



Detector

Slide

Push

Rotary

Power

Dual-in-line
Package Type

Horizontal
Type

Vertical
Type



■ Typical Specifications

| Items | Specifications |
|--|-----------------------------|
| Rating (max.)/(min.) (Resistive load) | 1A 14.5V DC / 50μA 3V DC |
| Contact resistance (Initial / After operating life) | 100mΩ max. / 100mΩ max. |
| Operating force | 3N, 5N |
| Operating life(With load) | 30,000 cycles (1A 14.5V DC) |
| Poles-position | 1-pole, 2-position |

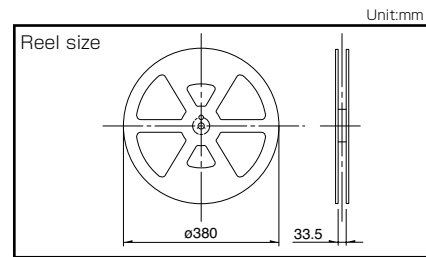
■ Product Line

| Changeover timing | Travel (mm) | Total travel (mm) | Operating force | Mounting method | Operating | Terminal type | Minimum order unit (pcs.) | | Product No. | Drawing No. | |
|-------------------|-------------|-------------------|-----------------|-----------------|-----------|---------------|---------------------------|-------------------|-------------------|-------------------|---|
| | | | | | | | Japan | Export | | | |
| Non shorting | 1.5 | 2.7 | 3N | PC board | Latching | Reflow | 660 | 1,320 | SPEF210101 | 1 | |
| | | | | | | Dip | 1,050 | 4,200 | SPEF110100 | 2 | |
| | | | Reflow | | | 660 | 1,320 | SPEF210200 | 1 | | |
| | | | Dip | | | 1,050 | 4,200 | SPEF110200 | 2 | | |
| | - | | 5N | | 3N | Alternate | Reflow | 660 | 1,320 | SPEF220100 | 1 |
| | | | | | | | Dip | 1,050 | 4,200 | SPEF120100 | 2 |
| | | | | | Reflow | | 660 | 1,320 | SPEF220200 | 1 | |
| | | | | | Dip | | 1,050 | 4,200 | SPEF120200 | 2 | |

■ Packing Specifications

Taping

| Product No. | Number of packages (pcs.) | | | Tape width (mm) | Export package measurements (mm) |
|--|---------------------------|----------------|-------------------------|-----------------|----------------------------------|
| | 1 reel | 1 case / Japan | 1 case / export packing | | |
| SPEF210101 SPEF210200 SPEF220100 SPEF220200 | 165 | 660 | 1,320 | 32 | 403×403×360 |



Tray

| Product No. | Number of packages (pcs.) | | Export package measurements (mm) |
|--|---------------------------|-------------------------|----------------------------------|
| | 1 case / Japan | 1 case / export packing | |
| SPEF110100 SPEF110200 SPEF120100 SPEF120200 | 1,050 | 4,200 | 540×360×230 |

Refer to P.130 for soldering conditions.

Dimensions

Unit:mm

| No. | Style | PC board mounting hole dimensions (Viewed from the direction A) |
|-----|-------------------------------------|--|
| 1 | <p>Reflow soldering type</p> | |
| 2 | <p>Dip soldering type</p> | |

Circuit Diagram (Viewed from Direction A)



Detector
Slide
Push
Rotary
Power
Dual-in-line
Package Type
Horizontal
Type
Vertical
Type

Push Switches

List of Varieties

| Series | | Vertical | | | | | |
|--------------------------------|---|---|---|---|--|---|---|
| | | SPEF | | SPED2 | SPED3 | SPED4 | SPED5 |
| Photo | |  |  |  |  |  |  |
| Dimensions (mm) | W | 9.4 | | 14 | | | 13.5 |
| | D | 9 | | 16.8 | 18 | | 18.2 |
| | H | 6.9 | | 18.3 | 13.2 | 13.1 | 14.3 |
| Travel (mm) | | 1.5 | | — | — | — | — |
| Total travel (mm) | | 2.7 | | 4.5 | 3.8 | | |
| Number of poles | | 1 | | 1 2 | 1 | | |
| Operating temperature range | | -40°C to +85°C | | | -40°C to +95°C | | |
| Automotive use | | ● | ● | ● | ● | ● | ● |
| Life cycle | |  | |  |  |  |  |
| Rating (max.) (Resistive load) | | 1A 14.5V DC | | | 2A 14.5V DC | | |
| Rating (min.) (Resistive load) | | 50μA 3V DC | | — | — | — | — |
| Durability | Operating life without load | — | — | — | — | — | — |
| | Operating life with load (at max. rated load) | 30,000 cycles 100mΩ max. | | | | | |
| Electrical performance | Initial contact resistance | 100mΩ max. | | | | | |
| | Insulation resistance | 3MΩ min. 100V DC | | | 3MΩ min. 500V DC | | |
| | Voltage proof | 100V AC for 1minute | | | | | |
| Mechanical performance | Terminal strength | — | — | — | — | — | Wire strength 30N |
| | Actuator strength | Operating direction | | | 98N | 90N | 98N |
| | | Pulling direction | | | 30N | — | — |
| Environmental performance | Cold | -40°C 96h | | | | | |
| | Dry heat | 85°C 96h | | 85°C 96h (Connector type) 105°C 192h (Dip type) | 105°C 192h | | |
| | Damp heat | 40°C, 90 to 95%RH 96h | | | | | |
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| | |
|------------------------------------|-----|
| Push Switches Soldering Conditions | 130 |
| Push Switches Cautions | 131 |

Note
● Indicates applicability to all products in the series.

Example of Reflow Soldering Condition

1. Heating method: Double heating method with infrared heater.
2. Temperature measurement: Thermocouple ϕ 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) |
|----------------------|-------------------|--------|-------|--------|--------|-------|
| SPEJ | 260 | 230 | 40 | 180 | 150 | 120 |
| SPEF | | | | | | |
| SPEH | | | | | | |

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. 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 |
|---|-----------------------|----------------|
| SPPJ3, SPPJ2, SPUN, SPPH4, SPPH1 | 350±10°C | 3+1/0s |
| SPED2, SPED4 | 350±10°C | 3±0.5s |
| SPEJ | 350±10°C | 4s max. |
| SPEF | 350±5°C | 3s max. |
| SPEH | 350°C max. | 3s max. |
| SPUJ | 300±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 |
| SPPJ3 | 100°C max. | 60s max. | 260±5°C | 5±1s |
| SPUN | 100°C max. | 60s max. | 260±5°C | 10±1s |
| SPUJ, SPPH4 | — | — | 260±5°C | 5±1s |
| SPPJ2, SPPH1, SPED2, SPED4, SPEF | — | — | 260±5°C | 10±1s |

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