

# General Specifications

## Electrical Capacity (Resistive Load)

**Power Level (silver):** 5A @ 125/250V AC or 5A @ 30V DC  
**Logic Level (gold):** 0.4VA maximum @ 28V AC/DC maximum  
 (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)  
 Note: Find additional explanation of operating range in Supplement section.

## Other Ratings

**Contact Resistance:** 50 milliohms maximum for silver; 100 milliohms maximum for gold  
**Insulation Resistance:** 200 megohms minimum @ 500V DC  
**Dielectric Strength:** 1,000V AC minimum between contacts for 1 minute minimum;  
 1,500V AC minimum between contacts & case for 1 minute minimum  
**Mechanical Life:** 1,000,000 operations minimum for momentary;  
 200,000 operations minimum for alternate action  
**Electrical Life:** 10,000 operations minimum for silver;  
 200,000 operations minimum for gold  
**Nominal Operating Force:** Single Pole: 1.90N  
 Double Pole: 2.55N  
**Contact Timing:** Break before make  
**Travel:** Pretravel .067" (1.7mm); Overtravel .024" (0.6mm); Total Travel .091" (2.3mm)

## Materials & Finishes

**Housing/Bezel:** Glass fiber reinforced polyamide (UL94V-0)  
**Snap-in Frame:** Stainless steel  
**Movable Contactor:** Phosphor bronze  
**Movable Contacts:** Silver alloy or copper with gold plating  
**Stationary Contacts:** Silver alloy or copper with gold plating  
**Switch Terminals:** Phosphor bronze with silver or gold plating  
**Lamp Terminals:** Brass with tin plating  
**Base:** Glass fiber reinforced liquid crystal polymer (UL94V-0)

## Environmental Data

**Operating Temperature Range:** -25°C through +50°C (-13°F through +122°F) for Illuminated  
 -25°C through +70°C (-13°F through +158°F) for Nonilluminated  
**Humidity:** 90 ~ 95% humidity for 240 hours @ 40°C (104°F)  
**Vibration:** 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours  
**Shock:** 50G (490m/s<sup>2</sup>) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

## Installation

**Cap Installation Force:** 15.0N maximum downward force on cap

## Processing

**Soldering:** Wave Soldering (PC version): See Profile A in Supplement section.  
 Manual Soldering: See Profile A in Supplement section.  
**Cleaning:** These devices are not process sealed. Hand clean locally using alcohol based solution.

## Standards & Certifications

**Flammability Standards:** UL94V-0 housing/bezel & base  
**UL:** File No. E44145 - Recognized only when ordered with marking on switch.  
 Add "/U" or "/CUL" before dash in part number to order UL recognized switch.  
 UL recognized only when ordered switch body with cap assembled.  
 All single & double pole models recognized at 5A @ 125/250V AC or 0.014A @ 28V DC.

# Distinctive Characteristics

Wide selection of illumination effects is achieved with single and bicolor, 1- or 6-element LEDs in flat, beveled, or sculptured caps.

Alternating legends in choice of sculptured or flat caps, combined with super bright bicolor LED.

Combination of PCB mountability and short body allows use in compact applications.

Small behind panel dimension for snap-in mounting in tight spaces.

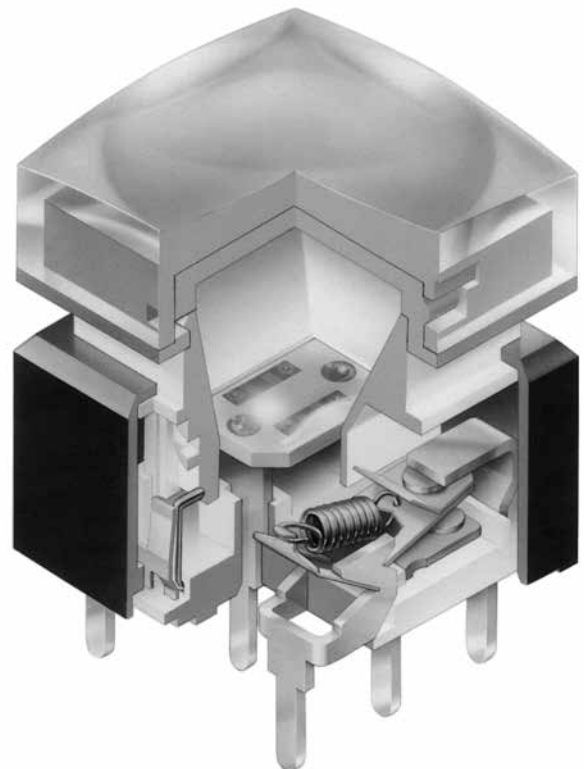
Snap-acting contact mechanism provides sensitive actuation with audible feedback; quick-make, quick-break characteristic limits arcing and prolongs electrical life.

Latchdown mechanism, independent of switching mechanism, gives outstanding stability and reliability plus visible and tactile indication of circuit status.

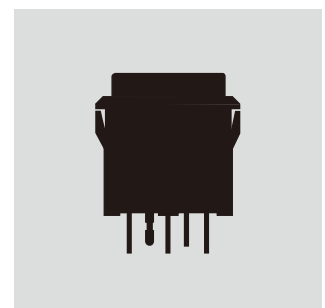
Terminals are epoxy sealed to lock out flux, solvents, and other contaminants.

Momentary and alternate action circuits available in the same space-saving body size.

Matching indicators available.



Actual Size



UB2

1

5

SK

G

03

| Poles |      |
|-------|------|
| 1     | SPDT |
| 2     | DPDT |

| Circuits                        |    |      |
|---------------------------------|----|------|
| 5                               | ON | (ON) |
| ( ) = Momentary                 |    |      |
| 6                               | ON | ON   |
| Alternate Action with Latchdown |    |      |

| Mounting Types                       |        |
|--------------------------------------|--------|
| PCB Mounting                         |        |
| SK                                   | Square |
| * Snap-in Mounting                   |        |
| KK                                   | Square |
| * Standard with Solder Lug terminals |        |

| Terminals |                                   |
|-----------|-----------------------------------|
| 01        | Solder Lug (for Snap-in Mounting) |
| 03        | Straight PC                       |

| Contacts & Ratings |                                      |
|--------------------|--------------------------------------|
| W                  | Silver Rated 5A @ 125/250V AC        |
| G                  | Gold Rated 0.4VA max @ 28V AC/DC max |

| Part Numbers for Alternating Legends |                            |                           |
|--------------------------------------|----------------------------|---------------------------|
| Color                                | 15mm Square Sculptured Cap | 15mm Square Flat Cap      |
|                                      | Part Number                | Part Number               |
| Red/Green                            | AT3069JCF11 ~ AT3069JCF14  | AT3070JCF11 ~ AT3070JCF14 |
| Amber/Blue                           | AT3069JDG11 ~ AT3069JDG14  | AT3070JDG11 ~ AT3070JDG14 |

Refer to Ordering Table for Alternating Legend that corresponds with last 2 digits of part number.

IMPORTANT:



Switches are supplied without UL & cULus marking unless specified. **UL & cULus recognized only when ordered with marking on switch.** Specific models, ratings, & ordering instructions are noted on the General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

UB215SKG035C-1JC



## ORDERING EXAMPLE

5C

## LEDS

## Bright LED

|    |       |
|----|-------|
| 5C | Red   |
| 5D | Amber |
| 5F | Green |

## Super Bright LED

|    |       |
|----|-------|
| 6B | White |
| 6F | Green |
| 6G | Blue  |

## Super Bright Bicolor LED

|     |            |
|-----|------------|
| 6CF | Red/Green  |
| 6DG | Amber/Blue |

## Nonilluminated

|   |                |
|---|----------------|
| N | Nonilluminated |
|---|----------------|

1JC

## Cap Types &amp; Colors

## Sculptured Cap Lens/Diffuser Colors

|     |             |
|-----|-------------|
| 1JB | Clear/White |
| 1JC | Clear/Red   |
| 1JD | Clear/Amber |
| 1JF | Clear/Green |

## Beveled Cap &amp; Colors

|    |       |
|----|-------|
| 2B | White |
| 2C | Red   |
| 2D | Amber |
| 2F | Green |

## Flat Cap Lens/Diffuser Colors

|     |             |
|-----|-------------|
| 3JB | Clear/White |
| 3JC | Clear/Red   |
| 3JD | Clear/Amber |
| 3JF | Clear/Green |

## Sculptured Cap Lens/Diffuser Color

|     |             |
|-----|-------------|
| 1JB | Clear/White |
|-----|-------------|

## Beveled Cap &amp; Color

|    |       |
|----|-------|
| 2B | White |
|----|-------|

## Flat Cap Lens/Diffuser Color

|     |             |
|-----|-------------|
| 3JB | Clear/White |
|-----|-------------|

## Sculptured Cap Lens/Diffuser Color

|     |             |
|-----|-------------|
| 1JB | Clear/White |
|-----|-------------|

## Beveled Cap &amp; Color

|    |       |
|----|-------|
| 2B | White |
|----|-------|

## Flat Cap Lens/Diffuser Color

|     |             |
|-----|-------------|
| 3JB | Clear/White |
|-----|-------------|

## Sculptured Cap with Alternating Legend

|      |                   |
|------|-------------------|
| 4JCF | Clear; Red/Green  |
| 4JDG | Clear; Amber/Blue |

## Flat Cap with Alternating Legend

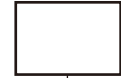
|      |                   |
|------|-------------------|
| 5JCF | Clear; Red/Green  |
| 5JDG | Clear; Amber/Blue |

## Sculptured Cap Lens/Insert Colors

|     |             |     |             |
|-----|-------------|-----|-------------|
| 4JA | Clear/Black | 4JD | Clear/Amber |
| 4JB | Clear/White | 4JF | Clear/Green |
| 4JC | Clear/Red   |     |             |

## Beveled Cap &amp; Colors

|    |       |    |       |
|----|-------|----|-------|
| 5A | Black | 5D | Amber |
| 5B | White | 5F | Green |
| 5C | Red   |    |       |



## Alternating Legends

|    |          |           |
|----|----------|-----------|
| 11 | ON (pos) | OFF (pos) |
| 12 | ON (neg) | OFF (neg) |
| 13 | START    | STOP      |
| 14 | OPEN     | CLOSE     |

See Part Numbers Table on Previous Page.

Contact factory for custom options.

## POLES &amp; CIRCUITS

| Pole | Model           | Plunger Position<br>( ) = Momentary |            | Connected Terminals |         | Throw & Switch/Lamp Schematics                                                                                                |
|------|-----------------|-------------------------------------|------------|---------------------|---------|-------------------------------------------------------------------------------------------------------------------------------|
|      |                 | Normal                              | Down       | Normal              | Down    |                                                                                                                               |
| SP   | UB215<br>*UB216 | ON<br>ON                            | (ON)<br>ON | 1-3                 | 1-2     | SPDT<br>Notes: Switch is marked with NC, NO, COM, L+ & L-.<br>Lamp circuit is isolated and requires an external power source. |
| DP   | UB225<br>*UB226 | ON<br>ON                            | (ON)<br>ON | 1-3 4-6             | 1-2 4-5 | DPDT                                                                                                                          |

\* When in latchdown position for the alternate circuit, cap positions above the housing are:  
.059" (1.5mm) for snap-in models & .276" (7.0mm) for PCB models.

## MOUNTING TYPES &amp; SHAPES

## PCB Mounting



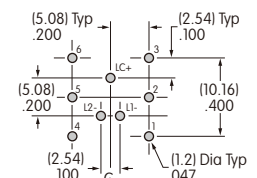
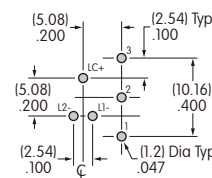
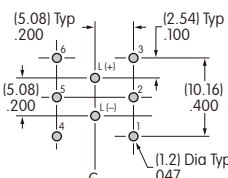
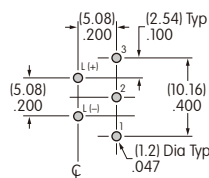
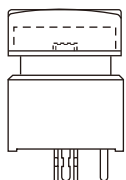
Square

SP, Single Color LED

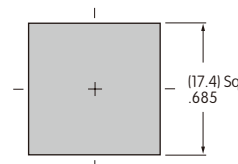
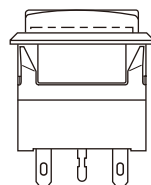
DP, Single Color LED

SP, Bicolor LED

DP, Bicolor LED



## Snap-in Mounting (Solder Lug)

Square  
with Built-in Bezel

Panel Thickness:  
.039 ~ .126"  
(1.0 ~ 3.2mm)

## CONTACT MATERIALS &amp; RATINGS



Silver Contacts

Power Level

5A @ 125V AC &amp; 250V AC



Gold Contacts

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Complete explanation of operating range in Supplement section.

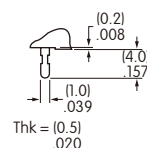
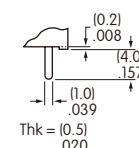
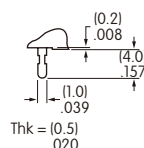
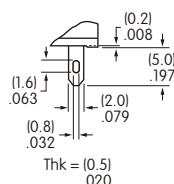
## SWITCH &amp; LAMP TERMINALS



Solder Lug

For Switch &  
Bright LEDFor Super Bright  
& Bicolor LED

Straight PC

For Switch &  
Bright LEDFor Super Bright  
& Bicolor LED

BRIGHT LED & CAPS

The electrical specifications shown are determined at a basic temperature of 25°C.  
LED circuit is isolated and requires an external power source. Polarity marks are on the bottom of the switch.  
If the source voltage exceeds the rated voltage, a ballast resistor is required.  
The resistor value can be calculated by using the formula in the Supplement section.

The LED is an integral part of the switch and not available separately.

Electrical Specifications for Bright LED

|                                   |              | 5C          | 5D    | 5F    |       |
|-----------------------------------|--------------|-------------|-------|-------|-------|
|                                   | Color        | Red         | Amber | Green | Unit  |
| Maximum Forward Current           | $I_{FM}$     | 30          | 30    | 25    | mA    |
| Typical Forward Current           | $I_F$        | 20          | 20    | 20    | mA    |
| Forward Voltage                   | $V_F$        | 1.85        | 2.0   | 2.1   | V     |
| Maximum Reverse Voltage           | $V_{RM}$     | 5           | 5     | 5     | V     |
| Current Reduction Rate Above 25°C | $\Delta I_F$ | 0.40        | 0.42  | 0.46  | mA/°C |
| Ambient Temperature Range         |              | -25° ~ +50° |       |       | °C    |

Bright Single Color LED with 1 element



Caps for Bright LED

1

AT3074  
Sculptured

Clear Lens

Translucent Colored Diffuser

2

AT3075  
Beveled

Translucent Colored Cap

3

AT3076  
Flat

Clear Lens

Translucent Colored Diffuser

Lens/Diffuser Colors Available:

- JB

Clear/White
- JC

Clear/Red
- JD

Clear/Amber
- JF

Clear/Green

Cap Colors Available:

- B

White
- C

Red
- D

Amber
- F

Green

Lens/Diffuser Colors Available:

- JB

Clear/White
- JC

Clear/Red
- JD

Clear/Amber
- JF

Clear/Green

Material: Polycarbonate      Finish: Glossy

## SUPER BRIGHT LEDS &amp; CAPS

The electrical specifications shown are determined at a basic temperature of 25°C. LED circuit is isolated and requires an external power source. Polarity marks are on the bottom of the switch. If the source voltage exceeds the rated voltage, a ballast resistor is required. The resistor value can be calculated by using the formula in the Supplement section.

The LED is an integral part of the switch and not available separately.

## Electrical Specifications for Super Bright LEDs

| Super Bright LEDs are Electrostatic Sensitive |  | Color        | <b>6B</b>   | <b>6F</b> | <b>6G</b> | Unit  |
|-----------------------------------------------|-----------------------------------------------------------------------------------|--------------|-------------|-----------|-----------|-------|
|                                               |                                                                                   |              | White       | Green     | Blue      |       |
| Maximum Forward Current                       |                                                                                   | $I_{FM}$     | 20          | 30        | 30        | mA    |
| Typical Forward Current                       |                                                                                   | $I_F$        | 15          | 20        | 20        | mA    |
| Forward Voltage                               |                                                                                   | $V_F$        | 3.3         | 3.5       | 3.6       | V     |
| Maximum Reverse Voltage                       |                                                                                   | $V_{RM}$     | 5           | 5         | 5         | V     |
| Current Reduction Rate Above 25°C             |                                                                                   | $\Delta I_F$ | 0.25        | 0.50      | 0.50      | mA/°C |
| Ambient Temperature Range                     |                                                                                   |              | -20° ~ +50° |           |           | °C    |

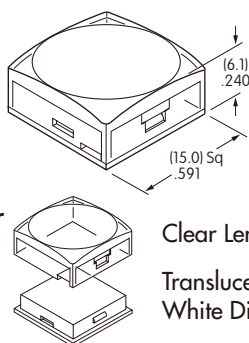
Super Bright Single Color LED with 1 element



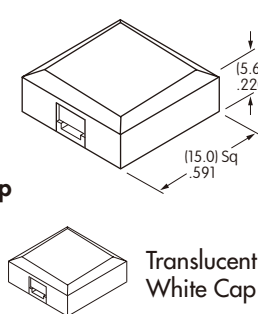
## Caps for Super Bright LED

**1JB**

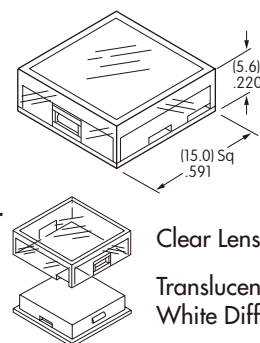
**AT3074JB**  
Sculptured  
Clear Lens/  
White Diffuser

**2B**

**AT3075B**  
Beveled  
White Cap

**3JB**

**AT3076JB**  
Flat  
Clear Lens/  
White Diffuser



Material: Polycarbonate

Finish: Glossy

## SUPER BRIGHT BICOLOR LEDS &amp; CAPS

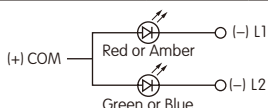
The electrical specifications shown are determined at a basic temperature of 25°C. LED circuit is isolated and requires an external power source. Polarity marks are on the bottom of the switch. If the source voltage exceeds the rated voltage, a ballast resistor is required. The resistor value can be calculated by using the formula in the Supplement section.

The LED is an integral part of the switch and not available separately.

## Electrical Specifications for Super Bright Bicolor LEDs

| Super Bright LEDs are Electrostatic Sensitive |  | Color        | <b>6CF</b>           | <b>6DG</b>           | Unit  |
|-----------------------------------------------|-------------------------------------------------------------------------------------|--------------|----------------------|----------------------|-------|
|                                               |                                                                                     |              | Red                  | Green                |       |
| Maximum Forward Current                       |                                                                                     | $I_{FM}$     | 30<br>* 25 for Amber | 25<br>* 22 for Amber | mA    |
| Typical Forward Current                       |                                                                                     | $I_F$        | 20                   | 20                   | mA    |
| Forward Voltage                               |                                                                                     | $V_F$        | 2.1                  | 3.5                  | V     |
| Maximum Reverse Voltage                       |                                                                                     | $V_{RM}$     | 4                    | 4                    | V     |
| Current Reduction Rate Above 25°C             |                                                                                     | $\Delta I_F$ | 0.40                 | 0.33                 | mA/°C |
| Ambient Temperature Range                     |                                                                                     |              | -20° ~ +50°          |                      | °C    |

Super Bright Bicolor  
LED with 2 elements

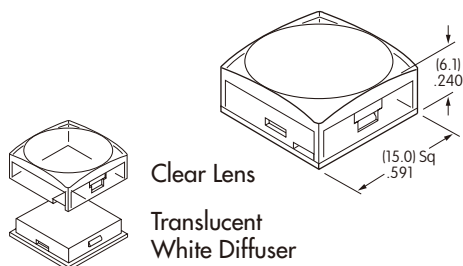


\* Amber color is achieved by lighting red and green simultaneously, but is not suitable for Alternating Legends.

## Caps for Super Bright Bicolor LED

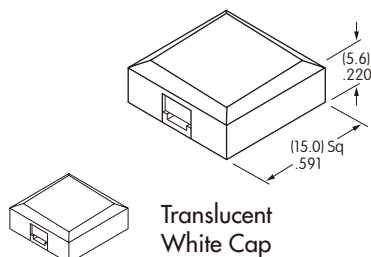
**1JB**

AT3074JB Sculptured  
Clear Lens/White Diffuser



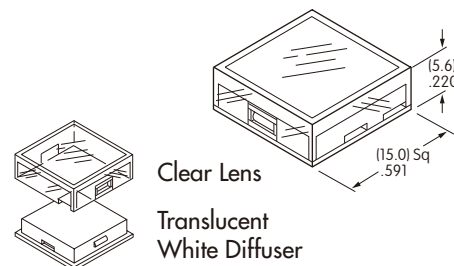
**2B**

AT3075B Beveled  
White Cap



**3JB**

AT3076JB Flat  
Clear Lens/White Diffuser



Material: Polycarbonate

Finish: Glossy

## Alternating Legend Caps for Super Bright Bicolor LED

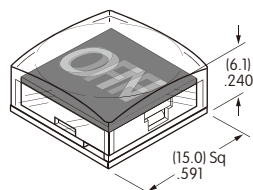
AT3069J Sculptured Cap  
with Alternating Legend

**4JCF**

Red/Green

**4JDG**

Amber/Blue



Clear Lens  
Alternating Legend Filter

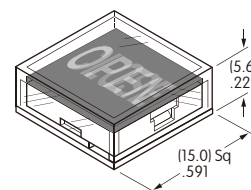
AT3070J Flat Cap with  
Alternating Legend

**5JCF**

Red/Green

**5JDG**

Amber/Blue



Clear Lens  
Alternating Legend Filter

Material: Polycarbonate

Finish: Glossy

## Standard Alternating Legend Pairs

**11**

ON

OFF

Green/Red or Blue/Amber

**12**

ON

OFF

Green/Red or Blue/Amber

**13**

START

STOP

Green/Red or Blue/Amber

**14**

OPEN

CLOSE

Green/Red or Blue/Amber

Cap illumination is alternating Green/Red or Blue/Amber; legend text is black.  
Contact factory for other Alternating Legends.

Legend illustrations are approximate representations of the actual characters on the filters.

**No Code**

No Lamp

## CAP TYPES & COLOR COMBINATIONS FOR NONILLUMINATED

**4**

AT3073 Sculptured

Lens/Insert  
Colors Available:

**JA**

Clear/Black

**JB**

Clear/White

**JC**

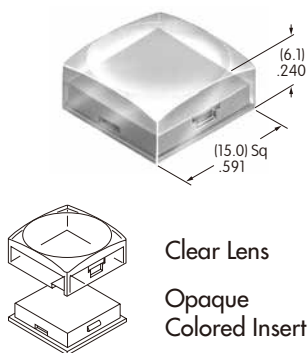
Clear/Red

**JD**

Clear/Amber

**JF**

Clear/Green



Clear Lens  
Opaque  
Colored Insert

Material: Polycarbonate  
Finish: Glossy

**5**

AT3077 Beveled

Cap  
Colors Available:

**A**

Black

**B**

White

**C**

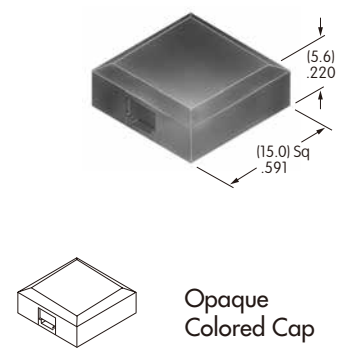
Red

**D**

Amber

**F**

Green

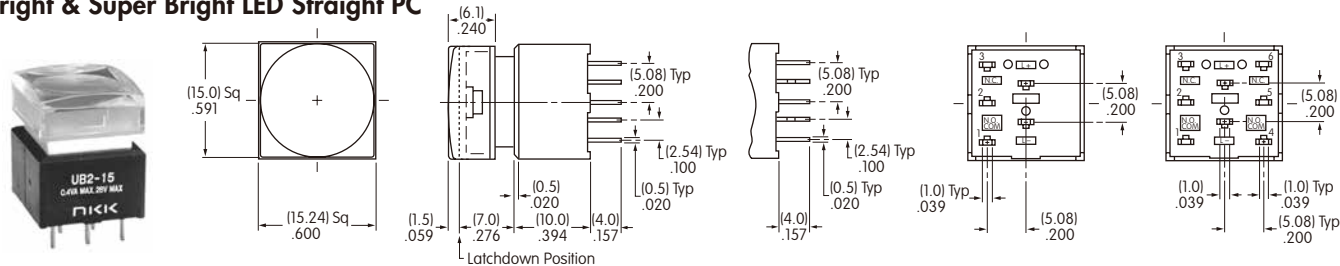


Opaque  
Colored Cap

Material: Polycarbonate  
Finish: Glossy

### TYPICAL SWITCH DIMENSIONS

#### Bright & Super Bright LED Straight PC



UB215SKG035C-1JC

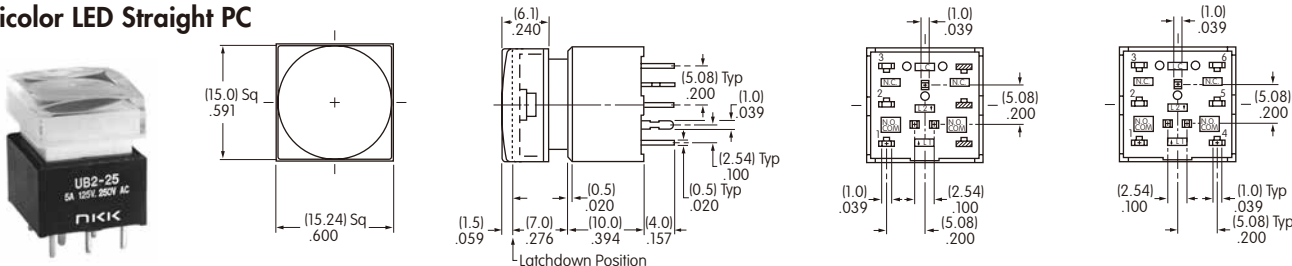
Bright Single Color LED

Super Bright Single Color LED

Single Pole

Double Pole

#### Bicolor LED Straight PC



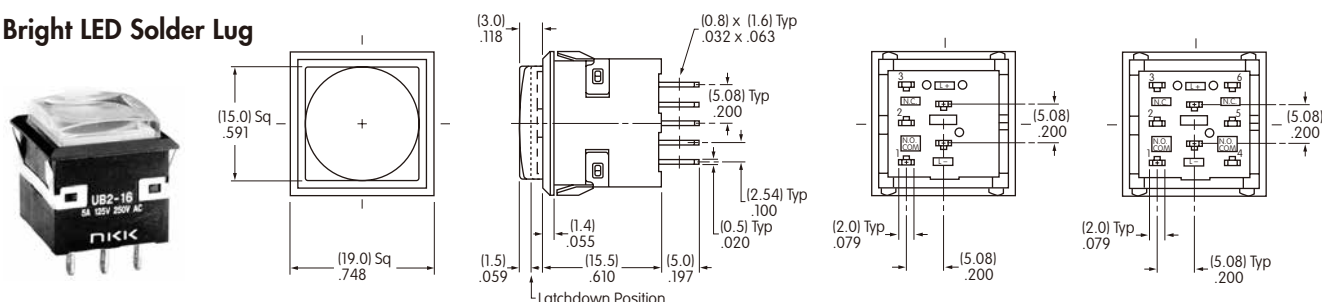
UB225SKG03CF-1JB

Bicolor LED Side View

Single Pole

Double Pole

#### Bright LED Solder Lug



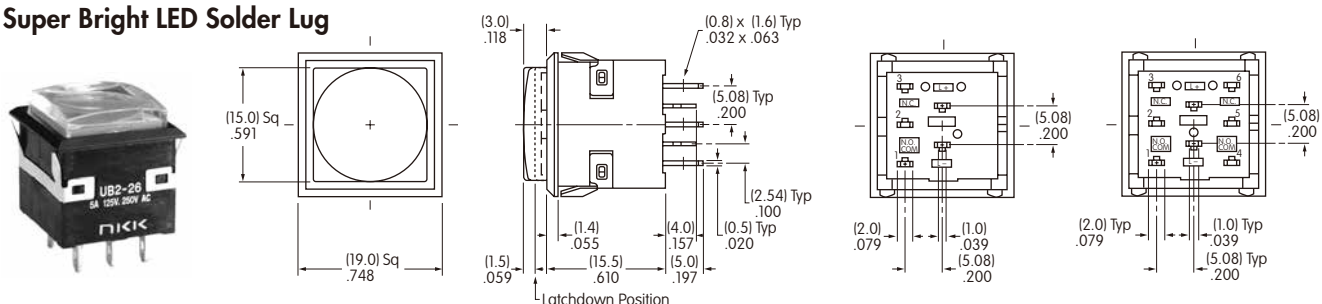
UB216KKW015F-1JF

Single Color LED Side View

Single Pole

Double Pole

#### Super Bright LED Solder Lug



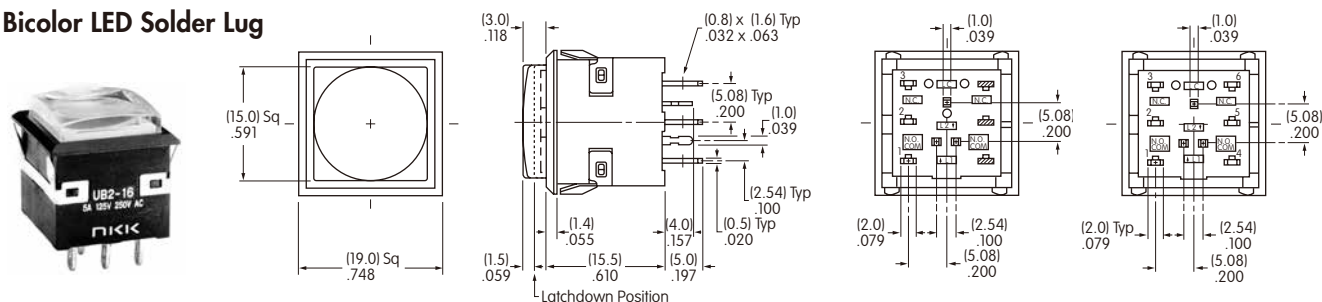
UB226KKW016F-1JF

Single Color LED Side View

Single Pole

Double Pole

#### Bicolor LED Solder Lug



UB216KKW01CF-1JB

Bicolor LED Side View

Single Pole

Double Pole

## OPTIONAL ACCESSORIES

### AT4141

Opens 90°  
Closes manually



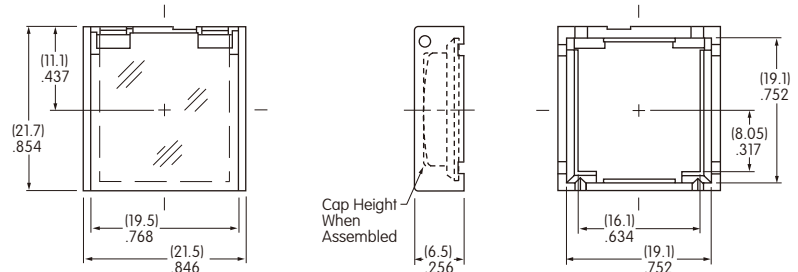
#### Materials:

Cover: Clear Polycarbonate  
Base: Black GFR Polyamide

#### Recommended Panel Thickness:

.039" ~ .106" (1.0mm ~ 2.7mm)

### Protective Guard for Snap-in Model



### Spring Loaded Protective Guard for Snap-in Mounting of PCB Model

### AT4170

Opens 180°  
Closes automatically



#### Materials:

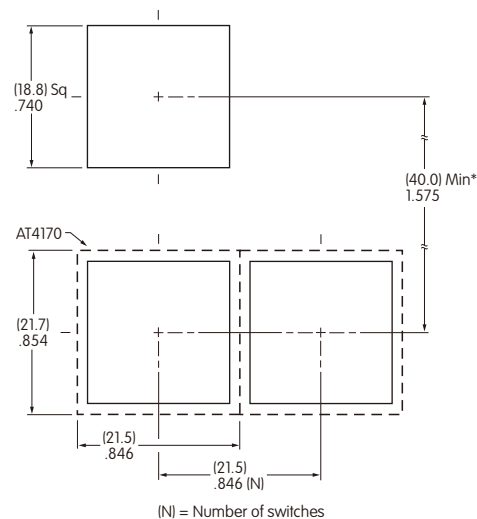
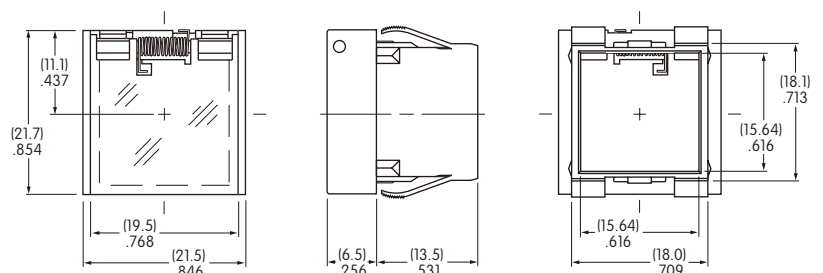
Cover: Clear Polycarbonate  
Base: Black Polyamide  
Coil Spring: Stainless Steel

#### Recommended Panel Thickness:

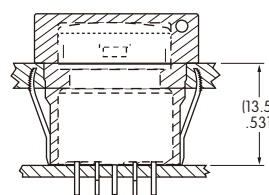
.039" ~ .126"  
(1.0mm ~ 3.2mm)

#### Recommended Panel-to-PCB Range:

.531" (13.5mm)

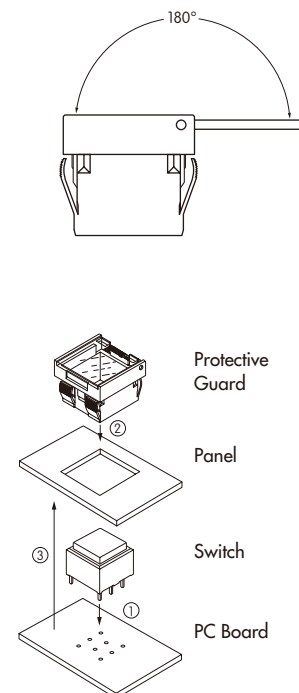


(N) = Number of switches  
\* Minimum dimension allows opening of cover to 180°



#### Installation

- 1 Install switch onto PC board.
- 2 Snap protective guard into panel.
- 3 Join the two assemblies.



### OPTIONAL ACCESSORIES

#### Spring Loaded Protective Guard for Snap-in Model

##### AT4142

Opens 180°  
Closes automatically

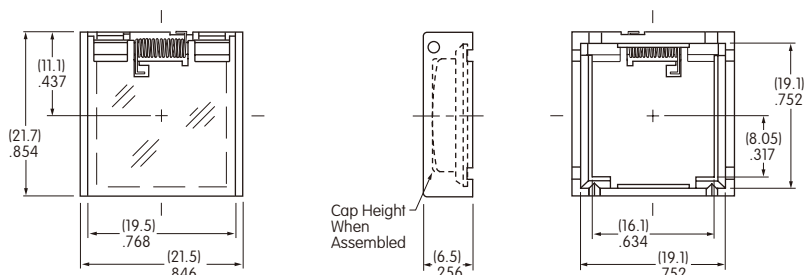


##### Materials:

Cover: Clear Polycarbonate  
Base: Black GFR Polyamide  
Coil Spring: Stainless Steel

##### Recommended Panel Thickness:

.039" ~ .106" (1.0mm ~ 2.7mm)

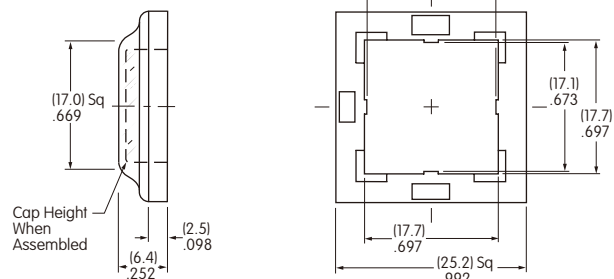
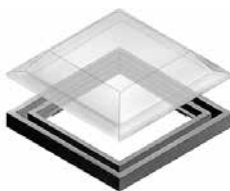


#### Dust Cover

AT4145 Not for use with barriers.

##### Materials:

Lid: Clear PVC  
Operating temperature range:  
0°C ~ +70°C (32°F ~ 158°C).  
Gasket: Polyethylene



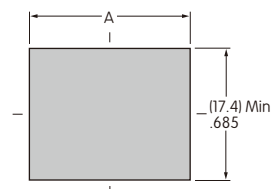
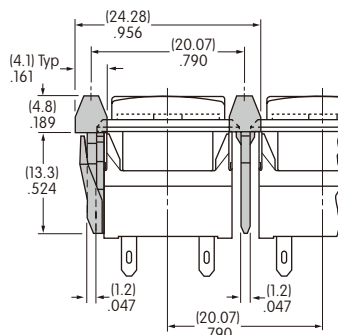
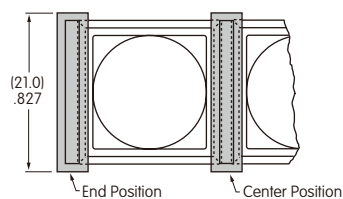
##### Recommended Panel Thickness

.039" ~ .098" (1.0mm ~ 2.5mm)

#### Barriers for Snap-in Mount

##### AT4143 End

##### AT4144 Center



Cutouts for more than 1 Switch:

$$A = .799" (20.3\text{mm}) \times \text{Number of Switches} + .063" (1.6\text{mm})$$

Material: Polyamide

LEGENDS

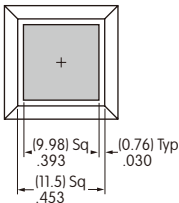
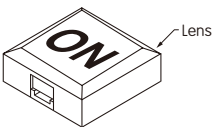
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for UB2 Lens, Film Insert or Diffuser

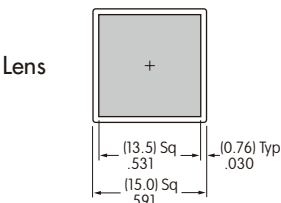
Recommended Methods: Laser Etch on clear lens, Screen Print or Pad Print on lens;  
Laser Print on film insert.

Shaded areas are printable areas.

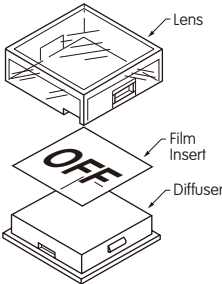
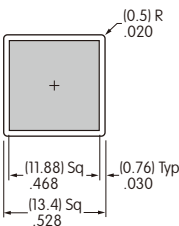
Beveled Cap



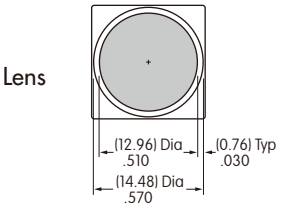
Flat Cap



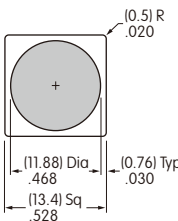
Film Insert or Diffuser



Sculptured Cap



Film Insert or Diffuser



Film Insert: Clear Polyester 4 mil maximum thickness