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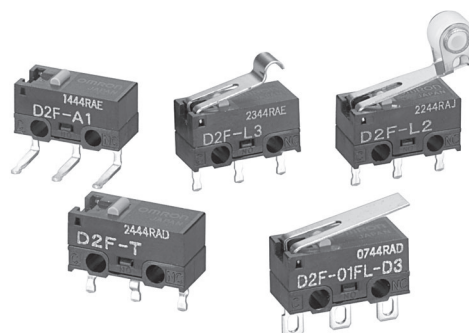
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# Snap Action Switch D2F

## Subminiature Snap Action Switch

- Switches 3 A loads (general-purpose), 1 A loads (low force general-purpose) and 0.1 A loads (microvoltage/microcurrent)
- Long life span assured by high-precision dual spring reverse-action mechanism
- Flux penetration prevented by using an insert terminal and allowing a height difference at the case bottom
- Ideal for a wide range of applications including appliances, office equipment, audio and communications equipment
- RoHS Compliant



## Ordering Information

Actuator	Contact type	Model	Contact OF	Model					
				Terminal type					
				PCB	Self-supporting	Solder	Compact Solder	Right-angle	Left-angle
	Microvoltage/current	Low force	75 g	D2F-01F	D2F-01F-T	D2F-01F-D3	D2F-01F-D	D2F-01F-A	D2F-01F-A1
		Standard	150 g	D2F-01	D2F-01-T	D2F-01-D3	D2F-01-D	D2F-01-A	D2F-01-A1
	General-purpose	Low force	75 g	D2F-F	D2F-F-T	D2F-F-D3	D2F-F-D	D2F-F-A	D2F-F-A1
		Standard	150 g	D2F	D2F-T	D2F-D3	D2F-D	D2F-A	D2F-A1
	Microvoltage/current	Low force	25 g	D2F-01FL	D2F-01FL-T	D2F-01FL-D3	D2F-01FL-D	D2F-01FL-A	D2F-01FL-A1
		Standard	80 g	D2F-01L	D2F-01L-T	D2F-01L-D3	D2F-01L-D	D2F-01L-A	D2F-01L-A1
	General-purpose	Low force	25 g	D2F-FL	D2F-FL-T	D2F-FL-D3	D2F-FL-D	D2F-FL-A	D2F-FL-A1
		Standard	80 g	D2F-L	D2F-L-T	D2F-L-D3	D2F-L-D	D2F-L-A	D2F-L-A1
	Microvoltage/current	Low force	40 g	D2F-01FL3	D2F-01FL3-T	D2F-01FL3-D3	D2F-01FL3-D	D2F-01FL3-A	D2F-01FL3-A1
		Standard	80 g	D2F-01L3	D2F-01L3-T	D2F-01L3-D3	D2F-01L3-D	D2F-01L3-A	D2F-01L3-A1
	General-purpose	Low force	40 g	D2F-FL3	D2F-FL3-T	D2F-FL3-D3	D2F-FL3-D	D2F-FL3-A	D2F-FL3-A1
		Standard	80 g	D2F-L3	D2F-L3-T	D2F-L3-D3	D2F-L3-D	D2F-L3-A	D2F-L3-A1
	Microvoltage/current	Low force	40 g	D2F-01FL2	D2F-01FL2-T	D2F-01FL2-D3	D2F-01FL2-D	D2F-01FL2-A	D2F-01FL2-A1
		Standard	80 g	D2F-01L2	D2F-01L2-T	D2F-01L2-D3	D2F-01L2-D	D2F-01L2-A	D2F-01L2-A1
	General-purpose	Low force	40 g	D2F-FL2	D2F-FL2-T	D2F-FL2-D3	D2F-FL2-D	D2F-FL2-A	D2F-FL2-A1
		Standard	80 g	D2F-L2	D2F-L2-T	D2F-L2-D3	D2F-L2-D	D2F-L2-A	D2F-L2-A1

## Model Number Legend

D2F-□ □ □ □  
1 2 3 4

### 1. Ratings

None: General loads  
01: Micro loads (0.1 A at 30 VDC)

### 2. Maximum Operating Force

None: 1.47 N {150 gf}  
F: 0.74 N {75 gf}

**Note:** These OF values are for the pin plunger models.

### 3. Actuator

None: Pin plunger  
L: Hinge lever  
L2: Hinge roller lever  
L3: Simulated roller lever

### 4. Terminals

None: PCB terminals/straight terminals  
-T: Self-clinching PCB terminals  
-A: Right-angled PCB terminals  
-A1: Left-angled PCB terminals  
-D3: Solder terminals  
-D: Compact solder terminals

# Specifications

## ■ Characteristics

Operating speed	1 to 500 mm/second (pin plunger models)
Operating frequency	Mechanical: 200 operations per minute max. Electrical: 30 operations per minute max.
Contact resistance	General Purpose: 30 mΩ max. (Standard force versions) 50 mΩ max. (Low force versions) Microload: 100 mΩ max.
Insulation resistance	100 MΩ min. at 500 VDC
Dielectric strength (See note 2)	600 VAC, 50/60 Hz for 1 minute between terminals of same polarity 1,500 VAC, 50/60 Hz for 1 minute between current-carrying metal parts and ground, and between each terminal and non-current-carrying metal parts
Vibration resistance (See note 3)	Malfunction: 10 to 55 Hz, 1.5 mm double amplitude
Shock resistance (See note 3)	Destruction: 1,000 m/s <sup>2</sup> (approx. 100G) max. Malfunction: 300 m/s <sup>2</sup> (approx. 30 g min.) max.
Degree of protection	IEC IP40
Degree of protection against electric shock	Class I
Proof tracking index (PTI)	175
Ambient operating temperature	-25° to 65°C (at 60% RH) with no icing
Ambient operating Humidity	85% max. (for 5° to 35°C)
Service life (Consult Omron for test conditions)	Mechanical: 1 million operations min. at 60 operations/minute. Electrical: 30,000 operations min. at 30 operations/minute.
Weight	Approx. 0.5 g (pin plunger models)

- Note:** 1. Data shown are of initial value.  
2. The dielectric strength shown in the table indicates a value for models with a separator.  
3. For pin plunger models, the values are measured at the free position and total travel position. For the lever models, they are measured at the total travel position.

## ■ Ratings

Rated Voltage	Resistive load			
	Microvoltage/current (D2F-01 models)		General-purpose (D2F models)	
	Low force	Standard	Low force	Standard
125 VAC	—	—	1 A	3 A
30 VDC	0.1 A	0.1 A	0.5 A	2 A

- Note:** 1. When using an inductive load or motor load, consult OMRON.  
2. The ratings apply under the following test conditions: Ambient Temperature = 20±2°C, Ambient Humidity = 65±5%, Operating frequency = 30 operations/min.

## ■ Approvals

### UL Recognized, CSA Certified

Rated voltage	D2F		D2F-01
	Standard Force	Low Force	
125 VAC	3 A	1A	---
30 VDC	2 A	0.5 A	0.1 A

**Note:** The rated values approved by each of the safety standards (e.g.UL,CSA) may be different from the performance characteristics individually defined in this catalog.

## ■ Contact Specifications

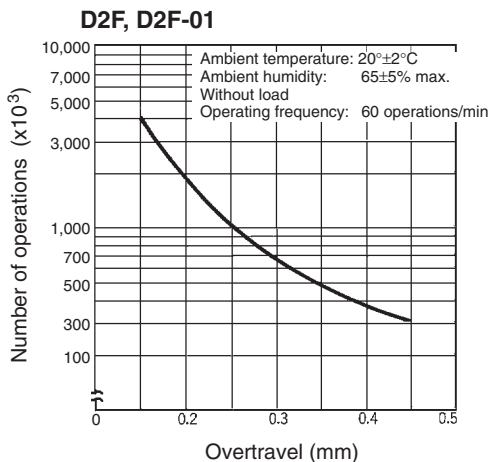
Item	D2F	D2F-01
Specification	Crossbar	
Material	Silver alloy	Gold alloy
Gap (Standard value)	0.25 mm	
Minimum Applicable Load (See note)	100 mA at 5 VDC	1 mA at 5VDC

**Note:** Minimum applicable loads are indicated by N standard reference values. This value represents the failure rate at a 60% ( $\lambda_{60}$ ) reliability level (JIS C5003).

The equation  $\lambda_{60}=0.5 \times 10^{-6}$ /operations indicates that a failure rate of 1/2,000,000 operations can be expected at a reliability level of 60%.

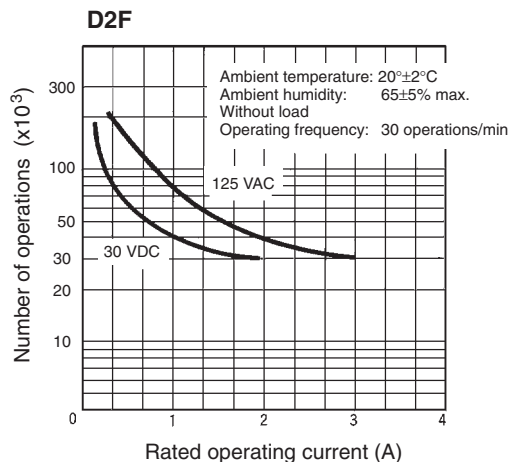
# Engineering Data

## ■ Mechanical Service Life



Note: Values are for pin plunger actuator type.

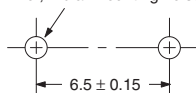
## ■ Electrical Service Life



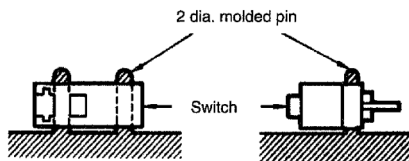
## ■ Mounting

All switches may be panel mounted using M2 mounting screws with plane washers or spring washers to securely mount the switch. Tighten the screws to a torque of 0.08 to 0.1 N-m.

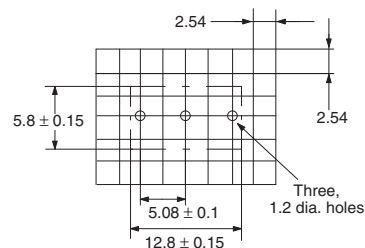
Two, 2-dia. mounting holes



Use of molded components is recommended for mounting purposes

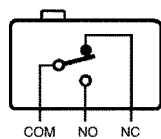


## ■ PCB Layout (reference)



## ■ Structure

### Contact Form (SPDT)

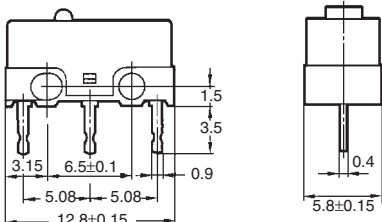


# Dimensions

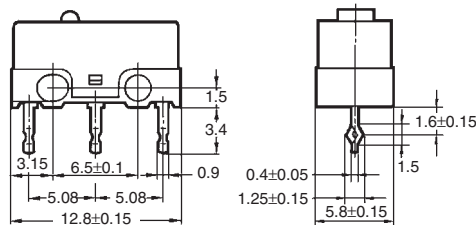
## ■ Terminals

Note: Unless otherwise specified, all units are in millimeters and a tolerance of  $\pm 0.4$  mm applies to all dimensions

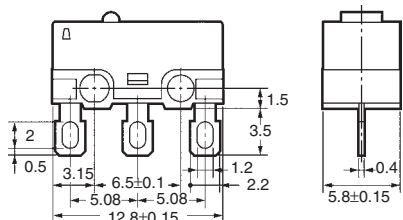
### PCB terminals D2F



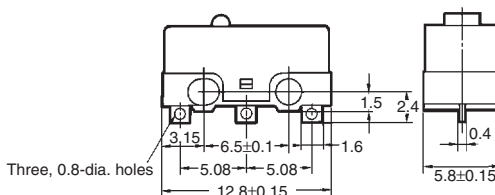
### Self-supporting terminals D2F-T



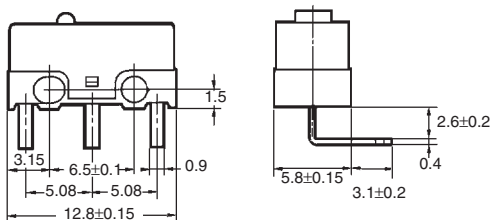
### Solder terminals D2F-D3



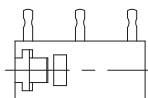
### Compact solder terminals D2F-D



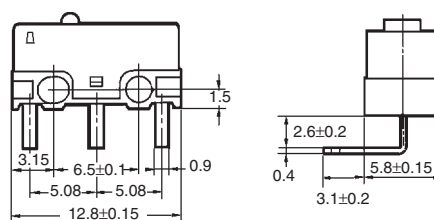
### Right-angle PCB terminals D2F-A



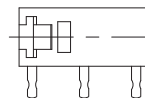
(Top view)



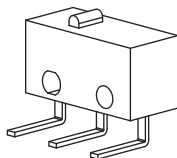
### Left-angle PCB terminals D2F-A1



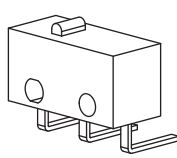
(Top view)



Note: Angled terminal directions are shown below.



Left-angled terminal



Right-angled terminal

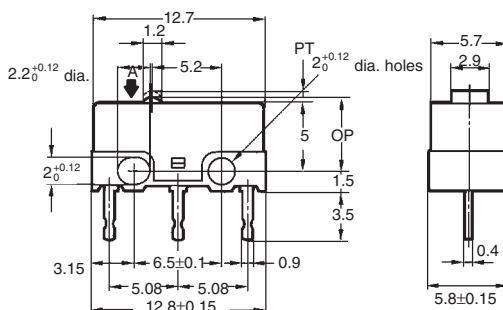
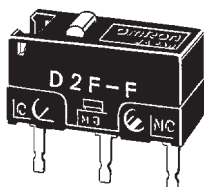
## ■ Dimensions and Operating Characteristics

Note: 1. Unless otherwise specified, all units are in millimeters and a tolerance of  $\pm 0.4$  mm applies to all dimensions

- Omitted dimensions are the same as pin plunger type.
- The following illustrations and dimensions are for models with PCB terminals. Refer to "Terminals" for models with self-supporting, solder and right / left angle terminal specifics.
- The operating characteristics are for operation in the A direction(↓)

### Pin Plunger Models

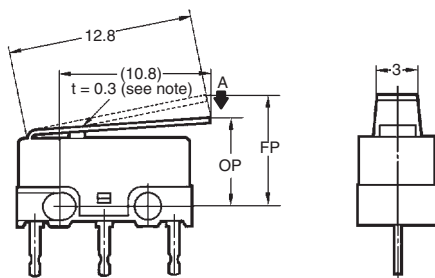
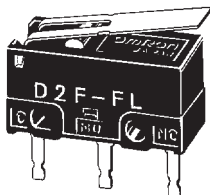
D2F-□  
D2F-01-□  
D2F-F-□  
D2F-01F-□



Characteristics	D2F-□ D2F-01-□	D2F-F-□ D2F-01F-□
OF max.	150 g	75 g
RF min.	20 g	5 g
PT max.	0.5 mm	0.5 mm
OT min.	0.25 mm	0.25 mm
MD max.	0.12 mm	0.12 mm
OP	5.5 ± 0.3 mm	5.5 ± 0.3 mm
FP max.	—	—

### Hinge Lever Models

D2F-L-□  
D2F-01L-□  
D2F-FL-□  
D2F-01FL-□

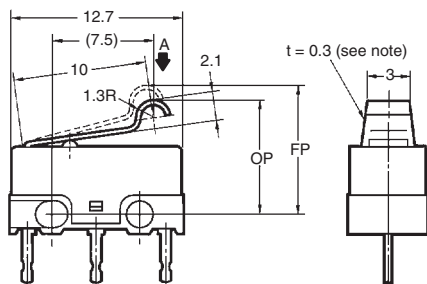
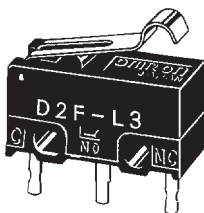


Note: Stainless-steel lever

Characteristics	D2F-L-□ D2F-01L-□	D2F-FL-□ D2F-01FL-□
OF max.	80 g	25 g
RF min.	5 g	2 g
PT max.	—	—
OT min.	0.55 mm	0.55 mm
MD max.	0.5 mm	0.5 mm
OP	6.8 ± 1.5 mm	6.8 ± 1.5 mm
FP max.	10 mm	10 mm

### Simulated Roller Lever Models

D2F-L3-□  
D2F-01L3-□  
D2F-FL3-□  
D2F-01FL3-□

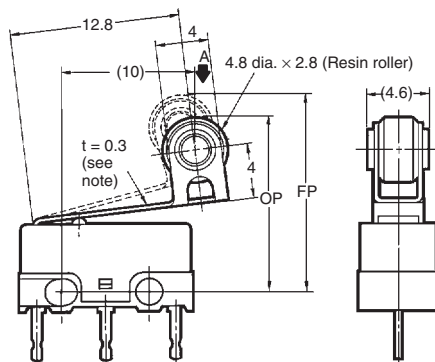
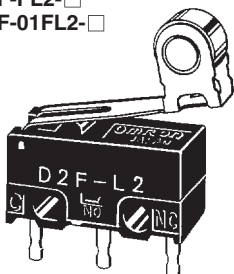


Note: Stainless-steel lever

Characteristics	D2F-L3-□ D2F-01L3-□	D2F-FL3-□ D2F-01FL3-□
OF max.	80 g	40 g
RF min.	5 g	2 g
PT max.	—	—
OT min.	0.5 mm	0.5 mm
MD max.	0.45 mm	0.45 mm
OP	8.5 ± 1.2 mm	8.5 ± 1.2 mm
FP max.	13 mm	13 mm

### Hinge Roller Lever Models

D2F-L2-□  
D2F-01L2-□  
D2F-FL2-□  
D2F-01FL2-□



Note: Stainless-steel lever

Characteristics	D2F-L2-□ D2F-01L2-□	D2F-FL2-□ D2F-01FL2-□
OF max.	80 g	40 g
RF min.	5 g	2 g
PT max.	—	—
OT min.	0.55 mm	0.55 mm
MD max.	0.5 mm	0.5 mm
OP	13 ± 2.0 mm	13 ± 2.0 mm
FP max.	16.5 mm	16.5 mm

# Precautions

Be sure to read the precautions and information common to all Snap Action and Detection Switches, contained in the Technical User's Guide, "Snap Action Switches, Technical Information" for correct use.

## ■ Correct Use

### Mounting

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

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

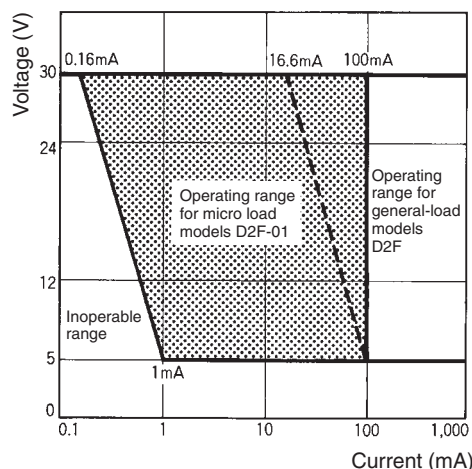
Allow sufficient insulation distance between terminals, terminal traces and between terminals and ground.

### Operating Stroke Setting

Take particular care in setting the operating stroke for the pin plunger models. Make sure that the operating stroke is 70% to 100% of the rated OT distance. Do not operate the actuator exceeding the OT distance, otherwise the service life of the switch maybe decreased.

### Using Microloads

Using a model for ordinary loads to switch microloads may result in faulty operation. Instead, use the models that are designed for microloads and that operate in the following range;



However, even when using microload models within the operating range shown above, if inrush current or inductive voltage spikes occur when the contact is opened or closed, it may increase contact wear and so decrease the service life. Therefore, insert a contact protection circuit where necessary.

## ■ Cautions

### Terminal Connection

When soldering a lead wire to the terminal, first insert the lead wire conductor into the terminal hole and then perform soldering.

Make sure that the capacity of the soldering iron is 30 W maximum and that the temperature of the soldering tip is approximately 300 °C. (350 °C maximum.) Complete soldering within 3 s. After soldering, do not apply external force to the soldered area for about 1 minute.

Using a switch with improper soldering may result in abnormal heating, possibly resulting in a burn.

Applying the soldering iron for more than 3 s or using an iron that is rated for more than 30 W may deteriorate 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.

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### I. GENERAL

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  - Seller:** Omron Electronic Components LLC and its subsidiaries
  - Buyer:** The buyer of Products, including any end user in section III through VI
  - Products:** Products and/or services of Seller
  - Including:** Including without limitation
- Offer; Acceptance:** These Terms are deemed part of all quotations, acknowledgments, invoices, purchase orders and other documents, whether electronic or in writing, relating to the sale of Products by Seller. Seller hereby objects to any Terms proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
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- Cancellation; Etc:** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Seller fully against all costs or expenses arising in connection therewith.
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- Shipping; Delivery:** Unless otherwise expressly agreed in writing by Seller:
  - All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Seller), at which point title to and all risk of loss of the Products shall pass from Seller to Buyer, provided that Seller shall retain a security interest in the Products until the full purchase price is paid by Buyer;
  - Delivery and shipping dates are estimates only; and
  - Seller will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
- Claims:** Any claim by Buyer against Seller for shortage or damage to the Products occurring before delivery to the carrier or any claim related to pricing or other charges must be presented in detail in writing to Seller within 30 days of receipt of shipment.

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- Suitability:** IT IS THE BUYER'S SOLE RESPONSIBILITY TO ENSURE THAT ANY OMRON PRODUCT IS FIT AND SUFFICIENT FOR USE IN A MOTORIZED VEHICLE APPLICATION. BUYER SHALL BE SOLELY RESPONSIBLE FOR DETERMINING APPROPRIATENESS OF THE PARTICULAR PRODUCT WITH RESPECT TO THE BUYER'S APPLICATION INCLUDING (A) ELECTRICAL OR ELECTRONIC COMPONENTS, (B) CIRCUITS, (C) SYSTEM ASSEMBLIES, (D) END PRODUCT, (E) SYSTEM, (F) MATERIALS OR SUBSTANCES OR (G) OPERATING ENVIRONMENT. Buyer acknowledges that it alone has determined that the Products will meet their requirements of the intended use in all cases. Buyer must know and observe all prohibitions of use applicable to the Product/s.
- Use with Attention:** The followings are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible use of any Product, nor to imply that any use listed may be suitable for any Product:
  - Outdoor use, use involving potential chemical contamination or electrical interference.

- Use in consumer Products or any use in significant quantities.
  - Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
  - Systems, machines, and equipment that could present a risk to life or property.
- Prohibited Use:** NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
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