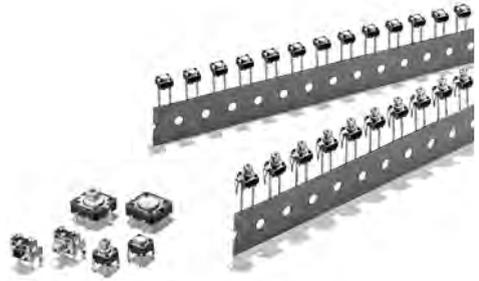


A Wide Range of Models: 6 x 6 mm, 12 x 12 mm, Vertical and High-force.

- ROHS compliant.
- A positive click action plus a long life equal to that of a no-contact switch.
- Radial models (taping specifications) that allow the use of general-purpose radial taping parts insertion machines have been added to the series.
- High reliability gold plated type available



Ordering Information

6 x 6 mm Models

Type	Plunger	Height	Operating force (of)	Bags (100 Switches)		
				Without ground terminal	With ground terminal	
Horizontal (B3F-1000)		4.3 mm	0.98 N {100 gf}	B3F-1000	B3F-1100	
			1.47 N {150 gf}	B3F-1002	B3F-1102	
			2.55 N {260 gf}	B3F-1005	B3F-1105	
			4.9 N {50 gf}	B3F-1006	–	
		5.0 mm	0.98 N {100 gf}	B3F-1020	B3F-1120	
			1.47 N {150 gf}	B3F-1022	B3F-1122	
			2.55 N {260 gf}	B3F-1025	B3F-1125	
			4.9 N {50 gf}	B3F-1026	–	
		5.0 mm (7.5-mm pitch)	0.98 N {100 gf}	–	B3F-1110	
		7.0 mm	0.98 N {100 gf}	B3F-1060	–	
			1.47 N {150 gf}	B3F-1062	–	
			2.55 N {260 gf}	B3F-1075	–	
	9.5 mm	0.98 N {100 gf}	B3F-1070	–		
		1.47 N {150 gf}	B3F-1072-N	–		
		2.55 N {260 gf}	B3F-1075	–		
	Projected		7.3 mm	0.98 N {100 gf}	B3F-1050	B3F-1150
				1.47 N {150 gf}	B3F-1052	B3F-1152
				2.55 N {260 gf}	B3F-1055	B3F-1155
				4.9 N {50 gf}	B3F-1056	–
Flat, high reliability gold plated		4.3 mm	1.76 N {180 gf}	B3F-1002-G	B3F-1102-G	
		5.0mm		B3F-1022-G	B3F-1122-G	
		7.0mm		B3F-1062-G	–	
		9.5mm		B3F-1072-G	–	
Projected, high reliability gold plated		7.3mm	1.76N (180gf)	B3F-1052-G	–	

Tactile Switch – B3F

6 x 6 mm Models

Type	Plunger	Height	Operating force (of)	Bags (100 Switches)		
				Without ground terminal	With ground terminal	
Vertical (B3F-3000)		3.15 mm	0.98 N {100 gf}	–	B3F-3100	
			1.47 N {150 gf}	–	B3F-3102	
			2.55 N {260 gf}	–	B3F-3105	
		3.85 mm	0.98 N {100 gf}	–	B3F-3120	
			1.47 N {150 gf}	–	B3F-3122	
			2.55 N {260 gf}	–	B3F-3125	
	Flat, high reliability gold plated	3.85mm	1.76N {180gf}	-	B3F-3122-G	
	Projected		6.15 mm	0.98 N {100 gf}	–	B3F-3150
				1.47 N {150 gf}	–	B3F-3152
2.55 N {260 gf}				–	B3F-3155	

Note: Switches are sold in units of 100 Switches. Orders must be made in multiples of 100 (the quantity per bag).

12 x 12 mm Models

Type	Plunger or LED colour	Height	Operating force	Bags (100 Switches)	
				Without ground terminal	With ground terminal
Standard (B3F-4000)	Flat	4.3 mm	1.27 N {130 gf}	B3F-4000	B3F-4100
			2.55 N {260 gf}	B3F-4005	B3F-4105
	Projected	7.3 mm	1.27 N {130 gf}	B3F-4050	B3F-4150
			2.55 N {260 gf}	B3F-4055	B3F-4155
Long life expectancy (B3F-5000)	Flat	4.3 mm	1.27 N {130 gf}	B3F-5000	B3F-5100
	Projected	7.3 mm		B3F-5050	B3F-5150
High reliability gold-plated (B3F-5000)	Flat	4.3 mm	1.27 N {130 gf}	B3F-5001	B3F-5101
	Projected	7.3 mm		B3F-5051	B3F-5151

Note: Switches are sold in units of 100 Switches. Orders must be made in multiples of 100 (the quantity per bag).

6 x 6 mm Radial Models (Taping Specifications)

Type	Plunger	Height	Operating force 0.98 N {100 gf}		Operating force 1.47 N {150 gf}	
			Without ground terminal	With ground terminal	Without ground terminal	With ground terminal
Standard (B3F-6000)	Flat	4.3 mm	B3F-6000	B3F-6100	B3F-6002	B3F-6106
		5.0 mm	B3F-6020	B3F-6120	B3F-6022	B3F-6122
	Projected	7.3 mm	B3F-6050	B3F-6150	B3F-6052	B3F-6152

Note: Switches are sold in units of 1,000 Switches. Orders must be made in multiples of 1,000. Switches are not sold individually.

■ Accessories (Order Separately)

Special Key Tops are available for projected plunger models.

Specifications

■ Rating/Characteristics

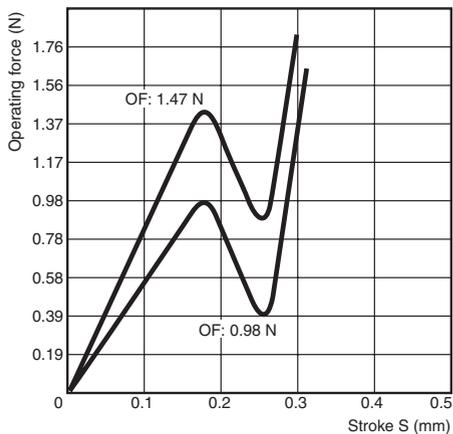
Switching capacity	1 to 50 mA, 5 to 24 VDC (resistive load), 100μ to 50 mA, 5 to 24 VDC for B3F-G series
Ambient temperature	-25°C to 70°C, at 60% maximum (with no icing)
Ambient humidity	35% to 85% (for +5° to 35°C)
Contact form	SPST-NO
Contact resistance	100 mΩ max. (initial value) (rated: 1 mA, 5 VDC), 100μA, 5 VDC for B3F-G series
Insulation resistance	100 MΩ min. (at 250 VDC)
Dielectric strength	500 VAC, 50/60 Hz for 1 min
Bounce time	5 ms max.
Vibration resistance	Malfunction: 10 to 55 Hz, 1.5 mm double amplitude
Shock resistance	Destruction: 1,000 m/s ² (approx. 100G) max. Malfunction: 100 m/s ² (approx. 10G) max.
Life expectancy	B3F-1000, B3F-3000, B3F-6000: 1,000,000 operations min (OF: 0.98 N) (B3F-1070: 500,000 operations min) 300,000 operations min (OF: 1.47 N) 100,000 operations min (OF: 2.55 N) 50,000 operations min (OF: 4.9 N) B3F-4000: 3,000,000 operations min (OF: 1.28 N) 1,000,000 operations min (OF: 2.55 N) B3F-5000: 10,000,000 operations min. B3F-G: 300,000 operations min
Weight	6 x 6 mm models: approx. 0.25 g 12 x 12 mm models (standard types): approx. 0.85 g Radial models: approx. 0.25 g

■ Operating Characteristics

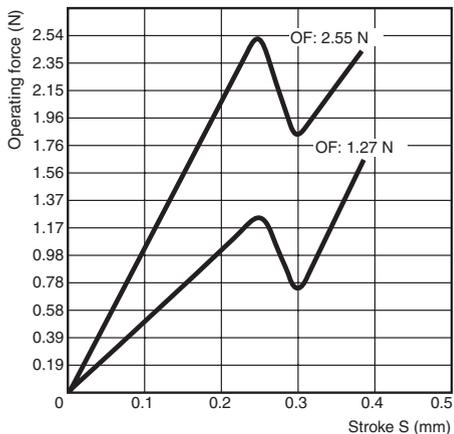
Operating force (OF)	B3F-1000, B3F-3000, B3F-6000				B3F-4000,	B3F-5000	B3F-G
	0.98 N	1.47 N	2.55 N	4.9 N	1.27 N	2.55 N	1.76N
	B3F-1□□□ B3F-3□□□ B3F-6□□□	B3F-1□□□2 B3F-3□□□2 B3F-6□□□2	B3F-1□□□5 B3F-3□□□5	B3F-10□□6	B3F-4□□□0 B3F-5□□□0	B3F-4□□□5	B3F-1□□□2-G B3F-3□□□2-G
Operating force (OF)	0.98±0.29 N {100±30 gf}	1.47±0.49 N {150±50 gf}	2.55±0.69 N {260±70 gf}	4.9±1.47N {100±30 gf}	1.27±0.49 N {130±50 gf}	2.55±0.69 N {260±70 gf}	1.76±0.49N {180±50gf}
Relapsing force (RF)	0.2 N {20 gf} min.	0.49 N {50 gf} min.	0.49 N {50 gf} min.	0.7 N {70 gf} min.	0.29 N {30 gf} min.	0.49 N min. {50 gf}	0.49N {50gf}
Pretravel (PT)	0.25 ^{+0.2/-0.1} mm				0.3 ^{+0.2/-0.1} mm		0.25 +0.2/ -0.1mm

Engineering Data

Operating Force vs. Stroke (Typical)
B3F-1000, -3000, -6000



B3F-4000, -5000



Dimensions

Note 1. All units are in millimetres unless otherwise indicated. Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

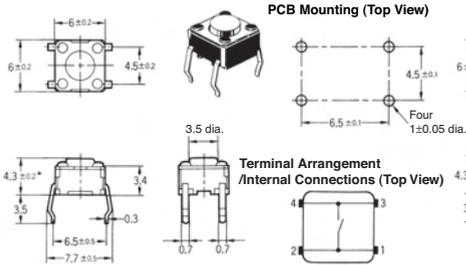
Note 2. No terminal numbers are indicated on the Switches. The numbers used for terminals in the following graphics are indicated in the "Bottom View" diagram below. In this diagram, the Switch is rotated so that the terminals are on the right and left-hand sides, and the OMRON logo appears the right way up.



6 x 6 mm Models

Horizontal, Flat Plunger Type (without Ground Terminal)

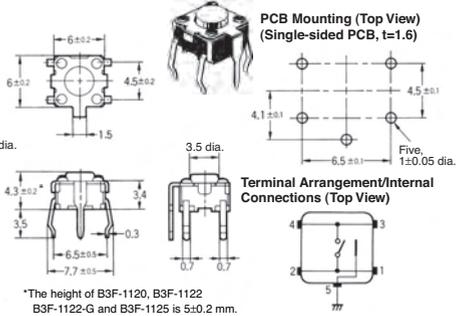
**B3F-1000, B3F-1002, B3F-1005, B3F-1006
B3F-1020 (See note), B3F-1022 (See note),
B3F-1025 (See note), B3F-1026 (See note).
B3F-1002-G, B3F-1022-G (see note).**



*The height of B3F-1020, B3F-1022, B3F-1022-G, B3F-1025 and B3F-1026 is 5 ± 0.2 mm.

Horizontal, Flat Plunger Type (with Ground Terminal, Pitch: 6.5 mm)

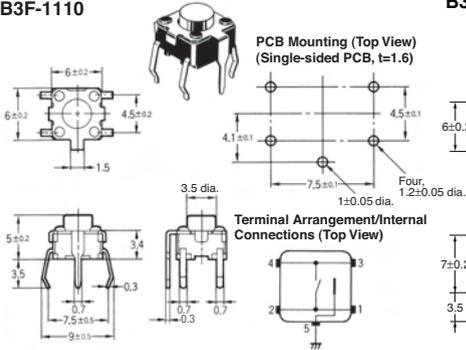
**B3F-1100, B3F-1102, B3F-1105
B3F-1120 (See note), B3F-1122 (See note).
B3F-1125 (See note), B3F-1102-G, B3F-1122-G (see note).**



*The height of B3F-1120, B3F-1122, B3F-1122-G and B3F-1125 is 5 ± 0.2 mm.

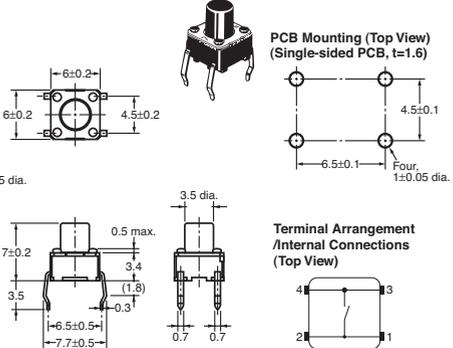
Horizontal, Flat Plunger Type (with Ground Terminal, Pitch: 7.5 mm)

B3F-1110



Horizontal, Flat Plunger Type (without Ground Terminal)

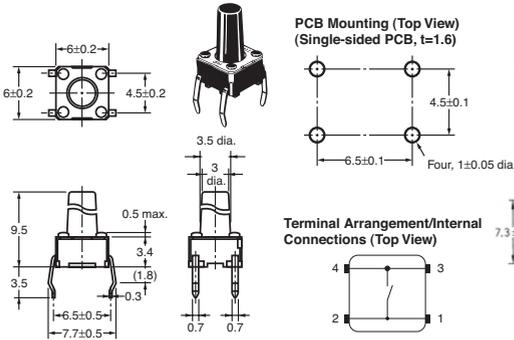
B3F-1060, B3F-1062, B3F-1062-G



Tactile Switch – B3F

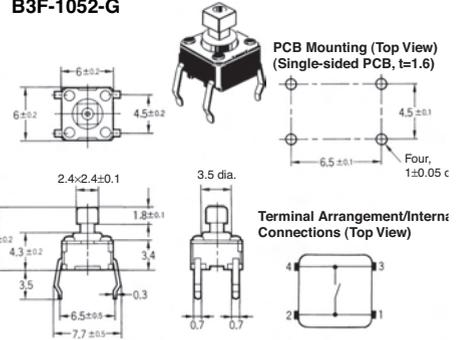
Horizontal, Flat Plunger Type (without Ground Terminal)

B3F-1070, B3F-1072-N, B3F-1075, B3F-1072-G



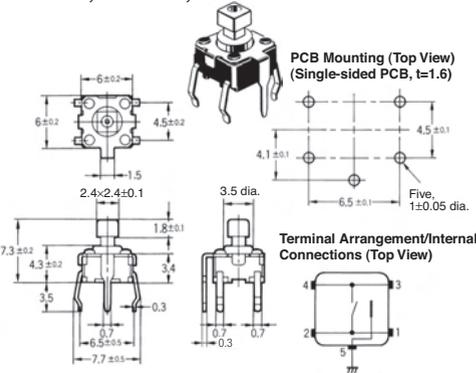
Horizontal, Projected Plunger Type (without Ground Terminal)

B3F-1050, B3F-1052, B3F-1055, B3F-1056
B3F-1052-G



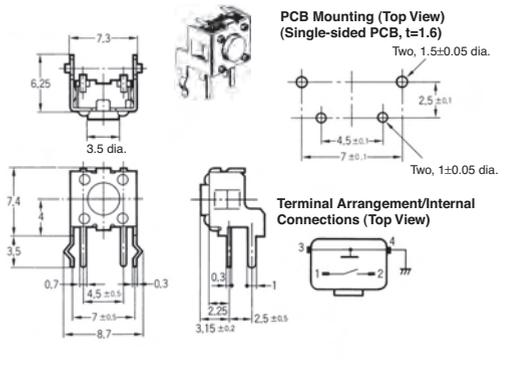
Horizontal, Projected Plunger Type (with Ground Terminal)

B3F-1150, B3F-1152, B3F-1155



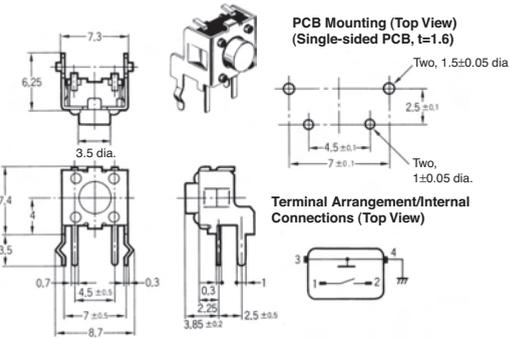
Vertical, Flat Plunger Type

B3F-3100, B3F-3102, B3F-3105



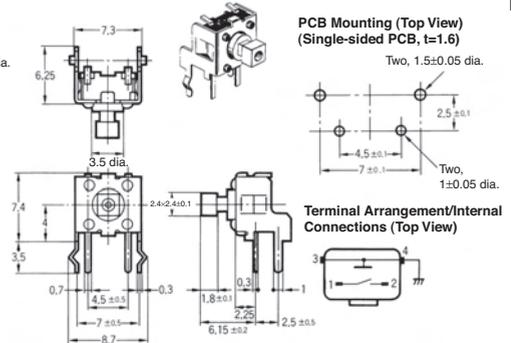
Vertical, Flat Plunger Type (Height: 3.85 mm)

B3F-3120, B3F-3122, B3F-3125, B3F-3122-G



Vertical, Projected Plunger Type

B3F-3150, B3F-3152, B3F-3155



Tactile Switch – B3F

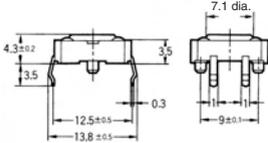
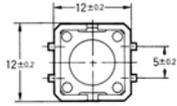
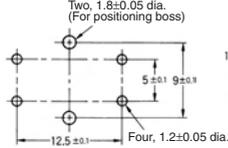
12 x 12 mm Models

Flat Plunger Type (without Ground Terminal)

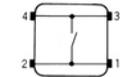
B3F-4000, B3F-4005,
B3F-5000, B3F-5001



PCB Mounting (Top View)
(Single-sided PCB, t=1.6)



Terminal Arrangement/Internal
Connections (Top View)

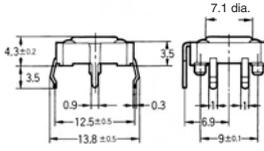
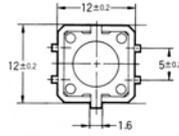
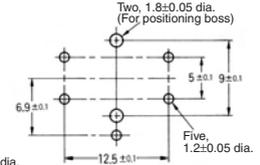


Flat Plunger Type (with Ground Terminal)

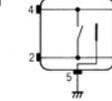
B3F-4100, B3F-4105,
B3F-5100, B3F-5101



PCB Mounting (Top View)
(Single-sided PCB, t=1.6)



Terminal Arrangement/Internal
Connections (Top View)

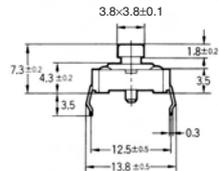
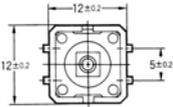
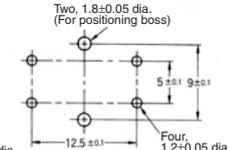


Projected Plunger Type (without Ground Terminal)

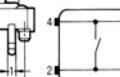
B3F-4050, B3F-4055,
B3F-5050, B3F-5051



PCB Mounting (Top View)
(Single-sided PCB, t=1.6)



Terminal Arrangement/Internal
Connections (Top View)

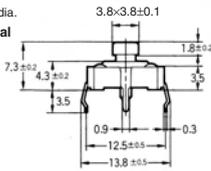
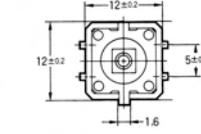
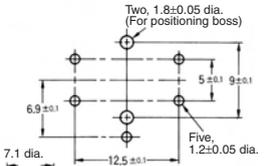


Projected Plunger Type (with Ground Terminal)

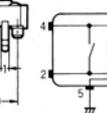
B3F-4150, B3F-4155,
B3F-5150, B3F-5151



PCB Mounting (Top View)
(Single-sided PCB, t=1.6)



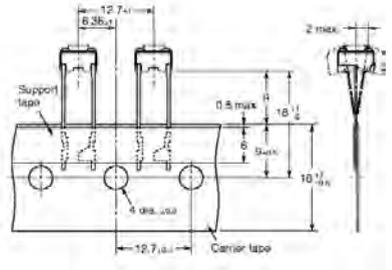
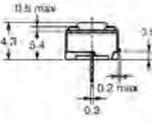
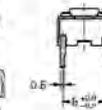
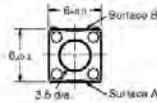
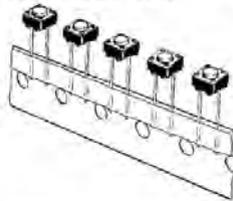
Terminal Arrangement/Internal
Connections (Top View)



Tactile Switch – B3F

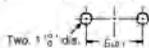
6 mm x 6 mm Radial Types (Taping Specifications): Sold in Units of 1,000 Switches

**Flat Plunger Type
(without Ground Terminal)**
B3F-6000, B3F-6002



Note: The tape is random between surface A and surface B.

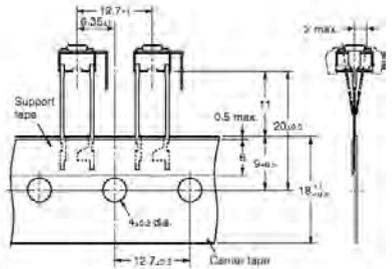
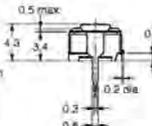
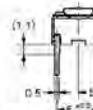
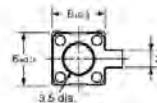
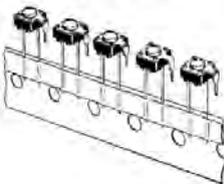
**PCB Mounting
(Top View)**
(Single-sided PCB, t=1.6)



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

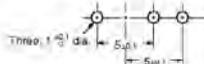


**Flat Plunger Type
(with Ground Terminal)**
B3F-6100, B3F-6102



Note: The tape is random between surface A and surface B.

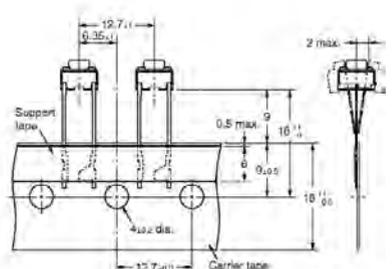
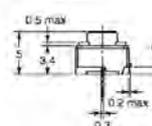
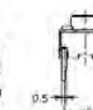
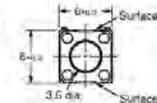
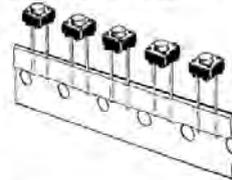
**PCB Mounting
(Top View)**
(Single-sided PCB, t=1.6)



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



**Flat Plunger Type
(without Ground Terminal)**
B3F-6020, B3F-6022



Note: The tape is random between surface A and surface B.

**PCB Mounting
(Top View)**
(Single-sided PCB, t=1.6)

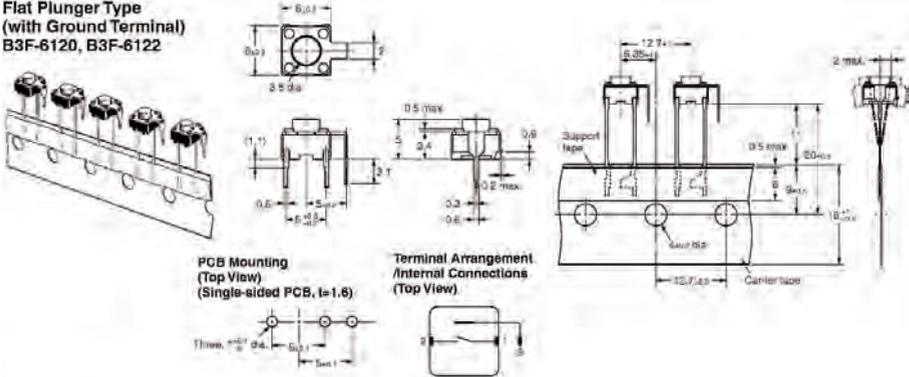


**Terminal Arrangement
/Internal Connections
(Top View)**

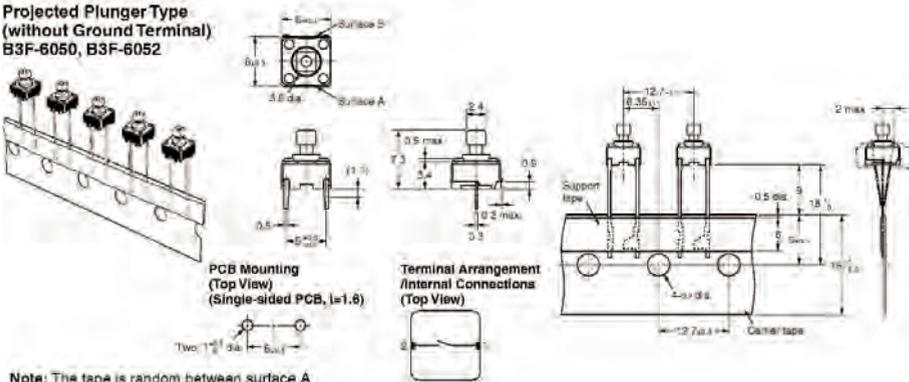


Tactile Switch – B3F

Flat Plunger Type (with Ground Terminal) B3F-6120, B3F-6122

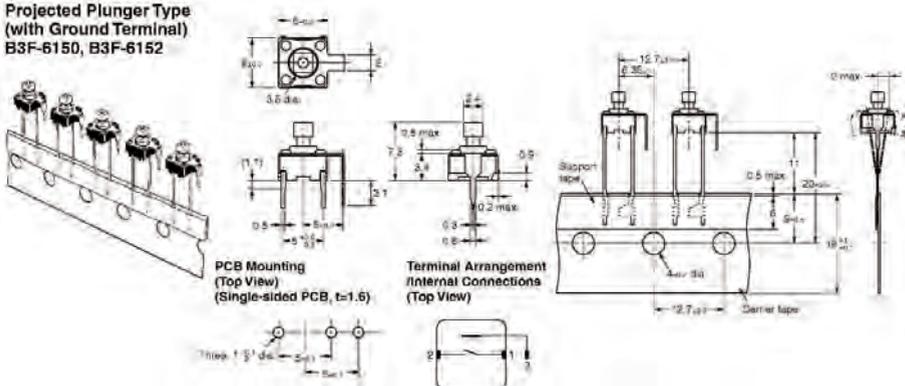


Projected Plunger Type (without Ground Terminal) B3F-6050, B3F-6052



Note: The tape is random between surface A and surface B.

Projected Plunger Type (with Ground Terminal) B3F-6150, B3F-6152



Key Tops

B32-series Special Key Tops are available for projected plunger models.

■ 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.

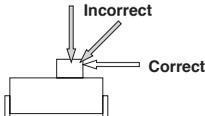
■ Correct Use

HANDLING

Operation

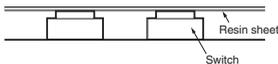
Do not repeatedly operate the Switch with excessive force. Applying excessive pressure or applying additional force after the plunger has stopped may deform the disc spring of the Switch, resulting in malfunction.

Be sure to set up the Switch so that the plunger will 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.



DUST PROTECTION

The Switches are not sealed and should be protected with a resin sheet as shown below when used in dust-prone environments.



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.

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.

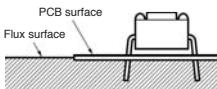
Do not solder the Switch more than twice, including rectification soldering. An interval of five minutes is required between the first and second soldering.

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

Soldering temperature: 260°C max.

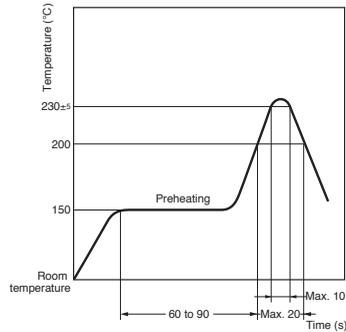
Soldering time: 5 s max. for a 1.6-mm thick single-side PCB

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.



Reflow Soldering (Surface Mounting) (B3FS, B3SN, B3S, B3J)

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 push-button operation.

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

Washable and Non-washable Models

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

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.

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.

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.

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.

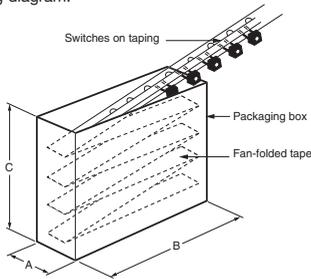
Do not use Sealed Switches while submersed in water or in locations exposed to water.

Technical Information – Tactile Switches

SWITCH PACKAGING (TAPING SPECIFICATION MODELS)

RADIAL TYPES

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



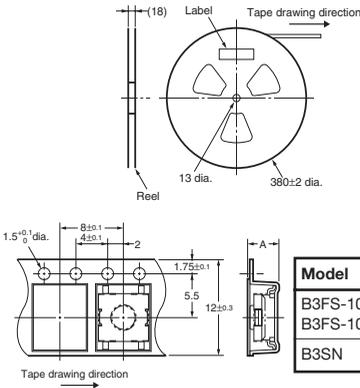
Model	A	B	C
B3F	50 mm	325 mm	275 mm
B3WN	53 mm	326 mm	350 mm

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.

Packaging Specifications for Embossed Tape (B3FS-1000P/-1002P, B3SN)

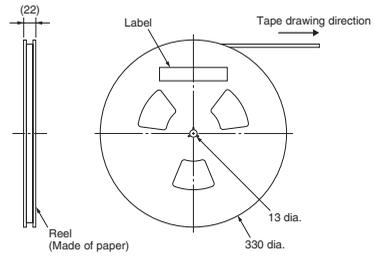


Model	A
B3FS-1000P	3.9 mm
B3FS-1002P	
B3SN	3.6 mm

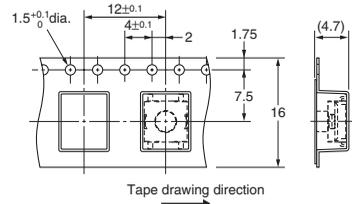
Standards	Conforms to JEITA.
Package	3,000 Switches
Heat resistance	50°C for 24 hours (without deformation)

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

B3FS-1010P

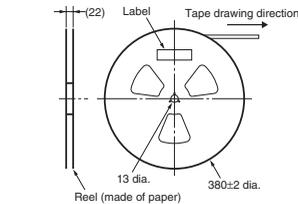


1.5^{+0.1} dia.

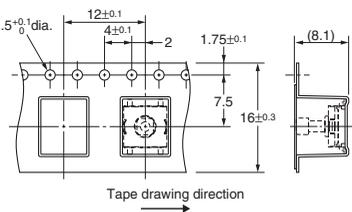


Standards	Conforms to JEITA.
Package	1,000 Switches
Heat resistance	60°C for 24 hours (without deformation)

B3FS-1050P



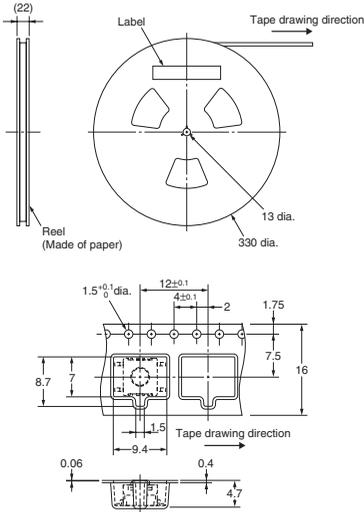
1.5^{+0.1} dia.



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

Technical Information – Tactile Switches

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.

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.

$$\text{Limiting resistance (R)} = \frac{\text{Voltage used (E) - LED forward voltage (VF)}}{\text{LED forward current (IF)}} \quad (2)$$

