

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.

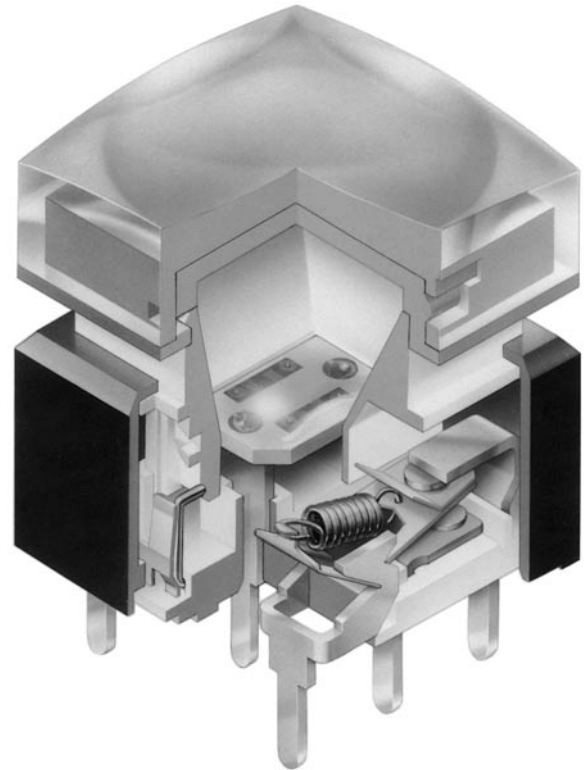
Latchdown mechanism, independent of switching mechanism, gives outstanding stability and reliability plus visible and tactile indication of circuit status.

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

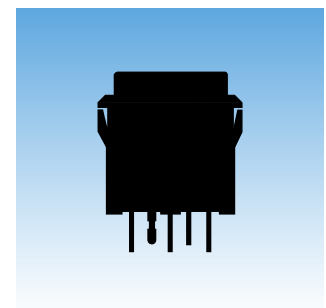
Momentary and alternate action circuits available in the same space-saving body size.

Nonilluminated models available and shown in Pushbutton section.

Matching indicators available and shown at the end of Section M.



Actual Size



General Specifications

Electrical Capacity (Resistive Load)

Power Level (code W): 5A @ 125/250V AC or 5A @ 30V DC
Logic Level (code G): 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 silver plating
Base: Glass fiber reinforced liquid crystal polymer (UL94V-0)

Environmental Data

Operating Temp Range: -25°C through +50°C (-13°F through +122°F)
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 & C-UL Recognized: All single & double pole models recognized at 5A @ 125/250V AC or 0.014A @ 28V DC;
 UL File No. WOYR2.E44145 & C-UL File No. WOYR8.E44145;
 add "/U" to end of part number to order UL mark on switch & add "/C-UL" to end of part number to order C-UL mark on switch (equivalent to CSA certification).



TYPICAL SWITCH ORDERING EXAMPLE

UB2 1 5 SK G 03 5C — 1JC

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

LEDS	
Bright LED	
5C	Red
5D	Amber
5F	Green

CAP TYPES & COLORS	
Sculptured Cap Lens/Diffuser Colors	
1JB	Clear/White
1JC	Clear/Red
1JD	Clear/Amber
1JF	Clear/Green
Beveled Cap & 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

CONTACTS & RATINGS	
W	Silver Rated 5A @ 125/250V AC
G	Gold Rated 0.4VA max @ 28V AC/DC max

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

Sculptured Cap Lens/Diffuser Color	
1JB	Clear/White
Beveled Cap & Color	
2B	White
Flat Cap Lens/Diffuser Color	
3JB	Clear/White

Super Bright Bicolor LED	
6CF	Red/Green

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

ALTERNATING LEGENDS	
01	ON/OFF
02	START/STOP
04	OPEN/CLOSE

IMPORTANT:




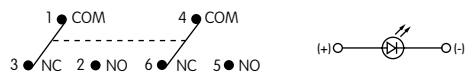
Switches are supplied without UL & C-UL marking unless specified. Specific models & ratings noted on General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

UB215SKG035C-1JC



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	

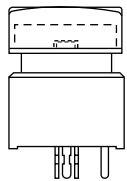
* When in latchdown position for the alternate circuit, cap positions above the housing are:
.059" (1.5mm) for snap-in models & .276" (7.0mm) for PCB models.

MOUNTING TYPES & SHAPES

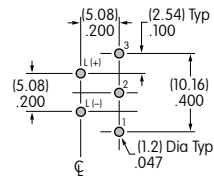
PCB Mounting

SK

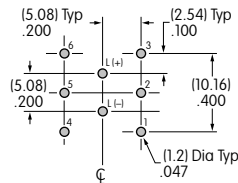
Square



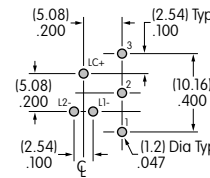
SP, Single Color LED



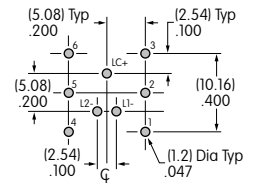
DP, Single Color LED



SP, Bicolor LED



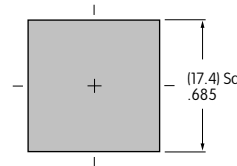
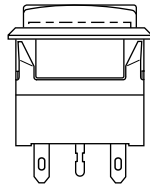
DP, Bicolor LED



Snap-in Mounting (Solder Lug)

KK

Square with Built-in Bezel



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

CONTACT MATERIALS & RATINGS

W

Silver Contacts

Power Level

5A @ 125V AC & 250V AC

G

Gold Contacts

Logic Level

0.4VA maximum @ 28V AC/DC maximum

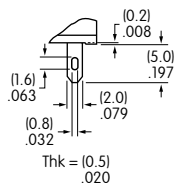
Complete explanation of operating range in Supplement section.

SWITCH & LAMP TERMINALS

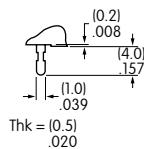
01

Solder Lug

For Switch & Bright LED



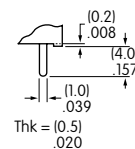
For Super Bright & Bicolor LED



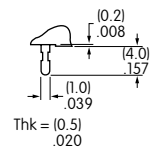
03

Straight PC

For Switch & Bright LED



For Super Bright & Bicolor LED



BRIGHT LED & CAPS

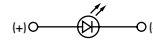
The electrical specifications shown are determined at a basic temperature of 25°C.
 LED circuit is isolated and requires external power source. Polarity marks are on the bottom of the switch.
 If the source voltage exceeds the rated voltage, a ballast resistor is required.
 The resistor value can be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

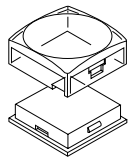
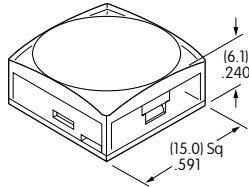
		5C	5D	5F	
	Color	Red	Amber	Green	Unit
Forward Peak Current	I_{FM}	30	30	25	mA
Continuous Forward Current	I_F	20	20	20	mA
Forward Voltage	V_F	1.85	2.0	2.1	V
Reverse Peak Voltage	V_{RM}	5	5	5	V
Current Reduction Rate Above 25°C	ΔI_F	0.40	0.42	0.46	mA/°C
Ambient Temperature Range		-25° ~ +50°			°C

Bright Single Color LED with 1 element



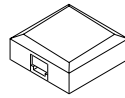
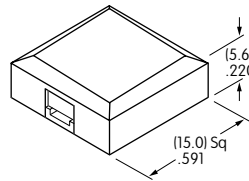
Caps for Bright LED

1 AT3074
Sculptured



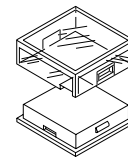
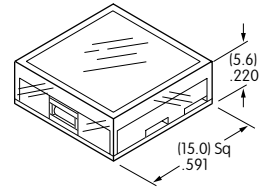
Clear Lens
 Translucent
 Colored Diffuser

2 AT3075
Beveled



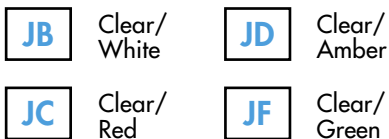
Translucent
 Colored Cap

3 AT3076
Flat



Clear Lens
 Translucent
 Colored Diffuser

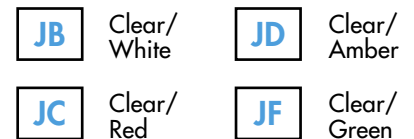
Lens/Diffuser Colors Available:



Cap Colors Available:



Lens/Diffuser Colors Available:




Material: Polycarbonate Finish: Glossy

SUPER BRIGHT LEDs & CAPS

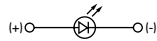
The electrical specifications shown are determined at a basic temperature of 25°C.
 LED circuit is isolated and requires external power source. Polarity marks are on the bottom of the switch.
 If the source voltage exceeds the rated voltage, a ballast resistor is required.
 The resistor value can be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

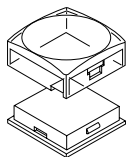
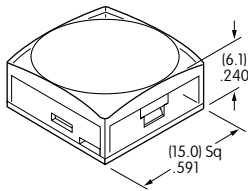
		Super Bright			
		6B	6F	6G	
Super Bright LEDs are Electrostatic Sensitive		White	Green	Blue	Unit
					
Forward Peak Current	I_{FM}	25	25	25	mA
Continuous Forward Current	I_F	20	20	20	mA
Forward Voltage	V_F	3.6	3.5	3.6	V
Reverse Peak Voltage	V_{RM}	5	5	5	V
Current Reduction Rate Above 25°C	ΔI_F	0.40	0.40	0.40	mA/°C
Ambient Temperature Range		-25° ~ +50°			°C

Super Bright Single
 Color LED with 1 element



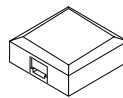
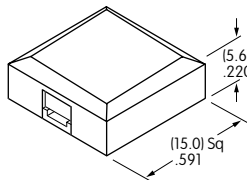
Caps for Super Bright LED

1JB AT3074JB Sculptured Clear Lens/White Diffuser



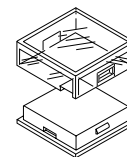
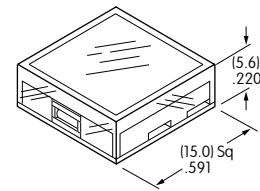
Clear Lens
 Translucent White Diffuser

2B AT3075B Beveled White Cap



Translucent White Cap

3JB AT3076JB Flat Clear Lens/White Diffuser



Clear Lens
 Translucent White Diffuser

Material: Polycarbonate Finish: Glossy

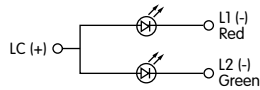
SUPER BRIGHT BICOLOR LED & CAPS

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.

Color	6CF		Unit
	Red	Green	
Forward Peak Current	I_{FM}	30/25 (25/22 for Amber)	mA
Continuous 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

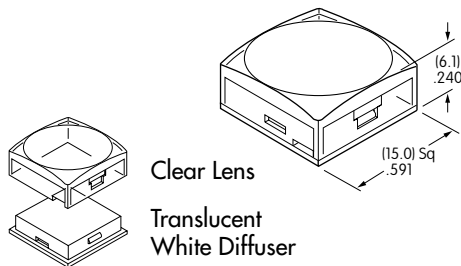
Super Bright Bicolor LED with 2 elements



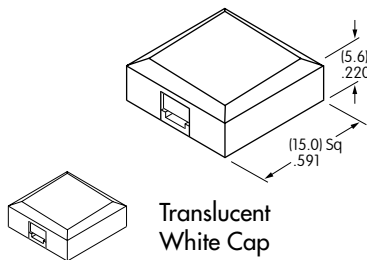
Amber color is achieved by lighting red and green simultaneously, but is not suitable for Alternating Legends.

Caps for Super Bright Bicolor LED

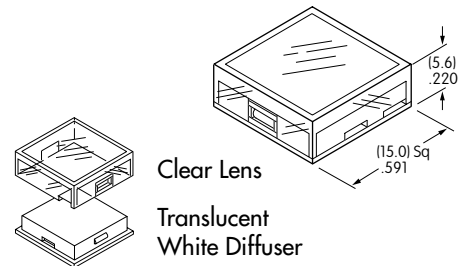
1JB AT3074JB Sculptured Clear Lens/White Diffuser



2B AT3075B Beveled White Cap



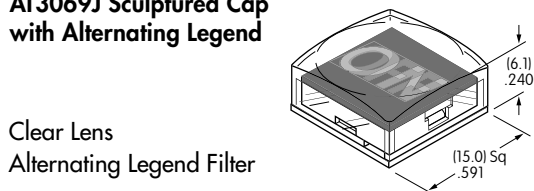
3JB AT3076JB Flat Clear Lens/White Diffuser



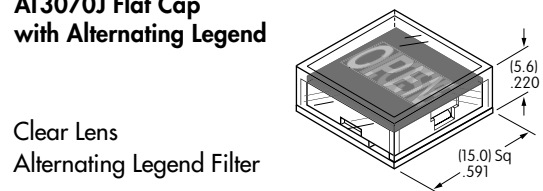
Material: Polycarbonate Finish: Glossy

Alternating Legend Caps for Super Bright Bicolor LED

4J AT3069J Sculptured Cap with Alternating Legend

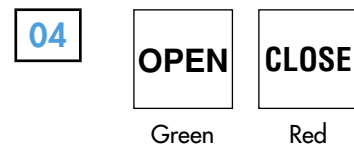
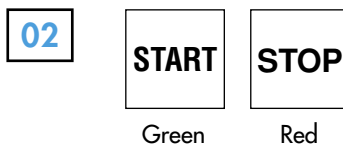
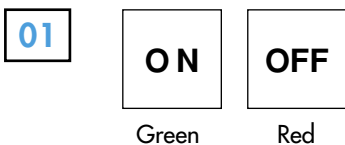


5J AT3070J Flat Cap with Alternating Legend



Material: Polycarbonate Finish: Glossy

Standard Alternating Legend Pairs



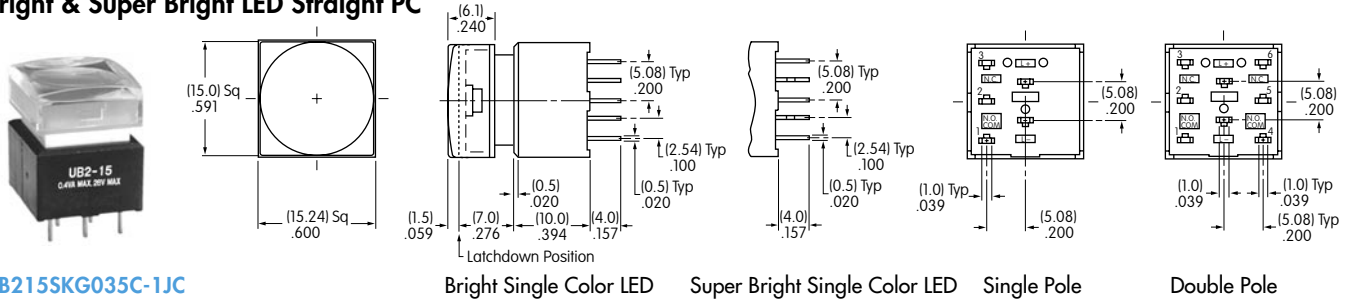
Cap illumination is alternating green/red; legend text is black.

Contact factory for other Alternating Legends.

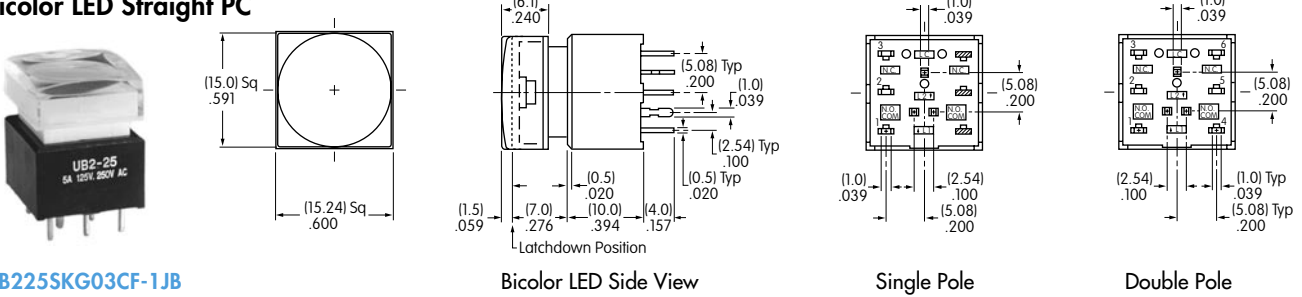
Legend illustrations are approximate representations of the actual characters on the filters.

TYPICAL SWITCH DIMENSIONS

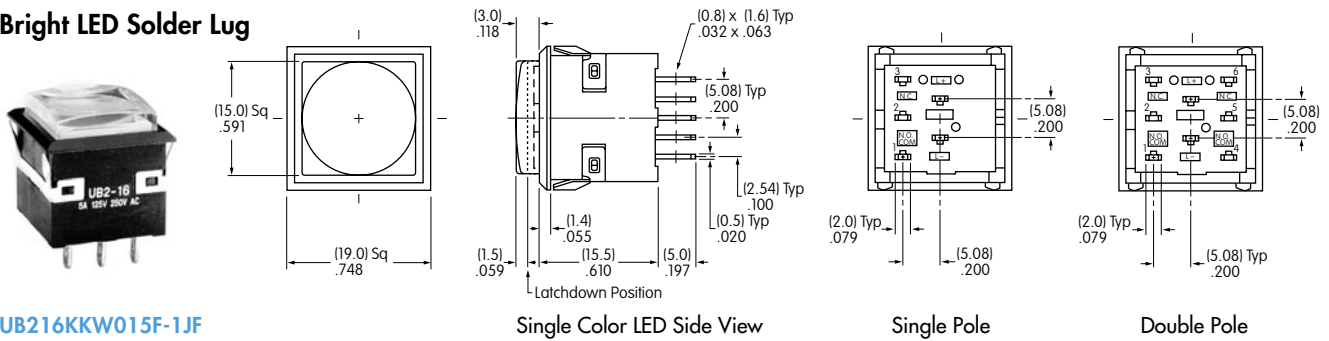
Bright & Super Bright LED Straight PC



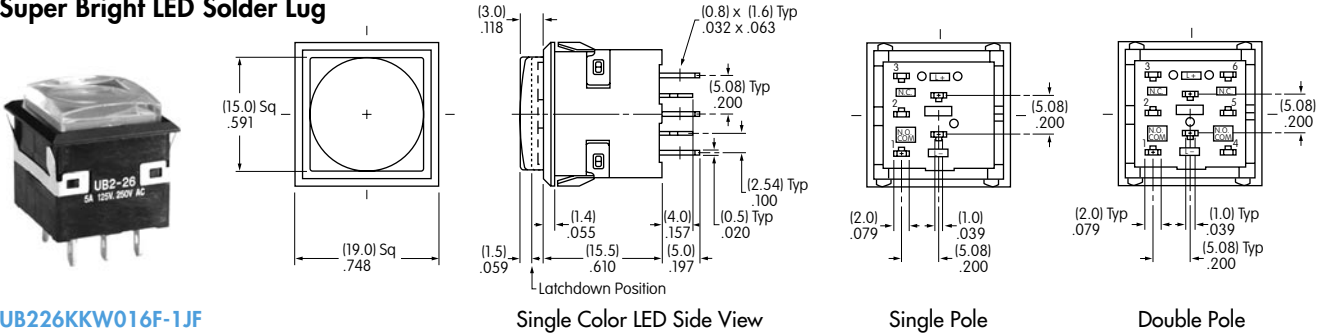
Bicolor LED Straight PC



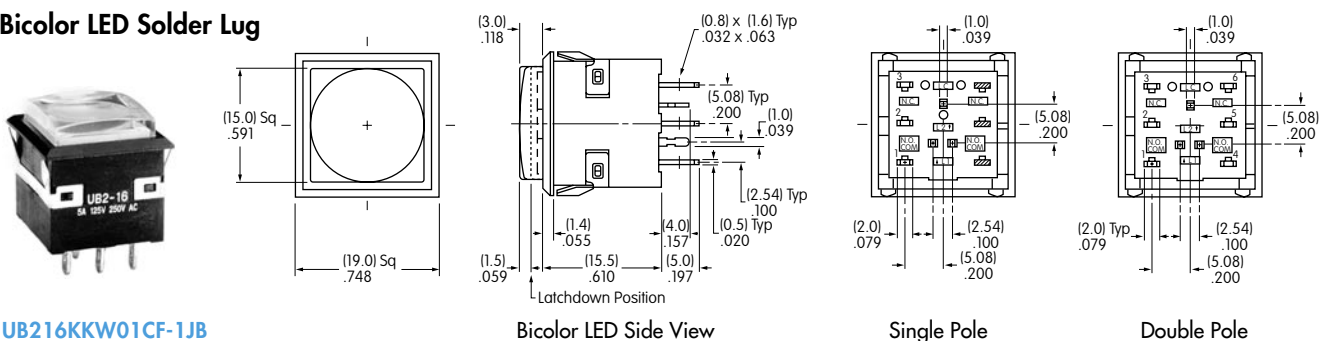
Bright LED Solder Lug



Super Bright LED Solder Lug



Bicolor LED Solder Lug



OPTIONAL ACCESSORIES

Protective Guard for Snap-in Model

AT4141

Opens 90°
Closes manually

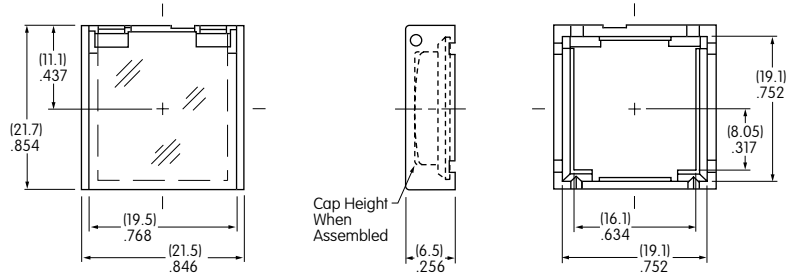


Materials:

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:

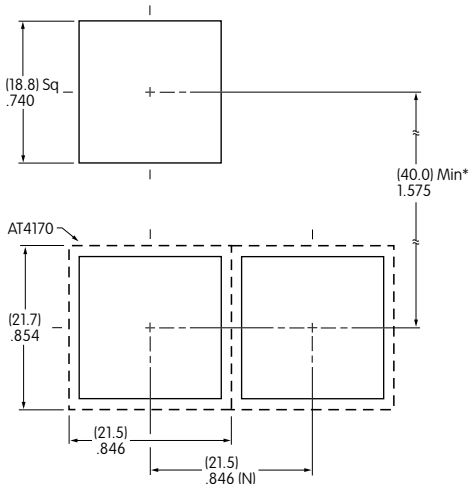
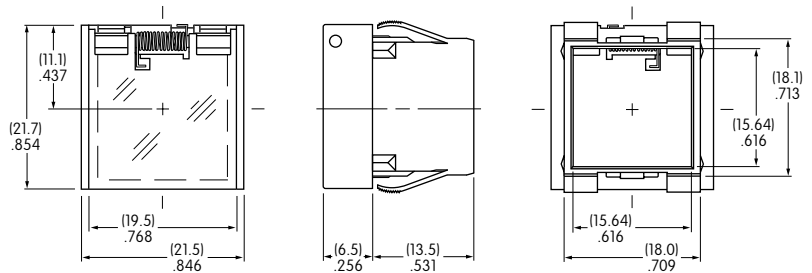
Cover: Clear Polycarbonate
Base: Black Polyamide
Coil Spring: Stainless Steel

Recommended Panel Thickness:

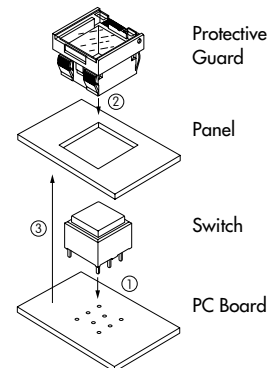
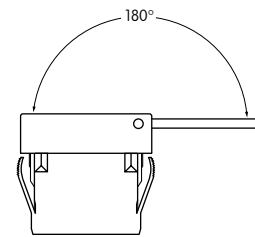
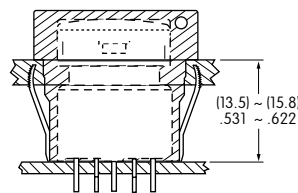
.039" ~ .126"
(1.0mm ~ 3.2mm)

Recommended Panel-to-PCB Range:

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



(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

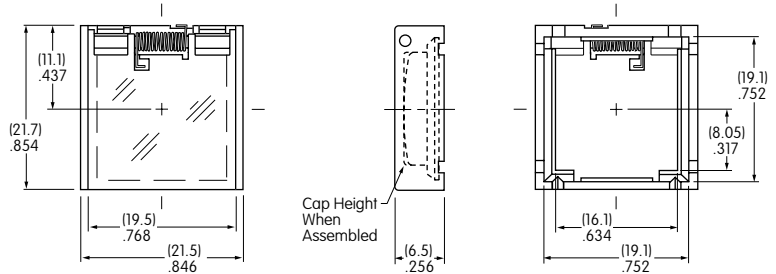
Spring Loaded Protective Guard for Snap-in Model

AT4142
 Opens 180°
 Closes automatically



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

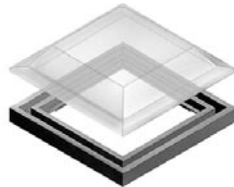
Recommended Panel Thickness:
 .039" ~ .106" (1.0mm ~ 2.7mm)



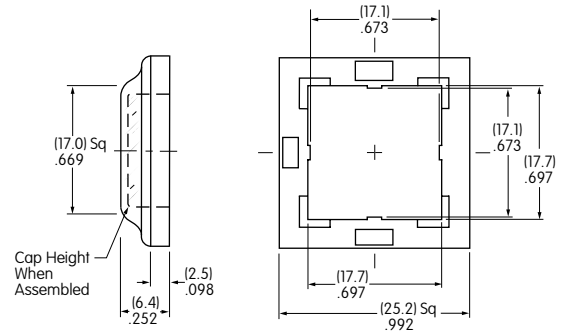
Dust Cover

AT4145 Not for use with barriers.

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

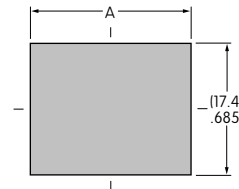
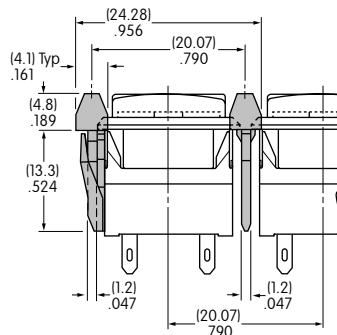
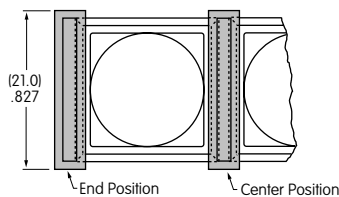


Recommended Panel Thickness
 .039" ~ .098" (1.0mm ~ 2.5mm)



Barriers for Snap-in Mount

AT4143 **AT4144**
End **Center**

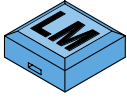


Cutouts for more than 1 Switch:

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

Material: Polyamide

LEGENDS



Easily create and submit your own legends using our new on-line Legend Maker.

Visit www.nkkswitches.com

For other legend support options, customers may either contact the factory and request the UB/UB2 Legend Packet, or utilize the general information and basic specifications presented below.

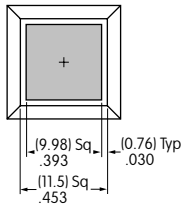
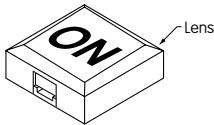
Suggested Printable Area for UB2 Lens, Film Insert or Diffuser

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

Epoxy based ink is recommended.

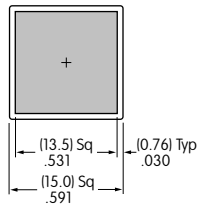
Shaded areas are printable areas.

Beveled Cap

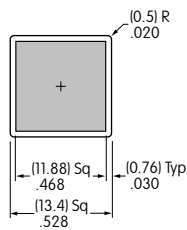


Flat Cap

Lens

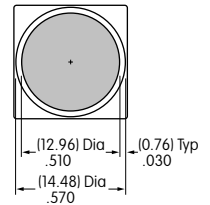


Film Insert or Diffuser

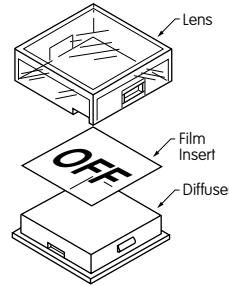
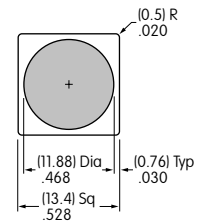


Sculptured Cap

Lens



Film Insert or Diffuser



Film Insert: Clear Polyester 4 mil maximum thickness