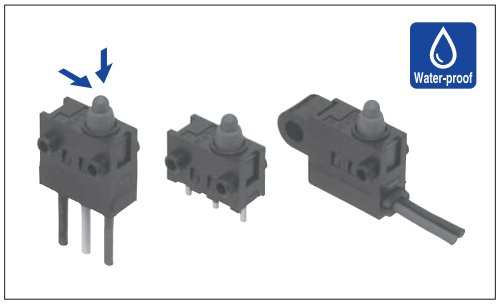
SPVQ3 Water-proof Type

Long travel type applicable to oblique pressing without an actuator.



Typical Specifications

Items		Specifications	
		Normal type	Longlife type
Rating (max.) / (min.) (Resistive load)		0.1A 12V DC 50μA 5V DC	0.3A 16V DC 1mA 5V DC
Contact resistance (Initial / After operating life)		500m Ω max. / 1 Ω max.	
Operating force		Push type	Actuator type
		1 ± 0.5N	3N max.
Operating life		Normal type	Long life type
	Without load	300,000cycles	1,200,000cycles
	With load	300,000cycles (0.1A 12V DC)	1,200,000cycles (0.3A 16V DC)
Poles		1	
Changeover timing		Non shorting	

Product Line

Operating life	Positions	Operating part shape	Terminal type	Product No. (Main body form) Normal	Boss - right side	Boss - left side	Boss - both sides	With a screw hole	Minimumo rder unit (pcs) Japan	Export	Packing specification type	Drawing No.
300,000 cycles	2	Push	For PC Board	SPVQ380400	SPVQ380300	SPVQ380201	SPVQ380100	–	1,300	5,200	A	1
			For Lead	–	SPVQ380700	SPVQ380600	SPVQ380500	–				2
			Right angle	–	SPVQ380900	–	–	–				3
			Left angle	–	–	SPVQ380800	–	–				4
			With wire (Downwards)	–	–	–	–	SPVQ361000※	400	1,600	B	5
					SPVQ361100※	SPVQ361200※	SPVQ361300※	–				6
	1		With wire (Right side)	–	–	–	–	SPVQ361400※				7
					SPVQ361500※	SPVQ361600※	SPVQ361700※	–				8
			With wire (Left side)	–	SPVQ361800※	SPVQ361900※	SPVQ362000※	–				9
	2	Acutuator A	For PC Board	SPVQ370400	SPVQ370300	SPVQ370201	SPVQ370100	–	1,300	5,200	A	1
			For Lead	–	SPVQ370700	SPVQ370600	SPVQ370500	–				2
			Right angle	–	SPVQ370900	–	–	–				3
			Left angle	–	–	SPVQ370800	–	–				4
			With wire (Downwards)	–	–	–	–	SPVQ350100※	120	480	C	5
					SPVQ350200※	SPVQ350300※	SPVQ350400※	–				6
	1		With wire (Right side)	–	SPVQ350600※	SPVQ350700※	SPVQ350800※	–				8
			With wire (Left side)	–	SPVQ350900※	SPVQ351000※	SPVQ351100※	–				9
	2	Acutuator B	For PC Board	SPVQ371300	SPVQ371200	SPVQ371100	SPVQ371000	–	1,300	5,200	A	1
			For Lead	–	SPVQ371600	SPVQ371500	SPVQ371400	–				2
			Right angle	–	SPVQ371800	–	–	–				3
			Left angle	–	–	SPVQ371700	–	–				4
			With wire (Downwards)	–	–	–	–	SPVQ351200※	120	480	C	5
					SPVQ351300※	SPVQ351400※	SPVQ351500※	–				6
	1		With wire (Right side)	–	SPVQ351700※	SPVQ351800※	SPVQ351900※	–				8
			With wire (Left side)	–	SPVQ352000※	SPVQ352100※	SPVQ352200※	–				9

SPVQ3 Water-proof Type

Product Line

Operating life	Positions	Operating part shape	Terminal type	Product No. (Main body form)					Minimum order unit (pcs)		Packing specification type	Drawing No.
				Normal	Boss - right side	Boss - left side	Boss - both sides	With a screw hole	Japan	Export		
1,200,000 cycles	2	Push	For PC Board	SPVQ340400	SPVQ340300	SPVQ340200	SPVQ340100	–	1,300	5,200	A	1
			For Lead	–	SPVQ340700	SPVQ340600	SPVQ340500	–				2
			Right angle	–	SPVQ340900	–	–	–				3
			Left angle	–	–	SPVQ340800	–	–				4
			With wire (Downwards)	–	–	–	–	SPVQ320100※	400	1,600	B	5
					SPVQ320200※	SPVQ320300※	SPVQ320400※	–				6
	1		With wire (Right side)	–	–	–	–	SPVQ320500※				7
					SPVQ320600※	SPVQ320700※	SPVQ320800※	–				8
			With wire (Left side)	–	SPVQ320900※	SPVQ321000※	SPVQ321100※	–				9
	2	Acutuator A	For PC Board	SPVQ330400	SPVQ330300	SPVQ330200	SPVQ330100	–	1,300	5,200	A	1
			For Lead	–	SPVQ330700	SPVQ330600	SPVQ330500	–				2
			Right angle	–	SPVQ330900	–	–	–				3
			Left angle	–	–	SPVQ330800	–	–				4
			With wire (Downwards)	–	–	–	–	SPVQ310100※	120	480	C	5
					SPVQ310200※	SPVQ310300※	SPVQ310400※	–				6
	1		With wire (Right side)	–	SPVQ310600※	SPVQ310700※	SPVQ310800※	–				8
			With wire (Left side)	–	SPVQ310900※	SPVQ311000※	SPVQ311100※	–				9
	2	Acutuator B	For PC Board	SPVQ331300	SPVQ331200	SPVQ331100	SPVQ331000	–	1,300	5,200	A	1
			For Lead	–	SPVQ331600	SPVQ331500	SPVQ331400	–				2
			Right angle	–	SPVQ331800	–	–	–				3
			Left angle	–	–	SPVQ331700	–	–				4
			With wire (Downwards)	–	–	–	–	SPVQ311200※	120	480	C	5
					SPVQ311300※	SPVQ311400※	SPVQ311500※	–				6
	1		With wire (Right side)	–	SPVQ311700※	SPVQ311800※	SPVQ311900※	–				8
			With wire (Left side)	–	SPVQ312000※	SPVQ312100※	SPVQ312200※	–				9

Notes

1. ※ Products with a wire will be supplied as follows.
   - Unless specified, the length of the lead wire is 250mm. Color is either red, black or yellow. Please consult us for length modification.
   - Unless circuit is specified, wired(downward) types will apply three wires.
   - Please specify circuits (N.O. or N.C.) for wired(side) types. Unless specified, the circuit will apply N.O.
   - Prduct with wire will be build-to-order.
2. This unit cannnot be used in water(IP67 rating, except for terminal).

Packing Specifications

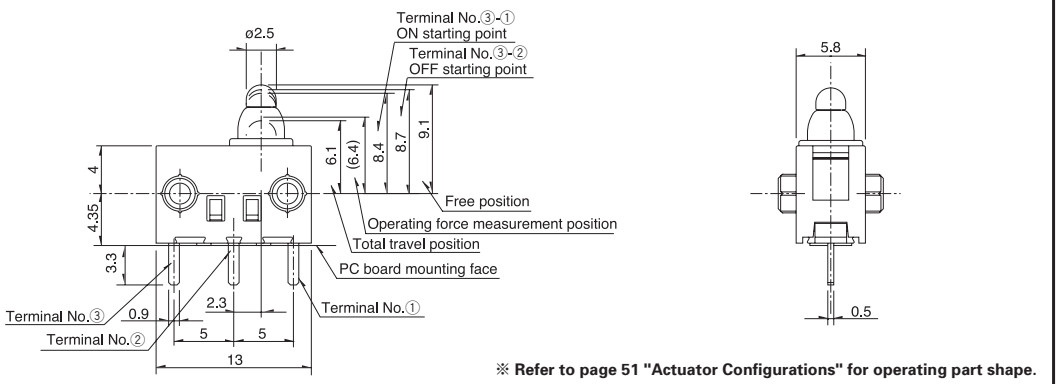
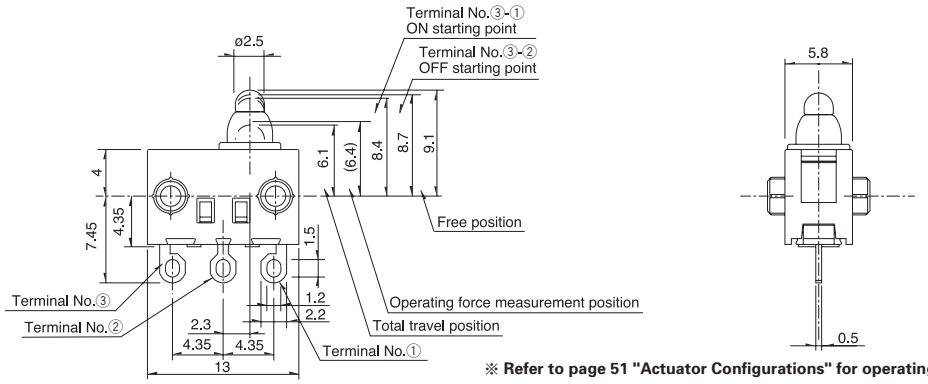
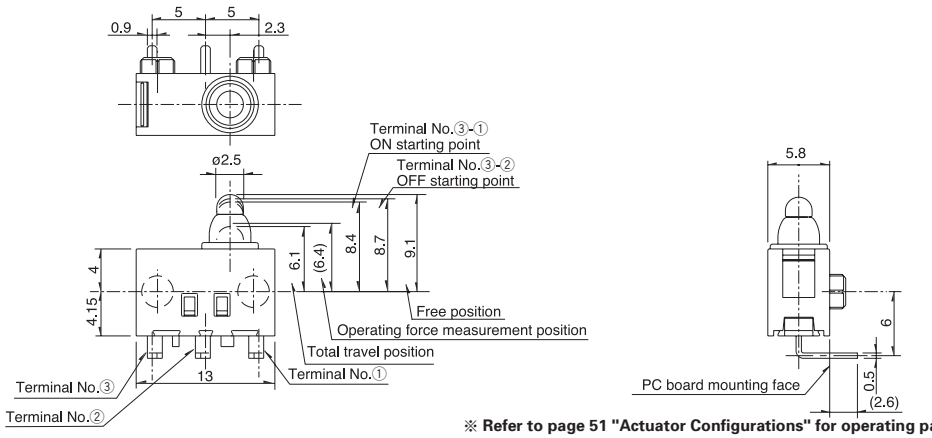
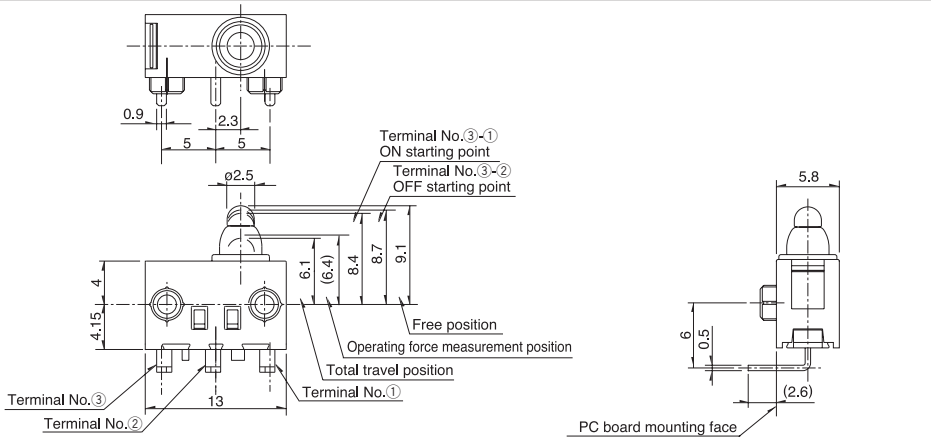
Bulk

Packing specification type	Number of packages (pcs.)		Export package measurements (mm)
	1 case / Japan	1 case / export packing	
A	1,300	5,200	540 × 360 × 290
B	400	1,600	555 × 375 × 223
C	120	480	555 × 375 × 223

Refer to **P.66** for soldering conditions.

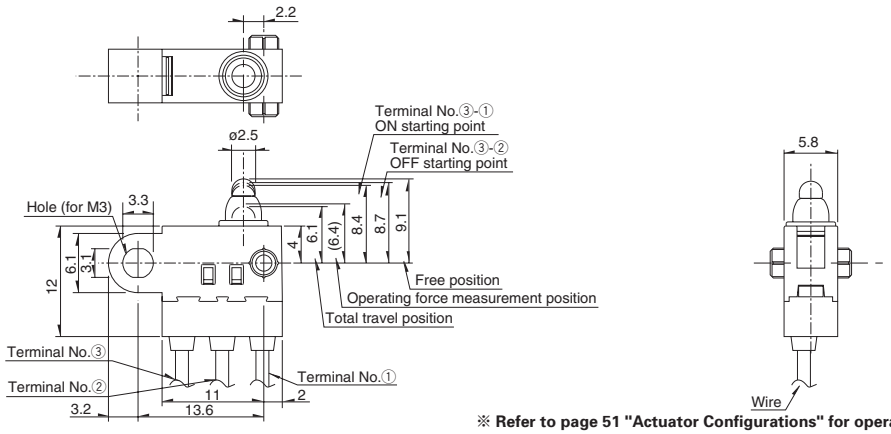
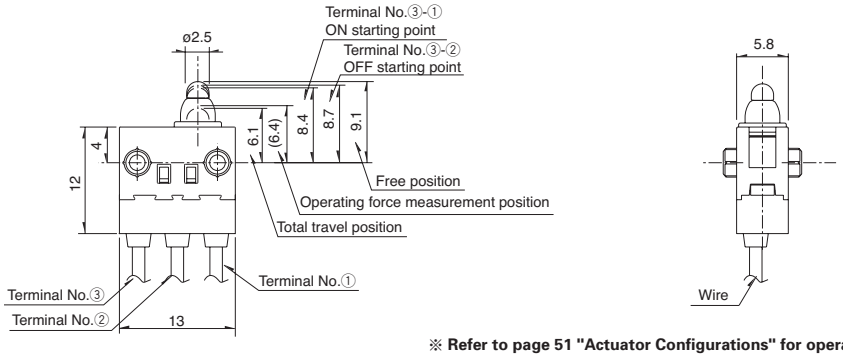
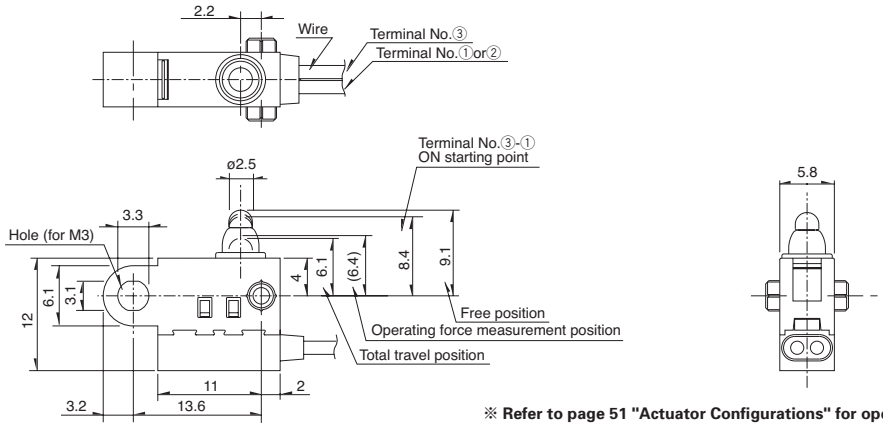
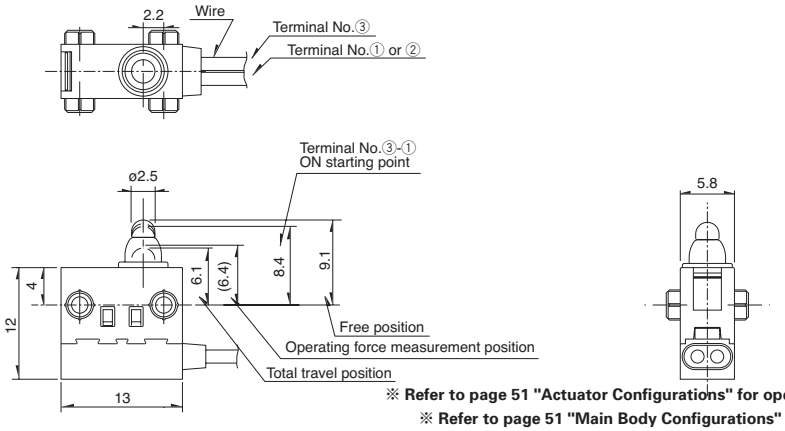
Dimensions

Unit:mm

No.	Style
1	 ※ Refer to page 51 "Actuator Configurations" for operating part shape. ※ Refer to page 51 "Main Body Configurations" for boss positions.
2	 ※ Refer to page 51 "Actuator Configurations" for operating part shape. ※ Refer to page 51 "Main Body Configurations" for boss positions.
3	 ※ Refer to page 51 "Actuator Configurations" for operating part shape.
4	 ※ Refer to page 51 "Actuator Configurations" for operating part shape.

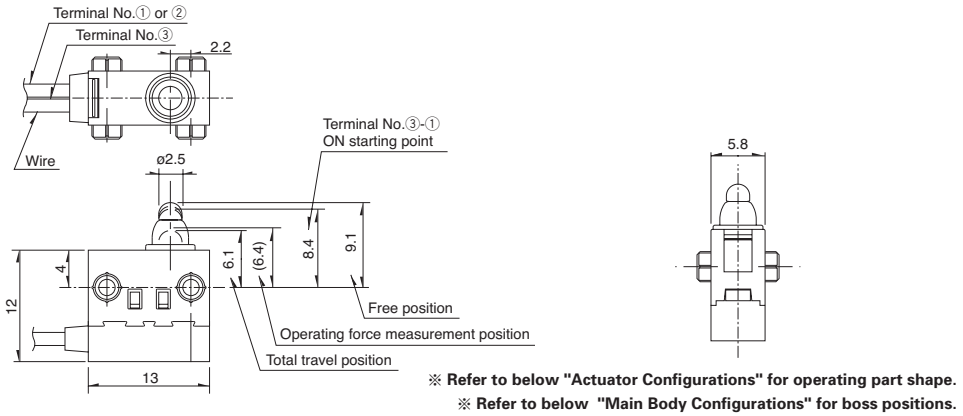
Dimensions

Unit:mm

No.	Style
5	 ※ Refer to page 51 "Actuator Configurations" for operating part shape.
6	 ※ Refer to page 51 "Actuator Configurations" for operating part shape. ※ Refer to page 51 "Main Body Configurations" for boss positions.
7	 ※ Refer to page 51 "Actuator Configurations" for operating part shape.
8	 ※ Refer to page 51 "Actuator Configurations" for operating part shape. ※ Refer to page 51 "Main Body Configurations" for boss positions.

Dimensions

Unit:mm

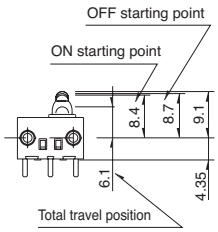
No.	Style
9	

※ Refer to below "Actuator Configurations" for operating part shape.
※ Refer to below "Main Body Configurations" for boss positions.

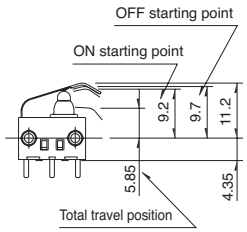
Actuator Configurations

Unit:mm

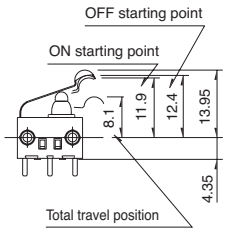
Push



Actuator A



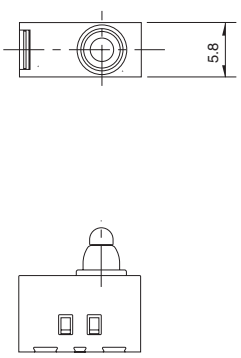
Actuator B



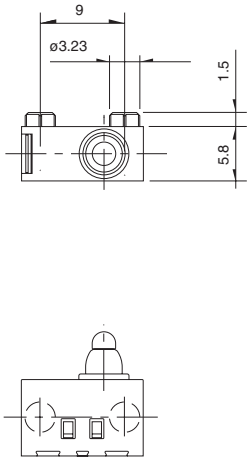
Main Body Configurations

Unit:mm

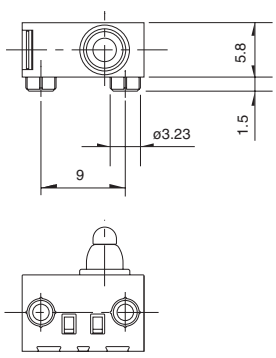
Normal



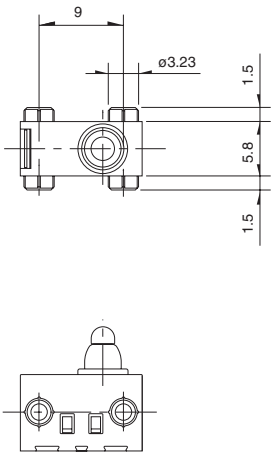
Boss - right side



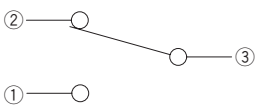
Boss - left side



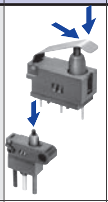
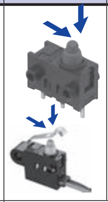
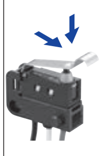
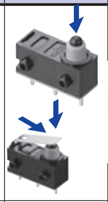
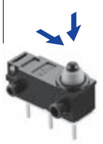
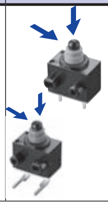
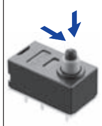
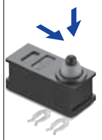
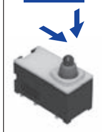
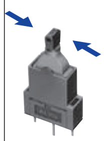
Boss - both sides



Circuit Diagram



List of Varieties (Water-proof Type)

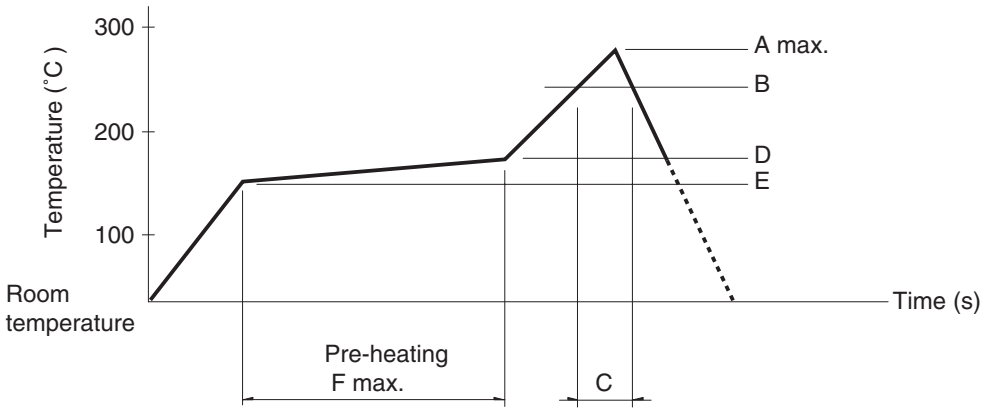
Series		Water-proof Type SPVQ1	SPVQ3	SPVQ4H	SPVQ6	SPVQ7	SPVQ8	SPVQ9	SPVQA	SPVQC	SSCN
Photo										NEW 	
Operation type		One-way Two-way	Two-way		One-way Two-way	Two-way					
Dimensions (mm)	W	13.3	13	19	13.3	14.7	8.3	15.4	15.2	15.4	13
	D	5.8		6	5.3	5.4	5.3	8.4	6.4	7.4	5
	H	8	8.35	11.9	7	6.7	6.5	7.5	7.95	7.5	15
Operating temperature range		−40℃ to +85℃									
Automotive use		●	●	●	●	●	●	●	●	●	●
Life cycle (availability)		★3	★3	★3	★3	★3	★3	★3	★3	★3	★3
Poles / Positions		1 / 2	1 / 1 1 / 2		1 / 2	1 / 1 1 / 2	1 / 1	2 / 2	1 / 1 1 / 2	2 / 2	1 / 2
Rating (max.) (Resistive load)		0.1A 12V DC	0.1A 12V DC or 0.3A 16V DC	0.1A 12V DC				50mA 26V DC	0.1A 12V DC	50mA 18V DC	0.1A 12V DC
Rating (min.) (Resistive load)		50μA 3V DC	50μA 5V DC or 1mA 5V DC	1mA 5V DC	50μA 5V DC						100μA 5V DC
Durability	Operating life without Load	300,000cycles 1Ω max.	300,000cycles or 1,200,000cycles 1Ω max.	300,000cycles 1Ω max.			300,000cycles or 1,000,000cycles 1Ω max.	300,000cycles 200mΩ max.	300,000cycles 1Ω max.	300,000cycles 200mΩ max.	100,000cycles 1Ω max.
	Operating life with Load Rating (max.) (Resistive load)	300,000cycles 1Ω max.	300,000cycles or 1,200,000cycles 1Ω max.	300,000cycles 1Ω max.			300,000cycles or 1,000,000cycles 1Ω max.	300,000cycles 200mΩ max.	300,000cycles 1Ω max.	300,000cycles 200mΩ max.	100,000cycles 1Ω max.
Electrical performance	Initial contact resistance	500mΩ max.						75mΩ	500mΩ max.	75mΩ max.	500mΩ max.
	Insulation resistance	100MΩ min. 500V DC									
	Voltage proof	500V AC for 1minute								250V AC for 1minute	500V AC for 1minute
Mechanical performance	Terminal strength	3N for 1minute(products with terminal) Wire strength 30N for 1minute (Applicable to product with wire)		Wire strengt 30N for 1 minute	3N for 1minute						
	Actuator strength	20N									10N
Environmental performance	Cold	-40±2℃ for 500h									
	Dry heat	85 ± 2℃ for 500h									
	Damp heat	60 ± 2℃, 90 ~ 95% RH for 500h									
Operation force		2N max. 5.9N max.	1 ± 0.5N 3N max.	3N max.	1 ± 0.5N 3N max.	1 ± 0.5N					2N max.
Page		43	47	52	53	55	57	61	62	64	65

Note
● indicates applicability to all products in the series.

Detector Switches 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	180	150	120
SPPW8			35			
SPVE	260		40			
SPVL						
SPVM						
SPVN						
SPVP						
SPVR						
SPVS						
SPVT						
SSCM						
SSCQ						
SPVQC	250					

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.

Reference for Hand Soldering

Series	Soldering temperature	Soldering time
SPVS, SPVN, SPVP, SPVT, SPVM, SPVR, SPVE, SPPW8,SSCQ, SSCM, SPVL, SSCT, SPVQC	350 ± 5℃	3s max.
SPVQ1, SPVQ3, SPVQ6, SPVQ7, SPVQ8, SPVQ9, SSCN, SPVQA	300 ± 10℃	3 +1 / 0s
SPPB	350 ± 5℃	5s max.
SSCF	350 ± 10℃	3 +1 / 0s

Reference for Dip Soldering

(For PC board terminal types)

Series	Items		Dip soldering	
	Preheating temperature	Preheating time	Soldering temperature	Duration of immersion
SSCT, SPVQ1, SPVQ3, SPVQ6, SPVQ7, SPVQ8, SPVQ9, SPVQA	100 ± 10℃	60s max.	260 ± 5℃	5 ± 1s
SPPW8, SPPB	100℃ max.	60s max.	255 ± 5℃	5 ± 1s
SSCF	–		260 ± 5℃	5 ± 1s