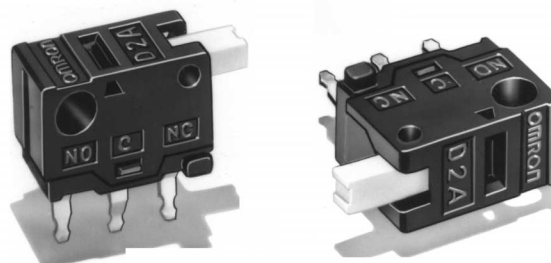


Ultra Subminiature Pushbutton Switch

D2A

Ultra Subminiature Detection Switch with Pushbutton Action

- Compact (8 × 6 × 4.2 mm (W × H × D)), light weight (approximately 0.3 g), and 3-mm long stroke.
- Built-in slide mechanism for selecting shorting or non-shorting timing of the switch.
- The switch's small size makes it ideal for household appliances, audio equipment, office equipment, communications equipment, etc.



Ordering Information

■ Model Number Legend

D2A- 1 0
 1 2

1. **Switching Timing**
1: Non-shorting
2: Shorting

2. **Operating Force max.**
1: 0.98 N {100 gf}
2: 0.49 N {50 gf}

■ List of Models

Actuator	OF 0.98 N {100 gf}		OF 0.49 N {50 gf}	
	Non-shorting Model	Shorting Model	Non-shorting Model	Shorting Model
Pin pushbutton	D2A-1110	D2A-2110	D2A-1120	D2A-2120

Specifications

■ Ratings

Electrical ratings	0.1 A at 30 VDC (resistive load)
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Note: The ratings values hold under the following test conditions:
 Ambient temperature: 20±2°C
 Ambient humidity: 65±5%
 Operating frequency: 30 operations/min

■ Characteristics

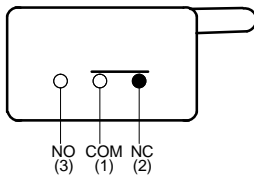
Operating speed	1 to 500 mm/s
Operating frequency	Mechanical: 200 operations/min Electrical: 30 operations/min
Insulation resistance	100 MΩ min. (at 250 VDC)
Contact resistance	50 mΩ max. (initial value)
Dielectric strength	250 VAC, 50/60 Hz for 1 min between terminals of same polarity 250 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Malfunction: 300 m/s ² {approx. 30G} max.
Life expectancy	50,000 operations min.
Degree of protection	IP00
Degree of protection against electric shock	Class III
Proof tracking index (PTI)	175
Ambient temperature	Operating: -10°C to 70°C (with no icing)
Ambient humidity	Operating: 35% to 85% max.
Weight	Approx. 0.3 g

■ Contact Specifications

Contact specification	Slide
Contact material	Silver alloy
Minimum operating load (See note.)	1 mA at 5 VDC

Note: For more information on very small loads, refer to *Using Micro Loads* under *Precautions* on page 229.

■ Contact Form (SPDT)

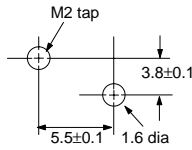


Dimensions

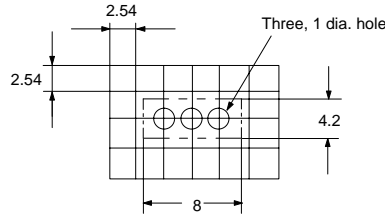
■ Mounting Holes

- Note:** 1. All units are in millimeters unless otherwise indicated.
 2. Use the following mounting dimensions when mounting the D2A with screws.

Mounting Holes



PCB Mounting Dimensions (Reference)

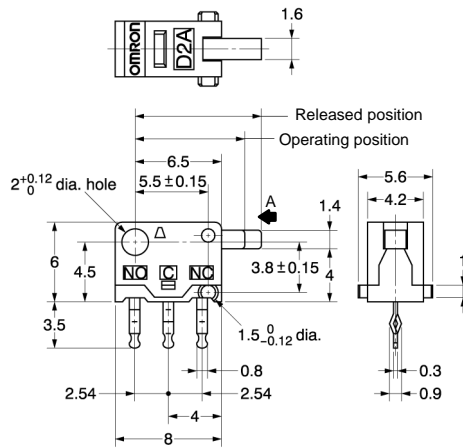
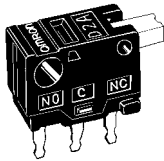


■ Dimensions and Operating Characteristics

- Note:** 1. All units are in millimeters unless otherwise indicated.
 2. Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions.
 3. The operating characteristics are for operation in the A direction (▼).

Pin Pushbutton Switches

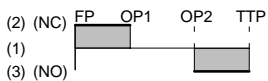
D2A-1110/-1120
 D2A-2110/2120



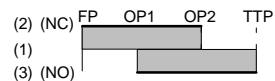
	Non-shorting Model		Shorting Model	
	D2A-1110	D2A-1120	D2A-2110	D2A-2120
OF max.	0.98 N {100 gf}	0.49 N {50 gf}	0.98 N {100 gf}	0.49 N {50 gf}
RF min.	0.15 N {15 gf}	0.05 N {5 gf}	0.15 N {15 gf}	0.05 N {5 gf}
TTP	6.5±0.2 mm			
FP max.	9.5 mm			
OP1	8.1±0.3 mm		8.0±0.3 mm	
OP2	7.4±0.3 mm		7.5±0.3 mm	

Switching Timing

Non-shorting Model



Shorting Model



Precautions

Refer to pages 26 to 33 for common precautions.

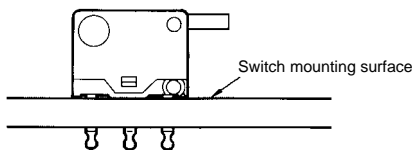
■ Cautions

Terminal Connection

When soldering the lead wire to the terminal, first bind the lead wire to the terminal and then apply the 6 (Sn) : 4 (Pb) solder to the terminal. Complete soldering within 5 s at a soldering iron temperature of 260°C. Soldering at a temperature exceeding 260°C, soldering for more than 5 s, or repeated soldering will degrade the Switch characteristics.

When soldering the lead wire to the PCB terminal, pay careful attention so that the flux and solder liquid level does not exceed the PCB level.

It is also recommended that you apply flux guard to the mounting surface of the Switch.



■ Correct Use

Mounting

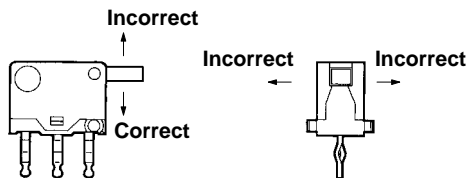
Turn OFF the power supply before mounting or removing the Switch, wiring, or performing maintenance or inspection. Failure to do so may result in electric shock or burning.

Use M1.6 mounting screws with plane washers or spring washers to securely mount the Switch. Tighten the screws to a torque of 4.9 to $9.8 \times 10^{-2} \text{ N} \cdot \text{m}$ (0.5 to 1 kgf \cdot cm).

Mount the Switch onto a flat surface. Mounting on an uneven surface may cause deformation of the Switch, resulting in faulty operation or breakage in the housing.

Application of Operation Force to the Lever

Apply operation forces to the pushbutton in its operating direction. Applying operating force to the pushbutton in any other directions will damage the Switch or cause malfunction.



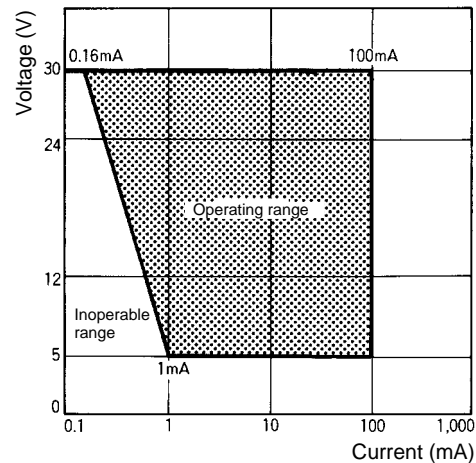
Mounting Plate

Use materials other than ABS or polycarbonate for the mounting plate. Since grease is used for the Switch, cracks may be caused if grease from the Switch comes in contact with such materials.

Using the Switch with Micro Loads

Using a model for ordinary loads to open or close the contact of a micro load circuit may result in faulty contact. Use models that operate in the following range. However, even when using micro load models within the operating range shown below, if inrush current occurs when the contact is opened or closed, it may increase contact wear and so decrease life expectancy. Therefore, insert a contact protection circuit where necessary.

The minimum applicable load is the N-level reference value. This value indicates the malfunction reference level for the reliability level of 60% ($\lambda 60$). The equation, $\lambda 60 = 0.5 \times 10^{-6} / \text{operations}$ indicates that the estimated malfunction rate is less than 1/2,000,000 operations with a reliability level of 60%.



Minimum operating load	1 mA at 5 VDC
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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.