Detector Switch
Compact Two-way Operation Type
SPVM Series

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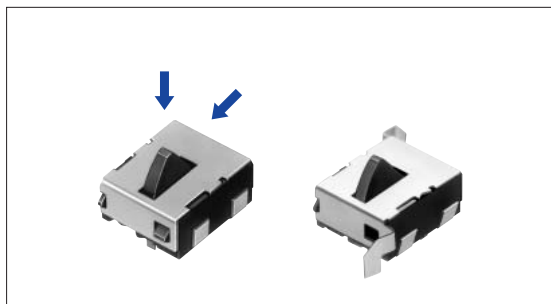Measures only 3.5×2.8mm and 1.5mm high.

Features

- Double-sided sliding contact provides high reliability.
- Reflow solderable.

Applications

- For detecting lids of mobile phones, personal digital assistants and digital still cameras
- For detection mechanisms in devices, including DVD players, and digital camcorders
- For switching modes of mobile phones and digital still cameras
- For detecting the insertion of IC cards
- For detecting media including CD-ROMs and FDDs

Typical Specifications

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

Products Line

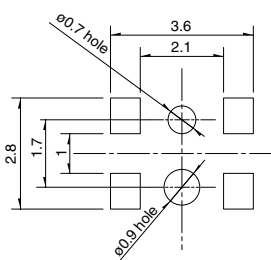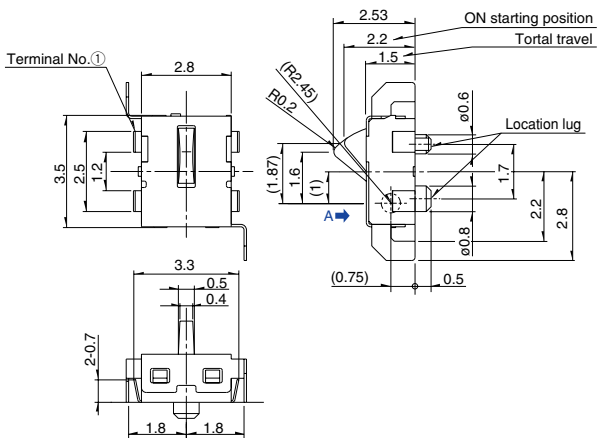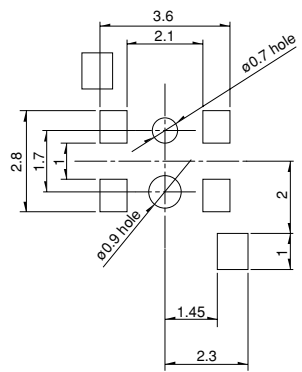| Poles	Positions	Terminal style	Housing	Location lug	Products No.	DrawingNo.
1	1	For PC board (Reflow)	Without terminal	With	SPVM110100	1
			Without terminal	Without	SPVM110200	1
			With terminal	With	SPVM210100	2
			With terminal	Without	SPVM210200	2
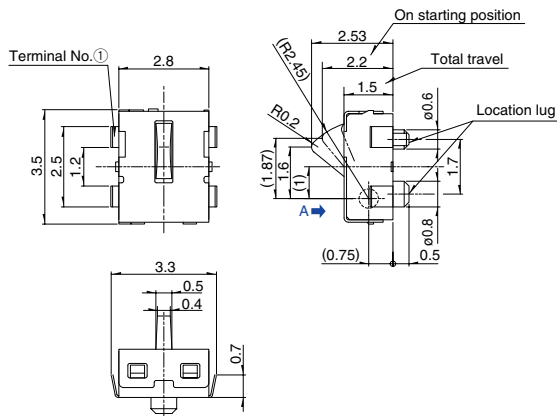
Note

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

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Dimensions

Unit:mm

No.	Photo	Style	PC board mounting hole dimensions (Viewed from switch mounting face)
1		Terminal No.① 2.8, 3.5, 2.5, 1.2, 3.3, 0.5, 0.4, 0.7 — On starting position, Total travel, Location lug, 2.53, 2.2, 1.5, ø0.6, (R2.45), R0.2, (1.87), 1.6, (1), 1.7, A, ø0.8, 0.5, (0.75)	ø0.7 hole, 3.6, 2.1, 2.8, 1.7, 1, ø0.9 hole
2		Terminal No.① 2.8, 3.5, 2.5, 1.2, 3.3, 0.5, 0.4, 2-0.7, 1.8, 1.8 — ON starting position, Tortal travel, Location lug, 2.53, 2.2, 1.5, ø0.6, (R2.45), R0.2, (1.87), 1.6, (1), 1.7, A, ø0.8, 2.2, 2.8, 0.5, (0.75)	3.6, 2.1, ø0.7 hole, 2.8, 1.7, 1, ø0.9 hole, 2, 1, 1.45, 2.3

Note

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

Terminal Layout (Viewed from Direction A)
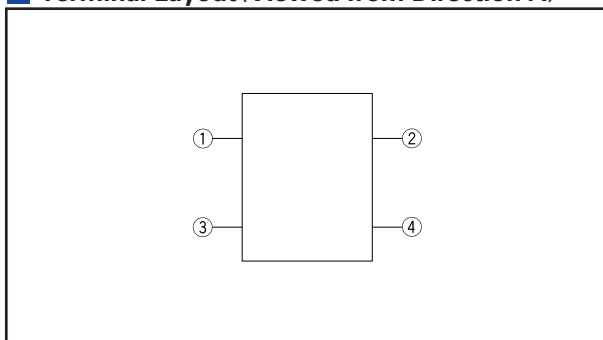
① ② ③ ④

Circuit Diagram

① ② ③ ④

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Products Specifications

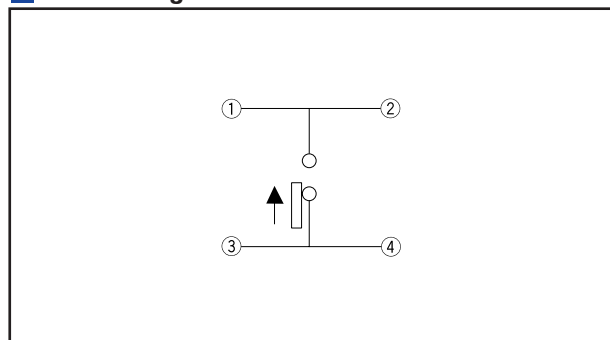| Items \ Series	SPPB	SPVE	SPPW8	SPVM	SPVR	SPVF	SSCU	SSCT	SSCF	SSCM
Operating temperature range	−10℃ to ＋60℃									
Rating (max.) (Resistive load)	0.1A 30V DC			1mA 5V DC			0.1A 12V DC			1mA 5V DC
Electrical performance — Initial contact resistance	1Ω max.	500mΩ max.	1Ω max.	2Ω max.	3Ω max.	500mΩ max.	70mΩ max.	20mΩ max.	100mΩ max.	2Ω max.
Electrical performance — Insulation resistance	100MΩ min. 100V DC						100MΩ min. 250V DC		100MΩ min. 100V DC	
Electrical performance — Voltage proof	100V AC for 1 min.						250V AC for 1 min.		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.	3N for 30 s	3N for 1 min.		5N for 1 min.	0.5N for 1 min.
Mechanical performance — Robustness of actuator	10N	5N	10N	5N	2N	1N	5N	10N		0.5N
Mechanical performance — 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℃, 5s max.	350±5℃, 3s max.					300±10℃, $3\,^{+1}_{\ 0}$ s	350±5℃, 3s max.		350±10℃, $3\,^{+1}_{\ 0}$ s	350±5℃, 3s max.
Resistance to soldering heat — Dip soldering	260±5℃, 5±1s	―	255±5℃, 5±1s	―		245±5℃, 5±1s max.	―	260±5℃, 5±1s		―
Resistance to soldering heat — Reflow soldering	Please see P.72					―				Please see P.72
Durability — Operating life without load	50,000 cycles 2Ω max.	50,000 cycles 1Ω max.	100,000 cycles 2Ω max.	50,000 cycles 5Ω max.		100,000 cycles 1Ω max.	10,000 cycles 100mΩ max.	10,000 cycles 40mΩ max.	50,000 cycles 200mΩ max.	50,000 cycles 5Ω max.
Durability — Operating life with load	(0.1A 30V DC) 50,000 cycles 2Ω max.	(0.1A 30V 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) 100,000 cycles 1Ω max.	(0.1A 12V DC) 10,000 cycles 150mΩ max.	(0.1A 12V DC) 10,000 cycles 60mΩ max.	(0.1A 12V DC) 50,000 cycles 300mΩ max.	(1mA 5V DC) 50,000 cycles 5Ω max.
Environmental performance — Cold	−20±2℃ for 96h			−40±2℃ for 96h			−20±2℃ for 96h			
Environmental performance — Dry heat	85±2℃ for 96h									
Environmental performance — Damp heat	40±2℃, 90 to 95%RH for 96h									

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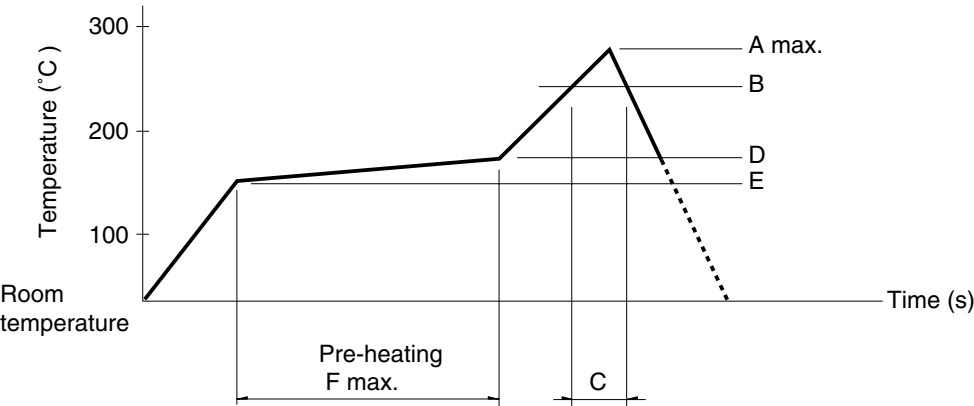
Series (Reflow type)	A (℃) 3s max.	B (℃)	C (s)	D (℃)	E (℃)	F (s)
SPPB	250	230	40			
SPPW8		200	20			
SPVE	260	230	40	180	150	120
SPVG						
SPVL						
SPVM						
SPVN						
SPVP						
SPVR						
SPVS						
SSCM						
SPPY5	240		20	150	Room Temperature	180

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.
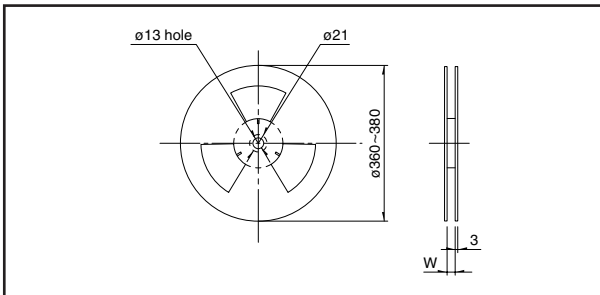2. As the conditions vary some how depending on the kind of reflow soldering equipment, please make sure you have the right one before use.

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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		
SPPW81	h = 6.1（Reflow）		1,000	2,000	4,000		
	h = 6.55（Reflow）						
	h = 7.6（Reflow）		850	1,700	3,400		
SPVE	Standard	h=3.8	2,800	5,600	22,400	12.4	12
		h=4.1					
		h=4.8	2,200	4,400	17,600		
		h=5.2	2,000	4,000	16,000		
		h=5.5					
	Low-profile	h=3.3	2,800	5,600	22,400		
SPVG			2,500	5,000	10,000	16.4	16
SPVL			5,000	10,000	20,000		
SPVM			3,000	6,000	12,000		
SPVN			5,000	10,000	20,000		
SPVP			4,500	9,000	18,000		
SPVR			2,500	5,000	10,000		
SPVS			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）.

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