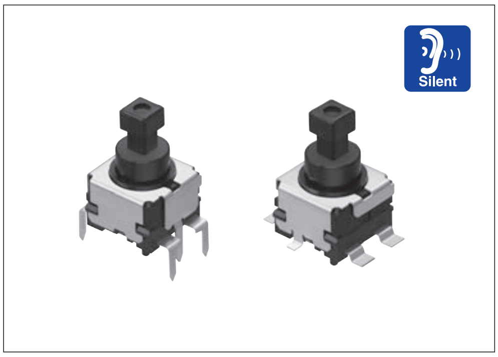
SPEF 1.5mm-travel Vertical Type

Surface mountable lead-free soldering push switch



Typical Specifications

Items	Specifications
Rating (max.)/(min.) (Resistive load)	1A 14.5V DC / 50μA 3V DC
Contact resistance (Initial / After operating life)	100mΩ max. / 100mΩ max.
Operating force	3N, 5N
Operating life (With load)	30,000 cycles (1A 14.5V DC)
Poles-position	1-pole, 2-position

Product Line

Changeover timing	Travel (mm)	Total travel (mm)	Operating force	Mounting method	Operating	Terminal type	Minimum order unit (pcs.)		Product No.	Drawing No.
							Japan	Export		
Non shorting	1.5	2.7	3N	PC board	Latching	Reflow	660	1,320	**SPEF210101**	1
						Dip	1,050	4,200	**SPEF110100**	2
			5N			Reflow	660	1,320	**SPEF210200**	1
						Dip	1,050	4,200	**SPEF110200**	2
	–		3N		Alternate	Reflow	660	1,320	**SPEF220100**	1
						Dip	1,050	4,200	**SPEF120100**	2
			5N			Reflow	660	1,320	**SPEF220200**	1
						Dip	1,050	4,200	**SPEF120200**	2

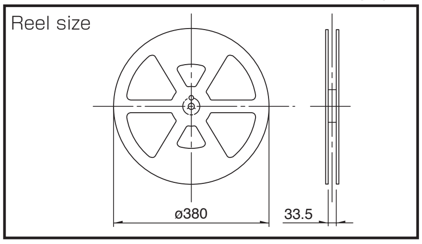
Packing Specifications

Taping

Product No.	Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
	1 reel	1 case / Japan	1 case / export packing		
SPEF210101 **SPEF210200** **SPEF220100** **SPEF220200**	165	660	1,320	32	403×403×360

Unit:mm

Reel size



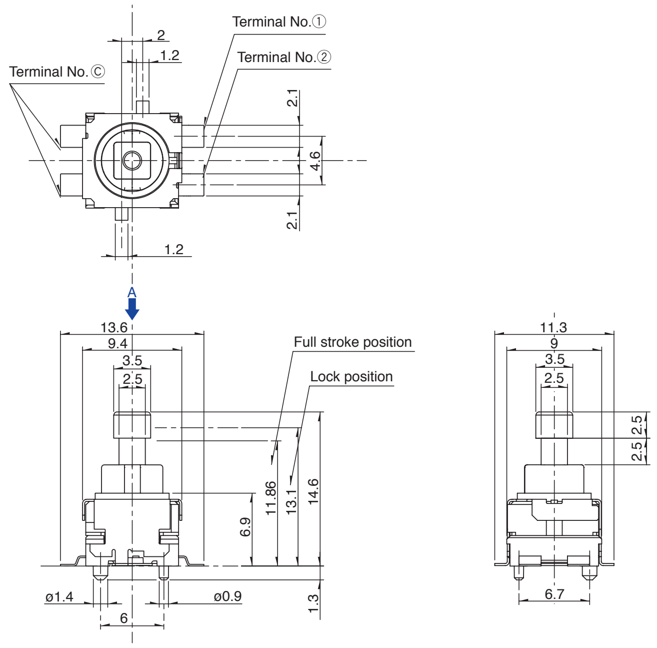
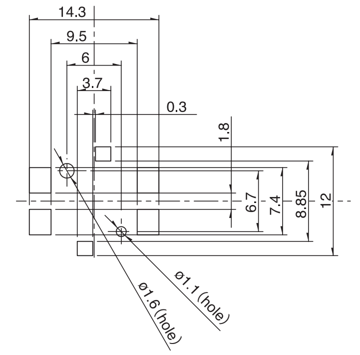
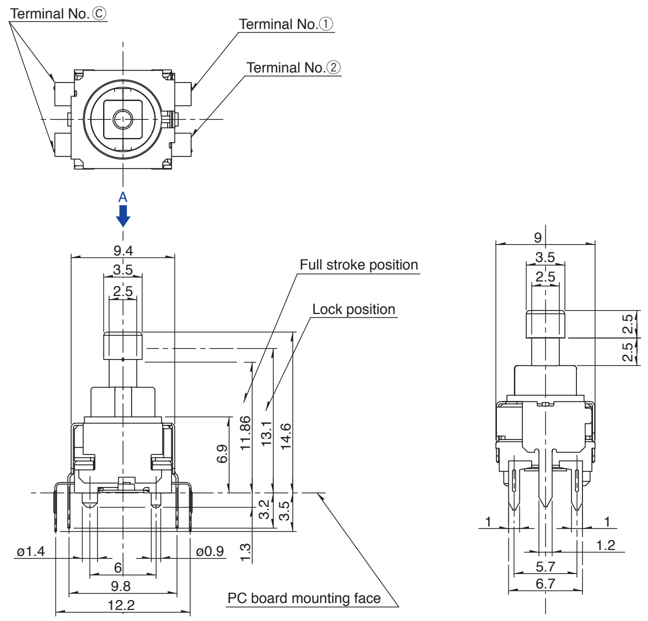
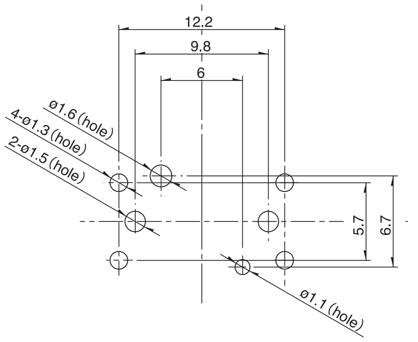
Tray

Product No.	Number of packages (pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
SPEF110100 **SPEF110200** **SPEF120100** **SPEF120200**	1,050	4,200	540×360×230

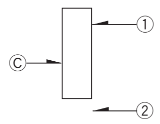
Refer to P.140 for soldering conditions.

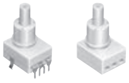
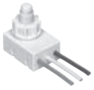
Dimensions

Unit:mm

No.	Style	PC board mounting hole dimensions (Viewed from the direction A)
1	**Reflow soldering type** 	
2	**Dip soldering type** 	

Circuit Diagram (Viewed from Direction A)



Series			Vertical					
			SPEF		**SPED2**	**SPED3**	**SPED4**	**SPED5**
Photo								
Dimensions (mm)	W		9.4		14			13.5
	D		9		16.8	18		18.2
	H		6.9		18.3	16.97	13.1	18
Travel (mm)			1.5		—	—	—	—
Total travel (mm)			2.7		4.5	3.8		
Number of poles			1		1 2	1		
Operating temperature range			−40℃ to +85℃			−40℃ to +95℃		
Automotive use			●	●	●	●	●	●
Life cycle			★3		★3	★3	★3	★3
Rating (max.) (Resistive load)			1A 14.5V DC			2A 14.5V DC		
Rating (min.) (Resistive load)			50μA 3V DC		—	—	—	—
Durability	Operating life without load		—	—	—	—	—	—
	Operating life with load (at max. rated load)		30,000 cycles 100mΩ max.					
Electrical performance	Initial contact resistance		100mΩ max.					
	Insulation resistance		3MΩ min. 100V DC		3MΩ min. 500V DC			
	Voltage proof		100V AC for 1minute					
Mechanical performance	Terminal strength		—	—	—	—	—	Wire strength 30N
	Actuator strength	Operating direction	90N			98N	90N	98N
		Pulling direction	30N		—	—	—	—
Environmental performance	Cold		−40℃ 96h					
	Dry heat		85℃ 96h		85℃ 96h (Connector type) 105℃ 192h (Dip type)	105℃ 192h		
	Damp heat		40℃, 90 to 95%RH 96h					
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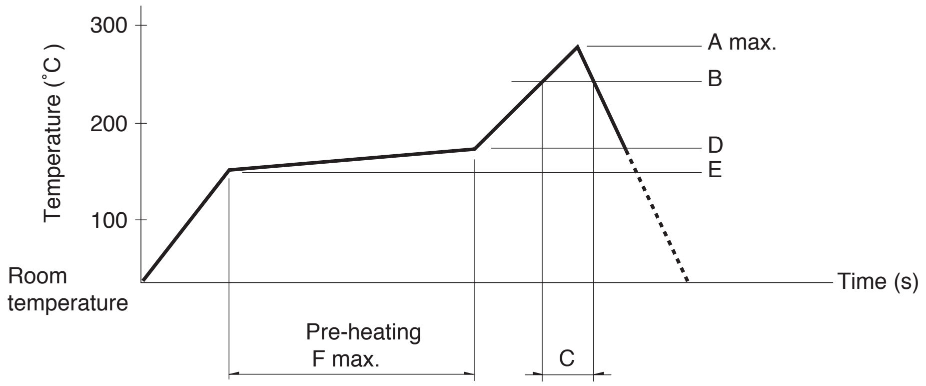
Note

● 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 (℃) 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