

SPPH1 1.5mm-travel Vertical Type

Vertical push switch with two types of knob available



Detector

Slide

Push

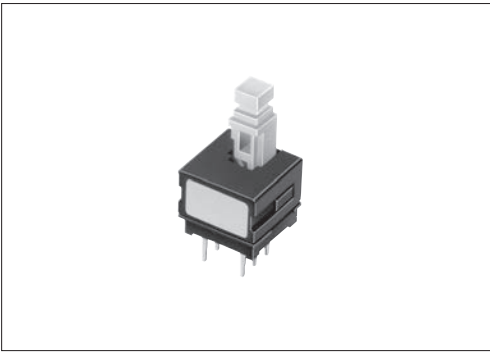
Rotary

Power

Dual-in-line Package Type

Horizontal Type

Vertical Type



Typical Specifications

Items		Specifications
Rating (max.)/(min.) (Resistive load)		0.1A 30V DC / 50μA 3V DC
Contact resistance (Initial/After operating life)		20mΩ max. / 40mΩ max.
Operating force		Refer to the products line
Operating life	Without load	10,000 cycles
	With load	10,000 cycles (0.1A 30V DC)

Product Line

Changeover timing	Travel (mm)	Total travel (mm)	Mounting method	Poles	knob style	Operating force	Operation	Terminal type	Minimum order unit (pcs.)		Product No.	Drawing No.	
									Japan	Export			
Non shorting	1.5	2.5	PC board	2	Standard	$2^{+1}_{-0.7}$ N	Latching	Straight	800	4,000	SPPH110800	1	
							Momentary				SPPH110300		
							Latching				2		SPPH120400
							Momentary						SPPH120100
					Standard	$3^{+1}_{-0.7}$ N	Latching	Snap-in	800	4,000	SPPH130400	1	
							Momentary				SPPH130100		
							Latching				2		SPPH140300
							Momentary						SPPH140100
					Short	$3^{+1}_{-0.7}$ N	Latching	Straight	800	4,000	SPPH110900	1	
							Momentary				SPPH130500		
							Latching				2		SPPH140400
							Momentary						SPPH140400

Packing Specifications

Bulk

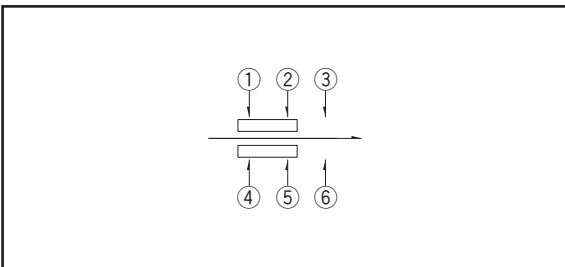
Number of packages (pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
800	4,000	400×270×290

■ Dimensions

Unit:mm

No.	Style	PC board mounting hole dimensions (Viewed from the direction A)	
1		<p>Straight terminal</p>	<p>Snap-in terminal</p> <p>Thickness of PC board t=1.6mm</p>
2		<p>Straight terminal</p>	<p>Snap-in terminal</p> <p>Thickness of PC board t=1.6mm</p>

■ Circuit Diagram (Viewed from Direction A)















■ Terminal Configuration

Unit:mm

Straight terminal	Snap-in terminal

Push Switches

List of Varieties

Series		Vertical						
		SPEH	SPEG	SPEJ	SPPH2	SPPH4	SPPH1	
Photo								
Dimensions (mm)	W	6	7.19	7	6	6.5	10	
	D	6	8.39	7	6.5	8.5	10	
	H	5	3.5	5.95	6.5	8.5		
Travel (mm)		—	—	1.7	1	2.2	1.5	
Total travel (mm)		1.6	1.1	1.7	1.5	3	2.5	
Number of poles		1	1	2	2			
Operating temperature range		-40°C to +90°C	-10°C to +60°C	-40°C to +85°C	-10°C to +60°C			
Automotive use		●	—	●	—	—	●	
Life cycle								
Rating (max.) (Resistive load)		50mA 16V DC	1mA 5V DC	0.2A 14V DC	0.1A 12V DC	0.1A 30V DC		
Rating (min.) (Resistive load)		10μA 1V DC	50μA 3V DC	—	50μA 3V DC			
Durability	Operating life without load	100,000 cycles 400mΩ max.	30,000 cycles 500mΩ max.	10,000 cycles 150mΩ max.	10,000 cycles 50mΩ max.	10,000 cycles 100mΩ max.	10,000 cycles 40mΩ max.	
	Operating life with load (at max. rated load)	100,000 cycles 400mΩ max.	30,000 cycles 500mΩ max.	10,000 cycles 150mΩ max.	10,000 cycles 50mΩ max.	10,000 cycles 100mΩ max.	10,000 cycles 40mΩ max.	
Electrical performance	Initial contact resistance	200mΩ max.	200mΩ max.	150mΩ max.	30mΩ max.	100mΩ max.	20mΩ max.	
	Insulation resistance	100MΩ min. 100V DC	3MΩ min. 100V DC	100MΩ min. 500V DC	100MΩ min. 500V DC			
	Voltage proof	250V AC for 1minute	100V AC for 1minute	500V AC for 1minute	500V AC for 1minute			
Mechanical performance	Terminal strength	—	0.5N for 1minute	—	5N for 1minute			
	Actuator strength	Operating direction	50N		49N	30N		50N
		Pulling direction	—	—	—	—	10N	—
Environmental performance	Cold	-40°C 1,000h	-20°C 96h	-40°C 500h	-20°C 96h			
	Dry heat	90°C 1,000h	85°C 96h	85°C 500h	85°C 96h			
	Damp heat	60°C, 90 to 95% RH 1,000h	40°C, 90 to 95% RH 96h	60°C, 90 to 95% RH 500h	40°C, 90 to 95%RH 96h			
Page		126	127	128	129	131	132	

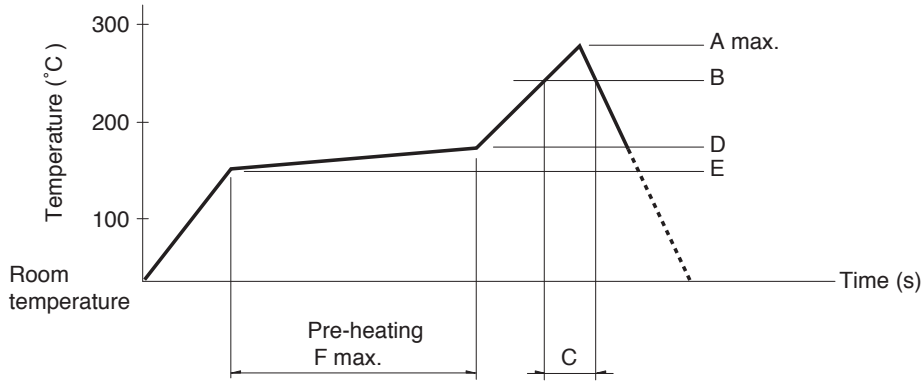
Push Switches Soldering Conditions	140
Push Switches Cautions	141

Note
● Indicates applicability to all products in the series.

Push Switches Soldering Conditions

Example of Reflow Soldering Condition

1. Heating method: Double heating method with infrared heater.
2. Temperature measurement: Thermocouple ϕ 0.1 to 0.2 CA (K) or CC (T) at soldering portion (copper foil surface). A heat resisting tape should be used for fixed measurement.
3. Temperature profile



Series (Reflow type)	A (°C) 3s max.	B (°C)	C (s)	D (°C)	E (°C)	F (s)
SPEG	260	230	40	180	150	120
SPEJ						
SPEF						
SPEH						

Notes

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. The above-stated conditions shall also apply to switch surface temperatures.
2. Soldering conditions differ depending on reflow soldering machines. Prior verification of soldering condition is highly recommended.

Reference for Hand Soldering

Series	Soldering temperature	Soldering time
SPPJ3, SPPJ2, SPUN, SPPH4, SPPH1	350±10°C	3+1/0s
SPED2, SPED4	350±10°C	3±0.5s
SPEJ	350±10°C	4s max.
SPEG, SPEF	350±5°C	3s max.
SPEH, SPPH2	350°C max.	3s max.
SPUJ	300±10°C	3+1/0s

Reference for Dip Soldering

(For PC board terminal types)

Series	Items		Dip soldering	
	Preheating temperature	Preheating time	Soldering temperature	Duration of immersion
SPPJ3	100°C max.	60s max.	260±5°C	5±1s
SPUN	100°C max.	60s max.	260±5°C	10±1s
SPUJ, SPPH2, SPPH4	—	—	260±5°C	5±1s
SPPJ2, SPPH1, SPED2, SPED4, SPEF	—	—	260±5°C	10±1s