

# EP Series Sealed Tiny Pushbutton Switches



## Features/Benefits

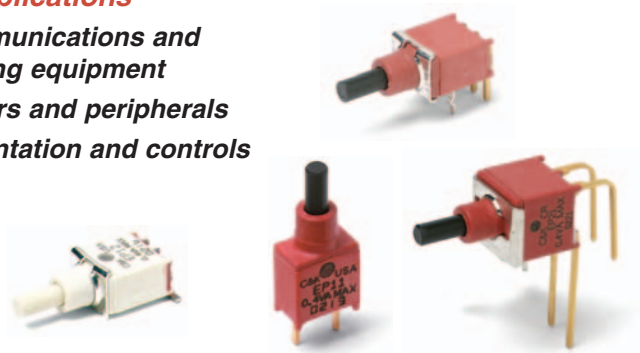
- Sealed against solder & cleaning processes
- Thru-hole and surface mount models
- Snap-fitting actuator accepts standard caps
- Tape & reel packaging available
- RoHS compliant models available



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<sup>9</sup> Ω 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 SMT models; glass filled nylon 6/6 on PC Through Hole models.

**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.

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

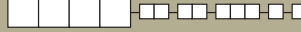


A

Pushbutton

# EP Series Sealed Tiny Pushbutton Switches

## SWITCH FUNCTION

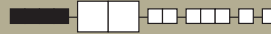
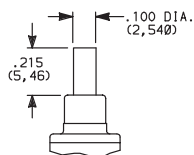
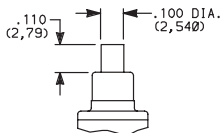
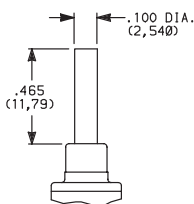
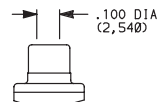
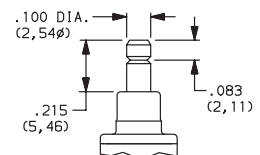


NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
		C&K marking on opposite side		C&K marking on opposite side		
SP	EP11	OFF	MOM.	OPEN	1-3	SPST
	EP12	ON	MOM.	2-1	2-3	SPDT
<b>SPDT</b>  Part number shown: EP12SD1CBE						
DP	EP21	OFF	MOM.	OPEN	1-3,4-6	DPST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

MOM. = Momentary

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

## PLUNGER

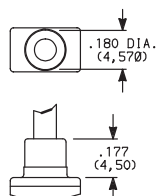
**S** .215" HIGH**S1** .110" HIGH**S2** .465" HIGH**FP** FLUSH PLUNGER**R** SNAP-FITTING

S1 &amp; S2 actuators are not available with EP12 &amp; EP21 models or SA1 termination style.

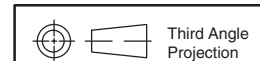
FP &amp; R actuators are not available with EP21 model or SA1 termination style.

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



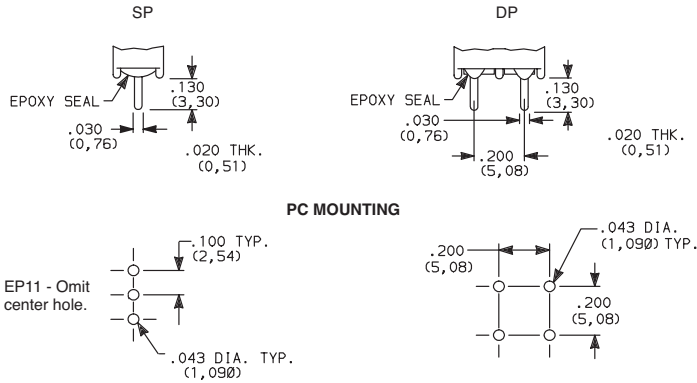
A

Pushbutton

## TERMINATIONS

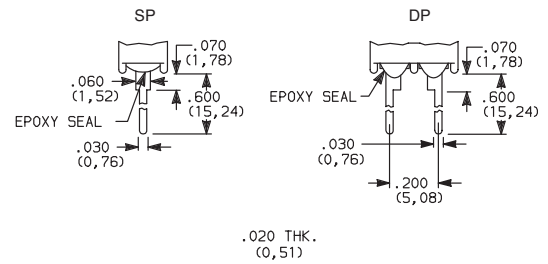


### C PC THRU-HOLE



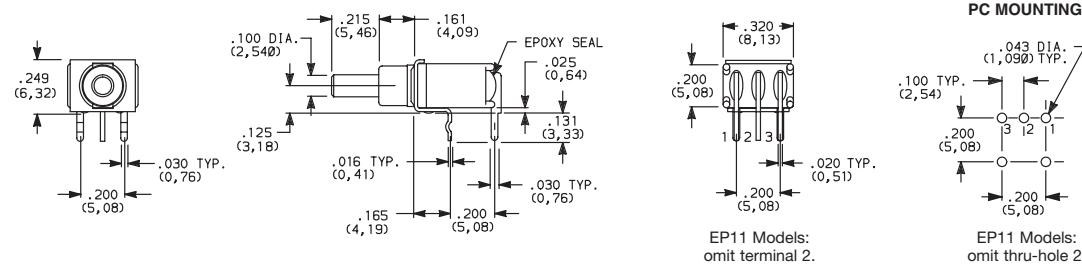
SP and DP

### W WIRE WRAP



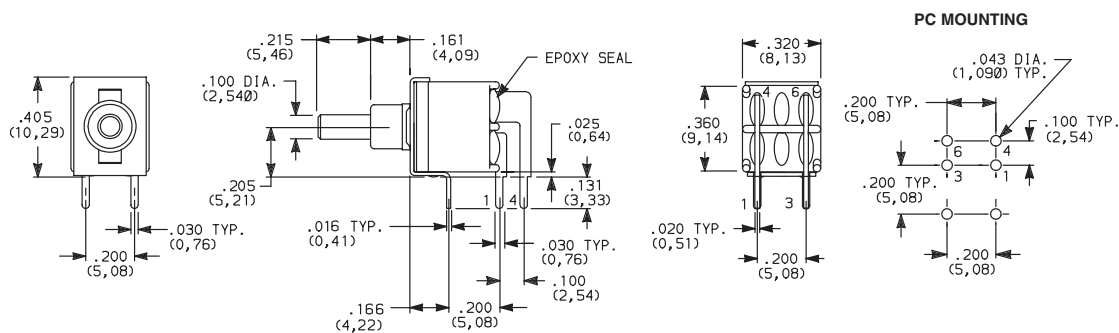
SP and DP

### A RIGHT ANGLE, PC THRU-HOLE



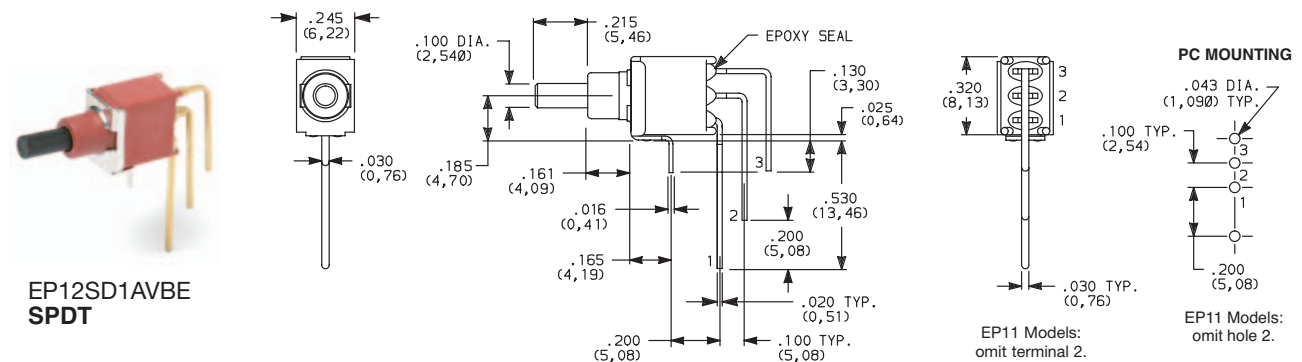
EP12SD1ABE  
SPDT

### A RIGHT ANGLE, PC THRU-HOLE



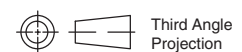
EP21SD1ABE  
DPST

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



EP12SD1AVBE  
SPDT

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



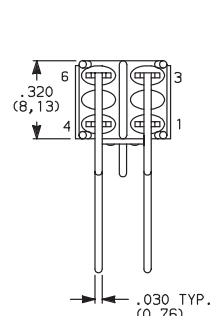
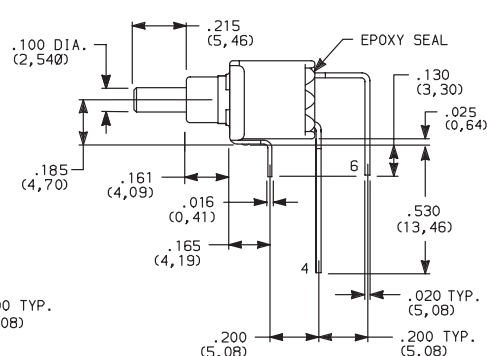
Dimensions are shown: Inches (mm)  
Specifications and dimensions subject to change



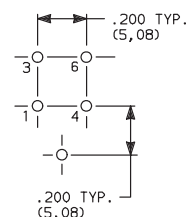
## TERMINATIONS



## Pushbutton



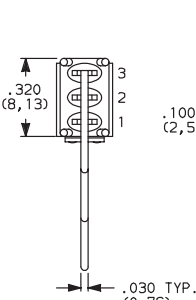
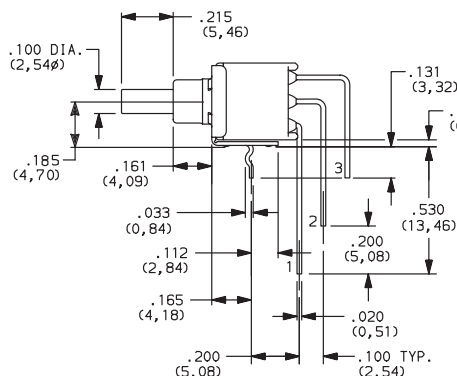
## PC MOUNTING



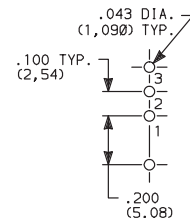
**NOTE:** Terminal bend radii and lead-in manufacturing option.



Technical drawing of a cable connector. The drawing shows a cross-section of the connector with a central circular opening. Above the connector, a dimension line indicates a width of .245 (6, 22). Below the connector, a dimension line indicates a diameter of .125 (3, 16).



## PC MOUNTING

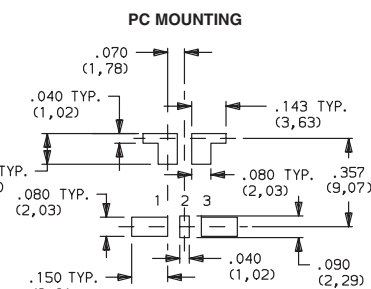
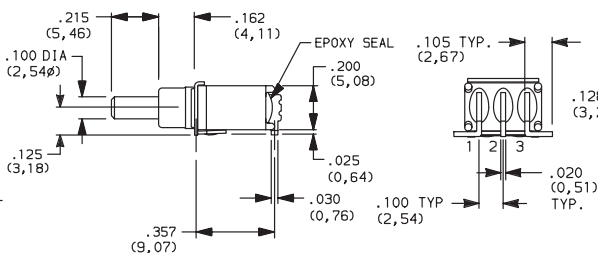


EP11 Models:  
omit hole 2.

**SMT**



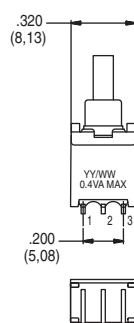
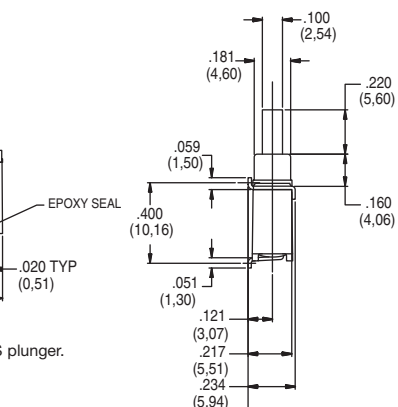
Technical drawing of a bearing housing. The drawing shows a cross-section of the housing with a central bore. Two dimensions are indicated with arrows: a top dimension of .320 (8,13) and a bottom dimension of .410 MAX (10,41).



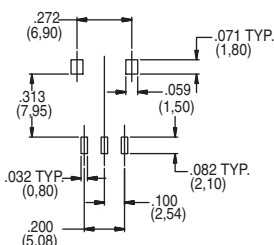
EP11 Models:  
omit pad 2.

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

EP11 Models:  
omit terminal 2.



PC MOUNTING



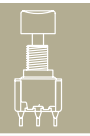
SA1 is only available with B contact materials option + S plunger.  
Not Available on DPST models.



Third Angle Projection

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

# EP Series Sealed Tiny Pushbutton Switches



A

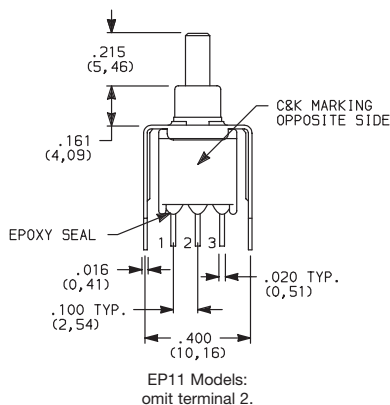
Pushbutton

## TERMINATIONS

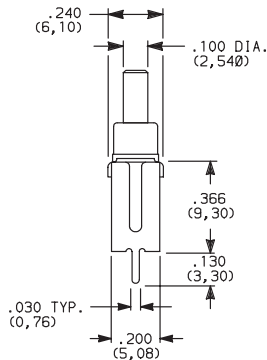


**V3** VERTICAL MOUNT, V-BRACKET

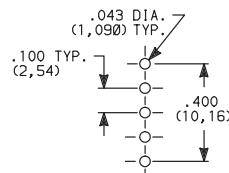
**V31** VERTICAL MOUNT, V-BRACKET, SNAP-IN



V31 SNAP-IN



### PC MOUNTING

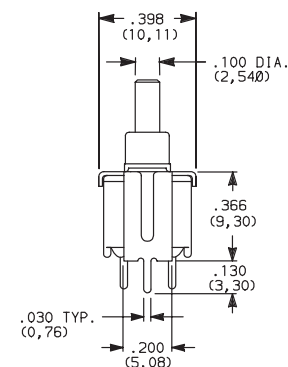
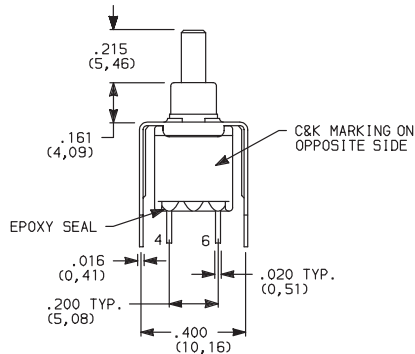


EP11 Models:  
omit centerhole.

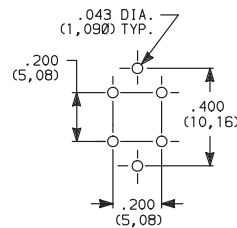


EP12SD1V3BE  
SPDT

**V3** VERTICAL MOUNT, V-BRACKET



### PC MOUNTING



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 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.

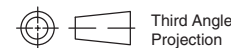
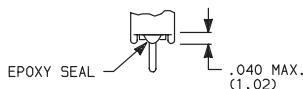
All models with all options when ordered with G, L, M, S, R or Q contact material.

K, L and M options represent Non RoHS tin lead product and are not recommended for new designs. For additional information please contact Customer Service.

## SEAL



**E** EPOXY SEAL



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





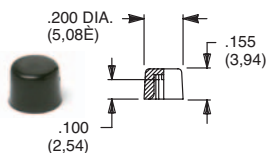
A

Pushbutton

# EP Series Sealed Tiny Pushbutton Switches

## AVAILABLE HARDWARE

Cap



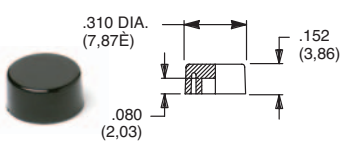
## PART NO.

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

Material: Nylon  
 Finish: Gloss

Not for use on S1 plunger

Cap



## PART NO.

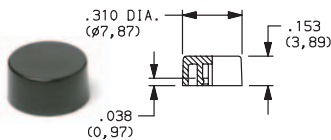
**465801000** WHITE  
**465802000** BLACK  
**465803000** RED

Material: Nylon  
 Finish: Gloss

Not for use on S1 plunger

Cap

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



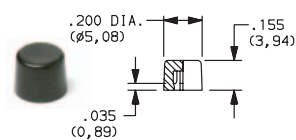
## PART NO.

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

Material: Nylon  
 Finish: Gloss

Cap

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



## PART NO.

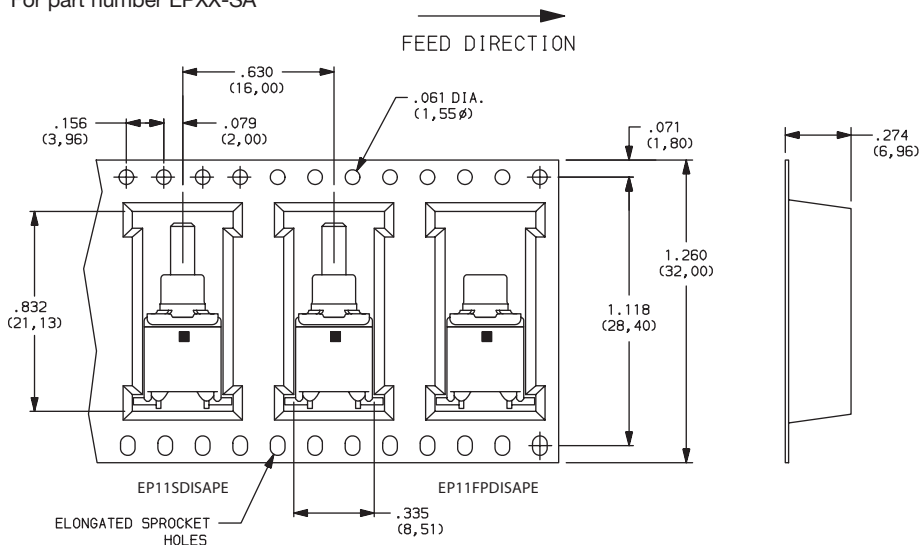
**785A01000** WHITE  
**785A02000** BLACK  
**785A03000** RED

Material: Nylon  
 Finish: Gloss

NOTE: Other colors available, consult Customer Service Center.

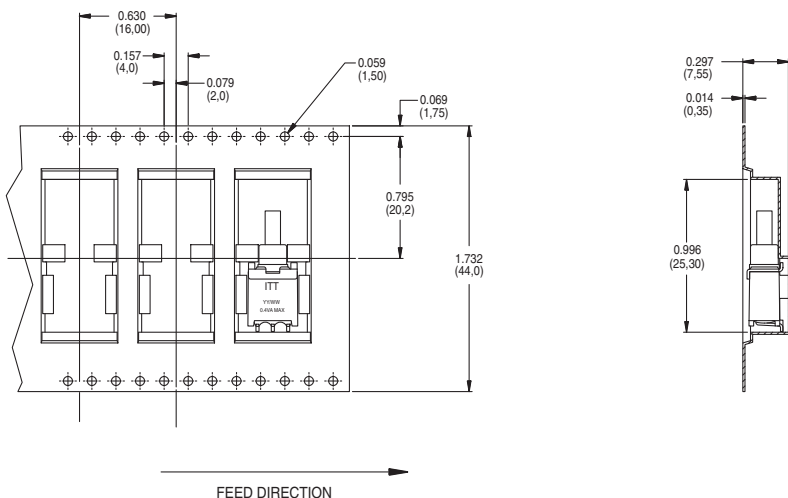
## TAPE & REEL

For part number EPXX-SA



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

For part number EPXX-SA1



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



Third Angle  
 Projection

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

**C&K**

# Mouser Electronics

Authorized Distributor

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[EP11S2D1V3QE](#) [EP11S1D1V3PE](#) [EP11SD1AV3BE](#) [EP11S2D1V31QE](#)