

Compact One-way Operation Type Detector Switch

SPVE Series

One of the minimum size class of products in the industry with a size 3.4×3.0 mm appropriate for use in compact digital equipment.

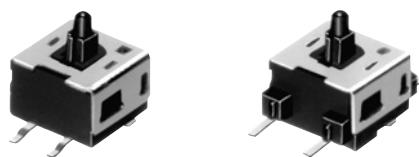
Power
Push
Slide
Rotary
Encoders

Detector

Dual-in-line
Package Type
Multi Control
Devices

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Features

- Miniaturized for space saving design.
- Double-sided sliding contact offers superior reliability.
- Reflow solderable.

Applications

- For detecting batteries in DSCs and LCDs
- For detecting the position of lids in mobile phones and laptop computers
- For detecting media in portable CD/MD players and 1/2 inch FDDs

Typical Specifications

Items		Specifications
Rating (max.) (Resistive load)		0.1A 30V DC
Contact resistance (Initial performance/After lifetime)		500m Ω max./1 Ω max.
Operating force		0.3N max.
Operating life	Without load	50,000 cycles
	With load	50,000 cycles (0.1A 12V DC)

Products Line

Poles	Positions	Terminal style	Slider height (mm)	ON start position (mm)	Total travel (mm)	Mounting method	Location lug	Minimum packing unit (pcs.)	Products No.	Drawing No.
1	1	For PC board (Reflow)	h=3.8	h ₁ =3.5	h ₂ =2.5	Standard	Without	2,800	SPVE110100	1
			h=4.1	h ₁ =3.8	h ₂ =2.9		With		SPVE110600	
			h=4.8	h ₁ =4.5	h ₂ =3.6		Without		SPVE110401	
			h=5.2	h ₁ =4.9	h ₂ =4.0		With		SPVE110801	
			h=5.5	h ₁ =5.2	h ₂ =4.3	Low-profile	Without	2,200	SPVE110200	
			h=3.3	h ₁ =3.0	h ₂ =2.0		With		SPVE110900	
			h=4.75	h ₁ =4.45	h ₂ =3.35		—	2,000	SPVE111300	
							—		SPVE111200	2
								2,800	SPVE210100	
								2,000	SPVE210200	

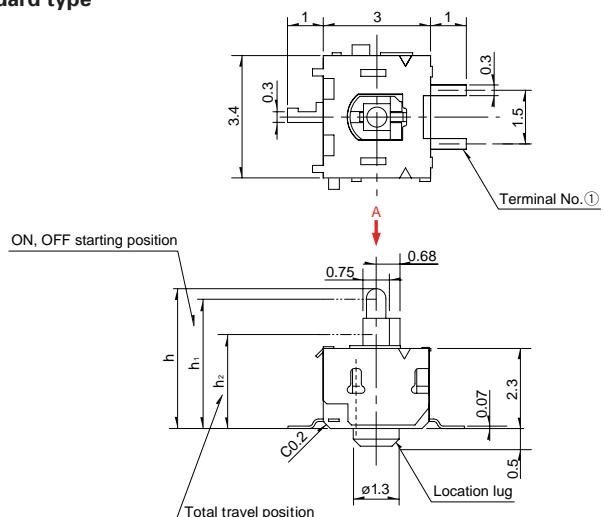
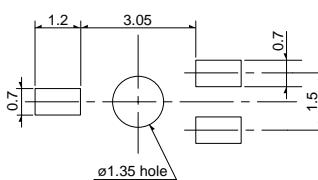
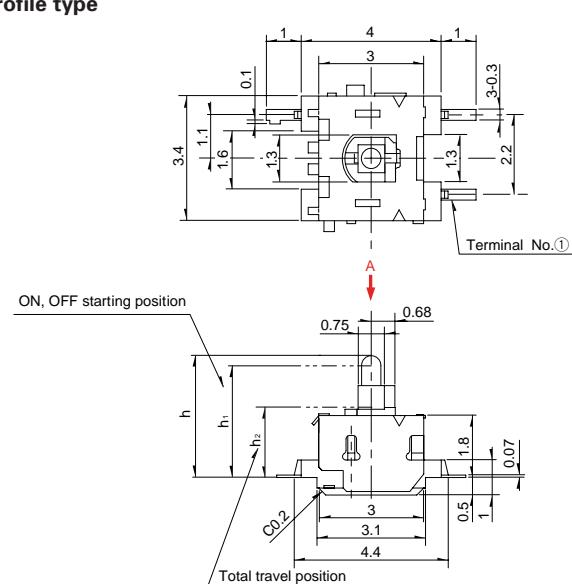
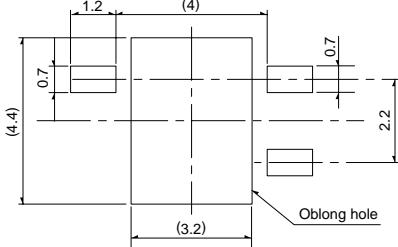
Notes

- The dimensions indicates the standard type with a locating lug.
- Additional switches not included in the above list are also available. Contact us for details.

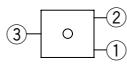
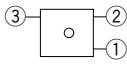
For other detailed specifications, see P.303
For specifications for the taping package, see P.307

Dimensions

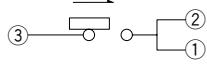
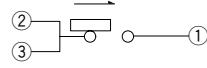
Unit:mm

No.	Style	PC board mounting hole dimensions
1	Standard type  <p>ON, OFF starting position</p> <p>Terminal No.①</p> <p>Location lug</p> <p>Reflow pattern</p>	
2	Low-profile type  <p>ON, OFF starting position</p> <p>Terminal No.①</p> <p>Total travel position</p> <p>Oblong hole</p>	

Terminal Layout (Viewed from Direction A)

Standard type	Low-profile type
	

Circuit Diagram

Standard type	Low-profile type
	

Products Specifications

Items	Series	SPPB	SPVE	SPPW8	SPVM	SPVR	SPVP	SPVN	SPVG	SPVL	SSCM							
Operating temperature range	-10°C to +60°C																	
Rating (max.) (Resistive load)	0.1A 30V DC	0.1A 12V DC	0.1A 30V DC	1mA 5V DC				50mA 20V DC	1mA 5V DC									
Electrical performance	Initial contact resistance	1Ω max.	500mΩ max.	1Ω max.	2Ω max.	3Ω max.	5Ω max.	2Ω max.	500mΩ max.	2Ω max.								
	Insulation resistance	100MΩ min. 100V DC																
	Voltage proof	100V AC for 1 min.																
Mechanical performance	Robustness of terminal	3N for 1 min.	0.5N for 1 min.	3N for 1 min.	1N for 1 min.	0.5N for 1 min.			1N for 1 min.	0.5N for 1 min.								
	Robustness of actuator	10N	5N	10N	5N	2N	5N		10N	5N	0.5N							
	Vibration	10 to 55 to 10Hz/min., the amplitude is 1.5mm for all the frequencies, in the 3 direction of X, Y and Z for 2 hours respectively																
	Resistance to soldering heat	Manual soldering	300±5°C, 5s max.	350±5°C, 3s max.														
Durability		Dip soldering	260±5°C, 5±1s	—	255±5°C, 5±1s	—												
		Reflow soldering	Please see P.306															
Operating life without load	50,000 cycles 2Ω max.	50,000 cycles 1Ω max.	100,000 cycles 2Ω max.	50,000 cycles 5Ω max.	50,000 cycles 10Ω max.	50,000 cycles 5Ω max.	100,000 cycles 1Ω max.	50,000 cycles 5Ω max.	50,000 cycles 5Ω max.									
Environmental performance	Operating life with load	(0.1A 30V DC) 50,000 cycles 2Ω max.	(0.1A 12V DC) 50,000 cycles 1Ω max.	(0.1A 30V DC) 100,000 cycles 2Ω max.	(1mA 5V DC) 50,000 cycles 5Ω max.	(1mA 5V DC) 50,000 cycles 10Ω max.	(1mA 5V DC) 50,000 cycles 5Ω max.	(50mA 20V DC) 100,000 cycles 1Ω max.	(1mA 5V DC) 50,000 cycles 5Ω max.	(1mA 5V DC) 50,000 cycles 5Ω max.								
	Cold	-20±2°C for 96h	-25±2°C for 96h	-20±2°C for 96h				-40±2°C for 96h		-20±2°C for 96h								
	Dry heat	85±2°C for 96h																
Durability	Damp heat	40±2°C, 90 to 95%RH for 96h																

Power

Push

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Dual-in-line
Package TypeMulti Control
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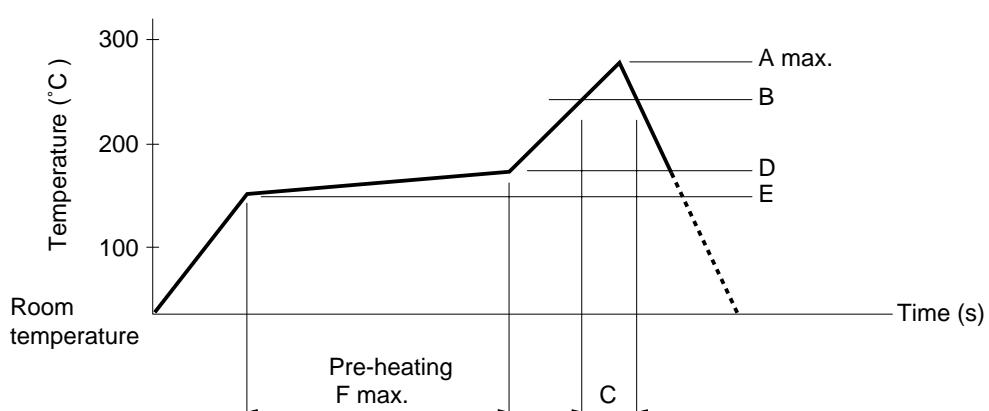
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Soldering Conditions

Example of Reflow Soldering Condition

1. Heating method: Double heating method with infrared heater.
2. Temperature measurement: Thermocouple 0.1 to 0.2 φ 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)
SPPB	250					
SPVE	260	230	40			
SPPW8	250	200	20			
SPVM						
SPVR						
SPVP						
SPVN	260	230	40	180	150	120
SPVG						
SPVL						
SSCM						
SPPY5	240		20	150	Room Temperature	180

Notes

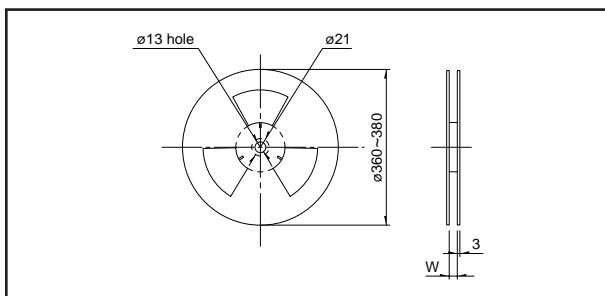
1. The condition mentioned above is the temperature on the mounting surface of a PC board. There are cases where the PC board's temperature greatly differs from that of the switch, depending on the PC board's material, size, thickness, etc. The above-stated conditions shall also apply to switch surface temperatures.
2. As the conditions vary some how depending on the kind of reflow soldering equipment, please make sure you have the right one before use.

Taping Specifications

Taping Packaging

Reel Size

Unit:mm



Series		Number of packages (pcs.)			Reel width W (mm)	Tape width (mm)		
		1 reel	1 case / domestic	1 case / export packing				
SPPB	53 (Horizontal)	1,500	3,000	6,000	24.4	24		
	53 (Vertical)	600	1,200	2,400				
	63, 64	1,300	2,600	5,200				
SPVE	Standard	h=3.8	2,800	5,600	12.4	12		
	h=4.1	h=4.8	2,200	4,400				
			2,000	4,000				
	Low-profile	h=3.3	2,800	5,600				
SPPW81	h = 6.1 (Reflow)	h = 6.55 (Reflow)	1,000	2,000	24.4	24		
	h = 7.6 (Reflow)		850	1,700				
SPVM		3,000	6,000	12,000	16.4	16		
SPVR		2,500	5,000	10,000				
SPVP		4,500	9,000	18,000				
SPVN		5,000	10,000	20,000				
SPVG		2,500	5,000	10,000				
SPVL		5,000	10,000	20,000				
SSCM		3,000	6,000	12,000				
SPPY5		550	1,650	3,300	44.4	44		

Note

Order products in N minimum packing units (1 reel or 1 case).