

# 12 x 12 SMD Tactile Switch

## B3FS-4

### Surface-mounting Switches with 12 x 12 mm size

- Surface-mounting device of B3F-4 series.
- Distinctive snapping action and extended mechanical and electrical service life.
- Available in embossed taping packages for automatic mounting.
- B32 series Keycaps are available for the projected plunger models
- RoHS Compliant



**NEW**

### Ordering Information

Type	Plunger	Height	Operating force (OF)	Plunger Color	Embossed tape	
					Model	Quantity per reel
12 x 12 mm (Flat)		4.3 mm	150 gf (1.47 N)	Black	B3FS-4002P	1,000
			260 gf (2.55 N)		B3FS-4005P <b>NEW</b>	
12 x 12 mm (Projected Plunger)		7.3 mm	150 gf (1.47 N)		B3FS-4052P <b>NEW</b>	500
			260 gf (2.55 N)		B3FS-4055P <b>NEW</b>	

**Note:** Order in multiples of the minimum order unit. Switches are not sold individually.

### Specifications

#### ■ Characteristics

Contact form	SPST-NO
Switching capacity	1 to 50 mA at 5 to 24 VDC (resistive load)
Minimum permissible load (reference value)	10 $\mu$ A at 1 VDC (resistive load)
Contact resistance	100 m $\Omega$ max. (rated: 1 mA at 5 VDC)
Insulation resistance	100 M $\Omega$ (at 250 VDC)
Dielectric strength	500 VAC, 50/60 Hz for 1 min.
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction: 1,000 m/s <sup>2</sup> (approx. 100 G) max. Malfunction: 100 m/s <sup>2</sup> (approx. 10G) max.
Ambient operating temperature	-25 to 70°C (at 60% RH max.) with no icing or condensation
Ambient operating humidity	35% to 85% (at 5 to 35°C)
Service Life	3,000,000 operations min. (OF: 150 gf (1.47 N)) 1,000,000 operations min. (OF: 260 gf (2.55 N))
Weight	Approx. 1g

**Note:** Data shown are of initial value

#### ■ Operating Characteristics

Characteristics	B3FS-4002P	B3FS-4052P	B3FS-4005P	B3FS-4055P
Operating force (OF)	150 $\pm$ 50 gf (1.47 $\pm$ 0.49 N)		260 $\pm$ 70 gf (2.55 $\pm$ 0.69 N)	
Release force (RF) min.	15 gf (0.15 N)		30 gf (0.29 N)	
Pretravel (PT)		0.25 $\pm$ 0.15 mm		

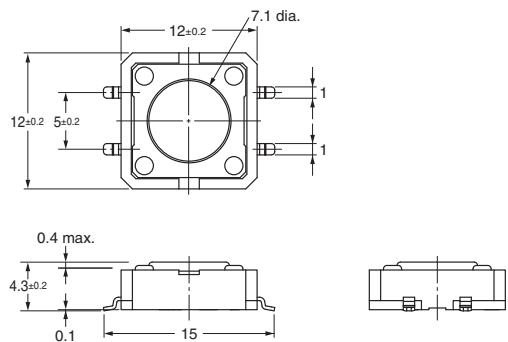
# Dimensions

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

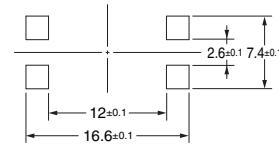
**2.** Terminal numbers are not indicated on this switch. With the switch turned over so that the logo mark "OMRON" is visible on the upper part of the rear side of the switch base, the terminal on the right of the logo mark is numbered "1" and that on the bottom right is "3." Accordingly, two terminals on the left side are numbered "2" and "4" respectively.

**B3FS-4002P**

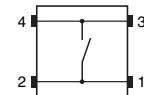
**B3FS-4005P**



**PCB Pad (Example)**  
(Top View)

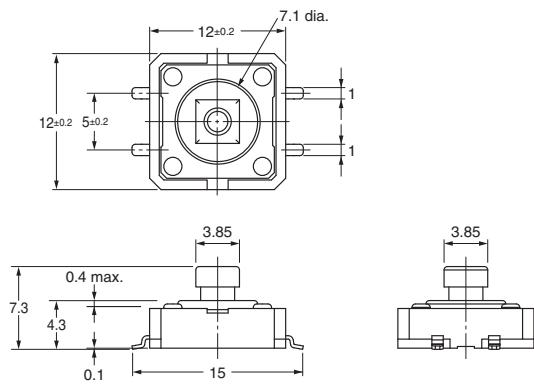


**Terminal Arrangement/**  
**Internal Connection**  
(Top View)

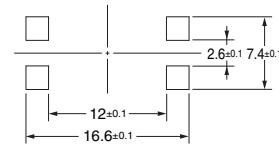


**B3FS-4052P**

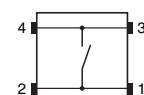
**B3FS-4055P**



**PCB Pad (Example)**  
(Top View)



**Terminal Arrangement/**  
**Internal Connection**  
(Top View)



# Precautions

Be sure to read the precautions common to all Tactile Switches, contained in the Technical User's Guide, "Tactile Switches, Technical Information" for correct use.

## ■ Precautions for Correct Use

### Soldering

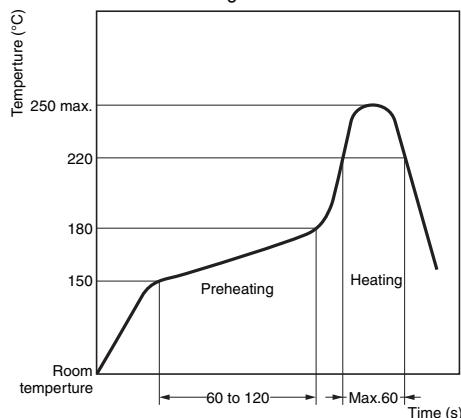
#### General Precautions

Before soldering the Switch on a multilayer PCB, test to confirm that soldering can be performed properly. Otherwise the Switch may be deformed by the soldering heat on the pattern or lands of the multilayer PCB.

Do not solder the Switch more than twice, including rectification soldering. An interval of five minutes is required between the first and the second soldering, or it may result in melting housing and deterioration of operating characteristics.

#### Reflow Soldering (Surface Mounting)

Solder the terminals within the heating curve shown in the following diagram.



**Note:** The above heating curve applies if the PCB thickness is 1.6 mm.

The peak temperature may vary depending on the reflow bath used. Confirm the conditions beforehand.

Do not use an automatic soldering bath for surface-mounted Switches. The soldering gas or flux may enter the Switch and damage the Switch's plunger operation.

#### Manual Soldering

Soldering temperature: 350 degC max. at the tip of the soldering iron  
Soldering time: 3 s max. for a 1.6-mm thick, single-side PCB

Before soldering the Switch on a PCB, make sure that there is no unnecessary space between the Switch and the PCB.

#### Washing

This switch cannot be washed.

Doing so will cause the washing agent, together with flux or dust particles on the PCB, to enter the Switch, resulting in malfunction.

#### PCBs

If the PCBs are separated after mounting the Switch, particles from the PCBs may enter the Switch. If PCB particles or foreign particles from the surrounding environment, workbench, containers, or stacked PCBs become attached to the Switch, contact failure may result.

### RoHS Compliant

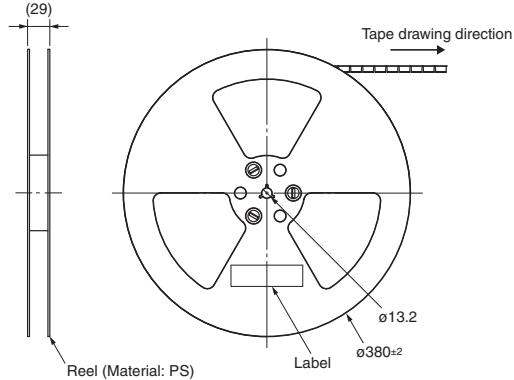
The "RoHS Compliant" designation indicates that the listed models do not contain the six hazardous substances covered by the RoHS Directive.

#### Reference:

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

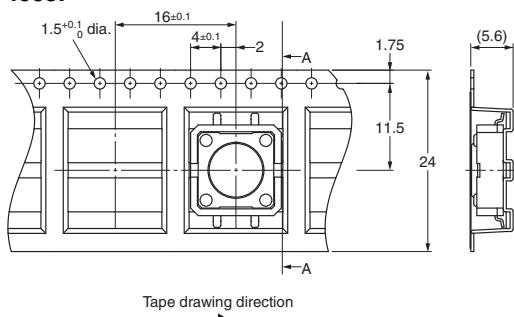
Lead:	1,000 ppm max.
Mercury:	1,000 ppm max.
Cadmium:	100 ppm max.
Hexavalent chromium:	1,000 ppm max.
PBB:	1,000 ppm max.
PBDE:	1,000 ppm max.

### Packaging Specifications for Embossed Taping



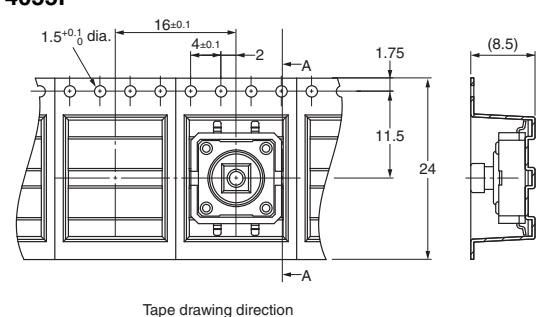
B3FS-4002P

B3FS-4005P



B3FS-4052P

B3FS-4055P



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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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