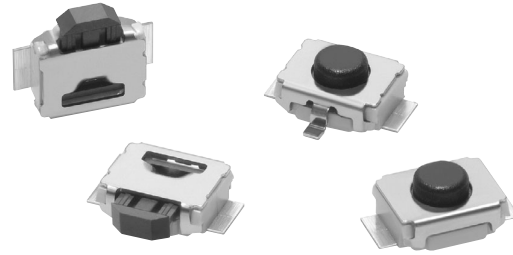


### Ultra-small-sized Tactile Switch with High Contact Reliability:

1.2 × 3 × 2.5 mm (H × W × D)

- Industry's smallest switch\* allows high-density mounting on PCBs for mobile equipment.  
\*As of October 2006 (according to OMRON survey).
- Dust-proof construction provides high reliability in dusty environments.
- Surface mounted: Ideal for high-density mounting.
- Models with ground terminals are available for protection against static electricity.

RoHS Compliant



**NEW**

### Ordering Information

Operation type	Order unit	Packaging Ground terminal	Embossed taping	
			Without ground terminal	With ground terminal
Top-actuated	3,500 pieces	Without boss	B3U-1000P	B3U-1100P
		With boss	B3U-1000P-B	B3U-1100P-B
Side-actuated	4,000 pieces	Without boss	B3U-3000P	B3U-3100P
		With boss	B3U-3000P-B	B3U-3100P-B

**Note:** Orders must be made in multiples of the order unit specified above.

### Specifications

#### ■ Ratings/Characteristics

Item	Operation type	Top-actuated (B3U-1000 Series)	Side-actuated (B3U-3000 Series)
Switching capacity		1 to 50 mA, 5 to 12 VDC (resistive load)	
Ambient operating temperature		-25 to 70°C, 60% humidity (with no icing or condensation)	
Ambient humidity		35% to 85% (at 5 to 35°C)	
Contact configuration		SPST-NO	
Contact resistance		100 mΩ max. (initial value) (rated: 1 mA, 5 VDC)	
Insulation resistance		100 MΩ min. (at 100 VDC)	
Dielectric strength		250 VAC, 50/60 Hz for 1 min	
Bounce time		5 ms max.	
Vibration resistance		10 to 55 Hz, 1.5 mm double amplitude	
Shock resistance		1,000 m/s <sup>2</sup> max.	
Life expectancy		200,000 operations min.	100,000 operations min.
Maximum operating force		30 N max.	
Weight		Approx. 0.022 g	

### Operating Characteristics

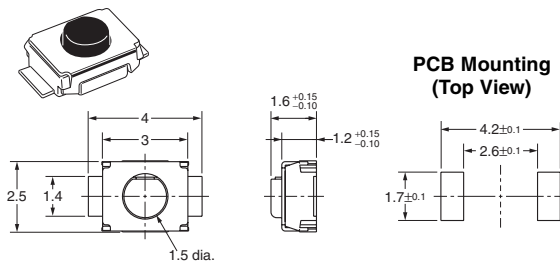
Item	Operation type	Top-actuated (B3U-1000 Series)	Side-actuated (B3U-3000 Series)
Operating force (OF)		1.50 ± 0.49 N	1.59 ± 0.49 N
Releasing force (RF)		0.2 N min.	
Pretravel (PT)		0.15 <sup>+0.2</sup> <sub>-0.1</sub> mm	0.2 <sup>+0.2</sup> <sub>-0.1</sub> mm

### Dimensions

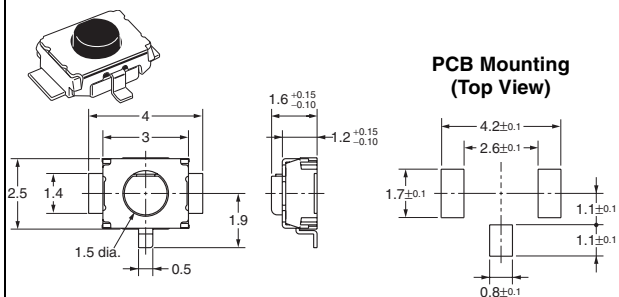
**Note:** All dimensions are in millimeters unless otherwise indicated. Unless otherwise specified, a tolerance of ±0.2 mm applies to all dimensions.

#### ■ Top-actuated Models

##### Without Ground Terminal, without Boss B3U-1000P

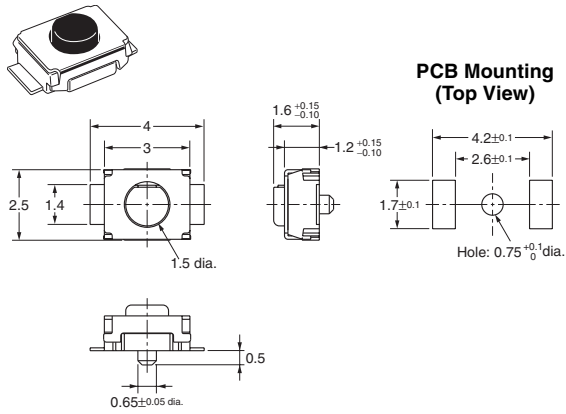


##### With Ground Terminal, without Boss B3U-1100P



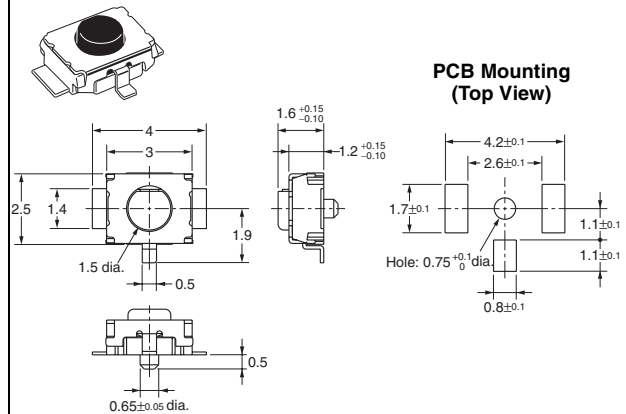
**Without Ground Terminal, with Boss**

**B3U-1000P-B**



**With Ground Terminal, with Boss**

**B3U-1100P-B**

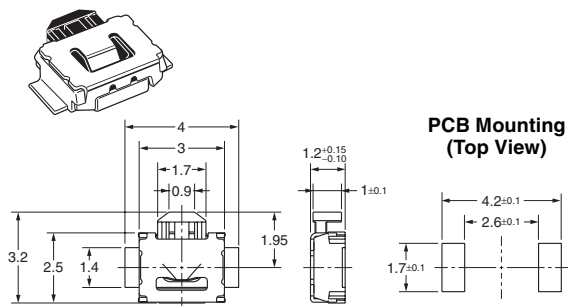


**■ Side-actuated Models**

**Note:** Unless otherwise specified, a tolerance of ±0.2 mm applies to all dimensions.

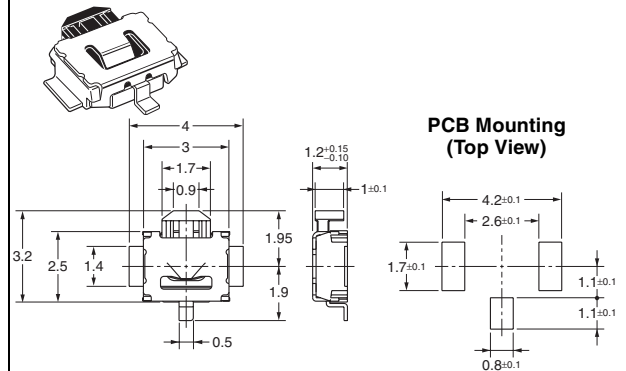
**Without Ground Terminal, without Boss**

**B3U-3000P**



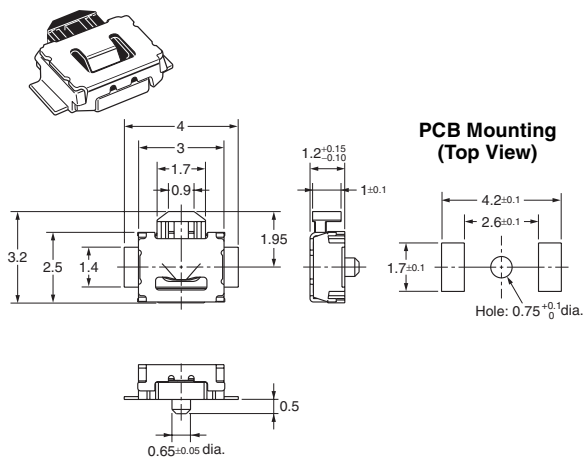
**With Ground Terminal, without Boss**

**B3U-3100P**



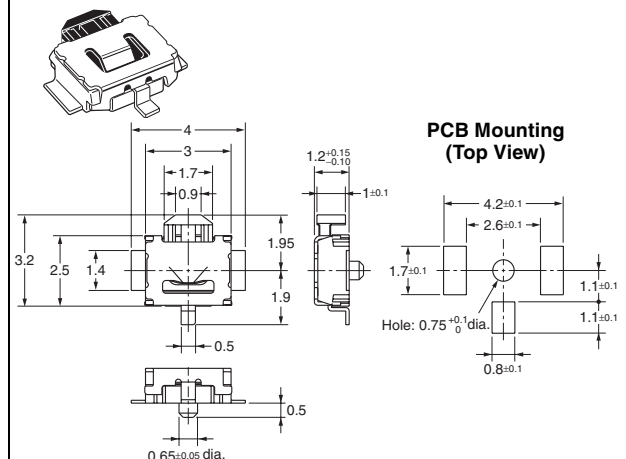
**Without Ground Terminal, with Boss**

**B3U-3000P-B**



**With Ground Terminal, with Boss**

**B3U-3100P-B**



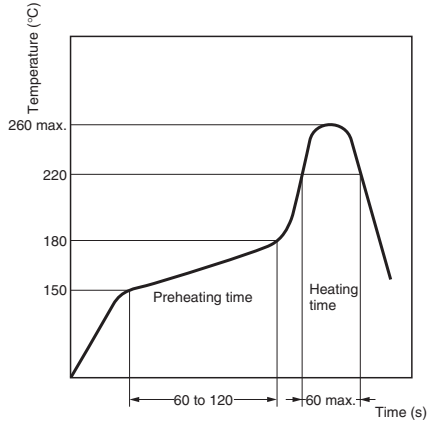
# Precautions

**Note:** Refer to *Safety Precautions* in the *Tactile Switches* (Cat. No. X037) for details on general safety precautions.

## ■ Precautions for Correct Use

### Soldering

Perform reflow soldering within the ranges shown in the terminal temperature profile in the following diagram.



### Washing

B3U Switches 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.

### Compliance with RoHS Directive

The "RoHS Compliant" designation indicates that the product does not contain the following 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.

### Storage and Operating Environment

Do not store the product under the following conditions to prevent discoloration and other deterioration of the terminals.

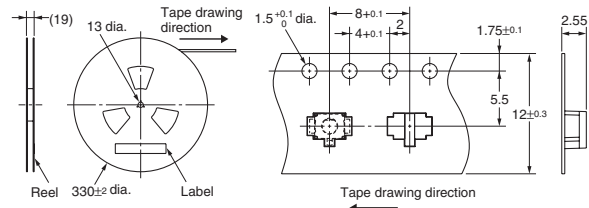
1. Locations subject to high temperatures or humidity
2. Locations containing corrosive gases
3. Locations subject to direct sunlight

The Switch is not provided with a watertight or drip-proof construction. Do not install or operate the product in locations subject to water spray or splashes.

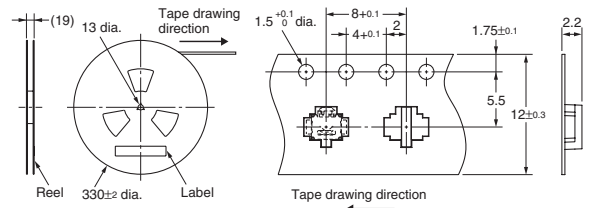
### Packaging Specifications

The specifications for B3U Switches packaged on embossed tape are as follows:

#### B3U-1000 Series



#### B3U-3000 Series

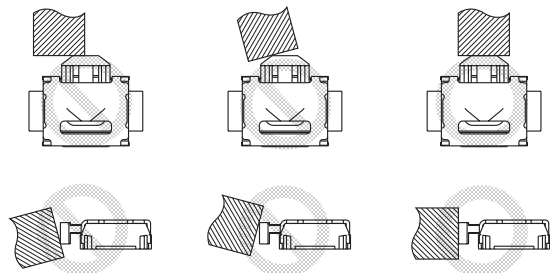


<b>Standards</b>	Conforms to JEITA.
<b>Package</b>	3,500 Switches (B3U-1000 Series) 4,000 Switches (B3U-3000 Series)
<b>Heat resistance</b>	50°C for 24 hours (without deformation)

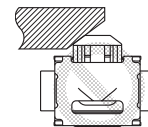
### Operation

Do not repeatedly operate the Switch with excessive force. Applying excessive pressure or applying additional force after the plunger has stopped may deform the disc spring of the Switch, resulting in malfunction.

Be sure to set up the Switch so that the plunger will be pressed straight in. The life of the Switch may be reduced if the plunger is pressed off-center or from an angle. Do not apply pressure from above or below the plunger. Doing so may deform or damage parts or cause faulty operation.



Do not operate the plunger from the side. Doing so may deform or damage the Switch.



**ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.**

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

Cat. No. A162-E1-03 **In the interest of product improvement, specifications are subject to change without notice.**

## **OMRON Corporation**

**Electronic Components Company**

### **Switch Division**

#### **Manual Switch Department**

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Printed in Japan  
1106-3M (1006) (C)

## Safety Precautions

### ■ Precautions for Safe Use

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.

### ■ Precautions for Correct Use

#### Storage

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

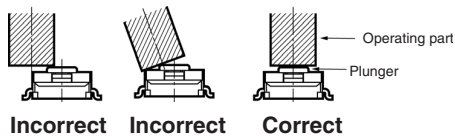
1. High temperature or humidity
2. Corrosive gases
3. Direct sunlight

#### Handling

##### 1. Operation

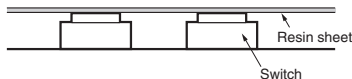
Do not repeatedly operate the Switch with excessive force. Applying excessive pressure or applying additional force after the plunger has stopped may deform the disc spring of the Switch, resulting in malfunction. In particular, applying excessive force to Side-operated Switches may damage the caulking, which in turn may damage the Switch. Do not apply force exceeding the maximum (29.4 N 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.



##### 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 faulty contact. If a Switch that is not sealed must be used in this kind of environment, use a sheet or other measure to protect it against dust.



#### 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 PCBs become attached to the Switch, faulty contact 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)

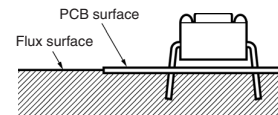
Soldering temperature: 260°C max.

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

Preheating temperature: 100°C max. (ambient temperature)

Preheating time: Within 60 s

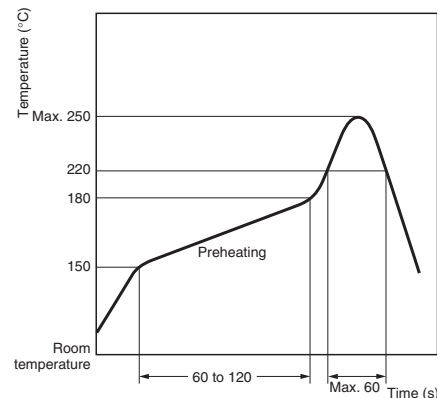
Make sure that no flux will rise above the level of the PCB. If flux overflows onto the mounting surface of the PCB, it may enter the Switch and cause a malfunction.



##### 3. Reflow Soldering (Surface Mounting)

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

##### B3S, B3SN, B3FS



**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 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

<b>Washable (sealed types)</b>	B3W, B3WN, B3S, B3SN
<b>Non-washable (standard types)</b>	B3F, B3FS, B3M, B3J, B3DA, B3D

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.

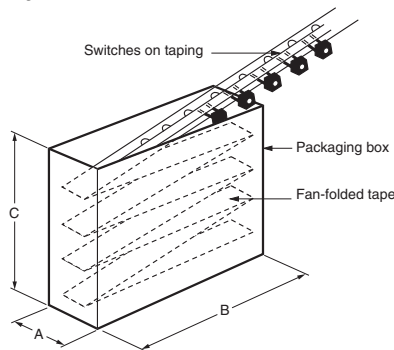
Do not clean washable models immediately after soldering. The cleaning agent may be absorbed into the Switch through respiration as the Switch cools. Wait for at least three minutes after soldering before cleaning washable models.

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

**Switch Packaging (Taping Specification Models)**

**1. Radial Types**

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



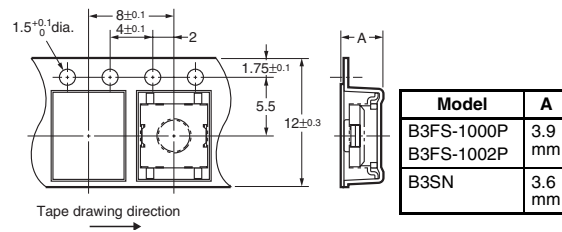
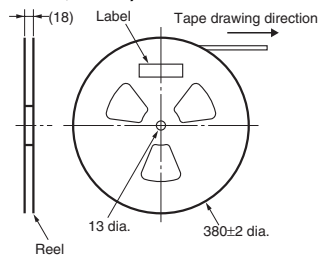
Model	A	B	C
B3F	50 mm	325 mm	275 mm
B3WN	53 mm	326 mm	350 mm

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 Specifications for Embossed Taping (B3FS-1000P/-1002P, B3SN)**

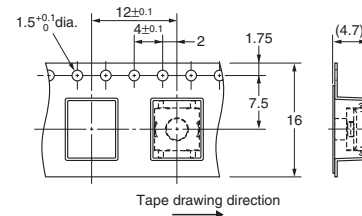
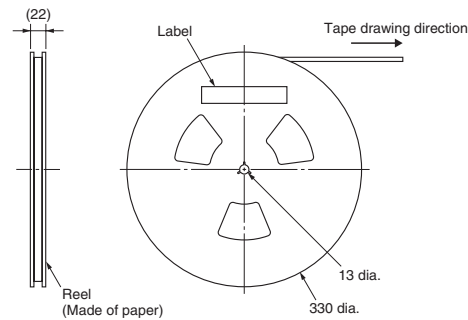


Model	A
B3FS-1000P	3.9 mm
B3FS-1002P	3.9 mm
B3SN	3.6 mm

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

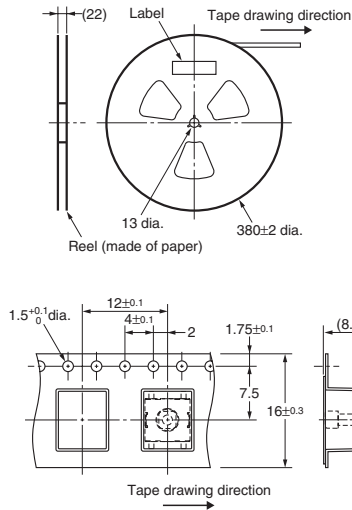
**Note:** Switches with ground terminals are packaged with the ground terminal on the opposite side of the guide hole.

**B3FS-1010P**



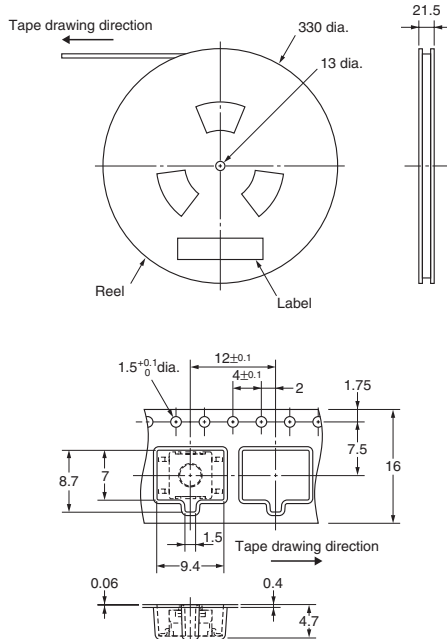
<b>Standards</b>	Conforms to JEITA.
<b>Package</b>	1,000 Switches
<b>Heat resistance</b>	60°C for 24 hours (without deformation)

**B3FS-1050P**



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

**B3S**



<b>Standards</b>	Conforms to JEITA.
<b>Package</b>	1,000 Switches
<b>Heat resistance</b>	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.

**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.

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

