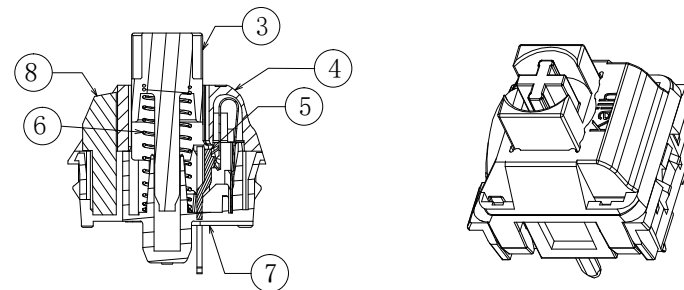
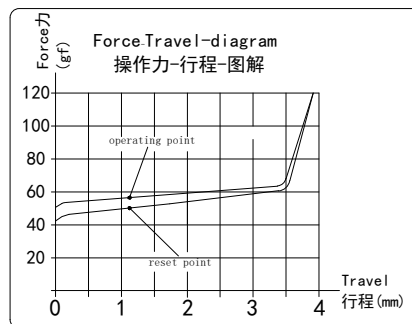
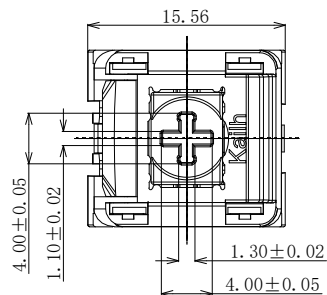


ABIDE BY ROHS

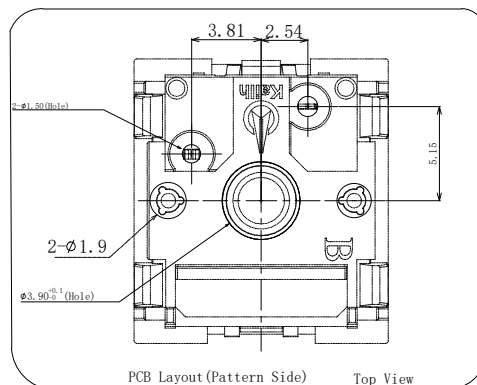
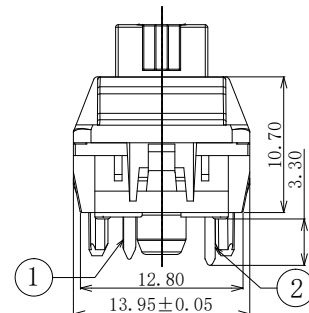
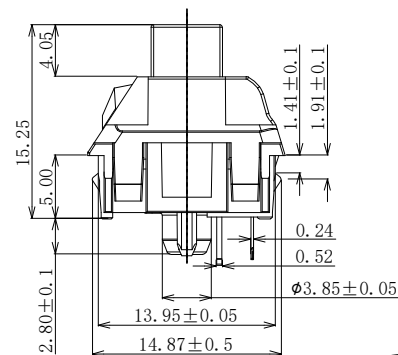
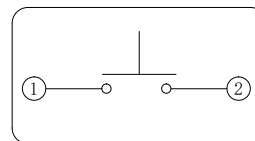


■ Specification :

- 1.Rating :12V AC/DC max. 2V DC min.
10mA AC/DC max. 10 μ A DC min.
- 2.Contact Resistance : 200m Ω Max
- 3.Insulation Resistance :100M Ω Min
(DC500V)
- 4.Withstand Voltage :AC100V(50-60Hz)
for 1 minute
- 5.Bounce Time:≤5msec (at 16 in/sec.
actuation speed)
- 6.Operation Force :55±10gf
- 7.Pre travel:1.2^{+0.4}_{-0.2}mm
- 8.Total travel:3.4±0.4mm
- 9.Operating Life :70,000,000 Cycles(temporary).

<Feel is allowed to have difference before and after life test>

■ SWITCH FUNCTION



⑧	Light guide	—	1	PC	—	—
⑦	Base	—	1	POM	baby blue	—
⑥	Spring	—	1	Stainless Steel	—	—
⑤	contact	—	2	Composite gold	—	—
④	Cover	—	1	POK	baby blue	—
③	Keystroke	—	1	POM	white	—
②	static plate	—	1	Brass	—	—
①	movable plate	—	1	Copper Alloy	—	—

ITEM	PART NAME	TER' NO.	QTY.	MATERIAL	FINISHING	REMARK	
APPROVALS			DATE	 DONGGUAN CITY KAIHUA ELECTRONICS CO.,LTD Kailh			
DRAWN	Duxiaosheng	2023.07.07					
CHECKED			TITLE:		PG1511 Keystroke Switch		
APPROVALS			PART NO.		CPG151101S283		
TOLERANCES ARE		 30	 ±0.30	ANGLE	UNIT: mm	SCALE: 1:1	PROJ: 
		 10	 ±0.20				
		 5	 ±0.15				
		 1	 ±0.10				
				±2°	DRAWING NO.	KHA-PG1511-490EN	SHEET 1 OF 1

ECN NO.	REV.	DATE.	DESCRIPTION.	CHANGE.	CHECK.	APPRO.
	A		NEW			



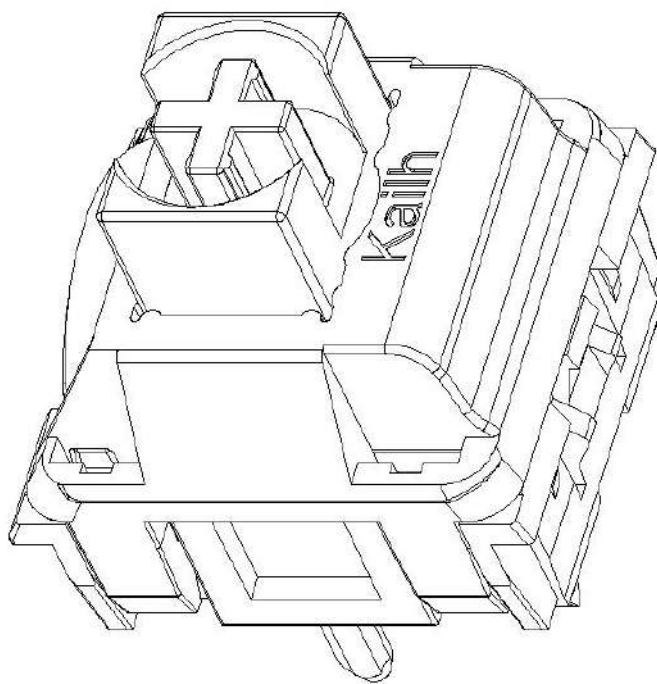
凱華電子
KAIHUA EEELETRONICS

Document Number:

KH-PS2306-39

产品规格书

Product Specification



P/N:

CPG151101S283

Title :

PG1511 Keystroke Switch

Rev.	ECN	Release and Revision Description:	Prepared By /Date:	Checked By/Date:	Approved By/Date:
A	— —	New releasing 初版发行	杜肖生 2023-08-25	谷跃新 2023-08-25	王小龙 2023-08-25



凱華電子
KAIHUA EEELETRONICS

Product Specification

P/N:	DOC. No.:	Rev.:	Page:
CPG151101S283	KH-PS2306-39	A	3/9

1. Scope/范围:

This Product Specification covers the requirement of Mechanical Keyboard switch on product performance, test methods and quality assurance provisions.

本规格书内容涵盖机械键盘开关产品的要求，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:

Mainly applied on computer keyboards, cash registers, industrial equipment and Man-Machine interface.

主要适用于电脑键盘、收银机、工业设备和人机界面。

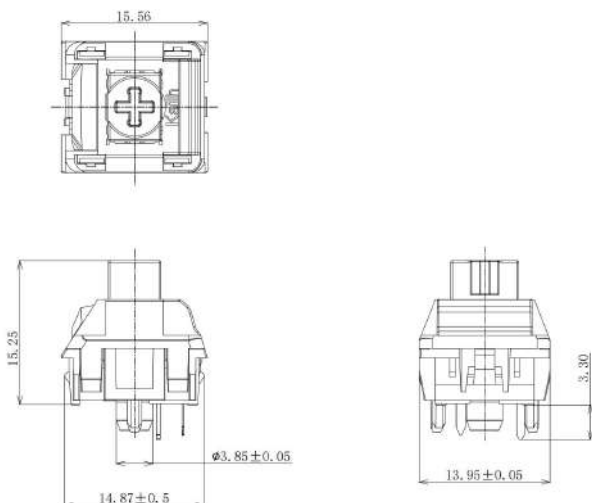
3. Technology Parameters/技术参数

Ambient Humidity 工作湿度:	45~85% R.H.;
Operating Temperature Range 使用温度范围:	-10℃~+70℃;
Storage Temperature Range 保存温度范围:	-20℃~+70℃;
Suggested storage period 贮存期限:	about 6 months 最多 6 个月
Require the tin part on the switch terminals should keep good after storage guarantee date 要求贮存期后开关端子部分上锡仍然良好。	
Normal Condition:	
Ambient temperature 环境温度:	20±2℃
Relative humidity 相对湿度:	65%±5% R.H.;
Air pressure 气压:	86~101KPa;
Solder Ability 可焊性:	POM 材质不适合高温焊接;
Withstand Soldering Temperature 耐焊接热:	POM 材质不适合高温焊接;

4. Ratings/额定性能要求

Rating 额定负荷:	12V AC/DC max.2V DC min. 10mA AC/DC max.10 μ A DC min; ≥100M Ω /DC 500V;
Insulation Resistance 绝缘电阻:	100V AC 1 Minute;
Withstand Voltage 耐电压:	70,000,000 Cycles.
Mechanical Life 机械寿命:	

5. Profile Dimensions /外形尺寸

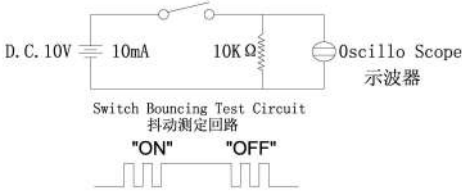


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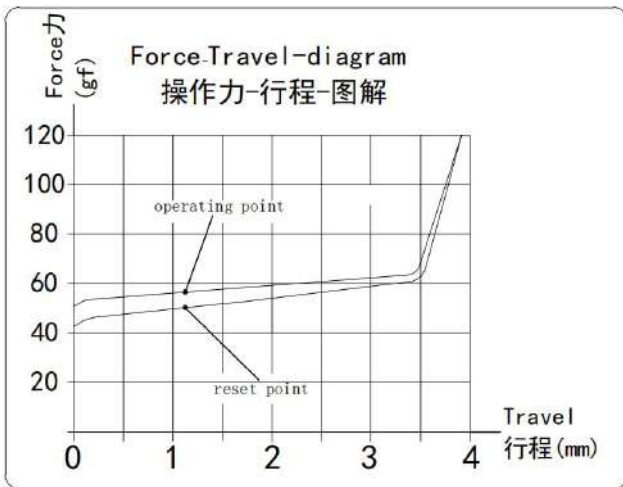
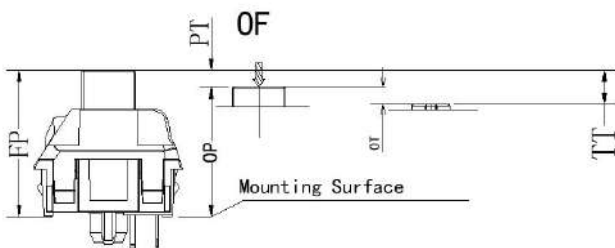


6. Electrical Performance/电气性能

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	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) 在低电流 ($\leq 100\text{mA}$) 条件下测试. Measured at low current (200mA or less).	200m Ω Max 200m Ω 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.	100M Ω Min 100 兆欧以上
6.3	Dielectric withstanding voltage 耐电压	Apply a Voltage of AC100 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.
6.4	Bouncing 触点抖动	Operation speed: 3~4 times/s 操作速度: 每秒 3~4 次 Oscillo scope 示波器 Switch Bouncing Test Circuit 抖动测定回路.  Switch Bouncing Test Circuit 抖动测定回路	Before Life cycle: On:5ms MAX,5 毫秒以下 Off: 5ms MAX,5 毫秒以下 After Life cycle: On:10ms MAX,10 毫秒以下 Off: 10ms MAX,10 毫秒以下



7. Mechanical Performance/机械性能

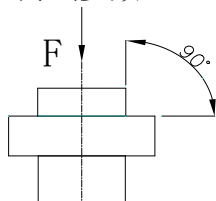
Item 项目	Description 项目描述	Test Condition 测试条件	Requirement 规格要求
7.1	Load Curve 荷重曲线	Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop. 开关的动作方向为垂直放置，向手柄中心逐渐施加负荷直到停止.  Force-Travel-diagram 操作力-行程-图解 The graph shows Force (gf) on the Y-axis (0 to 120) and Travel (mm) on the X-axis (0 to 4). The curve starts at approximately 40gf at 0mm, rises to about 60gf at 1mm, then gradually increases to about 110gf at 4mm. The 'operating point' is marked at approximately 60gf and 1.5mm, and the 'reset point' is marked at approximately 40gf and 1.5mm.	See page 8 见第 8 页
7.2	Loading parameter 荷重参数	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.  The diagram shows a cross-section of the switch assembly. Labels include: PT (Plunger Tip), OF (Operating Force), OP (Operating Point), IT (Insertion Thickness), and Mounting Surface.	See page 8 见第 8 页



7.3

Static
Strength
静止强度

A static load of 3kgf 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。



No damage
(Electrical)
And mechanical)
电气和机械性能正常。

7.4

Stem Pull
Strength
手柄拉拔强度

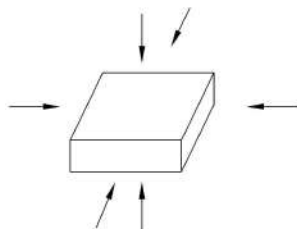
Break by a pull force applied opposite to the direction of stem operation.
在推柄动作方向反向垂直施加拉力，使其破坏的程度。

5kgf Min

7.5

Shock
机械冲击

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。



Shall meet No.6, 7.1,
7.2.
满足 6, 7.1, 7.2 要求。

7.6

Life Test
寿命测试

1) D.C. 12V 10mA resistance load
D.C 12V 10mA 电阻负荷
2) Operation speed : 10 times / s
动作速度: 10 次/ 秒
3) Push force : 150gf
按力: 150gf
4) Operation number: 70,000,000cycles
动作次数: 70, 000,000 次

Contact resistance:
1000 mΩ Max
接触电阻: 1000 毫欧以下
Bouncing: 10ms Max
触点抖动: 10 毫秒以下
Operation force:
Variation rate within ± 30%
操作力的变化范围在初始值的±30%以内。



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℃ 温度： - 20±2℃ (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: 200mΩ Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200mΩ 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 : 70±2℃ 温度： 70±2℃ (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: 200mΩ Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200mΩ 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><tr><td></td><td>Temperature 温度</td><td>Duration of test 持续时间</td></tr><tr><td rowspan="4">1 cycle 一次循环</td><td>20±5℃</td><td>1h</td></tr><tr><td>-20±5℃</td><td>1h</td></tr><tr><td>20±5℃</td><td>1h</td></tr><tr><td>70±5℃</td><td>1h</td></tr></table>		Temperature 温度	Duration of test 持续时间	1 cycle 一次循环	20±5℃	1h	-20±5℃	1h	20±5℃	1h	70±5℃	1h	Contact resistance: 200mΩ Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200mΩ 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±5℃	1h													
	-20±5℃	1h													
	20±5℃	1h													
	70±5℃	1h													
8.4	Humidity test 耐湿性	(1) Temperature : 60±2℃ 温度： 60±2℃ (2) relative humidity: 90~95% R.H. 相对湿度:90~95% R.H. (3) Duration of test: 48h 持续时间： 48 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	Contact resistance: 200mΩ Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 接触电阻 200mΩ 以下 满足: No. 6.2 to 6.4 No. 7.1 to 7.2												

8.5	Salt Spray 盐雾测试	Apply the following environment to test: 根据下列条件进行测试: (1) Temperature : 35±5℃ 温度: 35±5℃; (2) Salt water density: 5±1% 盐水浓度: 5±1%; (3) Duration: 12hours 持续时间: 12 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	Appearance: No corrosion spot, no crack, no base plate naked. 外观: 无腐蚀点, 无裂纹, 无裸露基材. Contact Resistance: 200 mΩ Max 接触电阻: 200 毫欧以下
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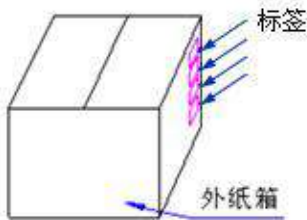
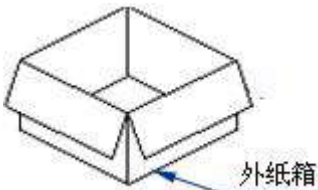
9. Loading Parameter (FP/OP/PT/OF / TT) Specification 荷重参数规格:

Parameter	Unit	Specification	Remark
FP(自由位置)	mm	15.25±0.2	
OP(动作位置)	mm	13.85±0.7	
PT(导通行程)	mm	1.4±0.4	
OF(操作力)	gf	55±8	
TT(总行程)	mm	3.4±0.4	

11. Packaging 包装

Packaging type: Tray, 1000Pcs/Tray, 4000Pcs/Carton.

包装方式: Tray 盘,1000Pcs/盘, 4000Pcs/箱.





12.Precaution 注意事项

- (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) 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.
- (3) 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.
- (4) This Product Specification is considered as the technical agreement on product between the receiving customer and Kailh. Any information on Product Catalogue which is in conflict with or different from the corresponding information of this document is considered as invalid.
该规格书为客户与凯华公司产品在技术方面的共识, 其他相关数据上与该规格书不一致的内容都是无效的.
- (5) It will be considered that customer already confirmed and accepted this specification if customer issue purchase order to us directly.
无论顾客收到规格书后有没有信息反馈直接向我公司订货, 我们将认为顾客对此产品已验证合格
- (6) If there is no order or no request for new specification after 1 year upon this specification is issued, the specification will be regarded as invalid.
本产品规格书从生效日起 1 年后, 如果没有订货或再次申请最新规格书时请做无效处理.
- (7) 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