

# Detector Switch Compact Two-way Operation Type

SPVM Series



3.5×2.8×height 1.5mm compact detector switch detects from both vertical and horizontal directions.

Detector

Push

Slide

Rotary

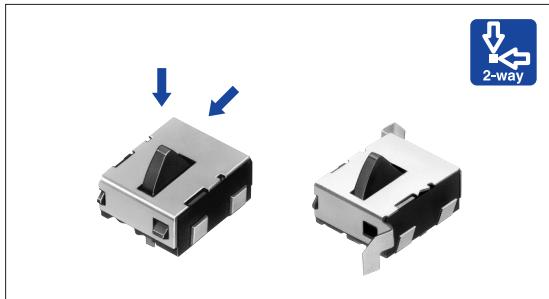
Encoders

Power

Dual-in-line  
Package Type

TACT Switch™

Custom-  
Products



## Typical Specifications

Items		Specifications
Rating (max.) / (min.) (Resistive load)		1mA 5V DC/50μA 3V DC
Contact resistance (Initial /After operating life)		2Ω max./5Ω max.
Operating force		0.4N max.
Operating life	Without load	50,000cycles
	With load	50,000cycles (1mA 5V DC)

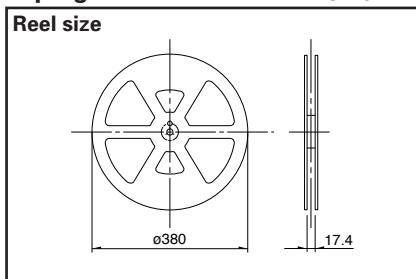
## Product Line

Poles	Positions	Terminal type	Frame	Location lug	Minimum order unit (pcs)	Product No.	Drawing No.
1	1	For PC board (Reflow)	Without terminal	With	12,000	SPVM110100	1
				Without		SPVM110200	
				With		SPVM210100	2
				Without		SPVM210200	

## Packing Specifications

### Taping

Unit:mm



Number of packages (pcs.)			Tape width (mm)	Export package measurements (mm)
1 reel	1 case /Japan	1 case /export packing		
3,000	6,000	12,000	16	417×409×139

### Notes

- When applying the soldered frame terminals as earth terminals, place No.3 and No.4 terminals on the same ground.
- Please place purchase orders per minimum order unit N (integer).



Automotive  
Use

Dimensions

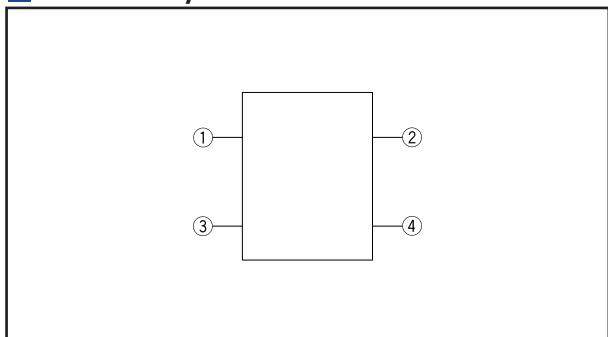
Unit:mm

No.	Photo	Style	PC board mounting hole and land dimensions (Viewed from direction A)
1		<p>Technical drawings for SPVM Series detector switch No. 1. The top drawing shows the terminal layout with Terminal No. ① at the top, followed by ②, ④, and ③ at the bottom. The middle drawing shows the switch in an 'ON starting position' with dimensions: Total travel = 2.53, Location lug = 1.7, and various other internal dimensions. The bottom drawing shows the switch in a 'Total travel position' with dimensions: Total travel = 2.53, Location lug = 1.7, and various other internal dimensions. The right side shows the PC board mounting hole and land dimensions with a total width of 3.6 mm, a central hole of Ø0.7 mm, and side holes of Ø0.9 mm.</p>	
2		<p>Technical drawings for SPVM Series detector switch No. 2. The top drawing shows the terminal layout with Terminal No. ① at the top, followed by ②, ④, and ③ at the bottom. The middle drawing shows the switch in an 'ON starting position' with dimensions: Total travel = 2.53, Location lug = 1.7, and various other internal dimensions. The bottom drawing shows the switch in a 'Total travel position' with dimensions: Total travel = 2.53, Location lug = 1.7, and various other internal dimensions. The right side shows the PC board mounting hole and land dimensions with a total width of 3.6 mm, a central hole of Ø0.7 mm, and side holes of Ø0.9 mm.</p>	

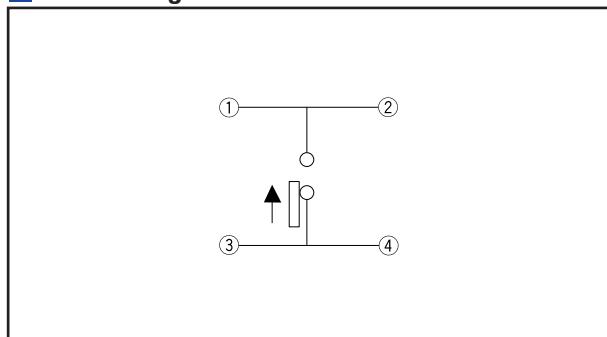
Note

Above dimensions indicate "with location lug" versions.

Terminal Layout (Viewed from Direction A)



Circuit Diagram



Automotive  
Use

Detector

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## List of Varieties (General-purpose Type)

Detector	Series	General-purpose Type					
		SPPB	SPVE	SPPW8	SPVM	SPVR	SSCU
Push	Photo						
Slide	Operation type	 1-way	 1-way	 1-way	 2-way	 2-way	 2-way
Rotary	Operating temperature range	-40°C to +85°C	-10°C to +60°C		-40°C to +85°C		
Encoders	Automotive use	●	—	—	●	●	●
Power	Rating (max.) (Resistive load)	0.1A 30V DC			1mA 5V DC		0.1A 12V DC
Dual-in-line Package Type	Rating (min.) (Resistive load)	50μA 3V DC		100μA 3V DC	50μA 3V DC	100μA 3V DC	50μA 3V DC
TACT Switch™	Electrical performance	Initial contact resistance	1Ω max.	500mΩ max.	1Ω max.	2Ω max.	3Ω max.
Custom-Products		Insulation resistance	100MΩ min. 100V DC				100MΩ min. 250V DC
		Voltage proof	100V AC for 1 minute				250V AC for 1 minute
Mechanical performance	Terminal strength	3N for 1 minute	0.5N for 1 minute	3N for 1 minute	1N for 1 minute	0.5N for 1 minute	3N for 1 minute
	Actuator strength	10N	5N	10N	5N	2N	5N
Durability	Operating life without Load	50,000cycles 2Ω max.	50,000cycles 1Ω max.	100,000cycles 2Ω max.	50,000cycles 5Ω max.		10,000cycles 100mΩ max.
	Operating life with Load	(0.1A 30V DC) 50,000cycles 2Ω max.	(0.1A 30V DC) 50,000cycles 1Ω max.	(0.1A 30V DC) 100,000cycles 2Ω max.	(1mA 5V DC) 50,000cycles 5Ω max.		(0.1A 12V DC) 10,000cycles 100mΩ max.
Environmental performance	Cold	-40±2°C for 500h	-20±2°C for 96h		-40±2°C for 500h		
	Dry heat	85±2°C for 500h	85±2°C for 96h		85±2°C for 500h		
	Damp heat	60±2°C, 90 to 95%RH for 500h	40±2°C, 90 to 95%RH for 96h		60±2°C, 90 to 95%RH for 500h		
Dimensions (mm)	W	6.3	3.4	5	2.8	3.6	11
	D	3		4	3.5	4.2	5.8
	H	4.9	2.3		1.5	1.2	7
Soldering	Manual soldering	300±5°C, 5s max.	350±5°C, 3s max.				
	Dip soldering	255±5°C, 5±1s	—	255±5°C, 5±1s	—		
	Reflow soldering	Please see P.97					—
Number of poles		1					
Operation force		0.35N max.	0.3N max.		0.4N max.	0.35N max.	0.5N max.
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**Note**

● marks in "Available for automotive use" indicate that all of the series products can work at the operating temperature range from -40°C to +85°C.

## 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  $\phi$  CA (K) or CC (T) at soldering portion (copper foil surface). A heat resisting tape should be used for fixed measurement.
3. Temperature profile

Detector

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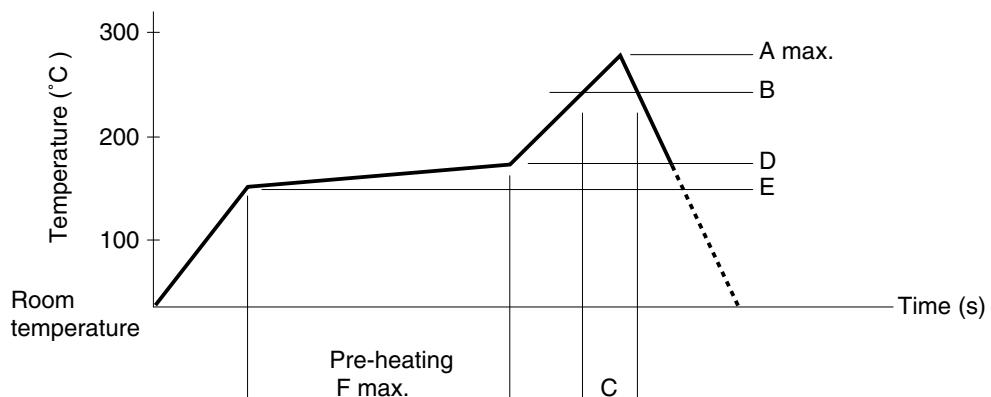
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Series (Reflow type)	A (°C) 3s max.	B (°C)	C (s)	D (°C)	E (°C)	F (s)
SPPB	250	230	40			
SPPW8		200	20			
SPVE						
SPVG						
SPVL						
SPVM				180	150	120
SPVN	260	230	40			
SPVP						
SPVR						
SPVS						
SPVT						
SSCM						
SPPY5	240		20	150	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, surface 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.