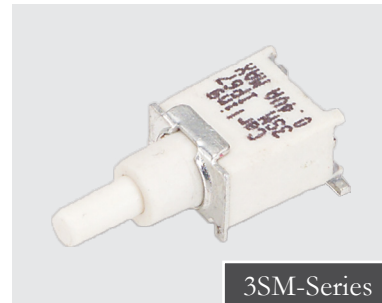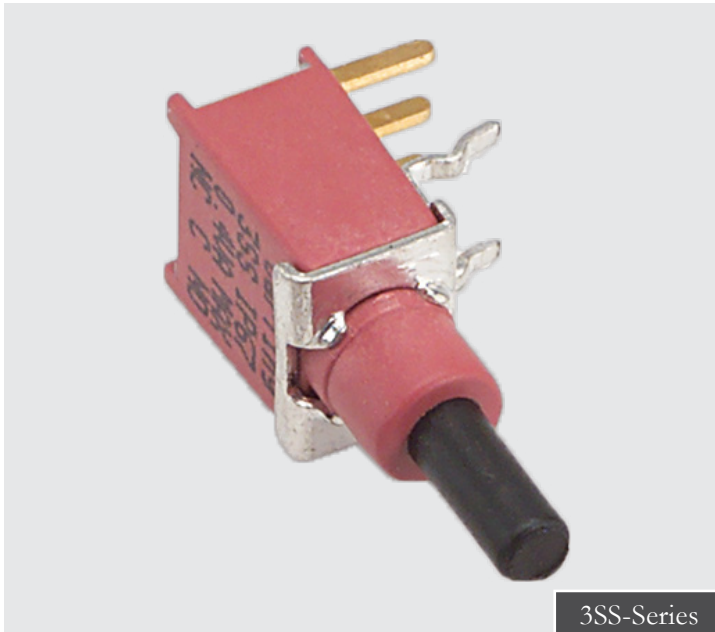# 3S-Series
SUB-MINIATURE PUSHBUTTONS

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.

3S1-Series

3SS-Series

3SM-Series

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
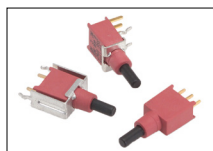- Instrumentation
- Low Power On/Off Designs

Carling Technologies®
Innovative Designs. Powerful Solutions.

3SS-Series
Sealed
Sub-Miniature
Pushbutton Switch

3S1-Series
Sub-Miniature
Pushbutton
Switch

3SM-Series
Sealed Surface Mount
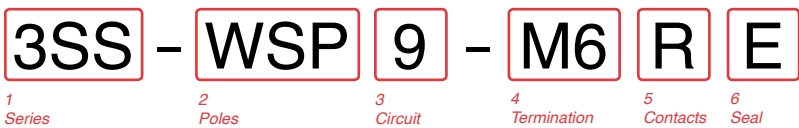Sub-Miniature
Pushbutton Switch

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
Plunger	*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
Bushing	*3S1-Series:* Brass, nickel plated *3SS-Series:* Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0) *3SM-Series:* Glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0)
Housing	Stainless Steel
Switch Support	Brass, tin plated
Terminal Seal	Epoxy

3SS	–	WSP	9	–	M6	R	E
1 Series		*2 Poles*	*3 Circuit*		*4 Termination*	*5 Contacts*	*6 Seal*

1 SERIES
3SS 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
	2-3, 5-6	2-1, 5-4
8	ON	(ON)
9	OFF	(ON)

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

	Contact Material	Terminal Plating	Rating	Approvals
G	silver [1]	gold over silver	1A 125VAC or 28VDC	IP67
K	gold [2]	tin [3,4]	0.4VA max 20V max (AC/DC)	IP67
P	silver [1]	tin [3,4]	1A 125VAC or 28VDC	IP67
R	gold [2]	gold [2]	0.4VA max 20V max (AC/DC)	IP67

6 EPOXY SEAL

E	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: tin over nickel over copper alloy
4 Tin option available with PC terminations only.

*Manufacturer reserves the right to change product specification without prior notice.

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3S1 - SP 9 - B6 - M7 - R E

3S1	SP	9	B6	M7	R	E
1 Series	2 Poles	3 Circuit	4 Bushing	5 Termination	6 Contacts	7 Seal

1 SERIES
3S1   Sub-Miniature Pushbutton Switch

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

3 CIRCUIT
( ) - momentary

Switching Position:	**1**	**2**
	2-3, 5-6	2-1, 5-4
8	ON	(ON)
9	OFF	(ON)

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

4 BUSHING

B5 [1]	10-48 Threaded	**B9**	Flush Bushing
B6	Unthreaded "D"	**B0**	1/4" Unthreaded "D"
B7	Unthreaded	**0P1**	Snap-In with bezel
B8 [2]	1/4-40 Threaded "D"	**P0**	Flush Plunger

5 TERMINATION

M1	Solder Lug	**M7**	PC Mount, 90° vertical
M2	PCB	**M71**	Snap-In, 90° vertical
M6	PC Mount, 90° horizontal	**VS2**	PC Mount, U bracket
M61	Snap-In, 90° horizontal	**VS21**	Snap-In, U bracket

See page 50-51 for dimensional specifications.

6 CONTACTS / TERMINALS

	Contact Material	*Terminal Plating*	*Rating*
G	silver [3]	gold over silver	1A@125VAC or 28VDC
K	gold [4,7]	tin [6]	0.4VA max @ 20V max (AC/DC)
P	silver [3,8]	tin [6]	1A@125VAC or 28VDC
Q	silver [3]	silver [3]	1A@125VAC or 28VDC
R	gold [4]	gold [5]	0.4VA max @ 20V max (AC/DC)

7 EPOXY SEAL

E	Epoxy Seal	**0**	without Epoxy Seal

Notes:
1   Hardware includes (2) 2M1-HDW21 nuts, and (1) 2M1-HDW22 washer
2   Hardware includes (2) 2M1-HDW21 nuts, (1) 2M1-HDW22 washer,
(1) 2M1-HDW11 washer, and (1) 2M1-HDW16 locking ring
3   Movable contact and terminal platings: silver over copper alloy
4   Movable contact and terminal platings: gold over nickel over copper alloy
5   Terminal platings: gold over nickel over copper alloy
6   Terminal platings: tin over copper alloy
7   Terminal contact platings: Gold over nickel alloy
8   Terminal contact platings: silver over nickel alloy

3SM - SP 9 - M6 - R E

3SM	SP	9	M6	R	E	
1 Series	2 Poles	3 Circuit	4 Termination	5 Contacts	6 Seal	7 Packaging

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:	**1**	**2**
	2-3	2-1
8	ON	(ON)
9	OFF	(ON)

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 CONTACTS / TERMINALS

	Contact Material	*Terminal Plating*	*Rating*		*Approvals*
G	silver [1]	gold over silver	1A 125VAC or 28VDC		IP67
K	gold [2,5]	tin [4]	0.4VA max 20V max (AC/DC)		IP67
P	silver [1,6]	tin [4]	1A 125VAC or 28VDC		IP67
Q	silver [1]	silver [1]	1A 125VAC or 28VDC		IP67
R	gold [2]	gold [3]	0.4VA max 20V max (AC/DC)		IP67

6 EPOXY SEAL

E	Epoxy Seal	**0**	without Epoxy Seal

7 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:
1   Movable contact and terminals platings: silver over copper alloy
2   Movable contact platings: gold over nickel over copper alloy
3   Terminal platings: gold over nickel over copper alloy
4   Terminals platings: tin over copper alloy
5   Terminal contact platings: gold over nickel alloy
6   Terminal contact platings: silver over nickel alloy

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.

Optional Cap

3S1 - C1 3

3S1	C1	3
1 Series	2 Toggle Cap Size	3 Color

1 SERIES
3S1   Fits 3SS, 3S1 or 3MS

2 TOGGLE CAP SIZE
C1	.158" [4.01 mm] height	**C2**	.138" [35.05 mm] height

3 CAP COLOR

1	White		
2	Black	**5**	Yellow
3	Red	**6**	Green
4	Orange	**7**	Blue

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3SS-Series Dimensional Specifications: in. [mm]

Single Pole

.177 DIA [4.50]
.100 DIA [2.54]
.244 [6.20]
.528 [13.40]
EPOXY SEAL
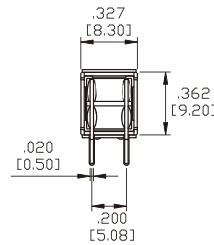.020 [0.50]
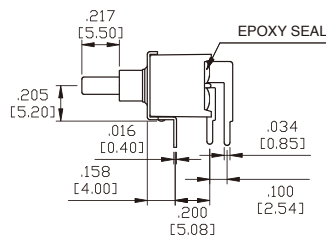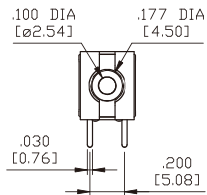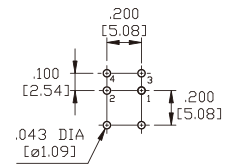.100 [2.54]
.102 [2.60]
.177 [4.50]
.201 [5.10]
.319 [8.10]
.030 [0.76]

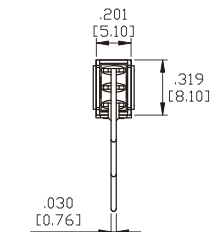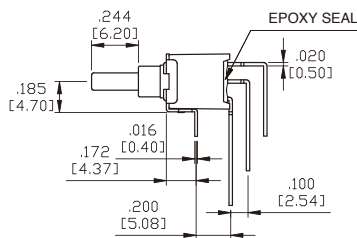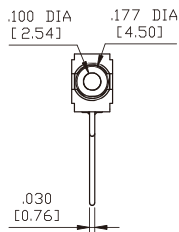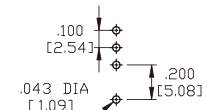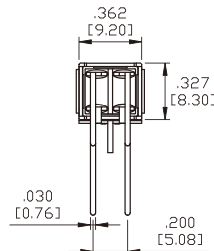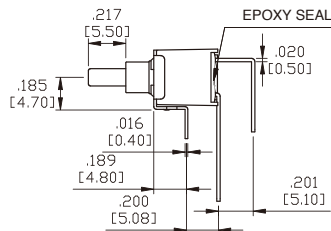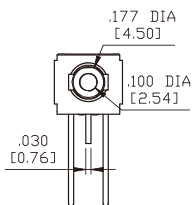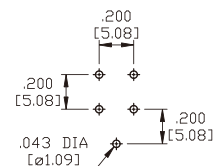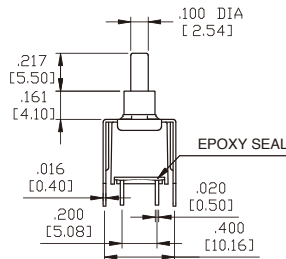* Double Throw shown. Single Throw uses two outer terminals only.

Double Pole

.177 DIA [4.50]
.100 DIA [2.54]
.217 [5.50]
.532 [13.50]
EPOXY SEAL
.020 [0.50]
.200 [5.08]
.177 [4.50]
.120 [3.05]
.362 [9.20]
.327 [8.30]
.030 [0.76]
.200 [5.08]

Termination Options

M6 Single Pole

.100 DIA [2.54]
.177 DIA [4.50]
.032 [0.80]
.200 [5.08]
.244 [6.20]
.528 [13.40]
EPOXY SEAL
.126 [3.20]
.016 [0.40]
.034 [0.85]
.200 [5.08]
.319 [8.10]
.201 [5.10]
.020 [0.50]
.100 [2.54]

P.C.MOUNTING

.100 [2.54]
.043 DIA [1.09]
.200 [5.08]
.200 [5.08]

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

M6 Double Pole

.100 DIA [ø2.54]
.177 DIA [4.50]
.030 [0.76]
.200 [5.08]
.217 [5.50]
EPOXY SEAL
.205 [5.20]
.016 [0.40]
.034 [0.85]
.158 [4.00]
.200 [5.08]
.100 [2.54]
.327 [8.30]
.362 [9.20]
.020 [0.50]
.200 [5.08]

P.C.MOUNTING

.200 [5.08]
.100 [2.54]
.200 [5.08]
.043 DIA [ø1.09]

M7 Single Pole

.100 DIA [2.54]
.177 DIA [4.50]
.030 [0.76]
.244 [6.20]
EPOXY SEAL
.185 [4.70]
.016 [0.40]
.172 [4.37]
.200 [5.08]
.100 [2.54]
.020 [0.50]
.201 [5.10]
.319 [8.10]
.030 [0.76]

P.C.MOUNTING

.100 [2.54]
.043 DIA [1.09]
.200 [5.08]

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

M7 Double Pole

.177 DIA [4.50]
.100 DIA [2.54]
.030 [0.76]
.217 [5.50]
EPOXY SEAL
.185 [4.70]
.016 [0.40]
.189 [4.80]
.200 [5.08]
.020 [0.50]
.201 [5.10]
.362 [9.20]
.327 [8.30]
.030 [0.76]
.200 [5.08]

P.C.MOUNTING

.200 [5.08]
.200 [5.08]
.200 [5.08]
.043 DIA [ø1.09]

3SS-Series Dimensional Specifications: in. [mm]

Termination Options

VS2 Single Pole

.177 DIA
[4.50]

.366
[9.30]

.130
[3.30]

.030
[0.76]

.201
[5.10]

.100 DIA
[2.54]

.244
[6.20]

.161
[4.10]

EPOXY SEAL

.016
[0.40]

.020
[0.50]

.100
[2.54]

.400
[10.16]

P.C.MOUNTING

.100
[2.54]

.400
[10.16]

.043 DIA
[1.09]
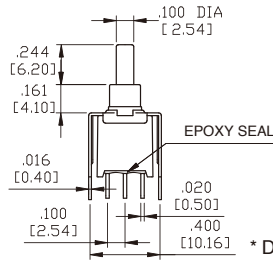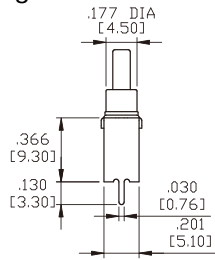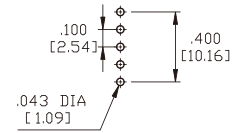
* Double Throw shown. Single Throw uses outer terminals only.

VS2 Double Pole
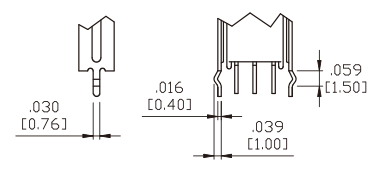
.177
[4.50]

.366
[9.30]

.130
[3.30]

.030
[0.76]

.201
[5.10]

.100 DIA
[2.54]

.217
[5.50]

.161
[4.10]

EPOXY SEAL

.016
[0.40]

.020
[0.50]
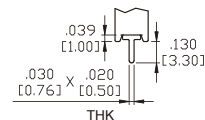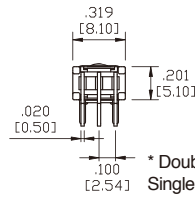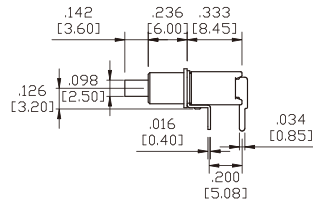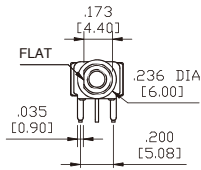
.200
[5.08]

.400
[10.16]

P.C.MOUNTING

.043 DIA
[1.09]

.200
[5.08]

.400
[10.16]

.200
[5.08]

Snap-In Termination Options

M61

.016
[0.40]

.039
[1.00]

M71

.016
[0.40]

.039
[1.00]

VS21

.030
[0.76]

.016
[0.40]

.059
[1.50]

.039
[1.00]

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

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3S1-Series Dimensional Specifications: in. [mm]

Single Pole

FLAT   .236 DIA [6.00]   .173 [4.40]

.154 [3.90]   .236 [6.00]   .020 [0.50]   .098 [2.50]   .100 [2.54]   .130 [3.30]

.201 [5.10]   .319 [8.10]   .030 [0.76]

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

Actuator Options for Snap-In Front Mount

OP1

.091 [2.30]   .150 [3.80]   .370 [9.40]

PANEL THICKNESS
.047 [1.19] TO .125 [3.18]

.614 [15.60]   .764 [19.40]   .449 [11.40]

PANEL MOUNTING

R.005 [R0.13]
.600 [15.24] MAX. TYP.   .500 [12.70]
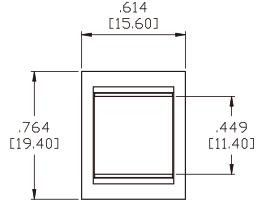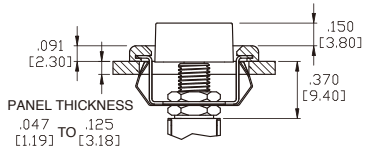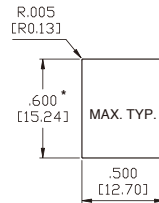
* Increase this dimension to .620/.625 [15.75/15.88] for .091/.125[2.31/3.18] thk. panels.

OP1 Without Frame

.240 [6.10]   .370 [9.40]

PANEL THICKNESS
.047 [1.19] TO .125 [3.18]

.472 [12.00]   .713 [18.10]   .476 [12.10]   .476 [12.10]

PANEL MOUNTING

R.005 [R0.13]
.600 [15.24] MAX. TYP.   .500 [12.70]
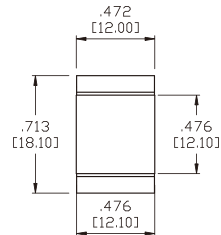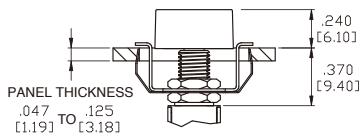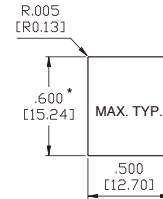
* Increase this dimension to .620/.625 [15.75/15.88] for .091/.125[2.31/3.18] thk. panels.

Bushing Options
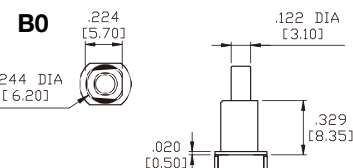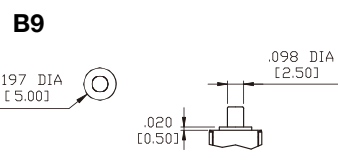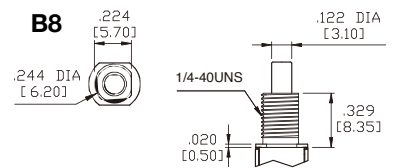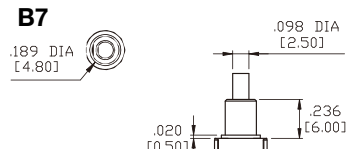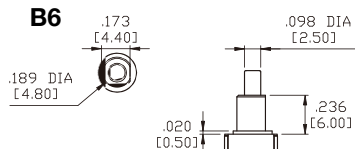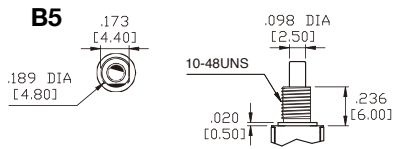
B5
.173 [4.40]   .189 DIA [4.80]   .098 DIA [2.50]   10-48UNS   .020 [0.50]   .236 [6.00]

B6
.173 [4.40]   .189 DIA [4.80]   .098 DIA [2.50]   .020 [0.50]   .236 [6.00]

B7
.189 DIA [4.80]   .098 DIA [2.50]   .020 [0.50]   .236 [6.00]

B8
.224 [5.70]   .244 DIA [6.20]   .122 DIA [3.10]   1/4-40UNS   .020 [0.50]   .329 [8.35]

B9
.197 DIA [5.00]   .098 DIA [2.50]   .020 [0.50]

B0
.224 [5.70]   .244 DIA [6.20]   .122 DIA [3.10]   .020 [0.50]   .329 [8.35]

Termination Options

M1
.039 [1.00]   .118 [3.00]   .059 [1.50]   .158 [4.00]   .028 [0.70]   .061 [1.55] X .020 [0.50] THK

M2
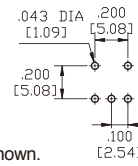.039 [1.00]   .130 [3.30]   .030 [0.76] X .020 [0.50]   THK
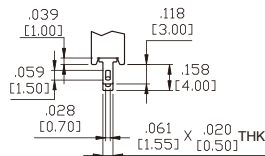
3S1-Series Dimensional Specifications: in. [mm]
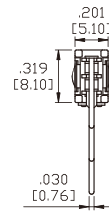
Termination Options
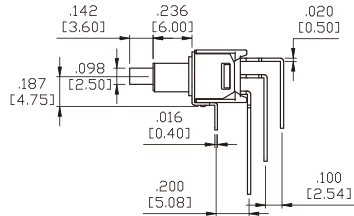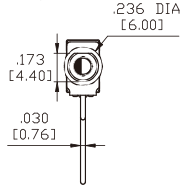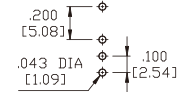
M6 Single Pole

P.C.MOUNTING

* Double Throw shown.
Single Throw uses two outer terminals only.
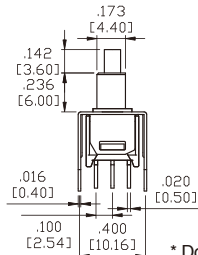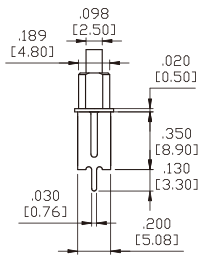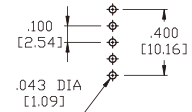
M7 Single Pole

P.C.MOUNTING

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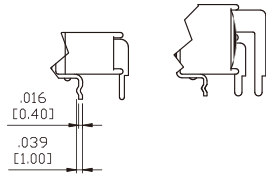Single Throw uses two outer terminals only.

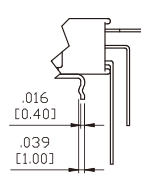### VS2 Single Pole

P.C.MOUNTING

* Double Throw shown. Single Throw uses outer terminals only.
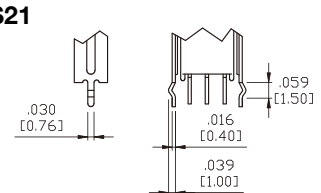
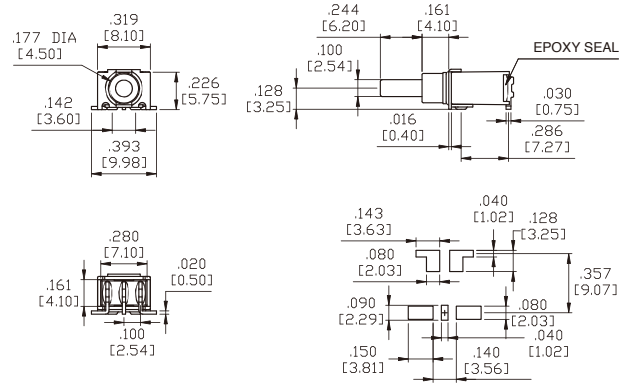## Snap-In Termination Options

M61

M71

VS21

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

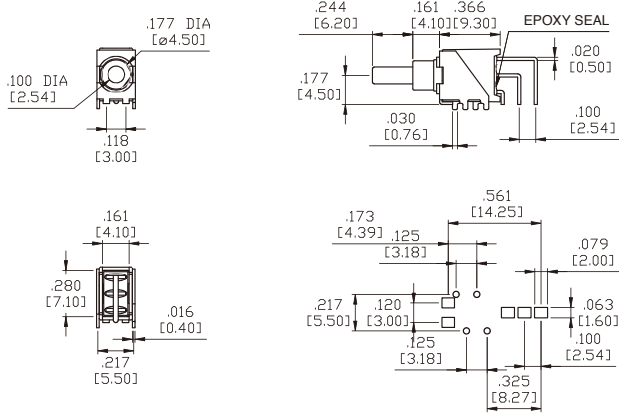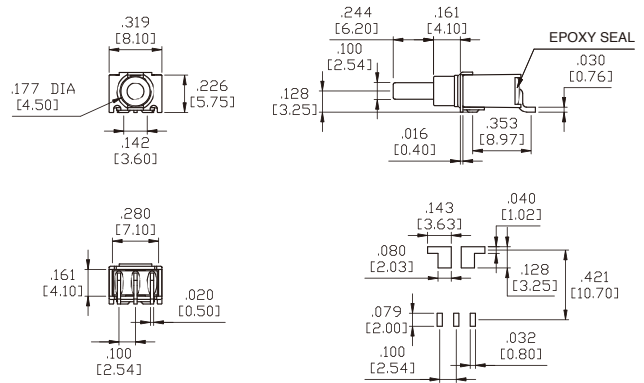# 3SM-Series Dimensional Specifications: in. [mm]
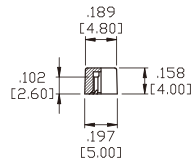
K6 Single Pole
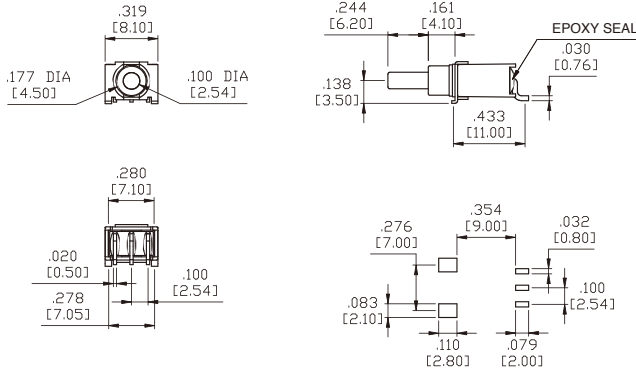
M6 Single Pole

M7 Single Pole

S6 Single Pole

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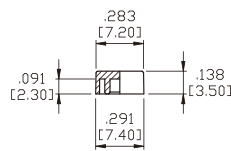
Plunger Caps

C1

* MATERIAL: ABS.

C2

* MATERIAL: ABS.

CAP COLORS			
1	White	6	Green
2	Black	7	Blue
3	Red	8	Brown
4	Orange	9	Gray
5	Yellow		