



Detector

Slide

Push

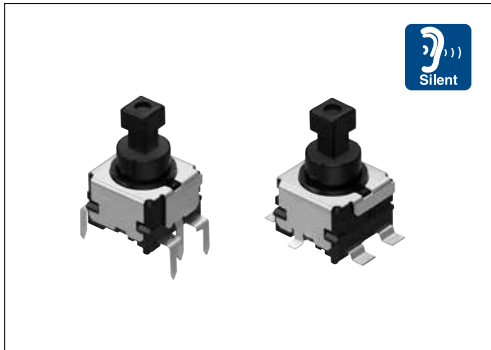
Rotary

Power

Dual-in-line Package Type

Horizontal Type

Vertical Type



**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

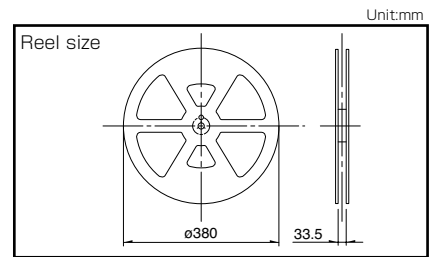
**Product Line**

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	<b>SPEF210101</b>	1	
						Dip	1,050	4,200	<b>SPEF110100</b>	2	
			Reflow			660	1,320	<b>SPEF210200</b>	1		
			Dip			1,050	4,200	<b>SPEF110200</b>	2		
	-		5N		3N	Alternate	Reflow	660	1,320	<b>SPEF220100</b>	1
							Dip	1,050	4,200	<b>SPEF120100</b>	2
					Reflow		660	1,320	<b>SPEF220200</b>	1	
					Dip		1,050	4,200	<b>SPEF120200</b>	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		
<b>SPEF210101</b> <b>SPEF210200</b> <b>SPEF220100</b> <b>SPEF220200</b>	165	660	1,320	32	403×403×360



Tray

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

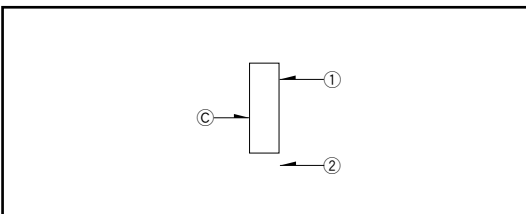
Refer to P.130 for soldering conditions.

■ Dimensions

Unit:mm

No.	Style	PC board mounting hole dimensions (Viewed from the direction A)
1	<p><b>Reflow soldering type</b></p>	
2	<p><b>Dip soldering type</b></p>	



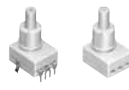








■ Circuit Diagram (Viewed from Direction A)



Detector  
Slide  
Push  
Rotary  
Power  
Dual-in-line  
Package Type  
Horizontal  
Type  
Vertical  
Type

# Push Switches

## List of Varieties

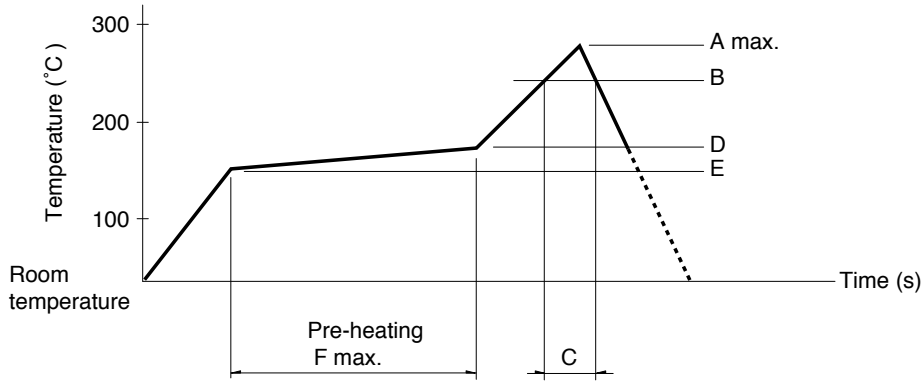
Series		Vertical						
		SPEF		SPED2	SPED3	SPED4	SPED5	
Photo								
Dimensions (mm)	W	9.4		14			13.5	
	D	9		16.8	18		18.2	
	H	6.9		18.3	13.2	13.1	14.3	
Travel (mm)		1.5		—	—	—	—	
Total travel (mm)		2.7		4.5	3.8			
Number of poles		1		1 2	1			
Operating temperature range		-40°C to +85°C			-40°C to +95°C			
Automotive use		●	●	●	●	●	●	
Life cycle								
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°C 96h						
	Dry heat	85°C 96h		85°C 96h (Connector type) 105°C 192h (Dip type)		105°C 192h		
	Damp heat	40°C, 90 to 95%RH 96h						
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**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  $\phi$  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)
<b>SPEJ</b>	260	230	40	180	150	120
<b>SPEF</b>						
<b>SPEH</b>						

### 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
<b>SPPJ3, SPPJ2, SPUN, SPPH4, SPPH1</b>	350±10°C	3+1/0s
<b>SPED2, SPED4</b>	350±10°C	3±0.5s
<b>SPEJ</b>	350±10°C	4s max.
<b>SPEF</b>	350±5°C	3s max.
<b>SPEH</b>	350°C max.	3s max.
<b>SPUJ</b>	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
<b>SPPJ3</b>	100°C max.	60s max.	260±5°C	5±1s
<b>SPUN</b>	100°C max.	60s max.	260±5°C	10±1s
<b>SPUJ, SPPH4</b>	—	—	260±5°C	5±1s
<b>SPPJ2, SPPH1, SPED2, SPED4, SPEF</b>	—	—	260±5°C	10±1s