


序号	零件料号	名称	材	料	数量	镀层/颜色	备注
1		LED灯			1	透明	黄绿光
2		按钮	PPA		1	瓷白	
3		弹片	不锈钢	t=0.06	1	Ag	借AMS30 (6X6防水)
4		塑座	PA66		1	黑色	
5		卡件	H62-Y1	t=0.3	1	Ag	

KLS ELECTRONIC CO.,LTD.


产品型号 L-KLS7-TSE2-01MA180G-11

带灯轻触
外形图


变更单号	版本	日期	内容描述	变更	审核	批准	未注公差
							>20~ ±0.15
							>10~20 ±0.10
							>5~10 ±0.05
							~5 ±0.03

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1. 一般特性 General Characteristics:			
1.1 适用范围: 该承认书适用于轻触开关的一般使用范围. Applicating: This Specification is applied tk rotary tact switch used for general application.			
1.2 使用温度范围:		-25℃~+75℃	
Operating Temperature Range:		-25℃~+75℃	
1.3 相对湿度:		≤85% RH	
Operating Relative Humidity:		≤85% RH	
1.4 实验条件:若没有特别说明,测试大气条件如下: Test Conditions: Unless ktherwise specified the atmospheric conditions for making measurements and tests are as follows:			
(1) 环境温度:		15~20℃	
Environment Temperature:		15~20℃	
(3) 相对湿度:		45~74%	
Relative Humidity:		45~74%	
(4) 大气压力:		86~106Kpa (860~1060mbar)	
Atmospheric Pressure:		86~106Kpa (860~1060mbar)	
2. 外观, 结构尺寸 Appearance, structure and Dimensions:			
2.1 外观: 产品外观良好, 无锈蚀, 裂纹和镀层缺陷。 Appearance:The switch shall have good finishing, and no rust, crack or plating defects .			
2.2 结构及尺寸:		参见产品图纸	
Structure&Dimensions		Refer to individual product drawing.	
2.3 标识:		参见产品图纸。	
Markings		Refer to individual product drawing .	
3. 额定负荷 Ratings		DC 30V 30mA	
4. 电气特性 Electrical Characteristics			
NO.	项目 Item	标准 Criteria	实验方法 Test Method
4.1	接触电阻 Contact Resistance	50mΩ Max	以100±2mA, 5V直流电, 采用电压降法测量。也可用误差不超过5%的仪表进行测量, 实验后的电阻取5次测量的平均值。(按动5-10次后测量) Measured by a voltage drop method at 100±2mA Max, 5VDC. Any equipment with error not more than 5% can be used. Resistance after test in the average of

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			5successive measurements(To measure after operated 5 to10 times)
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250V直流电, 持续时间60±5S 250V DC voltage is applied between each pair of terminals between the terminal between and the metal frame for 60±5S
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250V (50~60Hz) 交流电, 持续时间60±5S 。 250VAC (50~60Hz, cut-off current 2mA) is applied between non-connected terminals and between terminals and the metal frame for 60±5S
4.4	耐压 Withstand Voltage	应无闪弧及击穿现象漏电流<0.5mA。 No dielectric breakdown shall occur	端子相互间及每一端子和外壳间 250V.AC/50HZ 1 分钟 Between terminals and Between individual terminal and frame 250V.AC/50HZ for 1 min
5. 机械特性 Mechanical Characteristics			
NO.	项目 Item	标准 Criteria	实验方法 Test Method
5.1	按力 Press Force	180 ±50gf	开关垂直于操作方向放置, 在驱动件顶端中心逐渐施力, 测量开关导通所需的最大力度。 Placing the switch such that the direction of switch operation is vertical ,and thon gradually increasing the load applied to the center of the knob the maximum load for the knob to come to a stop shall be measured.
5.2	回弹力 Return Force	>50gf	开关垂直于操作方向放置, 在驱动件顶端中心下降至全程后, 测量顶端向自由位置返回的力度。Placing the switch such that the direction of switch operation is vertical ,and upon depression of knob in its center the whole travel distance ,the force of the knob to return to its free position shall be measured
5.3	行程 Travel	0.25±0.1mm	开关垂直于操作方向放置, 以一个等于2倍按力的静负荷施加于驱动件顶端中心, 测量顶端的移动距离。Placing the switch such that the direction of switch operation is vertical and then a static load twice the operating force to the center of the knob the travel distance for the knob to come to a stop shall be measured.
5.4	驱动件强度 Actuator Strength	满足5.1、6.1-6.3项要求且操作无件不被损坏或太松。Item 5.1、 6.1to 6.3shall be satisfied of actuator function and action is in gear	在驱动件顶端面中央, 施加10N的力于按压方向的停止位上5秒。 To the press direction 10 N until the stop for 5 sec .

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5.5	端子强度 Terminal Strength	<p>端子无松动, 损坏及绝缘层的破裂, 无功能性不良。</p> <p>Shall be free from terminal looseness, damage and insulator breakage No functional defectivr occur.</p>	<p>任意方向施加5N作用力于接线末端, 持续时间10s。</p> <p>A static load of 5N shall be applied to the tip of terminals for 10s in any direcion .</p>
5.6	振动 Vibration Proof	<p>实验后:</p> <p>接触电阻: 5Ω max.</p> <p>绝缘电阻: 50MΩ Min.</p> <p>电气性能应符合第4.3-4.5条的要求。表面及结构无明显变形</p> <p>After test,</p> <p>Contact resistance:5Ω max.</p> <p>Insulation resistance:50MΩ Min.</p> <p>The electrical performance Specified in item4.3-4.5 shall be satisfied.No abnormalities shall be recognized in appearance and construction</p>	<p>开关采用常规的安装方式牢固地安装在试验设备上, 并在下述参数条件下进行试验:</p> <p>(1) 振频=10~55Hz</p> <p>(2) 振幅1.5mm</p> <p>(3) 振动变化速率: 10-55-10HZ 大约1分钟</p> <p>(4) 变频方法: 线性型式</p> <p>(5) 振动方向: 三个相互垂直的方向, 其中一个方向是促动无件运动的方向。</p> <p>(6) 时间: 每个方向2小时(共6小时)</p> <p>Switch shall be secured to a testing machine by a normal mounting device and method.</p> <p>(1) Vibration frequency range=10~55Hz</p> <p>(2) Total amplitude =1.5mm</p> <p>(3) Sweep ratio:10~55~10HZ Approx. 1min</p> <p>(4) Method of changing the sweep vibration frequency:linear</p> <p>(5) Direction of vibration:Three perpendicular directions including actuating direction.</p>
5.7	冲击 Mechanical Shock	<p>实验后:</p> <p>接触电阻: 5Ω max.</p> <p>绝缘电阻: 50MΩ Min.</p> <p>无功能性不良, 表面无变形且操作无异常。</p> <p>After test</p> <p>Contact resistance: 5Ω max.</p> <p>Insulation resistance:50MΩ Min.</p> <p>The Electrical performance Electrical performance No</p>	<p>开关在下述参数条件下进行试验:</p> <p>(1) 安装方法: 常规方法</p> <p>(2) 加速度: 490m/S2 (50G)</p> <p>(3) 时间: 11ms</p> <p>(4) 实验方向: 图示6方向</p> <p>(5) 每个方向3次(总共18次)</p> <p>Switch shall be tested according to the following request:</p> <p>(1) Mounting Method:Normal</p> <p>(2) Acceleration: 490m/S2 (50G)</p> <p>(3) Duration: 11ms</p>

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5.7	冲击 Mechanical Shock	functional defective occur. Shall be free from mechanical abnormalities.	(4) Test Direction:6 directions (5) Number of shocks:3times per direction (18times in total)
5.8	可焊性 Solder Ability	超过80%的浸锡面积被焊料所覆盖. More than 80% of immersed part shall be covered with solder.	开关在下述参数条件下进行试验: (1)设备:自动焊接机 (2)焊料:常规 (3)焊剂:焊剂质量百分比为25%松, 75% 的无色透明溶液 (4)焊接温度:260±5℃ (5)浸渍时间: 3±0.5s (6)浸渍深度:接线端应浸到离开开关根部1.6mm处. Switch shall be tested according to the following request: (1)Equipment:Auto-Dip Chamber (2)Solder:Normal (3)Flux:Rosin Flux having a nominal composition of 25% solids by mass of white rosin in methyl alcohol solution. (4)Soldering Temperature260±5℃ (5)Immersing Time:3±0.5s (6) Immersion depth:
5.9	耐焊接热 Solder Heat Resistance	无外观及功能损坏 NO abnormalities shall be observed appearance and operation	开关在下述参数条件下进行试验: (1)焊料:常规 (2)焊剂:焊剂质量百分比为25%松, 75% 的无色透明溶液 (3)焊接温度及浸渍时间:自动焊接: 260±5℃ 5±1s 手工焊接: 350±10℃ 2-3s (4)浸渍深度:接线端应浸到离开开关根部1.6mm处. Switch shall be tested according to the following request: (1) Solder:Normal (2)Flux:Rosin Flux having a nominal composition of 25% solids by mass of white rosin in methyl alcohol solution. (3)Soldering Temperature & Immersing Time Dip soldering: 260±5℃ 5±1s Manul soldering: 350±10℃ 2-3s

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			(4)Immersion depth: immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm)
5.10	抗焊剂能力 Resistance to Flux	焊剂不得上升进入开关内部,影响接触转换. 试件在操作过程中不应发生变形. Flux shall not be risen up tk contact.The switch shall be free from abnormalities in operation.	开关在下述参数条件下进行试验: (1)焊料:常规 (2)焊剂:焊剂质量百分比为25%松,75%的无色透明溶液 (3)焊接温度:260±5℃ 浸渍时间: 3±0.5s 焊剂浸渍时间:5-10s (4)浸渍深度:接线端应浸到离开开关根部1.6mm处. Switch shall be tesed according to the following request: (1)Solder:Normal (2)Flux:Rosin Flux having a nominal composition of 25% solids by mass of white rosin in methyl alcohol solution. (3)Soldering Temperature:260±5℃ Immersing Time:3±0.5s (3)Soldering Temperature:260±5℃ Immersing Time:3±0.5s Flux immersing time shall be at 5-10s in normal romm temperature. (4) Immersion depth:immersion depth shall be at copper plating portion of PCB after mounting .(Thickness of PCB=1.6mm)

6. Durability characteristics

NO.	项目 Item	标准 Criteria	实验方法 Test Method
6.1	机械寿命 Mechanical life	实验后: 接触电阻: 5Ω max. 绝缘电阻: 50MΩ Min. 操作力衰变应在Σ±30%以内无功能性不良,开关外观及结构应无损坏 After test, Contact resistance: 5Ω max. Insulation resistance:50MΩ Min. Tolerance of operating force	在不带负荷的条件下,速度为20次/分,在寿命试验设备上连续转换100,000次。 100,000cycles of operation shall be performed continuously at a rate of 20 cycles per minute without load.

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6.2	电气寿命 Electronics life	Disintegration shall be within 30% of specified value No functional defrctive occur The switch shall be free from abnormalities in appearance Construction.	在带负荷的条件下,速度为30次/分,在寿命试验设备上连续转换100,000次。30mA 30V DC 100,000 cycles of operation shall be performed continuously at a rate of 30 cycles per minute load as follow 30mA 30V DC
7.Weather Proof Characteristics 耐候性能:			
7.1	低温 Cold Proof	实验后: 接触电阻: 5Ω max. 绝缘电阻: 50MΩ Min. 无功能性不良	试件在-25±2℃的温控箱内保持48小时,然后在正常温度和湿度下恢复1小时,并在此后1小时内对试品进行测量,水滴应消失。 After testing at -25±2℃ for 48 hours,the switch shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1 hour after that.Water drops shall be eliminated.
7.2	高温 Hot Proof	开关外观及结构应无损坏 After test, Contact resistance:5Ω max. Insulation resistance: 50MΩ Min.	试件在70±2℃的温控箱内保持48小时,然后在正常温度和湿度下恢复1小时,并在此后1小时内对试品进行测量,水滴应消失。 After testing at 70±2℃ for 48 hours,the switch shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1 hour after that.Water drops shall be eliminated.
7.3	恒定湿热 Moisture Resistance	No functional defrctive occur The switch shall be free from abnormalities in appearance Construction.	试件在40±2℃, 90~95%RH的温控箱内保持48小时,然后在正常温度和湿度下恢复1小时,并在此后1小时内对试品进行测量,水滴应消失。 After testing at 40±2℃, 90~95%RH for 48 hours,the switch shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1 hour after that.Water drops shall be eliminated.
7.4	温度转换 Temperature Cycling	实验后: 接触电阻: 5Ω max 绝缘电阻: 50MΩ Min. 无功能性不良 开关外观及结构应无损坏 After test, Contact resistance: 5Ω max.	试件按下述实验条件试验5次,然后在正常温度和湿度下恢复1小时,并在此后1小时内对试品进行测量,水滴应消失 After 5 cycles of following conditions the switch shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1hour after that.Water drops shall be eliminated.

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7.4	温度转换 Temperature Cycling	Insulation resistance: 50M Ω Min. No functional defrctive occur The switch shall be free from abnormalities in appearance Construction.	<p>试件按下述实验条件试验5次,然后在正常温度和湿度下恢复1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 5 cycles of following conditions the switch shall be allowed to stand under normal temperature and humidity conditions for 1hour,and measurement shall be made within 1hour after that. Water drops shall be eliminated.</p>
7.5	盐雾实验 Salt Mist	在金属件上没有腐蚀斑点。 No remarkable corrosion shall be recognized in metal part	<p>试件在下述实验后测量:</p> <p>(1)温度35\pm2$^{\circ}$C (2)盐溶液浓度:5\pm1%(质量百分比),浸泡5分钟。 (3)浸泡后的盐沉积物用水冲掉。 (4)时间12\pm1小时。</p> <p>The switch shall be checked after the following test:</p> <p>(1)Temperature: 35\pm2$^{\circ}$C (2)Salt Solution:5\pm1%(Solids by mass),immersing time:5minute. (3)After immersing,salt deposit shall be removed by runnig water. (4)Duration:12\pm1hours.</p>

► LED SPECIFICATIONS

Color	V _R	I _F	Recommended Operating Current	V _F	
				Nom.	Max.
Red	DC 5V	20 mA	20 mA	1.7 V	2.4 V
Green	DC 5V	20 mA	20 mA	1.9 V	2.4 V
Yellow	DC 5V	20 mA	20 mA	1.9 V	2.4 V
Blue	DC 5V	20 mA	20 mA	3.0 V	3.6 V
White	DC 5V	20 mA	20 mA	3.0 V	3.6 V
Full Green	DC 5V	20 mA	20 mA	3.0 V	3.6 V