

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/s²) 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 (patent pending) 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.

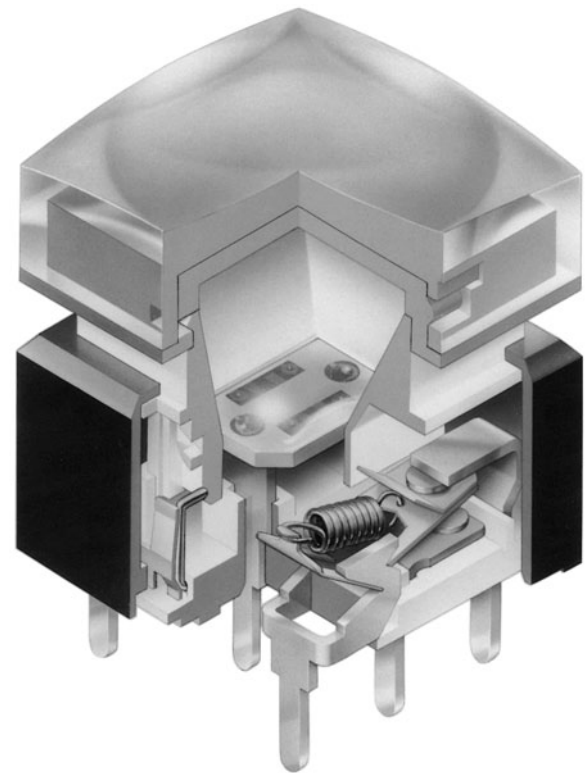
Snap-acting contact mechanism provides sensitive actuation with audible feedback; quick-make, quick-break characteristic limits arcing and prolongs electrical life.

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

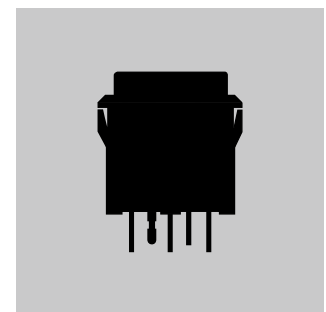
Terminals are epoxy sealed to lock out flux, solvents, and other contaminants.

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

Matching indicators available.



Actual Size



Toggles

Rockers

Pushbuttons

D Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

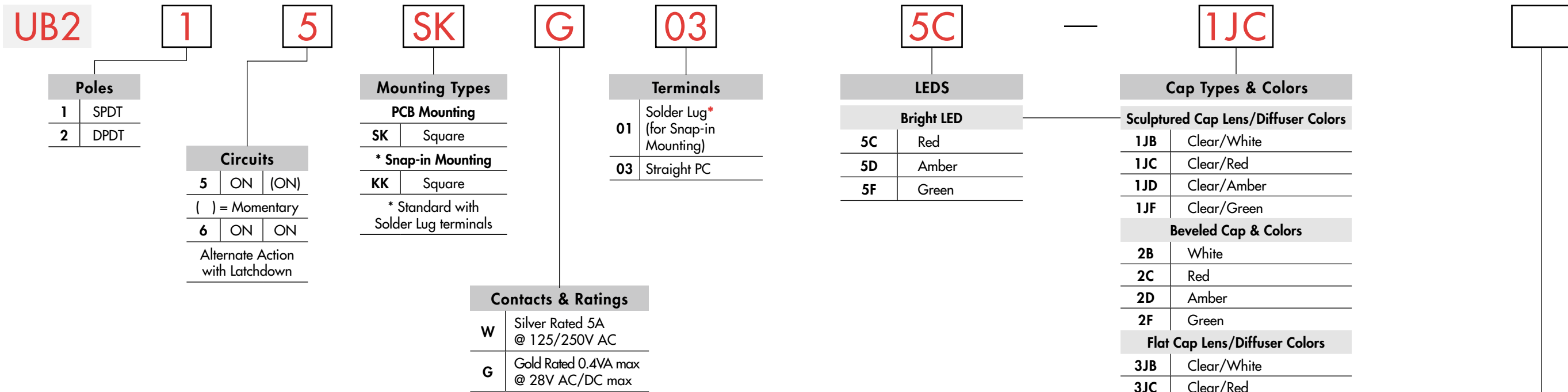
Touch

Indicators

Accessories

Supplement

TYPICAL SWITCH ORDERING EXAMPLE



IMPORTANT:

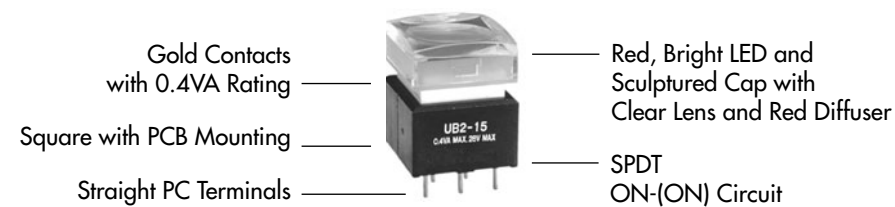


Switches are supplied without UL & cULus marking unless specified. **UL & cULus recognized only when ordered with marking on the switch.** Specific models, ratings, & ordering instructions are noted on General Specifications page.

* Wire harness & cable assemblies offered only in Americas

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

UB215SKG035C-1JC



| Super Bright LED | |
|------------------|-------|
| 6B | White |
| 6F | Green |
| 6G | Blue |

| Super Bright Bicolor LED | |
|--------------------------|-----------|
| 6CF | Red/Green |

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

| Sculptured Cap Lens/Diffuser Color | |
|------------------------------------|-------------|
| 1JB | Clear/White |

| Beveled Cap & Color | |
|---------------------|-------|
| 2B | White |

| Flat Cap Lens/Diffuser Color | |
|------------------------------|-------------|
| 3JB | Clear/White |

| Sculptured Cap Lens/Diffuser Color | |
|------------------------------------|-------------|
| 1JB | Clear/White |

| Beveled Cap & Color | |
|---------------------|-------|
| 2B | White |

| Flat Cap Lens/Diffuser Color | |
|------------------------------|-------------|
| 3JB | Clear/White |

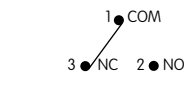
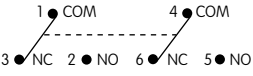
| Sculptured Cap with Alternating Legend | |
|--|------------|
| 4J | Clear Lens |

| Flat Cap with Alternating Legend | |
|----------------------------------|------------|
| 5J | Clear Lens |

| Sculptured Cap Lens/Insert Colors | | | |
|-----------------------------------|-------------|-----|-------------|
| 4JA | Clear/Black | 4JD | Clear/Amber |
| 4JB | Clear/White | 4JF | Clear/Green |
| 4JC Clear/Red | | | |
| Beveled Cap & Colors | | | |
| 5A | Black | 5D | Amber |
| 5B | White | 5F | Green |
| 5C Red | | | |

| Alternating Legends | |
|---------------------|------------|
| 01 | ON/OFF |
| 02 | START/STOP |
| 04 | OPEN/CLOSE |

POLES & CIRCUITS

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

* 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 & SHAPES

PCB Mounting



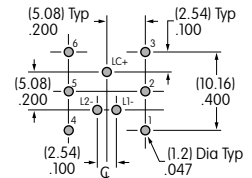
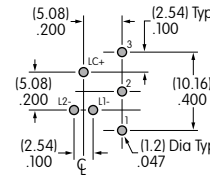
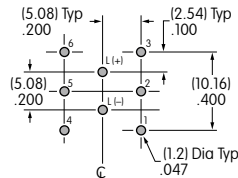
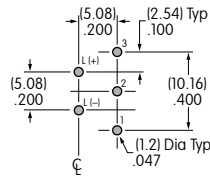
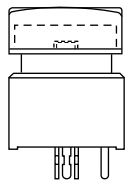
Square

SP, Single Color LED

DP, Single Color LED

SP, Bicolor LED

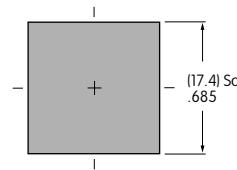
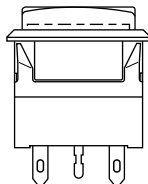
DP, Bicolor LED



Snap-in Mounting (Solder Lug)



Square with Built-in Bezel



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

CONTACT MATERIALS & RATINGS



Silver Contacts

Power Level

5A @ 125V AC & 250V AC



Gold Contacts

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Complete explanation of operating range in Supplement section.

SWITCH & LAMP TERMINALS



Solder Lug

For Switch & Bright LED

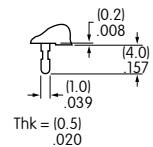
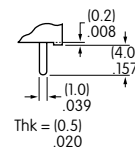
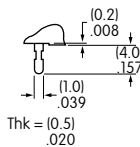
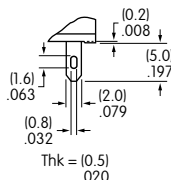
For Super Bright & Bicolor LED



Straight PC

For Switch & Bright LED

For Super Bright & Bicolor LED



BRIGHT LED & CAPS

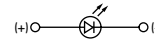
The electrical specifications shown are determined at a basic temperature of 25°C.
 LED circuit is isolated and requires an external power source. Polarity marks are on the bottom of the switch.
 If the source voltage exceeds the rated voltage, a ballast resistor is required.
 The resistor value can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

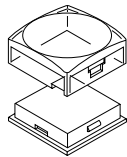
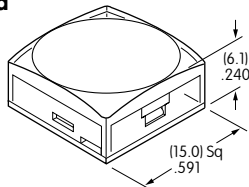
| | | 5C | 5D | 5F | |
|-----------------------------------|--------------|-------------|-----------|-----------|-------|
| | Color | Red | Amber | Green | Unit |
| Forward Peak Current | I_{FM} | 30 | 30 | 25 | mA |
| Typical Forward Current | I_F | 20 | 20 | 20 | mA |
| Forward Voltage | V_F | 1.85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

Bright Single Color LED with 1 element



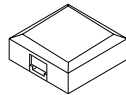
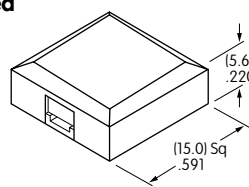
Caps for Bright LED

1 AT3074 Sculptured



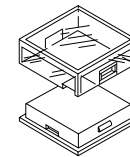
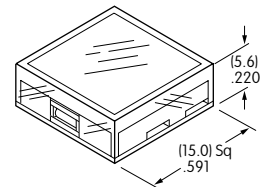
Clear Lens
 Translucent
 Colored Diffuser

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 & 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.

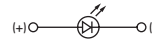
If the source voltage exceeds the rated voltage, a ballast resistor is required.
The resistor value can be calculated by using the formula in the Supplement section.

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

Electrical Specifications for Super Bright LEDs

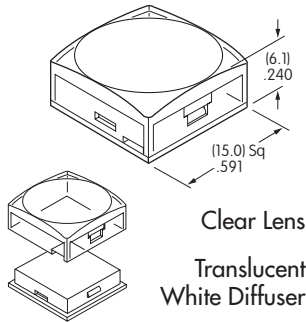
| Super Bright LEDs are Electrostatic Sensitive | ATTENTION ELECTROSTATIC SENSITIVE DEVICES | Color | 6B | 6F | 6G | Unit |
|---|---|--------------|-------------|-------|------|-------|
| | | | White | Green | Blue | |
| Forward Peak Current | | I_{FM} | 20 | 30 | 25 | mA |
| Typical Forward Current | | I_F | 15 | 20 | 20 | mA |
| Forward Voltage | | V_F | 3.3 | 3.5 | 3.6 | V |
| Reverse Peak Voltage | | V_{RM} | 5 | 5 | 5 | V |
| Current Reduction Rate Above 25°C | | ΔI_F | 0.25 | 0.50 | 0.40 | mA/°C |
| Ambient Temperature Range | | | -25° ~ +50° | | | °C |

Super Bright Single Color LED with 1 element

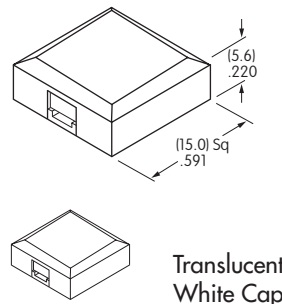


Caps for Super Bright LED

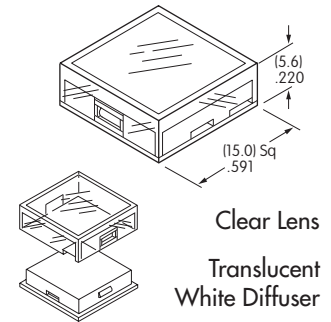
1JB AT3074JB Sculptured Clear Lens/White Diffuser



2B AT3075B Beveled White Cap



3JB AT3076JB Flat Clear Lens/White Diffuser



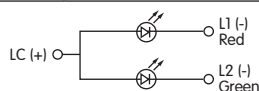
Material: Polycarbonate Finish: Glossy

SUPER BRIGHT BICOLOR LED & CAPS

Electrical Specifications for Super Bright Bicolor LED

| 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 bottom of 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 Supplement Section. The LED is an integral part of the switch and not available separately. | Super Bright LEDs are Electrostatic Sensitive | ATTENTION ELECTROSTATIC SENSITIVE DEVICES | 6CF | Unit | | | |
|--|---|---|-----------------------------------|------|--------------|-------------------------|-------|
| | | | Color | | Red/Green | | |
| | | | Forward Peak Current | | I_{FM} | 30/25 (25/22 for Amber) | mA |
| | | | Typical Forward Current | | I_F | 20/20 | mA |
| | | | Forward Voltage | | V_F | 2.1/3.5 | V |
| | | | Reverse Peak Voltage | | V_{RM} | 4/4 | V |
| | | | Current Reduction Rate Above 25°C | | ΔI_F | 0.40/0.33 | mA/°C |
| Ambient Temperature Range | | -25° ~ +50° | °C | | | | |

Super Bright Bicolor LED with 2 elements

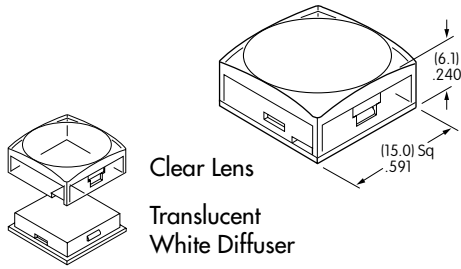


Amber color is achieved by lighting red and green simultaneously, but is not suitable for Alternating Legends.

Caps for Super Bright Bicolor LED

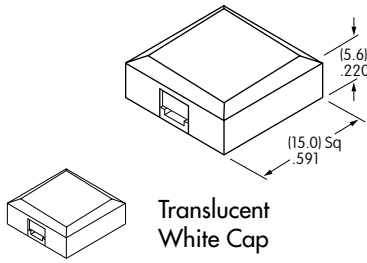
1JB

AT3074JB Sculptured Clear Lens/White Diffuser



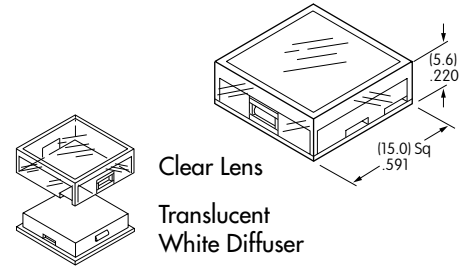
2B

AT3075B Beveled White Cap



3JB

AT3076JB Flat Clear Lens/White Diffuser



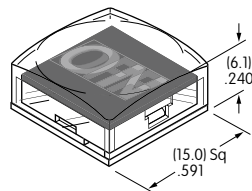
Material: Polycarbonate Finish: Glossy

Alternating Legend Caps for Super Bright Bicolor LED

4J

AT3069J Sculptured Cap with Alternating Legend

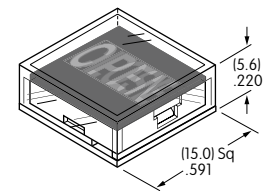
Clear Lens
Alternating Legend Filter



5J

AT3070J Flat Cap with Alternating Legend

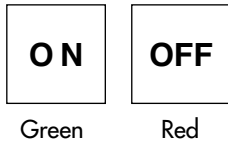
Clear Lens
Alternating Legend Filter



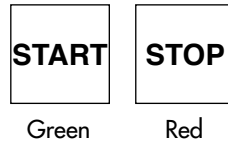
Material: Polycarbonate Finish: Glossy

Standard Alternating Legend Pairs

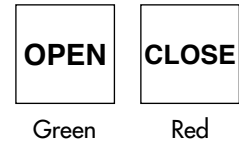
01



02



04



Cap illumination is alternating green/red; 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

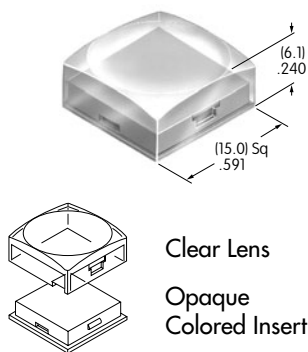
Clear/Red

JD

Clear/Amber

JF

Clear/Green



Material: Polycarbonate
Finish: Glossy

5

AT3077 Beveled

Cap
Colors Available:

A

Black

B

White

C

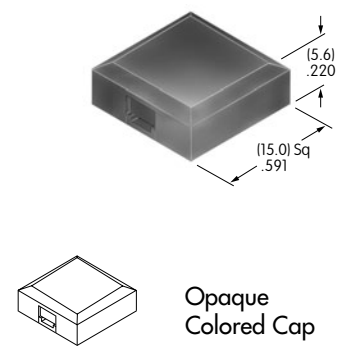
Red

D

Amber

F

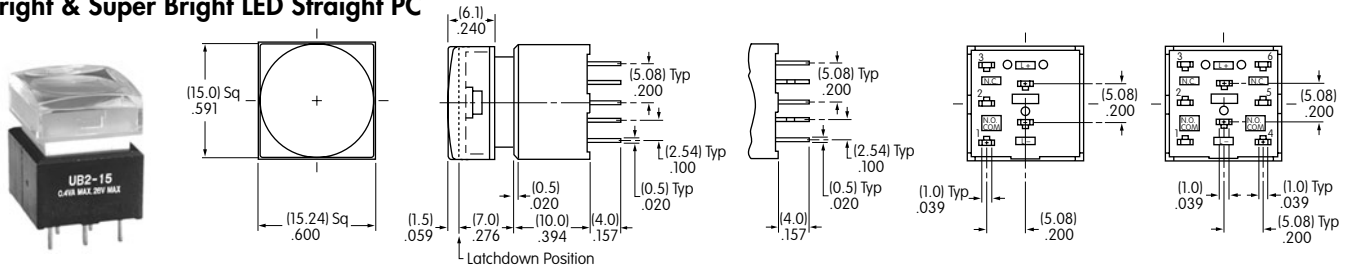
Green



Material: Polycarbonate
Finish: Glossy

TYPICAL SWITCH DIMENSIONS

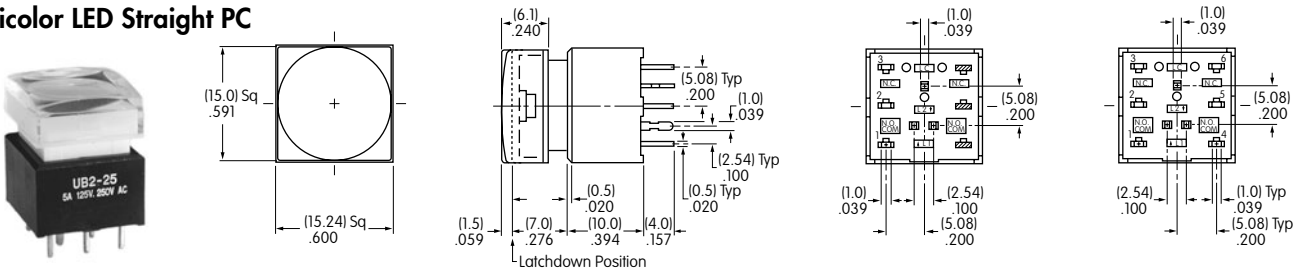
Bright & Super Bright LED Straight PC



UB215SKG035C-1JC

Bright Single Color LED Super Bright Single Color LED Single Pole Double Pole

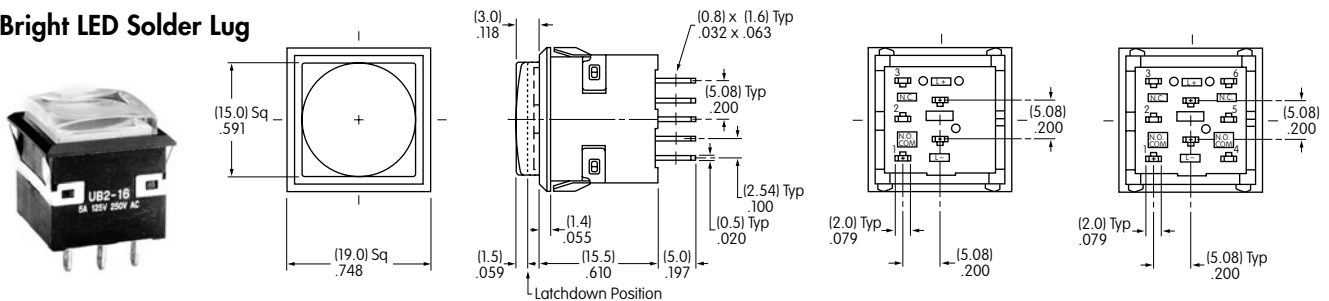
Bicolor LED Straight PC



UB225SKG03CF-1JB

Bicolor LED Side View Single Pole Double Pole

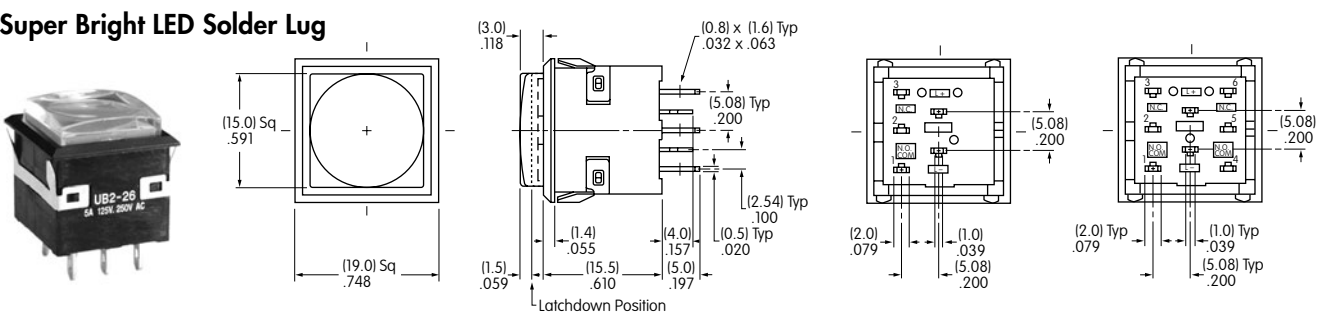
Bright LED Solder Lug



UB216KKW015F-1JF

Single Color LED Side View Single Pole Double Pole

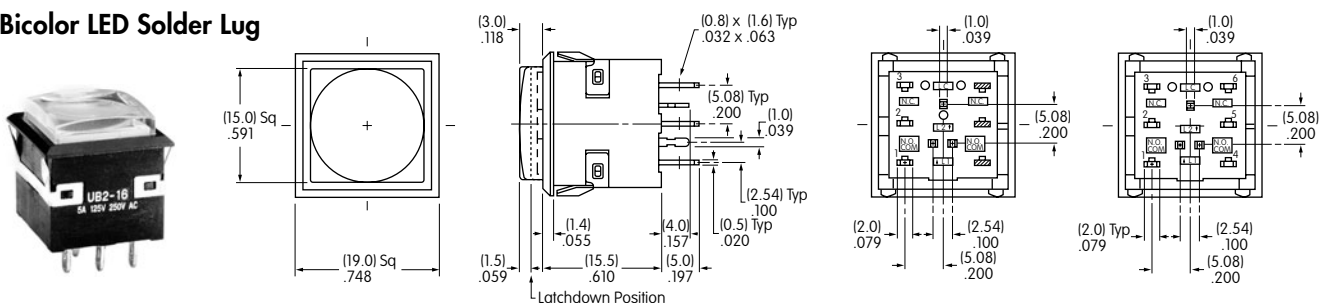
Super Bright LED Solder Lug



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

Toggle

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

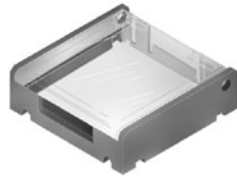
Supplement

OPTIONAL ACCESSORIES

Protective Guard for Snap-in Model

AT4141

Opens 90°
Closes manually

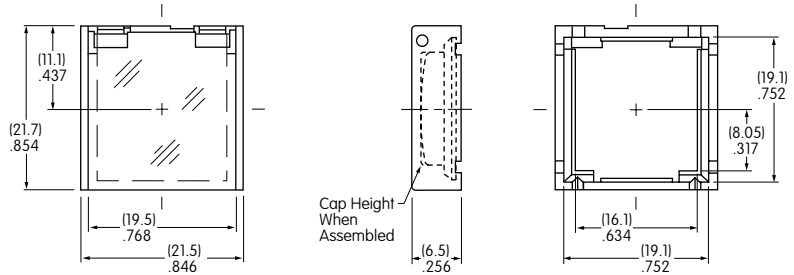


Materials:

Cover: Clear Polycarbonate
Base: Black GFR Polyamide

Recommended Panel Thickness:

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



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

AT4170

Opens 180°
Closes automatically



Materials:

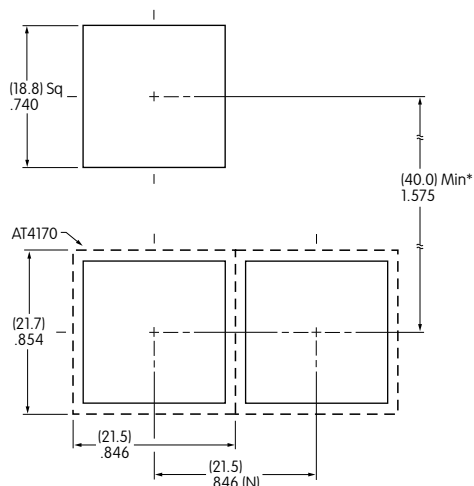
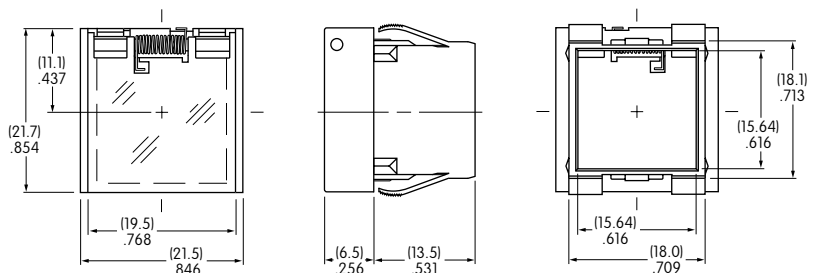
Cover: Clear Polycarbonate
Base: Black Polyamide
Coil Spring: Stainless Steel

Recommended Panel Thickness:

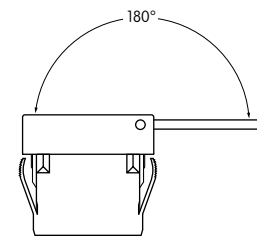
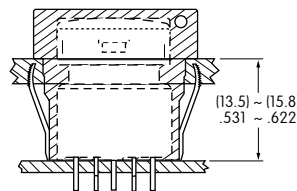
.039" ~ .126"
(1.0mm ~ 3.2mm)

Recommended Panel-to-PCB Range:

.531" ~ .622"
(13.5mm ~ 15.8mm)

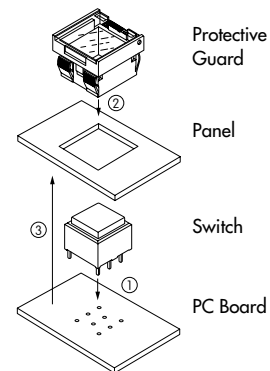


* Minimum dimension allows opening of cover to 180°



Installation

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

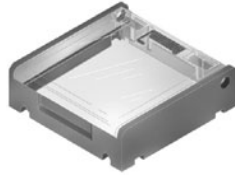


OPTIONAL ACCESSORIES

Spring Loaded Protective Guard for Snap-in Model

AT4142

Opens 180°
Closes automatically

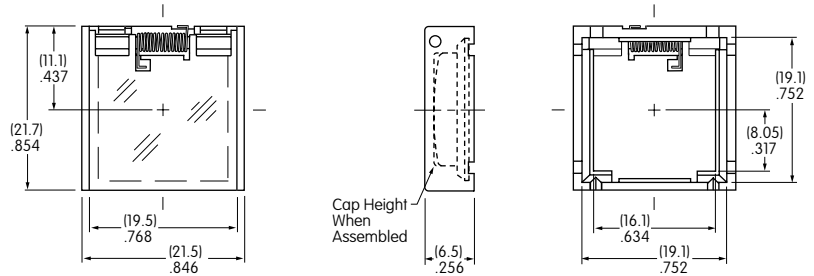


Materials:

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

Recommended Panel Thickness:

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

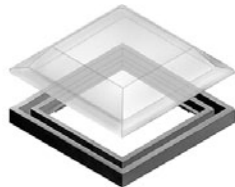


Dust Cover

AT4145 Not for use with barriers.

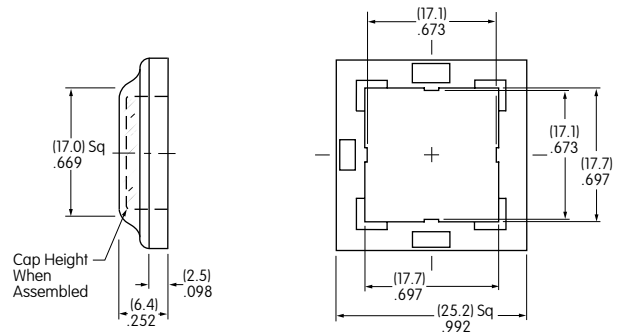
Materials:

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



Recommended Panel Thickness

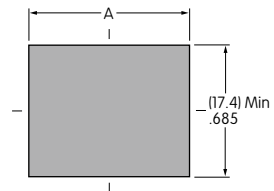
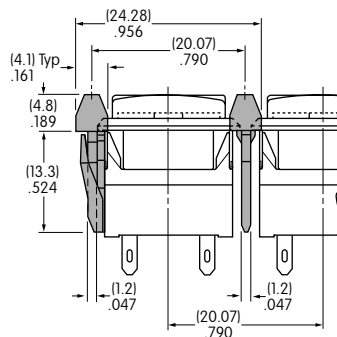
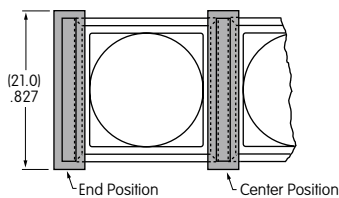
.039" ~ .098" (1.0mm ~ 2.5mm)



Barriers for Snap-in Mount

AT4143 End

AT4144 Center



Cutouts for more than 1 Switch:

$$A = .799" (20.3\text{mm}) \times \text{Number of Switches} + .051" (1.3\text{mm})$$

Material: Polyamide

LEGENDS

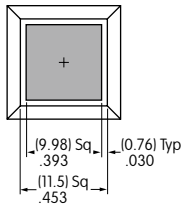
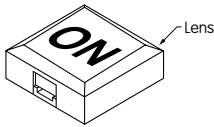
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for UB2 Lens, Film Insert or Diffuser

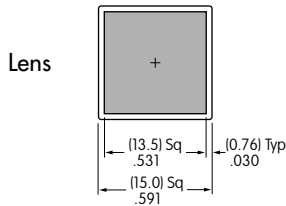
Recommended Methods: Laser Etch on clear lens, Screen Print or Pad Print on lens;
Laser Print on film insert.

Shaded areas are printable areas.

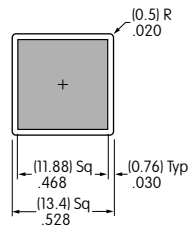
Beveled Cap



Flat Cap



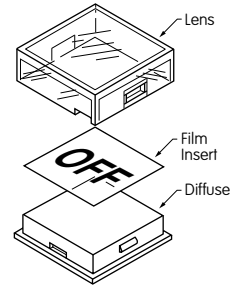
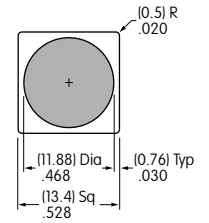
Film Insert or Diffuser



Sculptured Cap



Film Insert or Diffuser



Film Insert: Clear Polyester 4 mil maximum thickness

Toggles

Rockers

Pushbuttons

D Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement