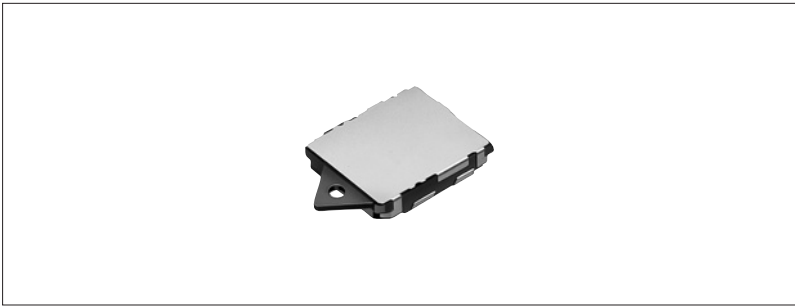


Low-profile Tri-directional Operation Type Detector Switch

SPVL Series

Flexible operation in arrangement at a 180° angle, and only 1mm thick.

- Power
- Push
- Slide
- Rotary
- Encoders
- Jog Shuttle
- Telephone-hook
- Detector**
- Vibration Sensors
- Dual-in-line Package Type
- Multi Control Devices
- TACT



Car Use

Features

- Tri-directional operation (vertical, right or left over a range of 180°).
- Highly reliable, double-sided sliding contact.
- Reflow solderable type only.

Applications

- For detection mechanisms in devices, including PDAs, mobile phones, IC recorders, silicon audio systems, car audio systems, and digital camcorders
- For detecting functions of information devices, including laptop computers, CD-R/RW drives, and DVD drives
- For detecting functions of DSCs and IC card readers/writers

Typical Specifications

Items		Specifications
Rating (max.) (Resistive load)		1mA 5V DC
Contact resistance (Initial performance / After lifetime)		2Ω max. / 5Ω max.
Operating force		0.35N max.
Operating life	Without load	50,000 cycles
	With load	50,000 cycles (1mA 5V DC)

Products Line

Poles	Positions	Terminal style	Location lug	Minimum packing unit (pcs.)	Products No.
1	1	For PC board (Reflow)	With	5,000	SPVL110100
			Without		SPVL120100

For other detailed specifications, see P.301
For specifications for the taping package, see P.303

- Power
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Dimensions

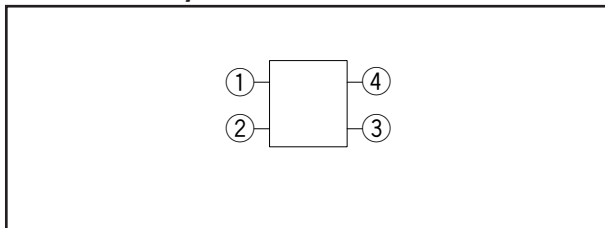
Unit : mm

Style	PC board mounting hole dimensions (Viewed from direction A)
<p>Terminal No. ①</p> <p>R0.3</p> <p>0.55</p> <p>2-(R1.66)</p> <p>Total travel</p> <p>ON Position, Operating force measurement position</p> <p>0.35</p> <p>0.6</p> <p>0.55</p> <p>0.7</p> <p>ø1</p> <p>6.6</p> <p>(0.475)</p> <p>2.4</p> <p>5.55</p> <p>1.2</p> <p>1.6</p> <p>3.75</p> <p>4.25</p> <p>5.75</p> <p>0.65</p> <p>6.21</p> <p>ON Starting position</p> <p>0.86</p> <p>0.86</p> <p>Control direction</p> <p>Control direction</p> <p>Control direction</p> <p>Control direction</p> <p>5.2</p> <p>5.2</p> <p>4.25</p> <p>4.25</p> <p>(5.3)</p> <p>In case of straight operation</p>	<p>2-ø1.1 hole</p> <p>1.9</p> <p>3</p> <p>1.5</p> <p>1.6</p> <p>0.8</p> <p>1.25</p> <p>0.4</p> <p>2.7</p> <p>2.8</p> <p>3.9</p>

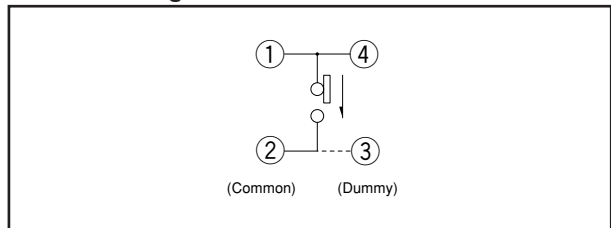
Note

Only the configurations with the location lug are indicated in the dimensions.

Terminal Layout (Viewed from Direction A)



Circuit Diagram



Products Specifications

Series		SPVC1	SPVN	SPVG	SPVL	SSCM	SSCF	SPVQ	SREF	
Items	Operating temperature range	-10°C to +60°C						-40°C to +85°C	-10°C to +60°C	
	Rating (max.) (Resistive load)	10mA 16V DC	1mA 5V DC	50mA 20V DC	1mA 5V DC		0.1A 12V DC		1mA 5V DC	
Electrical performance	Initial contact resistance	1Ω max.	2Ω max.	500mΩ max.	2Ω max.		100mΩ max.	500mΩ max.	1Ω max.	
	Insulation resistance	100MΩ min. 100V DC						100MΩ min. 500V DC	100MΩ min. 100V DC	
	Voltage proof	100V AC for 1 min.						500V AC for 1 min.	100V AC for 1 min.	
Mechanical performance	Robustness of terminal	3N for 1 min.	0.5N for 1 min.		1N for 1 min.	0.5N for 1 min.	5N for 1 min.	3N for 1 min.	—	
	Robustness of actuator	10N	5N	10N	5N	0.5N	10N	20N	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								
	Solderability	230±5°C, 3±0.5s								
	Resistance to soldering heat	Manual soldering	350±10°C, 3 ⁺¹ _{-0.5} s	350±5°C, 3s max.			350±10°C, 3 ⁺¹ _{-0.5} s	300±10°C, 3 ⁺¹ _{-0.5} s	—	
		Dip soldering	260±5°C, 3s max.	—			260±5°C, 5±1s		—	
Reflow soldering		—	Please see P.302			—				
Durability	Operating life without load	25,000 cycles 2Ω max.	50,000 cycles 5Ω max.	100,000 cycles 1Ω max.	50,000 cycles 5Ω max.	50,000 cycles 200mΩ max.	300,000 cycles 1Ω max.	150,000 cycles 2Ω max.		
	Operating life with load	(10mA 16V DC) 25,000 cycles 2Ω 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.	(0.1A 12V DC) 50,000 cycles 300mΩ max.	(0.1A 12V DC) 300,000 cycles 1Ω max.	(0.1A 5V DC) 150,000 cycles 2Ω max.		
Environmental performance	Cold	-20±2°C for 96h		-40±2°C for 96h	-20±2°C for 96h		-40±2°C for 500h	-20±2°C for 96h		
	Dry heat	85±2°C for 96h						85±2°C for 500h	85±2°C for 96h	
	Damp heat	40±2°C, 90 to 95%RH for 96h						60±2°C, 90 to 95%RH for 500h	40±2°C, 90 to 95%RH for 96h	

Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone-hook

Detector

Vibration Sensors

Dual-in-line Package Type

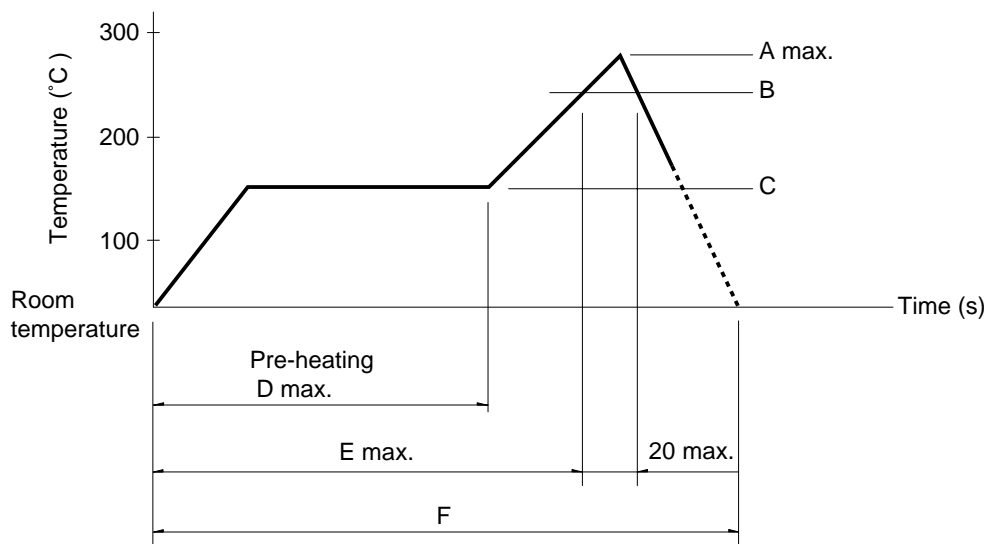
Multi Control Devices

TACT

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 (°C)	D (s)	E (s)	F (s)
SPPB	250	200	150	120	—	—
SPVE	240	230				
SPPW8	250	200				
SPVM						
SPVP						
SPVN						
SPVG	240	230				
SPVL	250					
SSCM						

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.

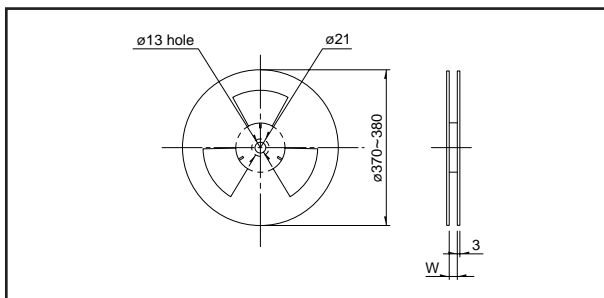
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Taping Specifications

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			
		h=5.2	2,000	4,000			
		h=5.5					
	Low-profile	h=3.3	2,800	5,600			22,400
		h=4.75	2,000	4,000			16,000
SPPW81	h = 6.1 (Reflow)	1,000	2,000	4,000	24.4	24	
	h = 6.55 (Reflow)						
	h = 7.6 (Reflow)						850
SPVM		3,000	6,000	12,000	16.4	16	
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			

Note

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

Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone-hook

Detector

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Dual-in-line Package Type

Multi Control Devices

TACT