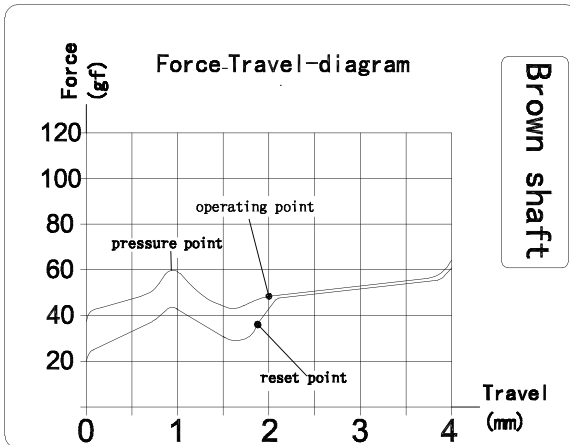
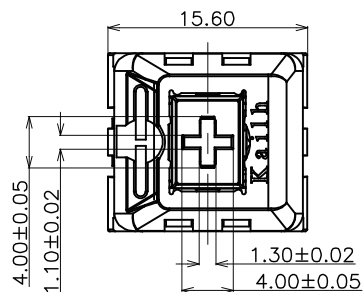
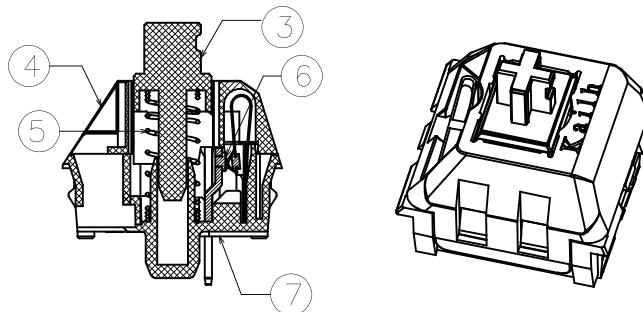


ABIDE BY ROHS

Brown shaft



Brown shaft

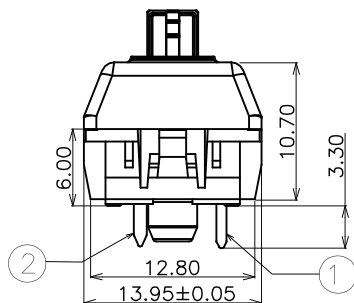
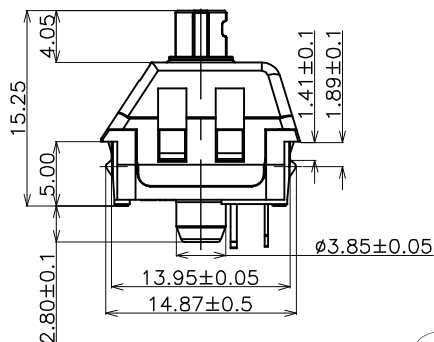


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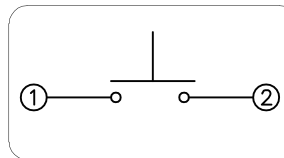
D

C

C



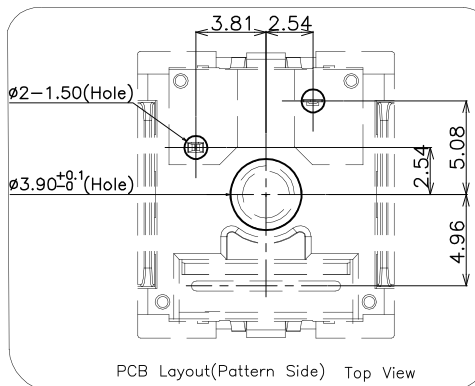
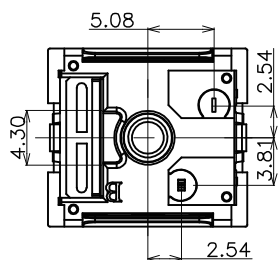
SWITCH FUNCTION



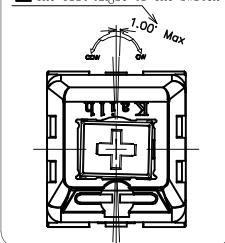
- Specification :
- 1. Rating : 12V AC/DC max. 2V DC min. 10mA AC/DC max. 10μA DC min.
 - 2. Contact Resistance : 100mΩ Max
 - 3. Insulation Resistance : 100MΩ Min (DC500V)
 - 4. Withstand Voltage : AC100V (50-60Hz) for 1 minute
 - 5. Bounce Time : ≤5msec (at 16 in./sec. actuation speed)
 - 6. Operation Force : 50±10gf
 - 7. Tactile Force : 60±10gf
 - 8. Pre travel : 1.9mm±0.5mm
 - 9. Total travel : 4.0⁺⁰_{-0.4}mm
 - 10. Operating Life : 70,000,000 Cycles (min).
<Feel is allowed to have difference before and after life test>

B

B



■ The Tilt Angle Of The Switch



⑦	Base	1	PA66	White		
⑥	contact	2	Composite gold			
⑤	Spring	1	Stainless Steel			
④	Cover	1	PC	Nature		
③	Keystroke	1	POM	Brown		
②	static plate	1	Brass	Plating NI		
①	movable plate	1	Copper Alloy			
ITEM	PART NAME	TER'NO.	QTY.	MATERIAL	FINISHING	REMARK

APPROVALS		DATE		Kailh KAIHUA ELECTRONICS CO., LTD		
DRAWN		2016.08.19				
CHECKED				TITLE: PG1511 Keystroke Switch(Brown shaft)		
APPROVALS				PART NO. CPG151101S22		
TOLERANCES ARE		ANGLE		UNIT: mm SCALE: 1:1 PROJ:		
30\leqL ±0.30		±2'		DRAWING NO. KHA-PG1511-118EN SHEET 1 OF 1		
10\leqL ≤30 ±0.20						
5\leqL ≤10 ±0.15						
L ≤5 ±0.10						

A

A

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

4

3

2

1

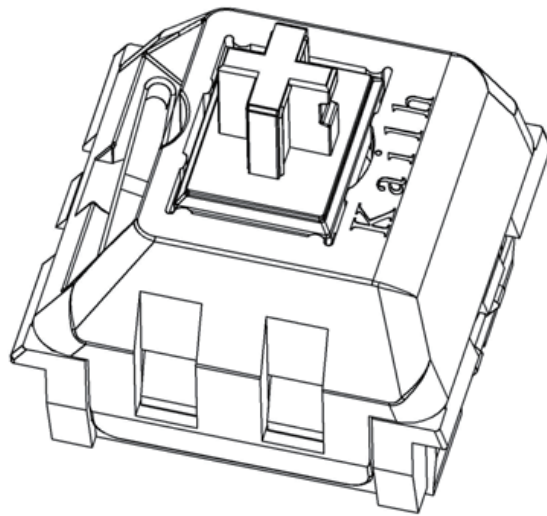
Kailh

KAIHUA ELECTRONICS

Document Number:

KH-PS1610-36

Product Specification



P/N:

CPG151101S22

Title :

PG1511 Keyboard Switch

P/N: CPG151101S22	DOC. No.: KH-PS1610-36	Rev.: A	Page: 2/11
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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% RH

Operating Temperature Range: $-10^{\circ}\text{C} \sim +70^{\circ}\text{C}$

Storage Temperature Range: $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$

Suggested storage period: about 6 months

Require the tin part on the switch terminals should keep good after storage guarantee date

Normal Condition:

Ambient temperature: $20 \pm 2^{\circ}\text{C}$

Relative humidity: $65\% \pm 5\% \text{RH}$

Air pressure: 86~101KPa

4. Ratings

Rating: 12V AC/DC max. 2V DC min

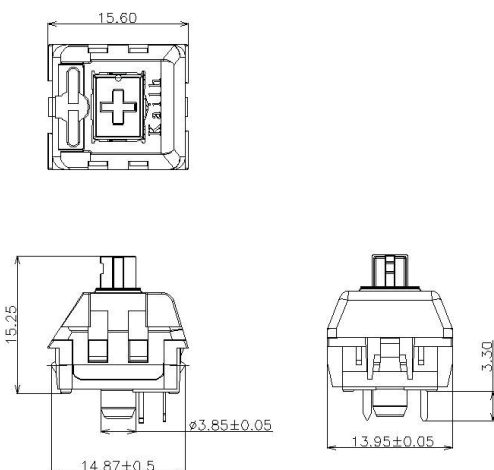
10mA AC/DC max. 10 μ A DC min

Insulation Resistance: $\geq 100\text{M}\Omega/\text{DC } 500\text{V}$

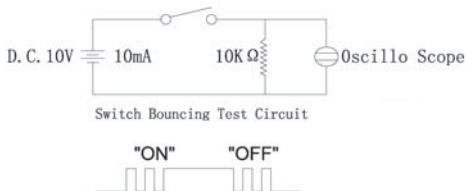
Withstand Voltage: 100 AC 1 Minute

Mechanical Life: 70,000,000 Cycles. (without load)

5. Profile Dimensions

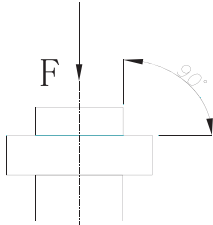
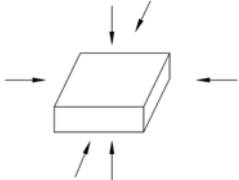


6. Electrical Performance

Item	Description	Test Condition	Requirement
6.1	Contact Resistance	<p>Static load: (Operation force)x2, which is applied on the center of Switch stem.</p> <p>Measurement tool: Contact resistance Meter. (1KHz,20mV,5~50mA)</p> <p>Measured at low current (100mA or less).</p>	100mΩ Max
6.2	Insulation Resistance	<p>Apply a Voltage of DC 500 V for 1 minute, according to the below method.</p> <p>(1) Between terminals. (2) Between terminal and Body.</p>	100mΩ Min
6.3	Dielectric withstanding voltage	<p>Apply a Voltage of AC100 V (50~60Hz) for 1 minute, according to the below method.</p> <p>(1) Between terminals. (2) Between terminal and Body.</p>	No evidence of breakdown
6.4	Bouncing	<p>Operation speed: 3~4 times/s</p> <p>Oscillo scope</p> <p>Switch Bouncing Test Circuit</p>  <p style="text-align: center;">Switch Bouncing Test Circuit</p> <p style="text-align: center;">"ON" "OFF"</p>	<p>Before Life cycle: On: 5ms MAX Off: 5ms MAX</p> <p>After Life cycle: On: 10ms MAX Off: 10ms MAX</p>

7. Mechanical Performance

Item	Description	Test Condition	Requirement
7.1	Load Curve	<p>Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop.</p> <div style="text-align: center;"> </div>	See page 11
7.2	Loading parameter	<p>Place the vertical direction of switch operation and gradually increase the load applied to the center of the stem until it stop.</p> <div style="text-align: center;"> </div>	See page 11

7.3	Static Strength	<p>A static load of 3kgf shall be applied in the direction of button operation for a period of 60 seconds.</p> 	<p>No damage (Electrical) And mechanical</p>
7.4	Stem Pull Strength	<p>Break by a pull force applied opposite to the direction of stem operation.</p>	<p>5kgf Min</p>
7.5	Shock	<p>Measured by according to the below condition: (1) Acceleration: 80g (2) Cycles of test: 3 cycles each in 6 directions, for a total of 18 cycles.</p> 	<p>Shall meet No.6, 7.1, 7.2.</p>
7.6	Life Test	<ol style="list-style-type: none"> 1) D.C.12V 10mA resistance load 2) Operation speed: 5-6 times / s 3) Push force: 150gf 4) Push travel: 4.0mm 5) Operation number: 70,000,000 cycles 	<p>Contact resistance: 1000 mΩ Max Bouncing: 10ms Max Operation force: Variation rate within ±30%</p>

8. Environmental Performance

Item	Description	Test Condition	Requirement												
8.1	Cold test	(1) Temperature: $-20\pm 2^{\circ}\text{C}$ (2) Duration of test: 48h (3) Take off a drop water (4) Standard conditions after test: 1h	Contact resistance: 200mΩ Max Shall meet: No. 6.2 to 6.4 No. 7.1 to 7.2												
8.2	Heat test	(1) Temperature: $70\pm 2^{\circ}\text{C}$ (2) Duration of test: 48h (3) Take off a drop water (4) Standard conditions after test: 1h	Contact resistance: 200mΩ Max Shall meet: No. 6.2 to 6.4 No. 7.1 to 7.2												
8.3	Temperature cycle	(1) Test cycles: 5 cycles (2) Standard condition after test: 1h <table border="1" data-bbox="411 1568 1015 1760"> <thead> <tr> <th></th> <th>Temperature</th> <th>Duration of test</th> </tr> </thead> <tbody> <tr> <td rowspan="4">1 cycle</td> <td>$20\pm 5^{\circ}\text{C}$</td> <td>1h</td> </tr> <tr> <td>$-20\pm 2^{\circ}\text{C}$</td> <td>1h</td> </tr> <tr> <td>$20\pm 5^{\circ}\text{C}$</td> <td>1h</td> </tr> <tr> <td>$70\pm 5^{\circ}\text{C}$</td> <td>1h</td> </tr> </tbody> </table>		Temperature	Duration of test	1 cycle	$20\pm 5^{\circ}\text{C}$	1h	$-20\pm 2^{\circ}\text{C}$	1h	$20\pm 5^{\circ}\text{C}$	1h	$70\pm 5^{\circ}\text{C}$	1h	Contact resistance: 200mΩ Max Shall meet: No. 6.2 to 6.4 No. 7.1 to 7.2
	Temperature	Duration of test													
1 cycle	$20\pm 5^{\circ}\text{C}$	1h													
	$-20\pm 2^{\circ}\text{C}$	1h													
	$20\pm 5^{\circ}\text{C}$	1h													
	$70\pm 5^{\circ}\text{C}$	1h													

8.4

Soldering heat test

Soldering area: T/2 of PWB thickness.
(PWB: T=1.6mm)
Soldering temperature: $260 \pm 5^\circ\text{C}$
Soldering time: $5 \pm 0.5\text{s}$

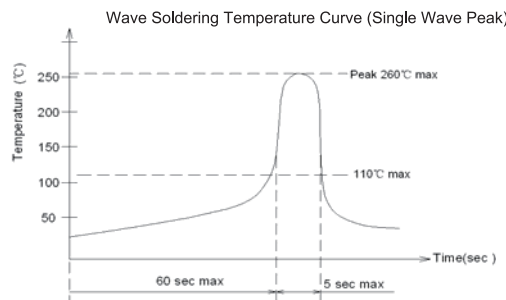
Appearance:
No abnormality.

8.5

Solder ability

1. Hand soldering:
Please practice according to below condition:
(1) Soldering Temperature: $350 \pm 5^\circ\text{C}$
(2) Continual soldering time: $3 \pm 0.5\text{s}$
(3) Capacity of soldering iron: $\leq 20\text{w}$

2. Automatic PIP soldering:
For the product of T/H according to below condition:



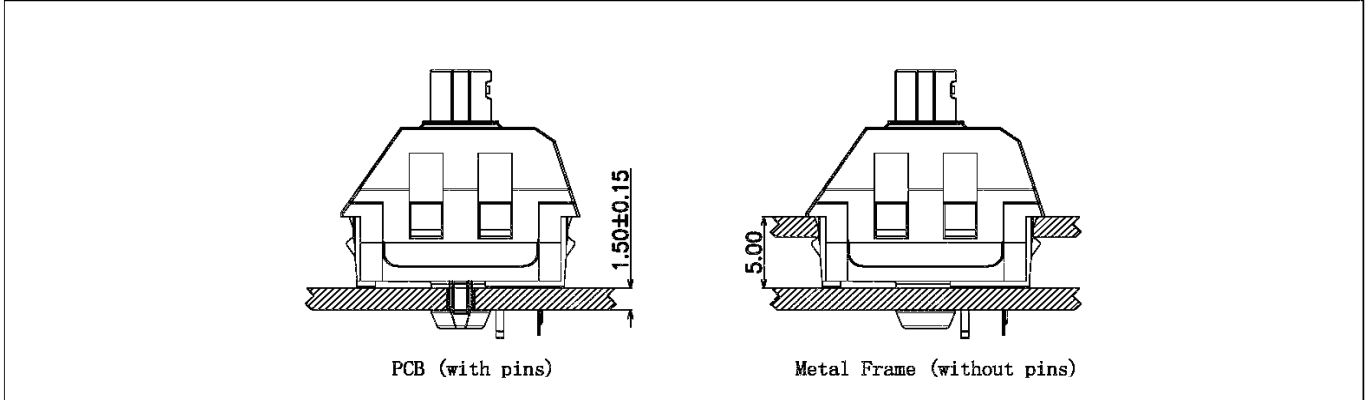
At least 95% of surface area of immersed portion shall be covered by solder.

8.6	Humidity test	(1) Temperature: $60\pm 2^{\circ}\text{C}$ (2) relative humidity: 90~95% R.H. (3) Duration of test: 48h (4) Take off a drop water (5) Standard conditions after test: 1h	Contact resistance: 200m Ω Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2
8.7	Salt Spray	Apply the following environment to test: (1) Temperature: $35\pm 5^{\circ}\text{C}$ (2) Salt water density: $5\pm 1\%$ (3) Duration: 12hours (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 Ω Max
8.8	Withstand K ₂ S	Apply the following environment to test: (1) Temperature: $35\pm 5^{\circ}\text{C}$ (2) K ₂ S Density: 2% (3) Duration: 2 minute.	Appearance: No corrosion spot, no crack, no base plate naked. Contact Resistance: 1000 m Ω Max

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9. Recommended PCB Layout

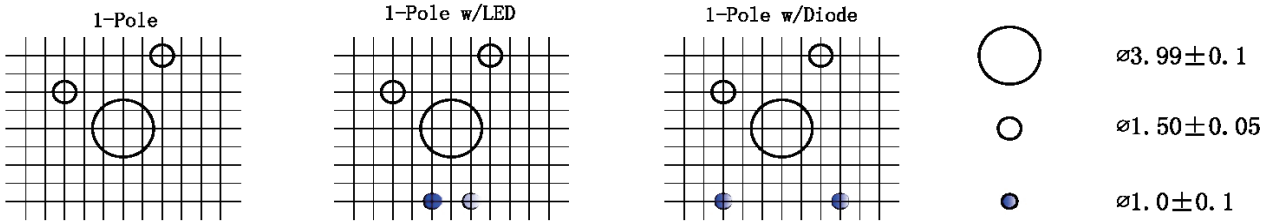
Mounting Options



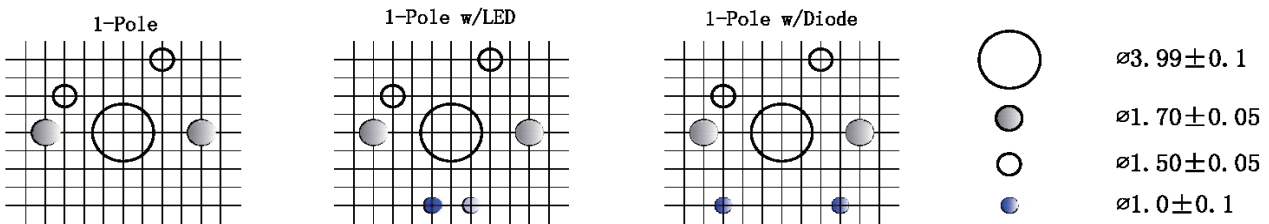
Circuit Board Layouts

Grid line spacing = 1.27mm

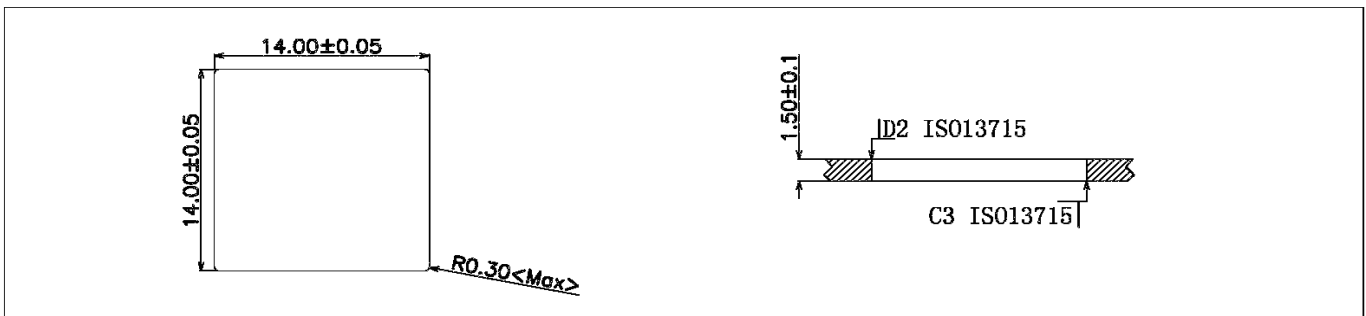
Keyswitch without fixation pins



Keyswitch with fixation pins



Metal Frame Cutout Dimensions



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

Parameter	Unit	Specification	Remark
FP	mm	15.25 ± 0.2	
OP	mm	13.35 ± 0.7	
PT	mm	1.90 ± 0.5	
OF	gf	50 ± 10	
OT	mm	1.2	Min
MD	mm	0.6	Max
RF	gf	15	Min
TT	mm	4.00 ⁺⁰ _{-0.4}	

11. Precaution

11.1 Immersion Soldering condition

ITEM	CONDITION
Preheat temperature	110°C Max (Ambient temperature of soldering surface of P.W.B)
Preheat time	60s, Max
Area of flux	1/2 Max of PWB Thickness
Temperature of solder	260±5°C
Time of immersion	Within 5s
Number of soldering	2time Max (But should down heat of the first soldering)
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°C max within 3 sec.

11.2 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.