

# EP Series Sealed Tiny Pushbutton Switches



A

Pushbutton

## 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



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 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE:  $10^9 \Omega$  min.

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 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.

|                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                      |                                    |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| <div>Switch Function</div> <div>EP11 SPST Off-Mom.</div> <div>EP12 SPDT On-Mom.</div> <div>EP21 DPST Off-Mom.</div> | <div>Plunger</div> <div>S .215" high</div> <div>S1 .110" high</div> <div>S2 .465" high</div> <div>FP Flush</div> <div>R Snap-fitting, .215 high</div> <div>Bushing</div> <div>D1 Unthreaded</div> <div>Terminations</div> <div>A Right angle, PC thru-hole</div> <div>C PC Thru-hole</div> <div>AV Vertical right angle, PC thru-hole</div> <div>AV3 Vertical right angle, snap-in, PC thru-hole</div> <div>SA Right angle, surface mount</div> <div>SA1 Right angle, surface mount rear facing</div> <div>V3 Vertical mount, v-bracket</div> <div>V31 Vertical mount, v-bracket, snap-in (EP11 &amp; EP12 only)</div> <div>W Wire wrap</div> | <div>Contact Material</div> <div>B Gold</div> <div>P Gold, matte-tin</div> <div>Q Silver</div> <div>S Silver, matte-tin</div> <div>G Gold over silver</div> <div>R Gold over silver, matte tin</div> | <div>Seal</div> <div>E Epoxy</div> |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|



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



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## SWITCH FUNCTION



| NO. POLES                         | MODEL NO. | SWITCH FUNCTION              |        | CONNECTED TERMINALS          |         | SCHEMATIC |
|-----------------------------------|-----------|------------------------------|--------|------------------------------|---------|-----------|
|                                   |           | POS. 1                       | POS. 2 | POS. 1                       | POS. 2  |           |
|                                   |           |                              |        |                              |         |           |
|                                   |           | C&K marking on opposite side |        | C&K marking on opposite side |         |           |
| SP                                | EP11      | OFF                          | MOM.   | OPEN                         | 1-3     | SPST      |
|                                   | EP12      | ON                           | MOM.   | 2-1                          | 2-3     | SPDT      |
| <b>SPDT</b>                       |           |                              |        |                              |         |           |
| <br>Part number shown: EP12SD1CBE |           |                              |        |                              |         |           |
| DP                                | EP21      | OFF                          | MOM.   | OPEN                         | 1-3,4-6 | DPST      |
|                                   |           |                              |        |                              |         |           |
| <b>DPST</b>                       |           |                              |        |                              |         |           |
| <br>Part number shown: EP21SD1CBE |           |                              |        |                              |         |           |

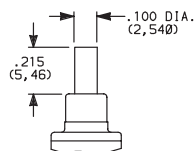
MOM. = Momentary

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

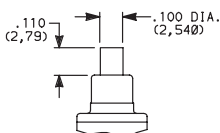
## PLUNGER



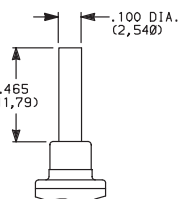
**S** .215" HIGH



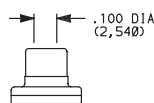
**S1** .110" HIGH



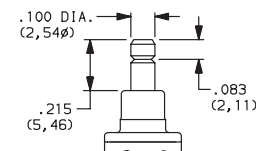
**S2** .465" HIGH



**FP** FLUSH PLUNGER



**R** SNAP-FITTING



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

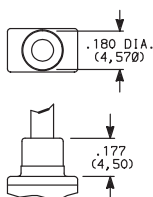
FP & R actuators are not available with EP21 model.

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

## BUSHING



**D1** UNTHREADED



NOTE: Internal actuator o-ring standard.



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

**C&K**

# EP Series Sealed Tiny Pushbutton Switches



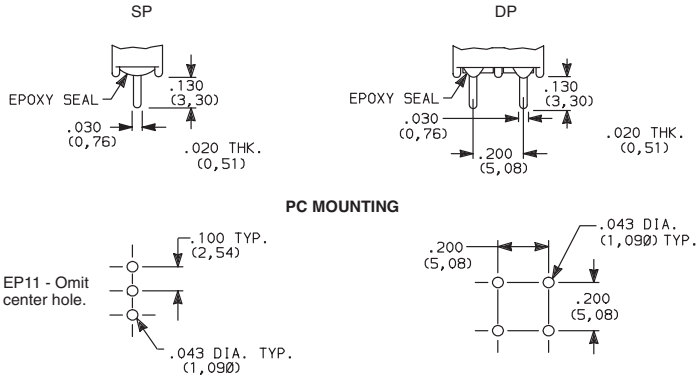
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## TERMINATIONS

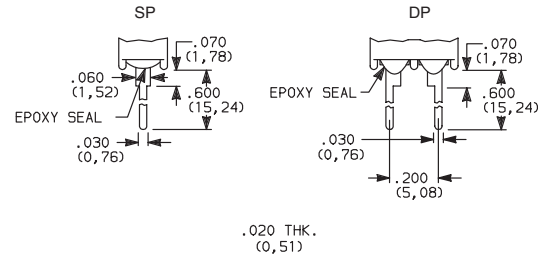


### C PC THRU-HOLE



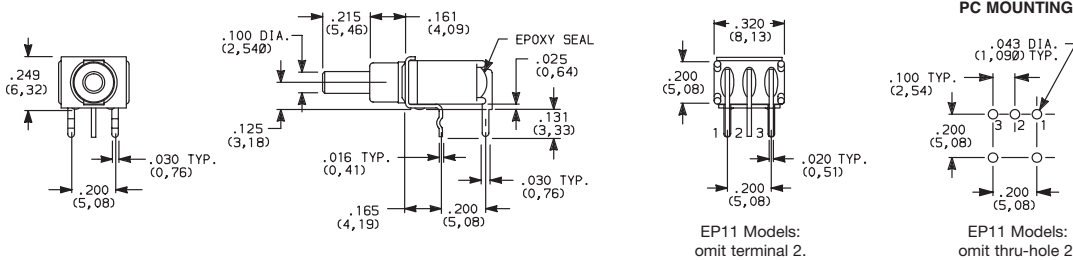
### SP and DP

### W WIRE WRAP



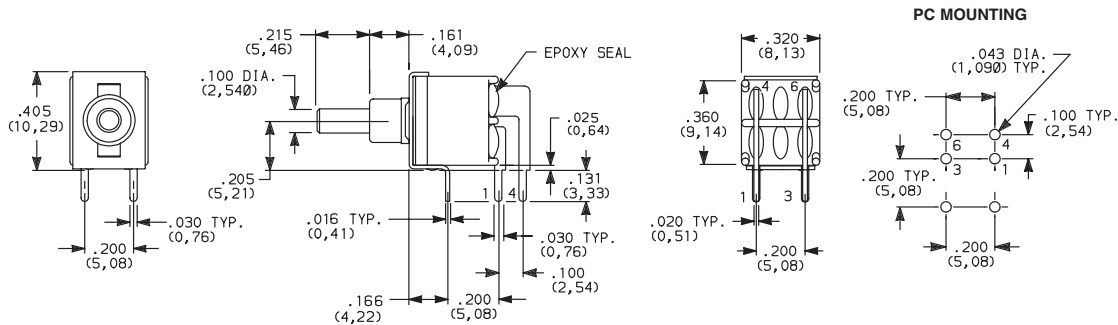
### SP and DP

### A RIGHT ANGLE, PC THRU-HOLE



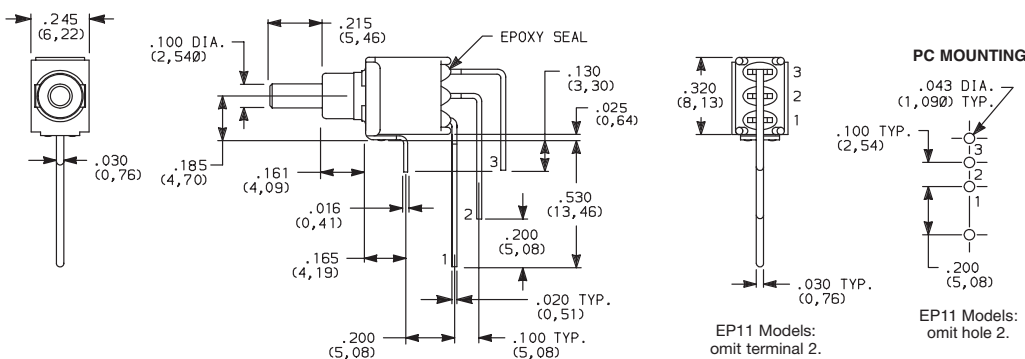
EP12SD1ABE  
SPDT

### A RIGHT ANGLE, PC THRU-HOLE



EP21SD1ABE  
DPST

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



EP12SD1AVBE  
SPDT

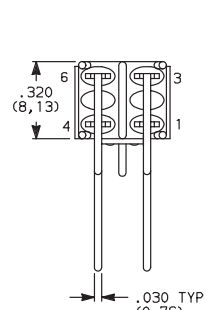
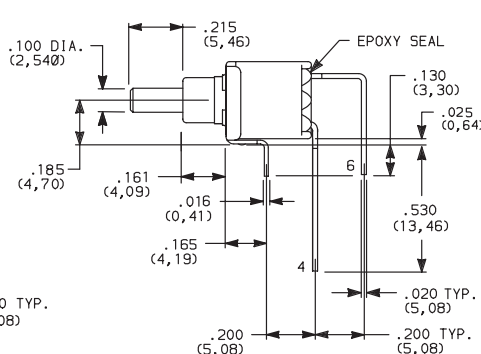
NOTE: Terminal bend radii and lead-in manufacturing option.



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



# Pushbutton

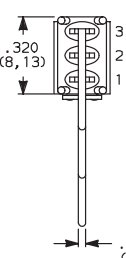
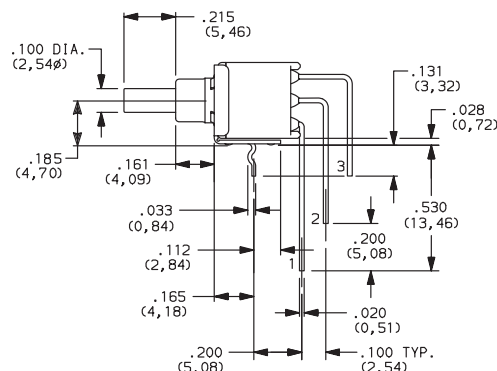


**AV3** VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE

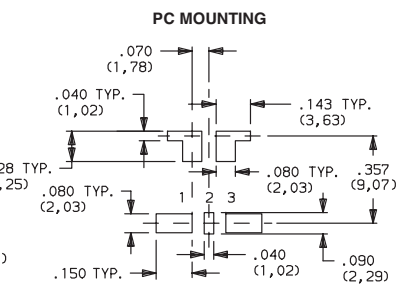
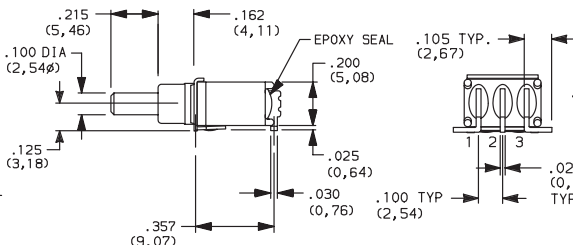


Technical drawing of a cable connector. The drawing shows a cross-section of the connector with two dimensions indicated by arrows and text:

- A horizontal dimension at the top indicates a width of  $.245$  (6, 22).
- A horizontal dimension at the bottom indicates a width of  $.030$  (0, 76).



**SA** RIGHT ANGLE, SURFACE MOUNT



EP11 Models:  
omit terminal 2

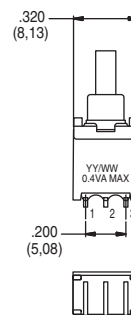
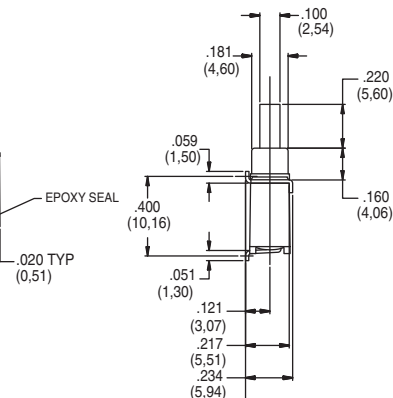


Figure 1 is a dimensional drawing of a 1/2" x 1/2" x 1/2" 303 stainless steel ball joint. The drawing shows a side view of the ball joint with various dimensions and tolerances. Dimensions are given in inches and millimeters. Tolerances are indicated as 'TYP.' (typical).

| Dimension                                                    | Value (inches) | Value (millimeters) |
|--------------------------------------------------------------|----------------|---------------------|
| Top horizontal dimension                                     | .272           | (6,90)              |
| Top horizontal dimension (typical)                           | .071 TYP.      | (1,80)              |
| Vertical dimension from top to first horizontal line         | .313           | (7,95)              |
| Horizontal dimension from centerline to first vertical line  | .059           | (1,50)              |
| Horizontal dimension from centerline to second vertical line | .082 TYP.      | (2,10)              |
| Horizontal dimension from centerline to third vertical line  | .100           | (2,54)              |
| Horizontal dimension from centerline to fourth vertical line | .200           | (5,08)              |
| Horizontal dimension from centerline to fifth vertical line  | .032 TYP.      | (0,80)              |



Third Angle Projection



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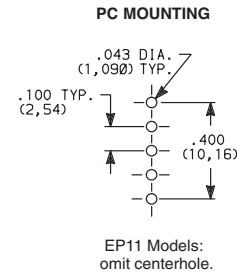
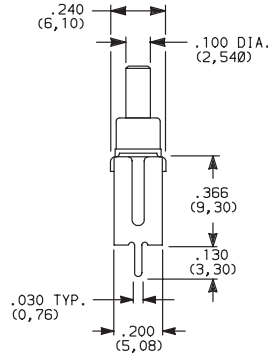
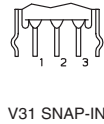
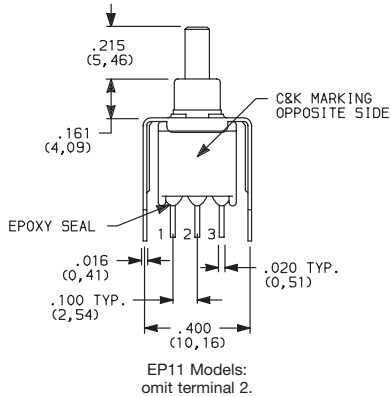
A

Pushbutton

## TERMINATIONS



- V3** VERTICAL MOUNT, V-BRACKET  
**V31** VERTICAL MOUNT, V-BRACKET, SNAP-IN

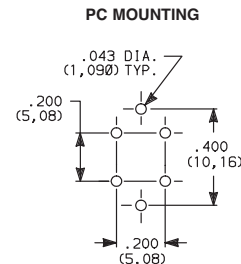
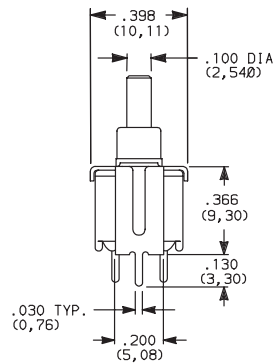
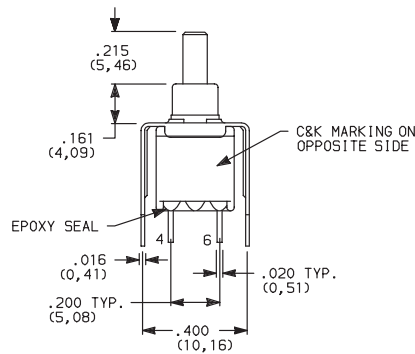


EP11 Models:  
omit centerhole.



EP12SD1V3BE  
SPDT

- V3** VERTICAL MOUNT, V-BRACKET



EP21SD1V3BE  
DPST

## 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                          | 1 AMP @ 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 | 0.4 VA MAX @ 20 V AC OR DC MAX. OR<br>1 AMP @ 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.

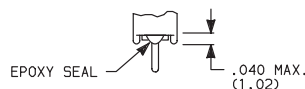
**NOTE:** Any models supplied with Q, B, P, S, R or G contact material are RoHS compliant.

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

## SEAL



- E** EPOXY SEAL



Third Angle  
Projection



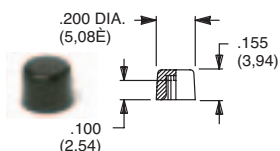
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



# EP Series Sealed Tiny Pushbutton Switches

## AVAILABLE HARDWARE

Cap



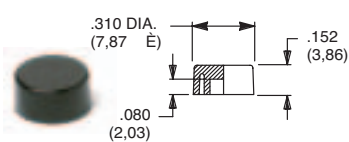
**PART NO.**

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

Material: Nylon  
Finish: Gloss

Not for use on S1 plunger

Cap



**PART NO.**

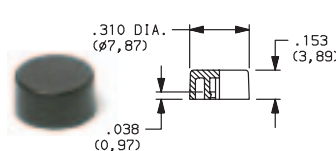
**465801000** WHITE  
**465802000** BLACK  
**465803000** RED

Material: Nylon  
Finish: Gloss

Not for use on S1 plunger

Cap

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



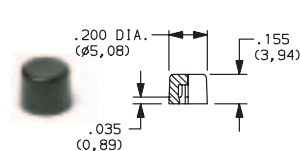
**PART NO.**

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

Material: Nylon  
Finish: Gloss

Cap

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



**PART NO.**

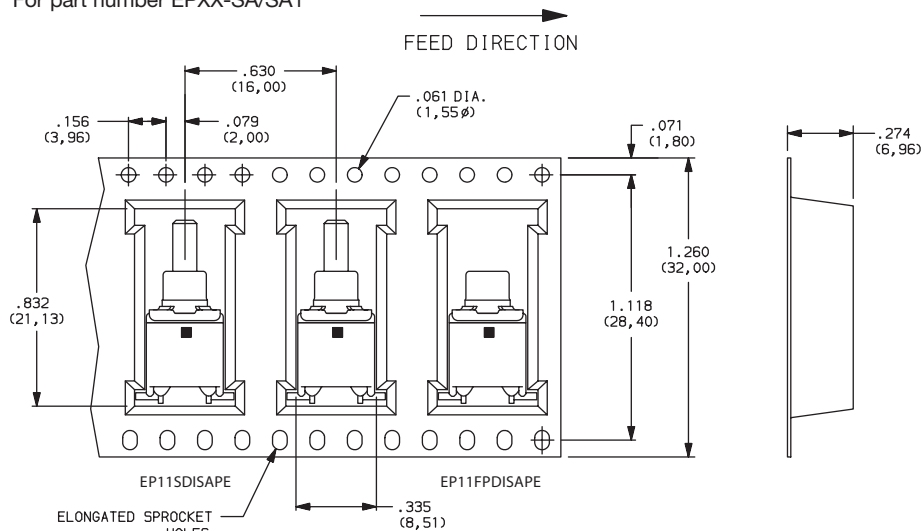
**785A01000** WHITE  
**785A02000** BLACK  
**785A03000** RED

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           |