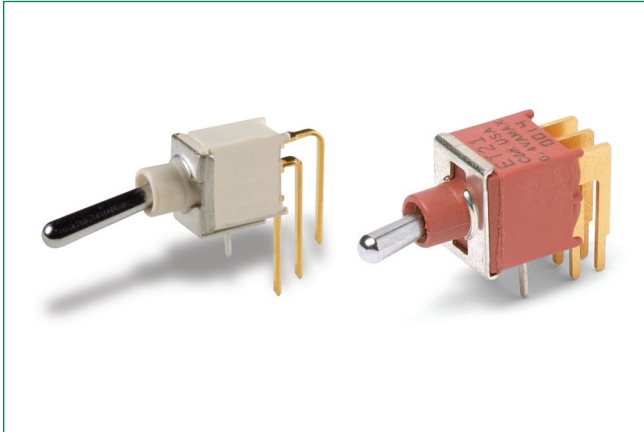


ET Series

Sealed Subminiature Toggle Switches



Agency Approvals

Agency	Agency File Number
US	E42363

Specifications

Contact Rating	B contact material: 0.4 VA max. @ 20 V AC or DC max.
Electrical Life	ETX1 models: 60,000 make-and-break cycles at full load. All other models: 30,000 cycles.
Contact Resistance	Below 20 m Ω typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.
Insulation Resistance	10 ⁹ Ω min.
Electrostatic Discharge ESD Resistant Option	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.
Dielectric Strength	1000 Vrms min. @ sea level.
Operating Temperature	-30°C to 85°C
Solderability	Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).
Degree of Protection	IP57; Protection against harmful dust deposit, full-scale voltage protection, temporary immersion.
Packaging	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

Case & Bushing	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.
Actuator	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.
Switch Support	Brass, tin plated.
Contact & Terminals	B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Copper alloy, silver plated.
Terminal Seal	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

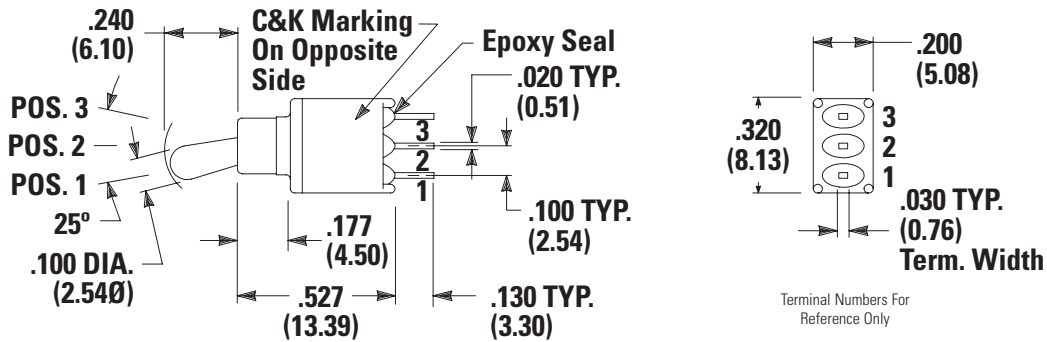
To order, simply select desired option from each category and place in the appropriate box. For additional options not shown in catalog, consult our Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.

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

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



Notes:
Part number shown: ET01MD1CBE

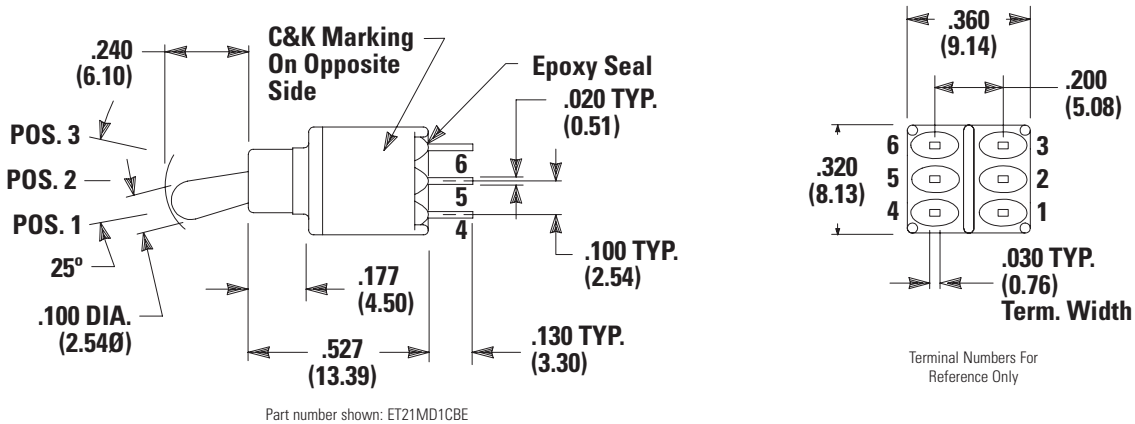
ET Series

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	

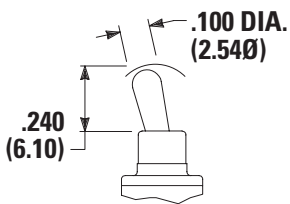


Part number shown: ET21MD1CBE

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.

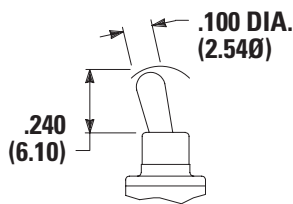
Actuator

M 0.240" High



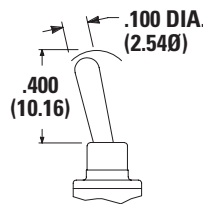
Standard with A, AV, V3 & V31 terminations.

M3 Plastic, Antistatic 0.240" High



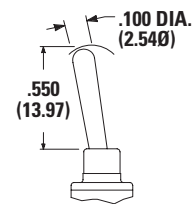
Material: Nylon 4/6 (UL 94V-0), black standard.
 Static resistance: 9,000 V DC min. @ sea level, actuator to terminals. Not available with F1 conductive bushing option. Not UL approved.

S 0.400" High



Standard with C or W terminations.

S1 0.550" High



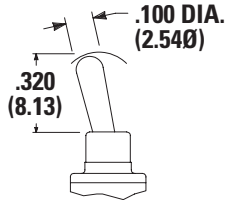
Notes: All actuators have chrome finish (except M3 & S3).

ET Series

Sealed Subminiature Toggle Switches



L 0.320" High

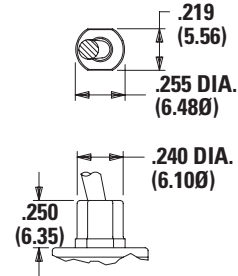


Option Code	L3 Actuator Color
(None)	Black (M3 & S3 only)
1	White (M3 & S3 only)

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

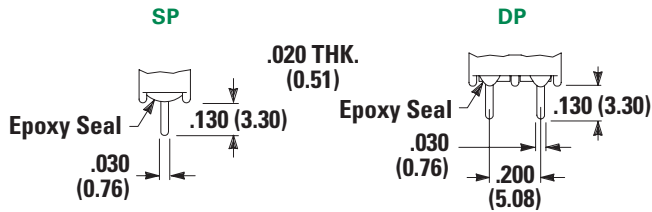


F1 bushing is not UL approved

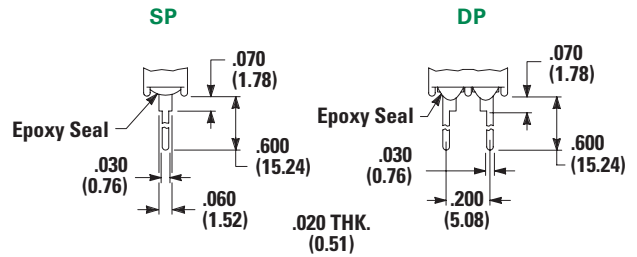
Notes: ESD protection depends on proper grounding of switch support bracket. F1 conductive bushing option is impregnated with carbon fibers; dissipates electrostatic discharge (ESD) up to 20,000 V from actuator to ground. Available with all metal actuator options and A, AV, AV3, V3 and V31 termination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

Terminations

C PC Thru-hole

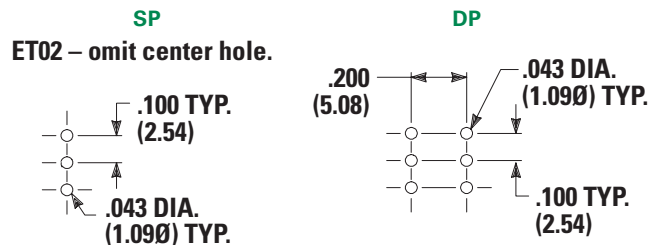


W Wire Wrap



SP and DP Not available with F1 conductive bushing.

PC Mounting



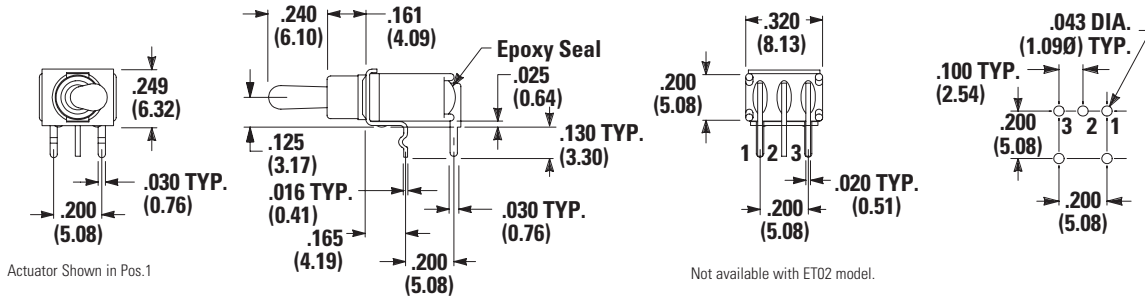
SP and DP Not available with F1 conductive bushing.

ET Series

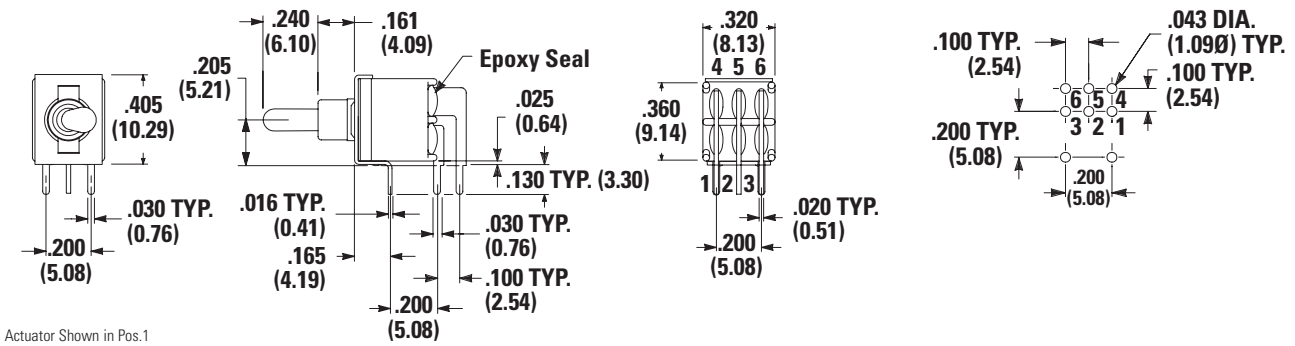
Sealed Subminiature Toggle Switches



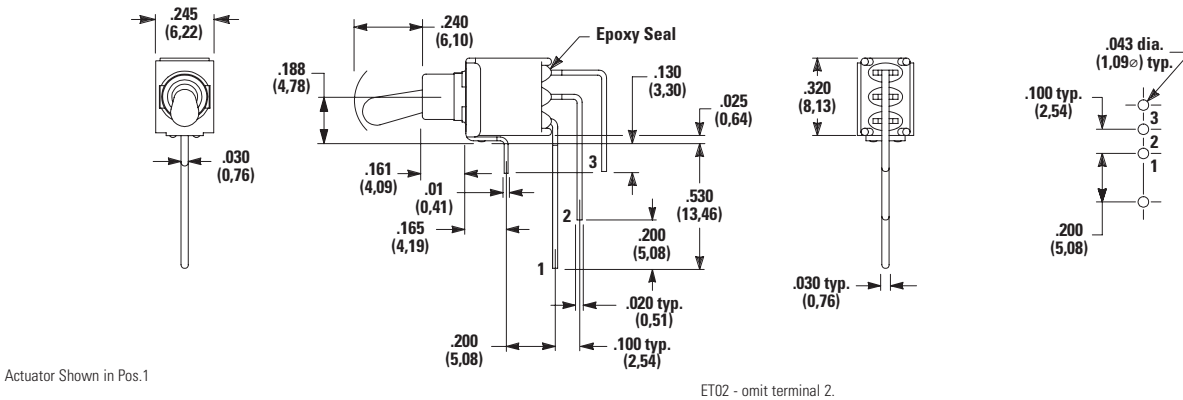
A Right Angle, PC Thru-hole ET01MD1ABE Horizontal Actuation SPDT



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



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



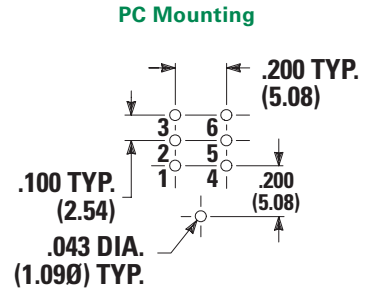
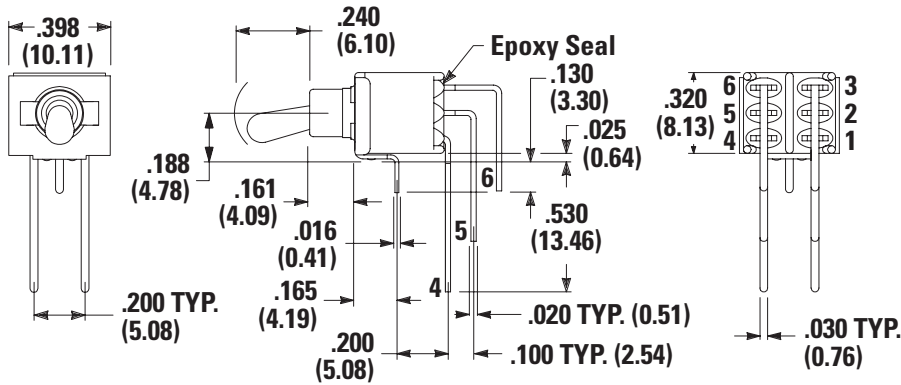
Notes: Terminal bend radii and lead-in manufacturing option.

ET Series

Sealed Subminiature Toggle Switches



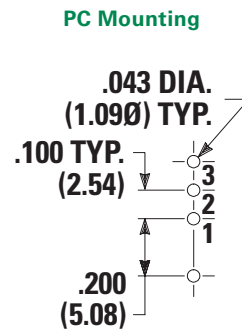
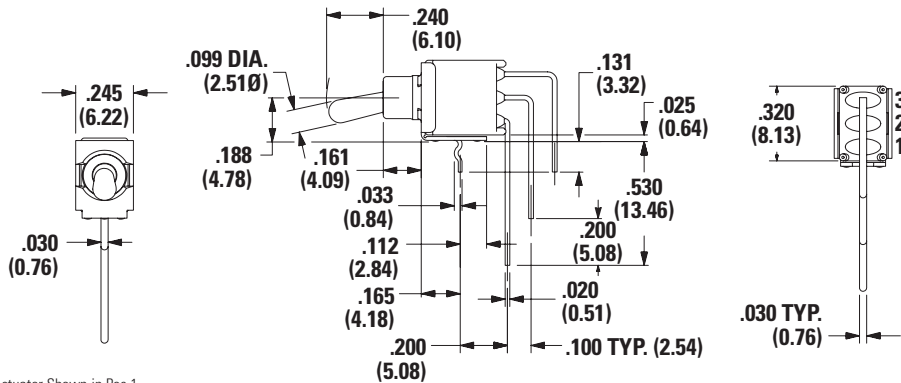
AV Vertical Right Angle, PC Thru-hole ET21MD1AVBE Vertical Actuation DPDT



Actuator Shown in Pos.1

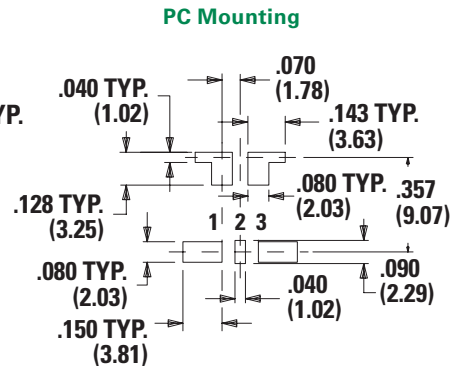
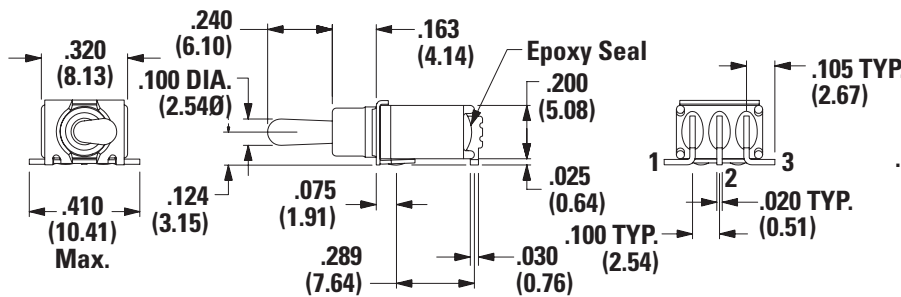
Notes: Terminal bend radii and lead-in manufacturing option.

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

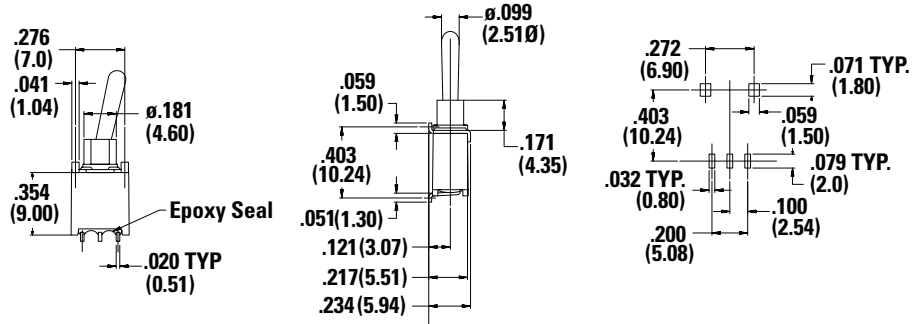
Notes: Not available with S and S1 actuators. Standard with tape & reel packaging.

ET Series

Sealed Subminiature Toggle Switches

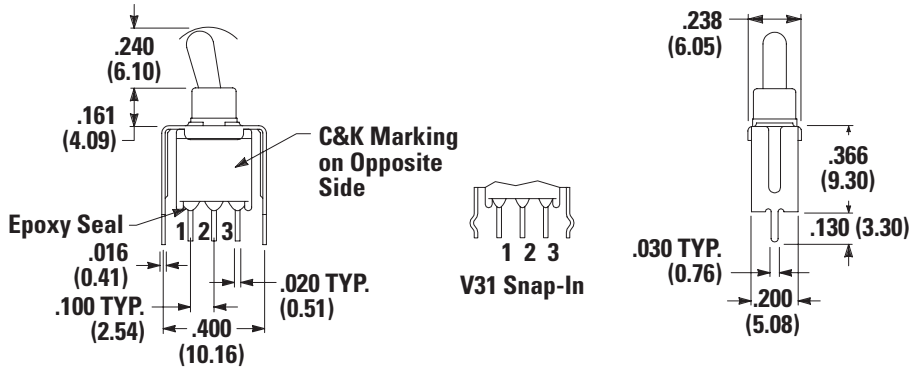


SA1 Right Angle, Surface Mount ET01M3D1SA1BE Horizontal Actuation SPDT Only



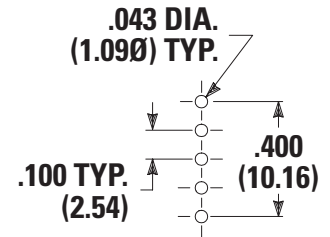
Notes: Not available in ET02. Actuators M and M3, bushing D1, contact material B. Standard with tape and reel packaging.

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

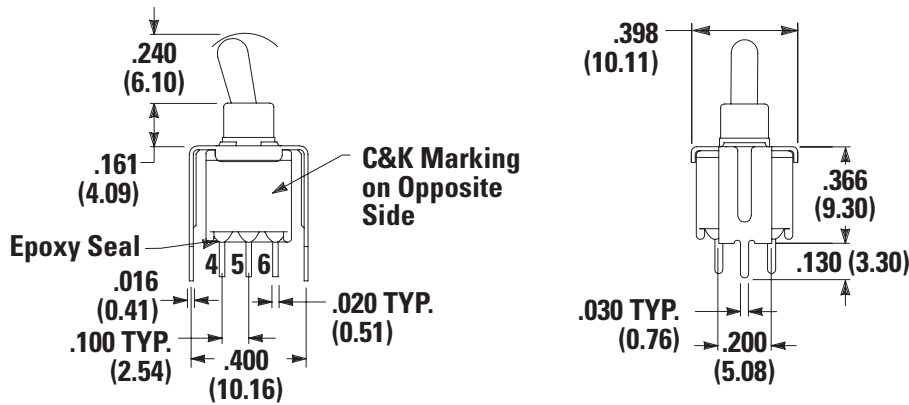


Actuator Shown in Pos.1
ET02 Models: Omit terminal 2

PC Mounting

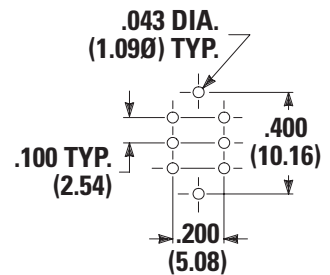


V3 Vertical Mount, V-Bracket ET21MD1V3BE DPDT



Actuator Shown in Pos.1

PC Mounting



ET Series


Sealed Subminiature Toggle Switches



Contact Material

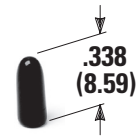
Option Code	Contact Material	Terminal Plating		Ratings
B	Gold ¹	Gold ¹	Low Level / Dry Circuit	0.4 VA Max. @ 20 V AC or DC Max.
P		Matte-Tin ⁶		
Q	Silver ^{4,5}	Silver ⁵	Power	ETX1 models: 3 amps @ 120 V AC OR 28 V DC All other models: 2 amps @ 120 V AC OR 28 V DC
S		Matte-Tin ⁶		
G	Gold over Silver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

- 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.

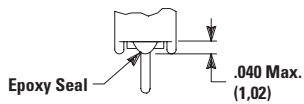
Available Hardware

Cap

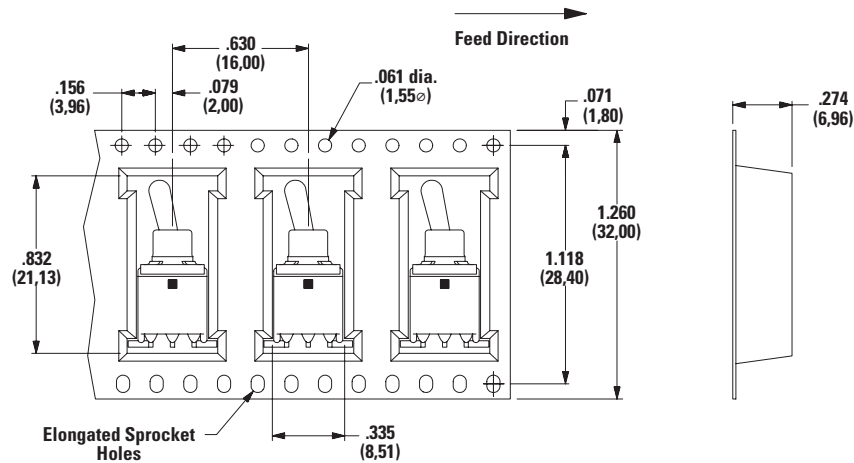


Part No.
 706201000 White
 706202000 Black
 706203000 Red
 Material: Vinyl
 Finish: Matte

Seal



Tape & Reel



For part number ET01M3D1SAPE

Reel Information

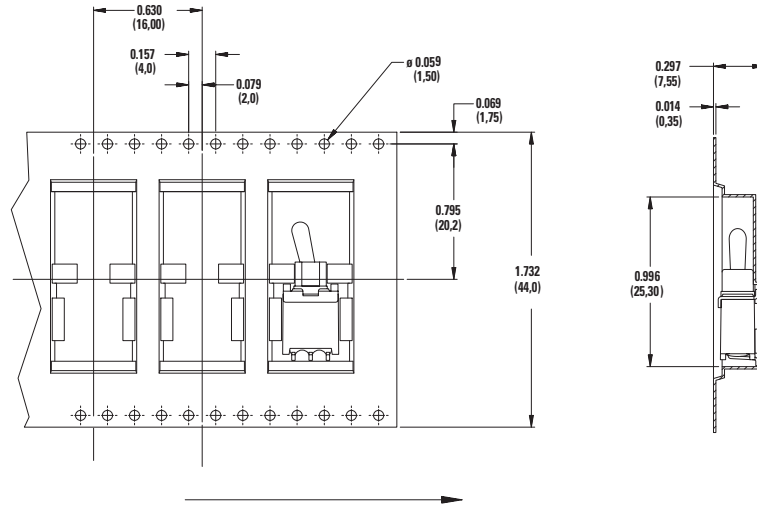
Outside Diameter	13.00 (330.0)
Pilot Hole	0.512 (13.0)
Quantity Per Reel	600

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>.