

## A variety of D2F Models including Models Incorporating Simulated Hinge Lever and Hinge Roller Lever

- ROHS Compliant.
- Ultra sub-miniature switch (12.8 x 6.5x 5.8 (W x H x D)) ideal for PCB mounting.
- Incorporating a snapping mechanism made with two highly precise split springs which ensures a long service life (1,000,000 operations).
- Two-stage bottom different in level and insertion moulded terminals prevents flux penetration.
- PCB, self-clinching, solder, and right-angle terminals are available.
- Ideal for home appliances, audio equipment, office machines, and communications equipment.



## Ordering Information

### ■ Model Number Legend

D2F-□□□□  
1 2 3 4

#### 1. Ratings

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

#### 2. Operating Force max.

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

**Note:** These values are for the pin plunger model.

#### 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

# Ultra Subminiature Basic Switch (Non-Sealed) – D2F

## ■ List of Models

Actuator	Ratings		General loads		Micro loads	
			3A	1A	0.1A	
	OF max. (see note)		General-purpose 1.47N {150gf}	Low-operating Force 0.74N {75gf}	General-purpose 1.47N {150gf}	Low operating force 0.74N {75gf}
<b>Pin plunger</b> 	PCB terminals	PCB	D2F	D2F-F	D2F-01	D2F-01F
		Self-clinching	D2F-T	D2F-F-T	D2F-01-T	D2F-01F-T
		Right-angled	D2F-A	D2F-F-A	D2F-01-A	D2F-01F-A
		Left-angled	D2F-A1	D2F-F-A1	D2F-01-A1	D2F-01F-A1
	Solder terminals	Solder	D2F-D3	D2F-F-D3	D2F-01-D3	D2F-01F-D3
Compact solder		D2F-D	D2F-F-D	D2F-01-D	D2F-01F-D	
<b>Hinge lever</b> 	PCB terminals	PCB	D2F-L	D2F-FL	D2F-01L	D2F-01FL
		Self-clinching	D2F-L-T	D2F-FL-T	D2F-01L-T	D2F-01FL-T
		Right-angled	D2F-L-A	D2F-FL-A	D2F-01L-A	D2F-01FL-A
	Solder terminals	Left-angled	D2F-L-A1	D2F-FL-A1	D2F-01L-A1	D2F-01FL-A1
		Solder	D2F-L-D3	D2F-FL-D3	D2F-01L-D3	D2F-01FL-D3
Compact solder	D2F-L-D	D2F-FL-D	D2F-01L-D	D2F-01FL-D		
<b>Simulated roller lever</b> 	PCB terminals	PCB	D2F-L3	D2F-FL3	D2F-01L3	D2F-01FL3
		Self-clinching	D2F-L3-T	D2F-FL3-T	D2F-01L3-T	D2F-01FL3-T
		Right-angled	D2F-L3-A	D2F-FL3-A	D2F-01L3-A	D2F-01FL3-A
		Left-angled	D2F-L3-A1	D2F-FL3-A1	D2F-01L3-A1	D2F-01FL3-A1
	Solder terminals	Solder	D2F-L3-D3	D2F-FL3-D3	D2F-01L3-D3	D2F-01FL3-D3
Compact solder		D2F-L3-D	D2F-FL3-D	D2F-01L3-D	D2F-01FL3-D	
<b>Hinge roller lever</b> 	PCB terminals	PCB	D2F-L2	D2F-FL2	D2F-01L2	D2F-01FL2
		Self-clinching	D2F-L2-T	D2F-FL2-T	D2F-01L2-T	D2F-01FL2-T
		Right-angled	D2F-L2-A	D2F-FL2-A	D2F-01L2-A	D2F-01FL2-A
		Left-angled	D2F-L2-A1	D2F-FL2-A1	D2F-01L2-A1	D2F-01FL2-A1
	Solder terminals	Solder	D2F-L2-D3	D2F-FL2-D3	D2F-01L2-D3	D2F-01FL2-D3
Compact solder		D2F-L2-D	D2F-FL2-D	D2F-01L2-D	D2F-01FL2-D	

Note: The OF values shown in the table are for the pin plunger models.

## Specifications

### ■ Ratings

Item	OF max.	D2F models		D2F-01 models	
		1.47 N {150 gf} (General-purpose)	0.74 N {75 gf} (Low operating)	1.47 N {150 gf} (General-purpose)	0.74 N {75 gf} (Low operating)
		Resistive load			
Rated voltage	125 VAC	3 A	1 A	---	
	30 VDC	2 A	0.5 A	0.1 A	

Note: 1. Consult your OMRON representative before using the Switch with inductive or motor loads.

2. The ratings values apply under the following test conditions:

Ambient temperature: 20±2°C

Ambient humidity: 65±5%RH

Operating frequency: 30 operations/min

# Ultra Subminiature Basic Switch (Non-Sealed) – D2F

## ■ Characteristics

Operating speed	1 to 500 mm/s (at pin plunger models)
Operating frequency	Mechanical: 200 operations/min Electrical: 30 operations/min
Insulation resistance	100 M $\Omega$ min. (at 500 VDC)
Contact resistance (initial value)	D2F models: 30 m $\Omega$ max. D2F-F models: 50 m $\Omega$ max. D2F-01 models: 100 m $\Omega$ max.
Dielectric strength	600 VAC, 50/60 Hz for 1 min between terminals of the same polarity 1,500 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground (see note 1), and between each terminal and non-current-carrying metal part
Vibration resistance (see note 2)	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance (see note 2)	Destruction: 1,000 m/s <sup>2</sup> (approx. 100G) max Malfunction: 300 m/s <sup>2</sup> (approx. 30G) max.
Life expectancy	Electrical: D2F: 30,000 operations min. (Refer to Engineering Data) D2F-01: 100,000 operations min.
Degree of protection	IEC IP40
Degree of protection against electric shock	Class I
Proof tracking index (PTI)	175
Ambient temperature	Operating: -25°C to 85°C (at ambient humidity of 60% max) (with no icing)
Ambient humidity	Operating: 85% max. (for 5°C to 35°C)
Weight	Approx. 0.5 g (pin plunger models)

Notes: 1. The data given are initial values.

- For the pin plunger models, the values are at the free position and total travel position. For the lever models, they are at the total travel position.
- For testing conditions, consult your OMRON sales representative.

## ■ Approved Standards

UL1054 (File No. 41515)  
CSA C22.2 No. 55 (LR21642)

Rated voltage	D2F (general-purpose)	D2F (low operating force)	D2F-01
125 VAC	3 A	1 A	---
30 VDC	2 A	0.5 A	0.1 A

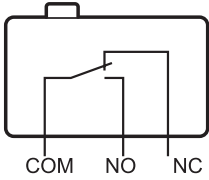
## ■ Contact Specifications

Item		D2F models	D2F-01 models
Contact	Specification	Crossbar	
	Material	Silver alloy	Gold alloy
	Gap (standard value)	0.25 mm	
Minimum applicable load		100 mA at 5 VDC	1 mA at 5 VDC

Note: For more information on minimum applicable load, refer to Using Micro Load at the end of this datasheet.

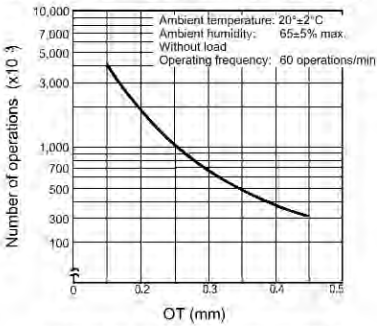
# Ultra Subminiature Basic Switch (Non-Sealed) – D2F

## Contact Form (SPDT)



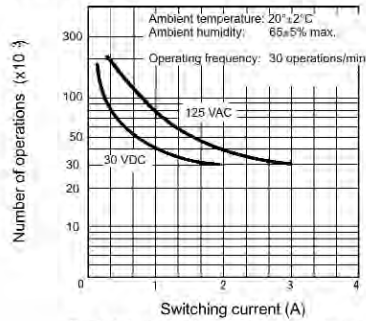
## Engineering Data

### Mechanical Life Expectancy (D2F, D2F-01)



The values are for the pin plunger model.

### Electrical Life Expectancy (D2F)



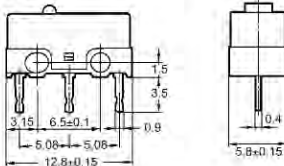
For details about the D2F-01, contact your OMRON sales representative.

## Dimensions

### ■ Terminals

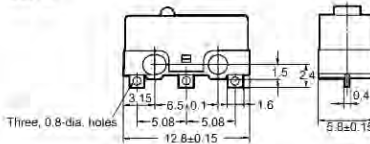
#### PCB Terminals (Standard)

##### D2F



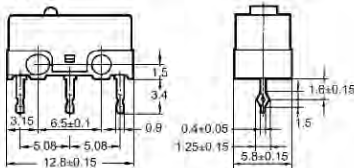
#### Solder Terminals

##### D2F-D



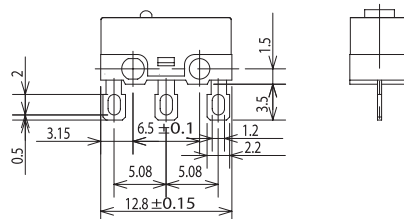
#### Self-clinching PCB Terminals

##### D2F-T



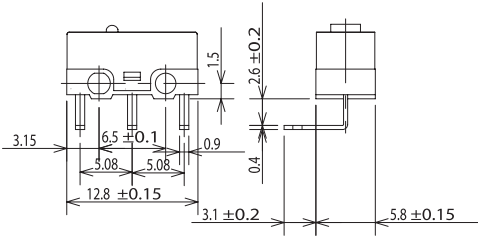
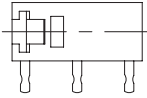
#### Solder Terminals

##### D2F-D3

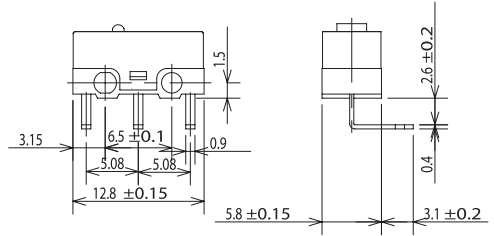
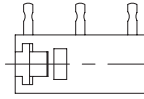


# Ultra Subminiature Basic Switch (Non-Sealed) – D2F

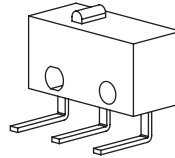
**PCB left-angle terminal  
D2F-A1**



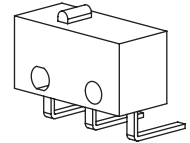
**PCB right-angle terminal  
D2F-A**



**Note:** Angled terminal directions are shown below.



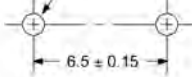
Left-angled terminal



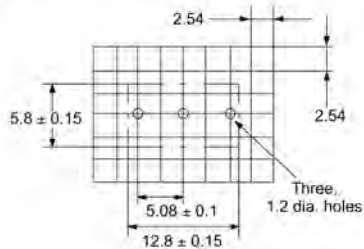
Right-angled terminal

## Mounting Holes

Two, 2-dia. mounting holes



## Mounting Dimensions



# Ultra Subminiature Basic Switch (Non-Sealed) – D2F

## ■ Dimensions and Operating Characteristics

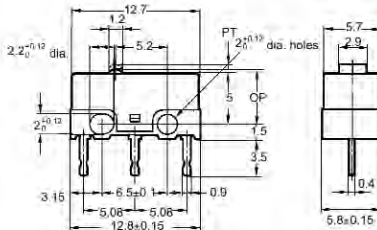
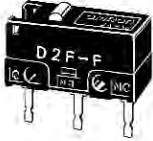
**Note:** 1. All units are in millimeters unless otherwise indicated.

2. Unless otherwise specified, a tolerance of  $\pm 0.4$  mm applies to all dimensions.

3. The following illustrations and drawings are for D2F models with PCB terminals. Self-clinching, solder, and right-angle terminals are omitted from the following drawings. When ordering, replace □ with the code for the terminal that you need.

### Pin Plunger

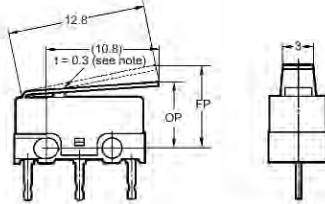
D2F-□  
D2F-01□  
D2F-F□  
D2F-01F□



Model	D2F-□ D2F-01□	D2F-F□ D2F-01F□
OF max.	1.47 N {150 gf}	0.74 N {75 gf}
RF min.	0.20 N {20 gf}	0.05 N {5 gf}
PT max.	0.5 mm	
OT min.	0.25 mm	
MD max.	0.12 mm	
OP	5.5±0.3 mm	

### Hinge Lever

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

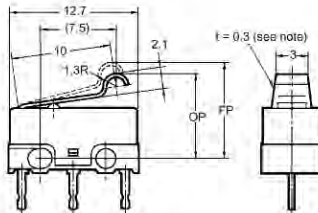


**Note:** Stainless-steel lever.

Model	D2F-L□ D2F-01L□	D2F-FL□ D2F-01FL□
OF max.	0.78 N {80 gf}	0.25 N {25 gf}
RF min.	0.05 N {5 gf}	0.02 N {2 gf}
OT min.	0.55 mm	
MD max.	0.5 mm	
FP max.	10 mm	
OP	6.8±1.5 mm	

### Simulated Roller Lever

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

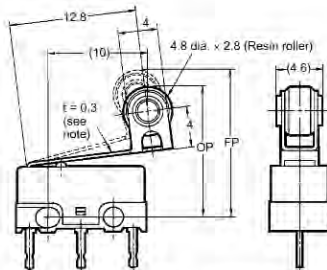


**Note:** Stainless-steel lever.

Model	D2F-L3□ D2F-01L3□	D2F-FL3□ D2F-01FL3□
OF max.	0.78 N {80 gf}	0.39 N {40 gf}
RF min.	0.05 N {5 gf}	0.02 N {2 gf}
OT min.	0.5 mm	
MD max.	0.45 mm	
FP max.	13 mm	
OP	8.5±1.2 mm	

### Hinge Roller Lever

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



**Note:** Stainless-steel lever.

Model	D2F-L2□ D2F-01L2□	D2F-FL2□ D2F-01FL2□
OF max.	0.78 N {80 gf}	0.39 N {40 gf}
RF min.	0.05 N {5 gf}	0.02 N {2 gf}
OT min.	0.55 mm	
MD max.	0.5 mm	
FP max.	16.5 mm	
OP	13±2 mm	

## Precautions

### ■ Mounting Dimensions

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 M2 mounting screws with plain or spring washers to mount the Switch. Tighten the screws to a torque of 0.08 to 0.1N • m {0.8 to 1 kgf • 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.

### ■ Terminal Connections

When soldering the lead wire to the terminal, first insert the lead wire conductor through the terminal and then apply solder. Use a soldering iron rated at 30 W maximum (temperature of soldering iron: 350°C max.) within 3 s.

If soldering is not carried out under the proper conditions there is a danger of over-heating and subsequent heat damage.

Applying a soldering iron for too long a time or using one that is rated at more than 30 W may degrade the Switch characteristics.

When soldering the PCB terminal to the PCB, the flux and solder liquid level should not exceed the PCB level.

### Handling

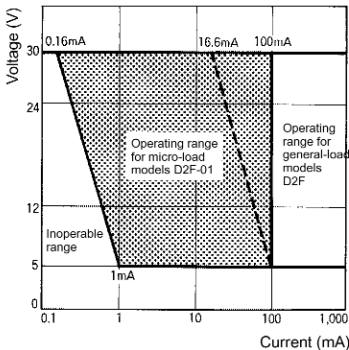
Mount the Switch on a smooth and flat surface. Mounting a Switch on an uneven surface may cause malfunction or break the housing.

### ■ Using Micro Loads

Using a model for ordinary loads to open or close the contact of a microload 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 durability. 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%.

Use the Switch in the following operating range.



**ALL DIMENSIONS SHOWN ARE IN MILLIMETRES.**

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