

# Product Specification

Number: L-KLS7-KS01-B  
Name: Key Switch  
Specification: \_\_\_\_\_  
Customer: D02  
Date: 2021-12-16

Customer Signature:



**NINGBO KLS ELECTRONIC CO; LTD**

Tel : 0086-574-86828566

Fax : 0086-574-86824882

ADD : NO. 8-1, RONGXIA RD. XIAPU SHANQIAN  
INDUSTRIAL ZONE BEILUN NINGBO ZHEJIANG.

Compile	Check	Review	Approval
Jenny	Jack.C		

产品型号 Item.#	L-KLS7-KS01-B	说明 Description	按键开关 Key Switch	版本 Version	A
页 码 Page	第 2 页 2 of 7		日期 Date	2021-12-16	

## 1. 一般特性 General Characteristics:

1.1 适用范围 Application	该规格书适用于按键开关的一般使用范围 This specification is applied to Key Switch used for general applications.
1.2 使用温度范围 Operating Temperature Range	-40° C to +80° C
1.3 使用相对湿度范围 Operating Relative Humidity Range	≦85% RH, +40° C
1.4 实验条件 Test Conditions	若没有特别说明, 则试验大气条件如下: Unless otherwise specified, the atmospheric conditions for making measurements and tests are as follows: 环境温度 Ambient Temperature: 5-35° C 大气压力 Air Pressure: 86-106 Kpa 相对湿度 Relative Humidity: 45-85% RH

## 2. 外观, 结构及尺寸 Appearance, Structure and Dimensions:

2.1 外观 Appearance	产品外观良好, 无锈蚀、裂纹和镀层缺陷。 The switch shall have good finishing, and no rust, crack or plating defects.
2.2 结构及尺寸 Structure and Dimensions	参见产品图纸 Refer to individual product drawing
2.3 标识 Markings	参见产品图纸。 Refer to individual product drawing.

## 3. 额定负荷 Ratings :

额定负荷 Ratings	10mA 12V AC/DC
--------------	----------------

## 4. 电气性能 Electrical Characteristics:

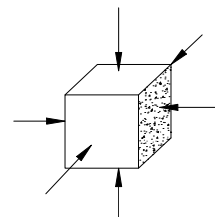
	项目 Item	标准 Criteria	实验方法 Test Method
4.1	接触电阻 Contact Resistance	初始值 Initial Resistance:200 mΩ Max	以 1mA 5V 直流电, 采用点对点测量; 也可用误差不超过 5% 的仪表进行测量, 试验后的电阻取 4 次测量的平均值。 Measured by contact-to-contact method at 1mA Max, 5VDC, Any equipment with error not more than 5% can be used Resistance after test is the average of 4 successive measurements.
4.2	绝缘电阻 Insulation Resistance	100MΩ Min.	在相互绝缘的所有端子之间及各接线端子与外露的非载流金属零件之间加载 100V 直流电, 持续时间 60 ± 5 秒。 100V DC voltage is applied between each pair of terminals, and between the terminal and the metal frame for 60 ± 5 Sec.
4.3	抗电强度 Dielectric Voltage	无击穿现象发生 No dielectric breakdown shall occur	在相互绝缘的所有接线端子之间及各接线端子与外壳或非载流金属零件之间加载 500V (50-60Hz, 泄漏电流 2mA ) 交流电, 持续时间 60 ± 5 秒。 500V (50-60HZ, cut - off current 2mA ) alternate current load is applied between open terminals and between terminals and the metal frame or between metal parts, for 60 ± 5 Sec.

产品型号 Item.#	L-KLS7-KS01-B	说明 Description	按键开关 Key Switch	版本 Version	A
页 码 Page	第 3 页 3 of 7		日期 Date	2021-12-16	

4.4	触点动作响应时间 Contact bounce time	≤5 ms	测试条件: 操作速度 v=0.40m/s, 负载 5 VDC/5mA Test conditions: v=0.40m/s, 5 VDC/5mA
-----	---------------------------------	-------	---

5. 机械性能 Mechanical Characteristics:

项目 Item	标准 Criteria	实验方法 Test Method
5.1 总行程 Total travel	0 4.0 <sub>-0.4</sub> mm	按键轴沿操作方向从初始位置到最大行程位置时的距离 The Actuator hall be reduced to the tip of actuator in operating direction to change component from operating position to end point
5.2 动作行程 Output resolution	2.0±0.6 mm	按键轴沿操作方向从初始位置到按键开关动作位置时的距离 The Actuator shall be applied to the tip of actuator in operating direction to change the component to operating position
5.3 操作力 Operating Force	60±10gf	在操作元件末端沿操作方向均匀施加静载荷, 使操作元件转换到2mm位置 A static load shall be applied to the tip of actuator in operating direction to change the component to 2mm position
5.4 全行程压力 End force	<110gf	按键轴沿操作方向从初始位置到最大行程位置时的动作力 The Actuator hall be reduced to the tip of actuator in operating direction to change component from operating position to end point
5.5 振动试验 Vibration	实验后 After test: - 电气性能应符合第 4.1~4.4 项要求 - Electrical characteristics of items 4.1 ~ 4.4 shall be satisfied. - 机械性能应符合 5.1~5.4 项要求 - Mechanical characteristics of items 5.1 ~ 5.4 shall be satisfied.	按键开关按常规的安装方法牢固地安装在试验设备上, 并在下述参数条件下进行试验(10个一组): Key Switch be secured to a testing machine by a normal mounting device and method. Switch shall be measured after following test(10 pcs of group).: 1. 振频(Vibration frequency range) = <u>10-22.5</u> Hz 振幅(Total amplitude) = <u>0.25mm</u> 振动变化速率(Sweep ratio): <u>10-55-10Hz</u> 2. 振频(Vibration frequency range) = <u>10-16</u> Hz 振幅(Total amplitude) = <u>3mm</u> 振动变化速率(Sweep ratio): <u>10-55-10Hz</u>
5.6 冲击试验 Shock		试件在下述参数条件下进行试验: (Switch shall be measured after following test:) (1) 安装方法: 常规方法( Mounting Method: Normal ) (2) 加速度(Acceleration) : <u>245m/s<sup>2</sup></u> (25G) (3) 时间( Duration ) : <u>11ms</u> (4) 实验方向: 图示 6 方向(Test Direction : 6 directions) (5) 冲击次数: 每个方向 3 次 (总共 18 次) Number of shocks : 3 times per direction (18 times in total)



产品型号 Item.#	L-KLS7-KS01-B	说明 Description	按键开关 Key Switch	版本 Version	A
页 码 Page	第 4 页 4 of 7		日期 Date	2021-12-16	

5.7	可焊性 Solder-Ability	<p>超过 90% 的焊锡面积被焊料所覆盖</p> <p>More than 90% of immersed part shall be covered with solder.</p>	<p>试件在下述参数条件下进行试验</p> <p>Key Switch shall be checked after following test:</p> <p>(1) 焊料: 常规; Solder: Normal</p> <p>(2) 焊剂: 质量百分比为 25%松香, 75%甲醇的无色透明溶液; Flux: Rosin Flux having a nominal composition of 25% solids by mass of water white rosin in methyl alcohol solution.</p> <p>(3) 焊接温度: Soldering Temperature: <math>260 \pm 5^\circ \text{C}</math></p> <p>    浸渍时间: Immersing Time: <math>3 \pm 1 \text{ Sec}</math></p> <p>    焊剂浸渍时间: 5-10 Sec</p> <p>    Flux immersing time shall be 5-10s in normal room temperature.</p> <p>(4) 浸渍深度: 接线端应浸到离产品根部 1.5mm 处。</p> <p>    Immersion Depth: Immersion depth shall be at copper plating portion of PCB after mounting.</p> <p>    (Thickness of PCB=1.5mm)</p>
-----	-----------------------	---	--

6. 寿命试验 Durability Characteristics:

项目 Item	标准 Criteria	实验方法 Test Method
6.1 机械寿命 Mechanical Life	<p>实验前 Before test:</p> <p>    接触电阻: Contact resistance: <math>200\text{m}\Omega \text{ Max}</math></p> <p>    绝缘电阻 Insulation resistance: <math>100\text{M}\Omega \text{ Min.}</math></p> <p>实验后 After test</p> <p>    接触电阻: Contact resistance <math>10\Omega \text{ Max}</math> or switch can be conductanced is ok</p>	<p>在不带负荷的条件下, 在寿命试验设备上连续转换 50,000,000 次, 120 次 /分钟。</p> <p>50,000,000 cycles of operation shall be performed continuously at a rate of 120 cycles per minute without load.</p>
6.2 电气寿命 Electronics Life		<p>在带以下负荷的条件下, 在寿命试验设备上连续转换 50,000,000 次, 120 次/分。</p> <p>10mA 12VDC</p> <p>50,000,000 cycles of operation shall be performed continuously at a rate of 120 cycles per minute with load as follow:</p> <p>10mA 12VDC</p>

7. 耐候性能 Weather Proof Characteristics:

项目 Item	标准 Criteria	实验方法 Test Method
7.1 低温 Cold Proof	<p>实验后 After test:</p> <p>    接触电阻: Contact resistance: <math>200\text{m}\Omega \text{ Max}</math></p> <p>    绝缘电阻 Insulation resistance: <math>100\text{M}\Omega \text{ Min.}</math></p> <p>    电气性能应符合第 4.1~4.4 项要求。</p> <p>Electrical characteristics of items</p>	<p>试件在 <math>-40 \pm 2^\circ \text{C}</math> 的温控箱内保持 18 小时, 然后在正常温度和湿度下恢复 2 小时, 并在此后 1 小时内对试品进行测量, 水滴应消失。</p> <p>After testing at <math>-10 \pm 2^\circ \text{C}</math> for 18 hours, the switch can stay under normal temperature and humidity conditions for 2 hours, and measurement shall be made within 1 hour after that. Water drops shall be eliminated.</p>

产品型号 Item.#	L-KLS7-KS01-B	说明 Description	按键开关 Key Switch	版本 Version	A
页 码 Page	第 5 页 5 of 7		日期 Date	2021-12-16	

7.2	高温 Hot Proof	4.1 ~ 4.4 shall be satisfied.	试件在 $80\pm 2^{\circ}\text{C}$ 的温控箱内保持 96 小时，然后在正常温度和湿度下恢复 2 小时，并在此后 1 小时内对试品进行测量。 After testing at $70\pm 2^{\circ}\text{C}$ for 96 hours, the switch can stay under normal temperature and humidity conditions for 2 hours and measurement shall be made within 1 hour after that.
7.3	恒定湿热 Moisture Resistance		试件在 $40\pm 2^{\circ}\text{C}$ , 90-95%RH 的温控箱内保持 96 小时，然后在正常温度和湿度下恢复 2 小时，并在此后 1 小时内对试件进行测量，水滴应消失。 After testing at $40\pm 2^{\circ}\text{C}$ , 90-95% RH for 96 hours, the switch can stay under normal temperature and humidity conditions for 2 hours, and measurement shall be made within 2 hour after that. Water drops shall be eliminated.

## 8. 材料表 BOM:

序号 No.	零部件名称 Parts Name	数量 Quantity	材料, 规格 Material and Specifications	防火等级 Prevent fire grade	备注 Remarks
1	外壳 Cover	1	PA66		
2	底座 Case	1	PA66 GF30		
3	按键轴 Actuator	1	POM		黑色 Black
4	弹簧 Spring	1	SUS304		
5	接触端子 Contact blade	1	C5210		
6	静端子 Contact bracket	1	C5191		
7	触点 Contact	2	Au Alloy		Cross point contacts

## 注意事项 Precautions for use:

## 1. 一般事项 General:

本产品主要用于自动化装置，视像装置，家用电器，信息装置及通讯装置等常用电子设备中；如果该产品要用于其它具有更高安全性及可靠性的耐久性设备中（如生命维持装置，宇宙航空装置，防灾及安全性装置）时，请确认是否合用，或者同我方了解详细情况。

The product is used mainly in electronic devices such as automotive devices, visual devices, home electrical appliances, information devices and communication settings. If the products is intended to be used for other endurance equipments requiring higher safety and reliability such as life support system, space and aviation devices, disaster and safety system, it's necessary to make verification of conformity or contact us for the details before using.

## 2. 焊接安装 Soldering and assembly:

(1) 焊锡条件应按照实际的对应条件予以确认。

The soldering conditions should be confirmed according to the actual production environment.

(2) 焊锡工序完成后，不要尝试用溶剂或类似物品清洗开关。

Don't try to clean the switch with a solvent or similar substance after the soldering process.

(3) 开关焊锡后，还有热量时，请不要操作开关。

Don't operate the switch if it still has heat after soldering.

(4) 如使用水溶性助焊剂，可能会导致开关破损，因此应确保不要用这种助焊剂。

The switch might be damaged if using the water-soluble flux, so make sure not to use such kind of flux.

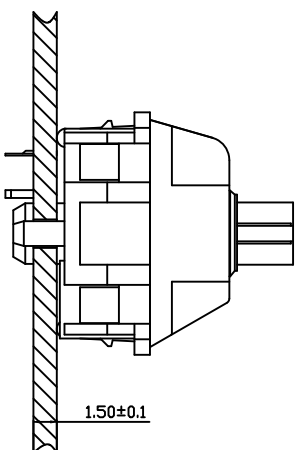
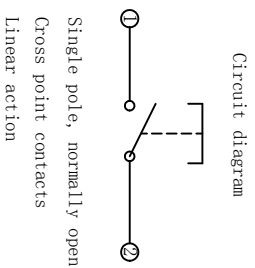
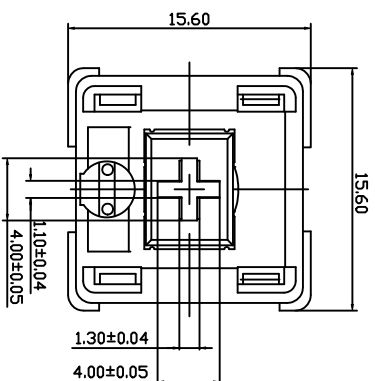
## 3. 安装构造，机械设计 Assembly structure and Mechanical design:

(1) 线路板上安装孔及安装图示的尺寸都须参照工程图中所建议的尺寸。

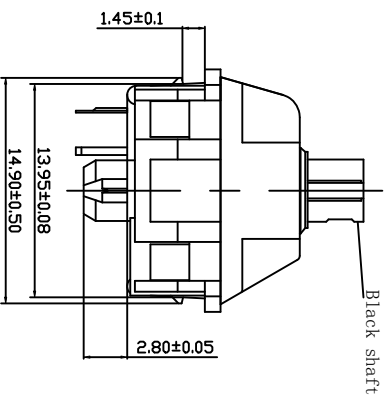
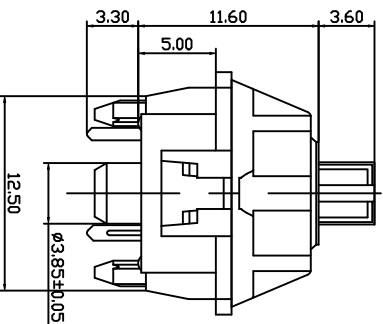
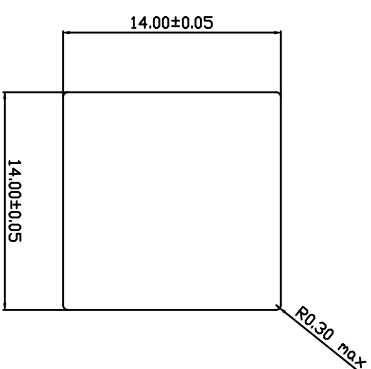
The dimensions for the holes and the pattern on PCB should refer to the recommended dimensions on the engineering

# L-KLS7-KS01-B

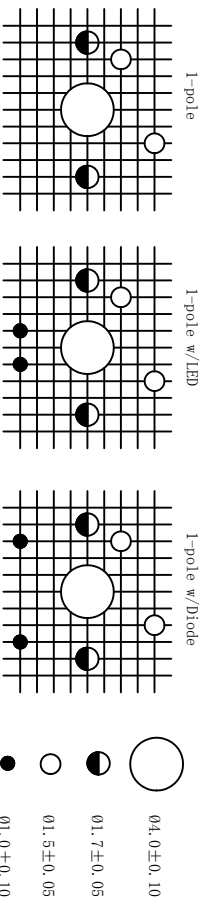
## Black switch w/Single colour LED



Metal Frame (with pins)



### PC board mounting hole dimensions



### Specification:

1. Rating : 10mA 12V AC/DC max.
2. Initial Contact Resistance: 200m Ω max
3. Insulation Resistance: 100M Ω (DC100V)
4. Withstand Voltage: AC100V(50--60Hz) for 1 minute
5. Bounce Time : ≤5msec(at 16in/sec actuation speed)
6. Operation Force: 60 ± 10gf
7. Total travel Force: 110gf max
8. Pretravel: 2.00 ± 0.6mm
9. Total Travel: 4.0<sup>0</sup><sub>-0.4</sub> mm
10. Operating Life: 50,000,000 Cycles(min)

REV	REF	DESCRIPTION	DW	BY	DATE
		Key Switch			
Title		Material		Version	
Model		Designed		Checked	
Part No.		Date		Date	
L-KLS7-KS01-B				Approved Jenny	
TOLERANCE UNLESS OTHERWISE SPECIFIED		SCALE		DATE	
DIMENSION		ANGLE		2021-12-16	
±0.4		±2°		UNIT	
		mm		mm	

**KLS** NINGBO KLS ELECTRONIC CO., LTD