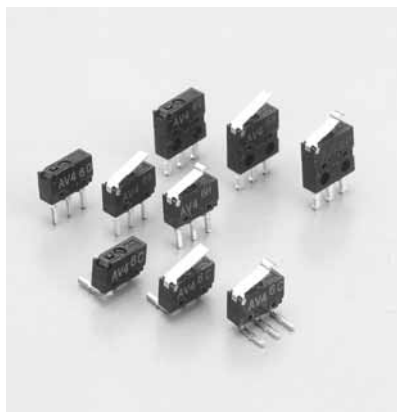


### Ultra-miniature Size and Light Weight Switches

# AV4 (FU) SWITCHES



RoHS compliant

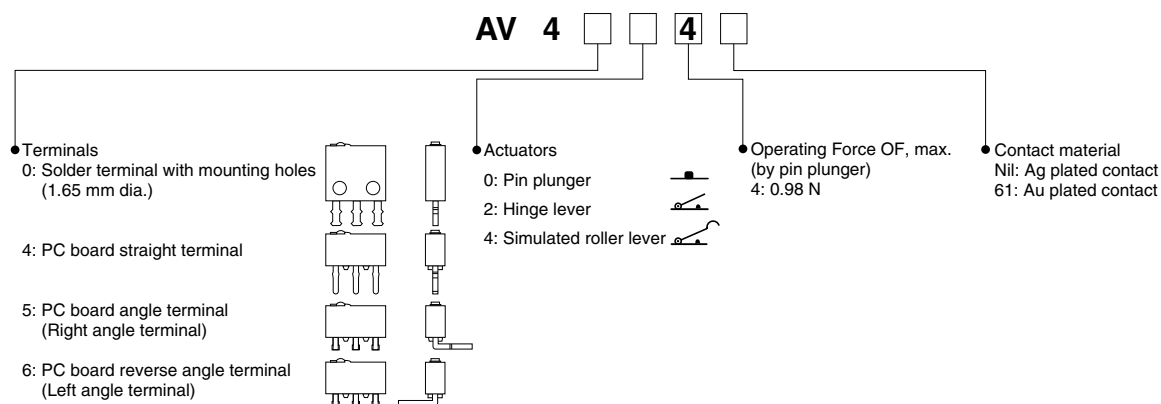
### FEATURES

- 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



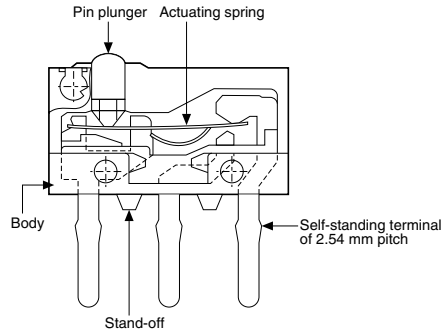
## PRODUCT TYPES

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

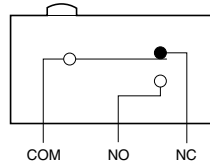
Type of contacts	Actuator	Operating Force OF, Max.	Part No.			
			PC board terminal			Solder terminal with mounting holes
			Straight terminal	Right angle terminal	Left angle terminal	
Ag plated contact type	Pin plunger	0.98 N	AV4404	AV4504	AV4604	AV4004
	Hinge lever	0.25 N	AV4424	AV4524	AV4624	AV4024
	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

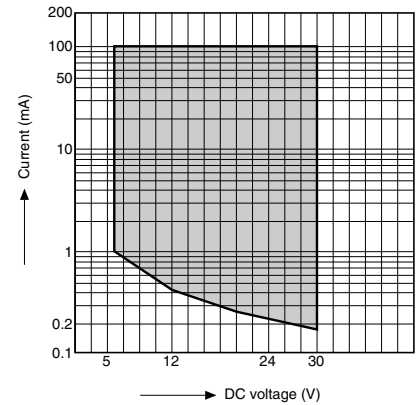


## CONTACT FORM



## 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. $3 \times 10^5$ operations (at 60 cpm)
	Electrical	Ag plated contact
		Au plated contact
Insulation resistance		Min. 100 M $\Omega$ (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 $\Omega$
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.)
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

## DIMENSIONS

(Unit: mm) General tolerance:  $\pm 0.15$

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

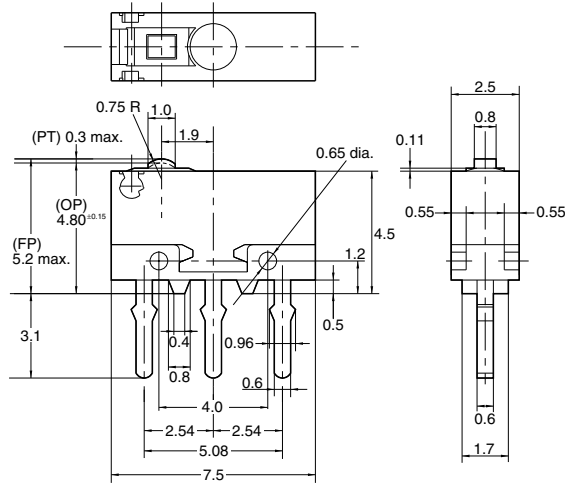
### PC board terminal

- Straight terminal
- Pin plunger

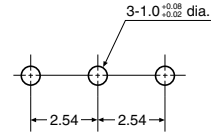
#### CAD Data



External dimensions



PC board pattern



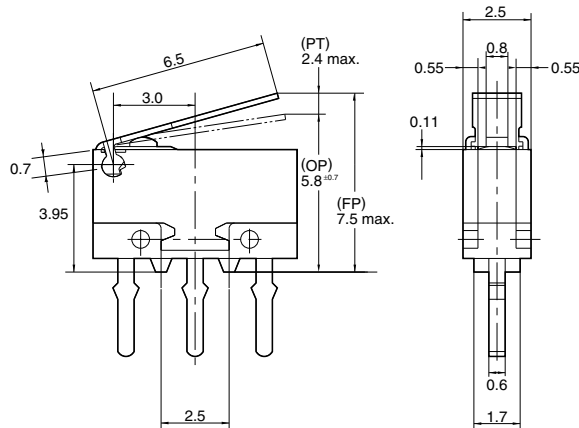
Pretravel PT, Max.	0.3 mm
Movement Differential MD, Max.	0.1 mm
Overtravel OT, Min.	0.1 mm
Operating Position OP	4.8 $\pm$ 0.15 mm
Free Position FP, Max.	5.2 mm

### Hinge lever type

#### CAD Data



External dimensions



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

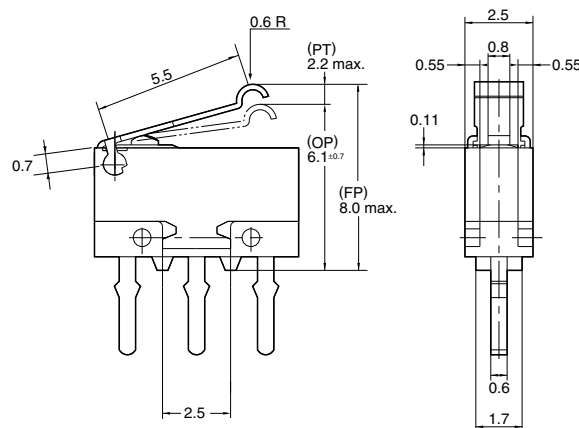
Note: All other dimensions are the same as those of pin plunger type.

### Simulated roller lever type

#### CAD Data



External dimensions



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

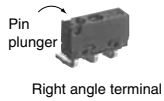
Note: All other dimensions are the same as those of pin plunger type.

# AV4 (FU) Miniature Switches

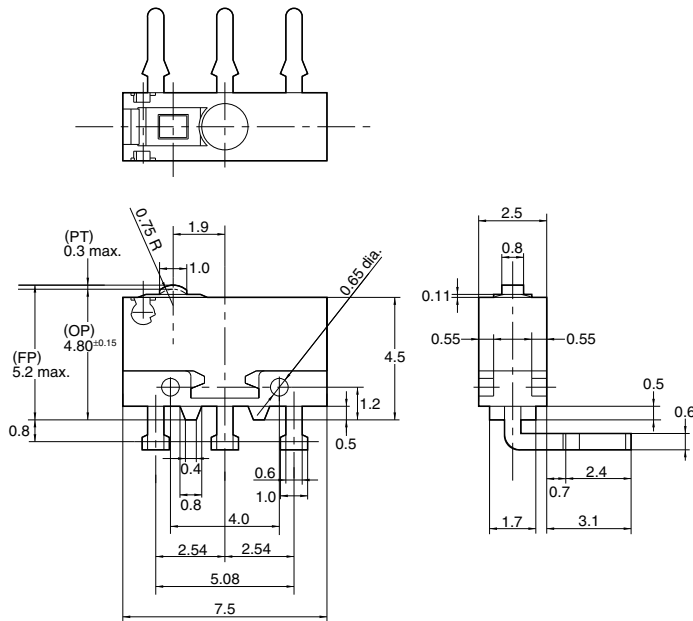
## ■ Angle terminal

- Right angle terminal

### CAD Data



External dimensions

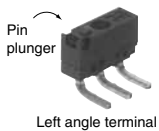


Pretravel PT, Max.	0.3 mm
Movement Differential MD, Max.	0.1 mm
Overtravel OT, Min.	0.1 mm
Operating Position OP	4.8±0.15 mm
Free Position FP, Max.	5.2 mm

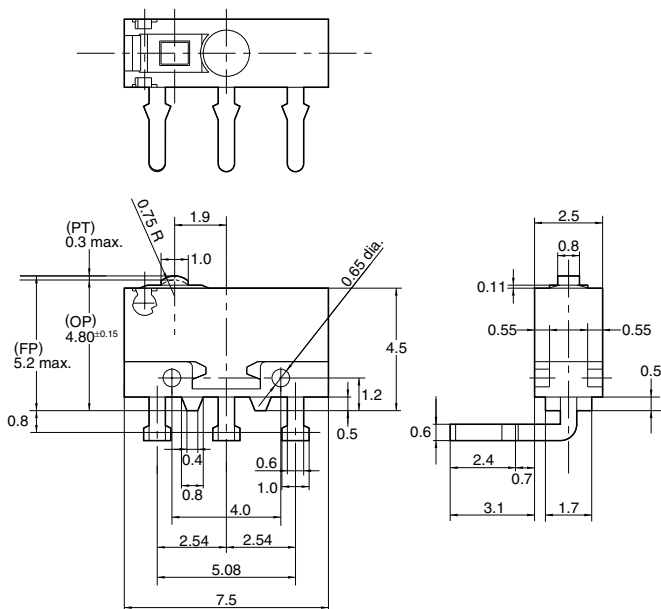
Note: All other dimensions of hinge lever type and simulated roller lever type are the same as those of straight terminal types.

- 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.

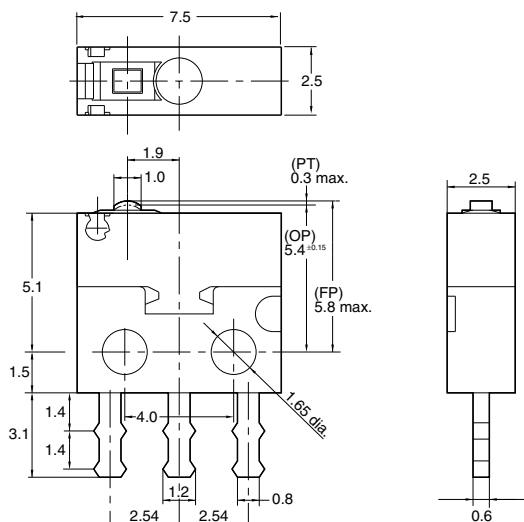
## ■ Solder terminal with mounting holes

- Pin plunger

### CAD Data



External dimensions



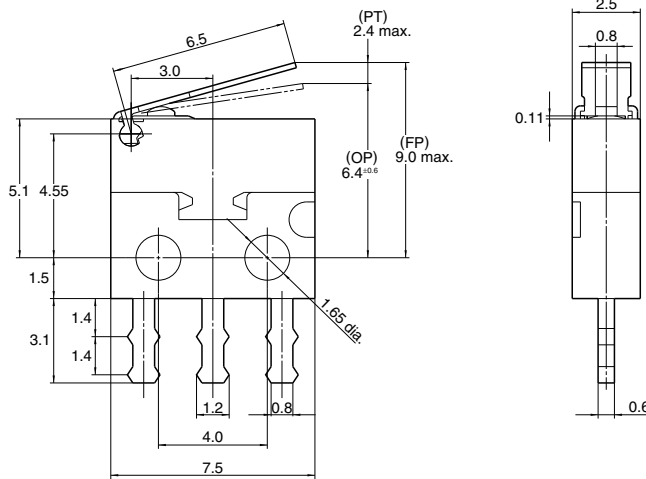
Pretravel PT, Max.	0.3 mm
Movement Differential MD, Max.	0.1 mm
Overtravel OT, Min.	0.1 mm
Operating Position OP	5.4±0.15 mm
Free Position FP, Max.	5.8 mm

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

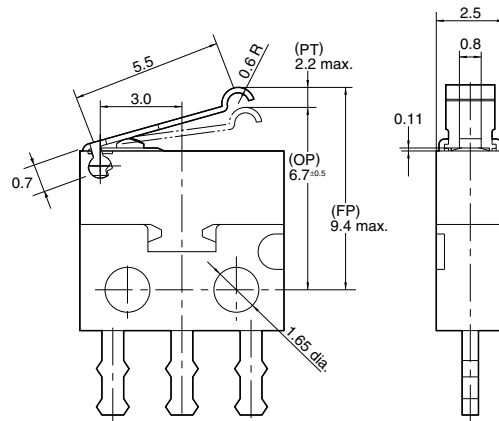
Note: All other dimensions are the same as those of pin plunger type.

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.