2S-Series
SUB-MINIATURE TOGGLES

The 2S family of sub-miniature toggle switches is composed of three switch series; the 2S1-Series toggle switch, the 2SS-Series sealed toggle switch, and the 2SM-Series surface mount sealed sub-miniature toggle switch. All of these series offer a variety of ratings, circuits, contact materials, terminal platings, and actuator types.

Product Highlights:
• IP67 Sealing
• 6 Actuator Options
• Surface, Thru Hole or Snap-in Mounting
• Dry-Circuit thru 3A 125VAC Ratings
• UL, CSA Approvals

Typical Applications:
• Telecommunications
• Instrumentation
• Networking
• Medical Equipment

Resources:
Configure a Complete Part
Download CAD & Sales Drawing
## Electrical
Contact Rating refer to ordering scheme
Electrical Life 30,000 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 2SS & 2SM-Series: IP67
Solder Heat Resistance MIL-STD-202, Method 210
Actuator Travel 25°

### Material
Case all UL94 V-0
2SS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized
2SM-Series: Glass filled nylon 6/6, flame retardant, heat stabilized
2S-Series: Brass, chrome plated.
2SS & 2SM-Series: Brass, chrome plated or nylon, internal o-ring sealed
2S-Series: Brass, nickel plated
2SS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0)
2SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0)
Housing Stainless Steel
Switch Support Brass, tin plated
Terminal Seal Epoxy

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**2SS - MSP**

**1 SERIES**
2SS Sealed Sub-Miniature Toggle Switch

**2 POLES**
MSP Single pole - uses terminals 1, 2 & 3
MDP Double pole - uses terminals 1, 2, 3, 4, 5 & 6

**3 CIRCUIT**
( ) - momentary
<table>
<thead>
<tr>
<th>Position</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ON</td>
<td>NONE</td>
<td>ON</td>
</tr>
<tr>
<td>2</td>
<td>ON</td>
<td>NONE</td>
<td>(ON)</td>
</tr>
<tr>
<td>3</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>4</td>
<td>(ON)</td>
<td>OFF</td>
<td>(ON)</td>
</tr>
<tr>
<td>5</td>
<td>ON</td>
<td>OFF</td>
<td>(ON)</td>
</tr>
</tbody>
</table>

**4 ACTUATOR STYLE / LENGTH**
T1 Round toggle .421" [10.70 mm]
T2 Round toggle .240" [6.10 mm]
T3 Round toggle .342" [8.70 mm]
T4 Round toggle .551" [14.00 mm]
P1 ESD resistant toggle .425" [10.80 mm]
P2 ESD resistant toggle .268" [6.80 mm]
P3 ESD resistant toggle .244" [6.20 mm]
P4 ESD resistant toggle .291" [7.40 mm]

**5 BUSHING**
B1 Threaded
B4 Unthreaded

**6 TERMINATION**
M1 Solder Lug
M2 PCB
M6 PC Mount, 90° horizontal
M61 Snap-In, U bracket, 90° horizontal
M7 PC Mount, 90° vertical
M71 Snap-In, U bracket, 90° vertical
VS2 PC Mount, U bracket
VS21 Snap-In, U bracket
See page 27-28 for dimensional specifications.

**7 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>3A 125VAC or 28VDC, 1.5A 250VAC</td>
<td>IP67</td>
</tr>
<tr>
<td>K gold 2</td>
<td>tin 3</td>
<td>0.4VA max 20V max (AC/DC)</td>
<td>IP67</td>
</tr>
<tr>
<td>P silver 1</td>
<td>tin 3</td>
<td>3A 125VAC or 28VDC, 1.5A 250VAC</td>
<td>IP67</td>
</tr>
<tr>
<td>R gold 2</td>
<td>gold 2</td>
<td>0.4VA max 20V max (AC/DC)</td>
<td>IP67</td>
</tr>
</tbody>
</table>

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

Notes:
- Tin option not available with M1 terminal.
- Movable contact & terminal platings: silver over copper alloy
- Movable contact & terminal platings: gold over nickel over copper alloy
- Terminal platings: tin over nickel over copper alloy

*Manufacturer reserves the right to change product specification without prior notice.*
2S1 - MSP 1 - T1 - B4 - M6 Q E

1 SERIES
2S1 - Sub-Miniature Toggle Switch

2 POLES
MSP - Single pole - uses terminals 1, 2 & 3
MDP - Double pole - uses terminals 1, 2, 3, 4, 5 & 6

3 CIRCUIT
( ) - momentary
Position: 1 2 3
1 ON 2-3, 5-6 Connected Terminals
2 ON NONE
3 ON OFF
4 (ON) OFF
5 ON OFF

3 ACTUATOR STYLE / LENGTH
T1 - Round toggle .374" [9.50 mm]
T2 - Round toggle .236" [6.00 mm]

5 BUSHING
B1 - Threaded Standard, keyway
B2 - Non-Threaded Standard, keyway
B3 - Threaded Short, keyway
B4 - Non-Threaded Short, keyway
B5 - High Torque, flat, .276"
B6 - High Torque, keyway, .276"
B7 - Long threaded
B8 - Non threaded Long, keyway

6 TERMINATION
M1 - Solder Lug
M2 - PCB
M6 - PC Mount, 90° horizontal
M61 - Snap-In, Right Angle
M7 - PC Mount, 90° vertical

7 CONTACTS / TERMINALS
Contact Material Terminal Plating Rating Approvals
G silver 2 gold over silver 3A 125VAC or 28VDC, 1.5A 250VAC
K gold 3,6 tin 5 0.4VA max 20V max (AC/DC) N/A
P silver 2 silver 2 tin 5 3A 125VAC or 28VDC, 1.5A 250VAC
Q silver 3 gold 4 3A 125VAC or 28VDC, 1.5A 250VAC
R gold 3,6 gold 2 0.4VA max 20V max (AC/DC) N/A

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

Notes:
1. Tin option available with PC type terminations only.
2. Movable contact and terminal platings: silver over copper alloy
3. Terminal terminations: tin over nickel over copper alloy
4. Terminal platings: gold over nickel over copper alloy
5. TB5 & B6 bushings: .108" smaller than B1 & B4 bushings.
6. TB7 & B8 bushings: .043" smaller than B5 & B7 bushings.
7. See page 76-77 for dimensional specifications.
8. Epoxy Seal without Epoxy Seal.

2SM - MSP 1 - T1 - M6 G E

1 SERIES
2SM - Sealed Surface Mount Sub-Miniature Toggle Switch

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

3 CIRCUIT
( ) - momentary
Position: 1 2 3
1 ON 2-3 5-6 Connected Terminals
2 ON NONE
3 ON OFF
4 (ON) OFF
5 ON OFF

3 ACTUATOR STYLE / LENGTH
T1 - Round toggle .425" [10.80 mm]
T2 - Round toggle .240" [6.10 mm]
T3 - ESD resistant plastic toggle .425" [10.80 mm]
T4 - ESD resistant plastic toggle .268" [6.80 mm]

5 TERMINATION
K6 - Surface Mount, .433" [11.00 mm]
L6 - Surface Mount, .354" [9.00 mm]
M6 - Surface Mount, 90° flat, .286" [7.26 mm]
M7 - Surface Mount, 90° vertical
S6 - Surface Mount, 90°, .353" [8.96 mm]

6 CONTACTS / TERMINALS
Contact Material Terminal Plating Rating Approvals
G silver 2 gold over silver 3A 125VAC or 28VDC, 1.5A 250VAC
K gold 3,6 tin 4 0.4VA max 20V max (AC/DC) IP67
P silver 2 tin 4 3A 125VAC or 28VDC, 1.5A 250VAC
Q silver 2 gold 2 3A 125VAC or 28VDC, 1.5A 250VAC
R gold 3,6 gold 2 0.4VA max 20V max (AC/DC) IP67

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

8 PACKAGING
T/R - tape reel - 500 pieces per reel

Notes:
1. Single Switches come with standard nut, washer and locking ring shipped bulk. B5 & B7 bushings styles use small locking ring. See page 76-77.
2. Movable contact and terminal platings: silver over copper alloy
3. Terminal terminations: gold over nickel over copper alloy
4. Terminal platings: gold over nickel over copper alloy
5. Terminal terminations: silver over nickel alloy
6. Terminal contact terminations: gold over nickel alloy
7. Terminal contact terminations: silver over nickel alloy
8. NOT AVAILABLE with M1 terminal
9. Lengths shown are with B1 - B4 bushings.
For B5 & B6 subtract .108", for B7 & B8 subtract .043".

For more information, visit www.carlingtech.com
### 2SS-Series Dimensional Specifications: in. [mm]

#### Single Pole

<table>
<thead>
<tr>
<th>Actuator Options</th>
<th>Termination Options</th>
<th>Bushing Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>P1 Plastic Toggle</td>
<td>B1</td>
</tr>
<tr>
<td>T2</td>
<td>P2 Plastic Toggle</td>
<td>B4</td>
</tr>
<tr>
<td>T3</td>
<td>P3 Plastic Toggle</td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>P4 Plastic Toggle</td>
<td></td>
</tr>
</tbody>
</table>

* B4 bushing shown. Subtract 2.55mm from toggle length for B1 bushing.

#### Double Pole

<table>
<thead>
<tr>
<th>Actuator Options</th>
<th>Termination Options</th>
<th>Bushing Options</th>
</tr>
</thead>
</table>

* Subtract 2.55mm from toggle length for B1 bushing.

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**Email:** sales@carlingtech.com  **Application Support:** team2@carlingtech.com  
**Phone:** (860) 793–9281  **Fax:** (860) 793–9231  
**Website:** www.carlingtech.com
2SS-Series Dimensional Specifications: in. [mm]

### M6 Double Pole
- **Dimensions:**
  - 0.30 [0.76] in.
- **Termination Options:**
- **P.C. MOUNTING:**
- **EPOXY SEAL:**

### M7 Single Pole
- **Dimensions:**
  - 0.30 [0.76] in.
- **Termination Options:**
- **P.C. MOUNTING:**
- **EPOXY SEAL:**

### M7 Double Pole
- **Dimensions:**
  - 0.30 [0.76] in.
- **Termination Options:**
- **P.C. MOUNTING:**
- **EPOXY SEAL:**

### VS2 Single Pole
- **Dimensions:**
  - 0.30 [0.76] in.
- **Termination Options:**
- **P.C. MOUNTING:**
- **EPOXY SEAL:**

### VS2 Double Pole
- **Dimensions:**
  - 0.30 [0.76] in.
- **Termination Options:**
- **P.C. MOUNTING:**
- **EPOXY SEAL:**

### M61
- **Dimensions:**
  - 0.16 [0.41] in.
  - 0.30 [0.76] in.
- **Termination Options:**

### M71
- **Dimensions:**
  - 0.16 [0.41] in.
  - 0.39 [1.00] in.
- **Termination Options:**

### VS21
- **Dimensions:**
  - 0.16 [0.41] in.
  - 0.39 [1.00] in.
- **Termination Options:**

*PC Mounting for M61, M71, VS21 refer to M6, M7, VS2 respectively.*
# 2S1-Series Dimensional Specifications: in. [mm]

## Single Pole

**Actuator Options**

<table>
<thead>
<tr>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Actuator Options T1" /></td>
<td><img src="image2" alt="Actuator Options T2" /></td>
<td><img src="image3" alt="Actuator Options T3" /></td>
<td><img src="image4" alt="Actuator Options T4" /></td>
</tr>
</tbody>
</table>

**Bushing Options**

<table>
<thead>
<tr>
<th>B1 Threaded</th>
<th>B2 Non-Threaded</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image5" alt="Bushing Options B1 Threaded" /></td>
<td><img src="image6" alt="Bushing Options B2 Non-Threaded" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B5 Threaded</th>
<th>B6 Non-Threaded</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image7" alt="Bushing Options B5 Threaded" /></td>
<td><img src="image8" alt="Bushing Options B6 Non-Threaded" /></td>
</tr>
</tbody>
</table>

**Panel Mounting**

<table>
<thead>
<tr>
<th>Panel Mounting</th>
<th>10-48 INCH BUSHING</th>
<th>1/4 INCH BUSHING</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image9" alt="Panel Mounting" /></td>
<td><img src="image10" alt="10-48 INCH BUSHING" /></td>
<td><img src="image11" alt="1/4 INCH BUSHING" /></td>
</tr>
</tbody>
</table>

**Termination Options**

<table>
<thead>
<tr>
<th>M1 Standard Solder Lug</th>
<th>M2 PC Thru-Hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Pole</td>
<td>Double Pole</td>
</tr>
<tr>
<td><img src="image12" alt="M1 Standard Solder Lug Single Pole" /></td>
<td><img src="image13" alt="M1 Standard Solder Lug Double Pole" /></td>
</tr>
<tr>
<td><img src="image14" alt="M2 PC Thru-Hole Single Pole" /></td>
<td><img src="image15" alt="M2 PC Thru-Hole Double Pole" /></td>
</tr>
</tbody>
</table>

## Double Pole

**Actuator Options**

| ![Actuator Options T1](image16) | ![Actuator Options T2](image17) | ![Actuator Options T3](image18) | ![Actuator Options T4](image19) |

**Bushing Options**

<table>
<thead>
<tr>
<th>B3 Threaded</th>
<th>B4 Non-Threaded</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image20" alt="Bushing Options B3 Threaded" /></td>
<td><img src="image21" alt="Bushing Options B4 Non-Threaded" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B7 Threaded</th>
<th>B8 Non-Threaded</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image22" alt="Bushing Options B7 Threaded" /></td>
<td><img src="image23" alt="Bushing Options B8 Non-Threaded" /></td>
</tr>
</tbody>
</table>

**Panel Mounting**

<table>
<thead>
<tr>
<th>Panel Mounting</th>
<th>10-48 INCH BUSHING</th>
<th>1/4 INCH BUSHING</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image24" alt="Panel Mounting" /></td>
<td><img src="image25" alt="10-48 INCH BUSHING" /></td>
<td><img src="image26" alt="1/4 INCH BUSHING" /></td>
</tr>
</tbody>
</table>

**Termination Options**

<table>
<thead>
<tr>
<th>M1 Standard Solder Lug</th>
<th>M2 PC Thru-Hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Pole</td>
<td>Double Pole</td>
</tr>
<tr>
<td><img src="image27" alt="M1 Standard Solder Lug Single Pole" /></td>
<td><img src="image28" alt="M1 Standard Solder Lug Double Pole" /></td>
</tr>
<tr>
<td><img src="image29" alt="M2 PC Thru-Hole Single Pole" /></td>
<td><img src="image30" alt="M2 PC Thru-Hole Double Pole" /></td>
</tr>
</tbody>
</table>

## M6 Single Pole

![M6 Single Pole](image31)

## P.C.MOUNTING

![P.C.MOUNTING](image32)
2S1-Series Dimensional Specifications: in. [mm]

**Termination Options**

### M6 Double Pole

- **Dimensions:**
  - 2.36 [6.00]
  - 0.30 [7.62]
  - 0.20 [5.08]
  - 0.34 [8.65]
  - 0.08 [2.00]

### M7 Single Pole

- **Dimensions:**
  - 2.36 [6.00]
  - 0.20 [5.08]
  - 0.34 [8.65]

### M7 Double Pole

- **Dimensions:**
  - 2.36 [6.00]
  - 0.20 [5.08]
  - 0.34 [8.65]

### VS2-VS3 Single Pole

- **Dimensions:**
  - 0.30 [7.62]
  - 0.20 [5.08]

### VS2-VS3 Double Pole

- **Dimensions:**
  - 0.30 [7.62]
  - 0.20 [5.08]

### Snap-In Termination Options

- **M61**
  - 0.06 [1.60]
  - 0.09 [2.30]

- **M71**
  - 0.06 [1.60]
  - 0.09 [2.30]

- **VS21**
  - 0.06 [1.60]

* PC Mounting for M61,M71,VS21 refer to M6,M7,VS2 respectively.
2SM-Series Dimensional Specifications: in. [mm]

### Actuator Options

<table>
<thead>
<tr>
<th>T1</th>
<th>P1 Plastic Toggle</th>
<th><strong>Available with L6, S6, K6, M7 terminals only.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>T2</td>
<td>P2 Plastic Toggle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P3 Plastic Toggle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P4 Plastic Toggle</td>
<td></td>
</tr>
</tbody>
</table>

Email: sales@carlingtech.com  Application Support: team2@carlingtech.com  Phone: (860) 793–9281  Fax: (860) 793–9231  www.carlingtech.com
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