Series MB2500
Snap-Action Pushbuttons

General Specifications

Electrical Capacity (Resistive Load)

- **Power Level (code W):** 3A @ 125V AC
- **Logic Level (code G):** 0.4VA maximum @ 28V AC/DC maximum
  (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
- **Logic/Power Level (code A):** Combines W & G ratings
  
  Note: See Supplement section to find explanation of operating range.

Other Ratings

- **Contact Resistance:** 20 milliohms maximum for silver; 30 milliohms maximum for gold
- **Insulation Resistance:** 1,000 megarms 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:** 200,000 operations minimum
- **Electrical Life:** 25,000 operations minimum for silver; 100,000 operations minimum for gold
- **Nominal Operating Force:** Single pole 2.45N; double pole 3.92N
- **Travel:** Pretravel .024” (0.6mm); Overtravel .016” (0.4mm); Total Travel .039” (1.0mm)

Materials & Finishes

- **Plunger:** Brass with nickel plating
- **Bushing:** Brass with nickel plating
- **Mounting & Body Frames:** Stainless steel
- **Support Bracket:** Brass with tin plating
- **Case:** Polybutylene terephthalate (PBT) (UL94V-0)
- **Base:** Diallyl phthalate resin
- **Movable Contactor:** Phosphor bronze with silver or gold plating
- **Movable Contacts:** Silver alloy (code W); copper with gold plating (code G)
- **Stationary Contacts:** Silver with silver plating (code W); copper or brass with gold plating (code G)
- **Terminals:** Copper with silver plating; copper or brass with gold plating

Environmental Data

- **Operating Temp Range:** -30°C through +85°C (-22°F through +185°F)
- **Humidity:** 90 ~ 95% humidity for 100 hours at 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:** 1.5Nm (13 lb•in) for double nut; 0.7Nm (6 lb•in) for single nut
- **Cap Installation Force:** 80N (18 lbf) maximum downward force on actuator

Processing

- **Soldering:** Wave Soldering Recommended: See Profile B in Supplement section.
- **Cleaning:** These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

- **Flammability Standards:** UL94V-0 Case
  
  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.
  All single & double pole models recognized at 3A @ 125V AC or 0.4VA max. @ 28V AC/DC max.
- **CSA:** **File No. 0235353_0_000 - Certified only when ordered with marking on switch.**
  Add “/C” before dash in part number to order CSA certified switch.
  Single pole & double pole models certified at 3A @ 125V AC or 0.4VA max. @ 28V AC/DC max.
Distinctive Characteristics

Short stroke and light touch.

Antijamming design protects contacts from damage due to excessive downward force on the actuator.

High torque bushing construction prevents rotation or separation from frame during installation.

Stainless steel frame resists corrosion.

Longer center solder lug terminal simplifies wiring and soldering.

Patented silver contacts of specially composed alloy for hardness.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.

Snap-acting mechanism gives smooth actuation and audible feedback.

Prominent external insulating barriers increase insulation resistance and dielectric strength.
### TYPICAL SWITCH ORDERING EXAMPLE

**MB25**

**S4**

**W**

**01**

**B**

**C**

#### Poles & Circuits

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>SPDT</td>
<td>ON</td>
<td>(ON)</td>
</tr>
<tr>
<td>21</td>
<td>DPDT</td>
<td>ON</td>
<td>(ON)</td>
</tr>
</tbody>
</table>

( ) = Momentary

#### Contact Materials & Ratings

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| W | Silver  
   | Rated 3A @ 125V AC |
| G | Gold  
   | Rated 0.4VA max @ 28V AC/DC max |

#### Bushing

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| S4 | .315” (8.0mm)  
   | Threaded with Keyway |

#### Caps

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>.315” (8.0mm) Diameter</td>
</tr>
<tr>
<td>C</td>
<td>.394” (10.0mm) Diameter</td>
</tr>
</tbody>
</table>

#### Terminals

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Solder Lug</td>
</tr>
<tr>
<td>03</td>
<td>.250” (6.35mm) Straight PC</td>
</tr>
</tbody>
</table>

#### Cap Colors

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
<tr>
<td>E</td>
<td>Yellow</td>
</tr>
<tr>
<td>F</td>
<td>Green</td>
</tr>
<tr>
<td>G</td>
<td>Blue</td>
</tr>
</tbody>
</table>

**IMPORTANT:**

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA 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**

**MB2511S4W01-BC**

- Red .315” (8.0mm) Diameter Cap
- SPDT ON-(ON) Circuit
- Silver Contacts with 3-Amp Rating
- .315” (8.0mm) Threaded Bushing with Keyway
- Solder Lug Terminals
Snap-Action Bushing Mount Pushbuttons

**Series MB2500**

### POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal Keyway</th>
<th>Down Keyway</th>
<th>Connected Terminals</th>
<th>Throw &amp; Switch Schematics</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2511</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1 3-2</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>MB2521</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1 6-4 3-2 6-5</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

**Note:** Terminal numbers are not actually on the switch.

### BUSHING

**S4**

.315” (8.0mm) Threaded with Keyway

![Bushing Diagram]

**Panel Cutouts**

- **Without Keyway**
- **With Keyway**
- **With Optional Locking Ring**

Maximum Panel Thickness with Standard Hardware: .134” (3.4mm)

### Standard Hardware

- **AT513M Threaded Hex Nut**
  - 2 included with each switch
  - Brass with nickel plating

### Optional Hardware

- **AT507M Locking Ring**
  - Steel with zinc/chromate

### CONTACT MATERIALS & RATINGS

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Silver over Silver</td>
<td>Power Level</td>
<td>3A @ 125V AC</td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Gold over Brass or Copper</td>
<td>Logic Level</td>
<td>0.4VA maximum @ 28V AC/DC maximum</td>
</tr>
</tbody>
</table>

**Note:** Complete explanation of operating range in Supplement section.
Series MB2500
Snap-Action Bushing Mount Pushbuttons

**TERMINALS**

01  **Solder Lug**

03  **.250” (6.35mm) Straight PC**

**CAPS & CAP COLORS**

B  **AT443**

.315” (8.0mm) Diameter Cap

Material: Polycarbonate
Finish: Glossy

C  **AT442**

.394” (10.0mm) Diameter Cap

Material: Polycarbonate
Finish: Glossy

Cap Colors Available:

A  Black  B  White  C  Red  E  Yellow  F  Green  G  Blue

**TYPICAL SWITCH DIMENSIONS**

**Solder Lug**

**Single Pole**

**Double Pole**

MB2511S4W01-BC

MB2521S4W01-BC
Snap-Action Bracket PC Mount Pushbuttons

Series MB2500

TYPICAL SWITCH ORDERING EXAMPLE

MB25 11 S2 G 13 B C

Poles & Circuits

11 SPDT ON (ON)
21 DPDT ON (ON)

( ) = Momentary

Contact Materials & Ratings

<table>
<thead>
<tr>
<th>Caps</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>.315&quot; (8.0mm)</td>
</tr>
<tr>
<td>C</td>
<td>.394&quot; (10.0mm)</td>
</tr>
</tbody>
</table>

Silver
Rated 3A @ 125V AC

Gold
Rated 0.4VA max @ 28V AC/DC max

Caps

Caps Colors

<table>
<thead>
<tr>
<th>A</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>White</td>
</tr>
<tr>
<td>C</td>
<td>Red</td>
</tr>
<tr>
<td>E</td>
<td>Yellow</td>
</tr>
<tr>
<td>F</td>
<td>Green</td>
</tr>
<tr>
<td>G</td>
<td>Blue</td>
</tr>
</tbody>
</table>

Bushing

S2 .300" (7.6mm) Smooth with Keyway

Terminals

13 .250" (6.35mm) Straight PC with Bracket
30 Right Angle (Single Pole only)
45 Vertical PC

IMPORTANT:

Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA 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

MB2511S2G13-BC

Red .315" (8.0mm) Diameter Cap

SPDT ON-(ON) Circuit

Gold Contacts with 0.4VA Rating

.300" (7.6mm) Smooth Bushing with Keyway

.250" (6.35mm) Straight PC Terminals with Bracket

www.nkkswitches.com
Series MB2500
Snap-Action Bracket PC Mount Pushbuttons

POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Connected Terminals</th>
<th>Note: Terminal numbers are not actually on the switch.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2511</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1</td>
<td>SPDT</td>
</tr>
<tr>
<td>DP</td>
<td>MB2521</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1 6-4</td>
<td>DPDT</td>
</tr>
</tbody>
</table>

BUSHING

S2 .300” (7.6mm) Smooth with Keyway

CONTACT MATERIALS & RATINGS

W Silver over Silver
Power Level 3A @ 125V AC

G Gold over Brass or Copper
Logic Level 0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

TERMINALS

13 .250” (6.35mm) Terminal with .465” (11.8mm) Bracket

30 Right Angle PC Single Pole only

45 Vertical PC
Snap-Action Bracket PC Mount Pushbuttons

Series MB2500

CAPS & CAP COLORS

B AT443 .315” (8.0mm) Diameter Cap
Material: Polycarbonate
Finish: Glossy

C AT442 .394” (10.0mm) Diameter Cap
Material: Polycarbonate
Finish: Glossy

Cap Colors Available:
A Black  B White  C Red  E Yellow  F Green  G Blue

TYPICAL SWITCH DIMENSIONS

Single Pole  Double Pole  Straight PC • Bracket

MB2511S2G13-BC

Single Pole  Right Angle PC

MB2511S2G30-BC

Single Pole  Double Pole  Vertical PC

MB2511S2G45-BC

www.nkkswitches.com
Series MB2500
Snap-Action Snap-in Mount Pushbuttons

TYPICAL SWITCH ORDERING EXAMPLE

MB25 11 J W 01 A

Poles & Circuits
- 11 SPDT ON (ON)
- 21 DPDT ON (ON)
  ( ) = Momentary

Contact Materials & Ratings
- W Silver
  Rated 3A @ 125V AC
- G Gold
  Rated 0.4VA max @ 28V AC/DC max

Mounting Frame
- J Snap-in Frame

Terminals
- 01 Solder Lug

Cap & Cap Colors
- A Black
- B White
- C Red
- E Yellow
- F Green
- G Blue
- H Gray

IMPORTANT:
Switches are supplied without UL, cULus & CSA marking unless specified. UL, cULus & CSA 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
MB2511JW01-A

Black Cap
SPDT ON-(ON) Circuit
Silver Contacts with 3-Amp Rating
Snap-in Frame
Solder Lug Terminals
Snap-Action Snap-in Mount Pushbuttons

**Series MB2500**

### POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Normal</th>
<th>Down</th>
<th>Normal</th>
<th>Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>MB2511</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1</td>
<td>3-2</td>
</tr>
<tr>
<td>DP</td>
<td>MB2521</td>
<td>ON</td>
<td>(ON)</td>
<td>3-1 6-4</td>
<td>3-2 6-5</td>
</tr>
</tbody>
</table>

Note: Terminal numbers are not actually on the switch.

### MOUNTING FRAME

- **Snap-in Frame**
- **Panel Cutout for Single Pole without Bezel**
- **Panel Cutout for Double Pole without Bezel**

Panel Thickness without Bezel: 0.039” ~ 0.157” (1.0mm ~ 4.0mm)
Panel Thickness with Bezel: 0.039” ~ 0.126” (1.0mm ~ 3.2mm)

### CONTACT MATERIALS & RATINGS

- **W** Silver over Silver
  - Power Level: 3A @ 125V AC

- **G** Gold over Brass or Copper
  - Logic Level: 0.4VA maximum @ 28V AC/DC maximum
  - Note: Complete explanation of operating range in Supplement section.

### TERMINALS

- **01** Solder Lug

### CAP & CAP COLORS

- **AT465**
  - .453” (11.5mm) Square Cap

Material: Polycarbonate
Finish: Glossy

Cap Colors Available: A Black, B White, C Red, E Yellow, F Green, G Blue, H Gray

Contact factory for matte finish.
Series MB2500
Snap-Action Snap-in Mount Pushbuttons

TYPICAL SWITCH DIMENSIONS

Solder Lug

<table>
<thead>
<tr>
<th>Solder Lug</th>
<th>Single Pole</th>
<th>Double Pole</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB2511JW01-A</td>
<td>![Single Pole Diagram]</td>
<td>![Double Pole Diagram]</td>
</tr>
<tr>
<td>(18.0) .709</td>
<td>(12.2) .480</td>
<td>(12.2) .480</td>
</tr>
<tr>
<td>(11.5) Sq 453</td>
<td>(3.3) .130</td>
<td>(3.3) .130</td>
</tr>
<tr>
<td>(11.5) Sq 453</td>
<td>(12.0) .472</td>
<td>(12.0) .472</td>
</tr>
<tr>
<td>(10.0) .394</td>
<td>(3.3) .130</td>
<td>(3.3) .130</td>
</tr>
<tr>
<td>(12.5mm)</td>
<td>(12.5mm)</td>
<td>(12.5mm)</td>
</tr>
<tr>
<td>(.492&quot;)</td>
<td>(.492&quot;)</td>
<td>(.492&quot;)</td>
</tr>
</tbody>
</table>

OPTIONAL SNAP-IN BEZELS & BEZEL COLORS

AT207 Bezel
Material: Polycarbonate
Finish: Glossy
Colors: Black, White, Red, Yellow, Green, Blue, Gray
Contact factory for matte finish.

AT208 Bezel for AT070 LED
Material: Polycarbonate
Finish: Glossy
Color: Black
Contact factory for matte finish.

AT212 Bezel for AT617 LED
Material: Polycarbonate
Finish: Semi-glossy
Color: Black
Sn-Action Snap-in Mount Pushbuttons

**Series MB2500**

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### OPTIONAL SNAP-IN BEZELS & BEZEL COLORS

**AT213 Bezel for AT618 LED**
- **Material:** Polycarbonate
- **Finish:** Semi-glossy
- **Color:** Black

---

### LED COLORS & SPECIFICATIONS

**Bezel Orientation on Switch**

**AT070 LED** For Bezel AT208 with 1 LED

**AT617 LED** For Bezel AT212 with 2 Round LEDs

**AT618 LED** For Bezel AT213 with 2 Rectangular LEDs

---

**Note:** Lead lengths may differ from manufacturing lot to lot. The longer lead is the anode (+).

---

<table>
<thead>
<tr>
<th></th>
<th><strong>AT070</strong></th>
<th><strong>AT617</strong></th>
<th><strong>AT618</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td><strong>C</strong></td>
<td><strong>F</strong></td>
<td><strong>C</strong></td>
</tr>
<tr>
<td>Red</td>
<td><strong>Green</strong></td>
<td><strong>Red</strong></td>
<td><strong>Yellow</strong></td>
</tr>
<tr>
<td>Maximum Forward Current $I_{FM}$</td>
<td>25mA</td>
<td>50mA</td>
<td>30mA</td>
</tr>
<tr>
<td>Typical Forward Current $I_{F}$</td>
<td>20mA</td>
<td>30mA</td>
<td>20mA</td>
</tr>
<tr>
<td>Forward Voltage $V_F$</td>
<td>2.8V</td>
<td>2.1V</td>
<td>2.0V</td>
</tr>
<tr>
<td>Maximum Reverse Voltage $V_{RM}$</td>
<td>4V</td>
<td>5V</td>
<td>5V</td>
</tr>
<tr>
<td>Current Reduction Rate Above 25°C $\Delta I_I$</td>
<td>0.33 mA/°C</td>
<td>0.40 mA/°C</td>
<td>0.40 mA/°C</td>
</tr>
<tr>
<td>Ambient Temperature Range (when used with a bezel)</td>
<td>$-10° \sim +70°C$</td>
<td>$-15° \sim +70°C$</td>
<td>$-25° \sim +70°C$</td>
</tr>
</tbody>
</table>

---

The electrical specifications shown are determined at a basic temperature of 25°C. LED circuit is independent of switch operation. LED is colored in OFF state.

If the source voltage is greater than the rated voltage of the LED, a ballast resistor must be connected in series with the LED. The ballast resistor calculation and more lamp detail are shown in the Supplement section.