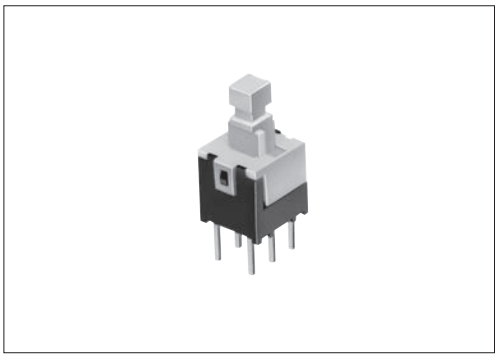
SPPH2 1mm-travel Compact-sized Vertical Type

1mm short travel



Typical Specifications

Items		Specifications
Rating (max.)/(min.) (Resistive load)		0.1A 12V DC / 50μA 3V DC
Contact resistance (Initial/ After operating life)		30mΩ max. / 50mΩ max.
Operating force		2±1N
Operating life	Without load	10,000 cycles
	With load	10,000 cycles (0.1A 12V DC)

Product Line

Changeover timing	Travel (mm)	Total travel (mm)	Mounting method	Poles	Knob style	Operation	Terminal type	Minimum order unit (pcs.) Japan	Minimum order unit (pcs.) Export	Product No.	Drawing No.
Non shorting	1	1.5	PC board	2	Standard	Latching	Straight	100	10,000	**SPPH210100**	1
						Momentary				**SPPH210500**	
						Latching	Snap-in			**SPPH260100**	2
						Momentary				**SPPH230500**	1
					Short	Latching				**SPPH240100**	3
						Momentary				**SPPH240300**	

Packing Specifications

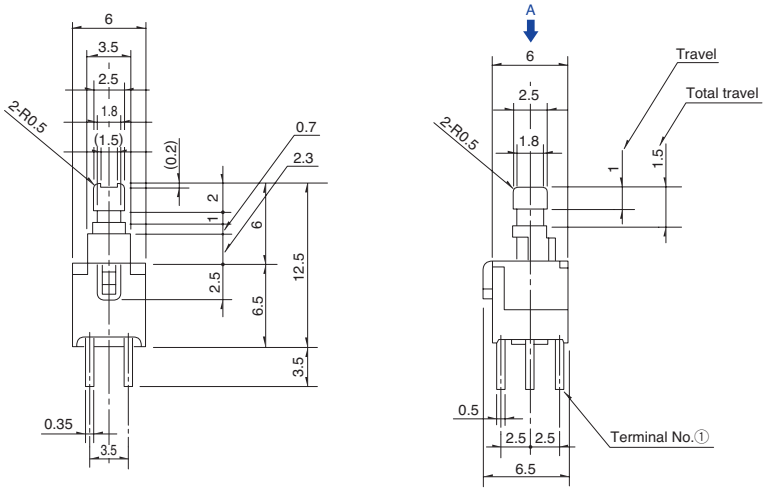
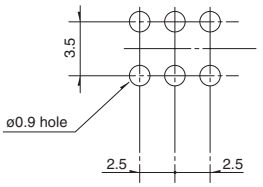
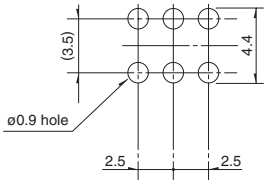
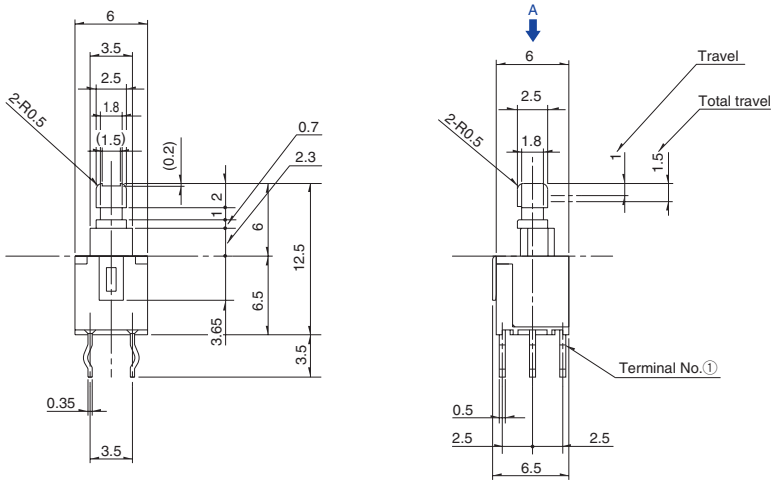
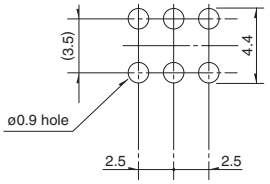
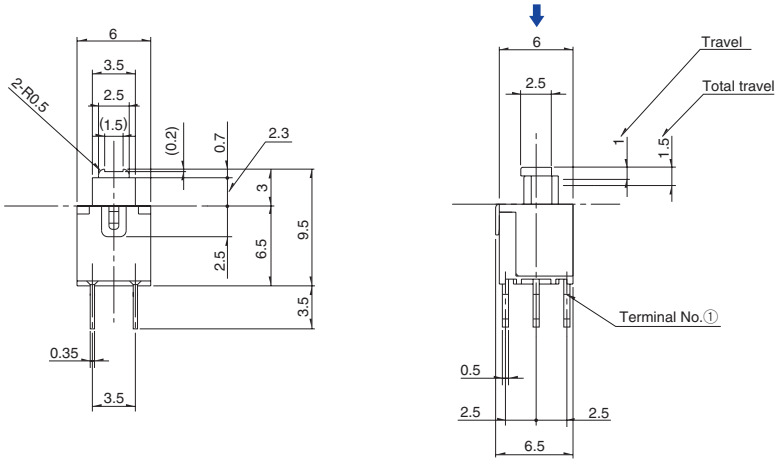
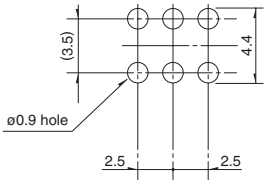
Bulk

Number of packages (pcs.)		Export package measurements (mm)
1 case / Japan	1 case / export packing	
2,000	10,000	400×270×290

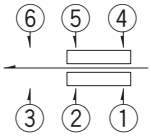
Refer to P.138 for soldering conditions.

Dimensions

Unit:mm

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

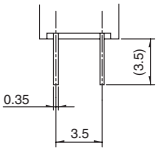
Circuit Diagram (Viewed from Direction A)



Terminal Configuration

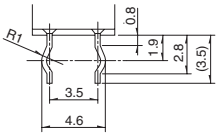
Unit:mm

Straight terminal



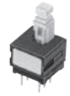
t=0.5

Snap-in terminal



t=0.5

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℃ to +90℃	−10℃ to +60℃	−40℃ to +85℃	−10℃ to +60℃		
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℃ 1,000h	−20℃ 96h	−40℃ 500h	−20℃ 96h		
	Dry heat		90℃ 1,000h	85℃ 96h	85℃ 500h	85℃ 96h		
	Damp heat		60℃, 90 to 95% RH 1,000h	40℃, 90 to 95% RH 96h	60℃, 90 to 95% RH 500h	40℃, 90 to 95%RH 96h		
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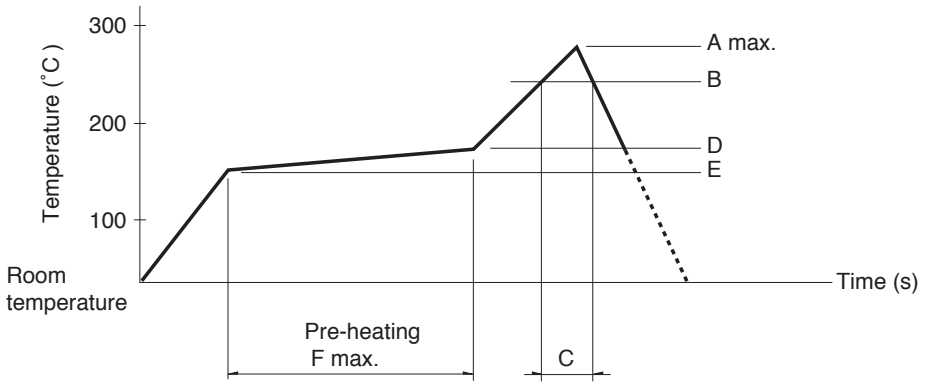
Push Switches Cautions 139

Note

● Indicates applicability to all products in the series.

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 (℃) 3s max.	B (℃)	C (s)	D (℃)	E (℃)	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℃	3+1/0s
SPED2, SPED4	350±10℃	3±0.5s
SPEJ	350±10℃	4s max.
SPEG, SPEF	350±5℃	3s max.
SPEH, SPPH2	350℃ max.	3s max.
SPUJ	300±10℃	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℃ max.	60s max.	260±5℃	5±1s
SPUN	100℃ max.	60s max.	260±5℃	10±1s
SPUJ, SPPH2, SPPH4	—		260±5℃	5±1s
SPPJ2, SPPH1, SPED2, SPED4, SPEF	—		260±5℃	10±1s