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| Items                                                  | Specifications                           |
|--------------------------------------------------------|------------------------------------------|
| Rating (Resistive load)                                | 1A 14.5V DC                              |
| Contact resistance<br>(Initial / After operating life) | 100mΩ max. / 100mΩ max.                  |
| Operating force                                        | 4.17±0.74N                               |
| Operating life (With load)                             | 30,000 cycles (1A 14.5V DC)              |
| Circuit configuration                                  | 2-pole, 1-position<br>1-pole, 2-position |

| Changeover timing | Total travel (mm) | Mounting method | Poles | Positions | Operation | Terminal type | Minimum order unit (pcs.) |        | Product No.       | Drawing No. |
|-------------------|-------------------|-----------------|-------|-----------|-----------|---------------|---------------------------|--------|-------------------|-------------|
|                   |                   |                 |       |           |           |               | Japan                     | Export |                   |             |
| Non shorting      | 4.5               | PC board        | 2     | 1         | Alternate | For PC board  | 280                       | 1,120  | <b>SPED220200</b> | 1           |
|                   |                   | Connector       | 1     | 2         |           | —             | 400                       | 2,000  | <b>SPED210203</b> | 2           |

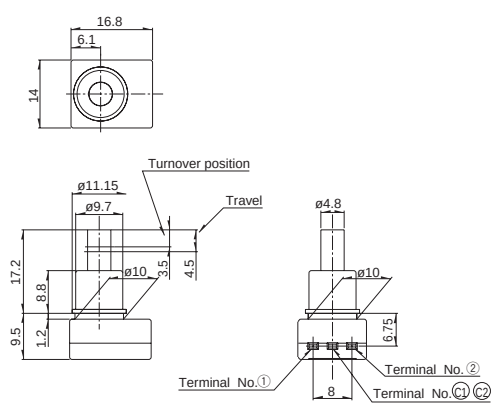
| Product No.       | Number of packages (pcs.) |                         | Export package measurements (mm) |
|-------------------|---------------------------|-------------------------|----------------------------------|
|                   | 1 case / Japan            | 1 case / export packing |                                  |
| <b>SPED220200</b> | 280                       | 1,120                   | 555×375×223                      |

| Product No.       | Number of packages (pcs.) |                         | Export package measurements<br>(mm) |
|-------------------|---------------------------|-------------------------|-------------------------------------|
|                   | 1 case / Japan            | 1 case / export packing |                                     |
| <b>SPED210203</b> | 400                       | 2,000                   | 400×270×290                         |

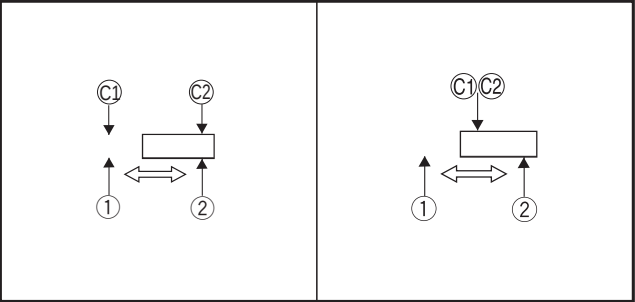
Refer to P.130 for soldering conditions.

■ Dimensions

Unit:mm

| No. | Style                                                                              |
|-----|------------------------------------------------------------------------------------|
| 2   |  |

■ Circuit Diagram



Note

Factory setting for contact points can be either 1 or 2.

Detector

Slide

Push

Rotary

Power

Dual-In-line  
Package Type

Horizontal  
Type

Vertical  
Type

# Push Switches

## List of Varieties

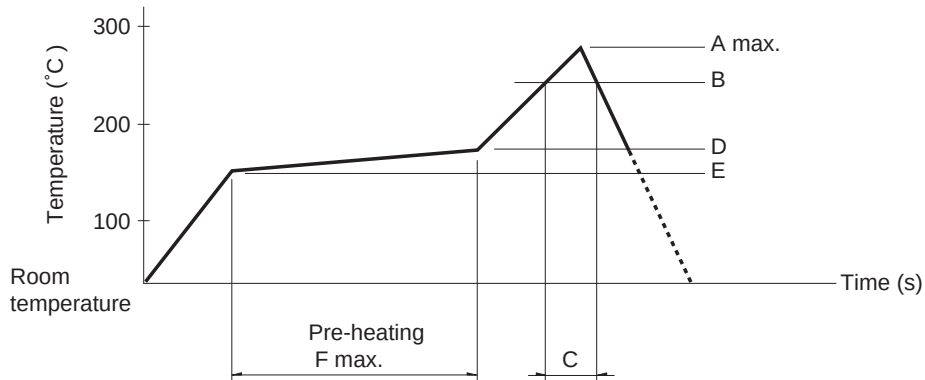
| Series                            |                                                  |                                                                                   | Vertical                                                                          |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                   |                                                  |                                                                                   | SPEF                                                                              |                                                                                   | SPED2                                                                               | SPED3                                                                               | SPED4                                                                               | SPED5                                                                               |
| Photo                             |                                                  |                                                                                   |  |  |    |   |  |  |
| Dimensions<br>(mm)                | W                                                | 9.4                                                                               |                                                                                   | 14                                                                                |                                                                                     |                                                                                     | 13.5                                                                                |                                                                                     |
|                                   | D                                                | 9                                                                                 |                                                                                   | 16.8                                                                              | 18                                                                                  |                                                                                     | 18.2                                                                                |                                                                                     |
|                                   | H                                                | 6.9                                                                               |                                                                                   | 18.3                                                                              | 13.2                                                                                | 13.17                                                                               | 14.3                                                                                |                                                                                     |
| Travel (mm)                       |                                                  | 1.5                                                                               |                                                                                   | —                                                                                 | —                                                                                   | —                                                                                   | —                                                                                   |                                                                                     |
| Total travel (mm)                 |                                                  | 2.7                                                                               |                                                                                   | 4.5                                                                               | 3.8                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| Number of poles                   |                                                  | 1                                                                                 |                                                                                   | 1<br>2                                                                            | 1                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| Operating temperature range       |                                                  | −40℃ to +85℃                                                                      |                                                                                   |                                                                                   | −40℃ to +95℃                                                                        |                                                                                     |                                                                                     |                                                                                     |
| Automotive use                    |                                                  |  |  |  |  |  |  |                                                                                     |
| Life cycle                        |                                                  |  |                                                                                   |  |   |  |  |                                                                                     |
| Rating (max.)<br>(Resistive load) |                                                  | 1A 14.5V DC                                                                       |                                                                                   |                                                                                   | 2A 14.5V DC                                                                         |                                                                                     |                                                                                     |                                                                                     |
| Rating (min.)<br>(Resistive load) |                                                  | 50μA 3V DC                                                                        |                                                                                   | —                                                                                 | —                                                                                   | —                                                                                   | —                                                                                   |                                                                                     |
| Durability                        | Operating life without load                      | —                                                                                 | —                                                                                 | —                                                                                 | —                                                                                   | —                                                                                   | —                                                                                   |                                                                                     |
|                                   | Operating life with load<br>(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                                                               | 90N                                                                               |                                                                                   |                                                                                     | 98N                                                                                 | 90N                                                                                 | 98N                                                                                 |
|                                   |                                                  | Pulling direction                                                                 | 30N                                                                               |                                                                                   | —                                                                                   | —                                                                                   | —                                                                                   | —                                                                                   |
| Environmental performance         | Cold                                             | −40℃ 96h                                                                          |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                   | Dry heat                                         | 85℃ 96h                                                                           |                                                                                   | 85℃ 96h (Connector type)<br>105℃ 192h (Dip type)                                  | 105℃ 192h                                                                           |                                                                                     |                                                                                     |                                                                                     |
|                                   | Damp heat                                        | 40℃, 90 to 95%RH 96h                                                              |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
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|                                    |     |
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| 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  $\phi$  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)<br>3s max. | B (°C) | C (s) | D (°C) | E (°C) | F (s) |
|----------------------|-------------------|--------|-------|--------|--------|-------|
| <b>SPEJ</b>          | 260               | 230    | 40    | 180    | 150    | 120   |
| <b>SPEF</b>          |                   |        |       |        |        |       |
| <b>SPEH</b>          |                   |        |       |        |        |       |

## 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 |
|-----------------------------------------------|-----------------------|----------------|
| <b>SPPJ3, SPPJ2, SPUN, SPUJ, SPPH4, SPPH1</b> | 350±10°C              | 3+1/0s         |
| <b>SPED2, SPED4</b>                           | 350±10°C              | 3±0.5s         |
| <b>SPEJ</b>                                   | 350±10°C              | 4s max.        |
| <b>SPEF</b>                                   | 350±5°C               | 3s max.        |
| <b>SPEH</b>                                   | 350°C max.            | 3s max.        |

## Reference for Dip Soldering

(For PC board terminal types)

| Series                                  | Items                  |                 | Dip soldering         |                       |
|-----------------------------------------|------------------------|-----------------|-----------------------|-----------------------|
|                                         | Preheating temperature | Preheating time | Soldering temperature | Duration of immersion |
| <b>SPPJ3</b>                            | 100°C max.             | 60s max.        | 260±5°C               | 5±1s                  |
| <b>SPUN</b>                             | 100°C max.             | 60s max.        | 260±5°C               | 10±1s                 |
| <b>SPUJ, SPPH4</b>                      | —                      |                 | 260±5°C               | 5±1s                  |
| <b>SPPJ2, SPPH1, SPED2, SPED4, SPEF</b> | —                      |                 | 260±5°C               | 10±1s                 |

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