## $12 \times 12$ SMD Tactile Switch B3FS-4

## Surface-mounting Switches with $12 \times 12 \mathrm{~mm}$ 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



## Ordering Information

| Type | Plunger | Height | Operating force (OF) | Plunger Color | Embossed tape |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Model | Quantity per reel |
| $\underset{\text { (Flat) }}{12 \times 12 \mathrm{~mm}}$ |  | 4.3 mm | $\begin{gathered} \hline 150 \mathrm{gf} \\ (1.47 \mathrm{~N}) \end{gathered}$ | Black | B3FS-4002P | 1,000 |
|  |  |  | $\begin{gathered} 260 \mathrm{gf} \\ (2.55 \mathrm{~N}) \end{gathered}$ |  | B3FS-4005P NEW |  |
| $12 \times 12 \mathrm{~mm}$ (Projected Plunger) |  | 7.3 mm | $\begin{gathered} \hline 150 \mathrm{gf} \\ (1.47 \mathrm{~N}) \end{gathered}$ |  | B3FS-4052P NEW | 500 |
|  |  |  | $\begin{aligned} & 260 \mathrm{gf} \\ & (2.55 \mathrm{~N}) \end{aligned}$ |  | B3FS-4055P NEW |  |

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) | $10 \mu \mathrm{~A}$ at 1 VDC (resistive load) |
| Contact resistance | $100 \mathrm{~m} \Omega$ max. (rated: 1 mA at 5 VDC) |
| Insulation resistance | $100 \mathrm{M} \Omega$ (at 250 VDC ) |
| Dielectric strength | $500 \mathrm{VAC}, 50 / 60 \mathrm{~Hz}$ for 1 min . |
| Vibration resistance | Malfunction: 10 to $55 \mathrm{~Hz}, 1.5-\mathrm{mm}$ double amplitude |
| Shock resistance | Destruction: $1,000 \mathrm{~m} / \mathrm{s}^{2}$ (approx. 100 G ) max. Malfunction: $100 \mathrm{~m} / \mathrm{s}^{2}$ (approx. 10G) max. |
| Ambient operating temperature | -25 to $70^{\circ} \mathrm{C}$ (at $60 \%$ RH max.) with no icing or condensation |
| Ambient operating humidity | $35 \%$ to $85 \%$ (at 5 to $35^{\circ} \mathrm{C}$ ) |
| Service Life | 3,000,000 operations min. (OF: $150 \mathrm{gf}(1.47 \mathrm{~N})$ ) $1,000,000$ operations min. (OF: $260 \mathrm{gf}(2.55 \mathrm{~N})$ ) |
| Weight | Approx. 1 g |

Note: Data shown are of initial value

## ■Operating Characteristics

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

## Dimensions

Note: 1. Unless otherwise specified, all units are in millimeters and a tolerance of $\pm 0.4 \mathrm{~mm}$ 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
en:
(BOTTOM VIEW) 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)


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 $1.6-\mathrm{mm}$ 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: | $1,000 \mathrm{ppm}$ max. |
| :--- | :--- |
| Mercury: | $1,000 \mathrm{ppm}$ max. |
| Cadmium: | 100 ppm max. |
| Hexavalent chromium: | $1,000 \mathrm{ppm}$ max. |
| PBB: | $1,000 \mathrm{ppm}$ max. |
| PBDE: | $1,000 \mathrm{ppm}$ max. |

## Packaging Specifications for Embossed Taping



B3FS-4002P
B3FS-4005P


B3FS-4052P
B3FS-4055P


All sales are subject to Omron Electronic Components LLC standard terms and conditions of sale, which can be found at http://www.components.omron.com/components/web/webfiles.nsf/sales_terms.html

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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