

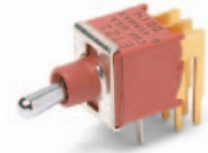
# ET Series Sealed Subminiature Toggle Switches

## 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

## Typical Applications

- Hand-held telecommunications
- Instrumentation
- Medical equipment



## Specifications

CONTACT RATING: B contact material: 0.4 VA max. @ 20 V AC or DC max. See page F-30 for additional ratings.

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<sup>9</sup> 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, see page F-31 for drawings and reel information.

## 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.

CONTACTS & TERMINALS: B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Copper alloy, silver plated. See F-35 for additional contact materials.

TERMINAL SEAL: Epoxy.

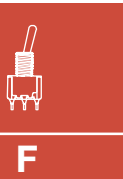
**NOTE:** Any models supplied with Q, B, G, P or R contact material are RoHS compliant and compatible.

**NOTE:** Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

## Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages F-26 thru F-31. 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.

|  |   |   |  |  |  |   |
|--|---|---|--|--|--|---|
| <p><b>Switch Function</b></p> <p><b>ET01</b> SP, On-None-On<br/> <b>ET02</b> SPST, Off-None-On<br/> <b>ET03</b> SP, On-Off-On<br/> <b>ET05</b> SP, Mom.-Off-Mom.<br/> <b>ET07</b> SP, On-Off-Mom.<br/> <b>ET08</b> SP, On-None-Mom.<br/> <b>ET21</b> DP, On-None-On<br/> <b>ET23</b> DP, On-Off-On<br/> <b>ET24</b> DP, On-On-On<br/> <b>ET25</b> DP, Mom.-Off-Mom.<br/> <b>ET27</b> DP, On-Off-Mom.<br/> <b>ET28</b> DP, On-None-Mom.</p> | <p><b>Actuator</b></p> <p><b>M</b> .240" high<br/> <b>M3</b> Plastic, anti-static, .240" high<br/> <b>S</b> .400" high<br/> <b>L</b> .320" high<br/> <b>S1</b> .540" high</p> | <p><b>Bushing</b></p> <p><b>D1</b> .177" High, Unthreaded<br/> <b>F1</b> .177" high, unthreaded, ESD conductive</p> | <p><b>Terminations</b></p> <p><b>A</b> Right angle, PC thru-hole<br/> <b>AV</b> Vertical right angle, PC thru-hole<br/> <b>C</b> PC Thru-hole<br/> <b>SA</b> Right angle, surface mount<br/> <b>SA1</b> Right angle, surface mount rear-facing<br/> <b>V3</b> Vertical mount, V-bracket<br/> <b>AV3</b> Vertical right angle, snap-in, PC thru-hole<br/> <b>V31</b> Vertical mount, V-bracket, snap-in<br/> <b>W</b> Wire wrap</p> | <p><b>Contact Material</b></p> <p><b>B</b> Gold<br/> <b>P</b> Gold, matte tin<br/> <b>Q</b> Silver<br/> <b>S</b> Silver/matte-tin<br/> <b>G</b> Gold over silver<br/> <b>R</b> Gold over silver, matte-tin</p> | <p><b>Seal</b></p> <p><b>E</b> Epoxy</p> | <p><b>Plastic Actuator Color</b></p> <p><b>NONE</b> No actuator color<br/> <b>2</b> Black<br/> <b>1</b> White</p> |
|--|---|---|--|--|--|---|



**Toggle**



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# ET Series Sealed Subminiature Toggle Switches

## SWITCH FUNCTION

| NO. POLES   | MODEL NO.     | SWITCH FUNCTION |            |            | CONNECTED TERMINALS |            |            | SCHEMATIC |
|---|---------------|-----------------|------------|------------|---------------------|------------|------------|-----------|
|   |               | POS. 1<br>      | POS. 2<br> | POS. 3<br> | POS. 1<br>          | POS. 2<br> | POS. 3<br> |           |
| SP  | <b>ET01</b>   | ON              | NONE       | ON         | 2-3                 | N/A        | 2-1        |           |
|   | <b>ET03</b>   | ON              | OFF        | ON         | 2-3                 | OPEN       | 2-1        |           |
|   | <b>ET05</b>   | MOM.            | OFF        | MOM.       |                     |            |            |           |
|   | <b>ET07</b>   | ON              | OFF        | MOM.       |                     |            |            |           |
|   | <b>ET08</b>   | ON              | NONE       | MOM.       | 2-3                 | N/A        | 2-1        |           |
|   | <b>ET02</b>   | OFF             | NONE       | ON         | OPEN                | N/A        | 3-1        |           |
| <p><b>SPDT</b></p> <p>Part number shown: ET01MD1CBE      ET02 Models: Omit terminal 2</p> |               |                 |            |            |                     |            |            |           |
| DP  | <b>ET21</b>   | ON              | NONE       | ON         | 2-3,5-6             | N/A        | 2-1,5-4    |           |
|   | <b>ET23</b>   | ON              | OFF        | ON         | 2-3,5-6             | OPEN       | 2-1,5-4    |           |
|   | <b>ET25</b>   | MOM.            | OFF        | MOM.       |                     |            |            |           |
|   | <b>ET27</b>   | ON              | OFF        | MOM.       |                     |            |            |           |
|   | <b>ET28</b>   | ON              | NONE       | MOM.       | 2-3,5-6             | N/A        | 2-1,5-4    |           |
|   | <b>ET24**</b> | ON              | ON         | ON         | 2-3,5-6             | 2-3,5-4    | 2-1,5-4    | DPDT      |
| <p><b>DPDT</b></p> <p>Part number shown: ET21MD1CBE</p>                                   |               |                 |            |            |                     |            |            |           |

MOM. = Momentary

\*\* Wiring for 3-way switch, see Section N.

All models with all options (except M3 actuator) when ordered with G, L, R or Q contact material except with F1 conductive bushing.



F

Toggle

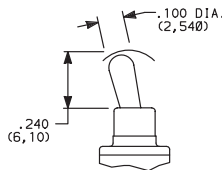


Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

# ET Series Sealed Subminiature Toggle Switches

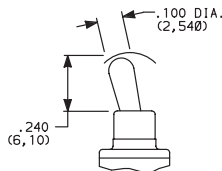
## ACTUATOR

**M** .240" HIGH



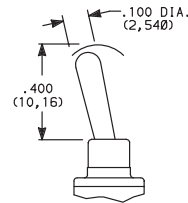
Standard with A, AV, V3 & V31 terminations.

**M3** PLASTIC, ANTISTATIC,  
.240" HIGH



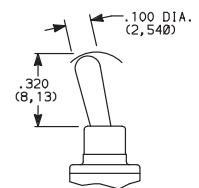
Material: Nylon 4/6 (UL 94V-0), black standard.  
Static resistance: 9,000 V DC min. @ sea level,  
actuator to terminals. Not available with F1  
conductive bushing option. Not UL approved.

**S** .400" HIGH

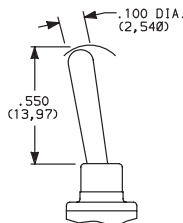


Standard with C or W terminations.

**L** .320" HIGH



**S1** .540" HIGH



| OPTION CODE | PLASTIC ACTUATOR COLOR |
|-------------|------------------------|
| (NONE)      | BLACK (M3 & S3 only)   |
| 1           | WHITE (M3 & S3 only)   |

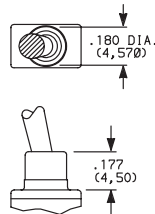
**NOTE:** All actuators have chrome finish (except M3 & S3).

## BUSHING

**D1** .177" HIGH, UNTHREADED

**F1** ESD, CONDUCTIVE BUSHING  
UNTHREADED, .177" HIGH

F1 bushing is not UL approved



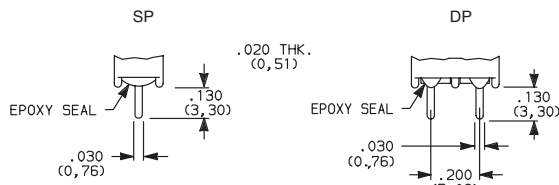
**NOTE:** ESD protection depends on proper grounding of switch support bracket. F1 conductive bushing is impregnated with carbon fibers; dissipates electrostatic discharge (ESD) up to 20,000 V from actuator to ground.

Available with all metal actuator options and A, AV, AV3, V3 and V31 termination options only.

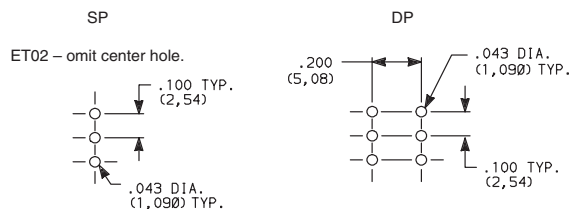
Internal actuator o-ring seal standard.

## TERMINATIONS

**C** PC THRU-HOLE



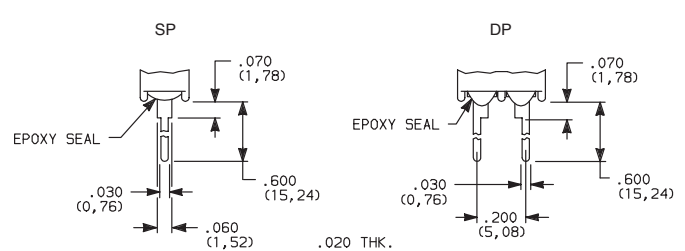
PC MOUNTING



SP and DP

Not available with F1 conductive bushing.

**W** WIRE WRAP



SP and DP

Not available with F1 conductive bushing.



Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



F

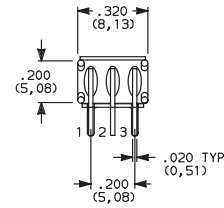
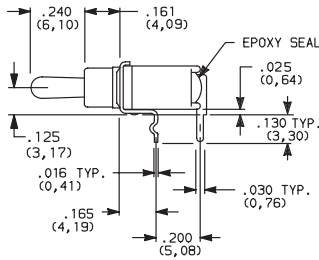
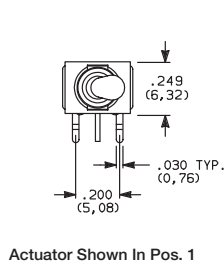
Toggle

# ET Series Sealed Subminiature Toggle Switches

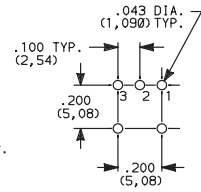
## TERMINATIONS

**A** RIGHT ANGLE, PC THRU-HOLE

**ET01MD1ABE**  
Horizontal Actuation  
**SPDT**

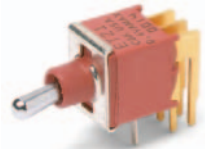


**PC MOUNTING**

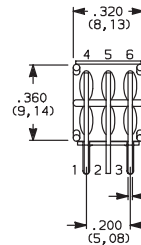
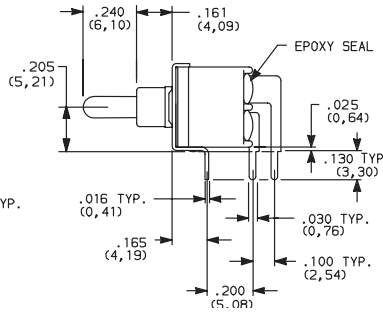
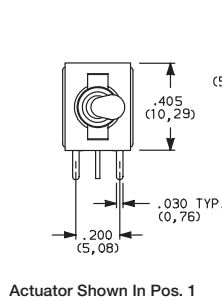


Not available with ET02 model.

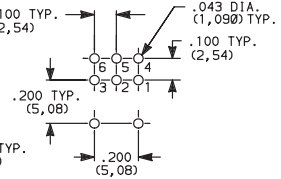
**A** RIGHT ANGLE, PC THRU-HOLE



**ET21MD1ABE**  
Horizontal Actuation  
**DPDT**



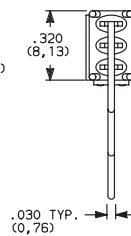
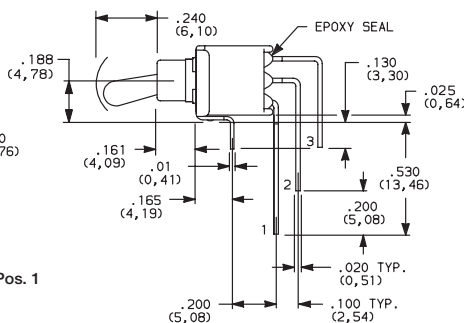
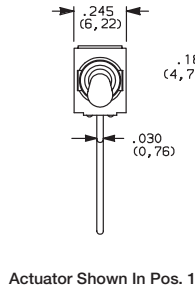
**PC MOUNTING**



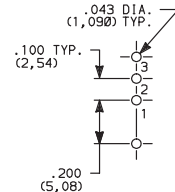
**AV** VERTICAL RIGHT ANGLE, PC THRU-HOLE



**ET01MD1AVBE**  
Vertical Actuation  
**SPDT**



**PC MOUNTING**



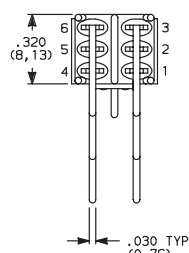
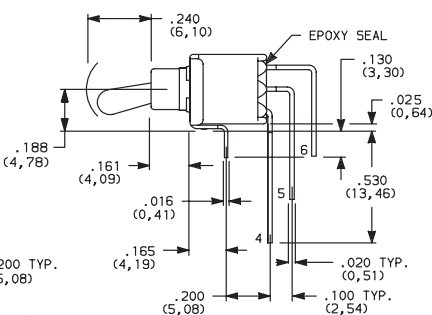
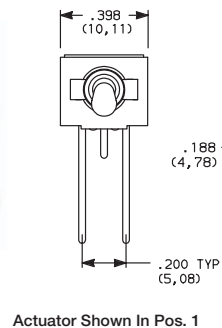
ET02 - omit terminal 2.

**NOTE:** Terminal bend radii and lead-in manufacturing option.

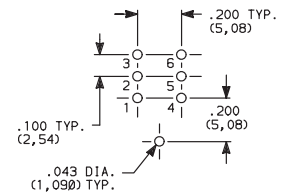
**AV** VERTICAL RIGHT ANGLE, PC THRU-HOLE



**ET21MD1AVBE**  
Vertical Actuation  
**DPDT**



**PC MOUNTING**



**NOTE:** Terminal bend radii and lead-in manufacturing option.

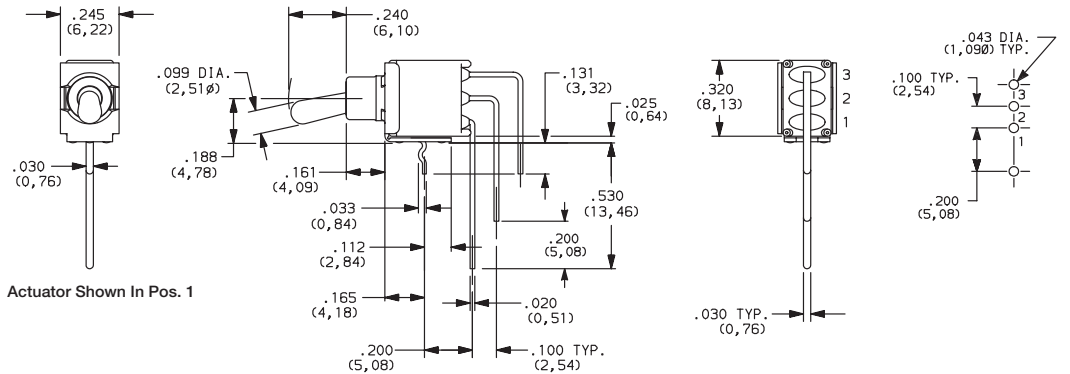


Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

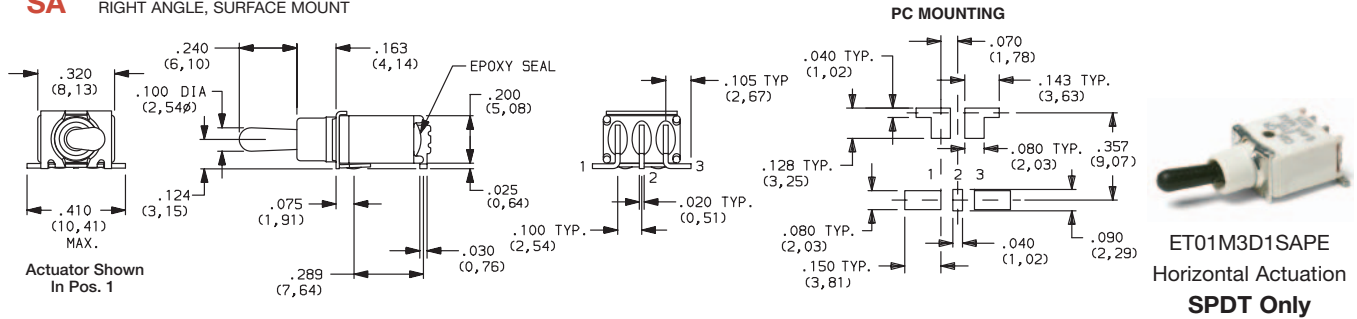
# ET Series Sealed Subminiature Toggle Switches

## TERMINATIONS

### AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE

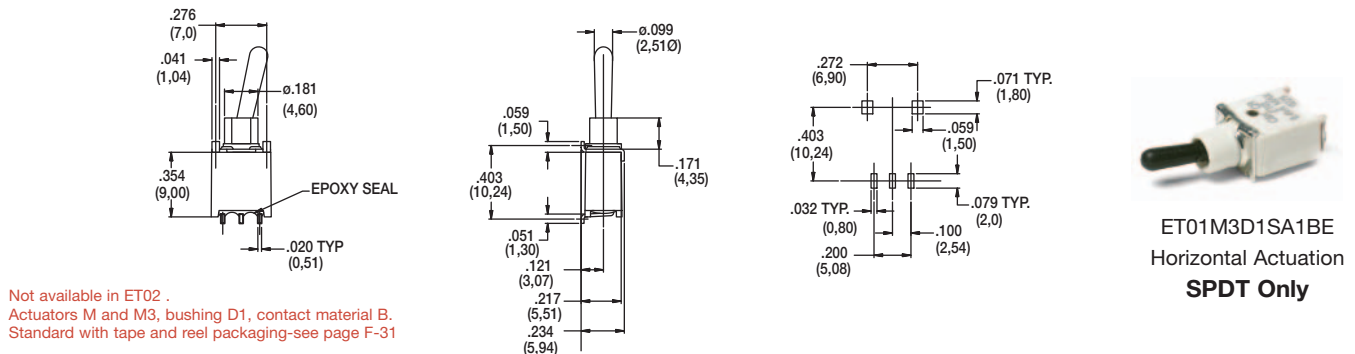


### SA RIGHT ANGLE, SURFACE MOUNT



Not available with S and S1 actuators. Standard with tape & reel packaging. See page F-31.

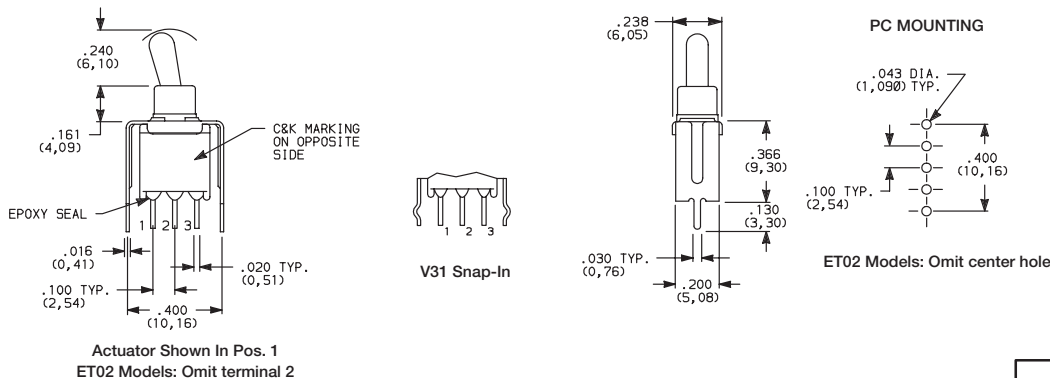
### SA1 RIGHT ANGLE, SURFACE MOUNT



Not available in ET02.  
Actuators M and M3, bushing D1, contact material B.  
Standard with tape and reel packaging-see page F-31

### V3 VERTICAL MOUNT, V-BRACKET

### V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN



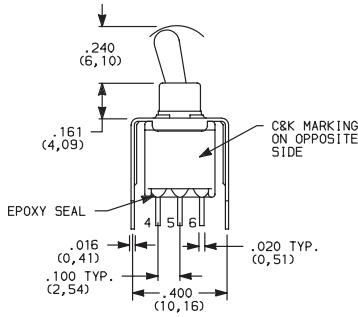
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



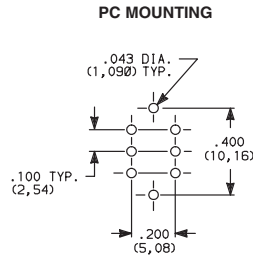
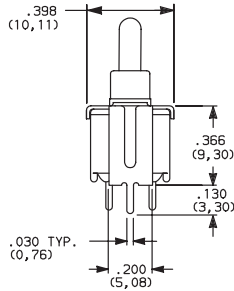
# ET Series Sealed Subminiature Toggle Switches

## TERMINATIONS

### V3 VERTICAL MOUNT, V-BRACKET



Actuator Shown In Pos. 1



ET21MD1V3BE  
DPDT

## 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:<br>3 AMPS @ 120 V AC OR 28 V DC<br>ALL OTHER MODELS:<br>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 CIRCUIT OR POWER | ETX1 MODELS:<br>0.4 VA MAX. @ 20 V AC OR DC MAX. OR 3 AMPS @ 120 V AC OR 28 V DC<br>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> |                                |  |

\* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

<sup>1</sup> CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>2</sup> END CONTACTS: Coin silver, with gold plate over nickel plate.


<sup>3</sup> CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

<sup>4</sup> END CONTACTS: Coin silver, silver plated.

<sup>5</sup> CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.

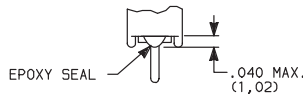
<sup>6</sup> TERMINALS: Copper alloy, with matte tin over nickel plate.

**NOTE:** Any models supplied with Q, B, G, P or R contact material are RoHS compliant.

All models  with all options (except M3 actuator) when ordered with G, L, R or Q contact material except with F1 conductive bushing.

## SEAL

### E EPOXY SEAL

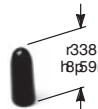


## AVAILABLE HARDWARE

### Cap

**PART NO.**  
706201000 WHITE  
706202000 BLACK  
706203000 RED

Material: Vinyl  
Finish: Matte



**NOTE:** Other colors available, consult Customer Service Center.



Third Angle  
Projection

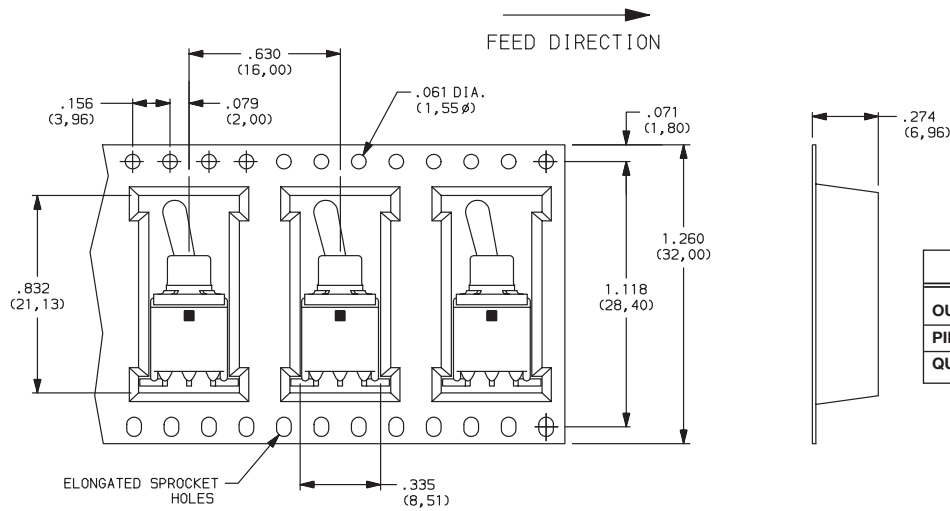
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www.ck-components.com

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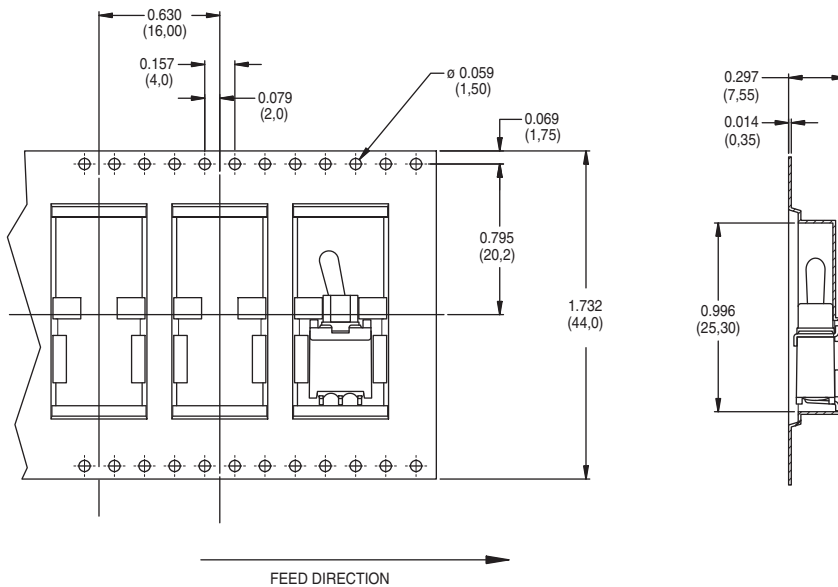
## TAPE & REEL

For part number ET01M3D1SAKE



| REEL INFORMATION  |               |
|-------------------|---------------|
| OUTSIDE DIAMETER  | 13.00 (330,0) |
| PILOT HOLE        | .512 (13,0)   |
| QUANTITY PER REEL | 600           |

For part number ET01M3D1SA1BE



| REEL INFORMATION  |               |
|-------------------|---------------|
| OUTSIDE DIAMETER  | 13.00 (330,0) |
| PILOT HOLE        | .795 (20,20)  |
| QUANTITY PER REEL | 500           |

