3S-Series
SUB-MINIATURE PUSHBUTTONS

The 3S family of sub-miniature pushbutton switches is composed of three switch series; the 3S1-Series sub-miniature pushbutton switch, the 3SS-Series sealed sub-miniature pushbutton switch, and the 3SM-Series surface mount sealed sub-miniature pushbutton switch. All switches are available with a variety of rating, termination and actuator choices, and will withstand temperatures from -30°C to +85°C.

Product Highlights:
• IP67 Sealing
• AC or Low Voltage DC Rated
• Snap-in, PC or Surface Mounting
• Bulk Packed or Tape Reel

Typical Applications:
• Telecommunications
• Performance Audio
• Networking
• Computers
• Instrumentation
• Low Power On/Off Designs

Resources:
Configure a Complete Part
Download CAD & Sales Drawing

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Application Support: team2@carlingtech.com
Phone: 860.793.9281 Fax: 860.793.9231
www.carlingtech.com
### Electrical

**Contact Rating**
- refer to ordering scheme

**Electrical Life**
- 50,000 make & break cycles @ full load

**Contact Resistance**
- 20 mΩ max. initial @ 2-4 VDC
- 100mA for both silver & gold plated contacts

**Insulation Resistance**
- 1000 MΩ min.

**Dielectric Strength**
- 1500 Volts RMS @ sea level

### Physical

**Operating Temperature**
- -30°C to +85°C

**Index of Protection**
- 3SS & 3SM-Series: IP67

**Solder Heat Resistance**
- MIL-STD-202, Method 210

### Material

**Case**
- all UL94 V-0
- 3S1-Series: Dially phthalate (DAP)
- 3SS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized
- 3SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized
- 3S1-Series: Thermoplastic polyester, black
- 3SS-Series: Thermoplastic polyester (UL 94V-0), with internal o-ring
- 3SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized
- (UL 94V-0)
- 3SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized
- (UL 94V-0)

**Plunger**
- Stainless Steel

**Bushing**
- Brass, tin plated

**Housing**
- Brass, tin plated

**Switch Support**
- Epoxy

**Terminal Seal**
- Epoxy

---

**3SS - WSP 9 - M6 R E**

**1 SERIES**
- 3S Series: Sealed Sub-Miniature Pushbutton Switch

**2 POLES**
- WSP: Single pole - uses terminals 1, 2 & 3
- WDP: Double pole - uses terminals 1, 2, 3, 4, 5 & 6

**3 CIRCUIT**
- ( ) - momentary

**Switching Position:**
- 1
  - 2-3, 5-6
  - ON
  - OFF

**Note:** Plunger at rest in Position 1, Plunger depressed in Position 2.

**4 ACTUATOR STYLE 4**
- M2: PCB
- M6: PC Mount, 90° horizontal
- M61: Snap-In, 90° horizontal
- M7: PC Mount, 90° vertical
- M71: Snap-In, 90° vertical
- VS2: PC Mount, U bracket
- VS21: Snap-In, U bracket

**5 CONTACTS / TERMINALS**

<table>
<thead>
<tr>
<th>Contact Material</th>
<th>Terminal Plating</th>
<th>Rating</th>
<th>Approvals</th>
</tr>
</thead>
<tbody>
<tr>
<td>G silver 1</td>
<td>gold over silver</td>
<td>1A</td>
<td>IP67</td>
</tr>
<tr>
<td>K gold 2</td>
<td>tinfoil 3,4</td>
<td>0.4VA max</td>
<td>IP67</td>
</tr>
<tr>
<td>P silver 1</td>
<td>tinfoil 3,4</td>
<td>1A</td>
<td>IP67</td>
</tr>
<tr>
<td>R gold 2</td>
<td>gold 2</td>
<td>0.4VA max</td>
<td>IP67</td>
</tr>
</tbody>
</table>

**6 EPOXY SEAL**
- Epoxy Seal: 0 without Epoxy Seal

**Notes:**
1. Movable contact & terminal platings: silver over copper alloy
2. Movable contact & terminal platings: gold over nickel over copper alloy
3. Terminal platings: In over nickel over copper alloy
4. Tin option available with PC terminations only.

*Manufacturer reserves the right to change product specification without prior notice.*
### 3S-Series Accessories

To order accessories assembled on a switch, specify the switch number followed by the accessory part number and the word “assembled”.

Ex: 3S1-SP9-B6-M7-RE-C23 ASSEMBLED. To order accessories in bulk, specify the Series, followed by the accessory. Ex: 3S1-C13.

#### 3S1 - SP 9 - B6 - M7 - RE

1 SERIES  
3S1 - Sub-Miniature Pushbutton Switch

2 POLES  
SP - Single pole - uses terminals 1, 2 & 3

3 CIRCUIT  
( ) - momentary
Switching Position:  
8-2, 3-5-6  
2-2, 1-5-4  
ON  
OFF  
Note: Plunger at rest in Position 1. Plunger depressed in Position 2.

4 BUSHING  
B5 1 - 10-48 Threaded  
B6 - Unthreaded “D”  
B7 - Snap-In with bezel  
B8 2 - 1/4-40 Threaded “D”  
B9 - 1/4” Unthreaded “D”  
P0 - Flush Plunger

5 TERMINATION  
M1 - Solder Lug  
M2 - PCB  
M6 - PC Mount, 90° horizontal  
M61 - Snap-In, 90° horizontal  
M7 - Snap-In, 90° vertical  
M71 - PC Mount, 90° vertical  
V9 - Snap-In, U bracket  
VS21 - PC Mount, U bracket  
Note: See page 50-51 for dimensional specifications.

6 CONTACTS / TERMINALS  

7 EPOXY SEAL  
E - Epoxy Seal  
0 - without Epoxy Seal  

8 EPOXY SEAL  
E - Epoxy Seal  
0 - without Epoxy Seal

9 TERMINATION  
K6 - Surface Mount, horizontal .433 [11.00 mm]  
M6 - Surface Mount, 90° flat .286 [7.26 mm]  
M7 - Surface Mount, 90° right angle  
S6 - Surface Mount, 90° horizontal .353 [8.97 mm]

10 TERMINATION  
K6 - Surface Mount, horizontal .433 [11.00 mm]  
M6 - Surface Mount, 90° flat .286 [7.26 mm]  
M7 - Surface Mount, 90° right angle  
S6 - Surface Mount, 90° horizontal .353 [8.97 mm]

1 SERIES  
3S1 - Fits 3S, 3S1 or 3MS

2 TOGGLE CAP SIZE  
C1 - .158” [4.01 mm] height  
C2 - .138” [3.50 mm] height

3 CAP COLOR  
1 - White  
2 - Black  
3 - Red  
4 - Orange  
5 - Yellow  
6 - Green  
7 - Blue

### 3SM - SP 9 - M6 - RE

1 SERIES  
3SM - Sealed Surface Mount Sub-Miniature Pushbutton Switch

2 POLES  
SP - Single pole - uses terminals 1, 2 & 3

3 CIRCUIT  
( ) - momentary
Switching Position:  
8-2, 3-5-6  
2-2, 1-5-4  
ON  
OFF  
Note: Plunger at rest in Position 1. Plunger depressed in Position 2.

4 TERMINATION  
K6 - Surface Mount, horizontal .433 [11.00 mm]  
M6 - Surface Mount, 90° flat .286 [7.26 mm]  
M7 - Surface Mount, 90° right angle  
S6 - Surface Mount, 90° horizontal .353 [8.97 mm]

5 TERMINATION  
M7 - Snap-In, 90° vertical  
M71 - PC Mount, 90° vertical  
V9 - Snap-In, U bracket  
VS21 - PC Mount, U bracket  
Note: See page 50-51 for dimensional specifications.

6 CONTACTS / TERMINALS  

7 EPOXY SEAL  
E - Epoxy Seal  
0 - without Epoxy Seal

8 EPOXY SEAL  
E - Epoxy Seal  
0 - without Epoxy Seal

9 TERMINATION  
K6 - Surface Mount, horizontal .433 [11.00 mm]  
M6 - Surface Mount, 90° flat .286 [7.26 mm]  
M7 - Surface Mount, 90° right angle  
S6 - Surface Mount, 90° horizontal .353 [8.97 mm]

10 TERMINATION  
K6 - Surface Mount, horizontal .433 [11.00 mm]  
M6 - Surface Mount, 90° flat .286 [7.26 mm]  
M7 - Surface Mount, 90° right angle  
S6 - Surface Mount, 90° horizontal .353 [8.97 mm]
### 3SS-Series Dimensional Specifications: in. [mm]

#### Single Pole

<table>
<thead>
<tr>
<th>M6 Single Pole</th>
<th>P.C.MOUNTING</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="M6 Single Pole Diagram" /></td>
<td><img src="image2" alt="P.C.MOUNTING Diagram" /></td>
</tr>
<tr>
<td><img src="image3" alt="M6 Single Pole Diagram" /></td>
<td><img src="image4" alt="P.C.MOUNTING Diagram" /></td>
</tr>
</tbody>
</table>

#### Double Pole

<table>
<thead>
<tr>
<th>M6 Double Pole</th>
<th>P.C.MOUNTING</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image5" alt="M6 Double Pole Diagram" /></td>
<td><img src="image6" alt="P.C.MOUNTING Diagram" /></td>
</tr>
<tr>
<td><img src="image7" alt="M6 Double Pole Diagram" /></td>
<td><img src="image8" alt="P.C.MOUNTING Diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M7 Single Pole</th>
<th>P.C.MOUNTING</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image9" alt="M7 Single Pole Diagram" /></td>
<td><img src="image10" alt="P.C.MOUNTING Diagram" /></td>
</tr>
<tr>
<td><img src="image11" alt="M7 Single Pole Diagram" /></td>
<td><img src="image12" alt="P.C.MOUNTING Diagram" /></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>M7 Double Pole</th>
<th>P.C.MOUNTING</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image13" alt="M7 Double Pole Diagram" /></td>
<td><img src="image14" alt="P.C.MOUNTING Diagram" /></td>
</tr>
<tr>
<td><img src="image15" alt="M7 Double Pole Diagram" /></td>
<td><img src="image16" alt="P.C.MOUNTING Diagram" /></td>
</tr>
</tbody>
</table>

* Double Throw shown. Single Throw uses two outer terminals only.
3SS-Series Dimensional Specifications: in. [mm]

Termination Options

VS2 Single Pole

VS2 Double Pole

Snap-In Termination Options

M61

M71

VS21

* PC Mounting for M61, M71, VS21 refer to M6, M7, VS2 respectively.
**3S1-Series Dimensional Specifications: in. [mm]**

### Single Pole

#### Actuator Options for Snap-In Front Mount

- **OP1**
  - *Double Throw shown. Single Throw uses two outer terminals only.*

#### Bushing Options

- **B5**
  - 1.169 DIA (4.64)
  - 0.020 (0.50)

- **B6**
  - 1.169 DIA (4.64)
  - 0.020 (0.50)

- **B7**
  - 1.169 DIA (4.64)
  - 0.020 (0.50)

- **B8**
  - 1.144 DIA (4.50)
  - 0.020 (0.50)

- **B9**
  - 1.197 DIA (4.72)
  - 0.020 (0.50)

- **B0**
  - 1.220 DIA (4.80)
  - 0.020 (0.50)

### Termination Options

- **M1**
  - 0.039 (1.00)
  - 0.059 (1.50)

- **M2**
  - 0.039 (1.00)
  - 0.059 (1.50)
## 3S1-Series Dimensional Specifications: in. [mm]

### Termination Options

#### M6 Single Pole

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>0.173 (4.40)</td>
</tr>
<tr>
<td>Height</td>
<td>0.235 (5.96)</td>
</tr>
<tr>
<td>Height</td>
<td>0.208 (5.28)</td>
</tr>
</tbody>
</table>

#### M7 Single Pole

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>0.197 (4.99)</td>
</tr>
<tr>
<td>Height</td>
<td>0.220 (5.59)</td>
</tr>
<tr>
<td>Height</td>
<td>0.202 (5.10)</td>
</tr>
</tbody>
</table>

#### VS2 Single Pole

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>0.198 (4.99)</td>
</tr>
<tr>
<td>Height</td>
<td>0.330 (8.38)</td>
</tr>
<tr>
<td>Height</td>
<td>0.200 (5.08)</td>
</tr>
</tbody>
</table>

### P.C. Mounting

- **M6**: 0.043 (1.09) 0.200 (5.08)
- **M7**: 0.043 (1.09) 0.200 (5.08)
- **VS2**: 0.043 (1.09) 0.200 (5.08)

* Double Throw shown. Single Throw uses two outer terminals only.

#### Snap-In Termination Options

- **M61**: [Diagram]
- **M71**: [Diagram]
- **VS21**: [Diagram]

* PC Mounting for M61, M71, VS21 refer to M6, M7, VS2 respectively.
3SM-Series Dimensional Specifications: in. [mm]

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensional Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>K6</td>
<td>177 DIA (4.50) 100 DIA (2.54) 244 (6.20) 161 (4.10) 293 (7.40) 319 (8.10)</td>
</tr>
<tr>
<td>M6</td>
<td>177 DIA (4.50) 126 (3.20) 293 (7.40) 319 (8.10)</td>
</tr>
<tr>
<td>M7</td>
<td>177 DIA (4.50) 138 (3.50) 354 (9.00) 383 (10.00) 610 (15.50) 915 (23.15)</td>
</tr>
<tr>
<td>S6</td>
<td>177 DIA (4.50) 126 (3.20) 293 (7.40) 319 (8.10)</td>
</tr>
</tbody>
</table>

* Double Throw shown. Single Throw uses two outer terminals only.

**Plunger Caps**

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensional Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>179 (4.60) 217 (5.50) 300 (7.60) 315 (8.00)</td>
</tr>
<tr>
<td>C2</td>
<td>189 (4.80) 217 (5.50) 300 (7.60) 315 (8.00)</td>
</tr>
</tbody>
</table>

* MATERIAL: ABS.

**CAP COLORS**

<table>
<thead>
<tr>
<th>Color</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>1</td>
</tr>
<tr>
<td>Black</td>
<td>2</td>
</tr>
<tr>
<td>Red</td>
<td>3</td>
</tr>
<tr>
<td>Orange</td>
<td>4</td>
</tr>
<tr>
<td>Yellow</td>
<td>5</td>
</tr>
<tr>
<td>Green</td>
<td>6</td>
</tr>
<tr>
<td>Blue</td>
<td>7</td>
</tr>
<tr>
<td>Brown</td>
<td>8</td>
</tr>
<tr>
<td>Gray</td>
<td>9</td>
</tr>
</tbody>
</table>

* MATERIAL: ABS.
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