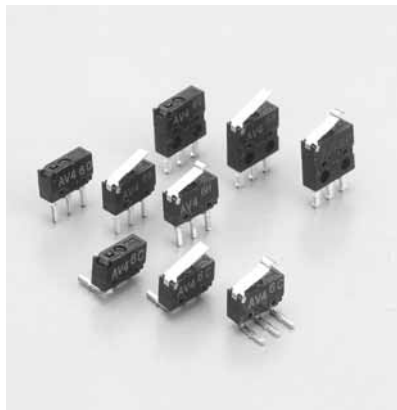


Ultra-miniature Size and Light Weight Switches

AV4 (FU) SWITCHES



RoHS compliant

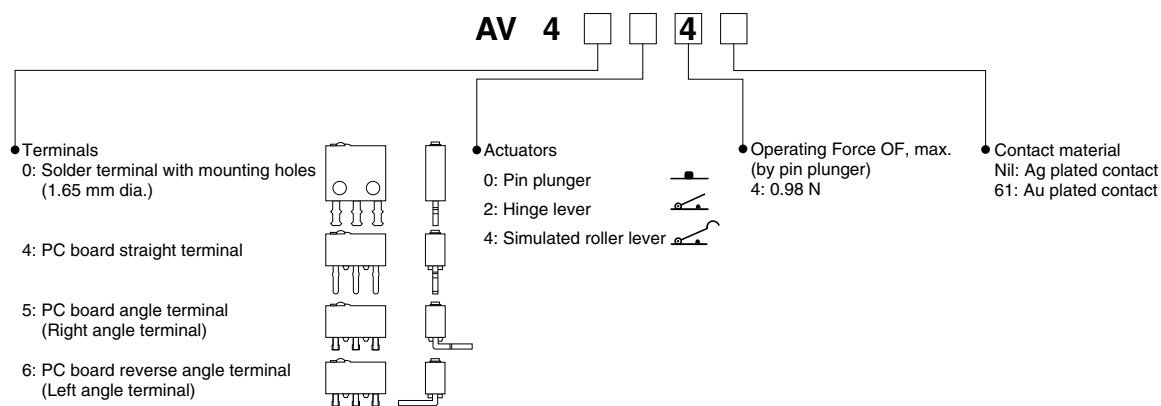
FEATURES

- Ultra-miniature size, light-weight snap action switches
- Solder terminal with mounting hole type available
- PC board terminal type with international 2.54 mm pitch for dense mounting
- Mechanical long life: 300,000 operations minimum
- Protection grade: IP40

TYPICAL APPLICATIONS

- Compact visual equipment
- Compact audio equipment
- Office automation equipment
- Other small portable electronic devices

ORDERING INFORMATION



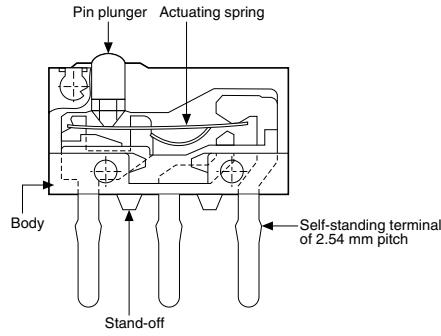
PRODUCT TYPES

Ag plated contact; Body and Cap: Black, Plunger: Black
 Au plated contact; Body and Cap: Black, Plunger: Red

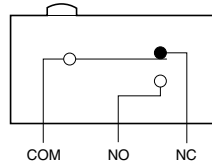
| Type of contacts | Actuator | Operating Force OF, Max. | Part No. | | | |
|------------------------|------------------------|--------------------------|-------------------|----------------------|---------------------|-------------------------------------|
| | | | PC board terminal | | | Solder terminal with mounting holes |
| | | | Straight terminal | Right angle terminal | Left angle terminal | |
| Ag 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 |
| Au 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 |

CONSTRUCTION

PC board straight terminal

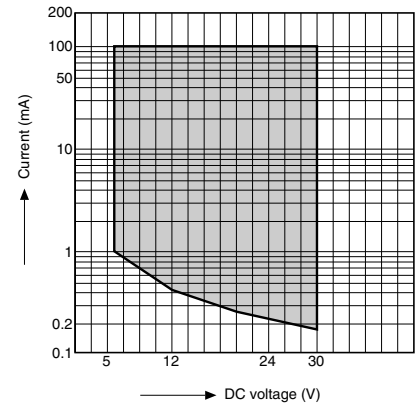


CONTACT FORM



DATA

Applicable current and voltage range for Au contact type (reference)



SPECIFICATIONS

■ Contact rating

| Type of contact | Load type | Resistive load ($\cos\phi \approx 1$) |
|--|-----------|---|
| Ag plated contact Plunger color: Black | | 0.5A 30V DC |
| Au plated contact Plunger color: Dark red | | 0.1A 30V DC |

■ Characteristics

| Items | | Specifications |
|-------------------------------------|---|--|
| Expected life | Mechanical | Min. 3×10^5 operations (at 60 cpm) |
| | Electrical | Ag plated contact |
| | | Au plated contact |
| Insulation resistance | | Min. 100 M Ω (250V DC by insulation resistance meter) |
| Dielectric strength | 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. |
| Contact resistance (initial) | | Max. 200 m Ω |
| 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 ² (contact opening: max. 1 msec.) |
| | Lever type | Min. 147m/s ² (contact opening: max. 1 msec.) |
| 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 (no freezing and condensing) |
| Unit weight | | PC board terminal type: Approx. 0.2g Solder terminal with mounting holes type: Approx. 0.3g |
| Protection grade | | IP40 |

Note: Test conditions and judgement are in accordance with NECA C4505.

■ Operating characteristics

1) PC board terminal

| Actuators | Operating Force OF, Max. | Release Force RF, Min. | Pretravel PT, Max. | Movement Differential MD, Max. | Overtravel OT, Min. | Operating Position OP |
|------------------------|--------------------------|------------------------|--------------------|--------------------------------|---------------------|-----------------------|
| Pin plunger | 0.98 N | 0.098 N | 0.3 mm | 0.1 mm | 0.1 mm | 4.8±0.15 mm |
| Hinge lever | 0.25 N | 0.010 N | 2.4 mm | 0.7 mm | 0.4 mm | 5.8±0.7 mm |
| Simulated roller lever | 0.29 N | 0.010 N | 2.2 mm | 0.7 mm | 0.3 mm | 6.1±0.7 mm |

2) Solder terminal

| Actuators | Operating Force OF, Max. | Release Force RF, Min. | Pretravel PT, Max. | Movement Differential MD, Max. | Overtravel OT, Min. | Operating Position OP |
|------------------------|--------------------------|------------------------|--------------------|--------------------------------|---------------------|-----------------------|
| Pin plunger | 0.98 N | 0.098 N | 0.3 mm | 0.1 mm | 0.1 mm | 5.4±0.15 mm |
| Hinge lever | 0.25 N | 0.020 N | 2.4 mm | 0.7 mm | 0.4 mm | 6.4±0.6 mm |
| Simulated roller lever | 0.29 N | 0.020 N | 2.2 mm | 0.7 mm | 0.3 mm | 6.7±0.5 mm |

(Unit: mm) General tolerance: ± 0.15

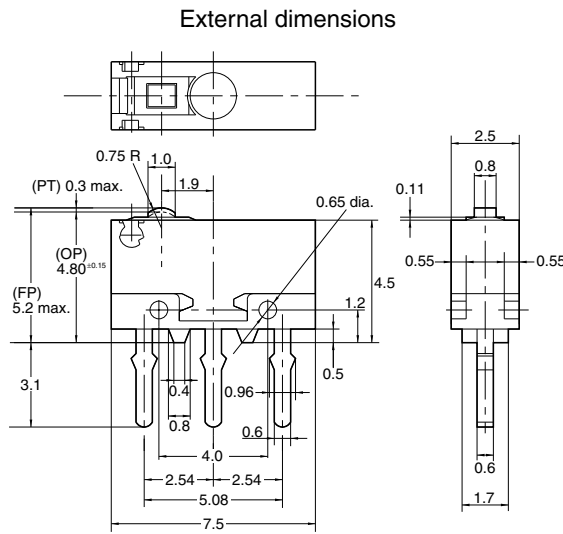
DIMENSIONS

The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

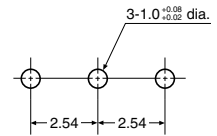
PC board terminal

- Straight terminal
- Pin plunger

CAD Data



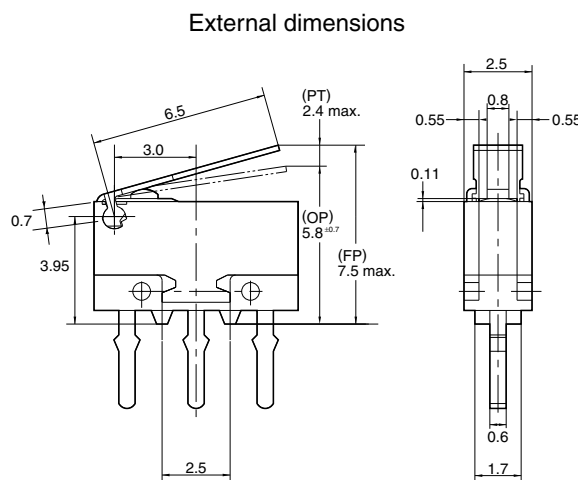
PC board pattern



| | |
|--------------------------------|-------------------|
| Pretravel PT, Max. | 0.3 mm |
| Movement Differential MD, Max. | 0.1 mm |
| Overtravel OT, Min. | 0.1 mm |
| Operating Position OP | 4.8 \pm 0.15 mm |
| Free Position FP, Max. | 5.2 mm |

Hinge lever type

CAD Data

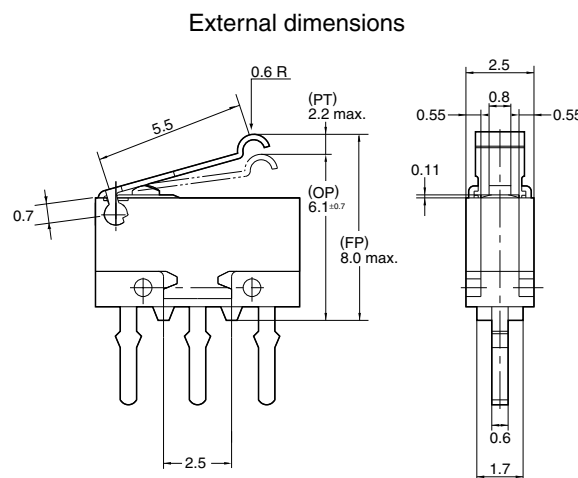


| | |
|--------------------------------|------------------|
| Pretravel PT, Max. | 2.4 mm |
| Movement Differential MD, Max. | 0.7 mm |
| Overtravel OT, Min. | 0.4 mm |
| Operating Position OP | 5.8 \pm 0.7 mm |
| Free Position FP, Max. | 7.5 mm |

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

Simulated roller lever type

CAD Data



| | |
|--------------------------------|------------------|
| Pretravel PT, Max. | 2.2 mm |
| Movement Differential MD, Max. | 0.7 mm |
| Overtravel OT, Min. | 0.3 mm |
| Operating Position OP | 6.1 \pm 0.7 mm |
| Free Position FP, Max. | 8.0 mm |

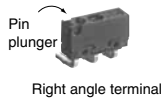
Note: All other dimensions are the same as those of pin plunger type.

AV4 (FU) Miniature Switches

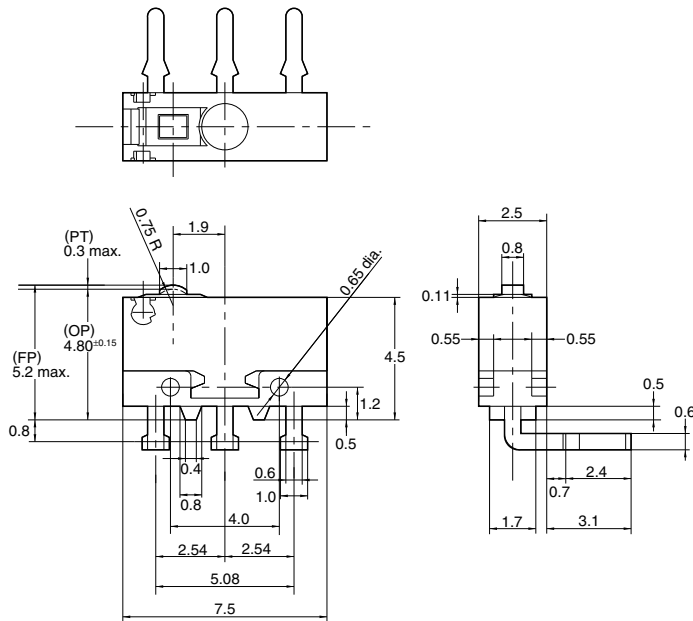
■ Angle terminal

- Right angle terminal

CAD Data



External dimensions

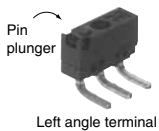


| | |
|--------------------------------|-------------|
| Pretravel PT, Max. | 0.3 mm |
| Movement Differential MD, Max. | 0.1 mm |
| Overtravel OT, Min. | 0.1 mm |
| Operating Position OP | 4.8±0.15 mm |
| Free Position FP, Max. | 5.2 mm |

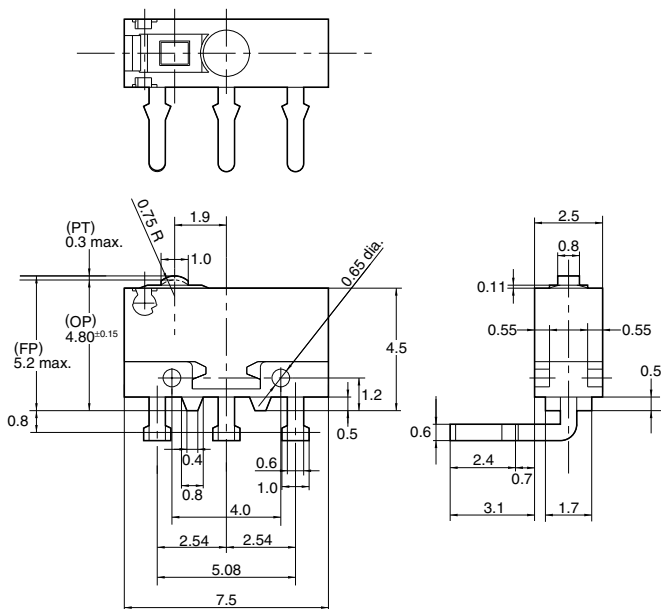
Note: All other dimensions of hinge lever type and simulated roller lever type are the same as those of straight terminal types.

- Left angle terminal

CAD Data



External dimensions



| | |
|--------------------------------|-------------|
| Pretravel PT, Max. | 0.3 mm |
| Movement Differential MD, Max. | 0.1 mm |
| Overtravel OT, Min. | 0.1 mm |
| Operating Position OP | 4.8±0.15 mm |
| Free Position FP, Max. | 5.2 mm |

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

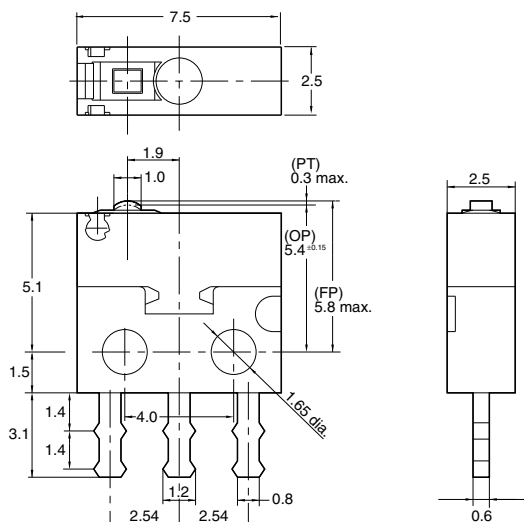
■ Solder terminal with mounting holes

- Pin plunger

CAD Data



External dimensions



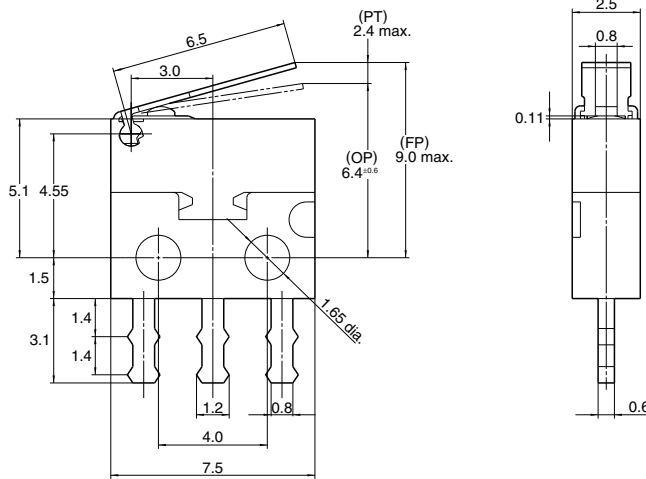
| | |
|--------------------------------|-------------|
| Pretravel PT, Max. | 0.3 mm |
| Movement Differential MD, Max. | 0.1 mm |
| Overtravel OT, Min. | 0.1 mm |
| Operating Position OP | 5.4±0.15 mm |
| Free Position FP, Max. | 5.8 mm |

Hinge lever

CAD Data



External dimensions



| | |
|--------------------------------|------------|
| Pretravel PT, Max. | 2.4 mm |
| Movement Differential MD, Max. | 0.7 mm |
| Overtravel OT, Min. | 0.4 mm |
| Operating Position OP | 6.4±0.6 mm |
| Free Position FP, Max. | 9.0 mm |

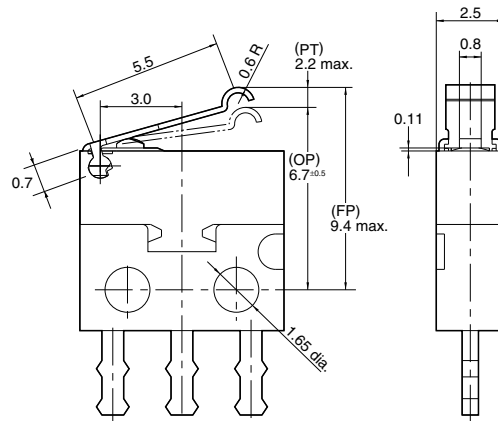
Note: All other dimensions are the same as those of pin plunger type.

Simulated roller lever

CAD Data



External dimensions



| | |
|--------------------------------|------------|
| Pretravel PT, Max. | 2.2 mm |
| Movement Differential MD, Max. | 0.7 mm |
| Overtravel OT, Min. | 0.3 mm |
| Operating Position OP | 6.7±0.5 mm |
| Free Position FP, Max. | 9.4 mm |

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

CAUTIONS FOR USE

■ Fastening of the switch body

1) In fastening the switch body, use the M1.4 screw (3 types ... screw head diameter from 2.4 dia. to 2.6 dia.), with tightening torque of not more than 0.098 N·m.

2) In setting the movement after operation, the over-travel should be set within the range of the minimum OT value. Please set up so that a operation object does not apply force to the switch body.

■ Environment

Avoid using and storing these switches in a location where they will be exposed to corrosive gases, silicon, or high dust levels, all of which can have an adverse effect on the contacts.

■ Soldering

1) Manual soldering should be accomplished within 5 seconds with max. 320°C iron. Care should be taken not to apply force to the terminals during soldering.

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 PC board (Insulation separator 0.2 to 0.4mm thick) to prevent the soldering flux from flowing under the PC board.

■ Cleaning

As AV4 (FU) switch is not completely sealed construction, avoid cleaning.

■ Selection of switch

Please make your selection so that there will be no problems even if the operating characteristics vary up to ±20% from the standard values.

■ When switching low-level circuits (max. 100 mA), Au contact types are recommended.