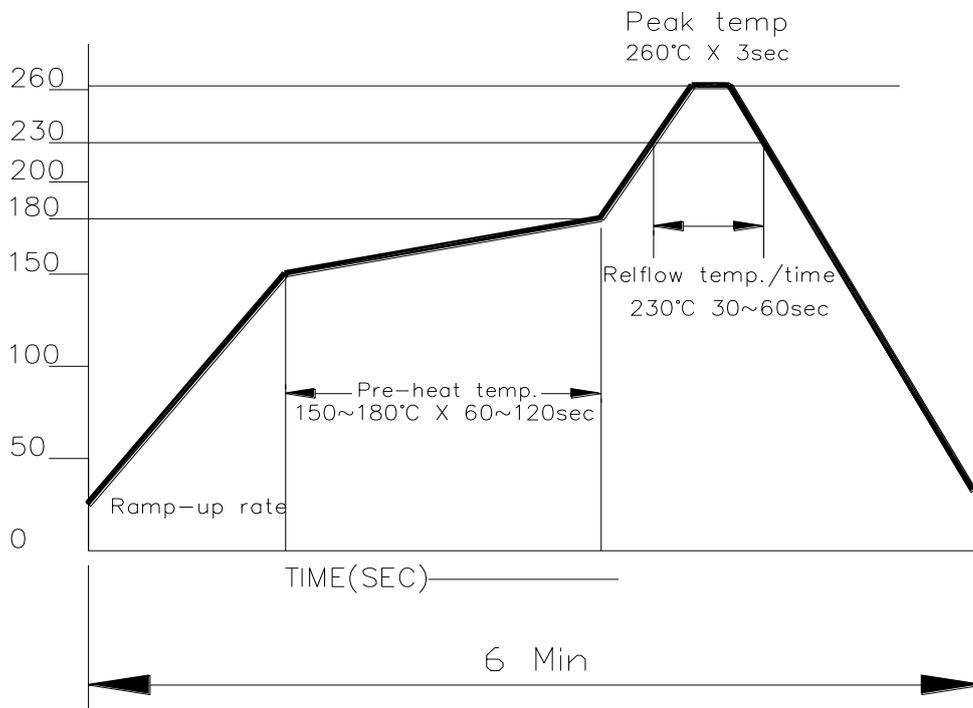
This specification covers the requirements for SMD standard type .

本规格适用于SMD标准型轻触开关

7.1. Reflow soldering conditions : 回流耐焊接条件

Item 项目	Soldering condition 耐焊接热条件
7.1.1 Preheat Temperature 预热温度	150~180°C Max.
	(Ambient temperature of printed circuit board on its soldering side.)
	耐焊接热印刷电路板的周边温度
7.1.2 Preheat Time 预热时间	60-120 sec
7.1.3 Flux Foaming 助焊剂泡沫	To such an extent that fluxes will be kept flush with the printed circuit board's top surface on which components are mounted. Preparatory flux must not be applied to that side of printed circuit board on which components are mounted or nearby.
	在固定的范围内将助焊剂以流体状置于印刷电路板表面，固定各组装部分。
	预备的助焊剂不能放在表面已装有各组件及端子的印刷电路板附近。
7.1.4 Soldering Temperature 耐焊接热温度	260°C Max.
7.1.5 Duration Of Solder Immersion 焊接持续时间	3sec. Max.
7.1.6 Allowable Frequency Of Soldering Process 耐焊接热次数	1 time Max.

Lead free reflow (SnAgCu)



7.2 Other Precautions 其它预防:

7.2.1 Following the soldering process, do not try to clean the switch with a solvent or the like.

依照耐焊接热的程序操作，不得使用溶剂或类似液体清洗开关；

7.2.2 Safeguard the switch assembly against flux penetration from its topside.

保护开关并防止助焊剂从开关顶部渗入；

7.2.3 Please have the products keep in close status and the storage time is 90 days guaranty after delivering the goods.

产品确保密封保存，出货后产品的保质期为90天

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8. Reel Packaging 料带包装

8.1 Scope 范围

This specification covers the requirements of the reel packaging for TSLW-3SWL of tact switches.

此规格书适用于TSLW-3SWL的轻触开关。

8.2 Packaging Materials 包装材料

Item 项目	Substance 材质
Carton 硬纸箱	Corrugated paper 瓦楞纸
Packing Carton 包装纸箱	Corrugated paper 瓦楞纸
Plastic Bag 塑料袋	PE 塑料袋
Pack Membrane 料膜	PS 聚乙烯
Reel 料盘	PS 聚乙烯
Carrier Tape 料带	PS 聚乙烯

8.3 Packaging Quantity 包装数量

The capacity of packing carton 包装箱的容量:

8.3.1 Every carton box contains 2 packing carton at most 每一个硬纸箱最多包含2包装纸箱

8.3.2 Every packing carton contains 15K PCS goods at most 每一个包装纸箱最多包15KPCS货物

8.3.3 Every reel contains 1500 PCS goods 每一个料盘最多包含1500PCS货物

8.3.4 The dimension of Packing carton 包装纸箱的尺寸: 35×34×21 cm

8.3.5 The dimension of Carton box 硬纸箱的尺寸: 69×36×26 cm