

SPVQ8 Water-proof Type

Industry's smallest size, with main unit dimensions of 8.3×5.3×7mm



Typical Specifications



| Items | | Specifications |
|---|--------------|---|
| Rating (max.)/(min.) (Resistive load) | | 0.1A 12V DC / 50μA 5V DC |
| Contact resistance (Initial / After operating life) | | 500mΩ max. / 1Ω max. (Standard type) 500mΩ max. / 3Ω max. (Long-life type) |
| Operating force | | 1±0.5N |
| Operating life | Without load | 300,000cycles (Standard type) 1,000,000cycles (Long-life type) |
| | With load | 300,000cycles (Standard type) 1,000,000cycles (Long-life type) |

Product Line

| Poles | Positions | Circuit | Terminal type | Main body form | Minimum order unit (pcs) | | Packing specifications type | Product No. | | Drawing No. | |
|-----------------------|-----------------|-----------|-----------------------|------------------|--------------------------|--------|-----------------------------|-------------------|-------------------|-------------------|---|
| | | | | | Japan | Export | | Standard type | Long-life type | | |
| 1 | 1 | N.O. | For PC board | Boss-both sides | 1,755 | 7,020 | A | SPVQ810101 | SPVQ830101 | 1 | |
| | | | Angle | Boss-single side | | | | SPVQ810301 | SPVQ830301 | 2 | |
| | | | | Without boss | | | | SPVQ810401 | SPVQ830401 | 3 | |
| | | | For PC board | Boss-single side | | | | SPVQ810501 | SPVQ830501 | 4 | |
| | | | | For Lead | | | | Boss-both sides | SPVQ810601 | SPVQ830601 | 5 |
| | | | Press fit | Boss-single side | | | | SPVQ810703 | SPVQ830701 | 6 | |
| | | | | Boss-both sides | | | | SPVQ810801 | SPVQ830801 | 7 | |
| | | | N.C. | For PC board | | | | Boss-both sides | SPVQ811004 | SPVQ831001 | 8 |
| | | | | Angle | | | | Boss-single side | SPVQ820101 | — | 1 |
| | | | | | | | | Without boss | SPVQ820301 | — | 9 |
| | | | | For PC board | | | | Boss-single side | SPVQ820401 | — | 3 |
| | | | | | | | | For Lead | Boss-both sides | SPVQ820501 | — |
| | | Press fit | | Boss-single side | SPVQ820601 | — | 10 | | | | |
| | | N.O. | With wire (Downwards) | Boss-single side | SPVQ820704 | — | 11 | | | | |
| | | | With wire (Downwards) | Boss-both sides | SPVQ820801 | — | 7 | | | | |
| | | | With wire (Left side) | Boss-single side | SPVQ821004 | — | 12 | | | | |
| | | | With wire (from side) | Boss-both sides | SPVQ850100* | — | 13 | | | | |
| | | | With wire (Downwards) | Boss-both sides | SPVQ850200* | — | 14 | | | | |
| | | | With wire (Left side) | Boss-single side | SPVQ850300* | — | 15 | | | | |
| | | N.C. | With wire (Downwards) | Boss-both sides | SPVQ850500* | — | 16 | | | | |
| | | | With wire (Downwards) | Boss-single side | SPVQ860100* | — | 17 | | | | |
| | | | With wire (Downwards) | Boss-both sides | SPVQ860200* | — | 14 | | | | |
| | | | With wire (Left side) | Boss-single side | SPVQ860300* | — | 18 | | | | |
| | | | With wire (from side) | Boss-both sides | SPVQ860500* | — | 16 | | | | |
| With wire (from side) | Boss-both sides | | | | | | | | | | |

Notes

- ※ Products with a wire will be supplied as follows.
 - Unless specified, the length of the lead wire is 250mm. Color is either red or black. Please consult us for length modification.
 - Please specify circuits (N.O. or N.C.) for wired (side) types. Unless specified, the circuit will apply N.O.
 - Product with wire will be build-to-order.
- This unit cannot be used in water (IP67 rating, except for terminal).

Packing Specifications

Tray

| Packing specifications type | Number of packages (pcs.) | | Export package measurements (mm) |
|-----------------------------|---------------------------|------------------------|----------------------------------|
| | 1 case /Japan | 1 case /export packing | |
| A | 1,755 | 7,020 | 540×360×270 |

Bulk

| Packing specifications type | Number of packages (pcs.) | | Export package measurements (mm) |
|-----------------------------|---------------------------|------------------------|----------------------------------|
| | 1 case /Japan | 1 case /export packing | |
| B | 400 | 1,600 | 555×375×223 |

Refer to P.73 for soldering conditions.

SPVQ8 Water-proof Type

Dimensions

Unit:mm

| No. | Style | No. | Style |
|-----|-------|-----|-------|
| 1 | | 5 | |
| 2 | | 6 | |
| 3 | | 7 | |
| 4 | | 8 | |

■ Dimensions

Unit:mm

| No. | Style | No. | Style |
|-----|-------|-----|-------|
| 9 | | 12 | |
| 10 | | 13 | |
| 11 | | 14 | |

Detector

Slide

Push

Rotary

Power

Dual-in-line
Package Type

General-
purpose Type

Water-proof
Type

Fast Switching
Type

SPVQ8 Water-proof Type

Detector
Slide
Push
Rotary
Power
Dual-in-line Package Type
General-purpose Type
Waterproof Type
Fast Switching Type

Dimensions

Unit:mm

| No. | Style | No. | Style |
|-----|-------|-----|-------|
| 15 | | 17 | |
| 16 | | 18 | |

Circuit Diagram



Recommended Unit Terminal Shape for Press-Fit Terminals (Normally Open)

Unit:mm

| Style |
|-------|
|-------|

SPVQ811004, SPVQ831001



Recommended Unit Terminal Shape for Press-Fit Terminals (Normally Closed)

Unit:mm

| Style |
|-------|
|-------|

SPVQ821004



Detector

Slide

Push

Rotary

Power

Dual-in-line
Package Type

General-
purpose Type

Water-proof
Type

Fast Switching
Type

| Series | | Water-proof Type | | | Fast Switching Type | | |
|--------------------------------|---|---|--------------------------|--------------------------|-----------------------------|------------------------|--|
| | | SPVQ8 | SPVQ9 | SSCN | SPVQ9 | SPVQC | SPVQE |
| Photo | | | | | | | |
| Operation type | | Two-way | | | | | |
| Dimensions (mm) | W | 8.3 | 15.2 | 13 | 15.4 | 15.4 | 17.2 |
| | D | 5.3 | 6.4 | 5 | 8.4 | 7.4 | 12 |
| | H | 6.5 | 7.95 | 15 | 7.5 | 7.5 | 7.5 |
| Operating temperature range | | -40°C to +85°C | | | | | |
| Automotive use | | ● | ● | ● | ● | ● | ● |
| Life cycle (availability) | | | | | | | |
| Poles / Positions | | 1/1 | 1/1 1/2 | 1/2 | 2/2 | 2/2 | 3/2 |
| Rating (max.) (Resistive load) | | 0.1A 12V DC | | | 50mA 26V DC | 50mA 18V DC | |
| Rating (min.) (Resistive load) | | 50µA 5V DC | | 100µA 5V DC | 50µA 5V DC | | |
| Durability | Operating life without load | 300,000cycles 1Ω max. or 1,000,000cycles 3Ω max. | 300,000cycles 1Ω max. | 100,000cycles 1Ω max. | 300,000cycles 200mΩ max. | | 300,000 cycles CIRCUIT ①-②-③ and ④-⑤-⑥ 200mΩ max. CIRCUIT ⑦-⑧-⑨ 1Ω max. |
| | Operating life with load Rating (max.) (Resistive load) | 300,000cycles 1Ω max. or 1,000,000cycles 3Ω max. | 300,000cycles 1Ω max. | 100,000cycles 1Ω max. | 300,000cycles 200mΩ max. | | 300,000 cycles CIRCUIT ①-②-③ and ④-⑤-⑥ 200mΩ max. CIRCUIT ⑦-⑧-⑨ 1Ω max. |
| Electrical performance | Initial contact resistance | 500mΩ max. | | | 75mΩ max. | | CIRCUIT ①-②-③ and ④-⑤-⑥ 75mΩ max. CIRCUIT ⑦-⑧-⑨ 250mΩ max. |
| | Insulation resistance | 100MΩ min. 500V DC | | | | 100MΩ min. 250V DC | 100MΩ min. 100V DC |
| | Voltage proof | 500V AC for 1minute | | | | 250V AC for 1minute | 100V AC for 1minute |
| Mechanical performance | Terminal strength | 3N for 1minute (with terminal) Wire strength 30N for 1minute (with wire) | 3N for 1minute | | | | |
| | Actuator strength | 20N | | 10N | 20N | | |
| Environmental performance | Cold | -40°C 500h | | | | | |
| | Dry heat | 85°C 500h | | | | | |
| | Damp heat | 60°C, 90 to 95% RH 500h | | | | | |
| Operation force | | 1±0.5N | | 2N max. | 1±0.5N | | |
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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 $\phi 0.1$ to 0.2 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 |
| SPPW8 | | | 35 | | | |
| SPVE | 260 | | 40 | | | |
| SPVL | | | | | | |
| SPVM | | | | | | |
| SPVN | | | | | | |
| SPVR | | | | | | |
| SPVS | | | | | | |
| SPVT | | | | | | |
| SSCM | | | | | | |
| SSCQ | | | | | | |
| SPVQC, SPVQE | 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, SPVT, SPVM, SPVR, SPVE, SPPW8, SSCQ, SSCM, SPVL, SSCT, SPVQC, SPVQE | 350±5°C | 3s max. |
| SPVQ1, SPVQ3, SPVQ6, SPVQ7, SPVQ8, SPVQ9, SSCN, SPVQA | 300±10°C | 3 + 1 / 0s |
| SPPB (Reflow) | 300±5°C | 5s max. |
| SSCF, SPPB (For Lead, Dip) | 350±10°C | 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°C | 60s max. | 260±5°C | 5±1s |
| SPPW8, SPPB | 100 °C max. | 60s max. | 255±5°C | 5±1s |
| SSCF | — | | 260±5°C | 5±1s |