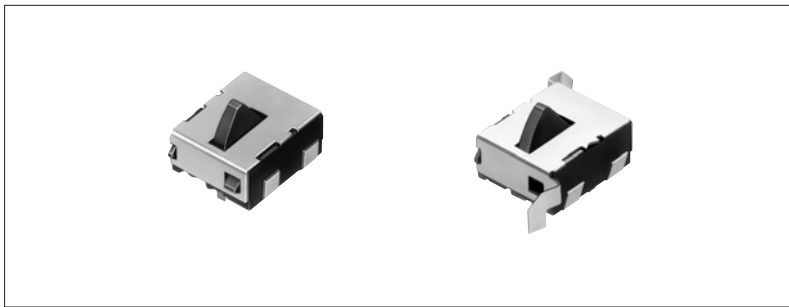


Compact Two-way Operation Type Detector Switch

SPVM Series

Compact detector switch. 2-direction-press, horizontal and vertical pressings, available. Measures only 3.5×2.8mm and 1.5mm high.

- Power
- Push
- Slide
- Rotary
- Encoders
- Detector**
- Dual-in-line Package Type
- Multi Control Devices
- TACT
- Custom-Products



Car Use

Features

- Double-sided sliding contact provides high reliability.
- Suitable for reflow-soldering.

Applications

- For detecting lids of mobile phones, PDAs and DSCs
- For detection mechanisms in devices, including DVD players, portable CD/MD players, and digital camcorders
- For switching modes of mobile phones and DSCs
- For detecting the insertion of IC cards
- For detecting media including CD-ROMs and Floppy disk drives

Typical Specifications

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

Products Line

Poles	Positions	Terminal style	Housing	Location lug	Minimum packing unit (pcs.)	Products No.	Drawing No.
1	1	For PC board (Reflow)	Without terminal	With	3,000	SPVM110100	1
				Without		SPVM110200	
			With terminal	With		SPVM210100	2
				Without		SPVM210200	

Note

If you are using the solder terminals on the frame as earth terminals, please place the 3rd and 4th terminals on the same ground.

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

- Power
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Dimensions

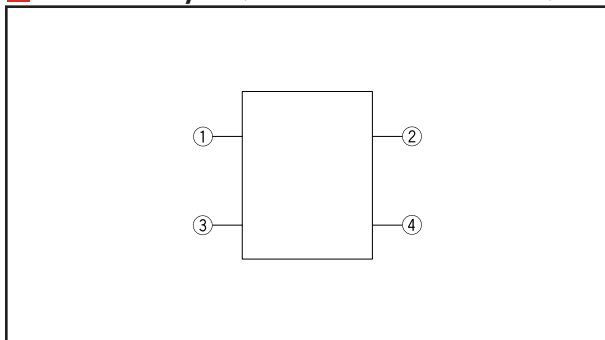
Unit:mm

No.	Style	PC board mounting hole dimensions (Viewed from switch mounting face)
1	<p>Technical drawing of Style 1 detector switch. It includes a side view with dimensions 3.5, 2.5, 1.2, and 2.8. A top view shows dimensions 3.3, 0.5, 0.4, and 0.7. A cross-sectional view shows the internal mechanism with dimensions: 2.53 (ON starting position), 2.2 (Total travel), 1.5, 1.7, 1.87, 1.6, 1.1, 0.8, 0.5, 0.6, 0.75, and 0.8. It also indicates a location lug and a radius of R0.2. An arrow 'A' points to the right.</p>	<p>PC board mounting hole dimensions for Style 1. The drawing shows a 2x2 grid of holes. Dimensions include 3.6, 2.1, 2.8, 1.7, 1, 0.7 hole diameter, and 0.9 hole diameter.</p>
2	<p>Technical drawing of Style 2 detector switch. It includes a side view with dimensions 3.5, 2.5, 1.2, and 2.8. A top view shows dimensions 3.3, 0.5, 0.4, 2±0.7, 1.8, and 1.8. A cross-sectional view shows the internal mechanism with dimensions: 2.53 (ON starting position), 2.2 (Total travel), 1.5, 1.7, 1.87, 1.6, 1.1, 0.8, 0.5, 0.6, 0.75, and 0.8. It also indicates a location lug and a radius of R0.2. An arrow 'A' points to the right.</p>	<p>PC board mounting hole dimensions for Style 2. The drawing shows a 2x2 grid of holes. Dimensions include 3.6, 2.1, 2.8, 1.7, 1, 0.7 hole diameter, 0.9 hole diameter, 1.45, 2.3, and 2.</p>

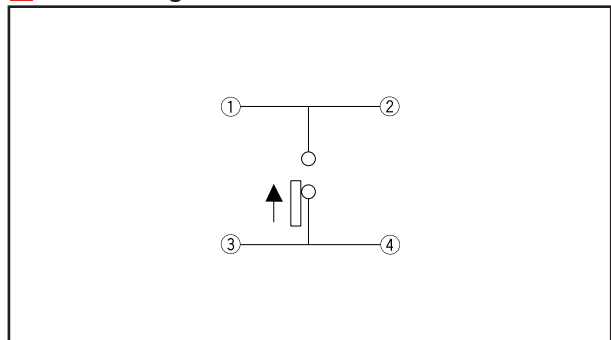
Note

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

Terminal Layout (Viewed from Direction A)



Circuit Diagram



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	1 Ω max.	500mΩ max.	1 Ω max.	2 Ω max.	3 Ω max.	5 Ω max.	2 Ω max.	500mΩ max.	2 Ω 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.							
		Dip soldering	260±5°C, 5±1s	—	255±5°C, 5±1s	—					
	Reflow soldering	Please see P.306									
Durability	Operating life without load	50,000 cycles 2 Ω max.	50,000 cycles 1 Ω max.	100,000 cycles 2 Ω max.	50,000 cycles 5 Ω max.	50,000 cycles 10 Ω max.	50,000 cycles 5 Ω max.	100,000 cycles 1 Ω max.	50,000 cycles 5 Ω max.		
	Operating life with load	(0.1A 30V DC) 50,000 cycles 2 Ω max.	(0.1A 12V DC) 50,000 cycles 1 Ω max.	(0.1A 30V DC) 100,000 cycles 2 Ω max.	(1mA 5V DC) 50,000 cycles 5 Ω max.	(1mA 5V DC) 50,000 cycles 10 Ω max.	(1mA 5V DC) 50,000 cycles 5 Ω max.	(50mA 20V DC) 100,000 cycles 1 Ω max.	(1mA 5V DC) 50,000 cycles 5 Ω max.		
Environmental performance	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									
	Damp heat	40±2°C, 90 to 95%RH for 96h									

Power

Push

Slide

Rotary

Encoders

Detector

Dual-in-line
Package Type

Multi Control
Devices

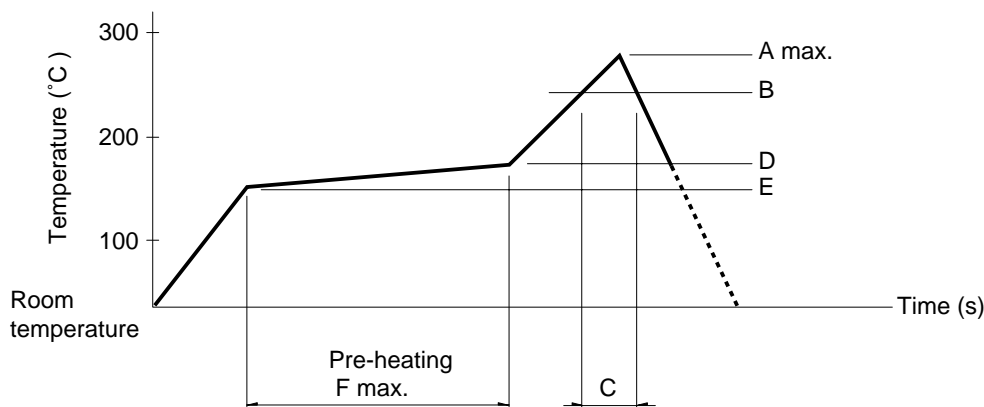
TACT

Custom-
Products

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	230	40	180	150	120
SPVE	260					
SPPW8	250	200	20			
SPVM	260	230	40			
SPVR						
SPVP						
SPVN						
SPVG	240		20	150	Room Temperature	180
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.

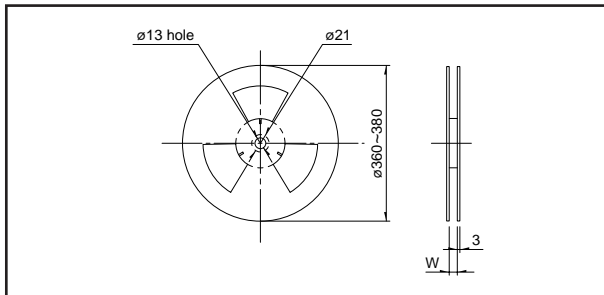
- Power
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Taping Specifications

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	
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

Note

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

Power

Push

Slide

Rotary

Encoders

Detector

Dual-in-line Package Type

Multi Control Devices

TACT

Custom-Products