General Specifications

**Electrical Capacity (Resistive Load)**

Power Level (silver): 0.1A maximum @ 30V AC/DC

**Other Ratings**

Contact Resistance: 50 milliohms maximum
Insulation Resistance: 100 megohms minimum @ 500V DC
Dielectric Strength: 500V AC minimum for 1 minute minimum
Mechanical Life: 100,000 operations minimum
Electrical Life: 50,000 operations minimum
Nominal Operating Force: 3.43N
Contact Timing: Nonshorting (break before make)
Travel: Pretravel .087” (2.2mm); Overtravel .031” (0.8mm); Total Travel .118” (3.0mm)

**Materials & Finishes**

- **Housing**: Glass fiber reinforced polyamide
- **Base**: Glass fiber reinforced polyamide
- **Movable Contact**: Phosphor bronze with silver plating
- **Stationary Contacts**: Phosphor bronze with silver plating
- **Common Terminal**: Phosphor bronze with silver plating
- **End Terminals**: Phosphor bronze with silver plating
- **Lamp Terminals**: Phosphor bronze with silver plating

**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 96 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**

- **Mounting Torque**: 0.49Nm (4.34 lb•in) maximum for round mounting nut
- **Cap Installation Force**: 9.8N (2.2 lb) maximum downward force on cap
- **Soldering Time & Temperature**: Manual Soldering: See Profile A in Supplement section.

**Standards & Certifications**

- **UL**: File No. E44145 - Recognized only when ordered with marking on switch.
  Add “/U” or “/CUL” before first dash in part number to order UL recognized switch.
  All models recognized at 0.1A @ 30V AC/DC.
Distinctive Characteristics

Full face and spot illumination available. Front panel relamping.

Choice of super bright LEDs in white, green, and blue in addition to bright red, amber, and green LEDs.

Compact front panel design with 9mm square or round bezel options.

Rear panel threaded mounting. Behind panel depth of less than one inch. 8mm body diameter fits common size panel cutout.

Latchdown feature gives indication of circuit status. Audible and tactile feedback with smooth and responsive operation.

Dual, sliding contacts with self-cleaning action provide contact stability, high reliability, and increased operating life.

Solder lug terminals have spacing of .100” (2.54mm) for choice of mounting.

Longer normally closed terminal facilitates wiring and soldering.

Molded-in terminals lock out flux, dust, and other contaminants.

Matching indicators available.
**Series HB**

**Subminiature Pushbuttons**

**TYPICAL SWITCH ORDERING EXAMPLE**

<table>
<thead>
<tr>
<th>HB</th>
<th>1</th>
<th>5</th>
<th>S</th>
<th>K</th>
<th>W01</th>
<th>6G</th>
<th>JB</th>
</tr>
</thead>
</table>

- **Pole**: SPDT
- **Shapes**: S Square, C Round
- **Contacts & Terminals**: W01 Silver Contacts and Solder Lug Terminals 0.1A @ 30V AC/DC
- **Cap Types & Colors**:
  - **LED Cap: Lens/Diffuser Color**
    - AB: Black Cap/White Window for Spot Illuminated (Square only)
    - CB: Red/White
    - DB: Amber/White
    - FB: Green/White
    - JB: Clear/White
  - **LED Cap: Lens/Diffuser Color**
    - JB: Clear/White

**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 the General Specifications page.

**DESCRIPTION FOR TYPICAL ORDERING EXAMPLE**

HB15SKW01-6G-JB

- **Blue, Super Bright LED**
- **Square Shape**
- **SPDT ON-(ON) Circuit**
- **White Cap**
- **Black Housing**
- **Silver Contacts & Solder Lug Terminals; rated 0.1A @ 30V AC/DC**

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### Subminiature Pushbuttons

#### Series HB

**POLES & CIRCUITS**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch/Lamp Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>HB15</td>
<td>Normal: ON, Down: ON</td>
<td>SPDT</td>
</tr>
<tr>
<td></td>
<td>*HB16</td>
<td>(ON)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-2</td>
<td></td>
</tr>
</tbody>
</table>

Notes: Switch is marked with NO, NC, C, L. LED circuit is isolated and requires external power source.

* When in latchdown position for the alternate circuit, cap position is .051” (1.3mm) above the built-in bezel.

#### SHAPES & PANEL CUTOUT

- **S** .354” (9.0mm) Square
- **C** .354” (9.0mm) Round

The bezel is an integral part of the switch body.

#### Panel Cutout & Mounting

Recommended Panel Thickness: .020 ~ .197” (0.5 ~ 5.0mm)

Overtightening the mounting nut AT073 may damage the switch housing.

#### HOUSING

- **K** Housing available in black only.

#### CONTACT MATERIALS, RATINGS, & TERMINALS

- **W01** Silver Contacts
  - Power Level: 0.1A maximum @ 30V AC/DC
  - Solder Lug

Solder lug terminals are spaced .100” x .200” (2.54mm x 5.08mm). This enables PCB mounting which can be accomplished by elongating PC board holes to .080” (2.03mm).
Series HB

Subminiature Pushbuttons

LED COLORS & SPECIFICATIONS

The electrical specifications shown are determined at a basic temperature of 25°C. LED circuit is isolated and requires external power source. Single element LED is colored in OFF state. 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.

<table>
<thead>
<tr>
<th>Bright AT633</th>
<th>Note for Super Bright:</th>
<th>Bright</th>
<th>Super Bright</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Red</td>
<td>5C</td>
<td>5D</td>
</tr>
<tr>
<td>Super Bright</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT624G</td>
<td>Maximum Forward Current</td>
<td>(I_{FM})</td>
<td>30</td>
</tr>
<tr>
<td>Blue</td>
<td>Typical Forward Current</td>
<td>(I_p)</td>
<td>20</td>
</tr>
<tr>
<td>AT629B</td>
<td>Forward Voltage</td>
<td>(V_f)</td>
<td>2.1</td>
</tr>
<tr>
<td>White</td>
<td>Maximum Reverse Voltage</td>
<td>(V_{RM})</td>
<td>10</td>
</tr>
<tr>
<td>AT630F</td>
<td>Current Reduction Rate Above 25°C</td>
<td>(\Delta I_f)</td>
<td>0.40</td>
</tr>
<tr>
<td>Green</td>
<td>Ambient Temperature Range</td>
<td></td>
<td>-25° ~ +50°C</td>
</tr>
</tbody>
</table>

No Code No Lamp

CAP TYPES & COLORS

Color Codes: A Black B White C Red D Amber E Yellow F Green G Blue J Clear

Cap Colors Available:

AB Black Cap with Translucent White Window for LED Display

Square only

Material: Polycarbonate

Finish: Matte

At4052 Spot Illuminated

Lens/Diffuser Colors Available:

CB Red/White

DB Amber/White

FB Green/White

Material: Polycarbonate

Finish: Glossy

AT4166 Square

AT4167 Round

Transparent Colored Lens

Translucent White Diffuser

Colored LED AT633

White Cap for Bright & Super Bright LEDs

JB Clear Lens/White Diffuser

Material: Polycarbonate

Finish: Glossy

AT4031 Square

AT4032 Round

Transparent Clear Lens

Translucent White Diffuser

Colored LEDs AT624, AT629, AT630, or AT633

Nonilluminated Caps

Cap Colors Available:

A Black

B White

C Red

E Yellow

F Green

G Blue

AT4035 Square

AT4036 Round

Material: Polycarbonate

Finish: Glossy

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**TYPICAL SWITCH DIMENSIONS**

**Single Pole**

<table>
<thead>
<tr>
<th>Single Pole</th>
<th>Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>(7.4) Sq</td>
<td>(2.54) Typ.</td>
</tr>
<tr>
<td>.291</td>
<td>.100</td>
</tr>
<tr>
<td>(9.0) Sq</td>
<td>(2.54) Typ.</td>
</tr>
<tr>
<td>.354</td>
<td>.100</td>
</tr>
<tr>
<td>(5.3)</td>
<td>.197</td>
</tr>
<tr>
<td>.209</td>
<td>.197</td>
</tr>
<tr>
<td>(5.0)</td>
<td>.197</td>
</tr>
<tr>
<td>.197</td>
<td>.197</td>
</tr>
<tr>
<td>(10.0)</td>
<td>.394</td>
</tr>
<tr>
<td>.291</td>
<td>.100</td>
</tr>
<tr>
<td>(15.5)</td>
<td>.610</td>
</tr>
<tr>
<td>.276</td>
<td>.079</td>
</tr>
<tr>
<td>(7.0)</td>
<td>.276</td>
</tr>
<tr>
<td>.209</td>
<td>.197</td>
</tr>
<tr>
<td>(5.0)</td>
<td>.197</td>
</tr>
<tr>
<td>(0.5)</td>
<td>.020</td>
</tr>
<tr>
<td>(1.8)</td>
<td>.071</td>
</tr>
</tbody>
</table>

**Round**

<table>
<thead>
<tr>
<th>Single Pole</th>
<th>LED Polarity &amp; Orientation in Lamp Socket</th>
<th>Cap Replacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>(7.4) Dia</td>
<td>For AT624, AT629, AT630 and AT633: Insert the LED with the D flat opposite the black dot molded inside the switch lamp socket.</td>
<td>1. Match the prongs on the cap base with the projections in the switch, at the same time aligning the spring clips on the cap with the indentations in the switch.</td>
</tr>
<tr>
<td>.291</td>
<td>D Flat opposite black dot molded inside the switch lamp socket.</td>
<td>2. Press firmly in place.</td>
</tr>
<tr>
<td>(9.0) Dia</td>
<td>AT624 AT629 AT630</td>
<td></td>
</tr>
<tr>
<td>.354</td>
<td>AT633</td>
<td></td>
</tr>
</tbody>
</table>

**ASSEMBLY INSTRUCTIONS**

**Cap Removal**

1. Have cap in extended position (not latchdown) for alternate action models.
2. Use the grip slots on the sides of the cap and pull it out of the switch.

**LED Polarity & Orientation in Lamp Socket**

For AT624, AT629, AT630 and AT633: Insert the LED with the D flat opposite the black dot molded inside the switch lamp socket.

**Cap Replacement**

1. Match the prongs on the cap base with the projections in the switch, at the same time aligning the spring clips on the cap with the indentations in the switch.
2. Press firmly in place.

**ATTENTION ELECTROSTATIC SENSITIVE DEVICES**

Super Bright LEDs AT624, AT629, AT630 are electrostatic sensitive.

**AT111 Lamping Tool**

Lamping Tool AT111 may be used to remove and replace LED.

**AT110 Socket Wrench**

Socket Wrench AT110 may be used to tighten the mounting nut.