



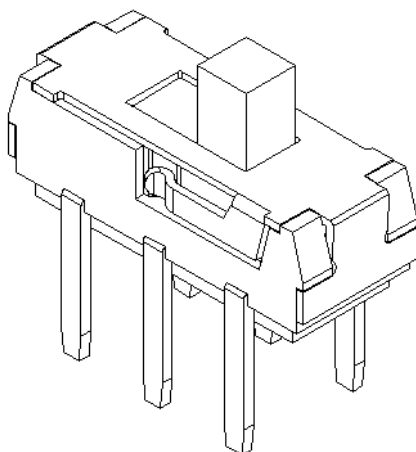
凱華電子  
KAIHUA EEELETRONICS

Document Number:

KH-PS1704-53

# 产品规格书

## Product Specification



P/N:

**CSL903610D01**

Title :

**Slide Switch**

Rev.	ECN	Release and Revision Description:	Prepared By/Date:	Checked By/Date:	Approved By/Date:
A	—	New releasing 初版发行	陈耿/2017/4/20	吕攀豪/2017/4/20	易平/2017/4/20



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**1. Scope/范围:**

This Product Specification covers the requirement of Micro switch on product performance, test methods and quality assurance provisions.

本规格书内容涵盖微动开关产品的要求，包括性能指标、测试方法及质量保证方面等。

**2. Product Application/产品应用:**

The Switch is applied in all types of Computer mouse. Please let us know before using any of the products in the application not described above.

该微动开关产品适用于所有类型的电脑鼠标，如果用于本文中未提及的领域请在使用前告知。

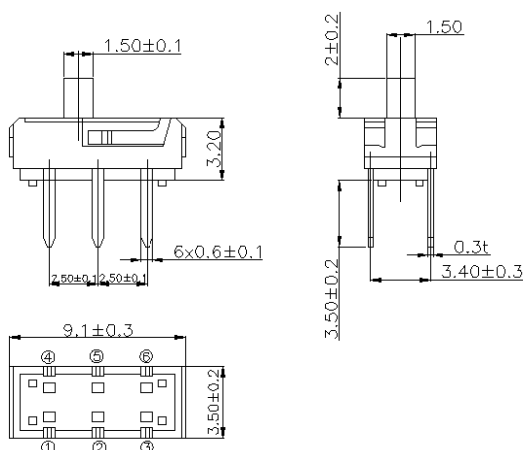
**3. Technology Parameters/技术参数:**

Ambient Humidity 工作湿度:	45~85% R.H.;
Operating Temperature Range 使用温度范围:	-10℃~+70℃;
Storage Temperature Range 保存温度范围:	-20℃~+80℃;
Normal Condition:	
Ambient temperature 环境温度:	20±5℃
Relative humidity 相对湿度:	65%±5% R.H.;
Air pressure 气压:	86~101KPa;
Contact Resistance 接触阻抗:	100 mΩ Max;
Operation Force 操作力:	250±50gf;
Solder Ability 可焊性:	245±5℃,3±0.5s;
Withstand Soldering Temperature 耐焊接热:	260±5℃,3±0.5s;

**4. Ratings/额定性能要求:**

Rating 额定负荷:	DC12V / 50mA;
Insulation Resistance 绝缘电阻:	≥50MΩ/ DC 100V;
Withstand Voltage 耐电压:	AC 250V 1 Minute;
Mechanical Life 机械寿命:	10000 Cycles.

**5. Profile Dimensions /外形尺寸:**



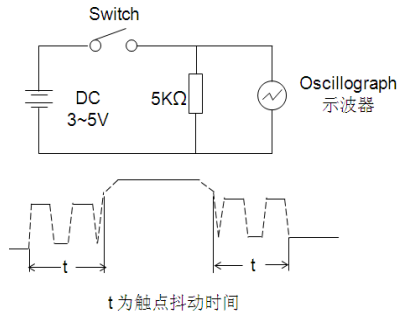


**6. Electrical Performance/电气性能:**

Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
6.1	Contact Resistance 接触电阻	MEASURED AT 1KHz SMALL CURRENT(100 mA OR LESS) 100mΩ MAX. 2.1 RESISTANCE 在 1KHz 微小电流(100mA 以下)测试.	100mΩ Max 100mΩ 以下
6.2	Insulation Resistance 绝缘电阻	APPLY A VOLTAGE OF 100V DC FOR 1 MIN. THE FOLLOWING CONTACT TEST METHOD: (1) BETWEEN BODY AND CONDUCTOR. (2) BETWEEN CONDUCTORS NOT TO BE CONTACT. 输入 100V DC 电压 1 分钟, 按以下接触方法测试: (1)接触端子之间. (2)胶座体和排脚之间.	50MΩ Min 50 兆欧以上
6.3	Dielectric withstanding voltage 耐电压	Apply a Voltage of AC 250 V (50~60Hz) for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body. 输入 250V AC 电压 1 分钟, 按如下接触方法测试: (1) 端子与端子之间. (2) 端子与外壳之间.	WITHOUT DAMAGE TO PARTS ARCING OR BREAKDOWN ETC. 没有绝缘破坏等异常
6.4	Bouncing 触点抖动	Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per sec), Bounce shall be tested when "ON" and "OFF". 在正常使用中(以每秒 3-4 次周期)轻轻地在手柄中心加力,在通与断瞬间测试抖动	Before Life cycle: On: 5ms MAX,5 毫秒以下 Off: 5ms MAX,5 毫秒以下  After Life cycle: On: 10ms MAX,10 毫秒以下 Off: 10ms MAX,10 毫秒以下



触点抖动用图:



**7. Mechanical Performance/机械性能:**

Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
7.1	Operation force 操作力	Place the switch such that the direction of switch operation is vertical and then gradually increase the load applied to the center and around 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及左右逐渐地增加负荷直到推柄停止时所测量的最大负荷	200gf±50gf
7.2	TRAVEL TOCLOSURE 动作行程	IN THE HORIZONTAL DIRECTION SWITCH HANDLE OPRATION, WITH AN EQUAL TO 2TIMES THE THRUST OF THE SWITCH FORM ONE POSITION TO THE NEXT GEAR, MOVING DISTANCE MEASURING HANDLE. 在开关推柄运行的水平方向，以一个等于2倍推力使开关从一个档位运动到下一档位，测量推柄的移动距离.	2mm±0.2mm

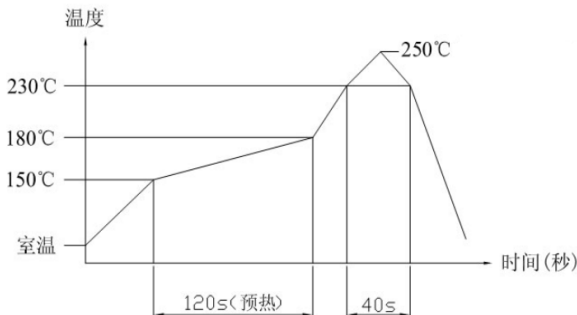


7.3	Static Strength 静止强度	AND ALONG THE RUNNING DIRECTION AT APEX HANDLE(500g)ON THESTRENGTH TEST, TIME IS 30 SECONDS. 在推柄的先端沿运行方向加上(500g)力度测试, 时间 30 秒.	No damage (Electrical and mechanical) 电气和机械性能正常.
7.4	Stem Pull Strength 手柄拉拔强度	Break by a pull force applied opposite to the direction of stem operation. 在推柄动作方向反向垂直施加拉力, 使其破坏的程度.	500gf Min
7.6	Life Test 寿命测试	AN ACTUATOR SHALL BE WITH A THRUST OF NO GREAT THAN 1 TIMES SWITH POWER TO 10000 CYCLES AT A SPEED OF 30 CYCLES FOR 1 MIN. 操作者以每分钟 30 次的频率, 施加不大于开关 1 倍的推力做 10000 次无负荷测试.	1) CONTACT RESISTANCE SHALL BE 500mΩ MAX. 2) LIFETIME:10000 次 1) 接触电阻不超于 500mΩ. 2)寿命:10000 次

**8. Environmental Performance/环境性能:**

Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
8.1	Cold test 耐寒性	(1) Temperature : - 25±3℃ 温度: - 25±3℃ (2) Duration of test: 96h 持续时间: 96 小时 (3) Take off a drop water 去掉水珠 (4) Standard conditions after test : 1h 试验后的放置条件: 1 小时	THERE SHALL BE NO DAMAGE ONAPPEARANCE. MECHANICAL AND ELECTRICAL CHARACTERISTICS SHALL BE SATISFIED. 外观无异常, 满足于机械, 电气性能



8.2	Heat test 耐热性	<p>(1) Temperature : 80±2℃ 温度: 80±2℃</p> <p>(2) Duration of test: 96h 持续时间: 96 小时</p> <p>(3) Take off a drop water 去掉水珠</p> <p>(4) Standard conditions after test : 1h 试验后的放置条件: 1 小时</p>	<p>THERE SHALL BE NO DAMAGE ONAPPEARANCE. MECHANICAL AND ELECTRICAL CHARACTERISTICS SHALL BE SATISFIED.</p> <p>外观无异常, 满足于机械, 电气性能</p>												
8.3	Temperature cycle 温度循环	<p>(1) Test cycles: 5 cycles 试验周期: 5 个周期</p> <p>(2) Standard condition after test:1h 试验后的放置条件: 1 小时</p> <table border="1" data-bbox="459 808 1059 1099"> <thead> <tr> <th></th> <th>Temperature 温度</th> <th>Duration of test 持续时间</th> </tr> </thead> <tbody> <tr> <td rowspan="4">1 cycle 一次循环</td> <td>20±5℃</td> <td>1h</td> </tr> <tr> <td>-20±2℃</td> <td>1h</td> </tr> <tr> <td>20±5℃</td> <td>1h</td> </tr> <tr> <td>80±5℃</td> <td>1h</td> </tr> </tbody> </table>		Temperature 温度	Duration of test 持续时间	1 cycle 一次循环	20±5℃	1h	-20±2℃	1h	20±5℃	1h	80±5℃	1h	<p>THERE SHALL BE NO DAMAGE ONAPPEARANCE. MECHANICAL AND ELECTRICAL CHARACTERISTICS SHALL BE SATISFIED.</p> <p>外观无异常, 满足于机械, 电气性能</p>
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1 cycle 一次循环	20±5℃	1h													
	-20±2℃	1h													
	20±5℃	1h													
	80±5℃	1h													
8.4	Soldering heat test 耐焊接热	<p>Soldering area: T/2 of PWB thickness. (PWB: T=1.6mm) 焊接面积: 印刷基板的 1/2 厚度处</p> <p>Soldering temperature: 260±5℃ 焊接温度: 260±5℃</p> <p>Soldering time: 3±0.5s 焊接时间: 3±0.5 秒</p>	<p>Appearance: No abnormality. 外观无异常</p>												
8.5	SOLDERING CONDITIONS 焊锡条件	<p>1) HAND SOLDERING 手焊: DIVCE 工具: SOLDER IRON 电烙铁. 270℃MAX.,3 sec Max</p> <p>2) REFLOW SOLDERING 回流焊: ≤250℃</p> 	<p>THERE SHALL BE NO DAMAGE ONAPPEARANCE MECHANICAL AND ELECTRICAL CHARACTERISTICS SHALL BE SATISFIED</p> <p>外观无异常, 满足于机械, 电气性能</p>												



# 凱華電子

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## Product Specification

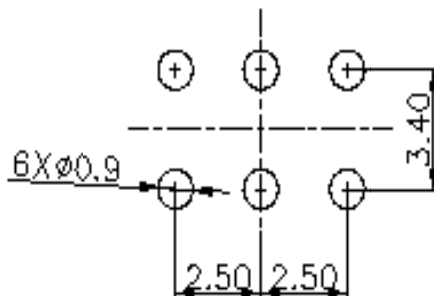
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8.6	Humidity test 耐湿性	<p>(1) Temperature : 40±2°C 温度: 40±2°C</p> <p>(2) relative humidity: 90~95% R.H. 相对湿度: 90~95% R.H.</p> <p>(3) Duration of test: 96h 持续时间: 96 小时</p> <p>(4) Take off a drop water 去掉水珠</p> <p>(5) Standard conditions after test: 1h 试验后的放置条件: 1 小时</p>	<p>THERE SHALL BE NO DAMAGE ONAPPEARANCE. MECHANICAL AND ELECTRICAL CHARACTERISTICS SHALL BE SATISFIED.</p> <p>外观无异常, 满足于机械, 电气性能</p>
8.7	Salt Spray 盐雾测试	<p>Apply the following environment to test: 根据下列条件进行测试:</p> <p>(1) Temperature : 35±5°C 温度: 35±5°C;</p> <p>(2) Salt water density: 5±1% 盐水浓度: 5±1%;</p> <p>(3) Duration: 24 hours 持续时间: 24 小时;</p> <p>(4) After test, the salt deposit shall be removed by running water. 实验后将盐沉积物用水冲掉</p>	<p>Appearance: No corrosion spot, no crack, no base plate naked. 外观: 无腐蚀点, 无裂纹, 无裸露基材.</p> <p>Contact Resistance: 200 mΩ Max 接触电阻: 200 毫欧以下</p>

### 9. Recommended PCB Layout 推荐的 PCB 安装焊盘规格:

(Top View)

(Single face board T=(1.6mm))



Recommended P.C.B Ldyout

“ Confidential ”





**10. Precaution 注意事项:**

**10.1 Immersion Soldering condition 浸焊条件**

ITEM 项目	CONDITION 条件
Preheat temperature 预热温度	120°C Max (Ambient temperature of soldering surface of P.W) 120°C 以下(印刷基板焊锡面周围的温度)
Preheat time 预热时间	60s, Max 60 秒以内
Area of flux 助焊剂面积	1/2 Max of PWB Thickness 印刷基板厚度的 1/2 以内
Temperature of solder 焊锡温度	250±5°C 250±5°C
Time of immersion 浸焊时间	Within 5s 5 秒以内
Number of soldering 焊接次数	2time Max (But should down heat of the first soldering) 2 次以内
Printed wiring board 印刷基板	Single side copper-clad laminates 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) Under the condition of using soldering iron, soldering temperature shall be 350±5°C, Welding time 3±0.5s.

在使用烙铁的情况下,焊锡温度应在350°C以下,焊接时间3秒以内.

**10.2 Notes 注意点:**

- (1) Please be cautious not to give excessive static load or shock to switches.  
注意不要施加超负荷的压力或晃动开关.
- (2) Please be careful not to stack up P. W. 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.
- (4) Products meet the ROHS & REACH environmental management substances control standards  
产品满足 **ROHS & REACH** 环境管理物质管制标准