



规格书

SPECIFICATION

CUSTOMER NAME	客户名称:	
CUSTOMER NO.	客户编号:	
SERIES	系 列:	机械键盘开关
MODEL NO.	型 号:	XB-KS-02 series
DRAWING NO.	图 形 号:	Mechanical keyboard switch

If specification of this product meets your request, please confirm all the items of it and return to us with signature and stamp, it will be basis of our production and record. Thanks your cooperation in advance!

若此产品规格符合贵司要求，敬请确认此规格书内所有项目
并签名和盖章后回传给我司，以作我司产品制作之

依据和存档之用，多谢合作！

EXAMINE & APPROVAL 审批

APPROVE 接受	NOT APPROVE 不接受
SIGNATURE 签署 STAMP 盖章 DATE 日期	

PREPARED BY.制表人	CHECKED BY.校对	APPROVED BY.审核	APPROVAL BY.批准
研发部 戴海明 2022. 06. 08	品质部 黄自清 2022. 06. 08	工程部 庞军 2022. 06. 08	总经办 吴量 2022. 06. 08

东莞市溪榜电子有限公司

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SWIFT/BIC: CITIHKHX (CITIHKHXXXX*If 11 characters are required)

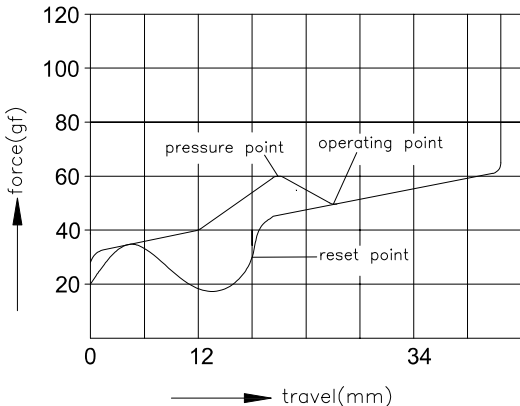
MAiL: HK@ALPSR. CN XB@ALPSR. CN

Quality core! Afterburner for Made in China!

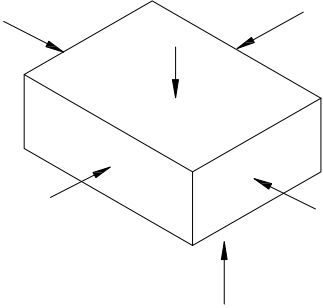
 东莞市溪榜电子有限公司 DONGGUAN GAOTE ELECTRONICS CO., LTD		文件编号 FILE NO.	XB-SK-02-XXX	页码 PAGE	1/6
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Title 名称	XB-Keyboard Switch	产品料号 PART NO.	XB-KS-02 series		

1. General Characteristics 一般特性: Applicating: This Specification is applied tk rotary Keyswitch switch used for general application. 适用范围: 该承认书适用于按键开关的一般使用范围. Operating Temperature Range: -10℃ ~ 70℃			
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5.Mechanical Characteristics 机械特性			
NO.	Item 项目	Criteria 标准	Test Method 实验方法
5.1	操作力-行程 -曲线图 Force-Travel - Curve	操作力: $60 \pm 10\text{gf}$ Operating Force: $60 \pm 10\text{gf}$ 总行程: $3.60 \sim 4.00\text{mm}$ Total- Travel: $3.60 \sim 4.00\text{mm}$ 启动行程: $2.20 \pm 0.6\text{mm}$ Start- Travel: $2.20 \pm 0.6\text{mm}$	
5.2	Terminal Strength 端子强度	Shall be free from terminal looseness,damage and insulator breakage No functional defectivr occur. 端子无松动, 损坏及绝缘层的破裂。 无功能性不良.	A static load of 3N shall be applied to the tip of terminals for 10s in any direction 任意方向施加 3N 作用力于接线端末端, 持续时间 10s
5.3	Vibration Proof 振动	After test, Contact resistance: $2 \Omega \text{ max.}$ Insulation resistance: $100\text{M} \Omega \text{ Min.}$ The electrical performance Specified in item 4.3-4.5 shall be satisfied. No abnormalities shall be recognized in appearance and construction 实验后: 接触电阻: $2 \Omega \text{ max.}$ 绝缘电阻: $100\text{M} \Omega \text{ Min.}$ 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。	Switch shall be secured to a testing machine by a normal mounting device and method. Switch shall be tested according to the following request: (1) Vibration frequency range= $10 \sim 55\text{Hz}$ (2) Total amplitude =1.5mm (3) Sweep ratio: $10 \sim 55 \sim 10\text{HZ}$ Approx. 1min (4) Method of changing the sweep vibration frequency:linear (5) Direction of vibration:Three perpendicular directions including actuating direction. 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: (1) 振频= $10 \sim 55\text{Hz}$ (2) 振幅 1.5mm (3) 振动变化速率: $10 \sim 55 \sim 10\text{HZ}$ 大约 1 分钟 (4) 变频方法: 线性型式 (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。 (6) 时间: 每个方向 2 小时 (共 6 小时)

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5.4	Mechanical Shock 冲击	After test: Contact resistance: 2 Ω max. Insulation resistance: 100MΩ Min. The Electrical performance No functional defectivr occur. Shall be bree from mechanical abnormalities. 实验后: 接触电阻: 2 Ω max. 绝缘电阻: 100MΩ Min. 无功能性不良. 表面无变形且操作无异常。	Switch shall be tested according to the following request: (1) Mounting Method:Normal (2) Acceleration: 490m/S² (50G) (3) Duration: 11ms (4) Test Direction:6 directions  (5) Number of shoks:3times per direction (18times in total) 开关在下述参数条件下进行试验: (1) 安装方法: 常规方法 (2) 加速度: 490m/S² (50G) (3) 时间: 11ms (4) 实验方向: 图示 6 方向 (5) 每个方向 3 次 (总共 18 次)
5.5	Solder Ability 可焊性	More than 80% of immersed part shall be covered with solder. 超过 85% 的浸锡面积被焊料所覆盖.	Switch shall be tesed according to the following request: (1)Equipment: Wave solder (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 Temperature:26 0$\pm$5°C (5)Immersing Time:5$\pm$0. 5s (6) Immersion depth: immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) 开关在下述参数条件下进行试验: (1)设备:波峰焊 (2)焊料:常规 (3)焊剂:焊剂质量百分比为 25%松香,75%的无色透明溶液 (4)焊接温度: 260$\pm$5°C (5)浸渍时间: 5$\pm$0. 5s (6) 浸渍深度:接线端应浸到离开关根部 1. 6mm 处.

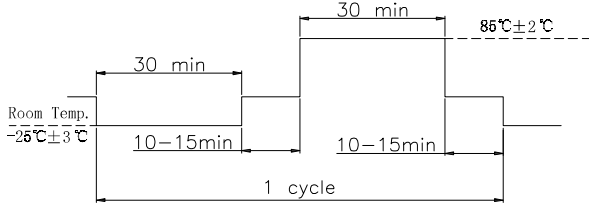
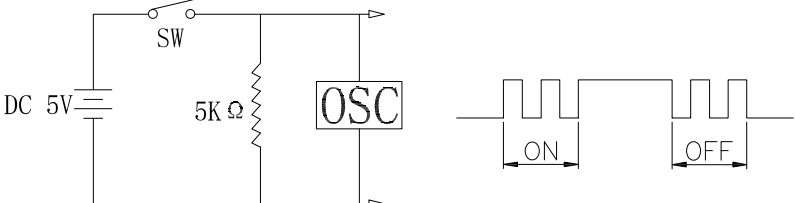
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5.6	Solder Heat Resistance 耐焊接热	NO abnormalities shall be observed in appearance and operation 无外观及功能损坏	Switch shall be tested according to the following request: (1)Solder:Normal (2)Flux:Rosin Flux having a nominal composition of 25% solids by mass of white rosin in methyl alcohol solution. (3)Soldering Temperature & Immersing Time Wave solder: 260±5℃ 5±1s Manual soldering: 300±10℃ 2-3s (4)Immersion depth: (For Dip Soldering) immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) 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: 波峰焊: 260±5℃ 5±1s 手工焊接:300±10℃ 2-3s (4)浸渍深度: (对于手动焊接) 接线端应浸到离开开关根部 1.6mm 处.
	Resistance to Flux 抗焊剂能力	Flux shall not be risen up tk contact. The switch shall be free from abnormalities in operation. 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.	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:260±5℃ Immersing Time:5±0.5s Flux immersing time shall be at 5-10s in normal room temperature. (4) Immersion depth: immersion depth shall be at copper plating portion of PCB after mounting. (Thickness of PCB=1.6mm) 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%松香,75%的无色透明溶液 (3)焊接温度: 260±5℃ 浸渍时间: 5±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.

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6. Durability characteristics			
NO	Ltem 项目	Criteria 标准	Test Method 实验方法
6.1	Mechanical life 机械寿命	After test, Contact resistance: 2 Ω max. Insulation resistance: 100MΩ Min. Tolerance of operating force Disintegration shall be within 30% of specified value No functional defrective occur The switch shall be free from abnormalities in appearance	50,000,000 cycles of operation shall be performed continuously at a rate of 200cycles per minute without load. 在不带负荷的条件下,速度为 200 次/分,在寿命试验设备上连续转换 50,000,000 次。
6.2	Electronics life 电气寿命	Construction. 实验后: 接触电阻: 2 Ω max. 绝缘电阻: 100MΩ 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	50,000,000 cycles of operation shall be performed continuously at a rate of 200 cycles per minute load as follow 10mA 5V DC 在带负荷的条件下,速度为 200 次/分,在寿命试验设备上连续转换 50,000,000 次。 10mA 5V DC
7.Weather Proof Characteristics 耐候性能:			
7.1	Cold Proof 低温	After test, Contact resistance:2 Ω max.	After testing at -25±2℃ for 96 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. 试件在-25±2℃的温控箱内保持 96 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。
7.2	Hot Proof 高温	Insulation resistance: 100MΩ Min. No functional defrective occur The switch shall be free from abnormalities in appearance Construction.	After testing at 70±2℃ for 96 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. 试件在 70±2℃的温控箱内保持 96 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。
7.3	Moisture Resistance 恒定湿热	实验后: 接触电阻: 2 Ω max. 绝缘电阻: 100MΩ Min. 无功能性不良 开关外观及结构应无损坏	After testing at 40±2℃, 90~95% RH for 96 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. 试件在 40±2℃, 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 1 小时,并在此后 1 小时内对试品进行测量,水滴应消失。

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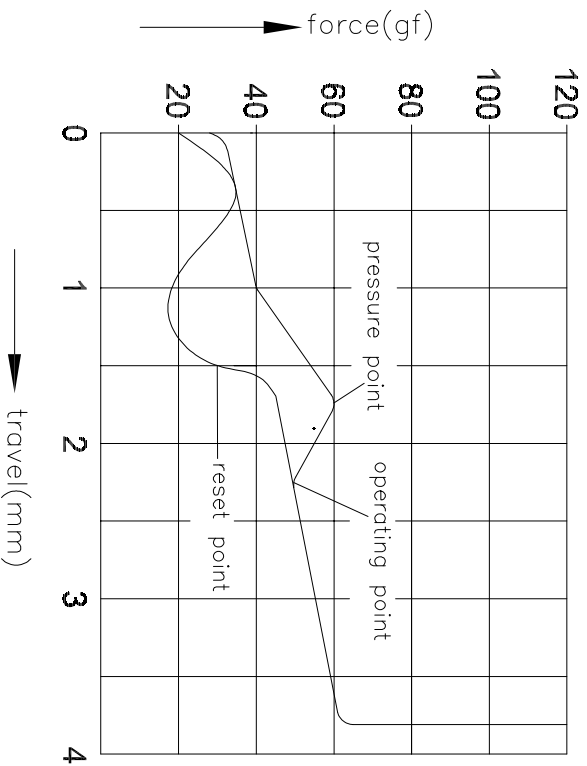
7.4	Temperature Cycling 温度转换	After test, Contact resistance: $2\ \Omega$ max. Insulation resistance: 100M Ω Min. No functional defrective occur The switch shall be free from abnormalities in appearance Construction. 实验后: 接触电阻: $2\ \Omega$ max. 绝缘电阻: $100M\ \Omega$ Min. 无功能性不良 开关外观及结构应无损坏	After 5 cycles 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. 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 
7.5	Salt Mist 盐雾实验	No remarkable corrosion shall be recognized in metal part 在金属件上没有腐蚀斑点。	The switch shall be checked after the following test: (1) Temperature: $35\pm 2^{\circ}\text{C}$ (2) Salt Solution:$5\pm 1\%$(Solids by mass),immersing time:5minute. (3) After immersing,salt deposit shall be removed by runnig water. (4) Duration:16 ± 1hours 试件在下述实验后测量: (1) 温度 $35\pm 2^{\circ}\text{C}$ (2) 盐溶液浓度: $5\pm 1\%$(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 16 ± 1 小时
7.6	Bounce 触点抖动	ON:5ms Max OFF:5ms Max	

备注说明:

此型号开关未设计防尘防水结构, 请根据使用环境谨慎使用;

DESIGNED BY	CHECKED BY	APPROVED BY
PANG.JUN	DAI.HAI.MING	CHEN.ZENQ

Force/Travel Diagram



Total Travel/总行程	4.00mm
Work Travel/导通行程	2.20±0.6mm
Work Force/导通力度	50±10gf
Tactile Force/触觉力度	60±10gf
Tactile Travel/触觉行程	1.80mm
Min trigger Force/最低触发力度	30gf Min
End Force/终止力度	65gf Max

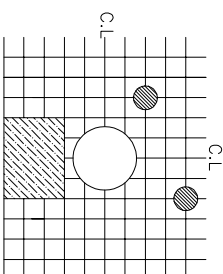
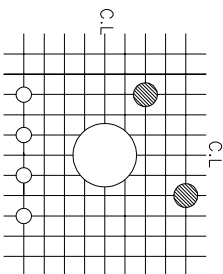
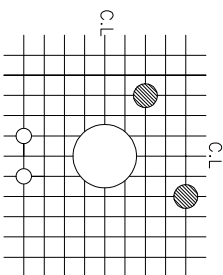
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CIRCUIT BOARD LAYOUTS

1-Pole

1-Pole w/LED

1-Pole w/Diode

 $\phi 4.00 \pm 0.10 \text{ mm}$  $\phi 1.50 \pm 0.05 \text{ mm}$  $\phi 1.00 \pm 0.10 \text{ mm}$ 

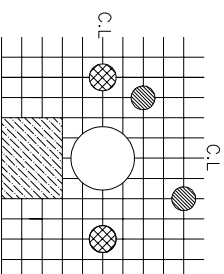
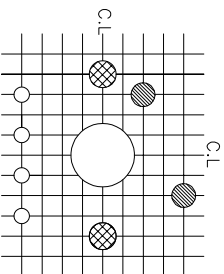
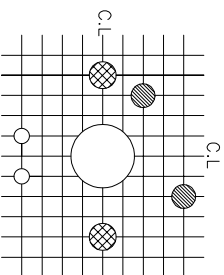
SQ1.27mm

Keyswitch without Fixation Pins

1-Pole

1-Pole w/LED

1-Pole w/Diode

 $\phi 4.00 \pm 0.10 \text{ mm}$  $\phi 1.70 \pm 0.05 \text{ mm}$  $\varnothing 1.50 \pm 0.05 \text{ mm}$  $\phi 1.00 \pm 0.10 \text{ mm}$ 

SO1.27mm

Keyswitch with Fixation Pins

										制图 DRAWN		PANG JUN		2023.6.5		比例 SCALE		2:1		 东莞市溪榜电子有限公司 DONGGUAN GAOTIE ELECTRONICS CO., LTD	
										审核 CHECKED		DALI HALLMING		2023.6.5		张数 SHEET		3/4			
										批准 APPROVE		CHEN ZENGO		2023.6.5		单位 UNIT		mm			
										一致公差		30 ≤ L 10 ≤ L ≤ 30		±0.50 ±0.30		角度 ANGLES		13.0°			
										变更内容 DEHINTION						公差 TOLERANCE		±0.50 ±0.30			
										日期 DATE						修改 DRAW					
										新发行						批准 APPROVE					
										/						/					
										/						/					
										ECON 编号 ECON NO.						变更内容 DEHINTION					
										REV.						修改 DRAW					
										A						B					
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