





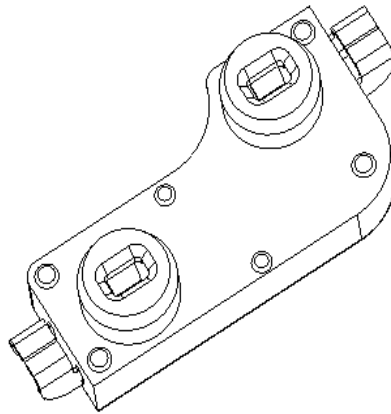
**凱華電子**  
KAIHUA EEELETRONICS

Document Number:

**KH-PS2110-09**

# 产品规格书

## Product Specification



P/N: \_\_\_\_\_

**CPG151101S11-4**

Title :

**1511 Connector**

Rev.	ECN	Release and Revision Description:	Prepared By /Date:	Checked By/Date:	Approved By/Date:
A	_____	New releasing 初版发行	胡海鑫/2021.10.13	胡前程/2021.10.13	郑建军/2021.10.13



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**1. Scope/范围:**

This Product Specification covers the requirement of Mechanical keyboard Connector switch on product performance, test methods and quality assurance provisions.  
本规格书内容涵盖机械键盘连接器产品的要求，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:**

Mainly applied on computer keyboards, cash registers equipment and Man-Machine interface.  
主要适用于电脑，收银机，工业设备和人机界面

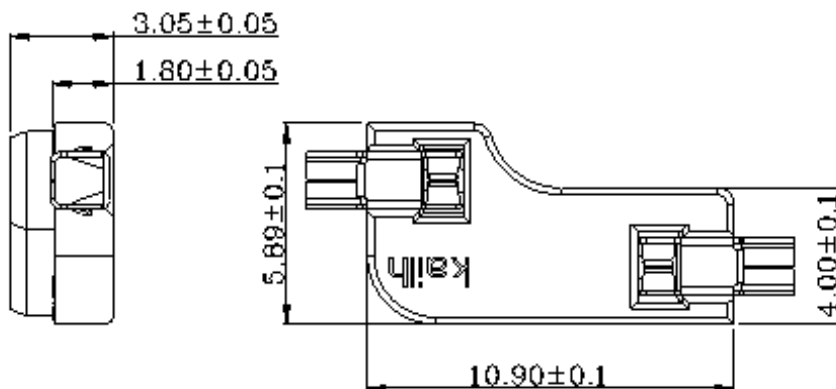
**3. Technology Parameters/技术参数**

Ambient Humidity 工作湿度:	45~95% R.H.;
Operating Temperature Range 使用温度范围:	-10℃~+60℃;
Storage Temperature Range 保存温度范围:	-20℃~+70℃;
Normal Condition:	
Ambient temperature 环境温度:	20±2℃
Relative humidity 相对湿度:	85%±5% R.H.;
Air pressure 气压:	86~101KPa;
Contact Resistance 接触阻抗:	100 m Ω Max;
Solder Ability 可焊性:	锡铅焊 245℃ Max 5s Max; 无铅焊 255℃ Max 5s Max;
Withstand Soldering Temperature 耐焊接热:	波焊焊接: 260±5℃ 5±0.5s;

**4. Ratings/额定性能要求**

Rating Voltare 额定电压:	12V AC/DC max; 2V DC min
Rating Current 额定电流	10mA AC/DC max; 10uA DC min
InsulationResistance 绝缘电阻:	≥100MΩ/DC 500V;
Withstand Voltage 耐电压:	AC 100V 1 Minute;
Mechanical Life 机械寿命:	5000Cycles.

**5. Profile Dimensions /外形尺寸**



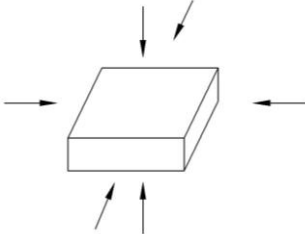


**6. Electrical Performance/电气性能**

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	Static load: (Operation force)x2, which is applied on the center of Switch stem. 静态负载: 动作力的 2 倍, 施加在手柄中心.  Measurement tool: Contact resistance Meter. 测量工具: 微电流接触电阻计(1KHz, 20mV,5~50mA)	100mΩ Max 100mΩ以下
6.2	Insulation Resistance 绝缘电阻	Apply a Voltage of DC 500 V for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body.  输入 500V DC 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.	100MΩ Min 100 兆欧以上
6.3	Dielectric withstanding voltage 耐电压	Apply a Voltage of AC 100 V (50~60Hz) for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body.  输入 100V 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.	No evidence of breakdown 无瞬断、击穿等破坏.



**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	Mating force 插入力	At 16in/minute.actuation speed	Mating force 插入力 3KG max
7.2	Unmating force 拔出力	At 16in/minute.actuation speed	Unmating force 拔出力 200gf min
7.3	Shock 机械冲击	<p>Measured by according to the below condition:            (1) Acceleration: 80g 加速度            (2) Cycles of test:3 cycles each in 6 directions, for a total of 18 cycles.            试验次数: 每个方向 3 次, 6 个方向共 18 次.</p> 	<p>Appearance:            No abnormality.            外观无异常</p>
7.4	Life Test 寿命测试	<p>(1) No load 无负载            (2) Mating force: Maximum value of operation force.            插入力: 操作力规格值的上限.            (3) Cycles: 5000 Min            操作次数: 5000 次以上</p>	<p>Contact resistance:            1000 mΩ Max            接触电阻: 1000 毫欧以下            Bouncing: 10ms Max</p>



**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 : - 20±2°C 温度: - 20±2°C (2) Duration of test: 48h 持续时间: 48 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	Contact resistance: 200m Ω Max 接触电阻 200m Ω 以下												
8.2	Heat test 耐热性	(1) Temperature : 70±2°C 温度: 70±2°C (2) Duration of test: 48h 持续时间: 48 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	Contact resistance: 200m Ω Max Shall meet : No. 6.2 接触电阻 200m Ω 以下 满足: No. 6.2												
8.3	Temperature cycle 温度循环	(1) Test cycles: 5 cycles 试验周期: 5 个周期 (2) Standard condition after test:1h 试验后的放置条件: 1 小时 <table border="1" data-bbox="432 1288 987 1480"> <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°C</td> <td>1h</td> </tr> <tr> <td>-20±5°C</td> <td>1h</td> </tr> <tr> <td>20±5°C</td> <td>1h</td> </tr> <tr> <td>70±5°C</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°C	1h	-20±5°C	1h	20±5°C	1h	70±5°C	1h	Contact resistance: 200m Ω Max Shall meet : No. 6.2 接触电阻 200m Ω 以下 满足: No. 6.2
	Temperature 温度	Duration of test 持续时间													
1 cycle 一次循环	20±5°C	1h													
	-20±5°C	1h													
	20±5°C	1h													
	70±5°C	1h													
8.4	Soldering heat test 耐焊接热	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 Soldering temperature: 260±5°C Soldering time: 5±0.5s 焊接温度: 260±5°C 焊接时间: 5±0.5 秒 <div data-bbox="432 1825 853 2072"> <p>SMT回流焊温度曲线图</p> <p>峰温: 260°C±5°C 5s±0.5s Peak temperature</p> </div>	Appearance: No abnormality. 外观无异常												



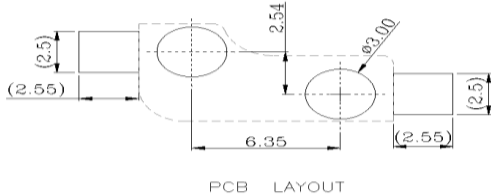
8.5	Solderability 可焊性	<p>Lead-tin soldering 锡铅焊接: Soldering temperature: 245±5°C Soldering time: 5±0.5s 焊接温度: 245±5°C 焊接时间: 5±0.5 秒</p> <p>Lead free soldering 无铅焊接: Soldering temperature: 255±5°C Soldering time: 5±0.5s 焊接温度: 255±5°C 焊接时间: 5±0.5 秒</p>	<p>At least 95% of surface area of immersed portion shall be covered by solder. 侵焊面积大于 95%以上.</p>
8.6	Humidity test 耐湿性	<p>(1) Temperature : 60±2°C 温度: 60±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: 48h 持续时间: 48 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>Contact resistance: 200m Ω Max Shall meet : No. 6.2 接触电阻 200m Ω 以下 满足: No. 6.2</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: 12 hours 持续时间: 12 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 m Ω 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**

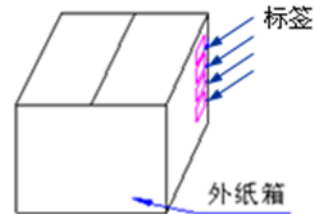
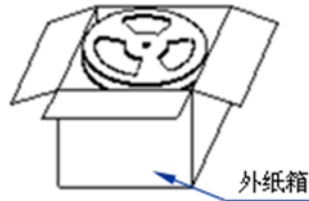
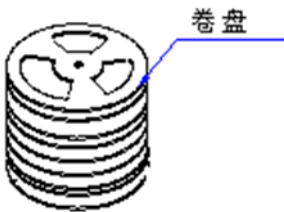
(Top View)  
(Single face board T=1.6mm)



**10. Packaging 包装**

Packaging type: 13Tray, 26000Pcs/Carton.

包装方式:13 /盘, 26000Pcs/箱.



**11. Precaution 注意事项**

**11.1 Soldering condition 回流焊条件**

ITEM 项目	CONDITION 条件	
Preheating zone 预热区	Heating zone 升温区	Speed <math>2^{\circ}\text{C}/\text{S}</math>, Preheating time 15 S Max, temperture 150 $^{\circ}\text{C}$ 速度 <math>2^{\circ}\text{C}/\text{S}</math>, 预热时间 15 S 最多, 温度 150 $^{\circ}\text{C}$
	Heatpreservati on area 保温区	Speed 1.2~3.5 $^{\circ}\text{C}/\text{S}$ , Preheating time 120 S Max, temperture 180 $^{\circ}\text{C}$ 速度 1.2~3.5 $^{\circ}\text{C}/\text{S}$ , 预热时间 120 S 最多, 温度 180 $^{\circ}\text{C}$
	Fast heating zone 快速升温区	Speed 3.5~4.5 $^{\circ}\text{C}/\text{S}$ , Preheating time 140 S Max, temperture 230 $^{\circ}\text{C}$ 速度 3.5~4.5 $^{\circ}\text{C}/\text{S}$ , 预热时间 140 S 最多, 温度 230 $^{\circ}\text{C}$
Weld area 焊接区	Welding time 40 S Max, welding temperature peak value, 3 sec Max. 焊接时间 40 S 最多, 焊接温度峰值 260 $^{\circ}\text{C}$ 最大, 3 S 最多	
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	260 $\pm$ 5 $^{\circ}\text{C}$ 260 $\pm$ 5 $^{\circ}\text{C}$	
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 reflow, be careful not to clean switches with solvent

回流焊后, 注意不要溶剂清洗.

(2) Under the condition of using soldering iron, soldering temperature shall be 350 $^{\circ}\text{C}$  max within 3 sec.

在使用烙铁的情况下, 焊锡温度应在350 $^{\circ}\text{C}$ 以下, 焊接时间3秒以内.



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### 11.2 Notes 注意点

- (1) Please be cautious not to give excessive static load connector.  
注意不要施加超负荷的压力或晃动连接器。
- (2) Connector be careful not to stack up P. W. B. after switches were soldered.  
连接器焊接以后,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) The standard storage period is 3 months, with maximum up to 6months, preferably to be used as soon as possible. After opening the package, you should put the remaining switches in a plastic bag to prevent from damp and corrosive gas.  
保存标准为 3 个月, 限度为 6 个月以内, 请尽早使用. 打开包装后, 有剩余品时, 应将剩余部分以胶袋包装好以同外界隔离, 请进行合适的防湿, 防腐蚀气体等处理后进行保管。
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产品满足 **ROHS & REACH** 环境管理物质管制标准