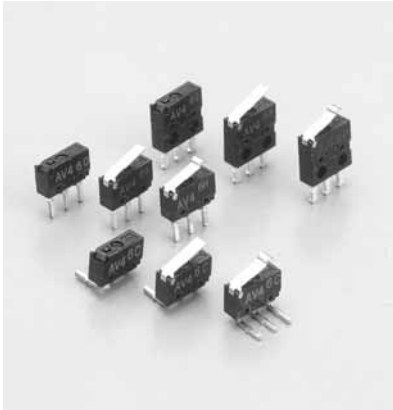


**Panasonic**  
ideas for life

**ONE OF THE SMALLEST  
SNAP-ACTION SWITCHES  
IN THE WORLD**

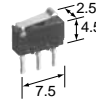
**AV4 (FU)  
SWITCHES**



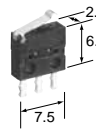
**FEATURES**

- Superminiature type, light-weight snap action switch

PC board terminal type (0.2g)



Solder terminal type with mounting holes (0.3g)

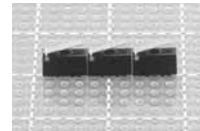
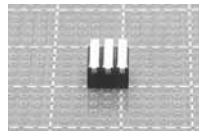


mm

- Mechanical life of 300,000 operations minimum

Stainless steel plated silver or gold is used for actuating spring

- Switches can be mounted close together in any directions



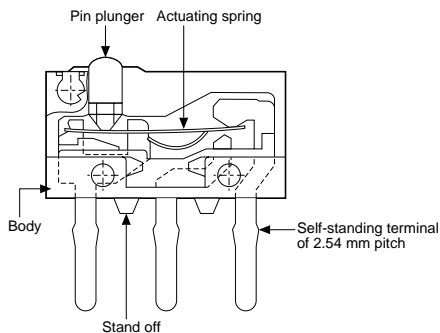
**ORDERING INFORMATION**

Ex. AV 4 4 0 4 61

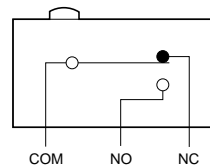
| Product Name | Terminals  | Actuators   | Operating force, max. (by pin plunger) | Contacts                                      |
|--------------|--|---|--|---|
| FU           | 0: Solder terminal with mounting holes (1.65 mm dia.)<br>4: PC board straight terminal<br>5: PC board angle terminal<br>6: PC board reverse angle terminal | 0: Pin plunger<br>2: Hinge lever<br>4: Simulated roller lever | 4: 0.98 N                              | Nil: Ag plate contact<br>61: Au plate contact |

**CONSTRUCTION**

PC board straight terminal type



**CONTACT ARRANGEMENT**



## PRODUCT TYPES

| Type of contacts           | Actuator               | Operating force, Max. | Type No.          |                |                        |                                     |
|----------------------------|------------------------|-----------------------|-------------------|----------------|------------------------|-------------------------------------|
|                            |                        |                       | PC board terminal |                |                        | Solder terminal with mounting holes |
|                            |                        |                       | Straight terminal | Angle terminal | Reverse angle terminal |                                     |
| Silver plated contact type | Pin plunger            | 0.98 N                | AV4404            | AV4504         | AV4604                 | AV4004                              |
|                            | Hinge lever            | 0.25 N                | AV4424            | AV4524         | AV4624                 | AV4024                              |
|                            | Simulated roller lever | 0.29 N                | AV4444            | AV4544         | AV4644                 | AV4044                              |
| Gold plated contact type   | Pin plunger            | 0.98 N                | AV440461          | AV450461       | AV460461               | AV400461                            |
|                            | Hinge lever            | 0.25 N                | AV442461          | AV452461       | AV462461               | AV402461                            |
|                            | Simulated roller lever | 0.29 N                | AV444461          | AV454461       | AV464461               | AV404461                            |

## SPECIFICATIONS

### 1. Contact rating

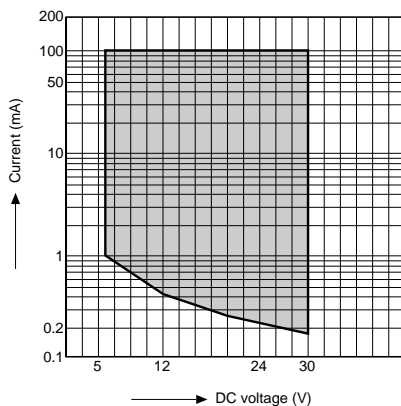
| Type of contact       | Resistive load ( $\cos\phi \approx 1$ ) |
|-----------------------|---|
| Silver plated contact | 0.5A 30V DC                             |
| Gold plated contact   | 0.1A 30V DC                             |

### 2. Characteristics

| Items                               |   | Characteristics  |  |
|-------------------------------------|---|--|--|
| Life                                | Mechanical  | Min. $3 \times 10^5$ operations (at 60 cpm)  |  |
|                                     | Electrical  | Silver plated contact  | Min. $2 \times 10^4$ operations (0.5A 30V DC; at 20 cpm) |
|                                     |   | Gold plated contact  | Min. $2 \times 10^5$ operations (0.1A 30V DC; at 20 cpm) |
| Insulation resistance               |   | Min. 100 M $\Omega$ (250V DC by insulation resistance meter)                                   |  |
| Voltage withstand                   | Between non-continuous terminals                    | 500V AC for 1 min.   |  |
|                                     | Between each terminal and other exposed metal parts | 500V AC for 1 min.   |  |
|                                     | Between each terminal and ground                    | 500V AC for 1 min.   |  |
| Vibration resistance                | Pin plunger type                                    | 10 to 55 Hz at single amplitude of 0.75mm (contact opening: max. 1 msec.)                      |  |
|                                     | Lever type  | 10 to 55 Hz at single amplitude of 0.15mm (contact opening: max. 1 msec.)                      |  |
| Shock resistance                    | Pin plunger type                                    | Min. 294m/s <sup>2</sup> (contact opening: max. 1 msec.)                                       |  |
|                                     | Lever type  | Min. 147m/s <sup>2</sup> (contact opening: max. 1 msec.)                                       |  |
| Contact resistance (initial value)  |   | Max. 200 m $\Omega$ (by YHP4328A)  |  |
| Allowable operation speed           |   | 0.1mm/s to 500mm/s (pin plunger type)  |  |
| Mechanical max. switching frequency |   | 60 operations/min.   |  |
| Ambient temperature                 |   | -25 to +80°C (Not freezing below 0°C)  |  |
| Unit weight                         |   | PC board terminal type: Approx. 0.2g<br>Solder terminal with mounting holes type: Approx. 0.3g |  |

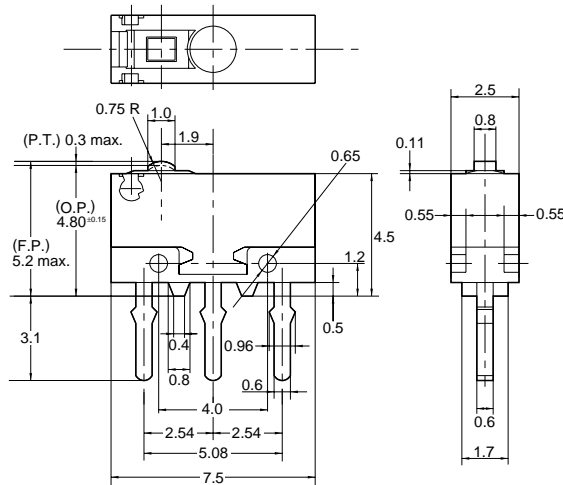
## DATA

Gold plate contact type  
Range of low-level current and voltage  
(Reference only)

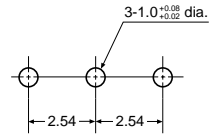


# DIMENSIONS

## 1. PC board terminal Straight terminal Pin plunger type

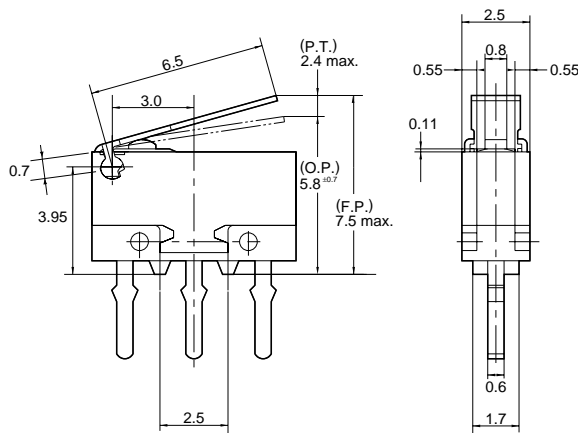


PC board pattern



|                       |                |
|-----------------------|----------------|
| Pretravel             | 0.3 max.       |
| Movement Differential | 0.1 max.       |
| Overtravel            | 0.1 min.       |
| Operating Position    | 4.8 $\pm 0.15$ |
| Free Position         | 5.2 max.       |

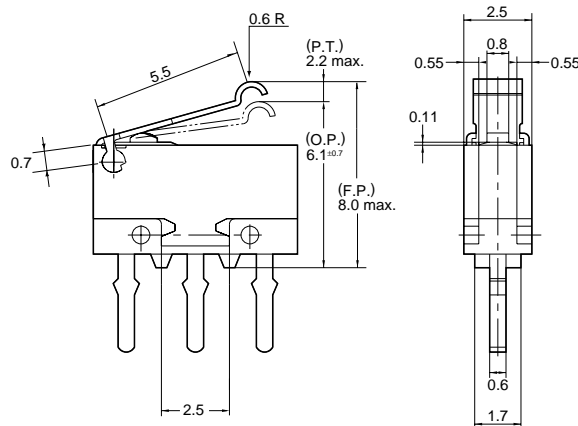
## Hinge lever type



|                       |               |
|-----------------------|---------------|
| Pretravel             | 2.4 max.      |
| Movement Differential | 0.7 max.      |
| Overtravel            | 0.4 min.      |
| Operating Position    | 5.8 $\pm 0.7$ |
| Free Position         | 7.5 max.      |

Note: All other dimensions are the same as those of pin plunger type.

## Simulated roller lever type

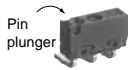


|                       |               |
|-----------------------|---------------|
| Pretravel             | 2.2 max.      |
| Movement Differential | 0.7 max.      |
| Overtravel            | 0.3 min.      |
| Operating Position    | 6.1 $\pm 0.7$ |
| Free Position         | 8.0 max.      |

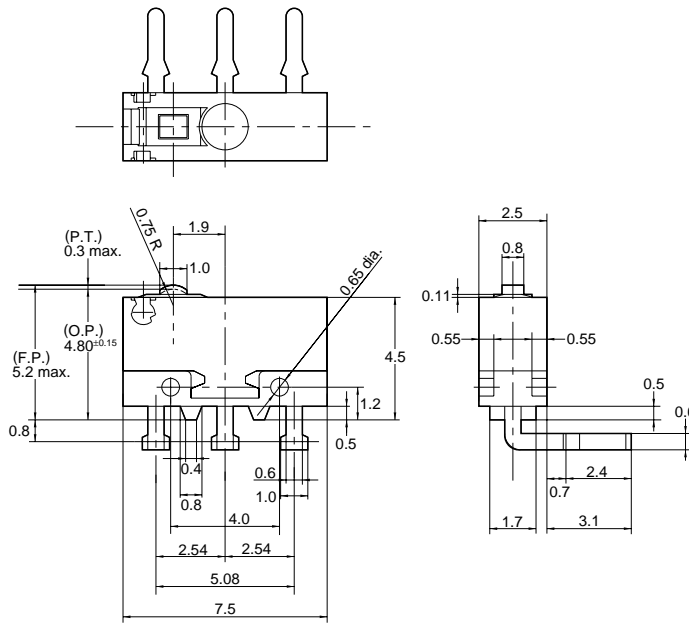
Note: All other dimensions are the same as those of pin plunger type.

## 2. Angle terminal Right angle terminal Pin plunger type

mm General tolerance:  $\pm 0.15$



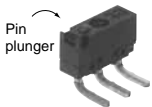
Right angle terminal



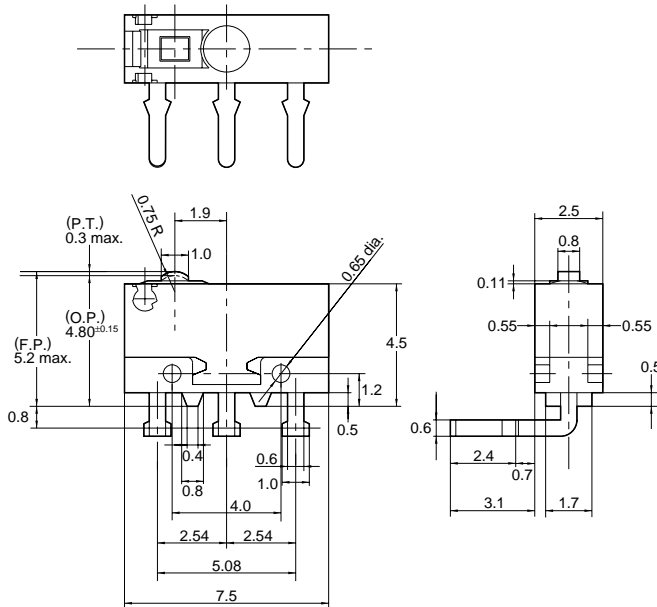
|                       |                |
|-----------------------|----------------|
| Pretravel             | 0.3 max.       |
| Movement Differential | 0.1 max.       |
| Overtravel            | 0.1 min.       |
| Operating Position    | $4.8 \pm 0.15$ |
| Free Position         | 5.2 max.       |

Note: All other dimensions of hinge lever type and simulated roller lever type are the same as those of straight terminal types.

## Left angle terminal Pin plunger type



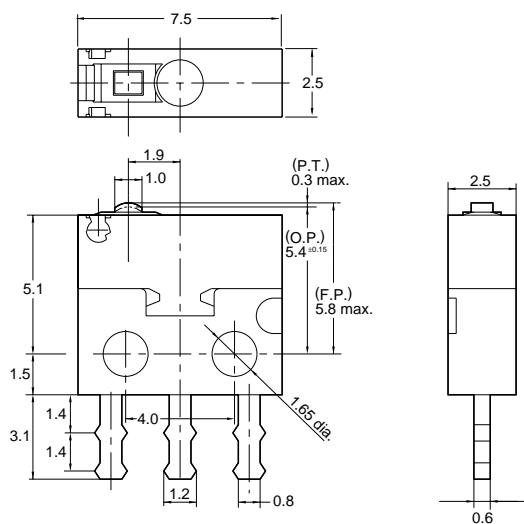
Left angle terminal



|                       |                |
|-----------------------|----------------|
| Pretravel             | 0.3 max.       |
| Movement Differential | 0.1 max.       |
| Overtravel            | 0.1 min.       |
| Operating Position    | $4.8 \pm 0.15$ |
| Free Position         | 5.2 max.       |

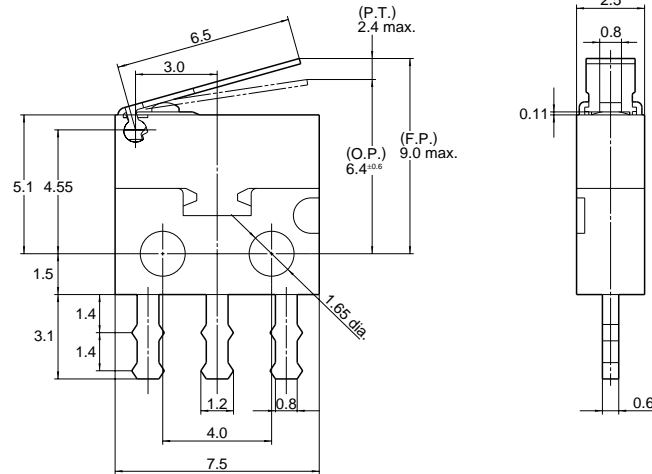
Note: All other dimensions of hinge lever type and simulated roller lever type are the same as those of straight terminal types.

## 3. Solder terminal with mounting holes Pin plunger type



|                       |                |
|-----------------------|----------------|
| Pretravel             | 0.3 max.       |
| Movement Differential | 0.1 max.       |
| Overtravel            | 0.1 min.       |
| Operating Position    | $5.4 \pm 0.15$ |
| Free Position         | 5.8 max.       |

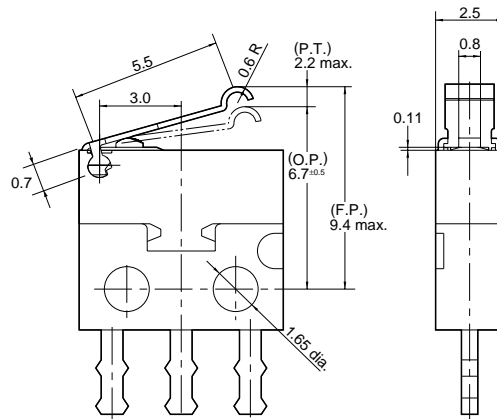
## Hinge lever type

mm General tolerance:  $\pm 0.15$ 

|                       |               |
|-----------------------|---------------|
| Pretravel             | 2.4 max.      |
| Movement Differential | 0.7 max.      |
| Overtravel            | 0.4 min.      |
| Operating Position    | 6.4 $\pm$ 0.6 |
| Free Position         | 9.0 max.      |

Note: All other dimensions are the same as those of pin plunger type.

## Simulated roller lever type



|                       |               |
|-----------------------|---------------|
| Pretravel             | 2.2 max.      |
| Movement Differential | 0.7 max.      |
| Overtravel            | 0.3 min.      |
| Operating Position    | 6.7 $\pm$ 0.5 |
| Free Position         | 9.4 max.      |

Note: All other dimensions are the same as those of pin plunger type.

## NOTES

**1. Mounting**

- 1) After mounting and wiring, the insulation distance between ground and each terminal should be confirmed as sufficient.
- 2) When the operation object is in the free position, force should not be applied to the actuator or to the pin plunger. Also force should be applied to the pin plunger from vertical direction to the switch.
- 3) In setting the movement after operation, the over-travel should be set within the range of the specified O.T. value.
- 4) In fastening the switch body, use the M1.4 screw, with tightening torque of not more than 0.098 N·m.

**2. Soldering**

- 1) Hand soldering should be accomplished in less than 5 seconds with an iron below 18 watts. Keep the soldering tip temperature less than 320°C. Avoid applying force to the terminals.
- 2) Terminal portion must not be moved within 1 minute after soldering. Also no tensile strength of lead wires should be applied to the terminals.
- 3) When using the angle terminal type, insert an insulation separator between the switch body and the printed circuit board (Insulation separator 0.2 to 0.4mm thick) to prevent the soldering flux from flowing under the PC board.

**3. Cleaning**

As FU switch is not completely sealed construction, avoid cleaning.

**4. Selection of switch**

When specifying FU switches, allow  $\pm 20\%$  to the listed operating characteristics.

**5. Avoid using and keeping switches in the following conditions:**

- In corrosive gases
- In a dusty environment
- Where silicon atmosphere prevails

**6. When switching low-level circuits (max. 100 mA), gold plate contact types are recommended.****7. When using the lever type, avoid applying force from the reverse and side direction of actuating.**