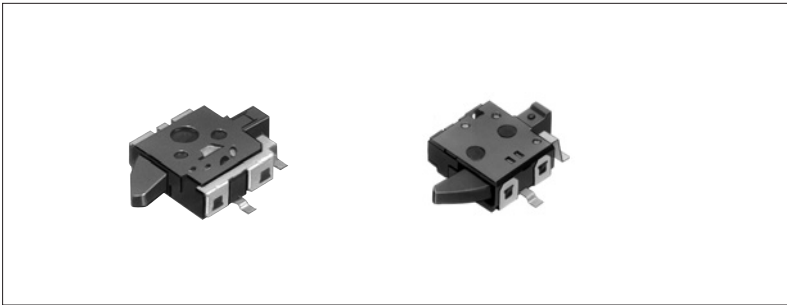


2mm-thick Two-way Operation Type Detector Switch

SPVG Series

2mm thick low-profile two-way detection type suitable for Surface Mount Device.

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



Car Use

Features

- This is a compact detection switch that can be pressed vertically, horizontally or at an angle.
- Reflow solderable.
- This is a low-profile unit with a 2mm height from the mounting surface of a PC board.

Applications

- For preventing inadvertent overwriting of DVD recorders
- For detection mechanisms in car navigation systems, car audio systems, CD changers, portable MD/CD players, CD-RW drives, and CD-ROM drives
- For detecting the position of lids of laptop computers and PDAs
- For detecting the position of camera shutters of mobile phones and DSCs

Typical Specifications

Items		Specifications
Rating (max.) (Resistive load)		50mA 20V DC
Contact resistance (Initial performance / After lifetime)		500mΩ max. / 1Ω max.
Operating force		0.4N max.
Operating life	Without load	100,000 cycles
	With load	100,000 cycles (50mA 20V DC)

Products Line

Poles	Positions	Terminal style	ON start position (mm)	Control direction	Side terminal	Location lug	Minimum packing unit (pcs.)	Products No.	Drawing No.
1	1	For PC board (Reflow)	2.96	Right	With both sides.	With	2,500	SPVG110301	1
					With a right side.			SPVG111500	2
					With a left side.			SPVG111400	3
					Without			SPVG120302	4
			4.16	Right	With both sides.	Without		SPVG130200	1
					Without	SPVG210302		5	
			2.96	Left	With both sides.	With		SPVG211200	6
					With a right side.			SPVG211300	7
					With a left side.			SPVG220300	8
					Without			SPVG230200	5
			4.16	Left	With both sides.	Without		SPVG310300	9
					Without	SPVG320200		10	
			2.45	Right	With both sides.	With		SPVG330200	9
					Without	SPVG410300		11	
			3.65	Right	With both sides.	Without		SPVG420200	12
					Without	SPVG430200		11	
2.45	Left	With both sides.	With						
		Without							
3.65	Left	With both sides.	Without						
		Without							

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

Dimensions

Unit : mm

No.	Style	PC board mounting hole dimensions
1	<p>Right operation type</p>	
2	<p>Right operation type</p>	
3	<p>Right operation type</p>	

Power

Push

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Dimensions

Unit : mm

No.	Style	PC board mounting hole dimensions
4	<p>Right operation type</p>	
5	<p>Left operation type</p>	
6	<p>Left operation type</p>	

Dimensions

Unit : mm

No.	Style	PC board mounting hole dimensions
7	<p>Left operation type</p>	
8	<p>Left operation type</p>	
9	<p>Right operation type</p>	

Power

Push

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Rotary

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Dimensions

Unit : mm

No.	Style	PC board mounting hole dimensions
10	<p>Right operation type</p>	
11	<p>Left operation type</p>	
12	<p>Left operation type</p>	

Note

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

Power

Push

Slide

Rotary

Encoders

Jog Shuttle

Telephone -hook

Detector

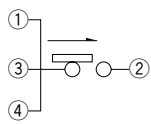
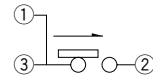
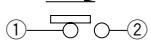
Vibration Sensors

Dual-in-line Package Type

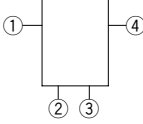
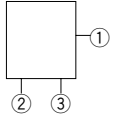
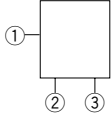
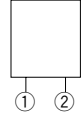
Multi Control Devices

TACT

Circuit Diagram

 <p>Drawing No. : 1, 5, 9, 11</p>	 <p>Drawing No. : 2, 3, 6, 7</p>
 <p>Drawing No. : 4, 8, 10, 12</p>	

Terminal Layout (Viewed from Direction A)

 <p>Drawing No. : 1, 5, 9, 11</p>	 <p>Drawing No. : 2, 6</p>
 <p>Drawing No. : 3, 7</p>	 <p>Drawing No. : 4, 8, 10, 12</p>

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 s	350±5°C, 3s max.			350±10°C, 3 ⁺¹ ₋₀ s	300±10°C, 3 ⁺¹ ₋₀ 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

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Telephone-hook

Detector

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Dual-in-line Package Type

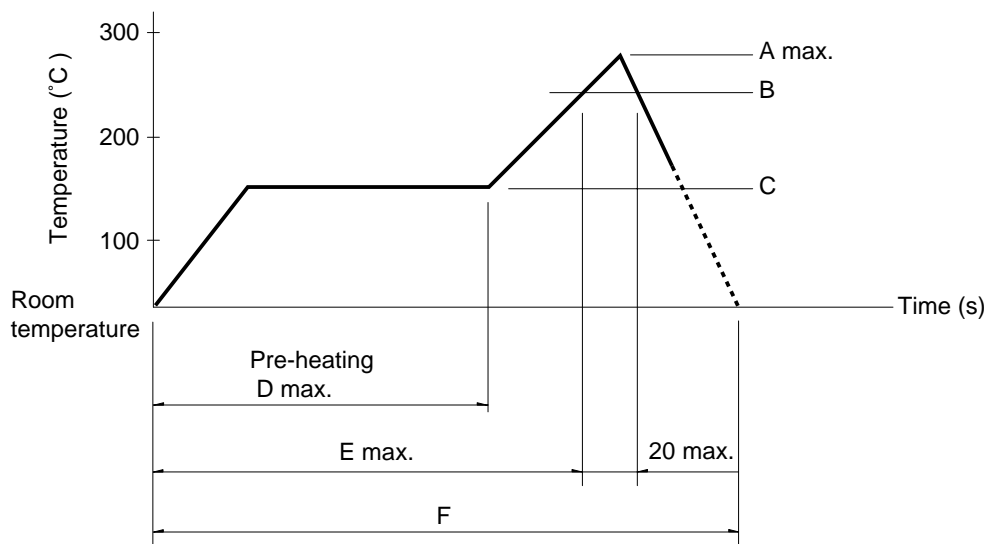
Multi Control Devices

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.

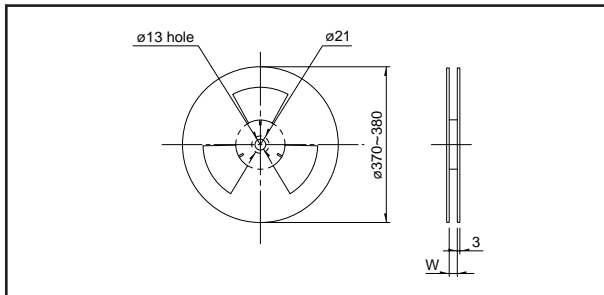
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Taping Specifications

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

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