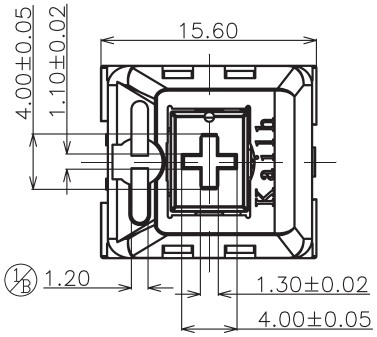
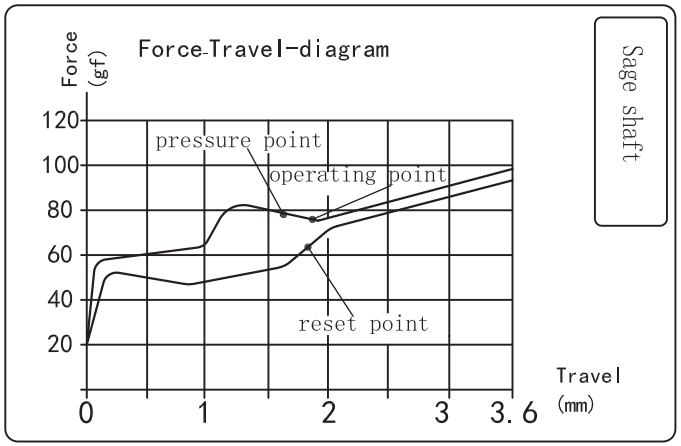
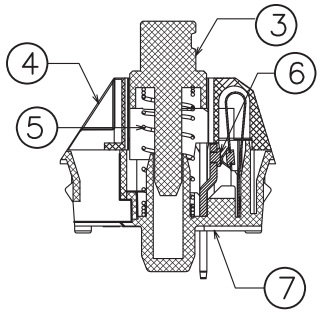
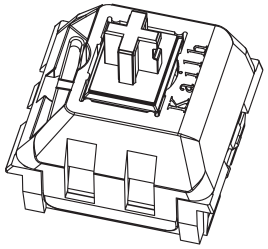
ABIDE BY ROHS

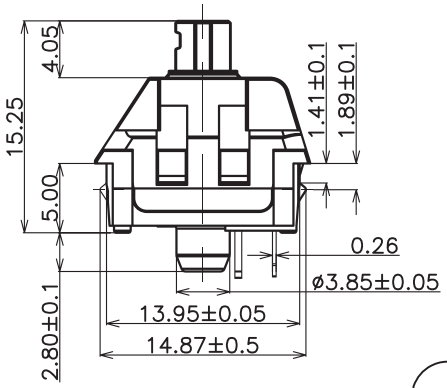
Sage shaft

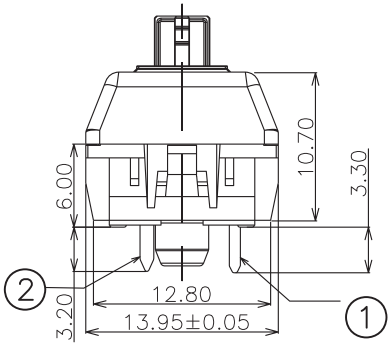




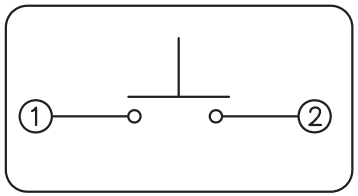






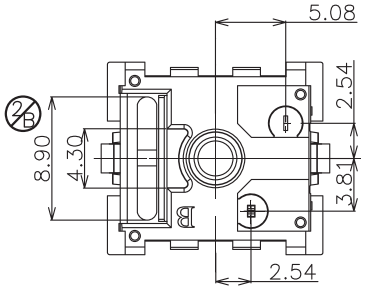


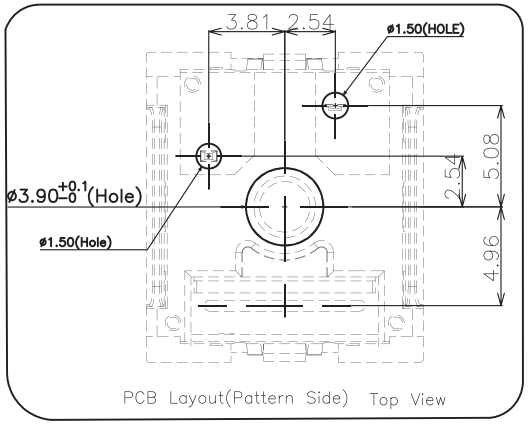
■ SWITCH FUNCTION

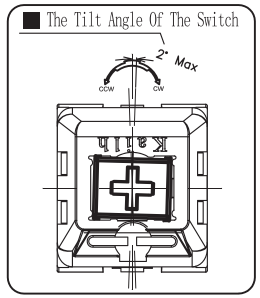


- Specification :
- 1. Rating :12V AC/DC max. 2V DC min. 10mA AC/DC max. 10μA DC min.
- 2. Contact Resistance : 100mΩ Max
- 3. Insulation Resistance :100MΩ Min (DC500V)
- 4. Withstand Voltage :AC100V(50-60Hz) for 1 minute
- 5. Bounce Time:≤5msec (at 16 in/sec. actuation speed)
- 6. Operation Force :70±15gf
- 7. Tactile Force :70±15gf
- 8. Pre travel:1.7mm±0.6mm
- 9. Total travel:3.6±0.6mm
- 10. Operating Life :70,000,000 Cycles(min).

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







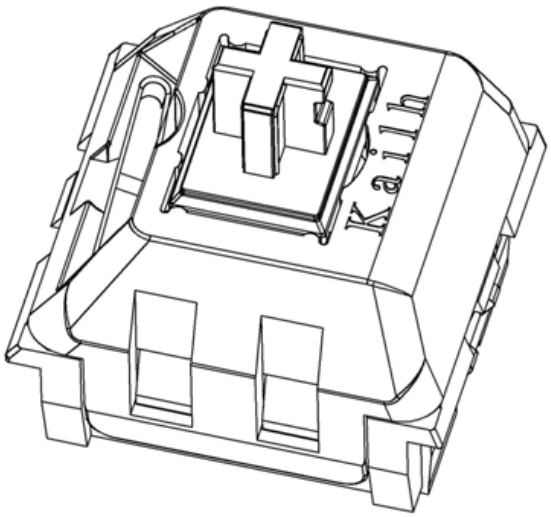
ITEM	PART NAME	TER'NO.	QTY.	MATERIAL	FINISHING	REMARK
⑦	Base	———	1	PA66	White	———
⑥	contact	———	2	Composite gold	———	———
⑤	Spring	———	1	Stainless Steel	———	———
④	Cover	———	1	PC	Nature	———
③	Keystroke	———	1	POM	Sage	———
②	static plate	———	1	Brass	sn-plating	———
①	movable plate	———	1	Copper Alloy	———	———

ECN NO.	REV.	DATE.	DESCRIPTION.	CHANGE.	CHECK.	APPRO.
———	B	———	Change cover size from 0.8*8.6mm to 1.2*8.9mm.Static plate coating add tin over Ni.	Wu Chuandong		
———	A	———	NEW	———	———	———

APPROVALS		DATE	Kailh KAIHUA ELECTRONICS CO.,LTD
DRAWN	Y.J.P	2017.09.15	
CHECKED			TITLE: PG1511 Keystroke Switch(Sage shaft)
APPROVALS			PART NO. CPG151101D233
TOLERANCES ARE	30<L: ±0.30; 10<L≦30: ±0.20; 5<L≦10: ±0.15; L≦5: ±0.10; ANGLE ±2°		UNIT: mm / SCALE: 1:1 / PROJ: / DRAWING NO. KHA-PG1511-201EN / SHEET 1 OF 1

Kailh KAIHUA ELECTRONICS	Document Number: KH-PS1710-07

Product Specification



P/N: CPG151101D233	Title : PG1511 Keyboard Switch

Content

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:

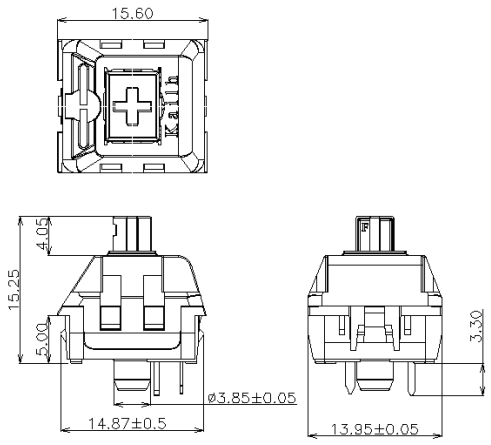
Ambient Humidity: 45 ~ 85% RH
Operating Temperature Range: -10°C ~ +70°C
Storage Temperature Range: -20°C ~ +70°C
Suggested storage period: about 6 months
Require the tin part on the switch terminals should keep good after storage guarantee date

Normal Condition:
Ambient temperature: 20±2°C
Relative humidity: 65%±5%RH
Air pressure: 86~101KPa

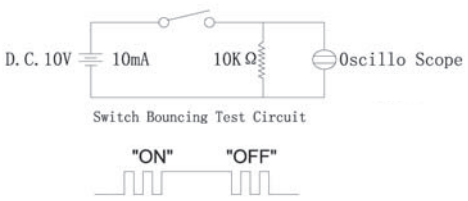
4. Ratings

Rating: 12V AC/DC max. 2V DC min
10mA AC/DC max. 10μA DC min
Insulation Resistance: ≥100MΩ/DC 500V
Withstand Voltage: 100 AC 1 Minute
Mechanical Life: 70,000,000 Cycles

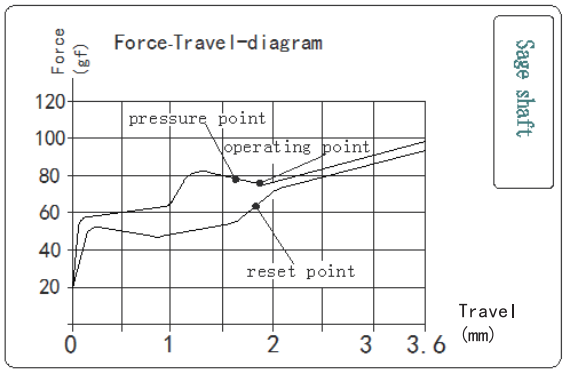
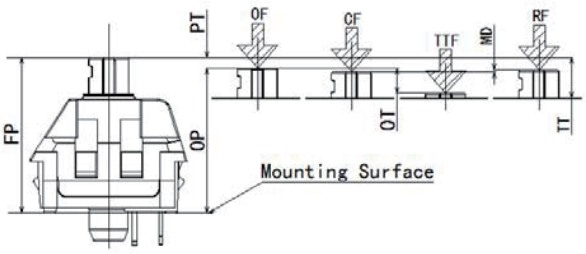
5. Profile Dimensions

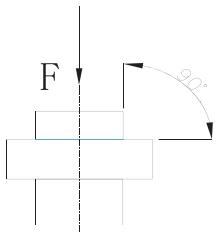
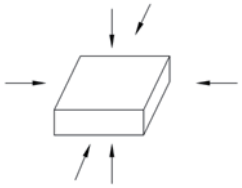


6. Electrical Performance

Item	Description	Test Condition	Requirement
6.1	Contact Resistance	Static load: (Operation force)x2, which is applied on the center of Switch stem. Measurement tool: Contact resistance Meter. (1KHz,20mV,5~50mA) Measured at low current (100mA or less).	100mΩ Max
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.	100mΩ Min
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.	No evidence of breakdown
6.4	Bouncing	Operation speed: 3~4 times/s Oscillo scope Switch Bouncing Test Circuit 	Before Life cycle: On: 5ms MAX Off: 5ms MAX After Life cycle: On: 10ms MAX Off: 10ms MAX

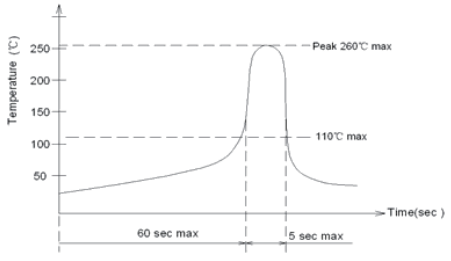
7. Mechanical Performance

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
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

7.3	Static Strength	A static load of 3kgf shall be applied in the direction of button operation for a period of 60 seconds. 	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 (2) Cycles of test: 3 cycles each in 6 directions, for a total of 18 cycles. 	Shall meet No.6，7.1，7.2.
7.6	Life Test	1) D.C.12V 10mA resistance load 2) Operation speed: 5-6 times / s 3) Push force: 150gf 4) Push travel: 3.6mm 5) Operation number: 70,000,000 cycles	Contact resistance: 1000 mΩ Max Bouncing: 10ms Max Operation force: Variation rate within ±30%

8. Environmental Performance

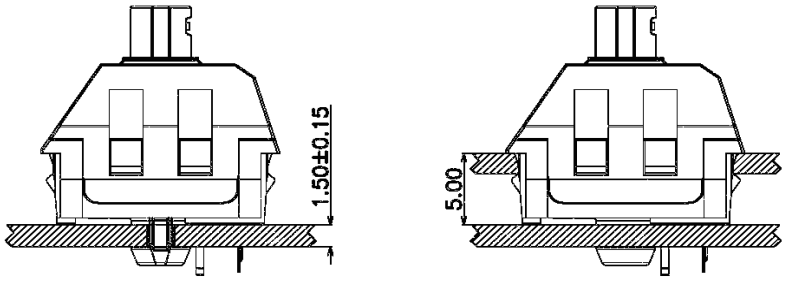
<table>
<tr><th>Item</th><th>Description</th><th>Test Condition</th><th>Requirement</th></tr>
<tr><td>8.1</td><td>Cold test</td><td>(1) Temperature: -20±2°C
(2) Duration of test: 48h
(3) Take off a drop water
(4) Standard conditions after test: 1h</td><td>Contact resistance:
200mΩ Max
Shall meet:
No. 6.2 to 6.4
No. 7.1 to 7.2</td></tr>
<tr><td>8.2</td><td>Heat test</td><td>(1) Temperature: 70±2°C
(2) Duration of test: 48h
(3) Take off a drop water
(4) Standard conditions after test: 1h</td><td>Contact resistance:
200mΩ Max
Shall meet:
No. 6.2 to 6.4
No. 7.1 to 7.2</td></tr>
<tr><td>8.3</td><td>Temperature cycle</td><td>(1) Test cycles: 5 cycles
(2) Standard condition after test: 1h
<table><tr><th></th><th>Temperature</th><th>Duration of test</th></tr><tr><td rowspan="4">1 cycle</td><td>20±5°C</td><td>1h</td></tr><tr><td>-20±2°C</td><td>1h</td></tr><tr><td>20±5°C</td><td>1h</td></tr><tr><td>70±5°C</td><td>1h</td></tr></table></td><td>Contact resistance:
200mΩ Max
Shall meet:
No. 6.2 to 6.4
No. 7.1 to 7.2</td></tr>
</table>

8.4	Soldering heat test	Soldering area: T/2 of PWB thickness. (PWB: T=1.6mm) Soldering temperature: 260±5°C Soldering time: 5±0.5s	Appearance: No abnormality.
8.5	Solder ability	1. Hand soldering: Please practice according to below condition: (1) Soldering Temperature: 350±5°C (2) Continual soldering time: 3±0.5s (3) Capacity of soldering iron: ≤20w 2. Automatic PIP soldering: For the product of T/H according to below condition: Wave Soldering Temperature Curve (Single Wave Peak)  	At least 95% of surface area of immersed portion shall be covered by solder.

8.6	Humidity test	(1) Temperature: 60±2°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: 200mΩ 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±5°C (2) Salt water density: 5±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 mΩ Max
8.8	Withstand K_2S	Apply the following environment to test: (1) Temperature: 35±5°C (2) K2S Density: 2% (3) Duration: 2 minute.	Appearance: No corrosion spot, no crack, no base plate naked. Contact Resistance: 1000 mΩ Max

9. Recommended PCB Layout

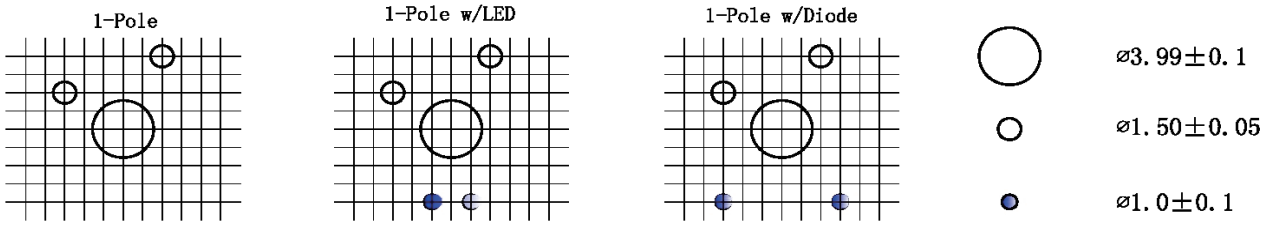
Mounting Options



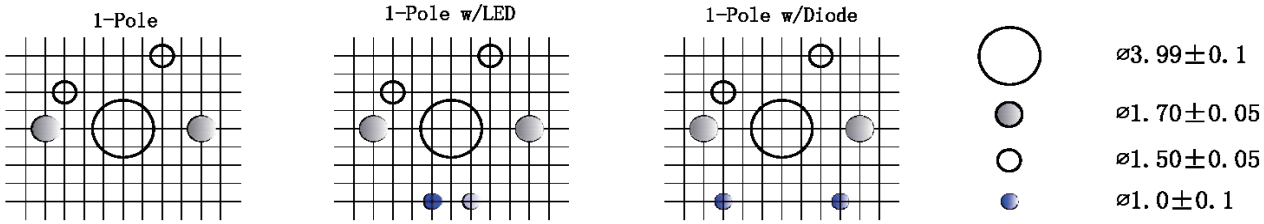
Circuit Board Layouts

Grid line spacing = 1.27mm

Keyswitch without fixation pins



Keyswitch with fixation pins



Metal Frame Cutout Dimensions

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

Parameter	Unit	Specification	Remark
FP	mm	15.25 ± 0.2	
OP	mm	13.55 ± 0.8	
PT	mm	1.7 ± 0.6	
TF	gf	70 ± 15	
OF	gf	70 ± 15	Min
OT	mm	0.7	Max
MD	mm	0.6	
TT	mm	3.6 ± 0.6	

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.