

# ET Series Sealed Subminiature Toggle Switches

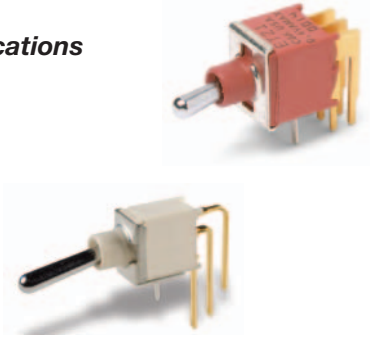
## Features/Benefits

- 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-35 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  $\Omega$  typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10<sup>9</sup>  $\Omega$  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.

### Switch Function

**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  
**ET24** DP, On-On-On  
**ET25** DP, Mom.-Off-Mom.  
**ET27** DP, On-Off-Mom.  
**ET28** DP, On-None-Mom.

### Actuator

**M** .240" high  
**M3** Plastic, anti-static, .240" high  
**S** .400" high  
**L** .320" high  
**S1** .540" high

### Bushing

**D1** .177" High, Unthreaded  
**F1** .177" high, unthreaded, ESD conductive

### Terminations

**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

### Contact Material

**B** Gold  
**P** Gold, matte tin  
**Q** Silver  
**S** Silver/matte-tin  
**G** Gold over silver  
**R** Gold over silver, matte-tin

### Seal

**E** Epoxy

### Plastic Actuator Color

**NONE** No actuator color  
**2** Black  
**1** White

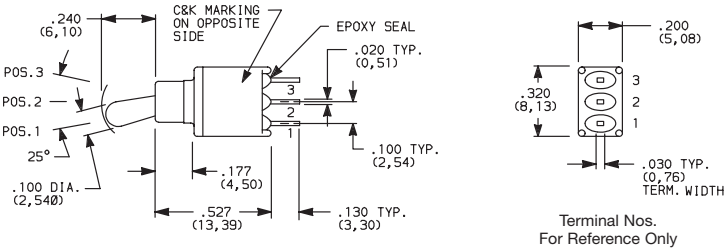


ET Series  
Sealed Subminiature Toggle Switches

SWITCH FUNCTION

| 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 |        |        | C&K marking on opposite side |        |        |           |
| SP        | ET01      | ON                           | NONE   | ON     | 2-3                          | N/A    | 2-1    |           |
|           | ET03      | ON                           | OFF    | ON     |                              |        |        |           |
|           | ET05      | MOM.                         | OFF    | MOM.   | 2-3                          | OPEN   | 2-1    |           |
|           | ET07      | ON                           | OFF    | MOM.   |                              |        |        |           |
|           | ET08      | ON                           | NONE   | MOM.   | 2-3                          | N/A    | 2-1    |           |
|           | ET02      | OFF                          | NONE   | ON     | OPEN                         | N/A    | 3-1    | SPST      |

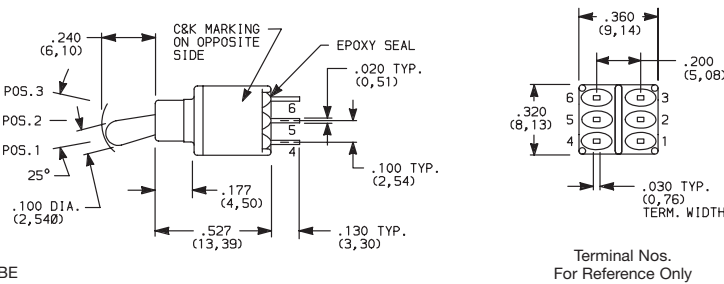
SPDT



Part number shown: ET01MD1CBE ET02 Models: Omit terminal 2

|    |        |      |      |      |         |         |         |      |
|----|--------|------|------|------|---------|---------|---------|------|
| DP | ET21   | ON   | NONE | ON   | 2-3,5-6 | N/A     | 2-1,5-4 |      |
|    | ET23   | ON   | OFF  | ON   |         |         |         |      |
|    | ET25   | MOM. | OFF  | MOM. | 2-3,5-6 | OPEN    | 2-1,5-4 |      |
|    | ET27   | ON   | OFF  | MOM. |         |         |         |      |
|    | ET28   | ON   | NONE | MOM. | 2-3,5-6 | N/A     | 2-1,5-4 |      |
|    | ET24** | ON   | ON   | ON   | 2-3,5-6 | 2-3,5-4 | 2-1,5-4 | DPDT |

DPDT



Part number shown: ET21MD1CBE

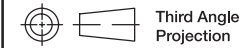
MOM. = Momentary

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

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



Toggle

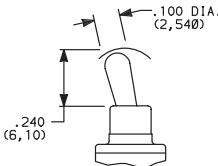


Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change

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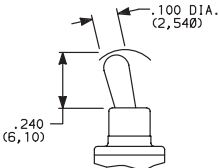
## ACTUATOR ACTUATOR COLOR

**M** .240" HIGH



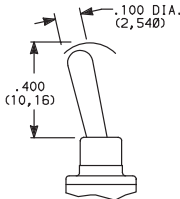
Standard with A, AV, V3 & V31 terminations.

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



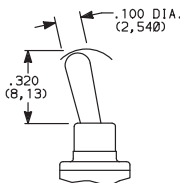
Material: Nylon 4/6 (UL 94V-0), black standard.  
Static resistance: 9,000 V DC min. @ sea level,  
actuator to terminals. Not available with F1  
conductive bushing option. Not UL approved.

**S** .400" HIGH

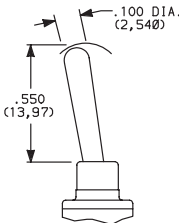


Standard with C or W terminations.

**L** .320" HIGH



**S1** .540" HIGH



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

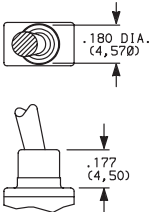
**NOTE:** All actuators have chrome finish (except M3 & S3 ).

## BUSHING

**D1** .177" HIGH, UNTHREADED

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

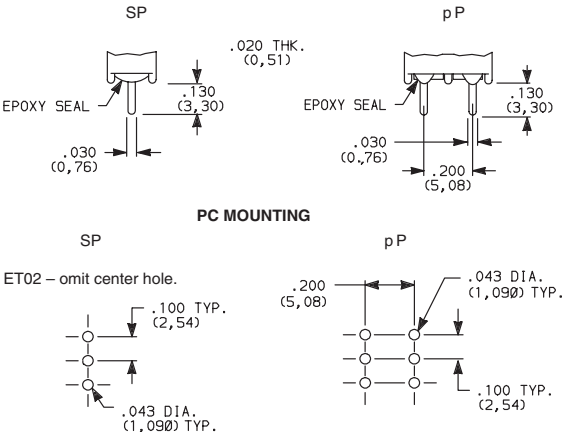
F1 bushing is not UL/CSA approved



**NOTE:** 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.

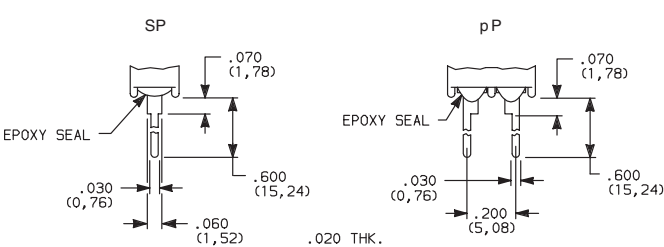
## TERMINATIONS

**C** PC THRU-HOLE



SP and DP

**W** WIRE WRAP



SP and DP



Third Angle  
Projection

Not available with F1 conductive bushing.

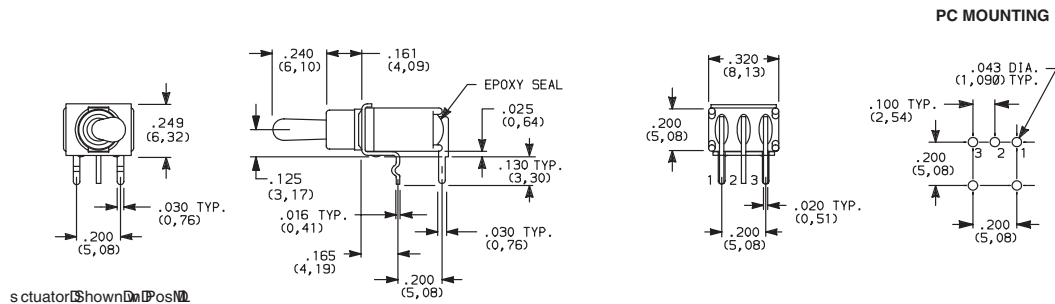


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## TERMINATIONS

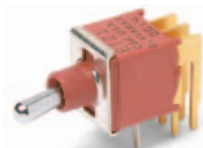
**A** RIGHT ANGLE, PC THRU-HOLE

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

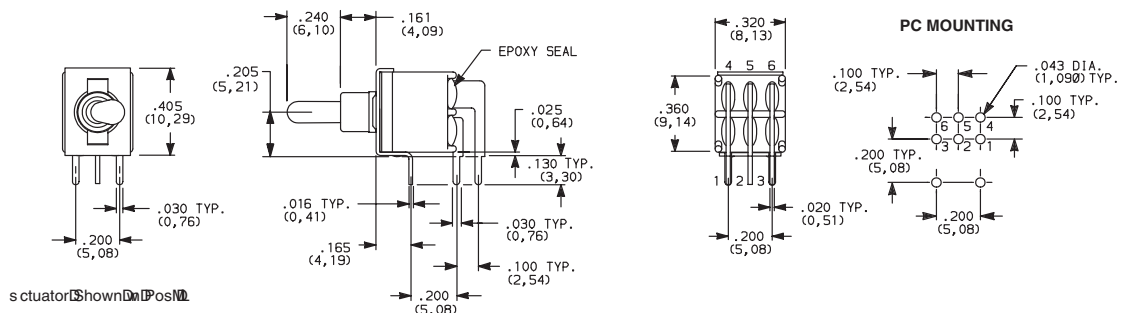


Not available with ET02 model.

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



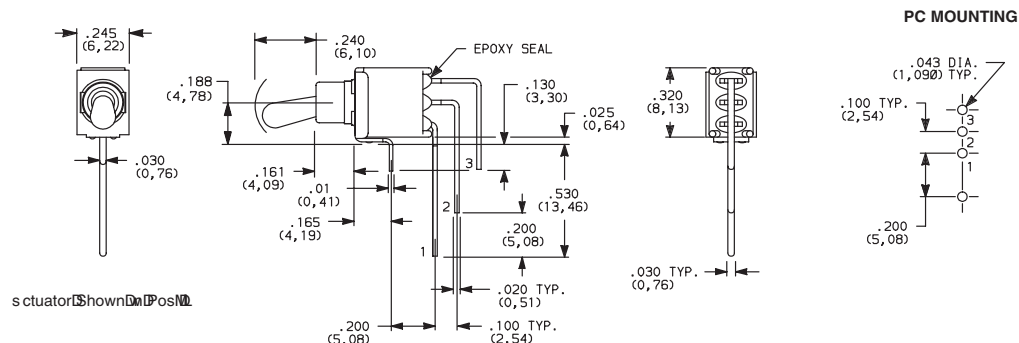
**ET21MD1ABE**  
Horizontal Actuation  
**DPDT**



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



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



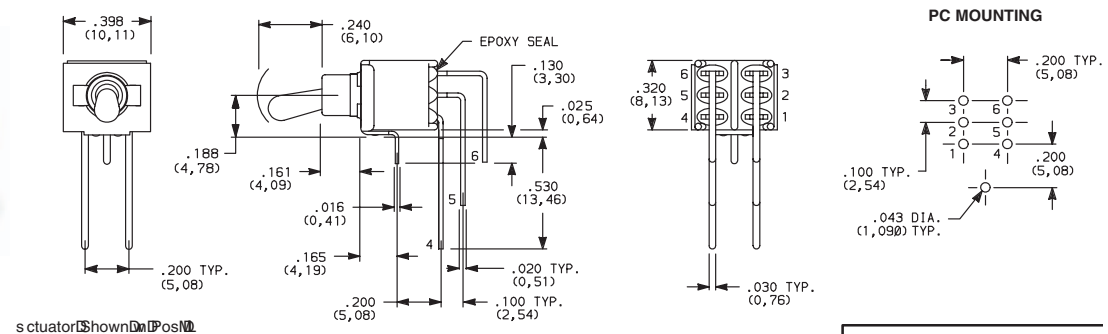
ET02 - omit terminal 2.

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

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



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



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



Third Angle Projection

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

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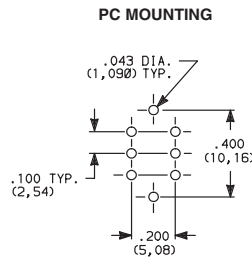
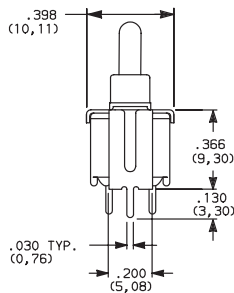
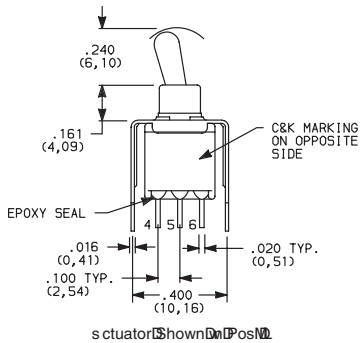
## Toggle

# ET Series

## Sealed Subminiature Toggle Switches

### TERMINATIONS

**V3** VERTICAL MOUNT, V-BRACKET



### CONTACT MATERIAL

| OPTION CODE | CONTACT MATERIAL                | TERMINAL PLATING       | RATINGS                        |                                                                                                                                                                        |
|-------------|---------------------------------|------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>B</b>    | GOLD <sup>1</sup>               | GOLD <sup>1</sup>      | LOW LEVEL/DRY CIRCUIT          | 0.4 VA MAX. @ 20 V AC OR DC MAX.                                                                                                                                       |
| <b>P</b>    |                                 | MATTE-TIN <sup>6</sup> |                                |                                                                                                                                                                        |
| <b>Q</b>    | 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                                                                      |
| <b>S</b>    |                                 | MATTE-TIN <sup>6</sup> |                                |                                                                                                                                                                        |
| <b>G</b>    | 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 |
| <b>R</b>    |                                 | 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.

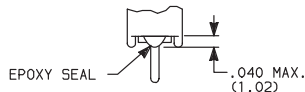
<sup>6</sup> TERMINALS: Copper alloy, with matte tin over nickel plate.

**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

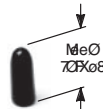


### AVAILABLE HARDWARE

Cap

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

Material: Vinyl  
Finish: Matte



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



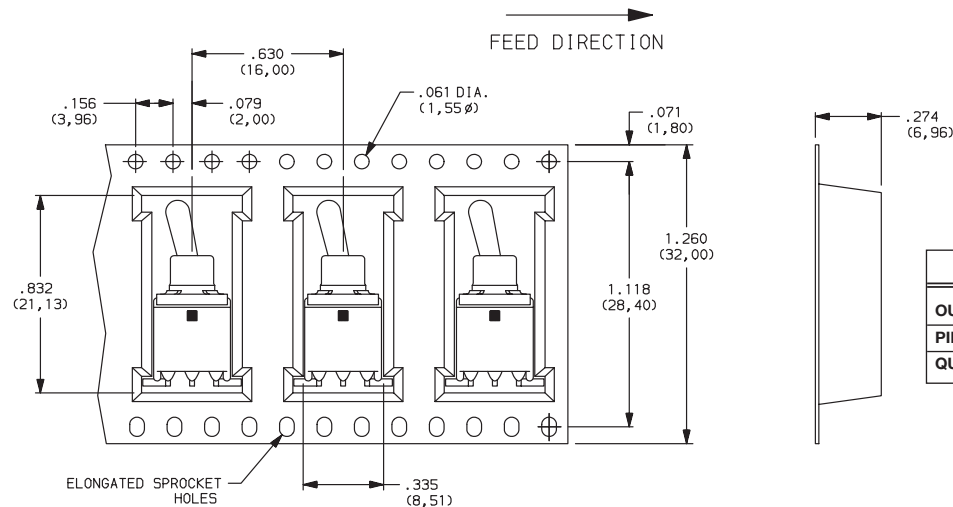
Dimensions are shown: Inches (mm)  
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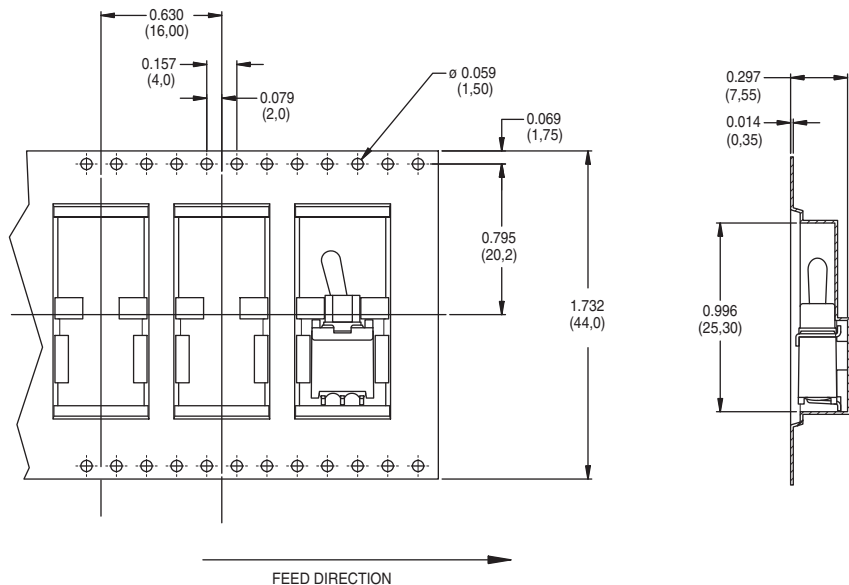
## TAPE & REEL

For part number ET01M3D1SAKE

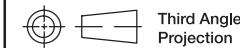


| REEL INFORMATION  |               |
|-------------------|---------------|
| OUTSIDE DIAMETER  | 13.00 (330,0) |
| PILOT HOLE        | .512 (13,0)   |
| QUANTITY PER REEL | 600           |

For part number ET01M3D1SA1BE

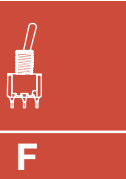


| REEL INFORMATION  |               |
|-------------------|---------------|
| OUTSIDE DIAMETER  | 13.00 (330,0) |
| PILOT HOLE        | .795 (20,20)  |
| QUANTITY PER REEL | 500           |



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

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Toggle