ALPS

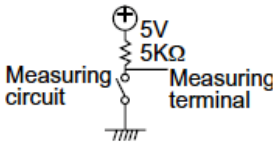
Lever and Push Operation Switch SLLB Series

Details

Product No.	Operating section style	Push-on switch	Operating force	
			Lever portion	Push portion
SLLB120100	Mounting knob	With	0.65±0.3N	2±1N

Travel (Push operation)	Lever color of operating section	Location lug	Minimum packing unit (pcs.)
Refer to the dimensions	Black only	With	1,350

Products Specifications

Operating temperature range	Ratings (max.) (Resistive load)	Electrical performance		
		Output voltage	Insulation resistance	Voltage proof
-10° C to +60° C	10mA 5V DC	1V max. at 5V DC 1mA (Resistive load) 	100MΩ min. 100V DC	100V AC for 1min.

Mechanical performance		
Robustness of terminal	Robustness of actuator	
	Pushing direction	Operation direction
3N for 1 min.	50N	10N

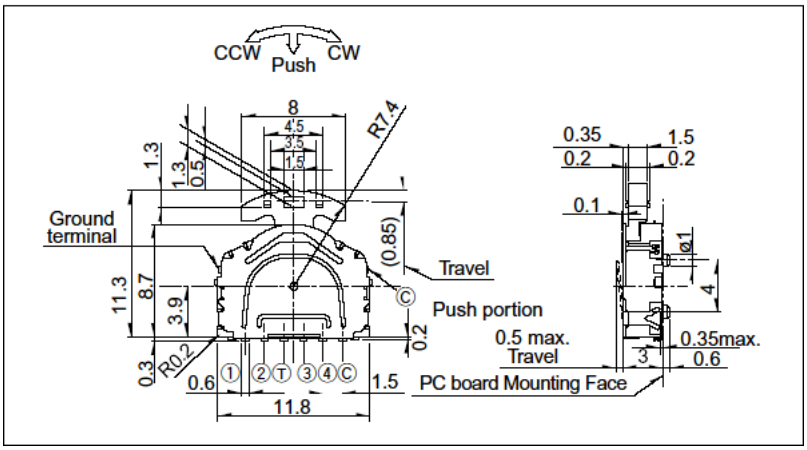
Mechanical performance			
Vibration	Solderability	Solder heat resistance	
		Manual soldering	Reflow soldering
10 to 55 to 10Hz/min., the amplitude is 1.5mm for all the frequencies, in the 3 direction of X, Y and Z and for 2 hours respectively	230±5° C, 3±0.5s	350±5° C, 3s max.	Refer to the soldering

Durability		Environmental performance		
Operating life without load	Operating life with load (Load: as ratings)	Cold	Long-term heat resistance	Moisture resistance
100,000 cycles	100,000 cycles	-20±2° C for 96h	85±2° C for 96h	40±2° C, 90 to 95%RH for 96h

1. Order products in N minimum packing units (1reel). Please see taping specifications.
2. Ask us for the export packaging unit.
3. Additional switches not included in the products list are also available. Contact us for details.
4. This product contains no lead in its internal connections, component parts, and materials.
5. This products can be used in vehicles.
Although these products are designed to perform over a wide operating temperature range, please ensure that you receive and read the formal delivery specifications before use.
6. Although we are exerting our best efforts to maintain the quality of these switches, we cannot guarantee that they will never cause short circuiting and open circuitry. Therefore, when designing an equipment or device with which the priority is given to the safety, you will please carefully study the influences to the whole equipment of a single function failure of a switch in advance to make out a fail-safe design providing necessary protective circuits.
7. Automotive Electronic Product is for that particular use only. Please always contact us in advance, if you plan to use a product, which is not listed in the product for products used in car equipment, for car use.
8. Specification indicated in this catalog is outline only. When employing the product, use of an officially authorized specification for supply contract is recommended.
9. The external appearance, performances, and other properties of the product may be changed for improvement without prior notice. The product introduced in this catalog may discontinue being produced without prior notice.
10. Names for products and companies and titles of specifications indicated in this catalog are mostly trademarks of registered trademarks of their respective owners.
11. Please contact us for any enquiries and queries on our products and their uses.

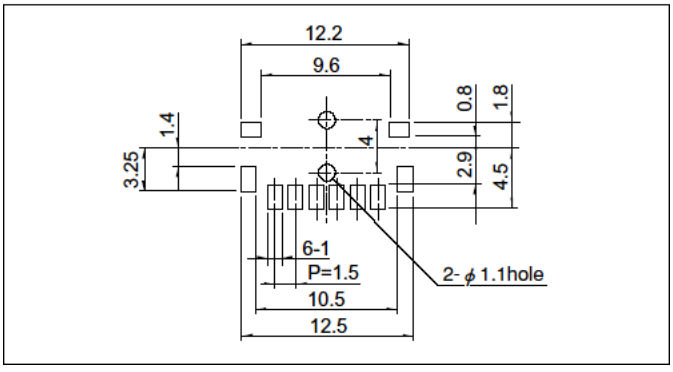
Standard Type
Mounting knob

Unit : mm

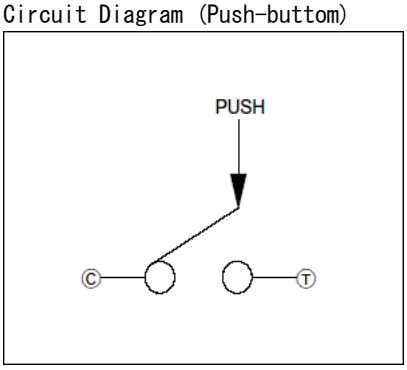


PC board Mounting Hole and Land Dimensions
(Viewed from Mounting Face)

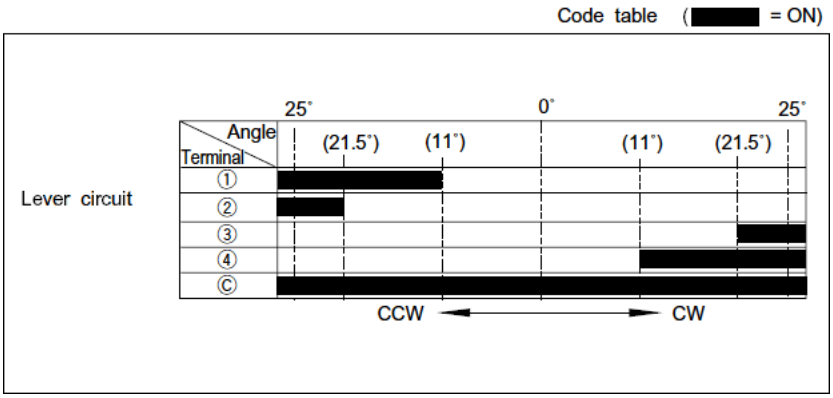
Unit : mm



Circuit Diagram (Push-buttom)



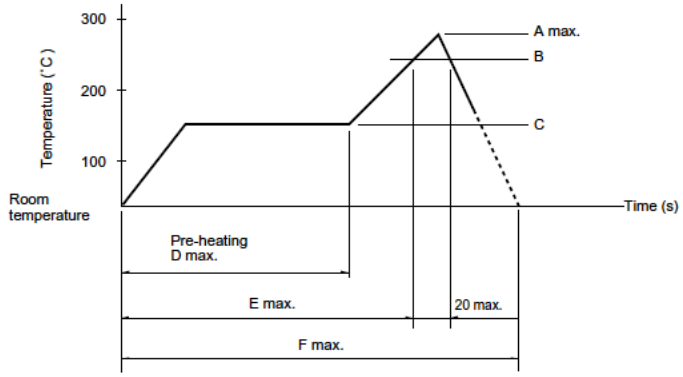
Standard Type



Soldering Condition

Example of Reflow Soldering Condition (Reference)

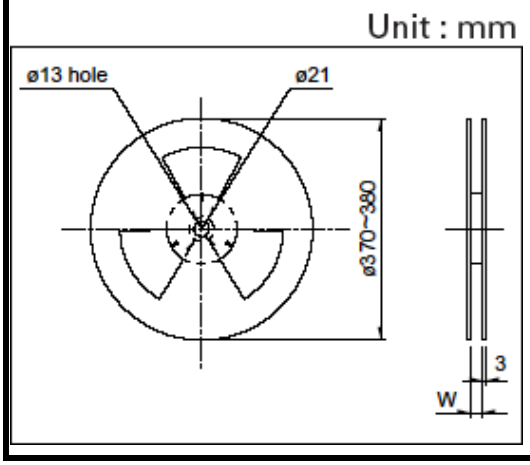
1. Heating method:
   Double heating method with infrared heater.
2. Temperature measurement:
   Thermocouple 0.1 to 0.2 Φ CA (K) or CC (T) at soldering portion (copper foil surface). A heat resisting tape should be used for fixed measurement.
3. Temperature profile
   (1) The condition mentioned above is the temperature on the mounting surface of a PC board. There are cases where the PC board's temperature greatly differs from that of the switch, depending on the PC board's material, size, thickness, etc. Care should be taken to prevent the switch's surface temperature from exceeding 260° C.
   (2) Soldering conditions differ depending on reflow soldering machines. You are requested to verify the soldering conditions thoroughly beforehand.
   (3) Ask us for the specifications of lead-free products.



Series (Reflow type)	A (°C) 3s max.	B (°C)	C (°C)	D (s)	E (s)	F (s)
SLLB	240	230	150	120	–	–

Taping Specifications

Taping Packaging

Reel size	Number of packages (pcs.) 1 reel	Number of packages (pcs.) 1 case/domestic	Number of packages (pcs.) 1 case/export packing	Reel width (mm)	Tape width (mm)
	1,350	2,700	5,400	24.4	24

●Notes Order products in N minimum packing units (1 reel or 1 case).

Measurement and Test Methods

Electrical performance

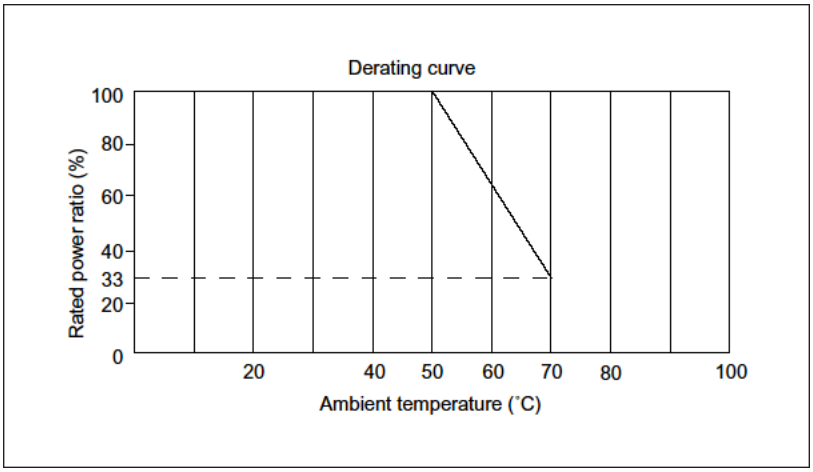
[Total Resistance]

With the shaft (lever) placed at the termination of terminal 1 or 3, total resistance shall be determined by measuring the resistance between the resistor terminals 1 and 3 unless otherwise specified.

[Rated Power]

Rated power shall be the maximum value of electric power that can be applied continuously to the whole area of a resistor (between terminals 1 and 3) at the rated ambient temperature.

The rated ambient temperature of a carbon film resistor shall be 50° C. The maximum power at an ambient temperature of 50 to 70° C shall be obtained by multiplying the rated power by the rated power ratio determined from the derating curve shown below.



[Rated Voltage]

Rated voltage is associated with the rated power and shall be determined by the following equation. When the resulting rated voltage exceeds the maximum operating voltage of a specific resistor, the maximum operating voltage shall be taken as the rated voltage.

$$E=\sqrt{P \cdot R}$$

E : rated voltage (V)
P : rated power (W)
R : total nominal resistance (Ω)

[Voltage Withstand]

Determined by applying AC voltage to the specified locations for one minute to checking for arc, burning, dielectric breakdown and other abnormalities. Respective terminals may be tested together. The locations described below shall be tested unless otherwise specified. However, if the section concerned is so constructed as to conduct, that particular part shall not be tested.

[Insulation Resistance]

Measured with a megger by applying specified voltage to the specified locations.

The locations below shall be tested unless otherwise specified. However, if the section concerned is so constructed as to conduct, that particular part shall not be tested.

[Measuring Locations For Withstand Voltage and Ins

- Between terminal and shaft (lever)
- Between terminal and metal cover (frame)
- Between terminals connected to separate resistor element and terminal connected to another resistor element (of multi-ganged-unit)
- Between switch terminal and shaft
- Between switch terminal and resistance terminal
- Between switch terminal and metal cover

[Contact Resistance of Switch]

Unless otherwise specified, contact resistance of switch shall be determined by measuring drop voltage when 5V DC, 1A is applied between contacts and the contacts are closed.

Mechanical Performance

[Total Rotational Angle (Travel)]

Determined by measuring the rotational angle (travel) when the shaft (lever) is turned (moved) from the termination position of terminal 1 to the termination position of terminal 3.

[Rotational Torque (Operating Force)]
Determined by measuring the torque (operating force) necessary to turn (move) the shaft (lever). Unless otherwise specified, measurement shall be made at an ambient temperature of 5 to 35° C, and the shaft rotational speed shall be 60° per second and the lever moving speed 20mm per second.

[Shaft Wobble]
Determined by measuring the amount of deflection at a position of 30mm from the reference surface with a bending moment of 0.1N·m (50mN·m for insulated shaft) applied perpendicularly to the shaft from 180° different directions at a point within 3mm from the place where a smooth cylindrical surface of the shaft ceases to exist. However, if the length of the shaft is less than 30mm, proportional calculation shall be used.

[Allowable Operating Torque for Shaft (Leer)]
With the shaft (lever) placed at the termination of terminal 1, a specified torsional moment (force) shall be applied in that direction for 10 seconds. Next, the shaft (lever) shall be placed at the termination of terminal 3 and a specified torsional moment (force) shall be applied similarly, to check the control part and other related sections for any deformation or breakage.

[Push-pull Strenght (Lever Push-pull Strenght)]
A specified force shall be applied in the axial direction of the shaft (lever) for 10 seconds to check the control part and other sections for any deformation or breakage and for operating condition.

Caution

1. Note that if the load is applied to the terminals during soldering, they might suffer deformation and defects in electrical performance.
2. Use of water-soluble soldering flux shall be avoided because it may cause corrosion of the switch.
3. Verify soldering conditions under actual mass production conditions.
4. When soldering twice, wait until the first soldered portion cools to normal temperature. Continuous heating will deform the external portions, loosen or dislodge terminals, or may deteriorate their electrical characteristics.
5. Flux from around and above the PC board should not adhere to the switches.
6. If you put the board with the switch in the oven so as to harden adhesive for other parts, consult with us.
7. If you use a through-hole PC board or a PC board thinner or thicker than the recommendation, here may be greater heat stress. Verify the soldering conditions thoroughly before use.
8. Solder the switches with detent at the detent position. Soldering switches fixed at the center of the detent may deform the detent mechanisms.
9. No cleaning.
10. Use care to protect small and thin switch from external forces in the SET mounting process.
11. Tighten the mounting screws by applying the specified torque. Tightening with a larger torque than the specified one will result in malfunction or breakage of screws.
12. Use of the switches with voltage below 1V DC or current below 10μA may make contacts unstable. When using these switches in this way, please consult with us beforehand.
13. This product is designed and manufactured assuming that it is to be used with the resistance for direct current. If you use other kinds of resistance [inductive (L) or capacitive (C)], consult with us beforehand.
14. The switch will be broke if you apply a greater stress than that specified. Take great care not to let the switch be subject to greater stress than specified.
15. Insert these switches to the specified mounting surface and mount them horizontally. If not mounted horizontally, these switches will malfunction.
16. Avoid using these switches in a dusty environment. Dust entering through the openings will result in imperfect contact or malfunction. Take this into account for set design.
17. When corrosive gas is generated by peripheral material of a set using the switch, malfunctions such as imperfect contacts can occur. Be mindful of this point thoroughly in advance.
18. Storage method
    (1) If you do not use the product immediately, store it just as delivered in the following environment: with neither direct sunshine nor corrosive gas and in normal temperatures. However, it is recommended that you should use it as soon as possible or within six months from the date of delivery at the most.
    (2) After you break the seal, you should put the remainder in a plastic bag to shut out outside air, and store it in the same environment mentioned above. You should use it up as soon as possible.
    (3) Do not stack too many switches for safety.