

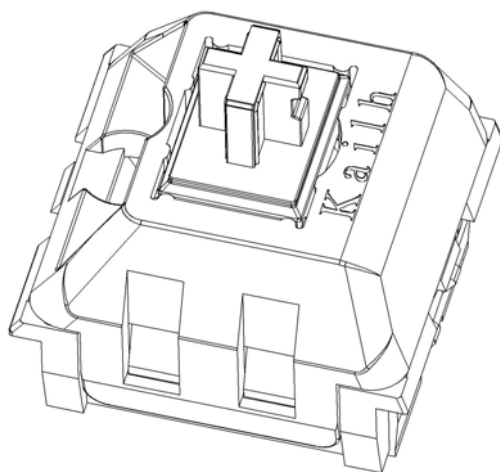


凱華電子
KAIHUA EEELETRONICS

Document Number:

KH-PS1706-31

Product Specification



P/N: _____

CPG151101D223

Title :

PG1511 Keyboard Switch

Rev. ECN

Release and Revision
Description:

Prepared By /Date: Checked By/Date: Approved By/Date:

A

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New releasing

/2017/06/17

/2017/06/17

David /2017/06/17



1. Scope/ :

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

2. Product Application/

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

3. Technology Parameters/

Ambient Humidity	45~85% R.H.
Operating Temperature Range	-10 +70
Storage Temperature Range	-20 +70
Suggested storage period	about 6 months 6
Require the tin part on the switch terminals should keep good after storage guarantee date	

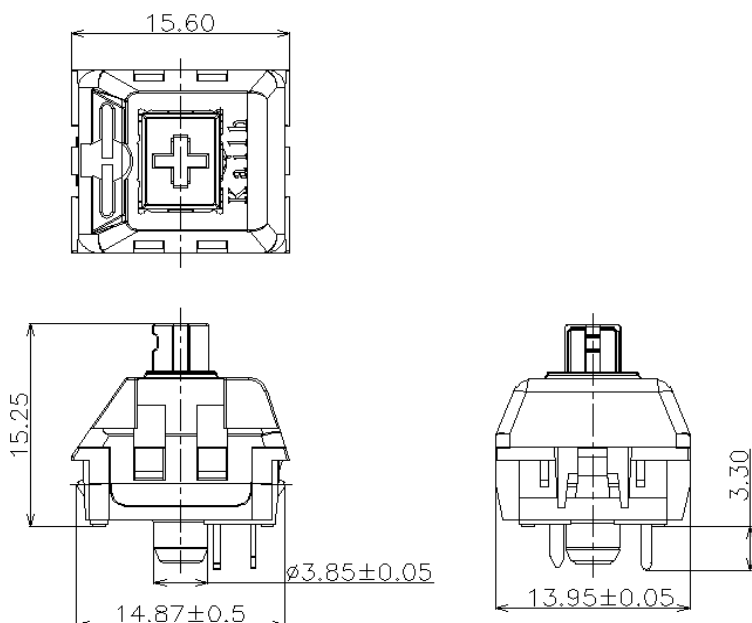
Normal Condition:

Ambient temperature	20 ± 2
Relative humidity	65% ± 5% R.H.
Air pressure	86~101KPa;

4. Ratings/

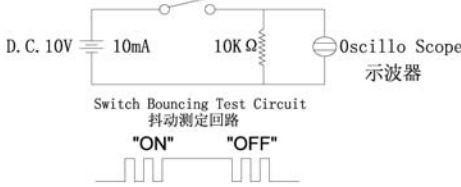
Rating	12V AC/DC max.2V DC min.
	10mA AC/DC max.10 A DC min
Insulation Resistance	100M /DC 500V;
Withstand Voltage	100 AC 1 Minute;
Mechanical Life	70,000,000 Cycles

5. Profile Dimensions /





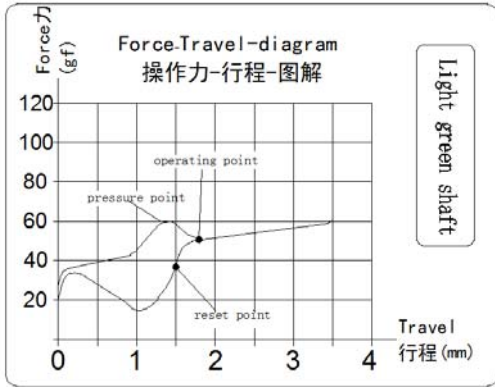
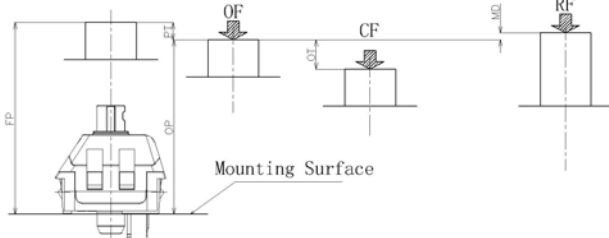
6. Electrical Performance/

Item	Description	Test Condition	Requirement
6.1	Contact Resistance	Static load: (Operation force) $\times 2$, which is applied on the center of Switch stem. 2 Measurement tool: Contact resistance Meter. (1KHz, 20mV, 5~50mA) 100mA Measured at low current (100mA or less).	100m Max 100m
6.2	Insulation Resistance	Apply a Voltage of DC 500 V for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body. 500V DC 1	100M Min 100
6.3	Dielectric withstanding voltage	Apply a Voltage of AC100 V (50~60Hz) for 1 minute, according to the below method. (1) Between terminals. (2) Between terminal and Body. 100V AC (1) (2)	No evidence of breakdown
6.4	Bouncing	Operation speed 3~4 times/s 3~4 Oscillo scope Switch Bouncing Test Circuit 	Before Life cycle: On: 5ms MAX, 5 Off: 5ms MAX, 5 After Life cycle: On: 10ms MAX, 10 Off: 10ms MAX, 10

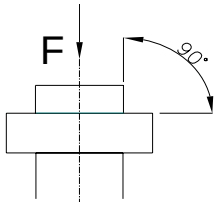
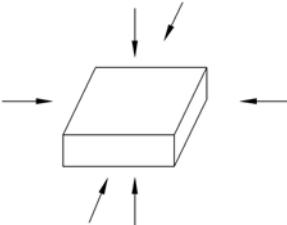
Off: 10ms MAX, 10



7. Mechanical Performance/

Item	Description	Test Condition	Requirement
7.1	Load Curve	Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop. 	See page 11 11
7.2	Loading parameter	Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop. 	See page 11 11



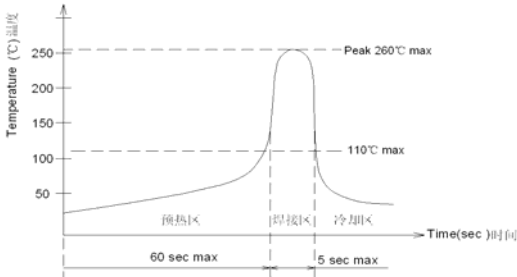
7.3	Static Strength	A static load of 3kgf shall be applied in the direction of button operation for a period of 60 seconds. 3kgf 60 , 	No damage (Electrical) And mechanical
7.4	Stem Pull Strength	Break by a pull force applied opposite to the direction of stem operation.	5kgf Min
7.5	Shock	Measured by according to the below condition: (1) Acceleration: 80g :80g (2) Cycles of test:3 cycles each in 6 directions, for a total of 18 cycles. 3 6 18 . 	Shall meet No.6 7.1 7.2. 6 7.1 7.2 .
7.6	Life Test	1) D.C.12V 10mA resistance load D.C 12V 10mA 2) Operation speed : 5-6 times / s 5-6 / 3) Push force : 150gf : 150gf 5) Push travel : 3.6mm : 3.6mm 6) Operation number: 70,000,000cycles : 70 000 000	Contact resistance: 200 m Max 200 Bouncing 10ms Max Operation force Variation rate within ± 30% ± 30%



8. Environmental Performance/

Item	Description	Test Condition	Requirement												
8.1	Cold test	(1) Temperature : - 20± 2 - 20 ± 2 (2) Duration of test: 48h 48 (3) Take off a drop water (4) Standard conditions after test : 1h 1	Contact resistance: 200m Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 200m : No. 6.2 to 6.4 No. 7.1 to 7.2												
8.2	Heat test	(1) Temperature : 70± 2 70± 2 (2) Duration of test: 48h 48 (3) Take off a drop water (4) Standard conditions after test : 1h 1	Contact resistance: 200m Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 200m : No. 6.2 to 6.4 No. 7.1 to 7.2												
8.3	Temperature cycle	(1) Test cycles: 5 cycles 5 (2) Standard condition after test:1h 1 <table><tr><td>Temperature</td><td></td><td>Duration of test</td></tr><tr><td rowspan="4">1 cycle</td><td>20± 5</td><td>1h</td></tr><tr><td>-20± 2</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		Duration of test	1 cycle	20± 5	1h	-20± 2	1h	20± 5	1h	70± 5	1h	Contact resistance: 200m Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 200m : No. 6.2 to 6.4 No. 7.1 to 7.2
Temperature		Duration of test													
1 cycle	20± 5	1h													
	-20± 2	1h													
	20± 5	1h													
	70± 5	1h													
8.4	Soldering heat test	Soldering area: T/2 of PWB thickness. (PWB: T=1.6mm) 1/2 Soldering temperature: 260± 5 Soldering time: 3± 0.5s 260± 5 3 ± 0.5	Appearance: No abnormality.												



8.5	Solder ability	1. Hand soldering Please practice according to below condition: (1) Soldering Temperature : 350 ± 5 350 ± 5 (2) Continual soldering time: $3 \pm 0.5s$ 3 ± 0.5 (1) Capacity of soldering iron: 20w 20 2. Automatic PIP soldering For the product of T/H according to below condition: () 	At least 95% of surface area of immersed portion shall be covered by solder. 95%
8.6	Humidity test	(1) Temperature : 60 ± 2 60 ± 2 (2) relative humidity: 90~95% R.H. :90~95% R.H. (3) Duration of test: 48h 48 (4) Take off a drop water (5) Standard conditions after test: 1h 1	Contact resistance: 200m Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2 200m : No. 6.2 to 6.4 No. 7.1 to 7.2
8.7	Salt Spray	Apply the following environment to test: (1) Temperature : 35 ± 5 : 35 ± 2 (2) Salt water density: 5 ± 1 % : 5 ± 1 % (3) Duration: 12hours : 12 (4) After test, the salt deposit shall be removed by running water.	Appearance: No corrosion spot, no crack, no base plate naked. Contact Resistance: 200 m Max 200



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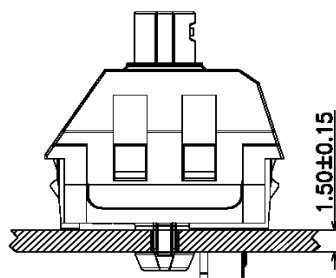
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8.8	Withstand K ₂ S	Apply the following environment to test: (1) Temperature: 35± 5 35± 5 (2) K ₂ S Density: 2% 2% (3) Duration: 2 minute. 2 Appearance: No corrosion spot, no crack, no base plate naked. Contact Resistance: 1000 m Max 1000
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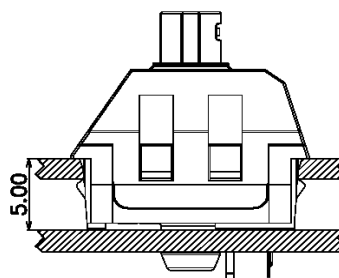


9. Recommended PCB Layout PCB

Mounting Options 安裝選項



PCB (with pins)



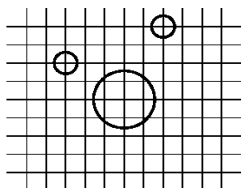
Metal Frame (without pins)

Circuit Board Layouts 电路板布局

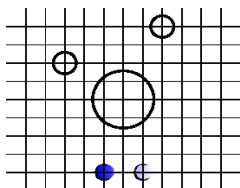
Grid line spacing = 1.27mm 网格线间距= 1.27毫米

Keyswitch without fixation pins
按键开关不带定位柱

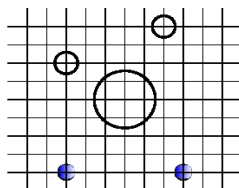
1-Pole



1-Pole w/LED



1-Pole w/Diode



ø3.99±0.1



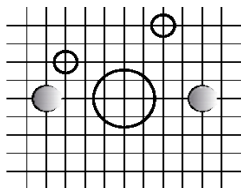
ø1.50±0.05



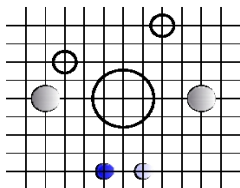
ø1.0±0.1

Keyswitch with fixation pins
按键开关带定位柱

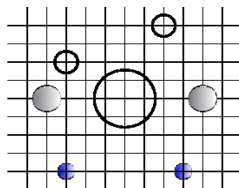
1-Pole



1-Pole w/LED



1-Pole w/Diode



ø3.99±0.1



ø1.70±0.05

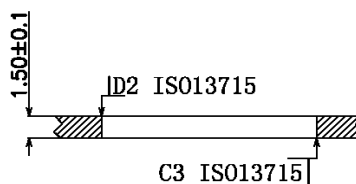
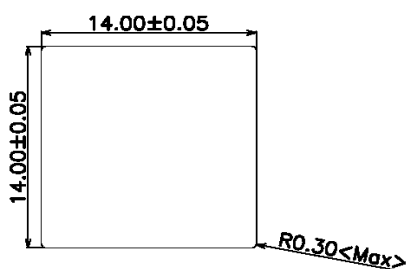


ø1.50±0.05



ø1.0±0.1

Metal Frame Cutout Dimensions





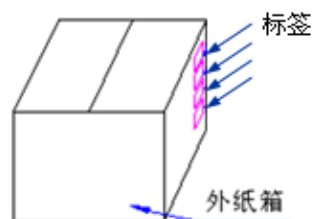
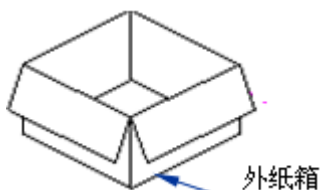
10. Loading Parameter (FP/OP/PT/OT /MD/CF/OF) Specification

Parameter	Unit	Specification	Remark
FP()	mm	15.25± 0.2	
OP()	mm	11.25± 0.7	
PT()	mm	1.70± 0.5	
OF()	gf	50± 10	
OT()	mm	1.7	Min
MD()	mm	2.3	Max
TF	gf	60± 10	
TT	mm	3.6± 0.6	

11. Packaging

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

: Tray ,1000Pcs/ , 4000Pcs/ .



12. Precaution

12.1 Immersion Soldering condition

ITEM	CONDITION
Preheat temperature	110 Max (Ambient temperature of soldering surface of P.W.B) (110)
Preheat time	60s, Max 60
Area of flux	1/2 Max of PWB Thickness 1/2
Temperature of solder	260± 5 260± 5
Time of immersion	Within 5s 5
Number of soldering	2time Max (But should down heat of the first soldering) 2
Printed wiring board	Single side copper-clad laminates

(1) After switches were soldered, please be careful not to clean switches with solvent

(2) Under the condition of using soldering iron, soldering temperature shall be 350 max within 3 sec.
350 , 3 .



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12.2 Notes

- (1) Please be cautious not to give excessive static load or shock to switches.
- (2) Please be careful not to stack up P. W. B. after switches were soldered.
- (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.
- (4) Products meet the ROHS & REACH environmental management substances control standards
[ROHS & REACH](#)