

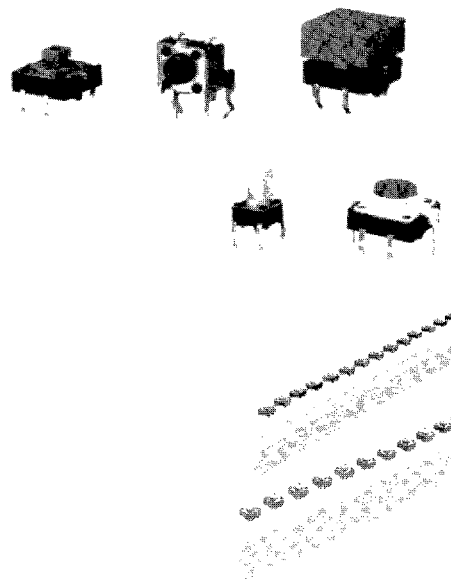


Mechanical Keyswitch

B3F

Miniature, Space-Saving Keyswitch Provides Long Service Life and Easy Mounting

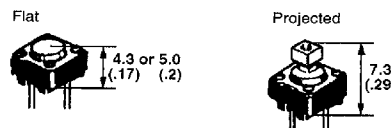
- Extended mechanical/electrical service life:
10 x 10⁶ operations for 12 x 12 mm type and
1 x 10⁶ operations for the 6 x 6 mm type
- Ideal for applications such as audio, office and communications equipment, measuring instruments, TVs, VCRs, etc.
- Taped radial type, vertical type, high force type, and gold-plated contact type are available as series versions
- Flux-tight base structure allows automatic soldering of the keyswitches onto a PC board



Ordering Information

■ B3F-1□□□, B3F-3□□□

6 x 6 mm type



Type	Plunger	Switch height x pitch	Operating Force	Part Number			
				Without ground terminal		With ground terminal	
				Bags	Sticks*	Bags	Sticks*
Standard	Flat	4.3 x 6.5 mm	General-purpose: 100 g	B3F-1000	B3F-1000S	B3F-1100	B3F-1100S
			150 g	B3F-1002	B3F-1002S	B3F-1102	B3F-1102S
			High-force: 260 g	B3F-1005	B3F-1005S	B3F-1105	B3F-1105S
		5.0 x 6.5 mm	General-purpose: 100 g	B3F-1020	B3F-1020S	B3F-1120	B3F-1120S
			150 g	B3F-1022	B3F-1022S	B3F-1122	B3F-1122S
			High-force: 260 g	B3F-1025	B3F-1025S	B3F-1125	B3F-1125S
	Projected	7.3 x 6.5 mm	General-purpose: 100 g	—	—	B3F-1110	—
			150 g	B3F-1050	B3F-1050S	B3F-1150	B3F-1150S
			High-force: 260 g	B3F-1052	B3F-1052S	B3F-1152	B3F-1152S
		3.15 mm	General-purpose: 100 g	—	—	B3F-3100	—
			150 g	—	—	B3F-3102	—
			High-force: 260 g	—	—	B3F-3105	—
Vertical	Flat	3.85 mm	General-purpose: 100 g	—	—	B3F-3120	—
			150 g	—	—	B3F-3122	—
			High-force: 260 g	—	—	B3F-3125	—
	Projected	6.15 mm	General-purpose: 100 g	—	—	B3F-3150	—
			150 g	—	—	B3F-3152	—
			High-force: 260 g	—	—	B3F-3155	—

* Number of switches per stick: Without ground terminal 90/stick
With ground terminal..... 75/stick

■ B3F-4□□□, B3F-5□□□, B3F-9□□□

12 x 12 mm type

Type	Plunger	Switch height x pitch	Operating Force	Part Number			
				Without ground terminal		With ground terminal	
				Bags	Sticks*	Bags	Sticks*
Standard	Flat	4.3 x 12.5 mm	General-purpose: 130 g	B3F-4000	B3F-4000S	B3F-4100	B3F-4100S
			High-force: 260 g	B3F-4005	B3F-4005S	B3F-4105	B3F-4105S
	Projected	7.3 x 12.5 mm	General-purpose: 130 g	B3F-4050	B3F-4050S	B3F-4150	B3F-4150S
			High-force: 260 g	B3F-4055	B3F-4055S	B3F-4155	B3F-4155S
Long service life	Flat	4.3 x 12.5 mm	General-purpose: 130 g	B3F-5000	B3F-5000S	B3F-5100	B3F-5100S
	Projected	7.3 x 12.5 mm		B3F-5050	B3F-5050S	B3F-5150	B3F-5150S
High reliability gold-plated contact	Flat	4.3 x 12.5 mm		B3F-5001	B3F-5001S	B3F-5101	B3F-5101S
	Projected	7.3 x 12.5 mm		B3F-5051	B3F-5051S	B3F-5151	B3F-5151S
Surface illumination	Red LED	7.3 x 12.5 mm		—	B3F-9100	—	—
	Green LED	7.3 x 12.5 mm		—	B3F-9200	—	—
	Yellow LED	7.3 x 12.5 mm		—	B3F-9300	—	—

* Number of switches per stick: Without ground terminal 45/stick
 With ground terminal 40/stick
 B3F-9□□□ 36/stick

■ B3F-6□□□

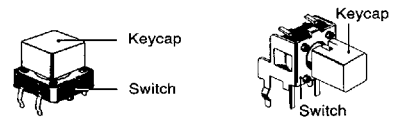
Taped Radial (Auto Insertion)
 6 x 6 mm type

Type	Plunger	Switch height x pitch	Operating Force	Part Number	
				Without ground terminal	With ground terminal
B3F-6000	Flat	4.3 x 6.5 mm	General-purpose: 100 g	B3F-6000	B3F-6100
			High-force: 150 g	B3F-6002	B3F-6102
		5.0 x 6.5 mm	General-purpose: 100 g	B3F-6020	B3F-6120
			High-force: 150 g	B3F-6022	B3F-6122
	Projected	7.3 x 6.5 mm	General-purpose: 100 g	B3F-6050	B3F-6150
			High-force: 150 g	B3F-6052	B3F-6152

Note: The above switches must be ordered in units of 1,000.

■ ACCESSORIES

Keycaps



Keycap color	Applicable type:	Part Number		
		6 x 6 mm		12 x 12 mm
		Size:	4 x 4 mm	9 x 9 mm
Light gray		B32-1000	B32-1200	B32-1300
Black		B32-1010	B32-1210	B32-1310
Orange		B32-1020	B32-1220	B32-1320
Yellow		B32-1030	B32-1230	B32-1330
Blue		B32-1040	B32-1240	B32-1340
Green		B32-1050	B32-1250	B32-1350
White		B32-1060	B32-1260	B32-1360
Light green		B32-1070	B32-1270	B32-1370
Red		B32-1080	B32-1280	B32-1380

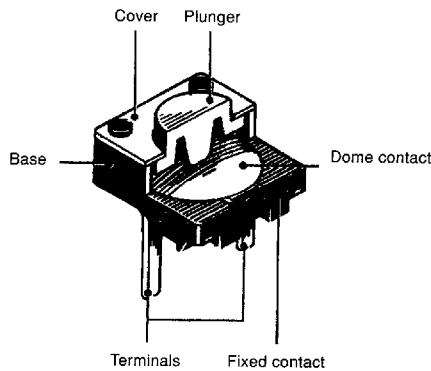
Note: Keycaps are available in different sizes and colors for exclusive use of the 6 x 6 mm and 12 x 12 mm projected plunger versions of Model B3F.

Plunger Identification Table

Use this table to determine keyswitch type by plunger color.

Plunger color	Operating force	Type
Light gray	100 g	B3F-1000, 1150, 3100, 6000, 6050
White	100 g	B3F-1050, 1100, 3150, 4000, 4050, 4100
Black	100 g	B3F-1020, 1110, 1120, 3120, 6020
Blue	130 g	B3F-5000
Yellow	150 g	B3F-1002, 1052, 1102, 1122, 4005, 4055, 4105, 4155, 6002, 6052
Medium gray	150 g	B3F-1022, 1122, 3122, 6022
Orange	260 g	B3F-1005, 1055, 1105, 3105, 6005, 6055
Pink	260 g	B3F-1025, 1125, 6025

■ CONSTRUCTION



Characteristics

	B3F-1□□□ B3F-3□□□	B3F-4□□□	B3F-5□□□	B3F-9□□□	B3F-6□□□
Service life (see note 1) [mechanical/electrical]	1 x 10 ⁶ (0.3 x 10 ⁶) operations min.	3 x 10 ⁶ (0.3 x 10 ⁶) operations min.	10 x 10 ⁶ operations min.	1 x 10 ⁶ operations min.	1,000,000 (300,000) operations min.
Weight (see note 2)	Approx. 0.25 g	Approx. 0.85 g	Approx. 0.85 g	Approx. 0.85 g	Approx. 0.25 g
Contact configuration	—	—	—	—	SPST-NO
Switching capacity	50 mA 24 VDC (resistive load)				5-24 VDC, 1-50 mA
Permissible load	1 mA 5 VDC min. (resistive load)				—
Contact resistance	100 MΩ max.				
Insulation resistance	100 MΩ min. (at 250 VDC)				
Dielectric strength	500 VAC, 50/60 Hz for 1 minute				
Bounce time	5 ms max.				
Vibration	Malfunction durability: 10 to 55 Hz, 1.5 mm double amplitude				
Shock	Mechanical durability: 1,000 m/s ² (approx. 100 G) Malfunction durability: 100 m/s ² (approx. 10 G)				
Ambient temperature	-25° to 70°C (with no icing)				
Humidity	35% to 85% RH				

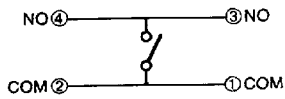
Note: 1. Figure in parentheses denotes the service life of high force type.

2. Denotes the weight of standard type.

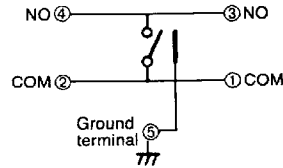
3. Data shown are of initial value.

CONTACT FORM

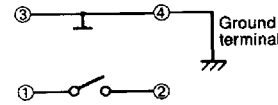
B3F-10
-40
-50



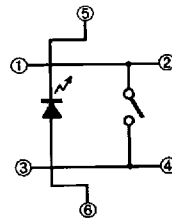
B3F-11
-41
-51



B3F-3

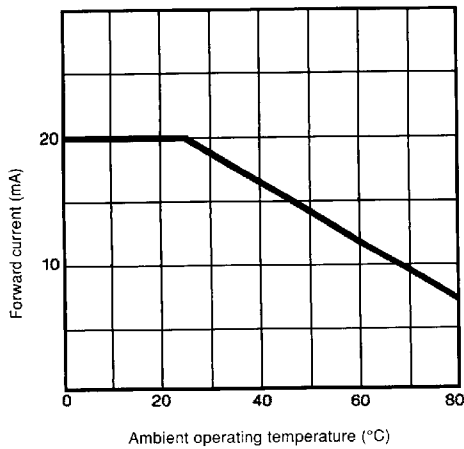


B3F-9

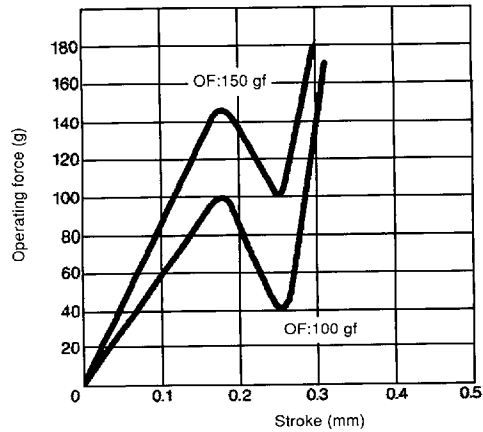


CHARACTERISTIC DATA

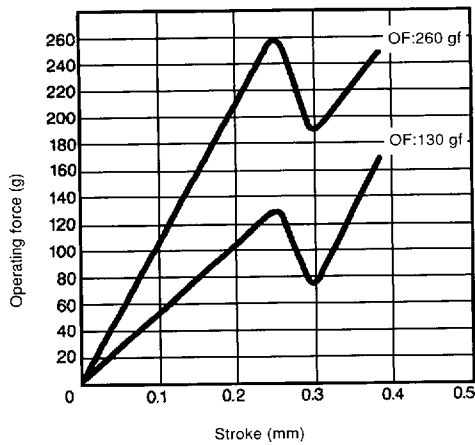
Forward current derating curve
BF-9



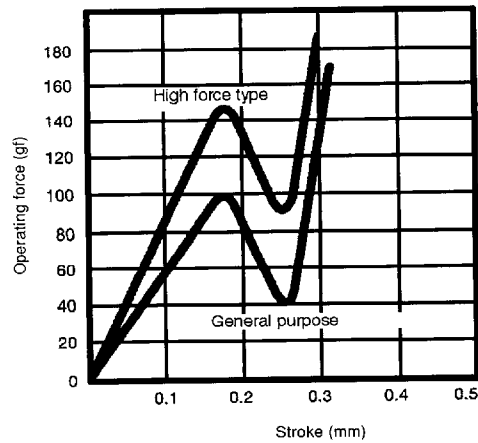
Operating force vs. stroke
B3F-1 / -3 (typical example)



B3F-4 / -5 / -9 (typical example)



B3F-6



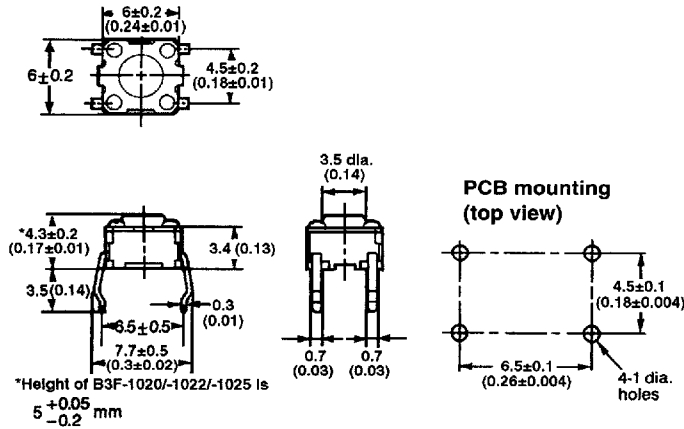
OPERATING CHARACTERISTICS

	B3F-1 / -3		B3F-4 / -5 / -9		B3F-6	
	General purpose type	High force type	General purpose type	High force type	General purpose type	High force type
Operating force (OF)	100 ± 30 g	150 ± 50 g	130 ± 50 g	260 ± 70 g	100 ± 30 g	150 ± 50 g
Release force (RF) min.	20 g	50 g	30 g	50 g	20 g	50 g
Pretravel (PT) max.	0.25 ^{+0.2} / _{-0.1} mm	0.25 ^{+0.2} / _{-0.1} mm	0.3 ^{+0.2} / _{-0.1} mm	0.3 ^{+0.2} / _{-0.1} mm	0.25 ^{+0.2} / _{-0.1} mm	0.25 ^{+0.2} / _{-0.1} mm

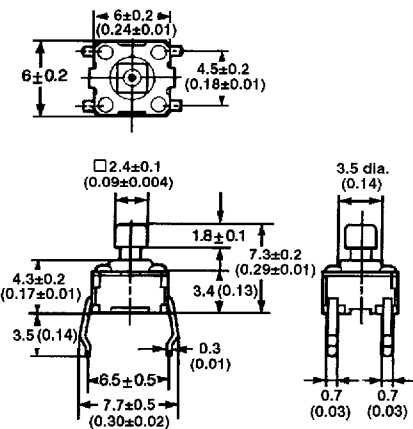
Dimensions

Unit: mm (inch)

B3F-1000/-1002/-1005/-1020*/-1022*/-1025*

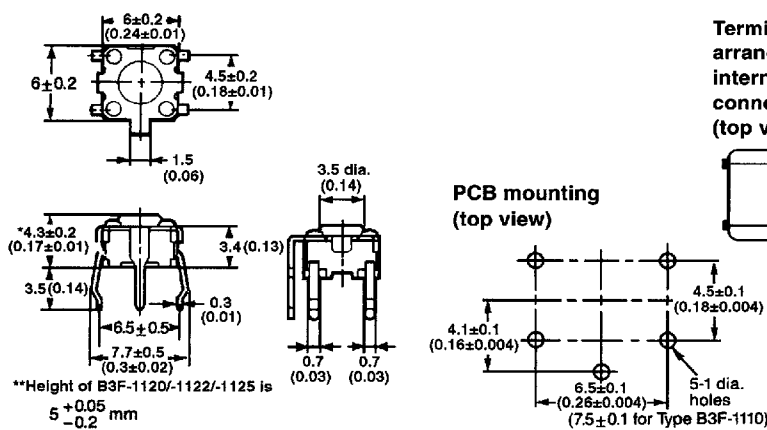


B3F-1050/-1052/-1055

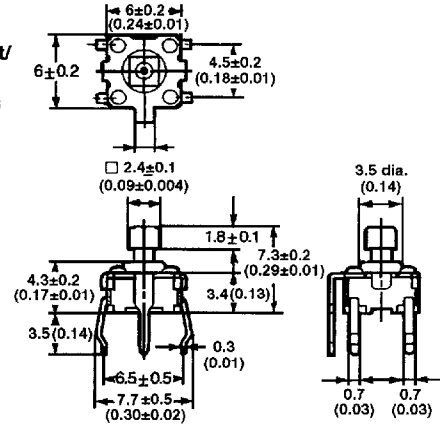


Note: Terminal numbers are not indicated on this switch. With the switch turned over so that the logo mark "OMRON" is visible on the upper part of the rear side of the switch base, the terminal on the right of the logo mark is numbered "1" and that on the bottom right is "3." Accordingly, two terminals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

B3F-1100/-1102/-1105/-1120**/-1122**/-1125**



B3F-1150/-1152/-1155



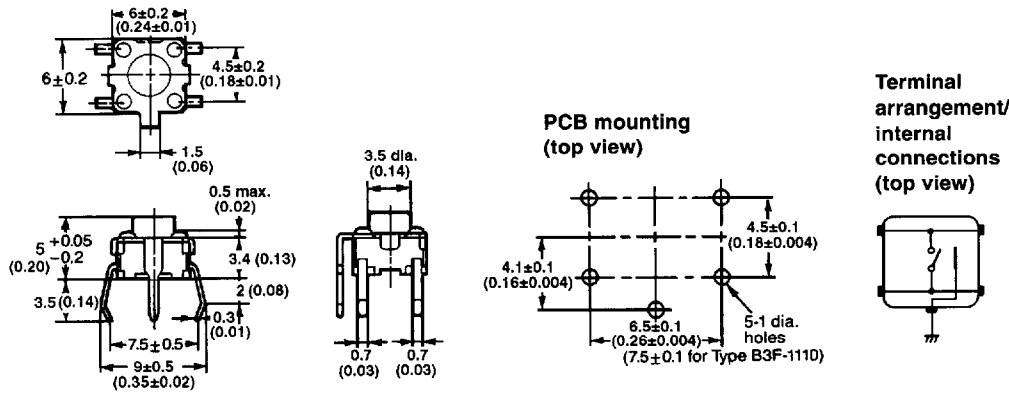
Note: Terminal numbers are not indicated on this switch. With the switch turned over so that the logo mark "OMRON" is visible on the upper part of the rear side of the switch base, the terminal on the right of the logo mark is numbered "1" and that on the bottom right is "3." Accordingly, two terminals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

Note: Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

2

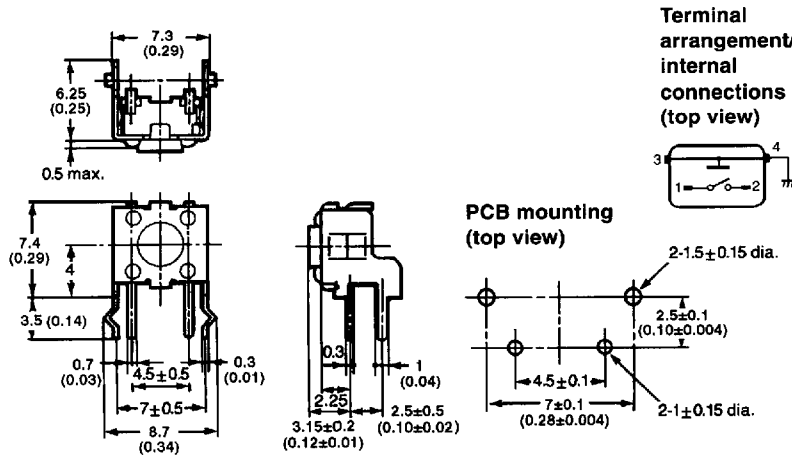
Unit: mm (inch)

B3F-1110

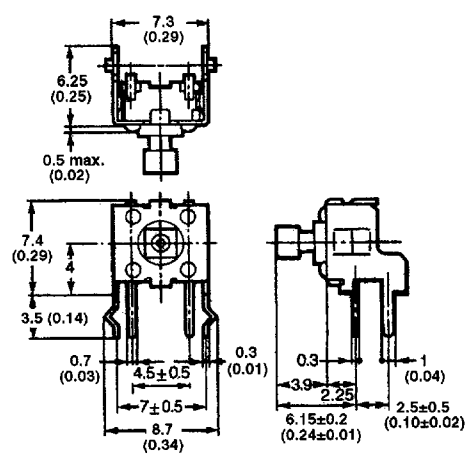


Note: Terminal numbers are not indicated on this switch. With the switch turned over so that the logo mark "OMRON" is visible on the upper part of the rear side of the switch base, the terminal on the right of the logo mark is numbered "1" and that on the bottom right is "3." Accordingly, two terminals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

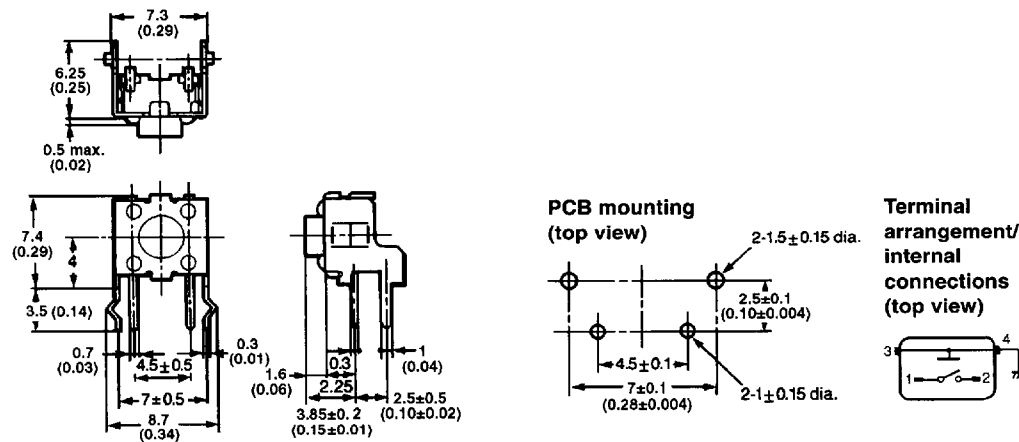
B3F-3100/-3102/-3105



B3F-3150/-3152/-3155

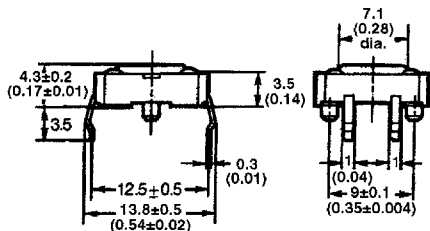
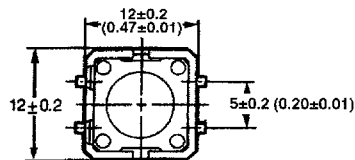


B3F-3120/-3122/-3125

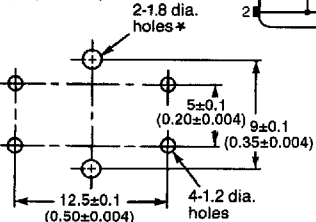


Note: Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

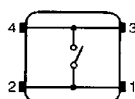
B3F-4000/-5000/-4005/-5001



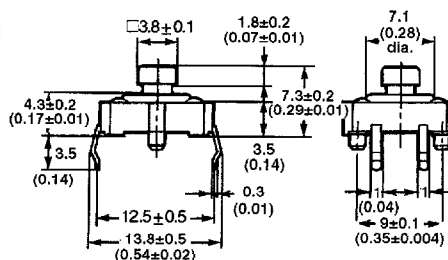
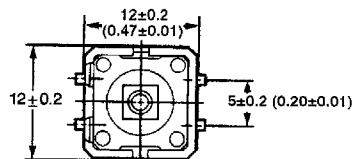
PCB mounting (top view)



Terminal arrangement/ internal connections (top view)

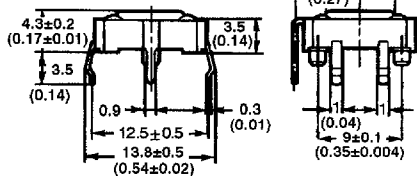
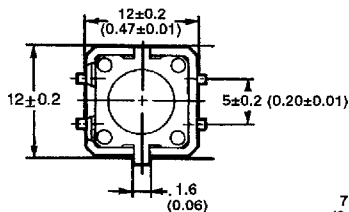


B3F-4050/-5050/-4055/-5051



* Fit the projection of the switch into this hole to secure the switch.

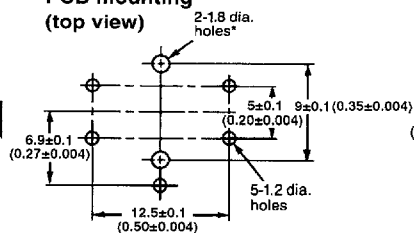
B3F-4101/-5100/-4105/-5101



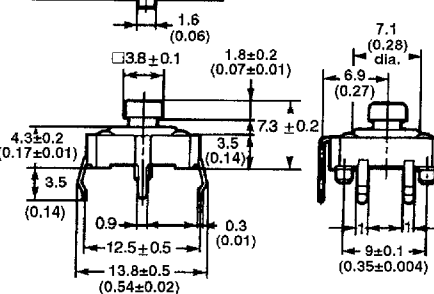
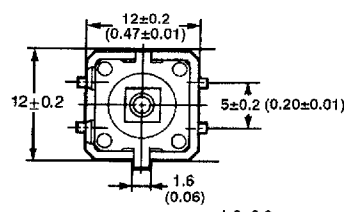
Terminal arrangement/ internal connections (top view)



PCB mounting (top view)

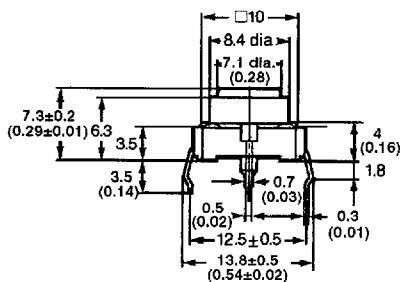
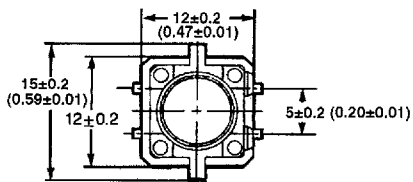


B3F-4150/-5150/-4155/-5151

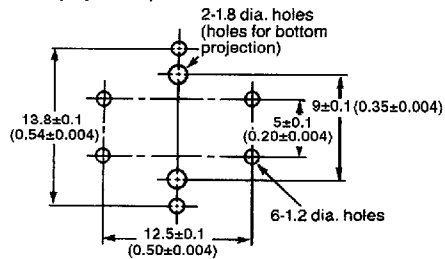


* Fit the projection of the switch into this hole to secure the switch.

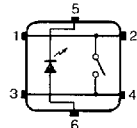
B3F-9



PCB mounting (top view)



Terminal arrangement/ internal connections (top view)



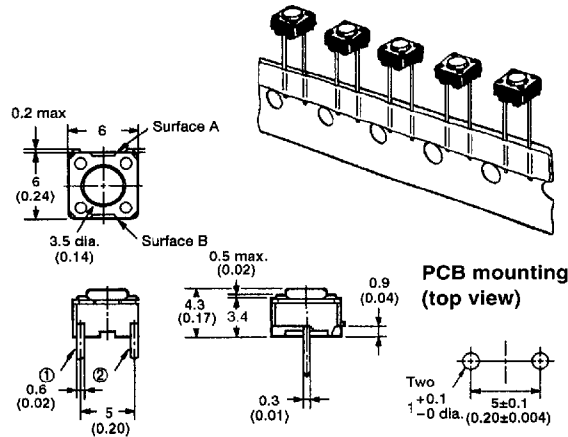
Note: Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

2

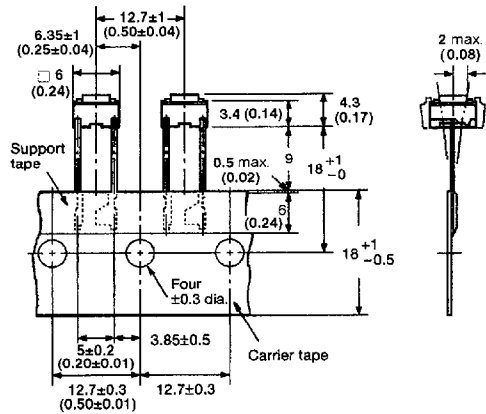
Unit: mm (inch)

B3F-6000/6002

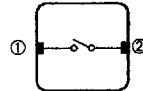
Flat plunger type (without ground terminal)



Tape-packaging dimensions



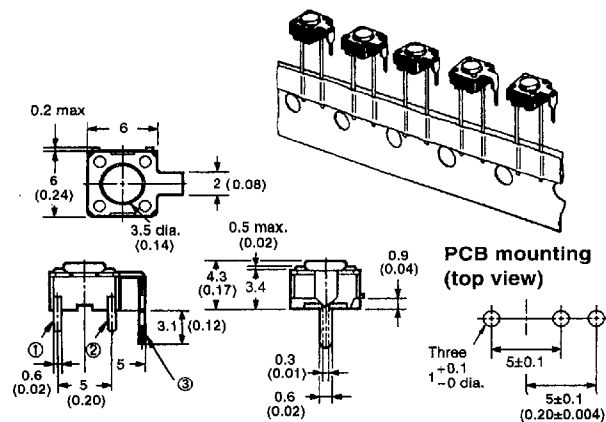
Terminal arrangement/
internal connections
(top view)



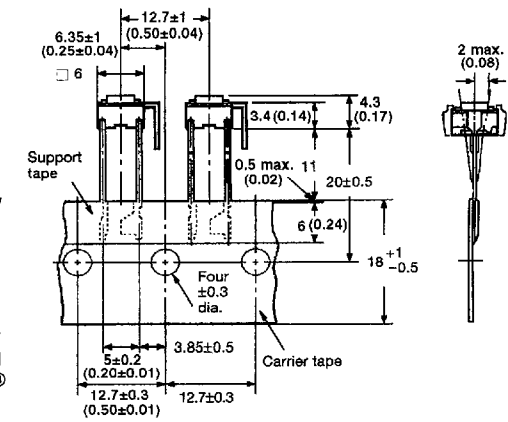
Note: The tape is random between surface A and surface B.

B3F-6100/6102

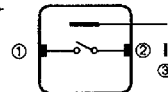
Flat plunger type (with ground terminal)



Tape-packaging dimensions

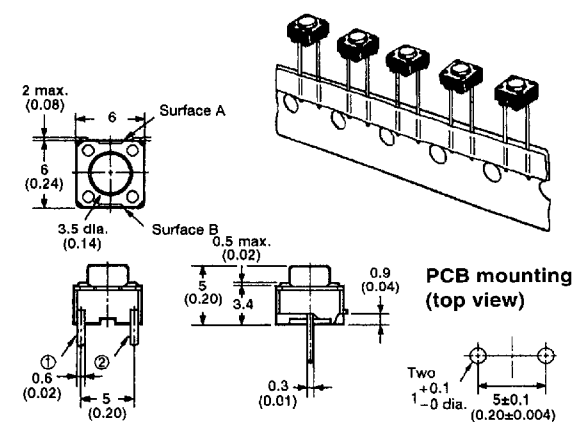


Terminal arrangement/
internal connections
(top view)

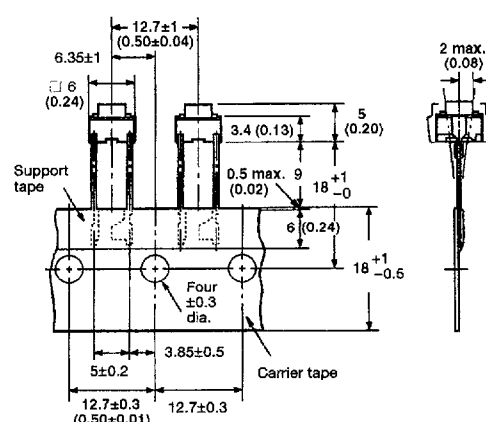


B3F-6020/6022

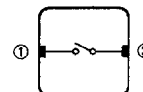
Flat plunger type (without ground terminal)



Tape-packaging dimensions

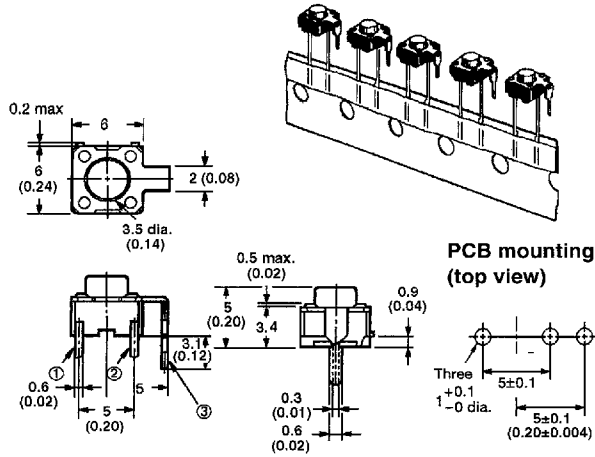


Terminal arrangement/
internal connections
(top view)

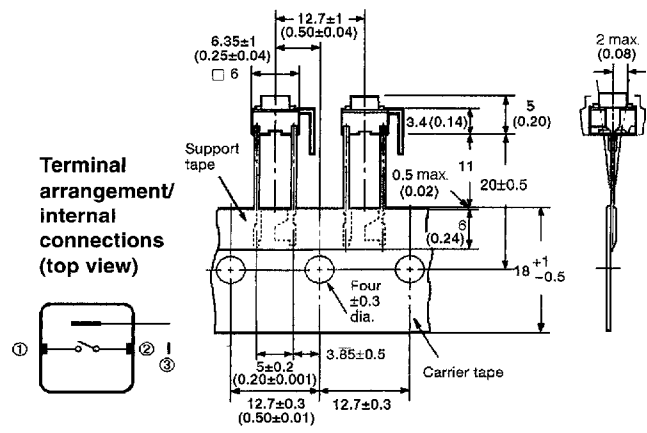


Note: Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

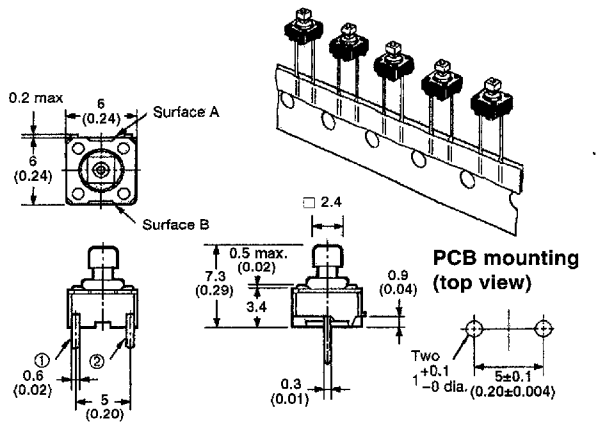
B3F-6120/6122
Flat plunger type (with ground terminal)



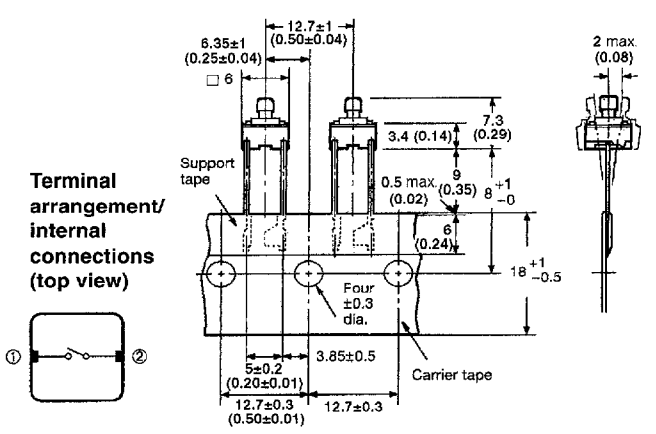
Tape-packaging dimensions



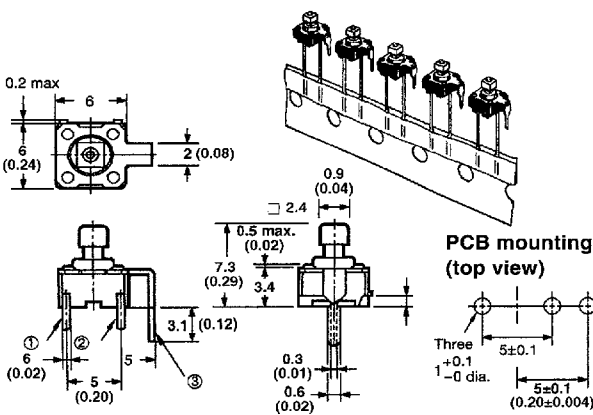
B3F-6050/6052
Projected plunger type (without ground terminal)



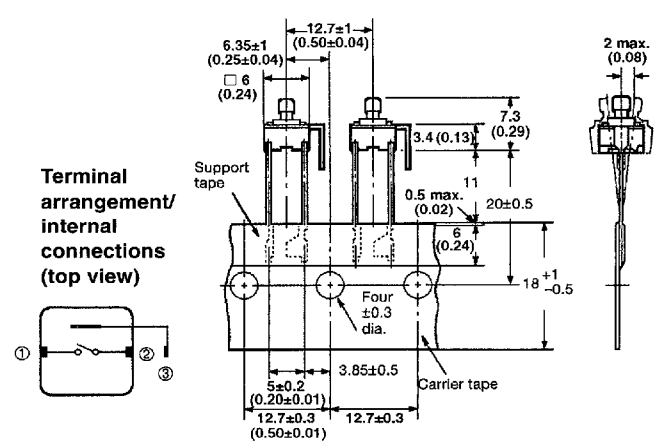
Tape-packaging dimensions



B3F-6150/6152
Projected plunger type (with ground terminal)



Tape-packaging dimensions



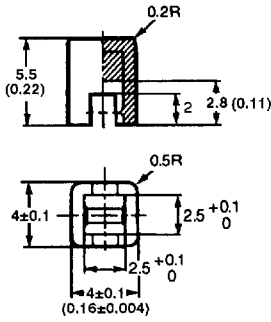
Note: Unless otherwise specified, a tolerance of ± 0.4 mm applies to all dimensions.

2

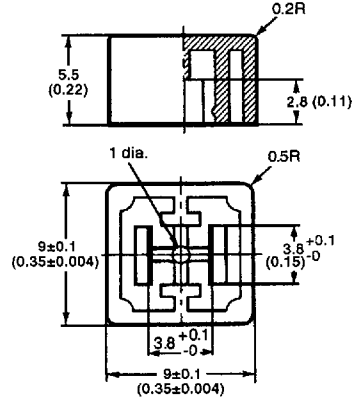
Unit: mm (inch)

KEYCAPS

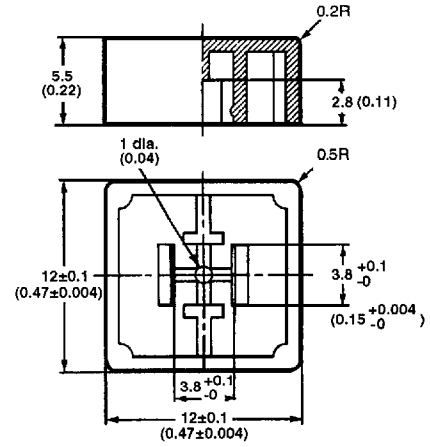
B32-10 0



B32-12 0

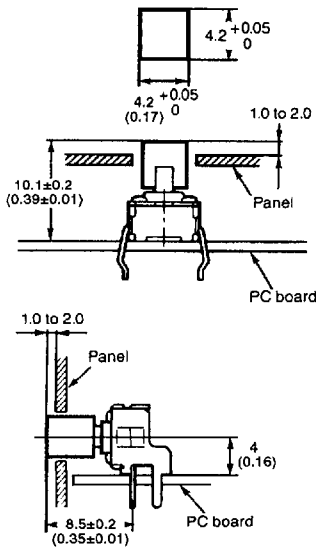


B32-13 0

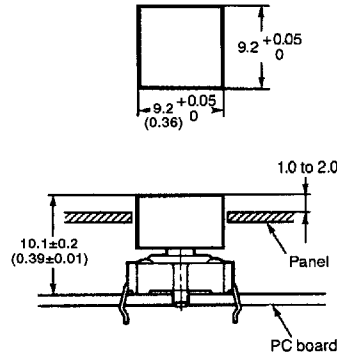


PANEL CUTOUTS

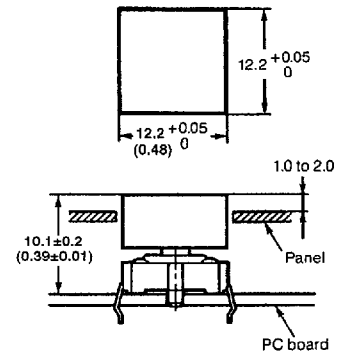
B32-10 0



B32-12 0



B32-13 0



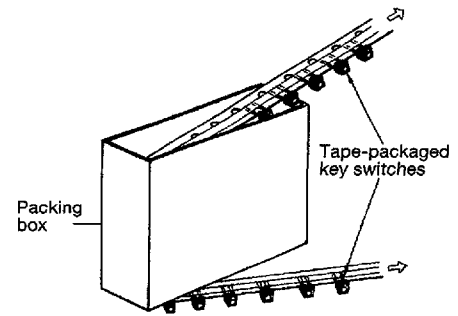
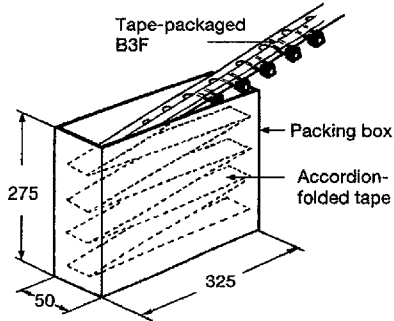
Note: 1. Unless otherwise specified, a tolerance of ± 0.2 mm applies to all dimensions.

2. Keycaps are available in different sizes and colors for exclusive use of the 6 x 6 mm and 12 x 12 mm projected plunger versions of model B3F.

Hints on Correct Use

■ TAPED RADIAL (AUTO INSERTION) PACKAGING

- Keyswitches packed on tape are placed into packing boxes as shown below.
- Number of switches per box: 1,000
- Tape may be drawn from the box either from the top or from the bottom.



■ TAPING STRENGTH

The keyswitches will not release from the tape when pulled in directions A and B at the following forces.

- A: 500 g
- B: 100 g

