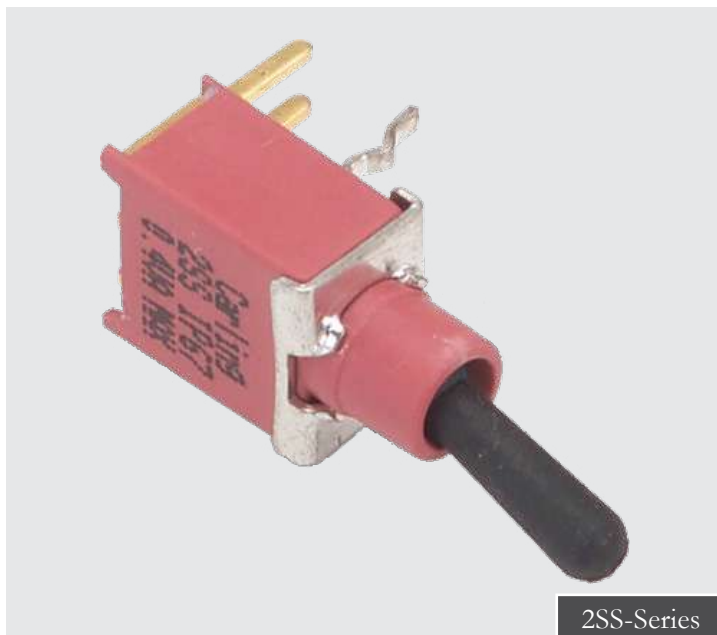


2SS/2S1/2SM

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:

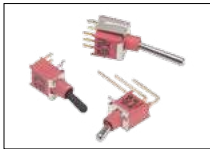
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www.carlingtech.com



2SS-Series
Sealed
Sub-Miniature
Toggle Switch



2S1-Series
Sub-Miniature
Toggle Switch



2SM-Series
Sealed Surface Mount
Sub-Miniature
Toggle Switch

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
2S1-Series: Dially phthalate (DAP)
2SS-Series: Glass filled nylon 6/6, flame retardant, heat stabilized
2SM-Series: Glass filled nylon 4/6, flame retardant, heat stabilized
 Rocker *2S1-Series:* Brass, chrome plated.
2SS & 2SM-Series: Brass, chrome plated or nylon, internal o-ring sealed
 Bushing *2S1-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



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

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

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° horizontal
VS2 PC Mount, U bracket
VS21 Snap-In, U bracket

See page 27-28 for dimensional specifications.

7 CONTACTS / TERMINALS

	Contact Material	Terminal Plating	Rating	Approvals
G	silver ¹	gold over silver	3A 125VAC or 28VDC, 1.5A 250VAC	IP67
K	gold ²	tin ³	0.4VA max 20V max (AC/DC)	IP67
P	silver ¹	tin ³	3A 125VAC or 28VDC, 1.5A 250VAC	IP67
R	gold ²	gold ²	0.4VA max 20V max (AC/DC)	IP67

8 EPOXY SEAL

E Epoxy Seal **0** without Epoxy Seal

Notes:

- Tin option not available with M1 terminal.
- ¹ Movable contact & terminal platings: silver over copper alloy
- ² Movable contact & terminal platings: gold over nickel over copper alloy
- ³ 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 2 Poles 3 Circuit 4 Actuator Style 5 Bushing 6 Termination 7 Contacts 8 Seal

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
2-3, 5-6	Connected Terminals	2-1, 5-4
1 ON	NONE	ON
2 ON	NONE	(ON)
3 ON	OFF	ON
4 (ON)	OFF	(ON)
5 ON	OFF	(ON)

4 ACTUATOR STYLE / LENGTH ⁹

T1 Round toggle .374" [9.50 mm] **T3** Round toggle .311" [7.90 mm]
T2 Round toggle .236" [6.00 mm] **T4** Round toggle .449" [11.40 mm]

5 BUSHING ¹

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 **M71** Right Angle PC Thru Hole, vertical
M2 PCB **VS2** PC Mount, U bracket
M6 PC Mount, 90° horizontal **VS21** Snap-In, U bracket
M61 Snap-In, Right Angle
M7 PC Mount, 90° vertical
 See page 29-30 for dimensional specifications.

7 CONTACTS / TERMINALS

	Contact Material	Terminal Plating	Rating	Approvals
G	silver ²	gold over silver	3A 125VAC or 28VDC, 1.5A 250VAC	UL, CE
K ⁸	gold ^{3,6}	tin ⁵	0.4VA max 20V max (AC/DC)	N/A
P ⁸	silver ^{2,7}	tin ⁵	3A 125VAC or 28VDC, 1.5A 250VAC	UL, CE
Q	silver ²	silver ²	3A 125VAC or 28VDC, 1.5A 250VAC	UL, CE
R	gold ³	gold ⁴	0.4VA max 20V max (AC/DC)	N/A

8 EPOXY SEAL

E Epoxy Seal **0** without Epoxy Seal

Notes: Tin option available with PC type terminations only.

- All Switches come with standard nut, washer and locking ring shipped bulk. B5 & B7 bushing styles use small locking ring. See page 76-77
- Movable contact and terminal platings: silver over copper alloy
- Movable contact and terminal platings: gold over nickel over copper alloy
- Terminal platings: gold over nickel over copper alloy
- Terminal platings: tin over copper alloy
- Terminal contact platings: gold over nickel alloy
- Terminal contact platings: silver over nickel alloy
- Not available with M1 terminal
- Lengths shown are with B1 - B4 bushings.
For B5 & B6 subtract .108", for B7 & B8 subtract .043"

2SM - **MSP** **1** - **T1** - **M6** **G** **E**

1 Series 2 Poles 3 Circuit 4 Actuator Style 5 Termination 6 Contacts 7 Seal 8 Packaging

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
2-3	Connected Terminals	2-1
1 ON	NONE	ON
2 ON	NONE	(ON)
3 ON	OFF	ON
4 (ON)	OFF	(ON)
5 ON	OFF	(ON)

4 ACTUATOR STYLE / LENGTH ¹

T1 Round toggle .425" [10.80 mm]
T2 Round toggle .240" [6.10 mm]
P1 ESD resistant plastic toggle .425" [10.80 mm]
P2 ESD resistant plastic toggle .268" [6.80 mm]
P3 ESD resistant plastic toggle .244" [6.20 mm]
P4 ESD resistant plastic toggle .291" [7.40 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]
 See page 31 for dimensional specifications.

6 CONTACTS / TERMINALS

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

7 EPOXY SEAL

E Epoxy Seal **0** without Epoxy Seal

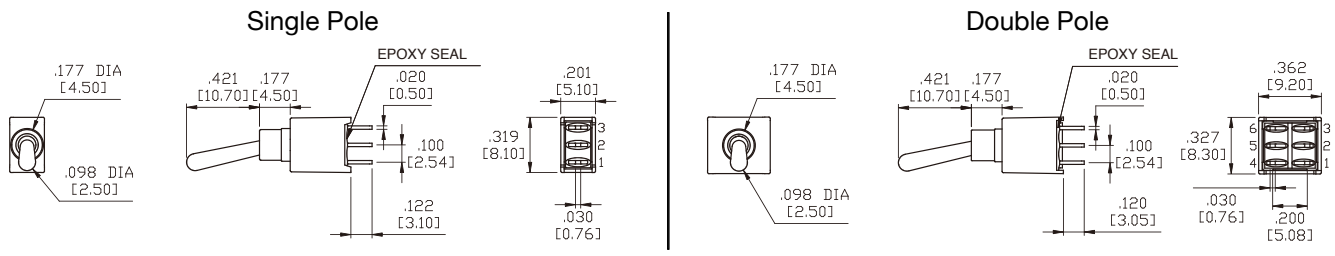
8 PACKAGING

T/R tape reel - 500 pieces per reel
 Switches are bulk packed, unless T/R is specified at the end of the part number.

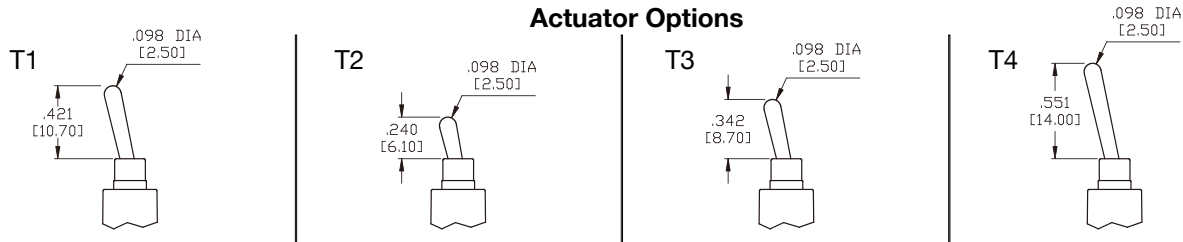
Notes:

- Tin option available with PC type terminations only.
- 1 Bushing is unthreaded .177" [4.50 mm] height
- 2 Movable contact & terminal platings: silver over copper alloy
- 3 Movable contact & terminal platings: gold over nickel over copper alloy
- 4 Terminal platings: tin over nickel over copper alloy

2SS-Series Dimensional Specifications: in. [mm]

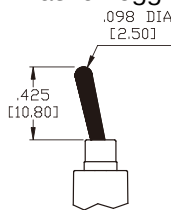


Actuator Options

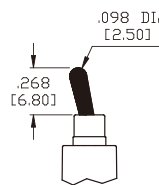


* B4 bushing shown. Subtract 2.55mm from toggle length for B1 bushing.

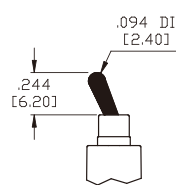
P1 Plastic Toggle



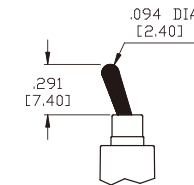
P2 Plastic Toggle



P3 Plastic Toggle



P4 Plastic Toggle



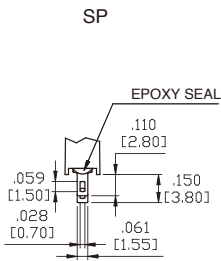
Bushing Options



* Subtract 2.55mm from toggle length for B1 bushing.

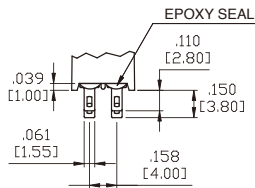
Termination Options

M1 STD. Solder Lug



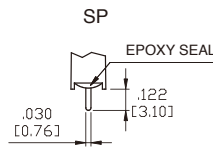
THK .020 [0.50]

DP

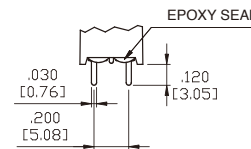


THK .020 [0.50]

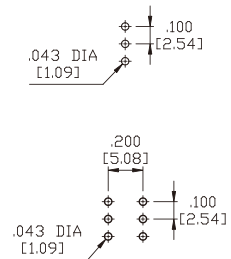
M2 PC Thru-Hole



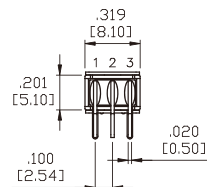
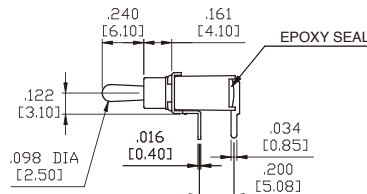
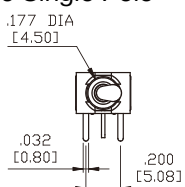
DP



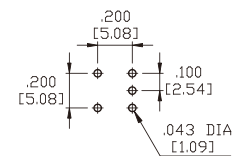
P.C.MOUNTING



M6 Single Pole



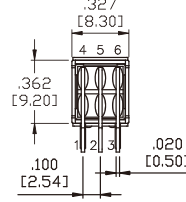
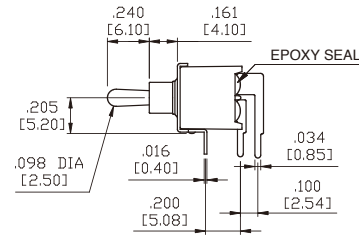
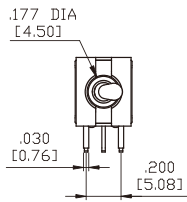
P.C.MOUNTING



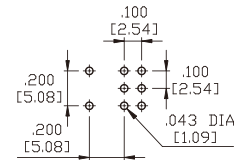
2SS-Series Dimensional Specifications: in. [mm]

Termination Options

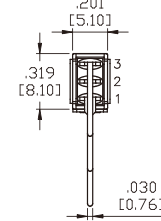
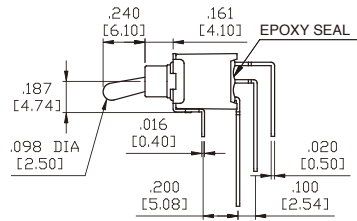
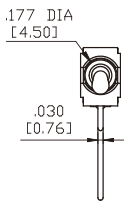
M6 Double Pole



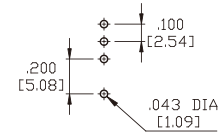
P.C.MOUNTING



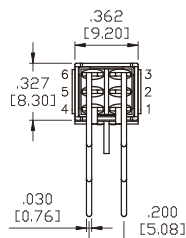
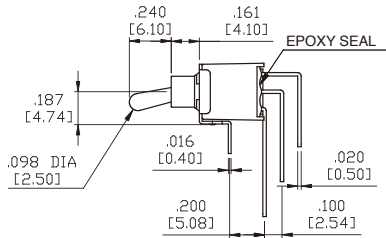
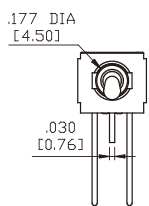
M7 Single Pole



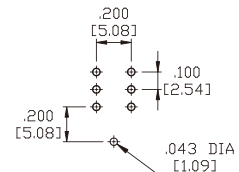
P.C.MOUNTING



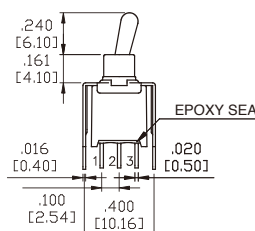
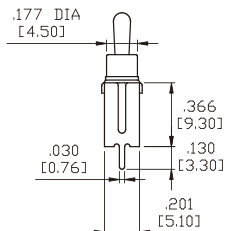
M7 Double Pole



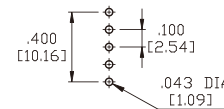
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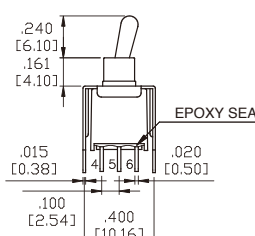
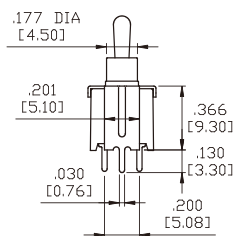
VS2 Single Pole



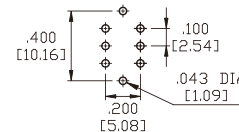
P.C.MOUNTING



VS2 Double Pole

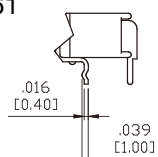


P.C.MOUNTING

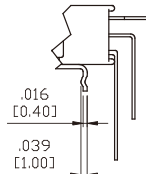


Snap-In Termination Options

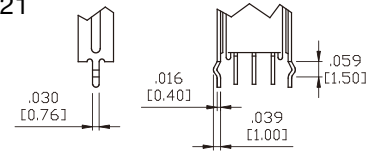
M61



M71

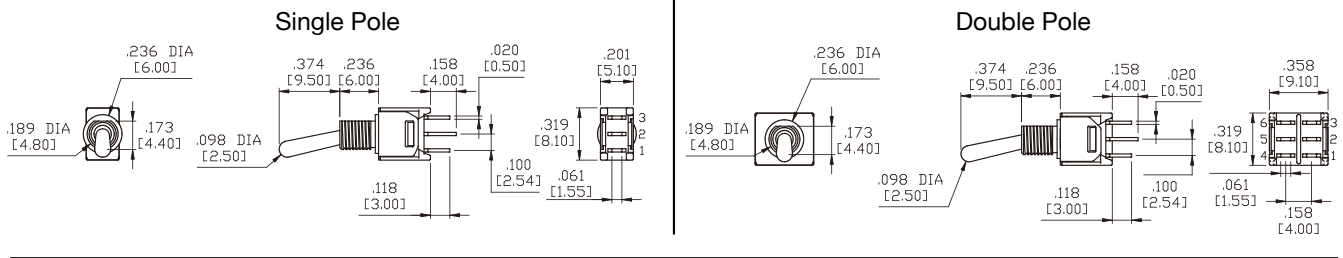


VS21

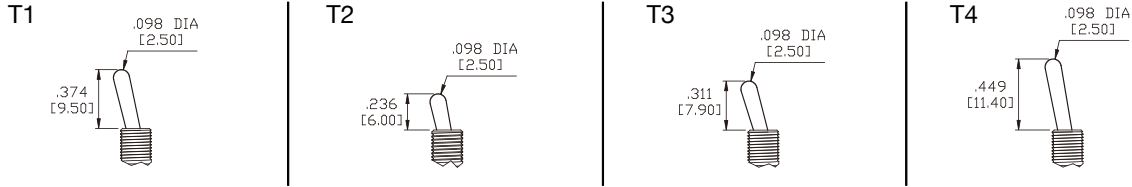


* PC Mounting for M61, M71, VS21 refer to M6, M7, VS2 respectively.

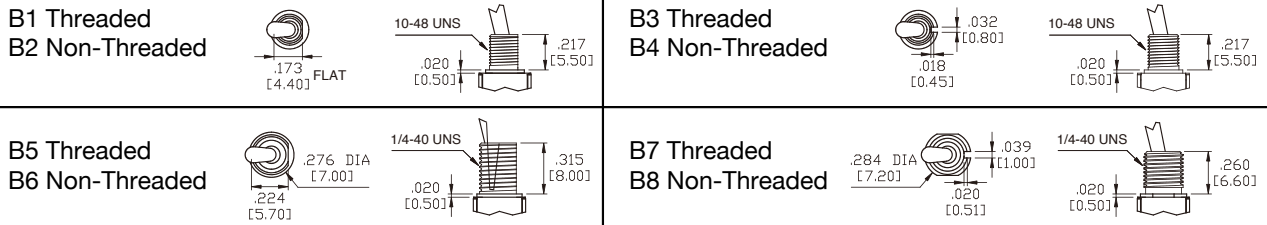
2S1-Series Dimensional Specifications: in. [mm]



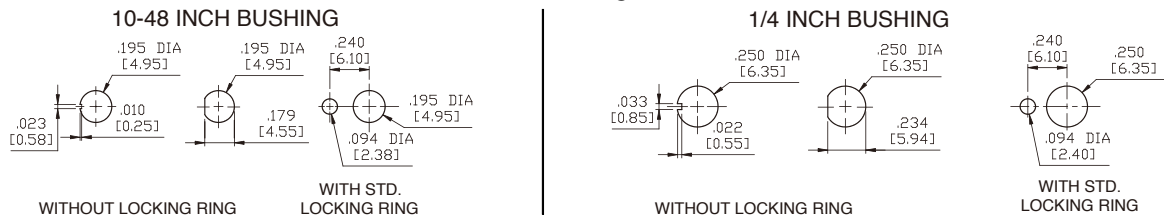
Actuator Options



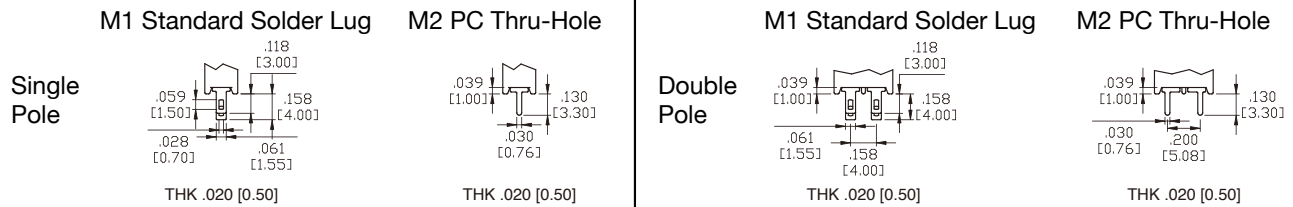
Bushing Options



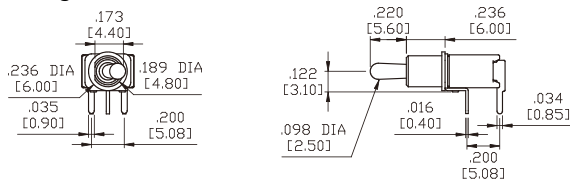
Panel Mounting



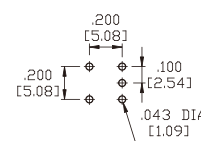
Termination Options



M6 Single Pole



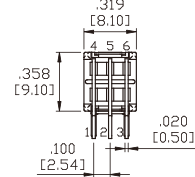
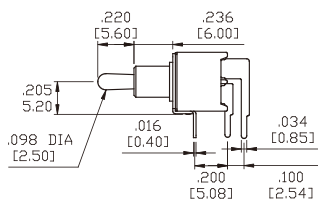
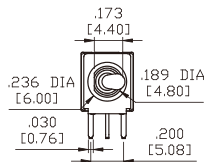
P.C. MOUNTING



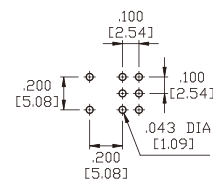
2S1-Series Dimensional Specifications: in. [mm]

Termination Options

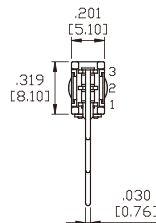
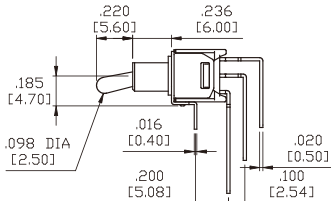
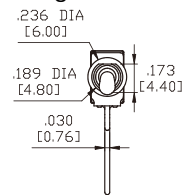
M6 Double Pole



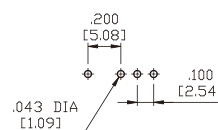
P.C.MOUNTING



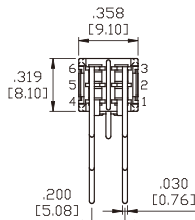
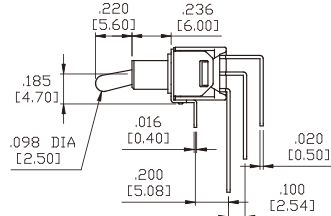
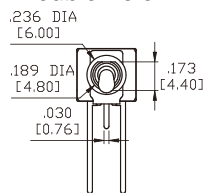
M7 Single Pole



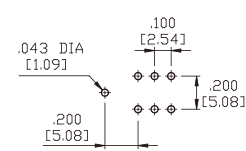
P.C.MOUNTING



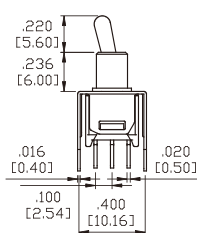
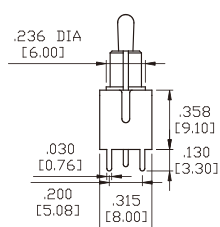
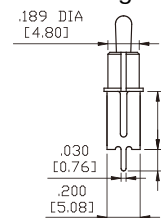
M7 Double Pole



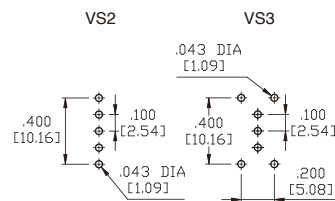
P.C.MOUNTING



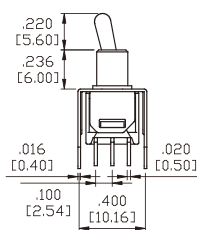
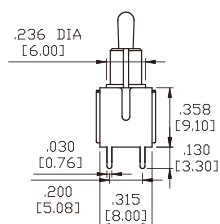
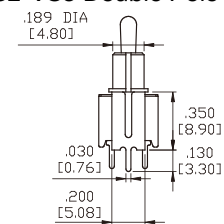
VS2-VS3 Single Pole



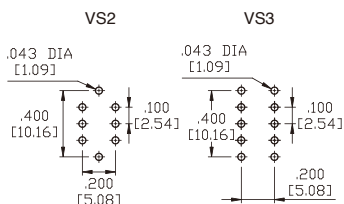
P.C.MOUNTING



VS2-VS3 Double Pole

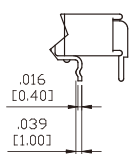


P.C.MOUNTING

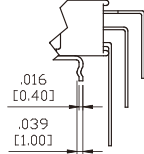


Snap-In Termination Options

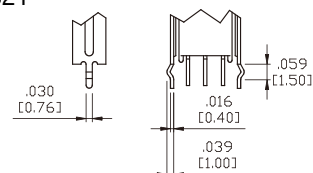
M61



M71



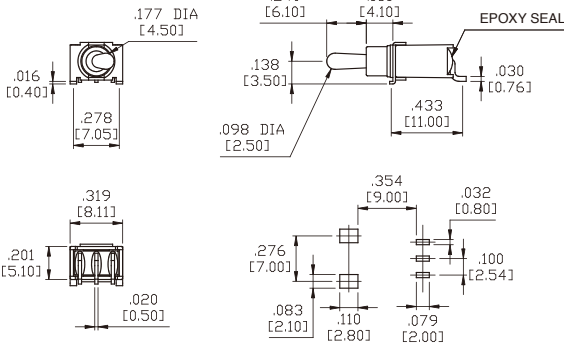
VS21



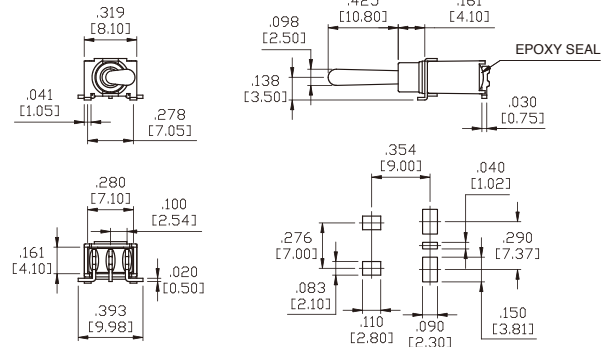
* PC Mounting for M61, M71, VS21 refer to M6, M7, VS2 respectively.

2SM-Series Dimensional Specifications: in. [mm]

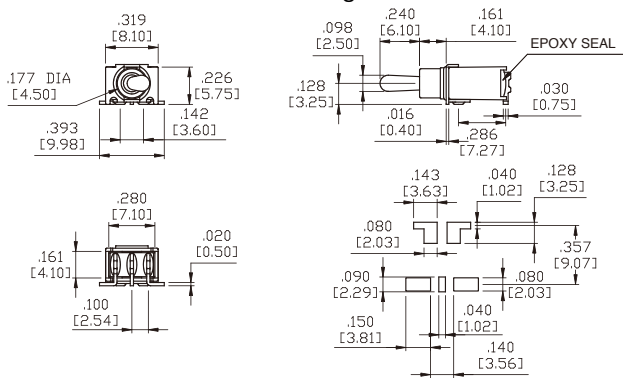
K6 Single Pole



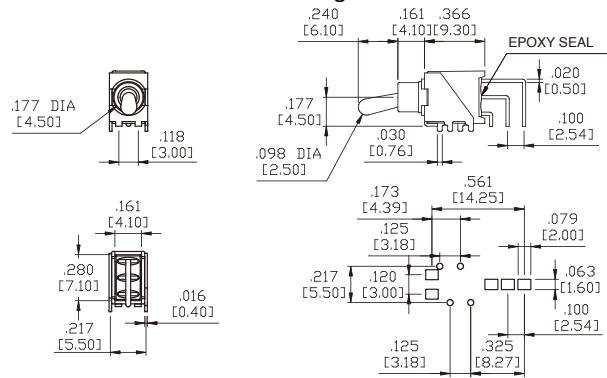
L6 Single Pole



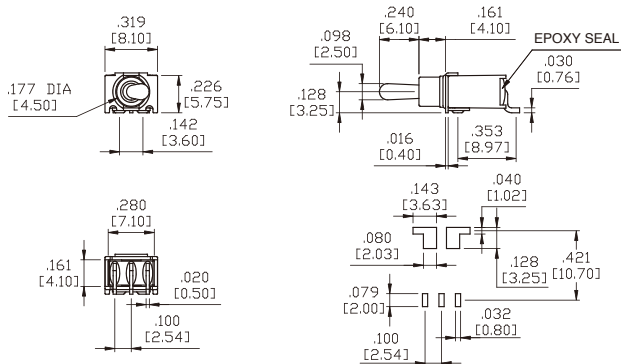
M6 Single Pole



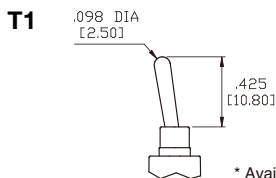
M7 Single Pole



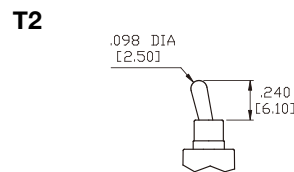
S6 Single Pole



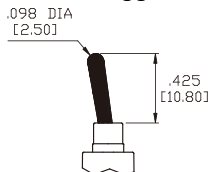
Actuator Options



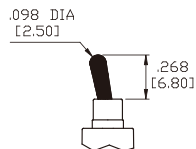
* Available with L6, S6, K6, M7 terminals only.



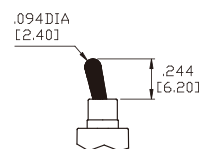
P1 Plastic Toggle



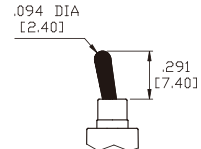
P2 Plastic Toggle



P3 Plastic Toggle



P4 Plastic Toggle



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