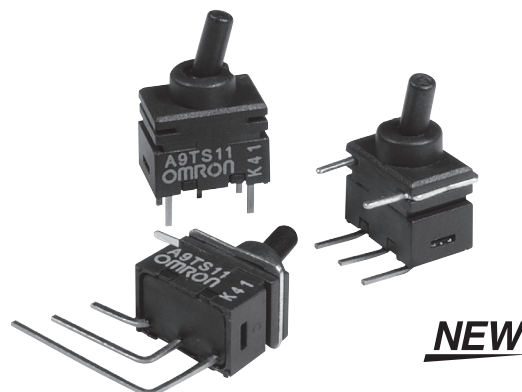


# Toggle Switch (Ultra subminiature)

## A9TS

### Ultra subminiature size.

- Gold-plated clip contacts ensure high reliability.
- Sealed bottom prevents flux penetration.
- Sealed to IP64 (IEC-60529). Washable with alcohol based solvents.
- 35% smaller than A9T
- Typical applications include Security Control Boards, Electric Power Instrumentation and Program Controllers.
- RoHS Compliant



## Ordering Information

### Model Number Legend

| A9TS | 1 | 2 | - | 00 | 3 | 4 | 1. | Contact Form | 2. | Switch Function | 3. | Actuator Style | 4. | Terminal Style          |
|------|---|---|---|----|---|---|----|--------------|----|-----------------|----|----------------|----|-------------------------|
|      |   |   |   |    |   |   | 1: | SPDT         | 1: | ON - ON         | 1: | Standard       | 1: | DIP, Top Actuated       |
|      |   |   |   |    |   |   | 2: | DPDT         | 2: | ON - OFF - ON   |    |                | 2: | Right Angle, Horizontal |
|      |   |   |   |    |   |   |    |              |    |                 |    |                | 3: | Right Angle, Vertical   |

### Available Models

| Terminal Style     |     |    | DIP Terminal, Top Actuated |                          | Right Angle, Horizontal  |                          | Right Angle, Vertical    |                          |
|--------------------|-----|----|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                    |     |    |                            |                          |                          |                          |                          |                          |
| Switching Function |     |    | Single Pole Double Throw   | Double Pole Double Throw | Single Pole Double Throw | Double Pole Double Throw | Single Pole Double Throw | Double Pole Double Throw |
|                    |     |    | A9TS11-0011                | A9TS21-0011              | A9TS11-0012              | A9TS21-0012              | A9TS11-0013              | A9TS21-0013              |
| ON                 | OFF | ON | A9TS12-0011                | A9TS22-0011              | A9TS12-0012              | A9TS22-0012              | A9TS12-0013              | A9TS22-0013              |
| Quantity per tray  |     |    | 100                        |                          | 25                       |                          | 50                       |                          |

- Note:** 1. Lever does not stop at “-” position.  
 2. Switching functions are shown from marked side of the switch.

## Specifications

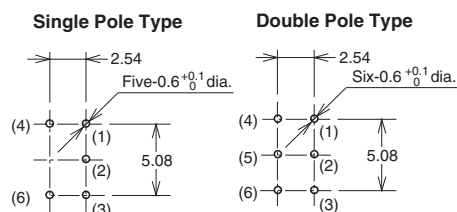
|                               |                                                                          |
|-------------------------------|--------------------------------------------------------------------------|
| Switching capacity            | 100mA @ 28 VAC/VDC                                                       |
| Minimum Permissible Load      | 0.1 $\mu$ A @ 20 mVAC/mVDC                                               |
| Operating force               | 500 gf max. (4.9 N max.)                                                 |
| Insulation resistance         | 500 M $\Omega$ min. (Initial value)                                      |
| Contact resistance            | 80 m $\Omega$ max (Initial value)                                        |
| Dielectric strength           | 500VAC for 1 min. between terminals, between terminals and ground        |
| Vibration resistance          | Malfunction: 10 to 55Hz, 1.5-mm double amplitude                         |
| Shock resistance              | Malfunction: 500m/s <sup>2</sup> min.                                    |
| Life expectancy               | Mechanical: 50,000 operations min.<br>Electrical: 50,000 operations min. |
| Ambient operating temperature | -20 to 80°C (at 60% RH max.) with no icing or condensation               |
| Ambient operating humidity    | 45% to 85% RH (at 5 to 35°C)                                             |
| Weight                        | 0.3 g                                                                    |

# Engineering Data

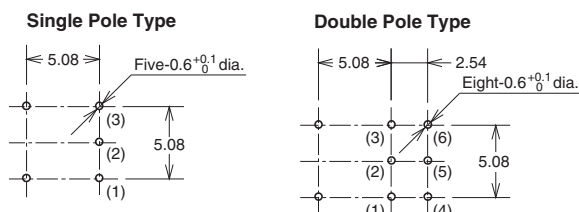
**Note:** Unless otherwise specified, all units are in millimeters.

## ■ PCB Layout (Top view)

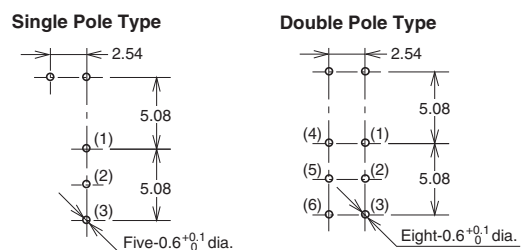
### DIP terminal



### Right Angle, Horizontal



### Vertical



## ■ Switching Function / Internal Connections

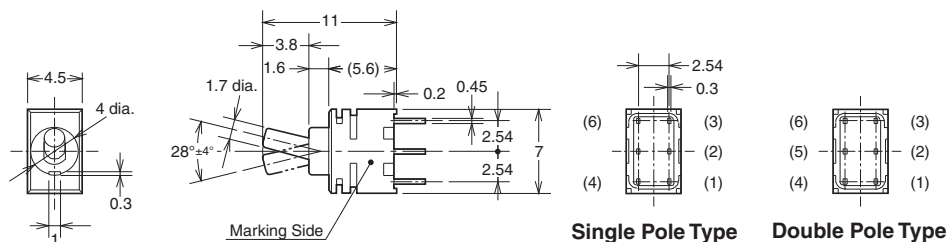
|             | Switching Functions |     |    |  |  |  |
|-------------|---------------------|-----|----|--|--|--|
| SPDT Models | ON                  | --- | ON |  |  |  |
|             | ON                  | OFF | ON |  |  |  |
| DPDT Models | ON                  | --- | ON |  |  |  |
|             | ON                  | OFF | ON |  |  |  |

**Note:** Lever does not stop at “-” position.

# Dimensions

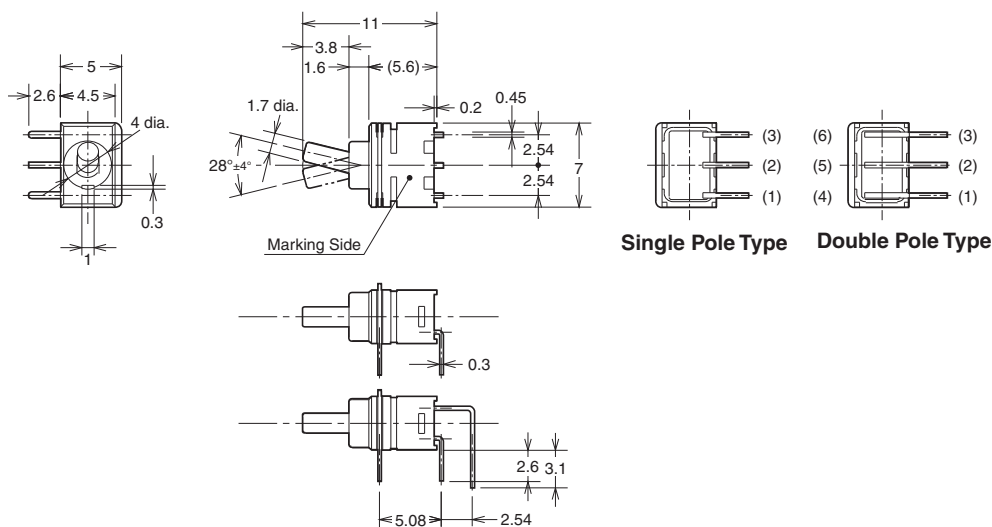
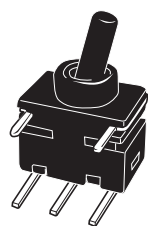
(Unit: mm)

## DIP terminal

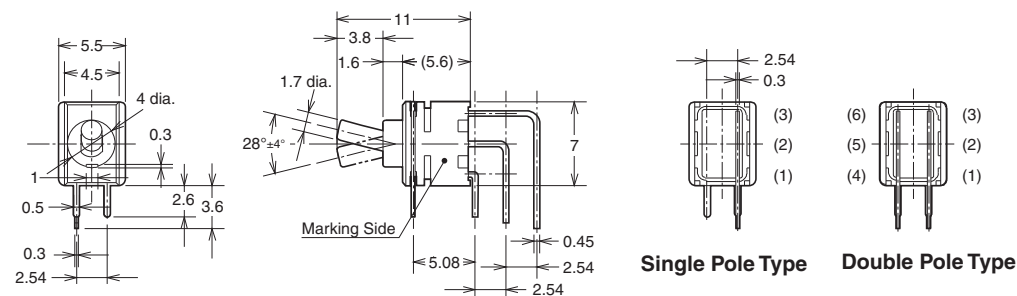
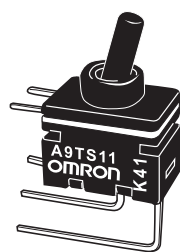


**Note:** NO.(4) and (6) terminals in the SPDT models are dummies to support the Switch case.

## Right Angle



## Vertical Mount



# Precautions

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## ■ Correct Use

### Soldering

Observe the following conditions when soldering the Switch.

#### Automatic Soldering Bath

Soldering temperature: 260°C max. (Preheating: 100°C 120 s)  
Soldering time: 5 s max.

#### Manual Soldering

Soldering temperature: 350°C at the tip of the soldering iron.  
Soldering time: 3 s max.

### Washing

Apply alcohol based solvents to clean.

Do not clean the switch immediately after soldering. Wait for at least five minutes after soldering before cleaning.

Ultrasonic cleaning is not available dip into the switch washing agents for two minute maximum.

### Using Flux

Making mistakes in the type of flux or in the amount or method in which it is applied can cause flux to enter the interior of the Switch, with adverse effects on Switch performance. Assess the proper flux, conditions, and methods prior to using it.

### Environment for Storage and Use

To prevent discoloration of the terminals and other problems during storage, do not store the switch in locations subject to the following conditions.

1. High temperatures or humidity
2. Corrosive gases
3. Direct sunlight

Also, the switch is not waterproof or splash-resistant. Do not install or use the switch in locations that are subject to contact with water.

Do not subject the switch to freezing or condensation.

## ■ Cautions

Use the Toggle Switch within the rated voltage and current ranges, otherwise the Toggle Switch may have a shortened life expectancy, radiate heat, or burn out. This particularly applies to the instantaneous voltages and currents when switching.

### Handling

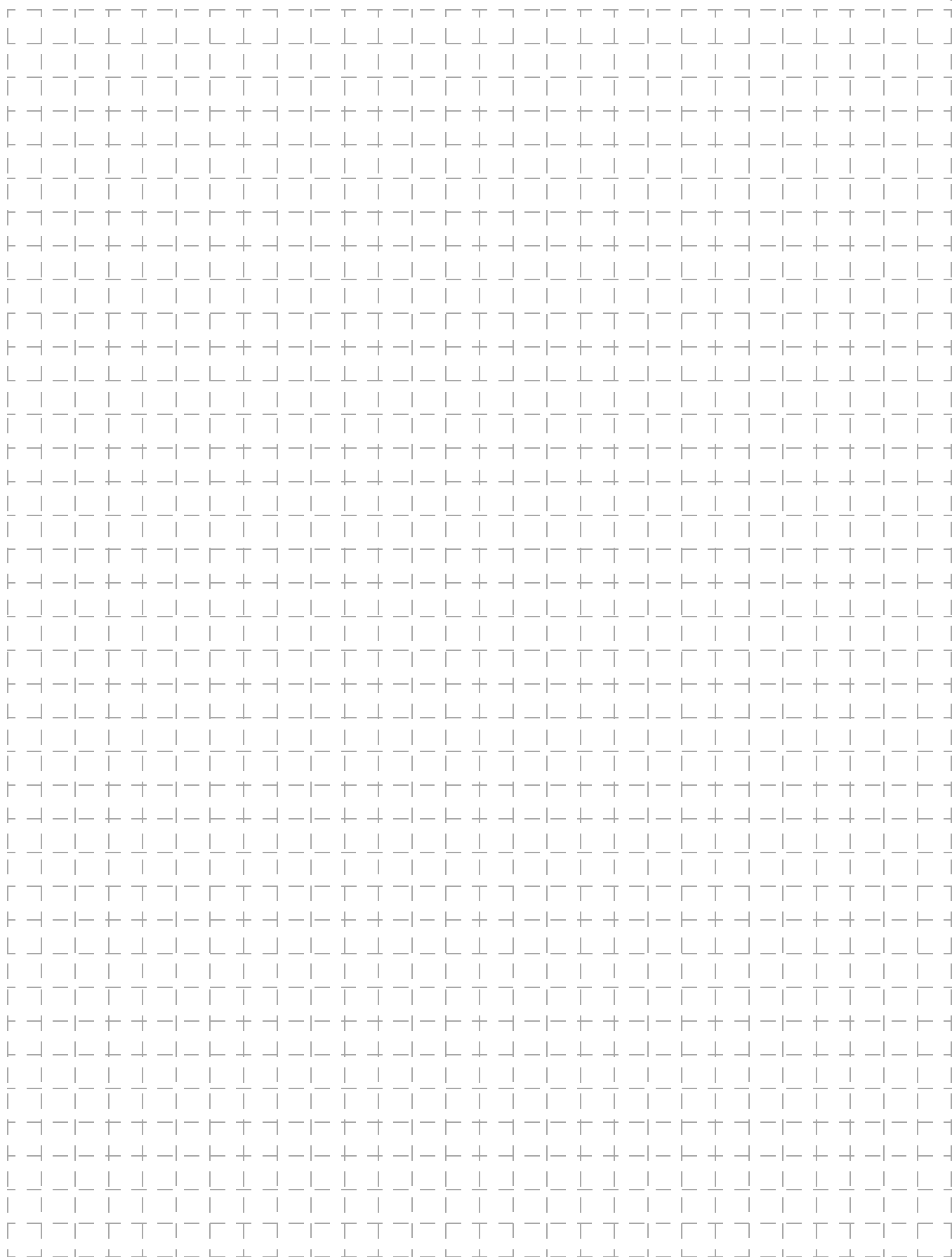
Do not apply excessive operating force to the Switch. Otherwise the Switch may be damaged or deformed, and the switch mechanism may malfunction as a result. Apply an operating force not exceeding 9.8 N (1,000 gf). Apply the operating load from the side of the striker in the direction of actuation travel. Do not apply a load from an angle or from above the striker. Doing so may deform the Switch contact.

## ■ RoHS Compliant

The "RoHS Compliant" designation indicates that the listed models do not contain the six hazardous substances covered by the RoHS Directive.

Reference: The following standards are used to determine compliance for the six substances.

|                      |                |
|----------------------|----------------|
| Lead:                | 1,000 ppm max. |
| Mercury:             | 1,000 ppm max. |
| Cadmium:             | 100 ppm max.   |
| Hexavalent chromium: | 1,000 ppm max. |
| PBB:                 | 1,000 ppm max. |
| PBDE:                | 1,000 ppm max. |



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**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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