# EP Series
# Sealed Tiny Pushbutton Switches

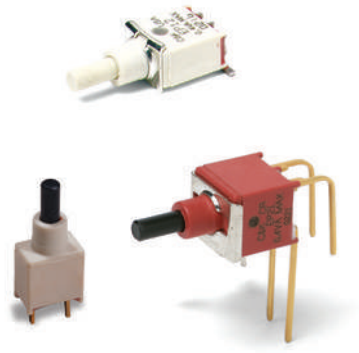
## Features/Benefits

- *Sealed against solder & cleaning processes*
- *Thru-hole and surface mount models*
- *Snap-fitting actuator accepts standard caps*
- *Tape & reel packaging available*
- *RoHS compliant models available*

c UL us
Models Available

## Typical Applications

- *Telecommunications and networking equipment*
- *Computers and peripherals*
- *Instrumentation and controls*



## Specifications

CONTACT RATING: B contact material: 0.4 VA max. @ 20 V AC or DC max. See page A-13 for additional ratings.

ELECTRICAL LIFE: EP11, EP21 models: 60,000 make-and-break cycles at full load. EP12 models: 30,000 cycles.

CONTACT RESISTANCE: Below 20 mΩ9 typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9$ Ω9 min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°9C to 859°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 standard in anti-static tape and reel packaging per EIA 481-3, see page A-14 for drawings and reel information. Tape and cover strip are conductive for use near statically sensitive components, consult Customer Service Center.

## Materials

CASE & BUSHING: High temperature material, glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0) on EP11 / EP12 models; glass filled nylon 6/6 on EP21.

PLUNGER: Thermoplastic polyester or glass filled nylon (UL 94V-0), with internal o-ring seal. SA surface mount: High temperature material, glass filled LCP (UL 94V-0).

SWITCH SUPPORT: Brass, matte-tin plated.

CONTACTS & TERMINALS: B contact material: Copper alloy, with gold plate over nickel plate. See page A-13 for additional contact materials.

TERMINAL SEAL: Epoxy.

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

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

CAUTION: PC mounting layouts and pads as shown are designed to be compatible with the latest equipment and reflow techniques. Care should be taken in the design and location of PC lands to suit individual needs. Orientation relative to reflow direction may significantly impact solder joint integrity.

## 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 A-10 thru A-14. For additional options not shown in catalog, consult Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.



**Switch Function**
**EP11** SPST Off-Mom.
**EP12** SPDT On-Mom.
**EP21** DPST Off-Mom.

**Plunger**
**S** .215" high
**S1** .110" high
**S2** .465" high
**FP** Flush
**R** Snap-fitting, .215 high (not available with **EP12** version)

**Bushing**
**D1** Unthreaded

**Terminations**
**A** Right angle, PC thru-hole
**C** PC Thru-hole
**AV** Vertical right angle, PC thru-hole
**AV3** Vertical right angle, snap-in, PC thru-hole
**SA** Right angle, surface mount
**SA1** Right angle, surface mount rear facing
**V3** Vertical mount, v-bracket
**V31** Vertical mount, v-bracket, snap-in (EP11 & EP12 only)
**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

# EP Series
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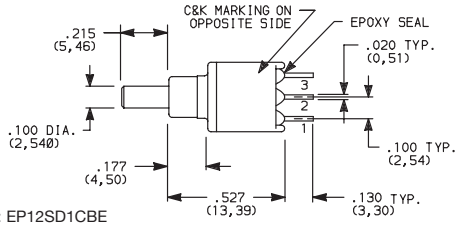
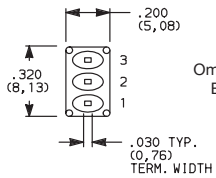
## SWITCH FUNCTION

| NO. POLES | MODEL NO. | SWITCH FUNCTION POS. 1 (C&K marking on opposite side) | SWITCH FUNCTION POS. 2 (C&K marking on opposite side) | CONNECTED TERMINALS POS. 1 (C&K marking on opposite side) | CONNECTED TERMINALS POS. 2 (C&K marking on opposite side) | SCHEMATIC |
|---|---|---|---|---|---|---|
| SP | EP11 | OFF | MOM. | OPEN | 1-3 | SPST 1 3 |
| | EP12 | ON | MOM. | 2-1 | 2-3 | SPDT NC 1, 2 (COMM), 3 NO |

### SPDT



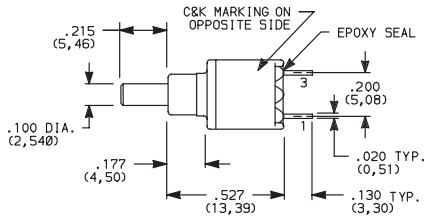

Omit terminal 2 for EP11 models.

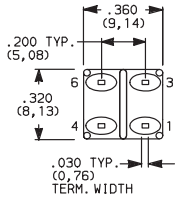
Terminal Nos. For Reference Only

Part number shown: EP12SD1CBE

| | | | | | | |
|---|---|---|---|---|---|---|
| DP | EP21 | OFF | MOM. | OPEN | 1-3,4-6 | DPST 1 3 4 6 |

### DPST




Terminal Nos. For Reference Only

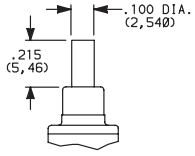
Part number shown: EP21SD1CBE

MOM. = Momentary

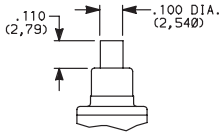
All models cULus with all options when ordered with G, Q, R or S contact material.

## PLUNGER

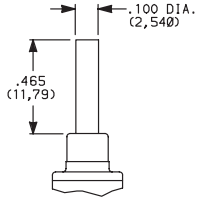
**S** .215" HIGH




**S1** .110" HIGH

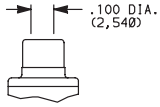



**S2** .465" HIGH

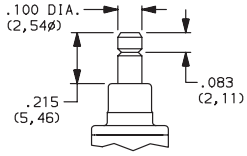



S1& S2 actuators are not available with EP12 & EP21 models.

**FP** FLUSH PLUNGER




**R** SNAP-FITTING

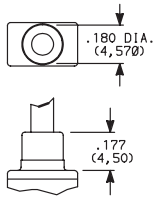



FP & R actuators are not available with EP21 model.
R actuators are not available with EP12 model.

NOTE: Caps available for plunger options, see page A-14.

## BUSHING

**D1** UNTHREADED



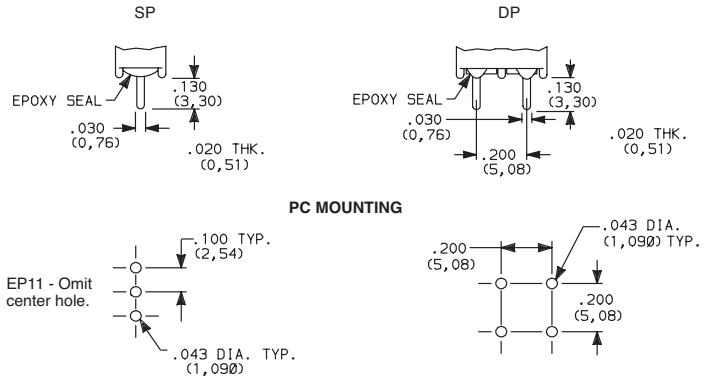

NOTE: Internal actuator o-ring standard.

Third Angle Projection

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

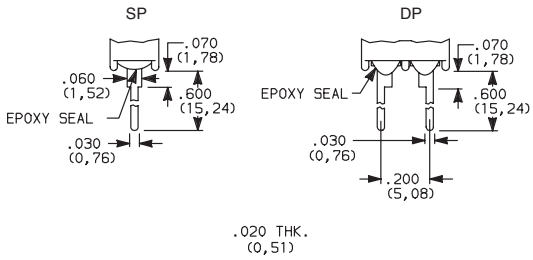
## TERMINATIONS

### C PC THRU-HOLE



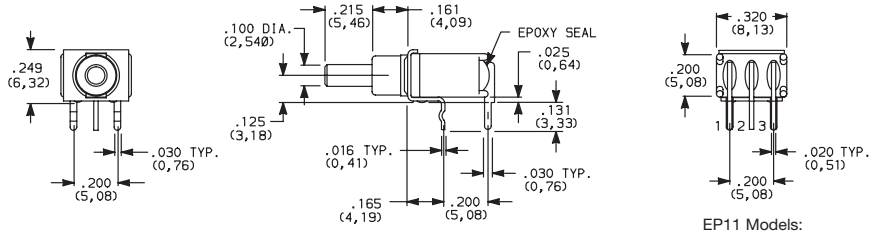

**SP and DP**

### W WIRE WRAP



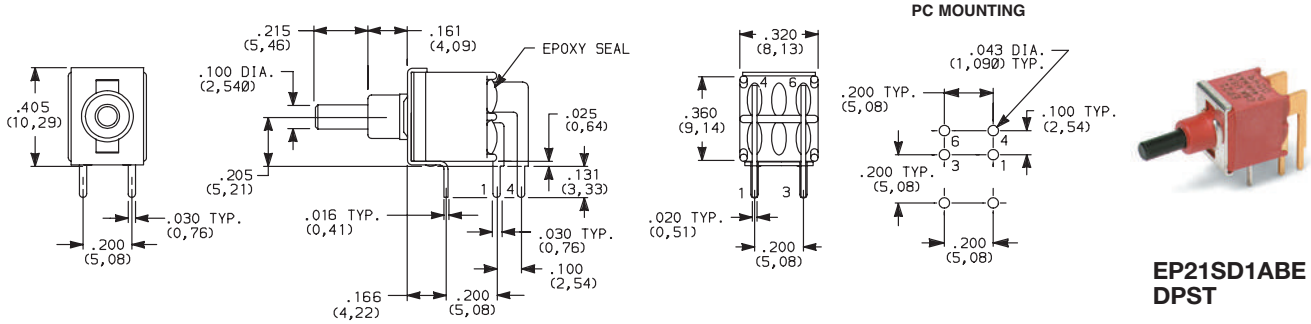

**SP and DP**

### A RIGHT ANGLE, PC THRU-HOLE




**EP12SD1ABE**
**SPDT**

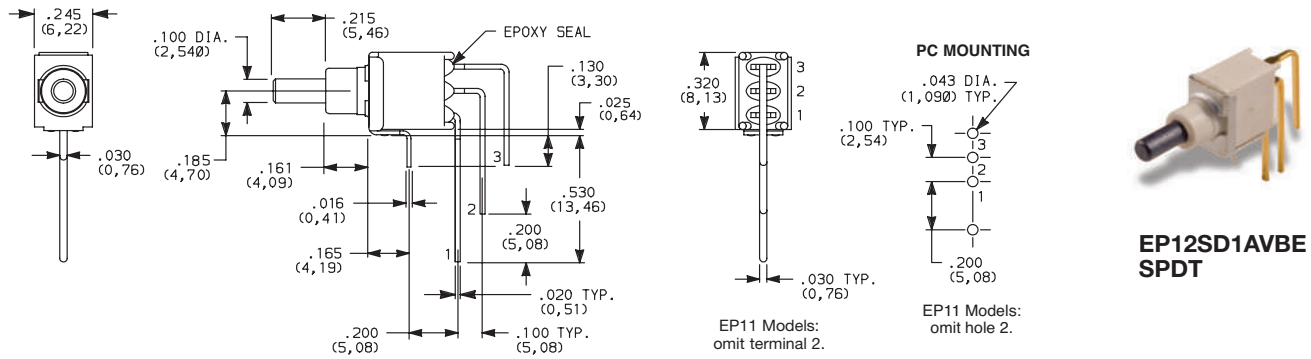
### A RIGHT ANGLE, PC THRU-HOLE






**EP21SD1ABE**
**DPST**

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




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



**EP12SD1AVBE**
**SPDT**

Third Angle Projection

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

# EP Series
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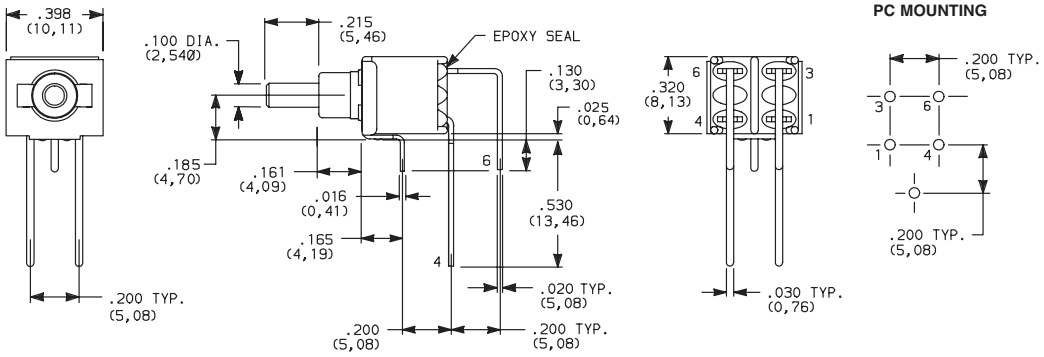
## TERMINATIONS

### AV VERTICAL RIGHT ANGLE, THRU-HOLE



**EP21SD1AVBE**
**DPST**

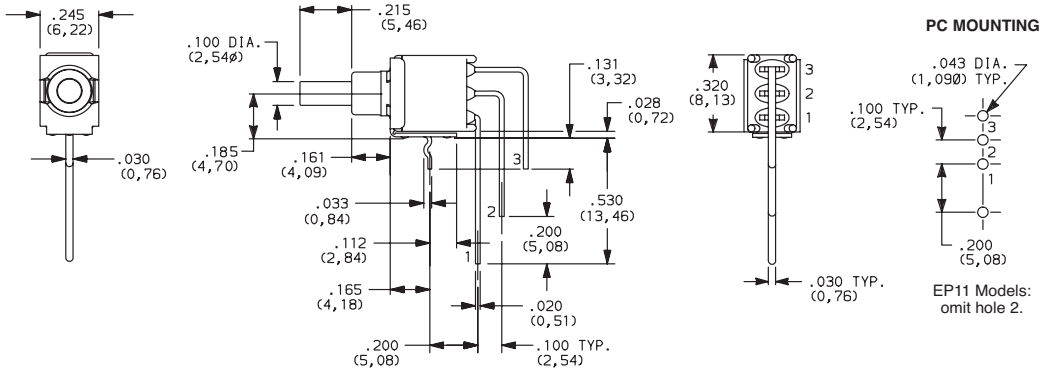



NOTE: Terminal bend radii and lead-in manufacturing option.

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



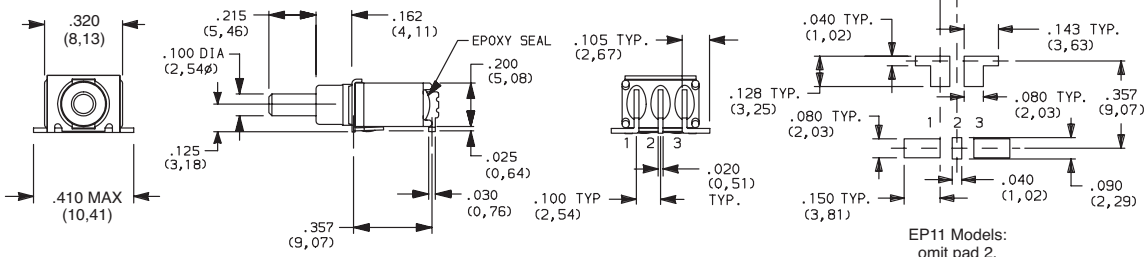
**EP12SD1AV3BE**
**SPST**




### SA RIGHT ANGLE, SURFACE MOUNT



**EP12SD1SAPE**
**SPDT**

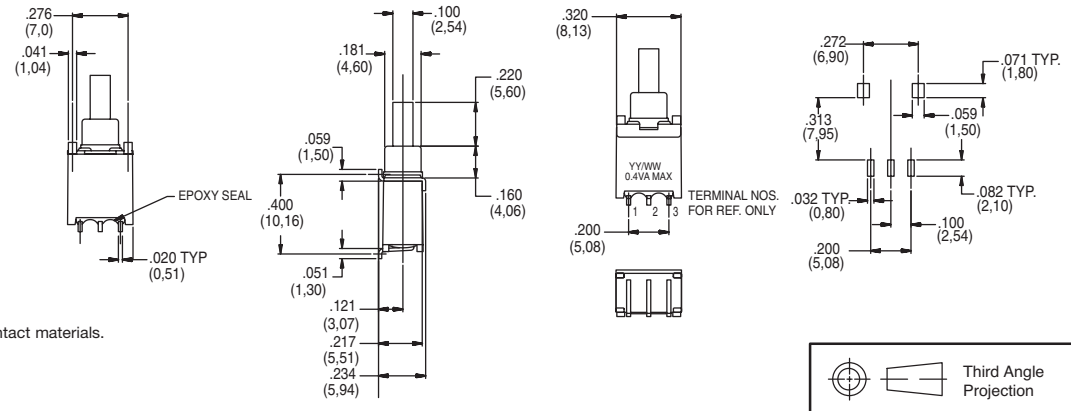



Available with P contact material only.
Not Available on DPST models.

### SA1 RIGHT ANGLE, SURFACE MOUNT



**EP12SD1SA1BE**
**SPDT**




SA1 is only available with B and P contact materials.
Not Available on DPST models.

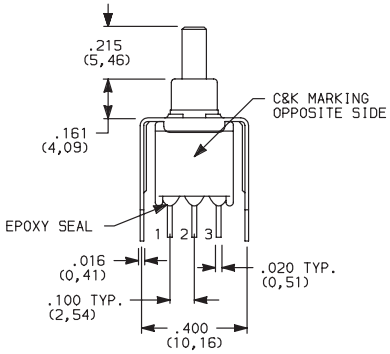
Third Angle Projection

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

## TERMINATIONS

**V3** VERTICAL MOUNT, V-BRACKET

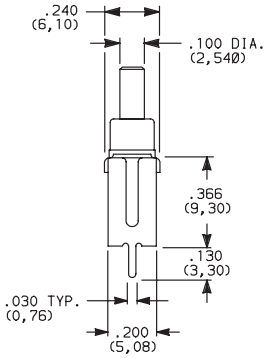
**V31** VERTICAL MOUNT, V-BRACKET, SNAP-IN

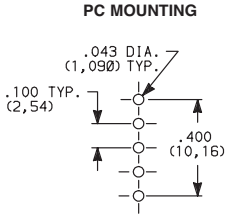



EP11 Models:
omit terminal 2.




V31 SNAP-IN




EP11 Models:
o e e ole



**EP12SD1V3BE**
**SPDT**

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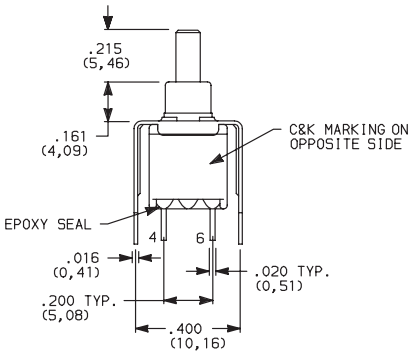
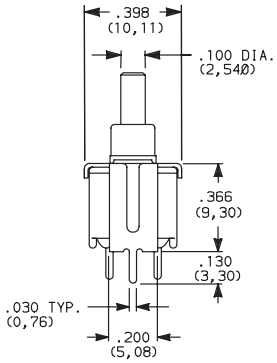
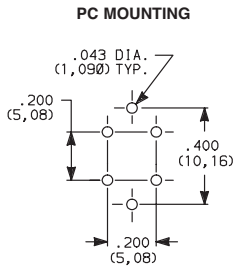
**V3** VERTICAL MOUNT, V-BRACKET






**EP21SD1V3BE**
**DPST**

## 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 | 1 AMP @ 120 V AC OR 28 V DC. |
| S | | MATTE-TIN [6] | | |
| G | GOLD OVER SILVER [2,3] | GOLD [3] | LOW LEVEL/DRY CIRCUIT OR POWER | 0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC. |
| R | | MATTE-TIN [6] | | |

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

[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 CONTACT & ALL TERMINALS: Copper alloy, silver plated.

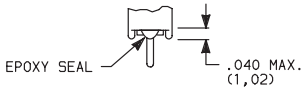
[6] TERMINALS: Copper alloy, with matte tin over nickel plate.

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

All models c UL us with all options when ordered with G, S, R or Q contact material.

## SEAL

**E** EPOXY SEAL

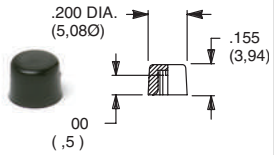



Third Angle Projection

# EP Series
# Sealed Tiny Pushbutton Switches

## AVAILABLE HARDWARE

**Cap**



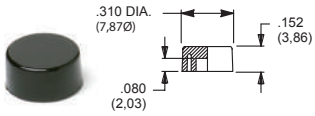

**PART NO.**

**508101000** WHITE
**508102000** BLACK
**508103000** RED

Material: Nylon
Finish: Gloss

Not for use on S1 plunger

**Cap**



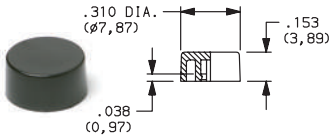

**PART NO.**

**465801000** WHITE
**465802000** BLACK
**465803000** RED

Material: Nylon
Finish: Gloss

Not for use on S1 plunger

**Cap**
**Compatible with snap-fitting plungers EP11 & EP12 Models. R option only.**

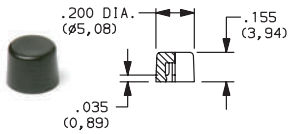



**PART NO.**

**585A01000** WHITE
**585A02000** BLACK
**585A03000** RED

Material: Nylon
Finish: Gloss

**Cap**
**Compatible with snap-fitting plungers EP11 & EP12 Models. R option only.**




**PART NO.**

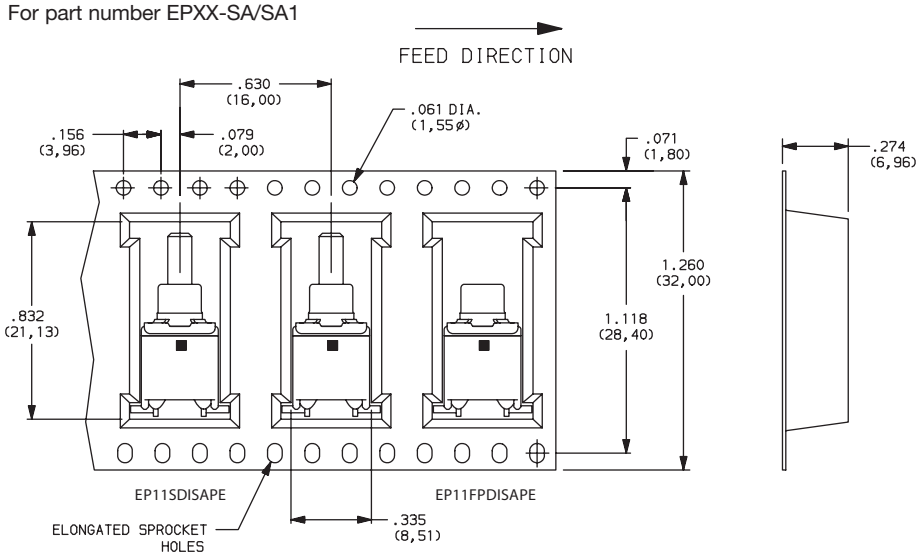
**785A01000** WHITE
**785A02000** BLACK
**785A03000** RED

Material: Nylon
Finish: Gloss

NOTE: Other colors available, consult Customer Service Center.

## TAPE & REEL

For part number EPXX-SA/SA1




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

Third Angle Projection

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