

Compact Illuminated Through-hole-mounting Switches with Two LEDs

- Compact construction 10 × 10 × 11 mm (W × D × H) and 12 × 12 × 11 mm (W × D × H) with bright and uniform illumination.
- Three-color illumination (red LED + green LED = orange).
- Standard force (1.57 N) and high-force (2.26 N) models.



RoHS Compliant

■ List of Models

10 × 10 mm Models

| Operation type | Contact material | Height | Operating force (OF) | LED color | No. of LEDs | Cap color | Box | |
|------------------------------------|------------------|--------------|-------------------------|-------------------------|-------------|-------------|----------------|----------------------|
| | | | | | | | Model | Minimum packing unit |
| B3W-9000 Series: Standard force | Silver plated | 11 mm | 1.57 N {160 gf} max. | Blue | 1 | Blue | B3W-9000-B1B | 300 pcs |
| | | | | | 1 | Transparent | B3W-9000-B1C | |
| | | | | | 1 | Milky white | B3W-9000-B1N | |
| | | | | | 2 | Blue | B3W-9000-B2B | |
| | | | | | 2 | Transparent | B3W-9000-B2C | |
| | | | | | 2 | Milky white | B3W-9000-B2N | |
| | | | | Green | 1 | Transparent | B3W-9000-G1C | |
| | | | | | 1 | Green | B3W-9000-G1G | |
| | | | | | 1 | Milky white | B3W-9000-G1N | |
| | | | | | 2 | Transparent | B3W-9000-G2C | |
| | | | | | 2 | Green | B3W-9000-G2G | |
| | | | | | 2 | Milky white | B3W-9000-G2N | |
| | | | | Green (high brightness) | 1 | Transparent | B3W-9000-HG1C | |
| | | | | | 1 | Green | B3W-9000-HG1G | |
| | | | | | 1 | Milky white | B3W-9000-HG1N | |
| | | | | | 2 | Transparent | B3W-9000-HG2C | |
| | | | | | 2 | Green | B3W-9000-HG2G | |
| | | | | | 2 | Milky white | B3W-9000-HG2N | |
| | | | | Red | 1 | Transparent | B3W-9000-R1C | |
| | | | | | 1 | Milky white | B3W-9000-R1N | |
| | | | | | 1 | Red | B3W-9000-R1R | |
| | | | | | 2 | Transparent | B3W-9000-R2C | |
| | | | | | 2 | Milky white | B3W-9000-R2N | |
| | | | | | 2 | Red | B3W-9000-R2R | |
| | | | | Red + Green | 2 | Transparent | B3W-9000-RG2C | |
| | | | | | 2 | Milky white | B3W-9000-RG2N | |
| | | | | Red + High bright green | 2 | Transparent | B3W-9000-RHG2C | |
| | | | | Red + Blue | 2 | Transparent | B3W-9000-RB2C | |
| | | | | Yellow | 1 | Transparent | B3W-9000-Y1C | |
| | | | | | 1 | Milky white | B3W-9000-Y1N | |
| 1 | Yellow | B3W-9000-Y1Y | | | | | | |
| 2 | Transparent | B3W-9000-Y2C | | | | | | |
| 2 | Milky white | B3W-9000-Y2N | | | | | | |
| 2 | Yellow | B3W-9000-Y2Y | | | | | | |

| Operation type | Contact material | Height | Operating force (OF) | LED color | No. of LEDs | Cap color | Box | |
|--------------------------------|------------------|--------------|-------------------------|---------------------------------|-------------|-------------|----------------|----------------------|
| | | | | | | | Model | Minimum packing unit |
| B3W-9002 Series: High force | Silver plated | 11 mm | 2.26 N {230 gf} max. | Blue | 1 | Blue | B3W-9002-B1B | 300 pcs |
| | | | | | 1 | Transparent | B3W-9002-B1C | |
| | | | | | 1 | Milky white | B3W-9002-B1N | |
| | | | | | 2 | Blue | B3W-9002-B2B | |
| | | | | | 2 | Transparent | B3W-9002-B2C | |
| | | | | | 2 | Milky white | B3W-9002-B2N | |
| | | | | Green | 1 | Transparent | B3W-9002-G1C | |
| | | | | | 1 | Green | B3W-9002-G1G | |
| | | | | | 1 | Milky white | B3W-9002-G1N | |
| | | | | | 2 | Transparent | B3W-9002-G2C | |
| | | | | | 2 | Green | B3W-9002-G2G | |
| | | | | | 2 | Milky white | B3W-9002-G2N | |
| | | | | Green (high bright- ness) | 1 | Transparent | B3W-9002-HG1C | |
| | | | | | 1 | Green | B3W-9002-HG1G | |
| | | | | | 1 | Milky white | B3W-9002-HG1N | |
| | | | | | 2 | Transparent | B3W-9002-HG2C | |
| | | | | | 2 | Green | B3W-9002-HG2G | |
| | | | | | 2 | Milky white | B3W-9002-HG2N | |
| | | | | Red | 1 | Transparent | B3W-9002-R1C | |
| | | | | | 1 | Milky white | B3W-9002-R1N | |
| | | | | | 1 | Red | B3W-9002-R1R | |
| | | | | | 2 | Transparent | B3W-9002-R2C | |
| | | | | | 2 | Milky white | B3W-9002-R2N | |
| | | | | | 2 | Red | B3W-9002-R2R | |
| | | | | Red + Green | 2 | Transparent | B3W-9002-RG2C | |
| | | | | | 2 | Milky white | B3W-9002-RG2N | |
| | | | | Red + High bright green | 2 | Transparent | B3W-9002-RHG2C | |
| | | | | Red + Blue | 2 | Transparent | B3W-9002-RB2C | |
| | | | | Yellow | 1 | Transparent | B3W-9002-Y1C | |
| | | | | | 1 | Milky white | B3W-9002-Y1N | |
| 1 | Yellow | B3W-9002-Y1Y | | | | | | |
| 2 | Transparent | B3W-9002-Y2C | | | | | | |
| 2 | Milky white | B3W-9002-Y2N | | | | | | |
| 2 | Yellow | B3W-9002-Y2Y | | | | | | |

12 × 12 mm Models

| Operation type | Contact material | Height | Operating force (OF) | LED color | No. of LEDs | Cap color | Box | |
|------------------------------------|------------------|--------------|-------------------------|-------------------------|-------------|-------------|----------------|----------------------|
| | | | | | | | Model | Minimum packing unit |
| B3W-9010 Series: Standard force | Silver plated | 11 mm | 1.57 N {160 gf} max. | Blue (high brightness) | 1 | Blue | B3W-9010-B1B | 300 pcs |
| | | | | | 1 | Milky white | B3W-9010-B1N | |
| | | | | | 2 | Blue | B3W-9010-B2B | |
| | | | | | 2 | Milky white | B3W-9010-B2N | |
| | | | | Green | 1 | Green | B3W-9010-G1G | |
| | | | | | 1 | Milky white | B3W-9010-G1N | |
| | | | | | 2 | Green | B3W-9010-G2G | |
| | | | | | 2 | Milky white | B3W-9010-G2N | |
| | | | | Green (high brightness) | 1 | Green | B3W-9010-HG1G | |
| | | | | | 1 | Milky white | B3W-9010-HG1N | |
| | | | | | 2 | Green | B3W-9010-HG2G | |
| | | | | | 2 | Milky white | B3W-9010-HG2N | |
| | | | | Red | 1 | Red | B3W-9010-R1R | |
| | | | | | 1 | Milky white | B3W-9010-R1N | |
| | | | | | 2 | Red | B3W-9010-R2R | |
| | | | | | 2 | Milky white | B3W-9010-R2N | |
| | | | | Red + Green | 2 | Milky white | B3W-9010-RG2N | |
| | | | | Red + High bright green | 2 | Milky white | B3W-9010-RHG2N | |
| | | | | Red + Blue | 2 | Milky white | B3W-9010-RB2N | |
| | | | | Yellow | 1 | Yellow | B3W-9010-Y1Y | |
| 1 | Milky white | B3W-9010-Y1N | | | | | | |
| 2 | Yellow | B3W-9010-Y2Y | | | | | | |
| 2 | Milky white | B3W-9010-Y2N | | | | | | |
| B3W-9012 Series: High-force | Silver plated | 11 mm | 2.26 N {230 gf} max. | Blue | 1 | Blue | B3W-9012-B1B | 300 pcs |
| | | | | | 1 | Milky white | B3W-9012-B1N | |
| | | | | | 2 | Blue | B3W-9012-B2B | |
| | | | | | 2 | Milky white | B3W-9012-B2N | |
| | | | | Green | 1 | Green | B3W-9012-G1G | |
| | | | | | 1 | Milky white | B3W-9012-G1N | |
| | | | | | 2 | Green | B3W-9012-G2G | |
| | | | | | 2 | Milky white | B3W-9012-G2N | |
| | | | | Green (high brightness) | 1 | Green | B3W-9012-HG1G | |
| | | | | | 1 | Milky white | B3W-9012-HG1N | |
| | | | | | 2 | Green | B3W-9012-HG2G | |
| | | | | | 2 | Milky white | B3W-9012-HG2N | |
| | | | | Red | 1 | Red | B3W-9012-R1R | |
| | | | | | 1 | Milky white | B3W-9012-R1N | |
| | | | | | 2 | Red | B3W-9012-R2R | |
| | | | | | 2 | Milky white | B3W-9012-R2N | |
| | | | | Red + Green | 2 | Milky white | B3W-9012-RG2N | |
| | | | | Red + High bright green | 2 | Milky white | B3W-9012-RHG2N | |
| | | | | Red + Blue | 2 | Milky white | B3W-9012-RB2N | |
| | | | | Yellow | 1 | Yellow | B3W-9012-Y1Y | |
| 1 | Milky white | B3W-9012-Y1N | | | | | | |
| 2 | Yellow | B3W-9012-Y2Y | | | | | | |
| 2 | Milky white | B3W-9012-Y2N | | | | | | |

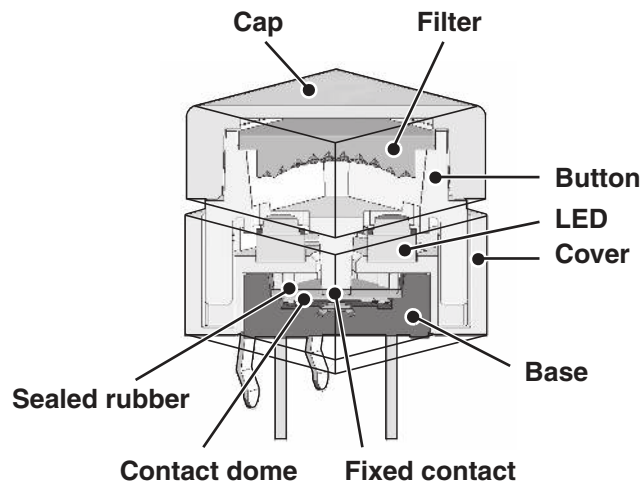
■ Ratings/Characteristics (Same for Both Standard and High-force Switches)

| | |
|---|--|
| Rating (resistive load) | 1 to 50 mA, 3 to 24 VDC |
| Minimum applicable load (reference value) | 10 μ A at 1 VDC (resistive load) |
| Ambient operating temperature | -25°C to +70°C at 60% max. humidity (with no icing or condensation) |
| Ambient operating humidity | 35% to 85% (at +5 to +35°C) |
| Contact form | SPST-NO |
| Contact resistance (initial value) | 100 m Ω max. |
| Insulation resistance | 100 M Ω min. (at 250 VDC with insulation tester) |
| 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. 100 G} max. Malfunction: 100 m/s ² {approx. 10 G} max. |
| Durability | Switch section 1.57 N (standard force):1,000,000 operations min. 2.26 N (high-force):300,000 operations min. |
| Degree of protection | IEC IP00 |
| Washing | Not possible |

■ Operating Characteristics

| Item | Standard-force Switches (B3W-90□0) | High-force Switches (B3W-90□2) |
|----------------------|---|--------------------------------|
| Operating force (OF) | 1.57 N {160 gf} max. | 2.26 N {230 gf} max. |
| Releasing force (RF) | 0.2 N {20 gf} min. | 0.49 N {50 gf} min. |
| Pretravel (PT) | 0.25 ^{+0.2} / _{-0.1} mm | |

■ Model Structure



■ LED Specifications

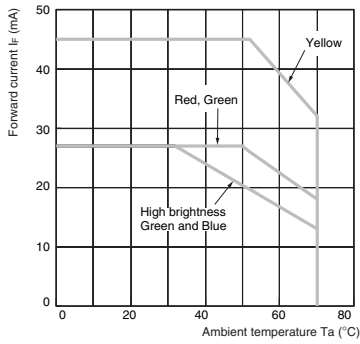
(Ambient temperature $T_a = 25^\circ\text{C}$)

| LED color | Red | Green | Green (high brightness) | Yellow | Blue |
|--|---------------|-------|-------------------------|--------|-------|
| Maximum operating current I_{FM} | 27 mA | 27 mA | 27 mA | 45 mA | 27 mA |
| Recommended operating current I_F | 20 mA | 10 mA | 20 mA | 20 mA | 20 mA |
| Forward voltage (standard value) V_F | 1.8 V | 2.1 V | 3.7 V | 2 V | 3.7 V |
| Maximum reverse voltage V_R | 5 V | 5 V | 5 V | 5 V | 5 V |
| Ambient operating temperature | -25°C to 70°C | | | | |

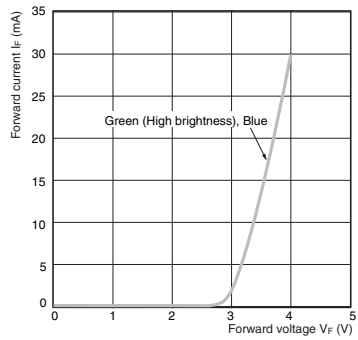
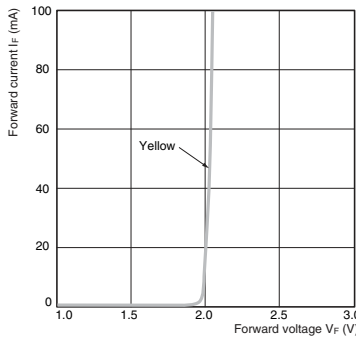
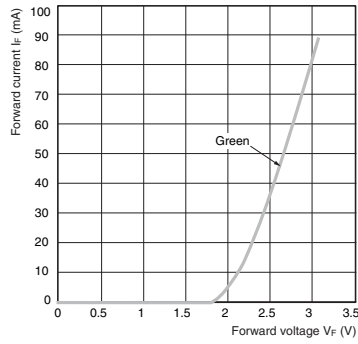
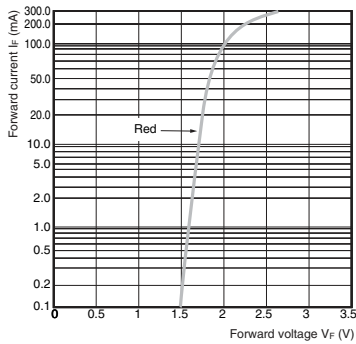
Note: For Switches with two LEDs, red and green, the recommended operating current is 12 mA for the red and 20 mA for the green LED for application with three-color illumination.

■ LEDs

● Forward current reduction curve

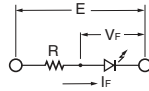


● Forward current and forward voltage curves



- Note:**
1. 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 with the OMRON mark.
 2. 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.

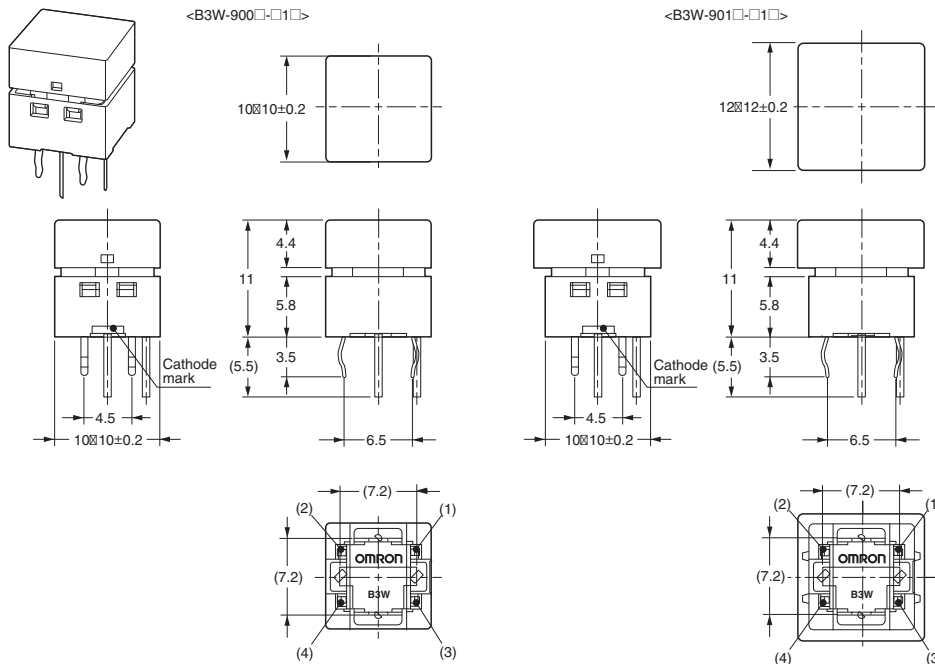
$$\text{Limiting resistance (R)} = \frac{\text{Voltage used (E)} - \text{LED forward voltage (VF)}}{\text{LED forward current (IF)}} (\Omega)$$



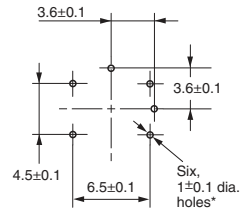
■ Dimensions (Unit: mm)

1 LED Types

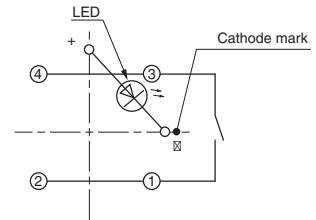
B3W-900□-□1□
B3W-901□-□1□



PCB Processing Dimensions (Reference Only) (Top View)



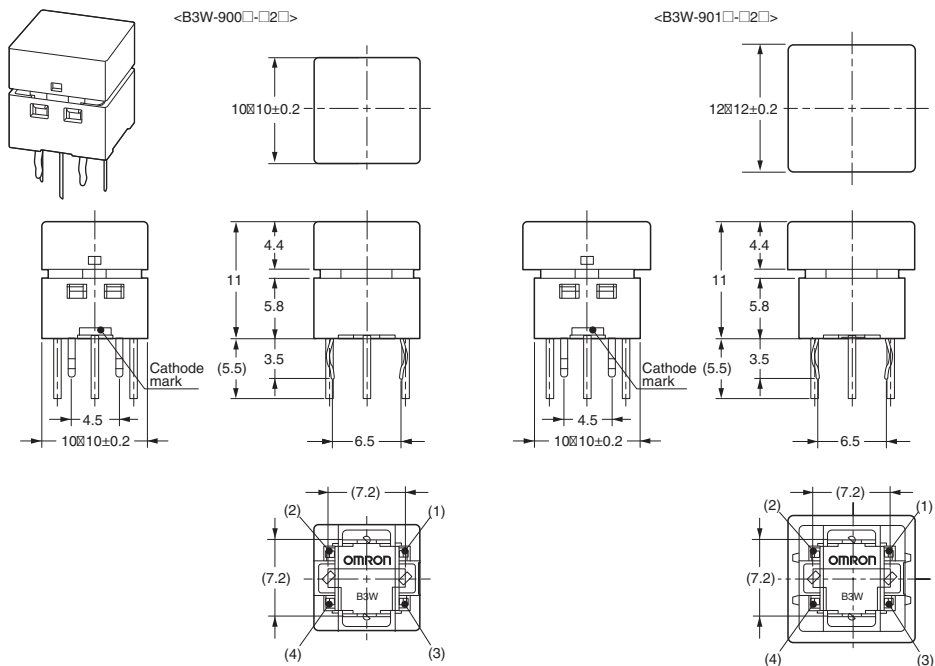
Terminal Arrangement/ Internal Connections (Top View)



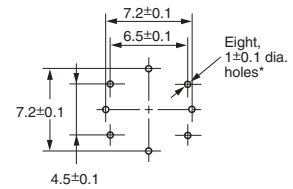
Note: If the poles of the LED are set incorrectly, it may result in malfunction.

2 LED Types

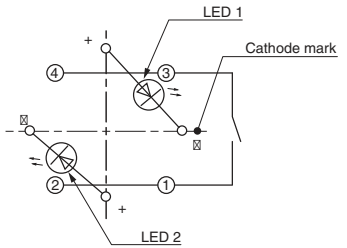
B3W-900□-□2□
B3W-901□-□2□



PCB Processing Dimensions (Reference Only) (Top View)



Terminal Arrangement/ Internal Connections (Top View)



Note 1: If the poles of the LED are set incorrectly, it may result in malfunction.
2: For models with two-color LEDs, the color of LED 1 is at position LED 1. The color of LED 2 is at the position LED 2.
B3W-90□-□RG2□
LED 2 color
LED 1 color

Note: Unless otherwise specified, a tolerance of ±0.4 mm applies to all dimensions. No terminal numbers are indicated on the Switches.

■ Accessories

B3W-9□□-F□

Text Combination Films

Text Combination Films for B3W-9 Illuminated Tactile Switches

- Display two different labels in combination with a 2-LED B3W-9 Switch.
- Color combinations: Red/Green or Red/Blue



■ Model Number Legend

B3W-9□□-F□

1 2 3

1. Color

R: Red

2. Color

B: Blue

G: Green

3. Color and text combination

F1: Red OFF
Blue or green ON

F2: Red 切 (OFF)
Blue or green 入 (ON)

F3: Red 閉 (CLOSE)
Blue or green 開 (OPEN)

F4: Red ×
Blue or green ○

F5: Red ▼
Blue or green ▲

Note: 1. Five text combinations are available.

2. Films can also be customized with other text for 50 sheets (1,250 films) per lot. Delivery time is approximately five weeks. (Ask your OMRON representative for details.)

| Text Combinations | LED colors | Model |
|------------------------------|------------|------------|
| "OFF" and "ON" | Red/Blue | B3W-9RB-F1 |
| | Red/Green | B3W-9RG-F1 |
| "切" and "入" (OFF) (ON) | Red/Blue | B3W-9RB-F2 |
| | Red/Green | B3W-9RG-F2 |
| "閉" and "開" (CLOSE)(OPEN) | Red/Blue | B3W-9RB-F3 |
| | Red/Green | B3W-9RG-F3 |
| "×" and "○" | Red/Blue | B3W-9RB-F4 |
| | Red/Green | B3W-9RG-F4 |
| "▼" and "▲" | Red/Blue | B3W-9RB-F5 |
| | Red/Green | B3W-9RG-F5 |

■ Recommended B3W-9 Switches

| Operating force | 2-LED Switches | Red/Blue | Red/Bright green |
|-------------------------|----------------|---------------|------------------|
| Standard-force Switches | | B3W-9000-RB2C | B3W-9000-RHG2C |
| High-force Switches | | B3W-9002-RB2C | B3W-9002-RHG2C |

■ Minimum Order

25 films/sheet

B3W-9 Films are sold in units of 25 films. Orders must be made in multiples of 25 (the quantity per sheet).

Note: Text Combination Films are sold without the Switches. Order one of the above models of B3W-9 Illuminated Tactile Switches separately.

■ Safety Precautions

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

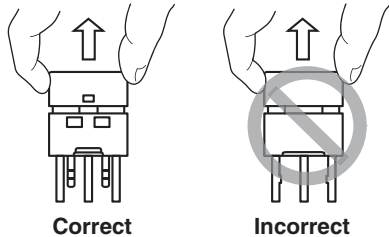
■ Precautions for Correct Use

LEDs

Switches with high-brightness green (HG) or blue (B) LEDs are susceptible to static electricity. Be careful when handling a Switch with these LEDs as it may cause the Switch to breakdown.

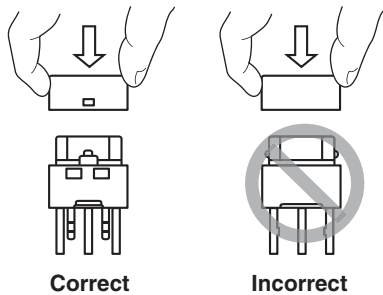
Removing the Cap

1. Hold the cap at the side away from the mating section. Pull straight up.
2. Do not remove the cap while the Switch is mounted. Doing so will apply force to the soldered section and LEDs, resulting in malfunction.



Placing the Cap on the Switch

Hold the Cap at the side away from the mating section. Push straight down until the mating section meets.

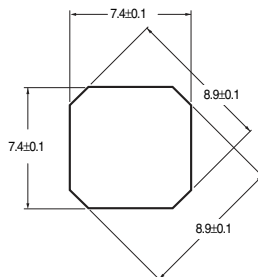


Removing the Cap

The Cap can be removed up to two times. Excessively removing the Cap will cause the mating section to become weak, resulting in the operating section not mating completely or the Cap may fall off.

Film Dimensions

Dimensions of the film are shown below. The thickness is 0.2 mm.



- Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.
- Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

Note: Do not use this document to operate the Unit.

OMRON Corporation
Electronic and Mechanical Components Company

Contact: www.omron.com/ecb

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