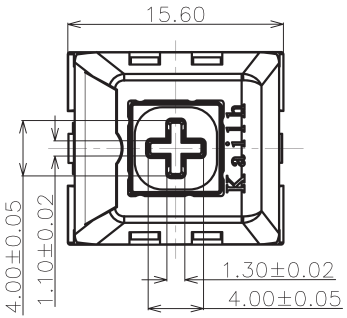
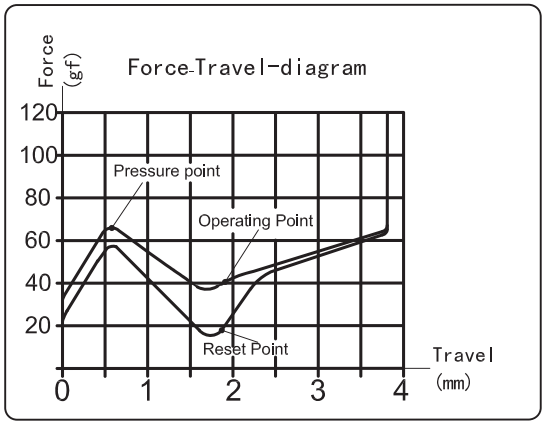
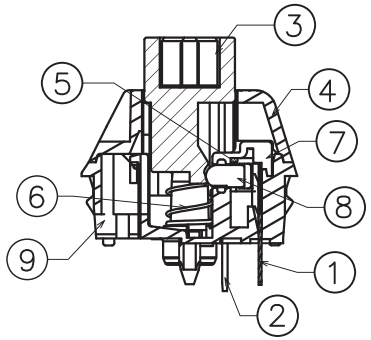
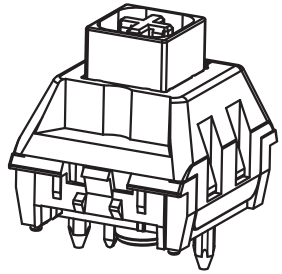
ABIDE BY ROHS

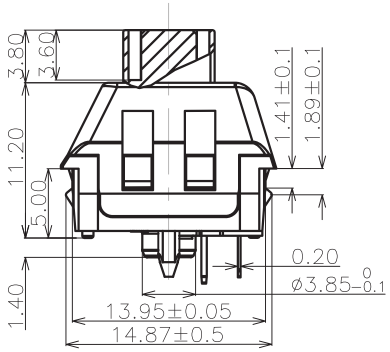
Clear Shaft

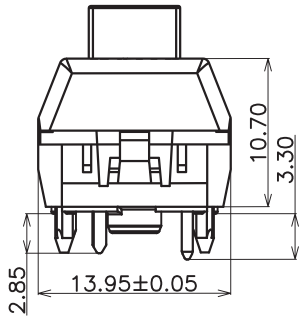




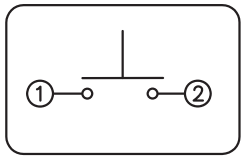








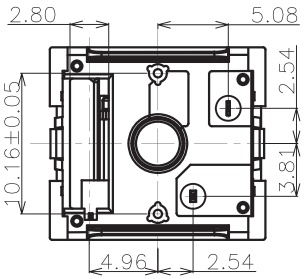
■ SWITCH FUNCTION

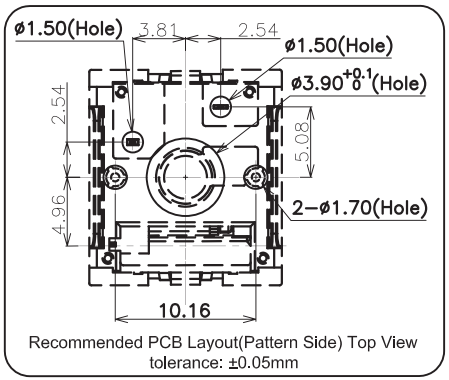


■ Specification :

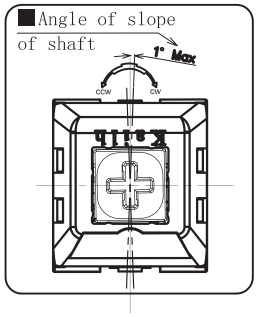
- 1. Rating: 12 VAC/DC max. 2 VDC min.
  10mA AC/DC max. 10μA DC min.
- 2. Contact Resistance: 200mΩ Max
- 3. Insulation Resistance: 100MΩ Min. (DC100V)
- 4. Withstand Voltage: AC100V(50-60Hz) for 1 minute
- 5. Tactile Force: 60～75gf
- 6. Operation Force: 40±15gf
- 7. Return Force: ≥10gf
- 8. Conduction travel: 1.80±0.4mm
- 9. Total travel: 3.60±0.3mm
- 10. Electrical Life: 80,000,000 Cycles(min).
- 11. Degree of protection: IP56(excluding the terminals)

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





Recommended PCB Layout(Pattern Side) Top View
tolerance: ±0.05mm



ITEM	PART NAME	TER'NO.	QTY.	MATERIAL	FINISHING	REMARK
⑨	Base	———	1	PC	Nature	———
⑧	Slider	———	1	POM	Green	———
⑦	Protecting Cover	———	1	PA66	Nature	———
⑥	Spring	———	1	Stainless Steel	Plating Au	———
⑤	Contact	———	2	Composite gold	———	———
④	Cover	———	1	PC	Nature	———
③	Keystroke	———	1	POM	Blue	———
②	Static Plate	———	1	Copper Alloy	Nature	———
①	Movable Plate	———	1	Copper Alloy	Nature	———

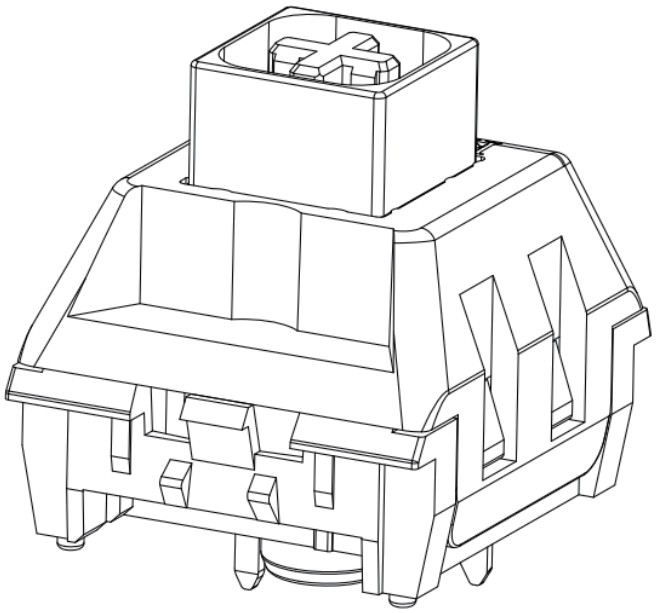
APPROVALS		DATE	Kailh KAIHUA ELECTRONICS CO.,LTD	
DRAWN	L.Zhang	2019.11.21		
CHECKED			TITLE:	PG1511F Keystroke Switch(clear shaft)
APPROVALS			PART NO.	CPG1511F01S35-2

TOLERANCES ARE			ANGLE	UNIT: mm	SCALE: 1:1	PROJ:
	30<L	±0.30				
	10<L≦30	±0.20				
	5<L≦10	±0.15	±2°	DRAWING NO.	KHA-PG1511F-057EN	SHEET 1 OF 1
	L≦5	±0.10				

ECN NO.	REV.	DATE.	DESCRIPTION.	CHANGE.	CHECK.	APPRO.
———	A	2019.11.21	NEW	Xiao Yijiang		

Kailh KAIHUA ELECTRONICS	Document Number: KH-PS1911-49

Product Specification



Clear Shaft

P/N: CPG1511F01S35-2	Title : **PG1511F 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:

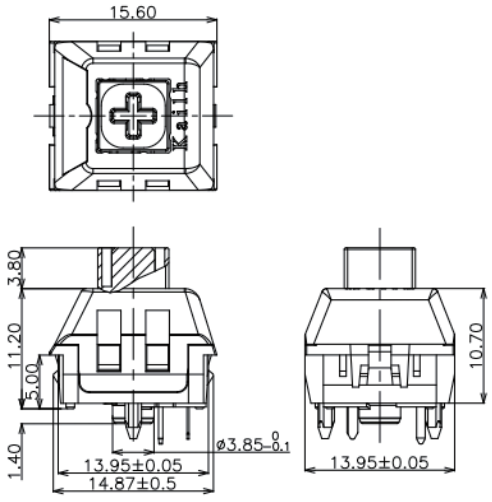
Ambient Humidity: 45 ~ 85% RH
Operating Temperature Range: -10°C ~ +70°C
Storage Temperature Range: -20°C ~ +70°C
Suggested storage period: about 6 months
Require the tin part on the switch terminals should keep good after storage guarantee date

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

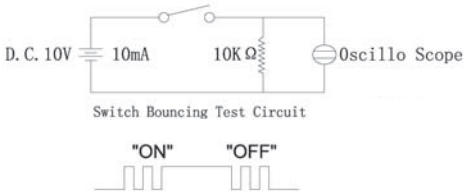
4. Ratings

Rating: 12V AC/DC max. 2V DC min
10mA AC/DC max. 10μA DC min
Insulation Resistance: ≥100MΩ/DC 100V
Withstand Voltage: 100 AC 1 Minute
Mechanical Life: 80,000,000 Cycles

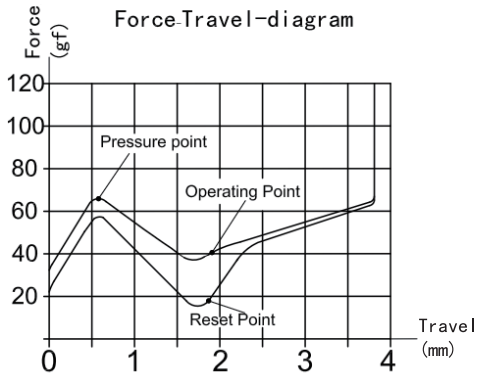
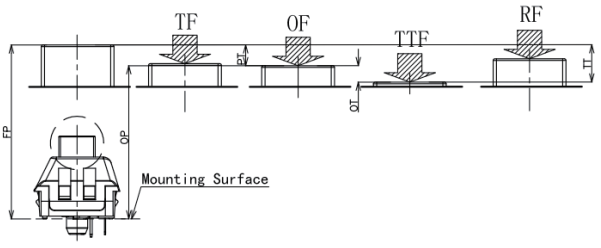
5. Profile Dimensions

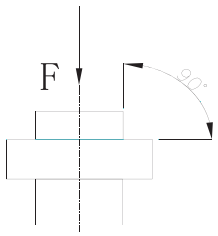
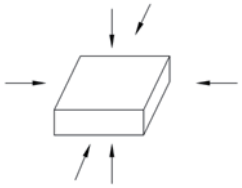


6. Electrical Performance

Item	Description	Test Condition	Requirement
6.1	Contact Resistance	Static load: (Operation force)x2, which is applied on the center of Switch stem. Be measured when the switch contact stabilization. Measurement tool: Contact resistance Meter. (1KHz,20mV,5~50mA) Measured at low current (100mA or less).	200mΩ Max
6.2	Insulation Resistance	Apply a Voltage of DC 100 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

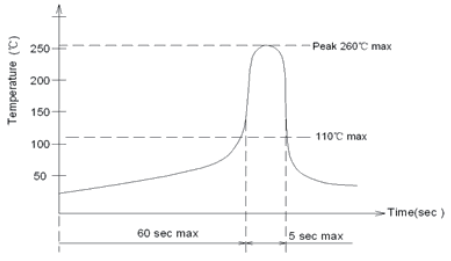
7. Mechanical Performance

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: 80,000,000 cycles	Contact resistance: 1Ω Max Bouncing: 10ms Max Operation force and tactile force: Variation rate within ±30%

8. Environmental Performance

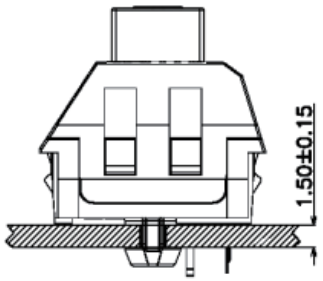
<table>
<tr><th>Item</th><th>Description</th><th>Test Condition</th><th>Requirement</th></tr>
<tr><td>8.1</td><td>Cold test</td><td>(1) Temperature: -20±2°C
(2) Duration of test: 48h
(3) Take off a drop water
(4) Standard conditions after test: 1h</td><td>Contact resistance:
200mΩ Max
Shall meet:
No. 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±5°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: 3±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.

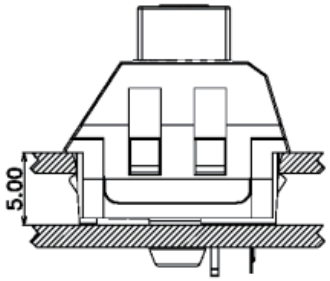
8.6	Humidity test	(1) Temperature: 60±2°C (2) relative humidity: 90~95% R.H. (3) Duration of test: 48h (4) Take off a drop water (5) Standard conditions after test: 1h	Contact resistance: 200mΩ Max Shall meet : No. 6.2 to 6.4 No. 7.1 to 7.2
8.7	Salt Spray	Apply the following environment to test(Only for contact 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	Protection Against ingress of dust(IP5X)	The switches are placed in a position of normal use inside the test chamber. The test is carried out according to the second enclosure of IEC60529/GB4208. The test shall be continued for a period of 8h.	After test: Operating is normal Between terminals, terminal and surface of the crust, Dielectric withstand in voltage ≥100V
8.9	Protection against ingress of water(IPX6)	The switches are placed in a position of normal use inside the test table. The test is carried out according to the second enclosure of IEC60529/GB4208.	After test: Operating is normal. Water don't enter electric parts of the switch inside. Between terminals, terminal and surface of the crust, Dielectric withstand in voltage ≥100V

9. Recommended PCB Layout

Mounting Options



PCB (with pins)

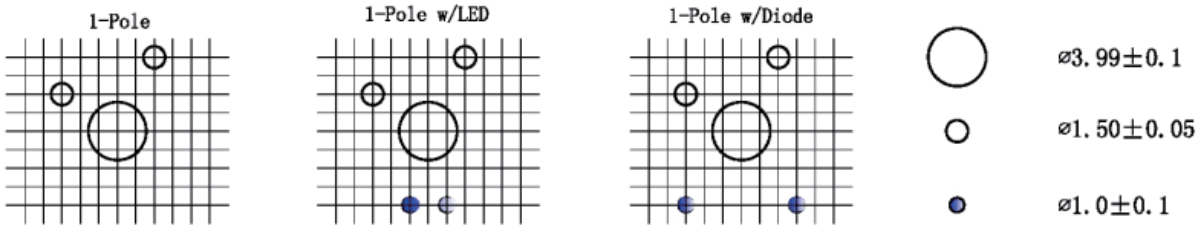


Metal Frame (without pins)

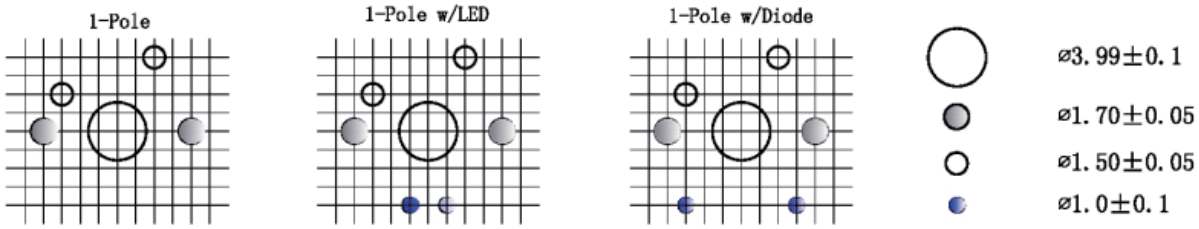
Circuit Board Layouts

Grid line spacing = 1.27mm

Keyswitch without fixation pins



Keyswitch with fixation pins



Metal Frame Cutout Dimensions

10. Loading Parameter (TT/PT/OT /OF/TF/RF) Specification

Parameter	Unit	Specification	Remark
TT	mm	3.60 ± 0.3	
PT	mm	1.80 ± 0.4	
OT	mm	1.30	Min
TF	gf	60~75gf	
OF	gf	40 ± 15	
RF	gf	10	Min

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	3s±0.5s
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±5°C with 3±0.5s.

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.