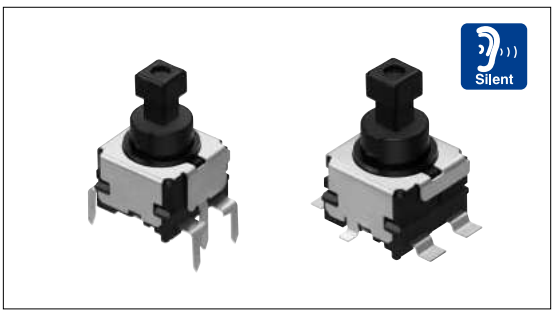
Surface Mount Type Push Switch

SPEF Series

Car Use RoHS compliant

Surface mountable lead-free soldering push switch.



Typical Specifications

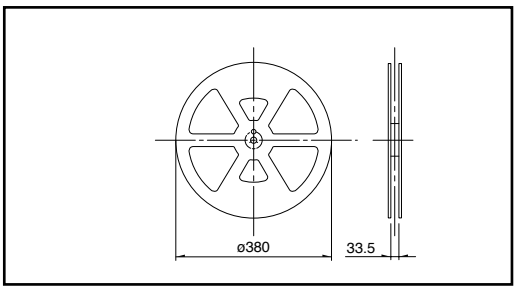
Items	Specifications
Rating (max) (Resistive load)	1A 14.5V DC
Initial contact resistance	100mΩ max.
Operating force	3N,5N
Operating life (Without load)	30,000cycles
Poles-Positions	1-pole,2-positions

Product Line

Changeover timing	Travel (mm)	Total travel (mm)	Operating force	Mounting method	Operating	Terminal type	Minimum order unit (pcs.)	Product No.	Drawing No.
Non shorting	1.5	2.7	3N	PC board	Latching	Reflow	1,320	SPEF210101	1
						Dip	2,100	SPEF110100	2
			5N			Reflow	1,320	SPEF210200	1
						Dip	2,100	SPEF110200	2

Taping Specifications (Taping Packaging)

Reel Size Unit:mm



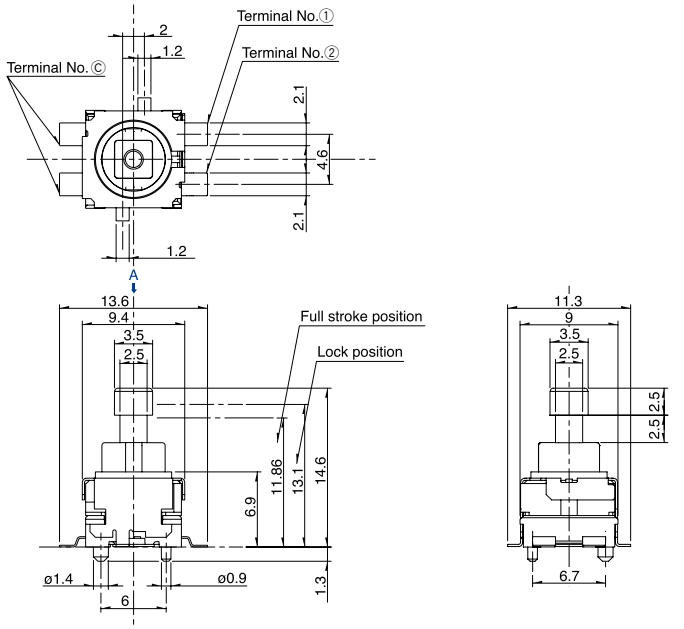
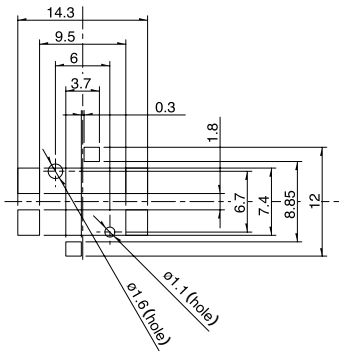
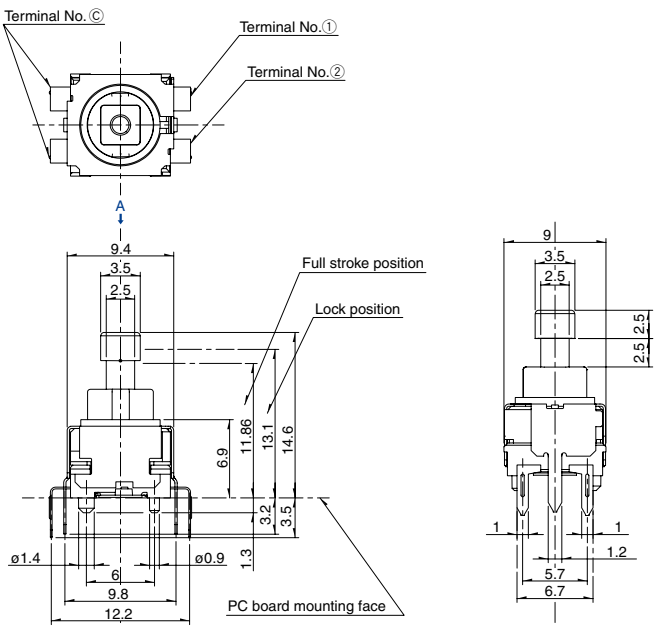
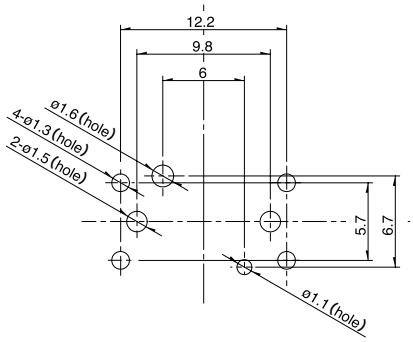
Number of packages (pcs.)			Tape width (mm)
1 reel	1 case /Japan	1 case /export packing	
165	660	1,320	32

Note

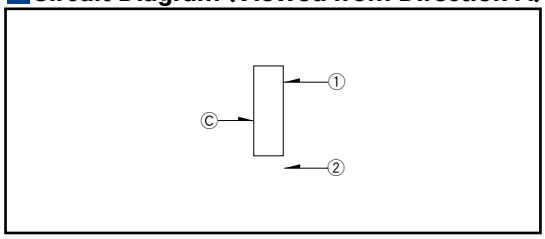
Please place purchase orders per minimum order unit (integer).

Dimensions

Unit:mm

No.	Style	PC board mounting hole dimensions
1	**Reflow Soldering Type** 	
2	**Dip Soldering Type** 	

Circuit Diagram (Viewed from Direction A)



List of Varieties

Series		SPPH4	SPPH1	SPEC	SPED2	SPED3	SPED4	SPED5	SPEF	
Photo										
Travel (mm)		2.2	1.5	2.5	—				1.5	
Total travel (mm)		3	2.5	3.4	4.5	3.8			2.7	
Number of poles		2				1				
Dimensions (mm)	W	8.5	10	12	14			13.5	9.4	
	D	6.5	10		16.8	18		18.2	9	
	H	8.5		12.5	26.7	20.7			6.9	
Operating temperature range		−10°C to +60°C	−40°C to +85°C							
Rating (max.) (Resistive load)		0.1A 30V DC			1A 14.5V DC					
Rating (min.) (Resistive load)		50μA 3V DC								
Electrical performance	Initial contact resistance	100mΩ max.	20mΩ max.	30mΩ max.	100mΩ max.					
	Insulation resistance	100MΩ min. 500V DC			3MΩ min. 500V DC				3MΩ min. 100VDC	
	Voltage proof	500V AC for 1minute			100V AC for 1minute					
Mechanical performance	Terminal strength	5N for 1minute		3N for 1minute	———					
	Actuator strength Operating direction	30N	50N						90N	
	Actuator strength Pulling direction	10N	—	50N	———				30N	
Durability	Operating life without load	10,000cycles 100mΩ max.	10,000cycles 40mΩ max.	10,000cycles 50mΩ max.	30,000cycles 100mΩ max.					
	Operating life without load Load:as rating									
Environmental performance	Cold	−20±2°C for 96h			−40±2°C for 96h					
	Dry heat	85±2°C for 96h								
	Damp heat	40±2°C, 90 to 95%RH for 96h								
Soldering	Manual soldering	350±10°C 3^{+1}_{0}s			350±10°C 3±0.5s ※3	—	350±10°C 3±0.5s	—	350±5°C 3s max.	
	Dip soldering	260±5°C 5±1s	260±5°C 10±1s	260°C max. 5s max.	260±5°C 10±1s ※3	—	260±5°C 10±1s	—	260±5°C10±1s ※4	
	Reflow soldering	———							Please see P.108	
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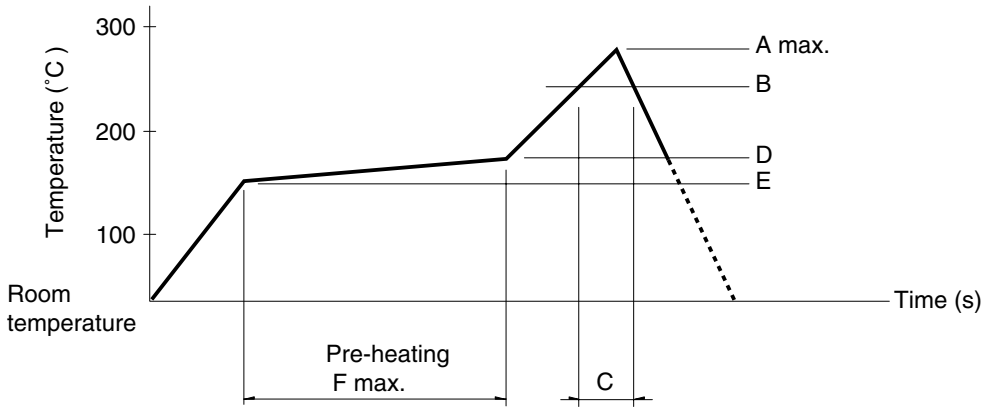
Notes

1. ※3. Applicable to SPED220200 (PC board type) only.
2. ※4. Applicable to SPEF110100 only.

Soldering Conditions

Example of Reflow Soldering Condition

1. Heating method: Double heating method with infrared heater.
2. Temperature measurement: Thermocouple 0.1 to 0.2ϕ 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)
SPEE	260	230	40	180	150	120
SPEF, SPEG						

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.