

## **Excellent Integrated System Limited**

Stocking Distributor

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[NKK Switches](#)

[JB15LPC-JB](#)

For any questions, you can email us directly:

[sales@integrated-circuit.com](mailto:sales@integrated-circuit.com)

# Series JB

## Illuminated Low Profile Process Sealed Tactiles

Toggles

Rockers

Pushbuttons

Programmable PB

Keylocks

Rotaries

Slides

Tactiles J

Tilt

Touch

Indicators

Accessories

Supplement

# General Specifications

### Electrical Capacity (Resistive Load)

**Low/Logic Level:** 50mA @ 24V DC maximum for Standard Operating Force models  
 125mA @ 24V DC maximum for High Operating Force models

### Other Ratings

|                                 | <b>Standard Operating Force</b>      | <b>High Operating Force</b>          |
|---------------------------------|--------------------------------------|--------------------------------------|
| <b>Contact Resistance:</b>      | 50 milliohms maximum                 | 50 milliohms maximum                 |
| <b>Insulation Resistance:</b>   | 500 megohms minimum @ 250V DC        | 500 megohms minimum @ 250V DC        |
| <b>Dielectric Strength:</b>     | 250V AC minimum for 1 minute minimum | 250V AC minimum for 1 minute minimum |
| <b>Mechanical Life:</b>         | 5,000,000 operations minimum         | 1,000,000 operations minimum         |
| <b>Electrical Life:</b>         | 5,000,000 operations minimum         | 1,000,000 operations minimum         |
| <b>Nominal Operating Force:</b> | 1.76N for JB15L                      | 2.65N for JB15HL & JB15HB            |
| <b>Total Travel:</b>            | .010" (.254mm)                       | .012" (.300mm)                       |

### Materials & Finishes

|                             |   |
|-----------------------------|---|
| <b>Actuator:</b>            | Polyacetal for Short; Glass fiber reinforced PBT for Extended |
| <b>Case:</b>                | Glass fiber reinforced polyamide (UL94V-0)                    |
| <b>Seal:</b>                | Nitrile butadiene rubber                                      |
| <b>Base:</b>                | Glass fiber reinforced PBT (UL94V-0)                          |
| <b>Movable Contacts:</b>    | Stainless steel   |
| <b>Stationary Contacts:</b> | Brass with silver plating                                     |
| <b>Terminals:</b>           | Brass with silver plating                                     |

### Environmental Data

|                                     |  |
|-------------------------------------|--|
| <b>Operating Temperature Range:</b> | -25°C through +70°C (-13°F through +158°F)   |
| <b>Humidity:</b>                    | 90 ~ 95% humidity for 240 hours @ 40°C (104°F)   |
| <b>Vibration:</b>                   | 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 |
| <b>Shock:</b>                       | 50G (490m/s <sup>2</sup> ) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)                               |

### PCB Processing

|                          |  |
|--------------------------|--|
| <b>Soldering:</b>        | Wave Soldering recommended. See Profile A in Supplement section.       |
| <b>Manual Soldering:</b> | See Profile A in Supplement section.                                   |
| <b>Cleaning:</b>         | Automated cleaning. See Cleaning specifications in Supplement section. |

### Standards & Certifications

|                                |  |
|--------------------------------|--|
| <b>Flammability Standards:</b> | UL94V-0 rated case & base<br>The JB Series tactiles have not been tested for UL recognition or CSA certification.<br>These switches are designed for use in a low-voltage, low-current, logic-level circuit.<br>When used as intended in a logic-level circuit, the results do not produce hazardous energy. |
|--------------------------------|--|

## Illuminated Low Profile Process Sealed Tactiles

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# Distinctive Characteristics

Choice of dimensions from PCB to top of cap adds to design flexibility.

Bright, full-face illumination with red, green, or yellow LEDs for attractive, functional panel layouts.

Higher operating force type provides more pronounced operating feel.

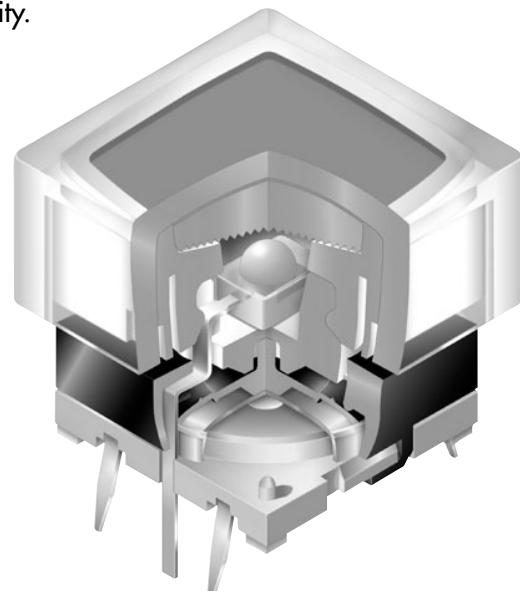
Dome contact gives crisp tactile feedback to positively indicate circuit transfer and assures high reliability and long life of up to 5,000,000 operations.

Rubber seal construction prevents contact contamination and allows automated soldering and cleaning.

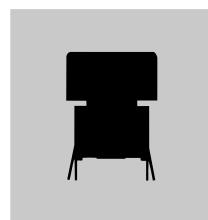
Slanted terminals provide a spring type action which ensures secure mounting and prevents dislodging during wave soldering.

Molded-in terminals are part of the sealed construction which allows automated soldering and cleaning.

Terminal spacing conforms to standard .100" (2.54mm) PCB grid.

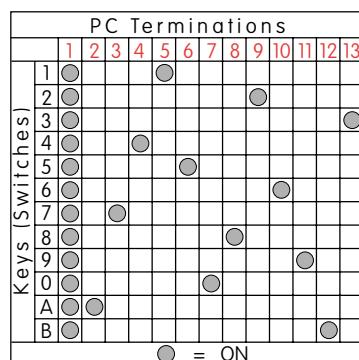
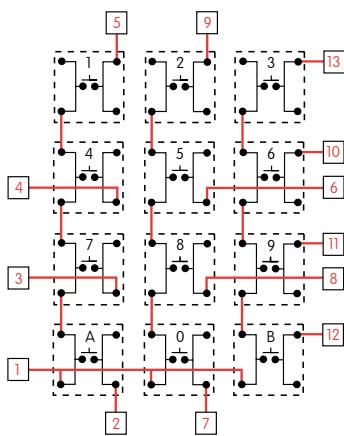


Actual Size



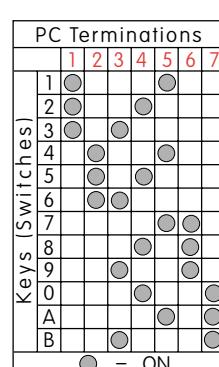
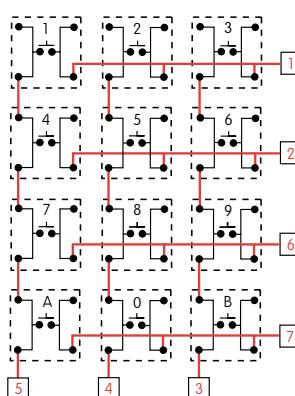
### Common Bus Matrix

These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.



### X-Y Matrix

These single pole, single throw switches can be arranged on a single-sided PC board matrix with strapped terminals to achieve an X-Y type electrical interconnection.



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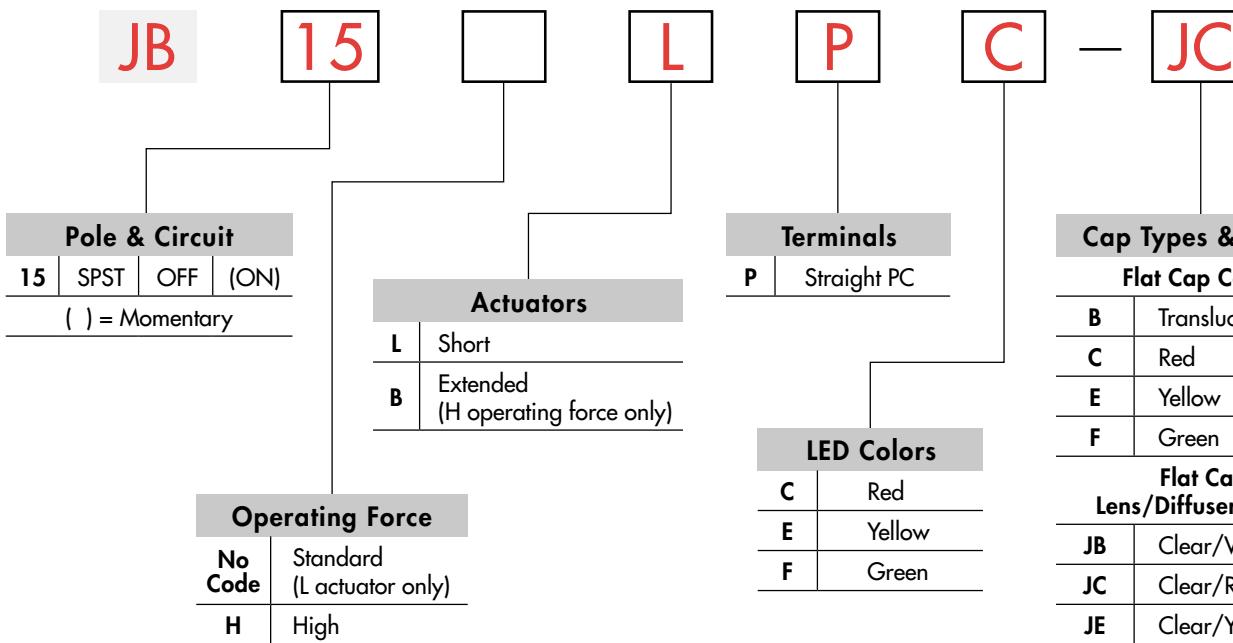
Touch

Indicators

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Supplement

### TYPICAL SWITCH ORDERING EXAMPLE



### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**JB15LPC-JC**


### POLE & CIRCUIT

|              |       | Actuator Position<br>( ) = Momentary |      | Switch Throw & Schematic | LED Schematic |  |
|--------------|-------|--------------------------------------|------|--------------------------|---------------|--|
| Pole & Throw | Model | Normal                               | Down | SPST                     |               | Notes: Terminal numbers are shown on switch. LED circuit is isolated & requires external power source. |
| SPST         | JB15  | OFF                                  | (ON) |                          |               |  |

## Illuminated Low Profile Process Sealed Tactiles

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### OPERATING FORCE



**Standard Nominal Operating Force**  
 1.76N

Available with short actuator only (code L)

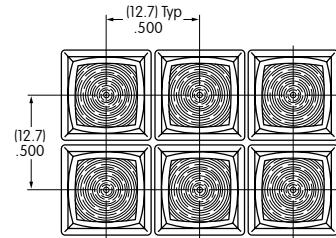
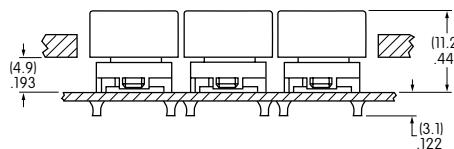
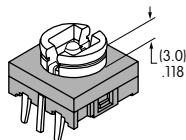


**High Nominal Operating Force**  
 2.65N

Available with both short and extended actuators



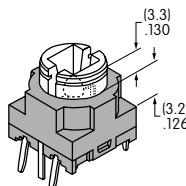
**Short Actuator**



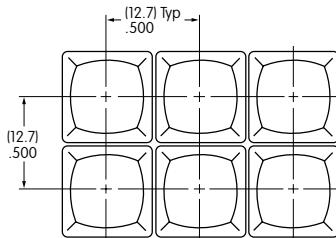
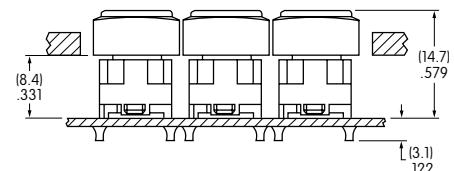
Custom keyboards can be designed with caps installed through a panel cutout (illustration with cap AT4060).



**Extended Actuator**



High operating force only

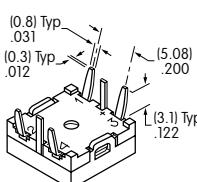


Custom keyboards can be designed with caps installed through a panel cutout (illustration with cap AT4076).

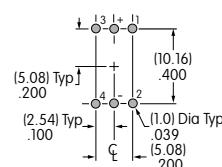
### TERMINALS



**Straight PC Terminals**



Further details in Typical Switch Dimensions



### LED COLORS & SPECIFICATIONS

LEDs are supplied as an integral part of illuminated devices and are not available separately.

LED polarity markings are on the bottom of the switch.

The electrical specifications shown here are determined at a basic temperature of 25°C.

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.

| Color  | C             | E      | F     |
|--|---------------|--------|-------|
| Red  | Red           | Yellow | Green |
| Forward Peak Current $I_{FM}$                  | 25mA          | 25mA   | 25mA  |
| Typical Forward Current $I_F$                  | 20mA          | 20mA   | 20mA  |
| Forward Voltage $V_F$                          | 2.0V          | 2.2V   | 2.1V  |
| Reverse Peak Voltage $V_{RM}$                  | 4V            | 4V     | 4V    |
| Current Reduction Rate Above 25°C $\Delta I_F$ | 0.42mA/°C     |        |       |
| Ambient Temperature Range                      | -25°C ~ +70°C |        |       |

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### SNAP-ON CAPS

#### AT4135 Flat

Cap Color Codes:



Translucent White



Red

Material: Polycarbonate

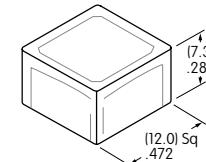


Yellow



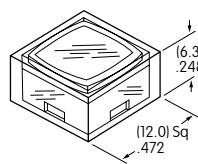
Green

Finish: Frosted



#### AT4060 Flat

Lens/Diffuser Color Codes:

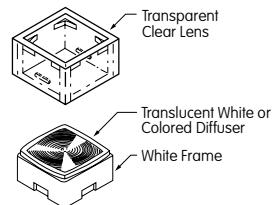


**JB** Clear/Translucent White

**JC** Clear/Red

**JE** Clear/Yellow

**JF** Clear/Green



Material: Polycarbonate

Lens Finish: Glossy

#### Framed: AT4076 Button with Frame

Translucent Button/Frame Color Codes:



White/White



White/Red



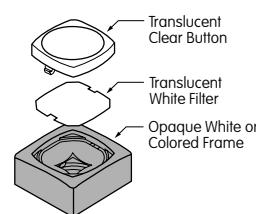
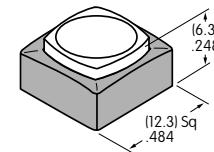
White/Yellow



White/Green



White/Gray

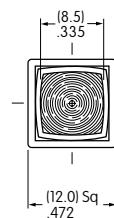


Material: Polycarbonate

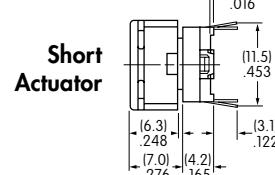
Button Finish: Frosted

### TYPICAL SWITCH DIMENSIONS

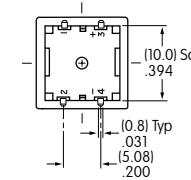
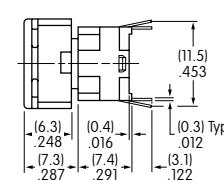
#### Flat Snap-on Cap



**Short Actuator**



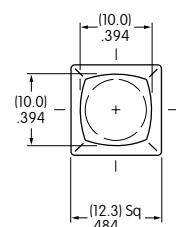
**Extended Actuator**



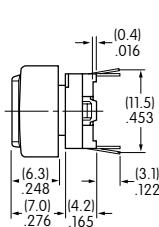
**JB15LPC-JC**

Spring action terminals conform to .100" (2.54mm) PCB spacing

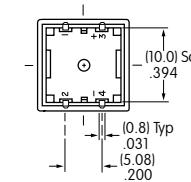
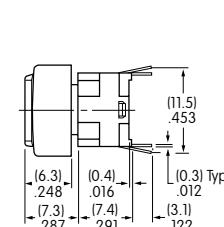
#### Framed Snap-on Cap



**Short Actuator**



**Extended Actuator**



**JB15HBPC-BC**

Spring action terminals conform to .100" (2.54mm) PCB spacing

## Illuminated Low Profile Process Sealed Tactiles

## Series JB

### LEGENDS

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

#### Suggested Printable Area for Cap, Lens, or Button

##### Recommended Methods:

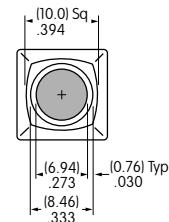
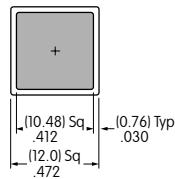
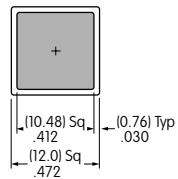
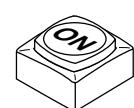
Laser Etch, Screen Print or Pad Print

Epoxy based ink  
is recommended.



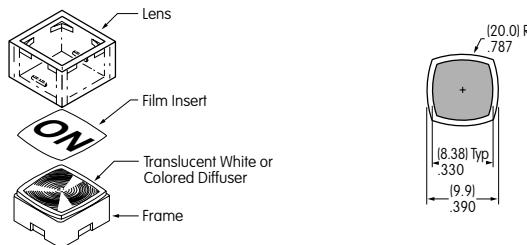
Laser Etch or Pad Print

Epoxy based ink  
is recommended.



Shaded areas are printable areas.

#### Suggested Printable Area for Film Insert



Shaded area is printable area.

Film Insert: Clear Polyester 7 mil maximum thickness