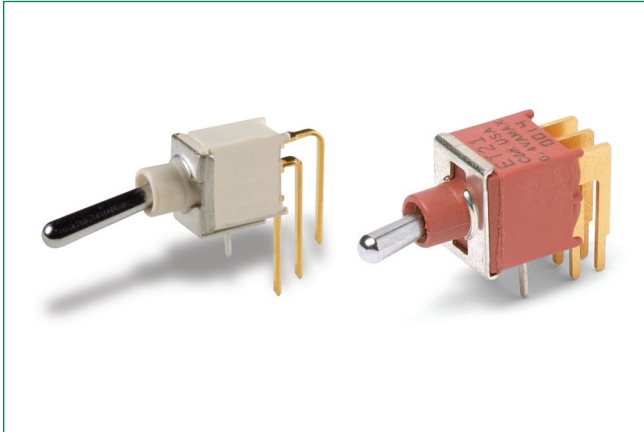


# ET Series

## Sealed Subminiature Toggle Switches



### Agency Approvals

Agency	Agency File Number
US	E42363

### Specifications

<b>Contact Rating</b>	B contact material: 0.4 VA max. @ 20 V AC or DC max.
<b>Electrical Life</b>	ETX1 models: 60,000 make-and-break cycles at full load. All other models: 30,000 cycles.
<b>Contact Resistance</b>	Below 20 m $\Omega$ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.
<b>Insulation Resistance</b>	10 <sup>9</sup> $\Omega$ min.
<b>Electrostatic Discharge ESD Resistant Option</b>	M3 & S3 insulating actuator only: 9,000 V DC min. @ sea level, actuator to terminals. F1 conductive bushing only: Dissipates up to 20,000 V DC from actuator to ground. M3 & S3 actuator and F1 bushing options are not recommended for use together.
<b>Dielectric Strength</b>	1000 Vrms min. @ sea level.
<b>Operating Temperature</b>	-30°C to 85°C
<b>Solderability</b>	Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).
<b>Degree of Protection</b>	IP57; Protection against harmful dust deposit, full-scale voltage protection, temporary immersion.
<b>Packaging</b>	Surface mount switches are shipped in tape and reel packaging.

### Description

The ET series sealed subminiature toggle switches are often used in the medical and telecommunications industry in hand-held or instrumentation applications. Featuring a small footprint (to help save space on the PCB) and ESD protection, long-lasting ET switches also come with strong protection from solder and cleaning process contaminants.

### Features & Benefits

- Sealed against solder and cleaning process contaminants
- ESD protection available
- Thru-hole and surface mount models
- Compact size and small footprint save PCB space
- RoHS compliant models available

### Applications

- Hand-held telecommunications
- Instrumentation
- Medical equipment

### Materials

<b>Case &amp; Bushing</b>	Glass filled nylon 6/6, flame retardant, heat stabilized (UL 94V-0) or glass filled 4/6 nylon, flame retardant, heat stabilized (UL 94V-0). F1 conductive bushing option is impregnated with carbon fibers.
<b>Actuator</b>	M3 & S3 anti-static actuator: Nylon 4/6, black standard (UL 94V-0). All other actuators: Brass, chrome plated. Internal o-ring seal standard with all actuators.
<b>Switch Support</b>	Brass, tin plated.
<b>Contact &amp; Terminals</b>	B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Copper alloy, silver plated.
<b>Terminal Seal</b>	Epoxy

#### Notes:

Any models supplied with Q, B, G, P or R contact material are RoHS compliant and compatible. Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

# ET Series

## Sealed Subminiature Toggle Switches



### Ordering Number

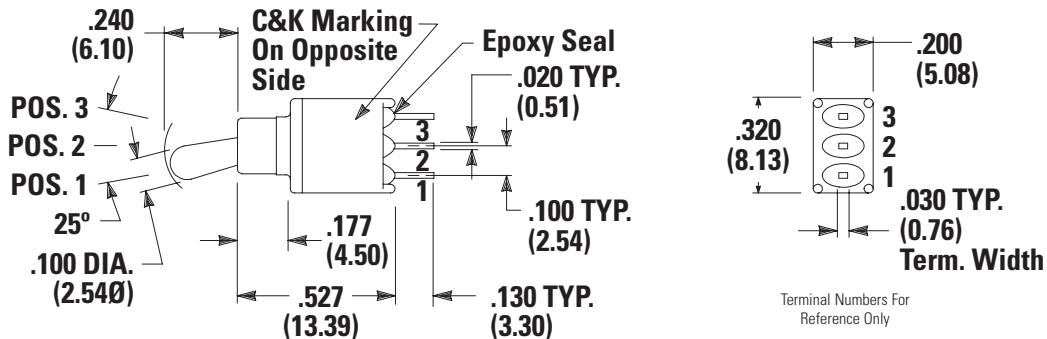
To order, simply select desired option from each category and place in the appropriate box. For additional options not shown in catalog, consult our Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.

**ETxx - x - x - x - x - E - x**

<p><b>Switch Function</b></p> <p><b>ET01:</b> SP, On-None-On  <b>ET02:</b> SPST, Off-None-On  <b>ET03:</b> SP, On-Off-On  <b>ET05:</b> SP, Mom.-Off-Mom.  <b>ET07:</b> SP, On-Off-Mom.  <b>ET08:</b> SP, On-None-Mom.  <b>ET21:</b> DP, On-None-On  <b>ET23:</b> DP, On-Off-On  <b>ET24:</b> DP, On-On-On  <b>ET25:</b> DP, Mom.-Off-Mom.  <b>ET27:</b> DP, On-Off-Mom.  <b>ET28:</b> DP, On-None-Mom.</p>	<p><b>Actuator</b></p> <p><b>M:</b> 0.240" high  <b>M3:</b> Plastic, anti-static, 0.240" high  <b>S:</b> 0.400" high  <b>L:</b> 0.320" high  <b>S1:</b> 0.550" high</p> <p><b>Bushing</b></p> <p><b>D1:</b> 0.177" High, Unthreaded  <b>F1:</b> 0.177" High, Unthreaded, ESD conductive</p>	<p><b>Terminations</b></p> <p><b>A:</b> Right angle, PC thru-hole  <b>AV:</b> Vertical right angle, PC thru-hole  <b>C:</b> PC Thru-hole  <b>SA:</b> Right angle, surface mount  <b>SA1:</b> Right angle, surface mount rear-facing  <b>V3:</b> Vertical mount, V-bracket  <b>AV3:</b> Vertical right angle, snap-in, PC thru-hole  <b>V31:</b> Vertical mount, V-bracket, snap-in  <b>W:</b> Wire wrap</p>	<p><b>Plastic Actuator Color</b></p> <p><b>None:</b> No actuator color  <b>1:</b> White</p> <p><b>Seal</b></p> <p><b>E:</b> Epoxy</p> <p><b>Contact Material</b></p> <p><b>B:</b> Gold  <b>P:</b> Gold, matte-tin  <b>Q:</b> Silver  <b>S:</b> Silver, matte-tin  <b>G:</b> Gold over silver  <b>R:</b> Gold over silver, matte-tin</p>
--	---	---	---

### Switch Function SPDT

No. Poles	Model No.	Switch Function			Connected Terminals			Schematic
		POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
		C&K Marking on Opposite Side						
SP	ET01	ON	NONE	ON	2-3	N/A	2-1	
	ET03	ON	OFF	ON	2-3	OPEN	2-1	
	ET05	MOM.	OFF	MOM.	2-3	OPEN	2-1	
	ET07	ON	OFF	MOM.	2-3	OPEN	2-1	
	ET08	ON	NONE	MOM.	2-3	N/A	2-1	
	ET02	OFF	NONE	ON	OPEN	N/A	3-1	



ET02 Models: Omit terminal 2

**Notes:**  
Part number shown: ET01MD1CBE

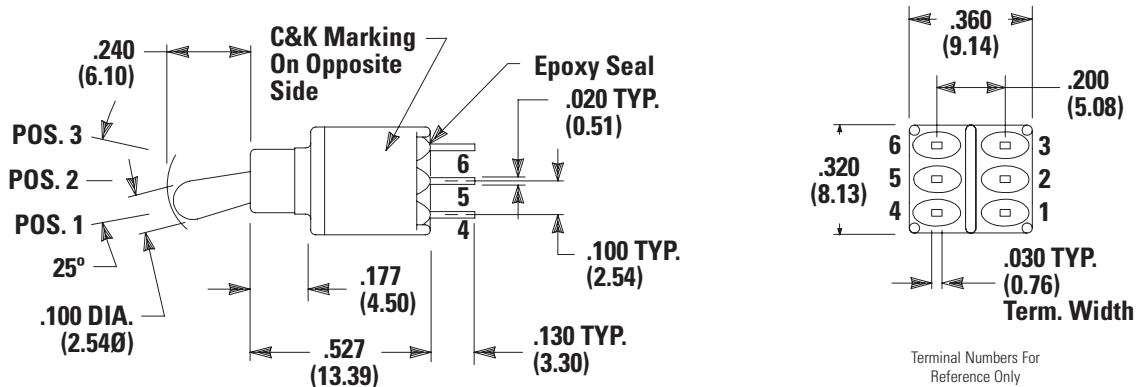
# ET Series

## Sealed Subminiature Toggle Switches



### DPDT

No. Poles	Model No.	Switch Function			Connected Terminals			Schematic
		POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
		C&K Marking on Opposite Side						
DP	ET21	ON	NONE	ON	2-3,5-6	N/A	2-1,5-4	
	ET23	ON	OFF	ON	2-3,5-6	OPEN	2-1,5-4	
	ET25	MOM.	OFF	MOM.	2-3,5-6	OPEN	2-1,5-4	
	ET27	ON	OFF	MOM.	2-3,5-6	OPEN	2-1,5-4	
	ET28	ON	NONE	MOM.	2-3,5-6	N/A	2-1,5-4	
	ET24 <sup>2</sup>	ON	ON	ON	2-3,5-6	2-3,5-4	2-1,5-4	

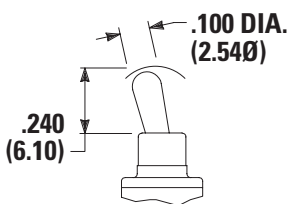


Part number shown: ET21MD1CBE

**Notes:**  
 MOM. = Momentary All models us with all options when ordered with G, R, Q or S contact material.  
 2. Wiring for 3 way switch.

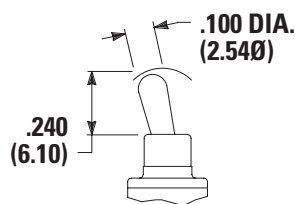
### Actuator

#### M 0.240" High



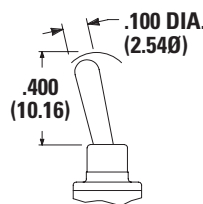
Standard with A, AV, V3 & V31 terminations.

#### M3 Plastic, Antistatic 0.240" High



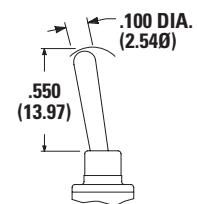
Material: Nylon 4/6 (UL 94V-0), black standard.  
 Static resistance: 9,000 V DC min. @ sea level, actuator to terminals. Not available with F1 conductive bushing option. Not UL approved.

#### S 0.400" High



Standard with C or W terminations.

#### S1 0.550" High



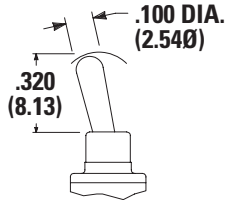
**Notes:** All actuators have chrome finish (except M3 & S3).

# ET Series

## Sealed Subminiature Toggle Switches



L 0.320" High

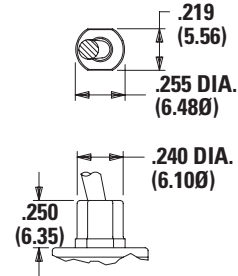


Option Code	L3 Actuator Color
(None)	Black (M3 & S3 only)
1	White (M3 & S3 only)

Notes: Other colors available, consult Customer Service Center. No color choice required for S & M actuators.

### Bushing

D1 0.177" High, Unthreaded  
F1 ESD Conductive Bushing, Unthreaded, 0.177" High

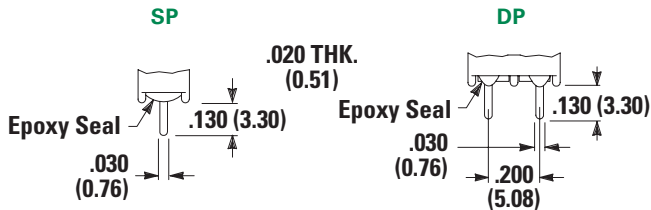


F1 bushing is not UL approved

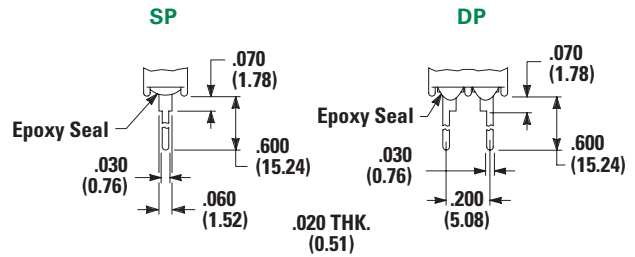
Notes: ESD protection depends on proper grounding of switch support bracket. F1 conductive bushing option is impregnated with carbon fibers; dissipates electrostatic discharge (ESD) up to 20,000 V from actuator to ground. Available with all metal actuator options and A, AV, AV3, V3 and V31 termination options only. Internal actuator o-ring seal standard.

### Terminations

#### C PC Thru-hole

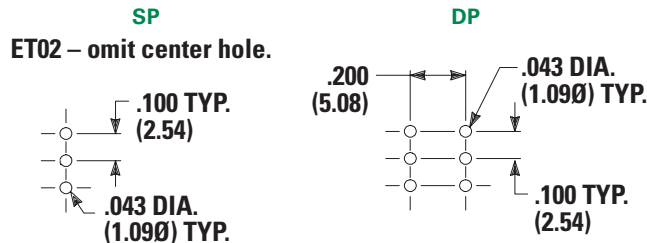


#### W Wire Wrap



SP and DP Not available with F1 conductive bushing.

#### PC Mounting



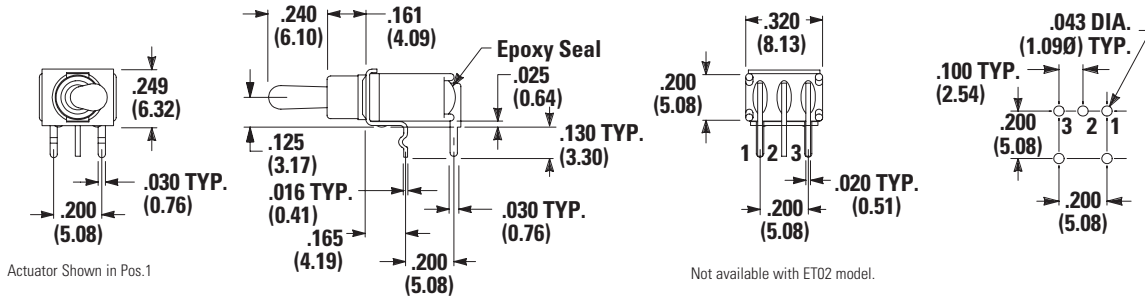
SP and DP Not available with F1 conductive bushing.

# ET Series

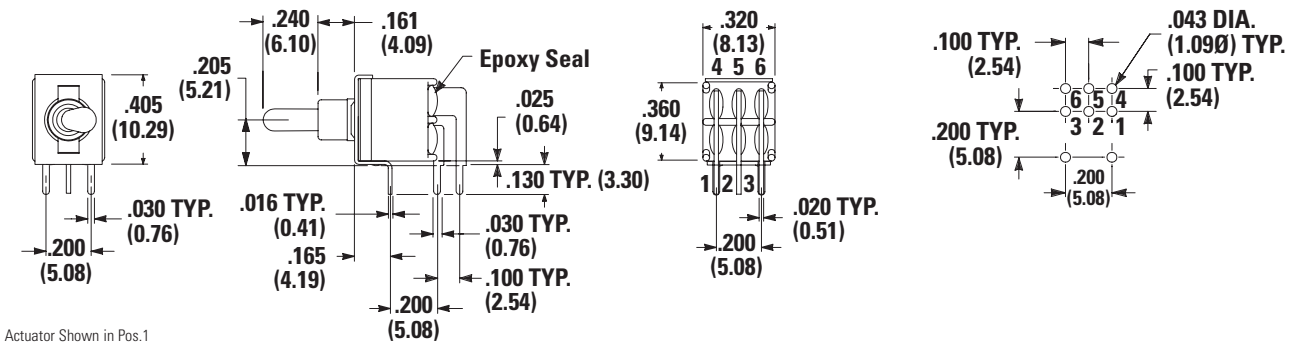
## Sealed Subminiature Toggle Switches



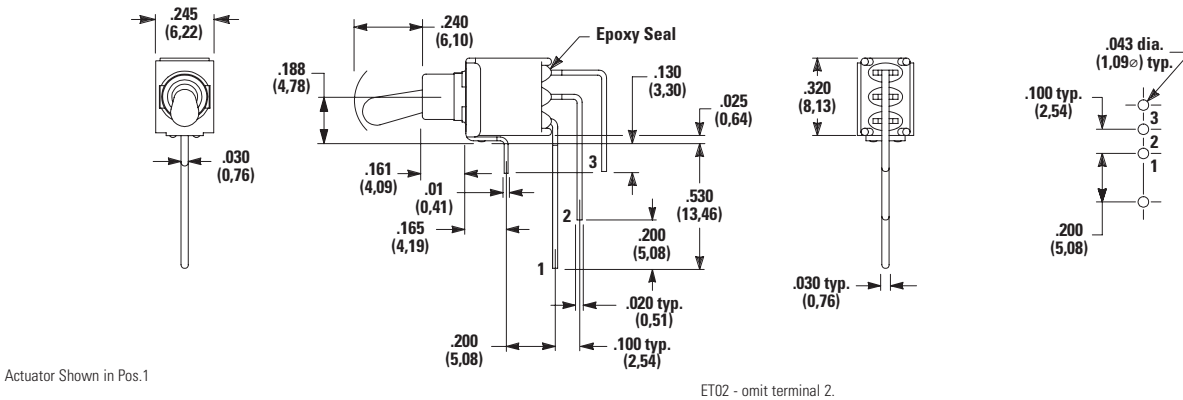
### A Right Angle, PC Thru-hole ET01MD1ABE Horizontal Actuation SPDT



### A Right Angle, PC Thru-hole ET21MD1ABE Horizontal Actuation SPDT



### AV Vertical Right Angle, PC Thru-hole ET01MD1AVBE Vertical Actuation SPDT



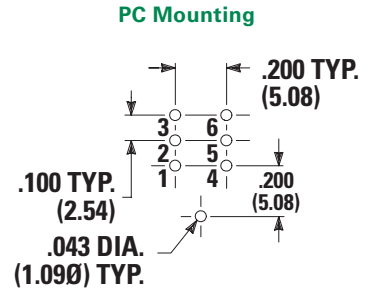
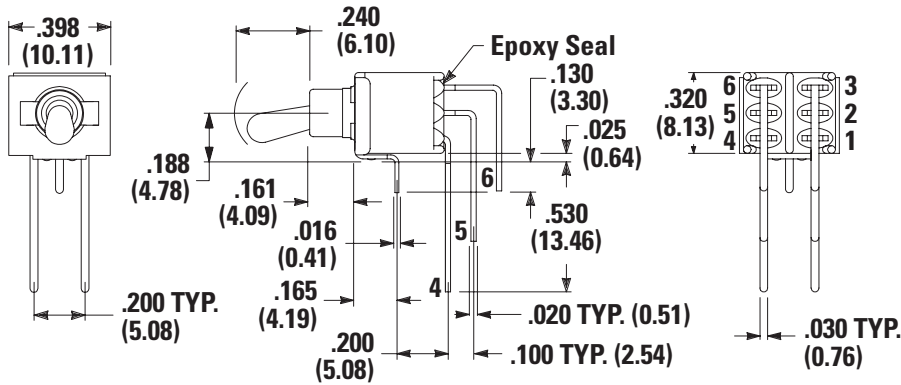
Notes: Terminal bend radii and lead-in manufacturing option.

# ET Series

## Sealed Subminiature Toggle Switches



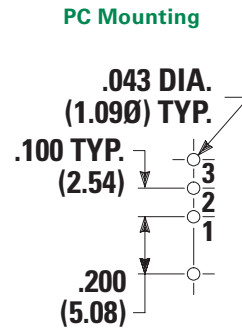
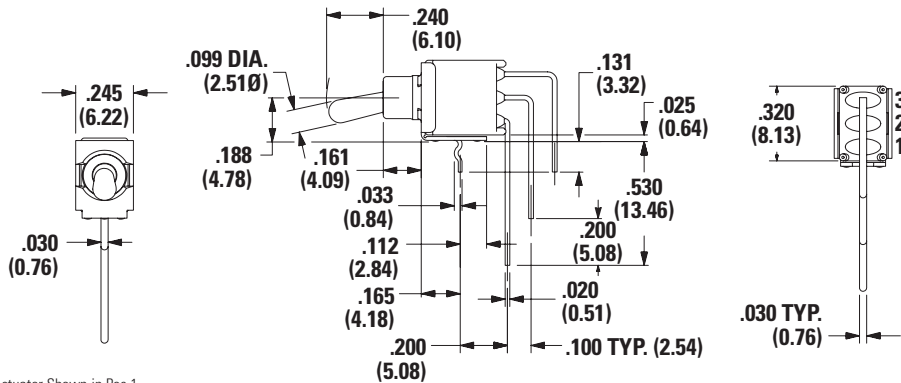
### AV Vertical Right Angle, PC Thru-hole ET21MD1AVBE Vertical Actuation DPDT



Actuator Shown in Pos.1

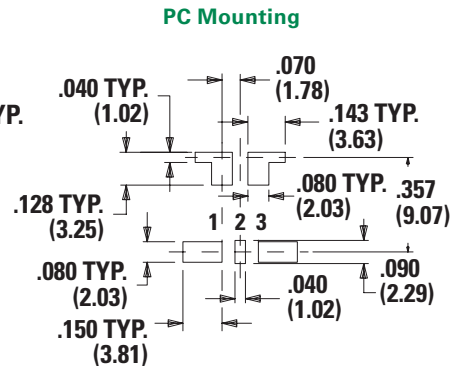
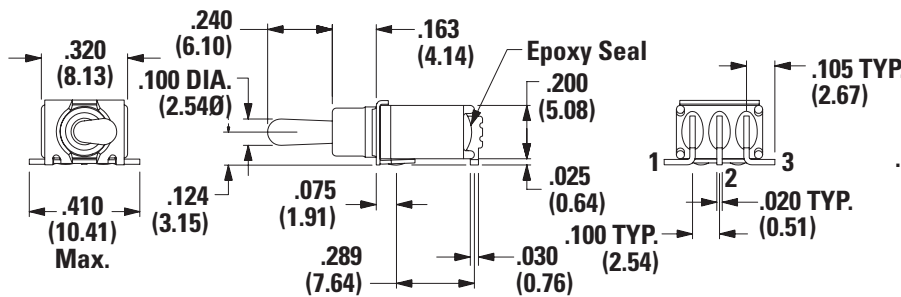
Notes: Terminal bend radii and lead-in manufacturing option.

### AV3 Vertical Right Angle, Snap-in, PC Thru-hole ET01SD1AV2BE Vertical Actuation SPDT



Actuator Shown in Pos.1

### SA Right Angle, Surface Mount ET01M3D1SAPE Horizontal Actuation SPDT Only



Actuator Shown in Pos.1

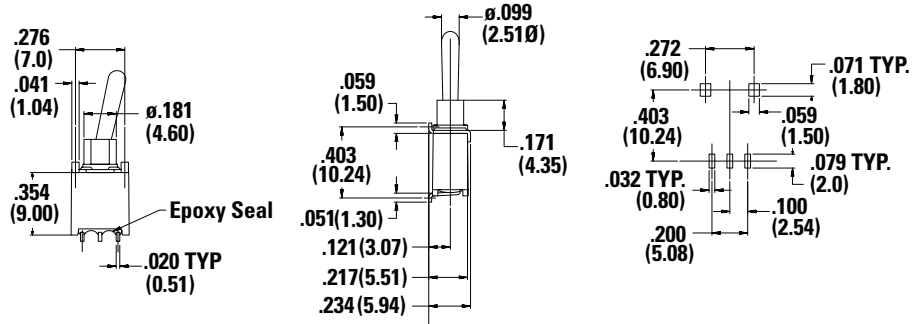
Notes: Not available with S and S1 actuators. Standard with tape & reel packaging.

# ET Series

## Sealed Subminiature Toggle Switches

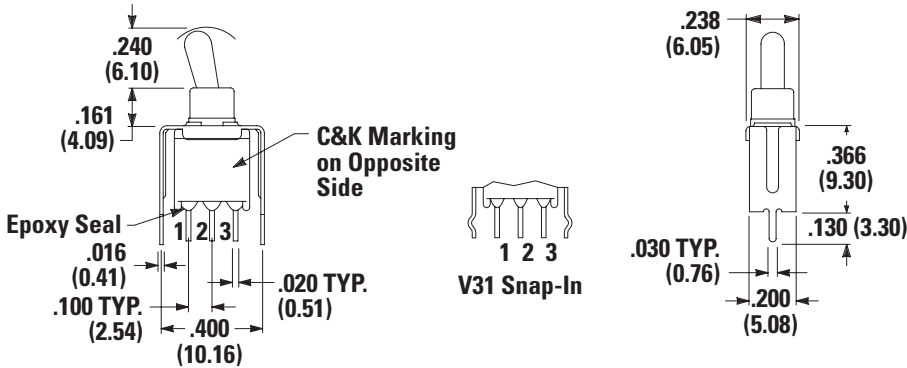


### SA1 Right Angle, Surface Mount ET01M3D1SA1BE Horizontal Actuation SPDT Only



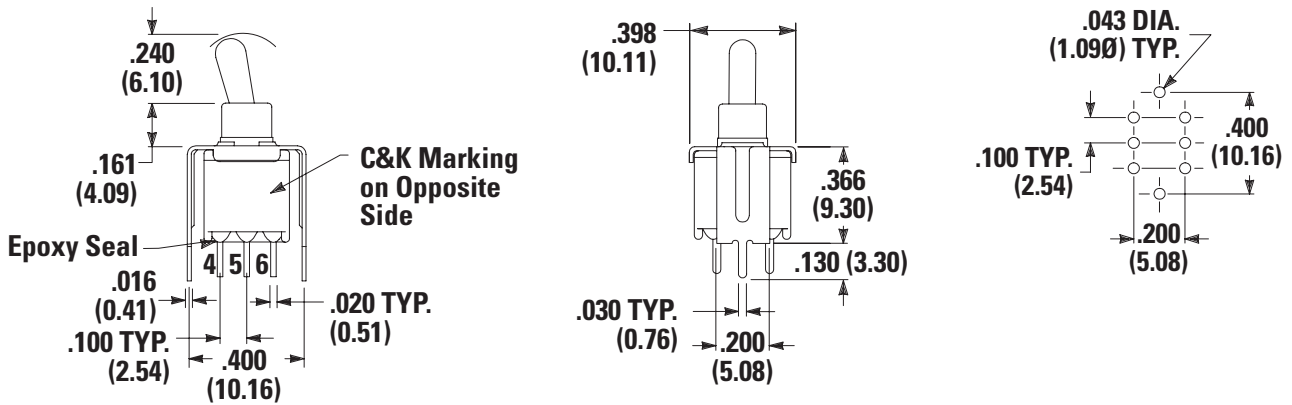
Notes: Not available in ET02. Actuators M and M3, bushing D1, contact material B. Standard with tape and reel packaging.

### V3 Vertical Mount, V-Bracket V31 Vertical Mount, V-Bracket, Snap-in ET01MD1V3BE SPDT



Actuator Shown in Pos.1  
ET02 Models: Omit terminal 2

### V3 Vertical Mount, V-Bracket ET21MD1V3BE DPDT



Actuator Shown in Pos.1

# ET Series


## Sealed Subminiature Toggle Switches



### Contact Material

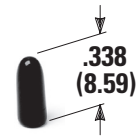
Option Code	Contact Material	Terminal Plating		Ratings
B	Gold <sup>1</sup>	Gold <sup>1</sup>	Low Level / Dry Circuit	0.4 VA Max. @ 20 V AC or DC Max.
P		Matte-Tin <sup>6</sup>		
Q	Silver <sup>4,5</sup>	Silver <sup>5</sup>	Power	ETX1 models: 3 amps @ 120 V AC OR 28 V DC All other models: 2 amps @ 120 V AC OR 28 V DC
S		Matte-Tin <sup>6</sup>		
G	Gold over Silver <sup>2,3</sup>	Gold <sup>3</sup>	Low Level / Dry Level Circuit or Power	ETX1 models: 0.4 VA Max. @ 20 V AC OR DC Max. or 3 amps @ 120 V AC OR 28 V DC All other models: 0.4 VA Max. @ 20 V AC OR DC Max. or 2 amps @ 120 V AC OR 28 V DC
R		Matte-Tin <sup>6</sup>		

- Notes:** 1. **Contacts & Terminals:** Copper alloy, with gold plate over nickel plate.  
 2. **End Contacts:** Coin silver, with gold plate over nickel plate.  
 3. **Center Contacts & All Terminals:** Copper alloy, with gold plate over nickel plate.  
 4. **End Contacts:** Coin silver, silver plated.  
 5. **Center Contacts & All Terminals:** Copper alloy, silver plated.  
 6. **Terminals:** Copper alloy, with matte tin alloy nickel plate.

**Notes:** Any models supplied with Q, B, G, P or R contact material are RoHS compliant. All models  us with all options (except M3 actuator) when ordered with G, L, R, or Q contact material except with F1 conductive bushings.

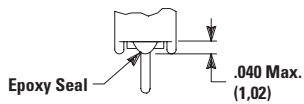
### Available Hardware

#### Cap

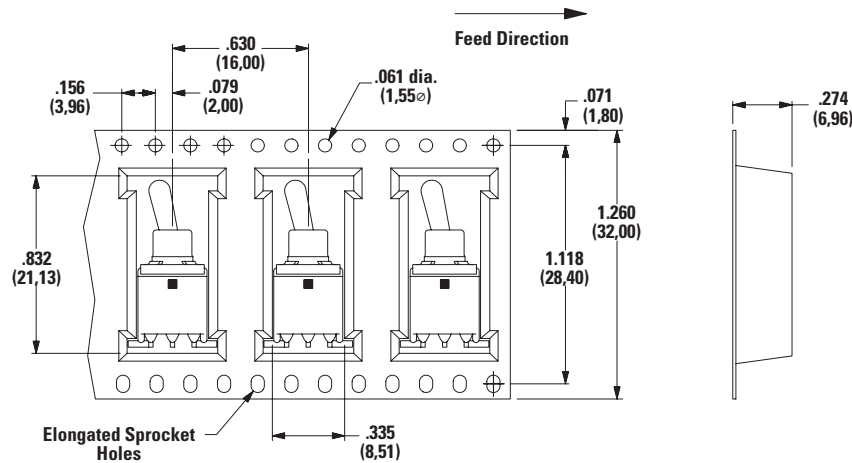


Part No.  
 706201000 White  
 706202000 Black  
 706203000 Red  
 Material: Vinyl  
 Finish: Matte

#### Seal



### Tape & Reel



For part number ET01M3D1SAPE

### Reel Information

Outside Diameter	13.00 (330.0)
Pilot Hole	0.512 (13.0)
Quantity Per Reel	600

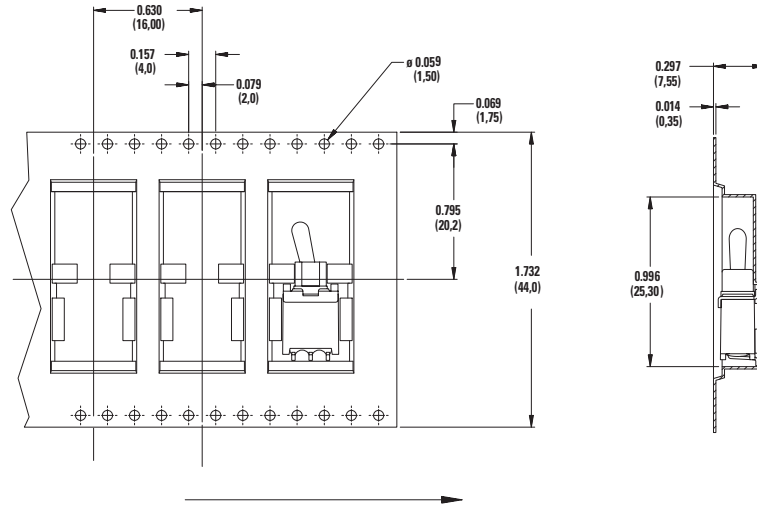


# ET Series

## Sealed Subminiature Toggle Switches



### Tape & Reel



For part number ET01M3D1SA1BE

### Reel Information

Outside Diameter	13.00 (330.0)
Pilot Hole	0.795 (20.20)
Quantity Per Reel	500

**Disclaimer Notice** - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at <http://www.littelfuse.com/disclaimer-electronics>.