Tactile Switches

Technical Information

Cautions

Use the Switch within the rated voltage and current ranges, otherwise the Switch may have a shortened life expectancy, radiate heat, or burn out.

This particularly applies to the instantaneous voltages and currents when switching.

Correct Use

■ Storage

Storage Environment

To prevent degradation, such as discoloration of the terminals during storage, do not store the Switch in locations that are subject to the following conditions;

- High temperature or humidity
- Corrosive gases
- Direct sunlight

Storage condition

Store the Switches in the packaging box.

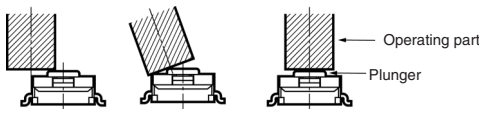
After the packaging box is opened, use the contents as quickly as possible. When storing leftover parts, make sure that appropriate measures are taken against humidity and corrosive gases.

■ Handling

1. Operation

Do not repeatedly operate the Switch with excessive force. Applying excessive pressure or applying additional force after the plunger has stopped may deform the contact dome of the Switch, resulting in malfunction. In particular, applying excessive force to side-operated switches may damage the caulking, which in turn may damage the switch. Do not apply force exceeding the maximum (29.4N {300 gf} for 1 minute, one time) when installing or operating side-operated switches.

Be sure to set up the Switch so that the plunger will operate in a straight vertical line. A decrease in the life of the Switch may result if the plunger is pressed off-center or from an angle.

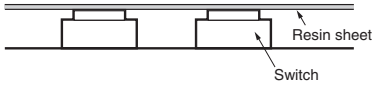


Incorrect Incorrect Correct

Tactile Switch is not recomended to use for detection purposes. Omron's Detection or Snap-action switches are recommended for this purpose.

2. Dust Protection

Do not use switches that are not sealed in dust-prone environments. Doing so may cause dust to penetrate inside the switch and cause contact failure. If a switch that is not sealed must be used in this kind of environment, use a resin sheet as shown below or other measure to protect it against dust.



3. Usage Environment

Before installing the switch, make sure that the area of installation is not subject to corrosive gases emited from surrounding parts.

Do not use in areas subject to high temeratures, high humidity or toxic gases such as sulfuric gas (H_2S, SO_2), ammonia gas (NH_3), nitric gas (HNO_3), or chlorine gas (Cl_2). It can cause corrosive damage to the contacts and result in malfunction.

If there is silicon in the atmosphere, it may stop the contacts from functioning properly. If silicon products such as silicon oil, silicon filler or silicon wires are used in the surrounding area, install a contact protection circuit to prevent arching or remove the silicon source.

The following situations may cause water to enter inside of the Swtich, resulting in a malufunction due to contact failure or corrosion:

- Using the switch in an outdoor environment where it is exposed to water drops for an extended period of time.
- Using the switch in an underwater setting where it is subject to strong water pressure.

Do not use switches that have been dripped. The mating section or other internal parts may be damaged, resulting in malfunction.

■ PCBs

The Switch is designed for a 1.6-mm thick, single-side PCB.

Using PCBs with a different thickness or using double-sided, through-hole PCBs may result in loose mounting, improper insertion, or poor heat resistance in soldering. These effects will occur, depending on the type of holes and patterns of the PCB. Therefore, it is recommended that a verification test is conducted before use.

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 PCB's become attached to the switch, contact failure may result.

■ Soldering

1. 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 second soldering.

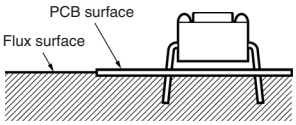
2. Automatic Soldering Baths
(B3F, B3W, B3WN, B3M, B3J)

Soldering temperature: 260°C max.

Soldering time: 5 s max. for a 1.6-mm thick single-side PCB

Preheating Temp: 100°C max. (ambient Temp.) within 60 s.

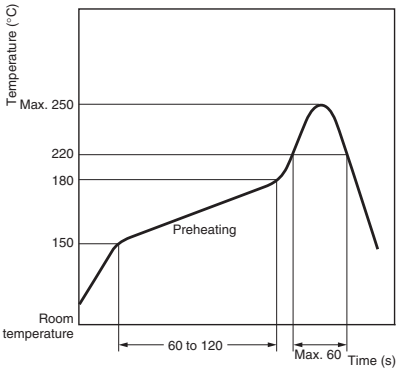
Make sure that no flux will rise above the level of the PCB. If flux overflows onto the mounting surface of the PCB, it may enter the Switch and cause a malfunction.



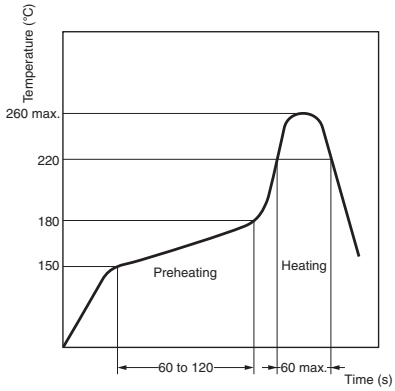
3. Reflow Soldering (Surface Mounting)

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

B3FS, B3SN, B3S



B3SL, B3U, B3AL



Note: The above heating curves apply 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 push-button operation.

4. Manual Soldering (All Models)

Soldering temperature: 350°C 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

1. Washable and Non-washable Models

Washable (sealed types)	B3W, B3WN, B3S, B3SN
Non-washable (Standard types)	B3F, B3FS, B3SL, B3W-9, B3J, B3M, B3U, B3AL

Standard Switches are not sealed, and 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.

2. Washing Methods

Washing equipment incorporating more than one washing bath can be used to clean washable models, provided that the washable models are cleaned for one minute maximum per bath and the total cleaning time does not exceed three minutes.

3. Washing Agents

Apply alcohol-based solvents to clean washable models. Do not apply any other agents or water to clean any washable model, as such agents may degrade the materials or performance of the Switch.

4. Washing Precautions

Do not impose any external force on washable models while washing.

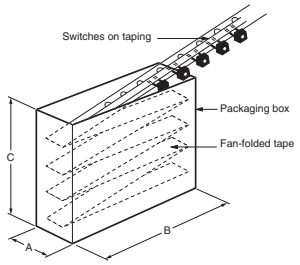
Do not clean washable models immediately after soldering. The cleaning agent may be absorbed into the Switch through respiration as the Switch cools. Wait for at least three minutes after soldering before cleaning washable models.

Do not use Sealed Switches while submersed in water or in locations exposed to water.

■ Tape Packaging

1. Radial Types

The tape is packaged by fan-folding into the box, as shown in the following diagram.



Model	A	B	C
B3F	50 mm	325 mm	275 mm
B3WN	53 mm	326 mm	350 mm

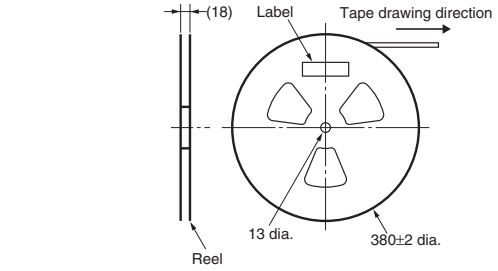
Do not apply any external force to the packaging box, or subject it to vibration. Doing so may deform the Switch terminals.

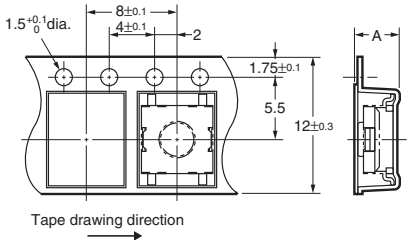
Remove the tape slowly, making sure that the Switches are not entangled or caught. Otherwise the terminals may be deformed.

Do not store the packaged Switches in locations subject to high temperatures or high humidity. The packaging boxes are sealed with paper tape and are not airtight. Storing the packaged Switches in locations with high temperature or high humidity may result in deterioration of the tape and Switches, and long-term storage under such conditions may cause discoloration of the Switch terminals.

2. Packaging for Embossed Tape

B3FS-1000P, B3SN



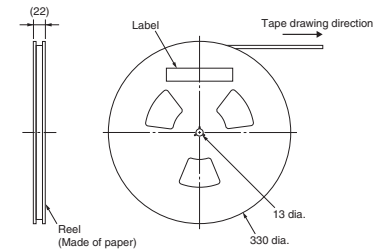


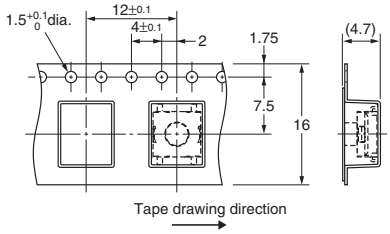
Model	A
B3FS-1000P	3.9 mm
B3SN	3.6 mm

Standards	Conforms to JEITA.
Package	3,000 Switches
Heat resistance	50°C for 24 hours (without deformation)

Note: Switches with ground terminals are packaged with the ground terminal on the opposite side of the guide hole.

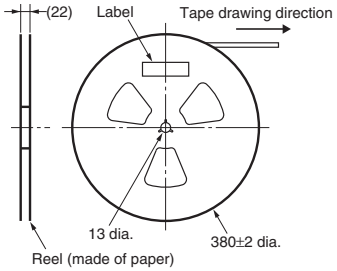
B3FS-1010P

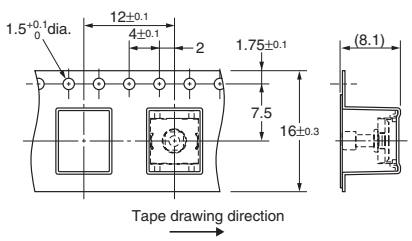




Standards	Conforms to JEITA.
Package	1,000 Switches
Heat resistance	60°C for 24 hours (without deformation)

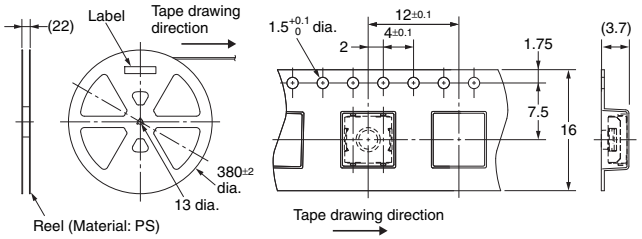
B3FS-1050P



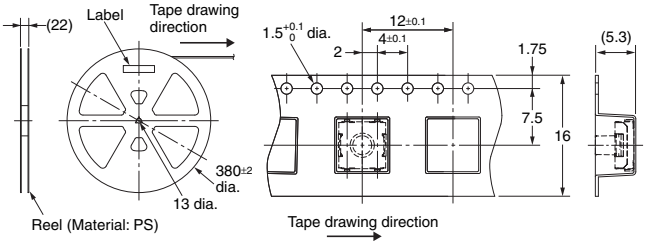


Standards	Conforms to JEITA.
Package	1,000 Switches
Heat resistance	60°C for 24 hours (without deformation)

B3SL-1002P / 1005P

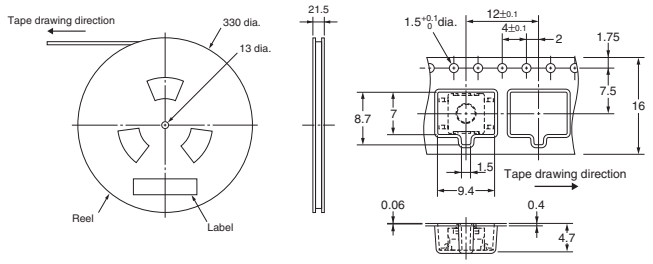


B3SL-1022P / 1025P



Standards	Conforms to JIS.
Package	2,000 Switches (B3SL-1002P / 1005P) 1,400 Switches (B3SL-1022P / 1025P)
Heat resistance	60°C for 24 hours (without deformation)

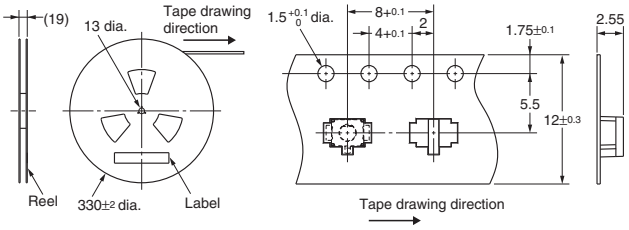
B3S



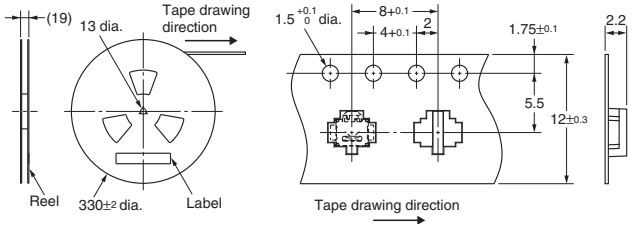
Standards	Conforms to JEITA.
Package	1,000 Switches
Heat resistance	50°C for 24 hours (without deformation)

Note: Switches with ground terminals are packaged with the ground terminal on the opposite side of the guide hole.

B3U-1000 Series

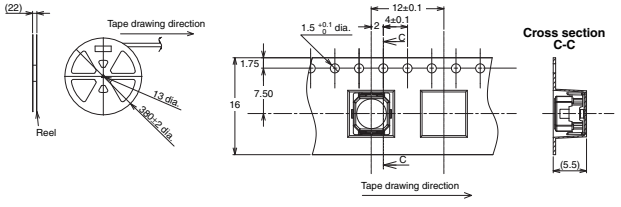


B3U-3000 Series



Standards	Conforms to JEITA.
Package	3,500 Switches (B3U-1000 Series) 4,000 Switches (B3U-3000 Series)
Heat resistance	50°C for 24 hours (without deformation)

B3AL Series



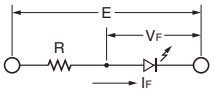
Standards	Conforms to JEITA.
Package	1,400 Switches
Heat resistance	50°C for 24 hours (without deformation)

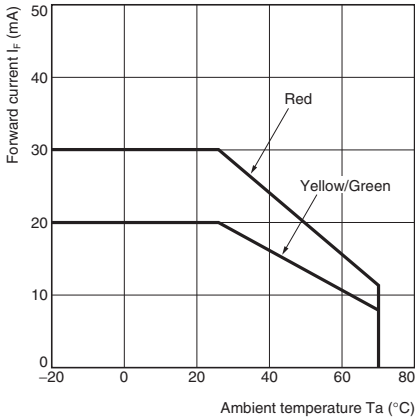
■ LEDs (B3J)

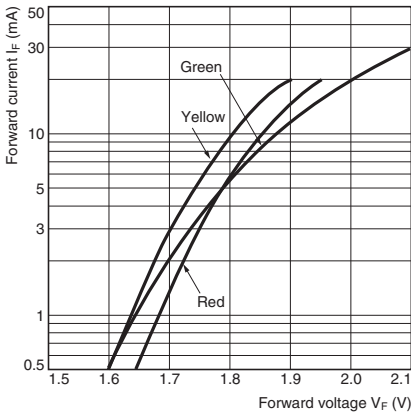
Make sure that the polarity of the LEDs is correct. The polarity is not indicated on the Switch, but the positive pole is located on the back surface of the Switch on the side without the OMRON mark.

Connect limiting resistors to the LEDs. The Switch does not have built-in limiting resistors, so satisfy the LED characteristics by obtaining the limiting resistance according to the following formula based on the voltage to be used.

$$\text{Limiting resistance (R)} = \frac{\text{(Voltage used (E) – LED forward voltage (VF))}}{\text{LED forward current (IF)}}\ (\Omega)$$







■ 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.

MEMO

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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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