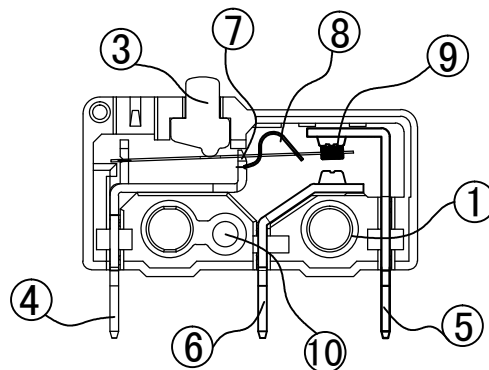
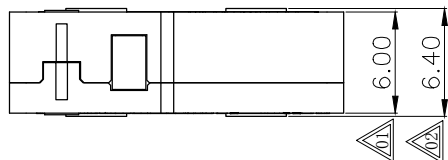


CMI191003W01 产品出货料号统计表

版次:A004

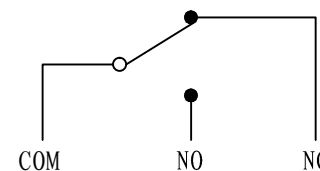
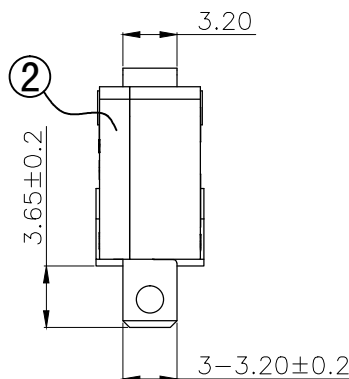
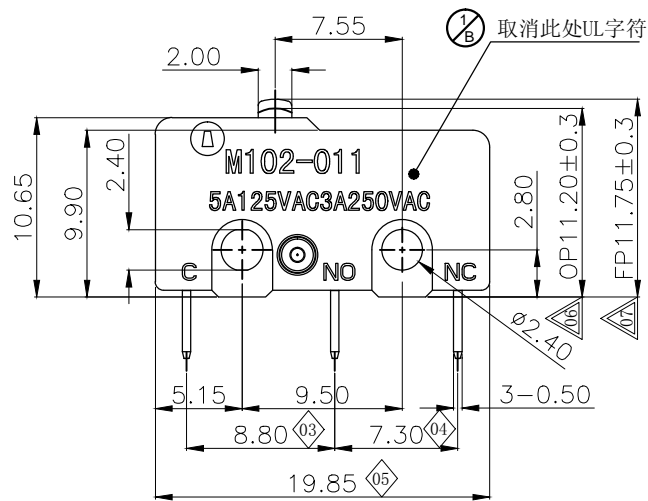
序号	凯华料号	客户料号	客户代码	克力	寿命	备注
1	CMI191003W01	KD073000-2	LH750002	110±30	100 万次	2017-9-16
2	CMI191003W01	无	LH755063	110±30	100 万次	2017-12-22
3	MI191003W01	无	LKHS-ID07	110±30	100 万次	2018-5-12
4	MI191003W01	无	KH000060	110±30	100 万次	2019-6-20

遵守欧盟WEEE和ROHS之规定



技术参数

额定值: DC12V 0.1A
 接触电阻: 100mΩ 最大
 绝缘电阻: DC 500V >100MΩ
 耐电压强度: AC 1000V 1分钟
 操作力: 110 ± 30gf
 PT行程: 0.6 ± 0.20
 机械寿命: 100万次



电原理图

备注:

◇: 表示重点管控尺寸, 一般为功能尺寸, 首检及巡检时需量测。
 △: 表示次重点管控尺寸, 一般为装配尺寸, 首检时需量测。
 1) 重点及次重点管控尺寸中的序号不可重复, 需依次往后增加。若其中有某个尺寸在变更或其它状况下, 尺寸消失或不要求管控时, 原序号不可再用。有其它尺寸需要增加管控时, 序号往后增加。
 2) 版次定义: 新开发而未转量产之产品图面版次为A1, A2, A3... 已转量产之产品图面版次为A, B, C...

序号	零件	端子编号	用量	材料	镀层/颜色	备注
⑩	铆钉	—	1	铝材	本色 (Natural)	
⑨	触头	—	1	Cu	镀银 (Ag40U ⁺)	
⑧	簧片	—	1	C1746OHT	本色 (Natural)	
⑦	直片	—	1	C1746OHT	本色 (Natural)	
⑥	端子(3)	NO	1	H65Y	镀银 (Ag)	
⑤	端子(2)	NC	1	H65Y	镀银 (Ag)	
④	端子(1)	COM	1	H65Y	镀银 (Ag)	
③	导芯	—	1	PBT G15	黑色 (Black)	
②	盖子	—	1	PBT G15	黑色 (Black)	
①	基座	—	1	PBT G15	黑色 (Black)	

承认		日期	东莞市凯华电子有限公司 KAIHUA ELECTRONICS CO.,LTD			
设计	徐其锋	2013.06.11				
审核			名称	M11910 簧片型中微动开关		
核准			料号	CMI191003W01		
未注尺寸公差	30<L	±0.30	角度	单位: mm	比例: 1:1	视角
	10<L≤30	±0.20				
	5<L≤10	±0.15				
	L≤5	±0.10				
		±2'	图号	KHA-M11910-005	页次 1 OF 1	

ECN-1706-22	B	2017.06.24	图示 处取消U字符	吴杰		
	A	2013.06.11	NEW	徐其锋		
工程变更单号	版次	日期	说明	修改	审核	核准



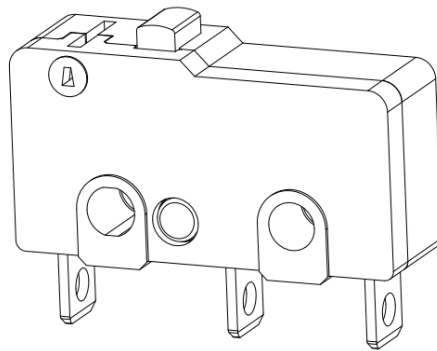
凱華電子
KAIHUA EEELETRONICS

Document Number:

KH-PS1612-52

产品规格书

Product Specification



P/N:

CMI191003W01

Title :

Micro Switch

Rev.	ECN	Release and Revision Description:	Prepared By/Date:	Checked By/Date:	Approved By/Date:
A	--	New releasing 初版发行	徐淇锋/2013/06/11	徐淇锋/2013/06/11	品攀豪/2016/06/13
B	--	Revise format 修订格式	张林/2016/12/27	张林/2016/12/27	易平/2016/12/27



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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 the automobile, home appliances , electric tools, industrial control equipment, medical equipment and security equipment. Please let us know before using any of the products in the application not described above.
该开关适用在汽车、家电、电动工具、工业控制设备、医疗设备和安防器材，如果用于本文中未提及的领域请在使用前告知。

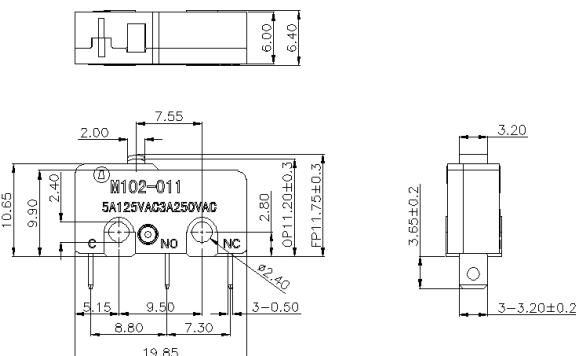
3. Technology Parameters/技术参数

Ambient Humidity 工作湿度:	45~85% R.H.;
Operating Temperature Range 使用温度范围:	-20℃ ~ +80℃;
Storage Temperature Range 保存温度范围:	-40℃ ~ +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:	110 ± 30gf;
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 / 0.1A;
Insulation Resistance 绝缘电阻:	≥ 100MΩ / DC 500V;
Withstand Voltage 耐电压:	1000V AC 1 Minute;
Mechanical Life 机械寿命:	1,000,000 Cycles.

5. Profile Dimensions /外形尺寸





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Product Specification

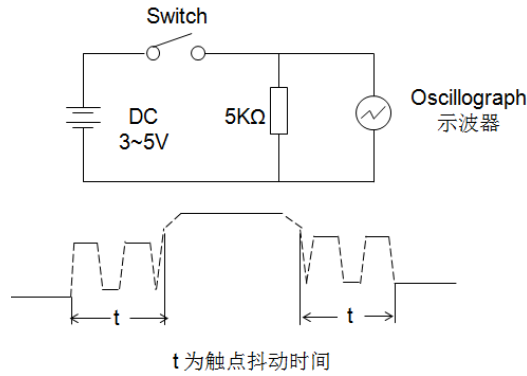
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6. Electrical Performance/电气性能

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	<p>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.</p> <p>Measurement tool: Contact resistance Meter. 测量工具: 微电流接触电阻计(1KHz, 20mV,5~50mA)</p> <p>Measured at low current (100mA or less). 在低电流 (≤100mA) 条件下测试.</p>	<p>100mΩ Max 100mΩ 以下</p>
6.2	Insulation Resistance 绝缘电阻	<p>Apply a Voltage of DC500 V for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body.</p> <p>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.</p>	<p>100MΩ Min 100 兆欧以上</p>
6.3	Dielectric withstanding voltage 耐电压	<p>Apply a Voltage of AC500 V (50~60Hz) for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body.</p> <p>输入 1000V 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.</p>	<p>No evidence of breakdown 无瞬断、击穿等破坏.</p>
6.4	Bouncing 触点抖动	<p>Operation speed: 3~4 times/s 操作速度: 每秒 3~4 次</p> <p>Slightly push the center of stem by 3~4 times/s, to test the bounce at "ON" and "OFF" 以每秒 3~4 次的速度, 轻轻在手柄中心加力, 在"导通"与"瞬断"间测试.</p> <p>Oscillo scope 示波器 Switch Bouncing Test Circuit 抖动测定回路.</p>	<p>Before Life cycle: On: 5ms MAX,5 毫秒以下 Off: 5ms MAX,5 毫秒以下</p> <p>After Life cycle: On: 10ms MAX,10 毫秒以下 Off: 10ms MAX,10 毫秒以下</p>

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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	Load curve 荷重曲线	<p>Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop. 开关的动作方向为垂直放置，向手柄中心逐渐施加负荷直到停止.</p>	See page 10 见第 9 页
7.2	Loading parameter 荷重参数	<p>Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop. 开关的动作方向为垂直放置，向手柄中心逐渐施加负荷直到停止.</p>	See page 10 见第 9 页

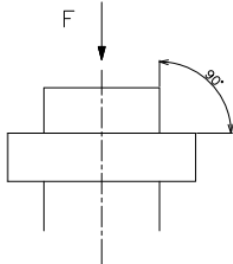
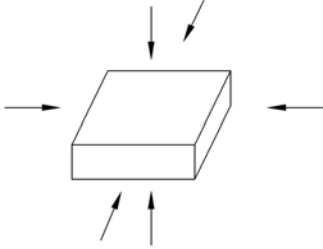


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7.3	Static Strength 静止强度	<p>A static load of 3 Kgf shall be applied in the direction of button operation for a period of 60 seconds. 在手柄动作方向施加 3kgf 的静负荷 60 秒, 然后测试参数.</p> 	<p>No damage (Electrical and mechanical) 电气和机械性能正常.</p> <p>Contact resistance 接触电阻: 100mΩ Max</p> <p>Contact force 接触力: 20gf Min</p>
7.4	Stem Pull Strength 手柄拉拔强度	<p>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.</p>	500gf Min
7.5	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>Shall meet No.6, 7.1, 7.2. 满足 6, 7.1, 7.2 要求.</p>
7.6	Life Test 寿命测试	<p>(1) 1mA 5VDC Resistance load 1mA 5VDC 阻抗负载 (2) Operation speed: 60 cycles/s 操作速度: 60 次/秒 (3) Actuation force: 250 gf 动作力: 250gf (4) Cycles: 1,000,000 times Min 操作次数: 100 万次以上</p>	<p>Contact resistance: 100Ω max 接触电阻 100Ω 以下 Bounce: 10m sec max 触点抖动: 10 毫秒以下 No 6.2 to 6.4 and 7.2 shall be satisfied 满足 6.2 到 6.4 项和 7.2 项.</p>

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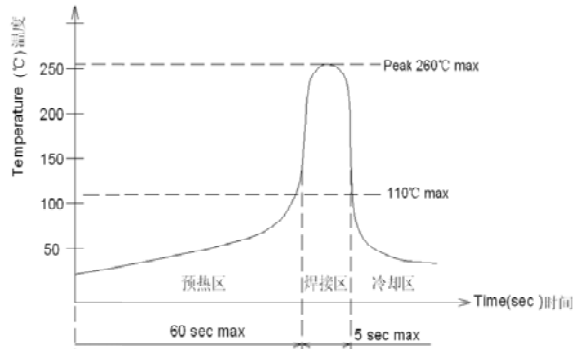
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8. Environmental Performance/环境性能

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 : $-20 \pm 2^{\circ}\text{C}$ 温度: $-20 \pm 2^{\circ}\text{C}$ (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	Contact resistance: 200m Ω Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200m Ω 以下满足: No. 6.2 to 6.4 No. 7.1 to 7.2												
8.2	Heat test 耐热性	(1) Temperature : $80 \pm 2^{\circ}\text{C}$ 温度: $80 \pm 2^{\circ}\text{C}$ (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	Contact resistance: 200m Ω Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200m Ω 以下满足: No. 6.2 to 6.4 No. 7.1 to 7.2												
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="450 1308 1054 1503"> <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>$20 \pm 5^{\circ}\text{C}$</td> <td>1h</td> </tr> <tr> <td>$-20 \pm 2^{\circ}\text{C}$</td> <td>1h</td> </tr> <tr> <td>$20 \pm 5^{\circ}\text{C}$</td> <td>1h</td> </tr> <tr> <td>$80 \pm 5^{\circ}\text{C}$</td> <td>1h</td> </tr> </tbody> </table>		Temperature 温度	Duration of test 持续时间	1 cycle 一次循环	$20 \pm 5^{\circ}\text{C}$	1h	$-20 \pm 2^{\circ}\text{C}$	1h	$20 \pm 5^{\circ}\text{C}$	1h	$80 \pm 5^{\circ}\text{C}$	1h	Contact resistance: 200m Ω Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200m Ω 以下满足: No. 6.2 to 6.4 No. 7.1 to 7.2
	Temperature 温度	Duration of test 持续时间													
1 cycle 一次循环	$20 \pm 5^{\circ}\text{C}$	1h													
	$-20 \pm 2^{\circ}\text{C}$	1h													
	$20 \pm 5^{\circ}\text{C}$	1h													
	$80 \pm 5^{\circ}\text{C}$	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: $260 \pm 5^{\circ}\text{C}$ Soldering time: $3 \pm 0.5\text{s}$ 焊接温度: $260 \pm 5^{\circ}\text{C}$ 焊接时间: 3 ± 0.5 秒	Appearance: No abnormality. 外观无异常												

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8.5	Solderability 可焊性	<p>1. Hand soldering 手工焊接: Please practice according to below condition: (1) Soldering Temperature : $350 \pm 5^{\circ}\text{C}$ 焊接温度: $350 \pm 5^{\circ}\text{C}$ (2) Continual soldering time: $3 \pm 0.5\text{s}$ 连续焊接时间: 3 ± 0.5 秒 (3) Capacity of soldering iron: $\leq 20\text{w}$ 电烙铁功率: 20 瓦以下</p> <p>2. Automatic Reflow soldering 自动焊接: For the product of PIP, according to below condition:</p> 	<p>At least 95% of surface area of immersed portion shall be covered by solder. 浸焊面积大于 95% 以上.</p>
8.6	Humidity test 耐湿性	<p>(1) Temperature : $60 \pm 2^{\circ}\text{C}$ 温度: $60 \pm 2^{\circ}\text{C}$ (2) relative humidity: 90~95% R.H. 相对湿度: 90~95% R.H. (3) Duration of test: 96h 持续时间: 96 小时 (4) Take off a drop water 去掉水珠 (5) Standard conditions after test: 1h 试验后的放置条件: 1 小时</p>	<p>Contact resistance: $200\text{m}\Omega$ Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 $200\text{m}\Omega$ 以下 满足: No. 6.2 to 6.4 No. 7.1 to 7.2</p>
8.7	Salt Mist test 盐雾测试	<p>Apply the following environment to test: 根据下列条件进行测试: (1) Temperature : $35 \pm 5^{\circ}\text{C}$ 温度: $35 \pm 2^{\circ}\text{C}$; (2) Salt water density: $5 \pm 1\%$ 盐水浓度: $5 \pm 1\%$; (3) Duration: 24 hours 持续时间: 24 小时; (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: $200\text{m}\Omega$ Max 接触电阻: 200 毫欧以下</p>



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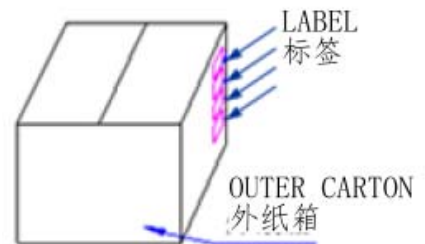
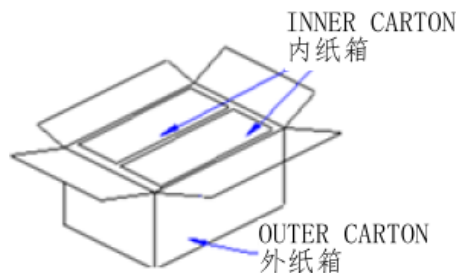
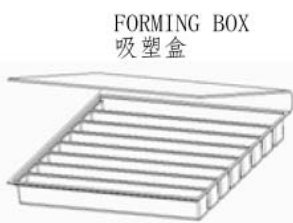
8.8	Withstand K ₂ S 硫化测试	<p>Apply the following environment to test: 根据下列条件进行测试</p> <p>(1) Temperature: 35±5℃ 温度: 35±5℃ (2) K₂S Density: 2%; 硫化钾浓度: 2% (3) Duration: 2 minute. 持续时间: 2 分钟</p>	<p>Appearance: No corrosion spot, no crack, no base plate naked. 外观: 无腐蚀点, 无裂纹, 无裸露基材.</p> <p>Contact Resistance: 200 mΩ Max 接触电阻: 200 毫欧以下</p>
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9. Loading Parameter (FP/OP/PT/OF/OT/MD/RF) Specification 荷重参数规格 :

Parameter	Unit	Specification	Remark
FP	mm	11.75±0.3	
OP	mm	11.20±0.3	
OF	gf	110±30	

10. Packaging 包装

Packing Style 包装类型	Quantity 数量	Notes 说明
Forming Box 吸塑盒	100PCS.	
内纸箱 Inner Carton	1500PCS.	Forming Box: 15PCS
外纸箱 Outer Carton	6000PCS.	Inner Carton: 4PCS



11. Precaution 注意事项

11.1 Immersion Soldering condition 浸焊条件

ITEM 项目	CONDITION 条件
Preheat temperature 预热温度	110℃ Max (Ambient temperature of soldering surface of P.W.B) 110℃ 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	260±5℃



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焊锡温度	260±5℃
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℃ max within 3 sec.
在使用烙铁的情况下,焊锡温度应在350℃以下,焊接时间3秒以内.

11.2 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