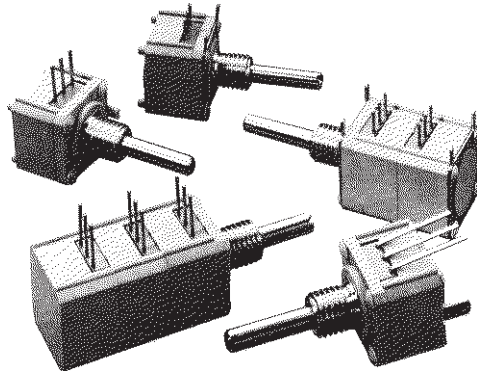


Series 308 Potentiometer
 1/2 in. sq. 0.5 Watt
 Series 309 Potentiometer
 1/2 in. sq. 1.0 Watt



308: Modular Style, Conductive Plastic

309: Modular Style, Thick-Film Cermet

Series 308 is RoHS compliant.

Description

The Series 308 and 309 are high-performance, low-cost potentiometers. They are also available with S.P.S.T. or S.P.D.T. rotary switch modules, S.P.S.T. momentary switch modules and/or potentiometer modules in multiple sections up to three sections.

Features

- **Compact** - 1/2 in. (12.7mm) miniature, modular size.
- **Cost-effective** - Design simplicity through fewer component parts.
- **Robust** - Horizontal or vertical mountings with support plates. Nickel-plated brass shaft and bushings in various diameters and lengths. Insert molded gold plated terminals for strength.
- **Precision Made** - screen-printed conductive plastic and thick-film cermet elements.
- **Stability** - Series 308 -40°C to +120°C; Series 309 -40°C to 150°C operating temperature.

Series 308 Electrical Specifications

<i>Resistance</i>	100Ω to 5 Megohms, linear; 500Ω to 2 Megohms, non-linear
<i>Resistance Range</i>	Linear: thru 500KΩ, ±10%; above 500K to 5 Megohms, ±20%. Non-linear thru 100KΩ, ±10%; above 100KΩ ±20%
<i>End Resistance</i>	Linear: 4Ω maximum each end. Taper low side 4Ω maximum; high side 1% of total R.
<i>Power Rating</i>	.5 watt @ 70°C. Derated linearly to zero watts at 120°C. See Figure 2, page 3 For non-linear tapered units or PC mounting, derate by 50%. Trimmer style, derate by 50%.
<i>Effective Rotation</i>	265° ±5° without rotary switch; 240° ±5° with rotary switch.
<i>Dynamic Noise</i>	Standard: Linear single controls maximum initial noise level of 1.5% of total resistance. Measurement made using constant current source and oscilloscope detection technique. Special: 1%

Series 309 Electrical Specifications

<i>Resistance</i>	Linear: 5Ω to 5 Megohms Taper: 100Ω to 2 Megohms
<i>Resistance Range</i>	± 10% standard; ±5% special. Trimmers ±20%.
<i>End Resistance</i>	2Ω maximum, 5Ω to 2500Ω; 4Ω maximum, 5KΩ and above.
<i>Power Rating</i>	1 watt @ 85°C. Derate linearly to zero watts at 150°C. For tapered units, trimmers or PC mounting, derate 50%.
<i>Effective Rotation</i>	250° +10° -5° without rotary switch; 225° +10° -5° with rotary switch.
<i>Dynamic Noise</i>	Standard: Linear single controls maximum initial noise level of 3% of total resistance. Measurement made using constant current source and oscilloscope detection technique. Special: 1.5%

Electrical Specifications continued, next page

Electrical Specifications continued, next page

Electrical Rotation	295° ±5°	295° ±5°
Working Voltage	350 Vdc across end terminals, but power not to exceed rating.	350 Vdc across end terminals, but power not to exceed rating.
Resistance Temperature Characteristics	See Chart C.	See Chart C.
Linearity	±5% independent	±5% independent
Non-linear Tapers	Right or left-hand available. See Chart A.	Right or left-hand available. See Chart A.
Taper Tolerance	±20% of nominal resistance @ 50%; ±3% of mechanical rotation	±20% of nominal resistance @ 50%; ±3% of mechanical rotation
Voltage Coefficient	.008%/Volt maximum.	.008%/Volt maximum
Dielectric Withstanding Voltage	750 Vac for 60 seconds @ ATM pressure. 350 Vac for 6 seconds @ 3.4 in. Hg.	900 Vac for 60 seconds @ ATM pressure. 350 Vac for 6 seconds @ 3.4 in. Hg.

Series 308/309 Mechanical Specifications

Mechanical Rotation

295° ±5°

Stop Torque

3 lb. in. minimum (metal shaft)
Other torque options available. Please contact State Electronics.

Torque Range

.20 to 3.0 oz. in. (Single); .3 to 3.5 oz. in. (Dual);
.4 to 4.5 oz. in. (Triple).
Other torque options available. Please contact State Electronics.

Torque Variation

Within control .5 oz. in. maximum

Bushing

Material: Brass nickel plated
Diameters: Supplied in .250" – 32 NEF 2A thread (6.35mm) and .375" – 32 NEF 2A thread (9.53mm)
Lengths: Available in .250" (6.35mm), .375" (9.53mm), and .500" (12.7mm).
Styles: Plain, locking and trimmer

Shafts

Material: Brass nickel plated and stainless steel
Diameters: Single shaft: .125" (3.18mm) and .250" (6.35mm)
Concentric: .078"/.125" (1.98/3.18mm) and .125"/.250" (3.18/6.35mm)
Lengths: Maximum of 3" (76.2mm) from bushing mounting surface; .025" (.635mm) minimum on trimmer or bushing
Styles: Plain, slotted flatted and concentric

Mechanical Specifications continued, next column

Push Momentary Switch

S.P.S.T., 125ma, 28Vdc, push momentary switch. Type DJ

Rotary Switch

S.P.S.T. or S.P.D.T., CCW or CW, 125ma, 28Vdc. Type AL

Housing

Thermoplastic polyester, blue. (U.L. SE-O rating)

Hardware

Nut: brass, nickel-plated
Lockwasher: phosphorous bronze, nickel-plated

Solvent Resistance

Housing resistant to trichlorethylene, *Chlorethene NU, Freon TMS, **Freon TMC, toluene, MEK, ethyl acetate and gasoline. For solvents not listed, please consult Factory. **Note:** Units not immersion sealed

Terminals

Gold-coated PC terminals or solder hook style. PC pins fit .100 grid spacing. Terminal mounting options available

Weight (approx.)

Metal shaft & bushing: (Single) .19 oz., (Dual) .27 oz., (Triple) .35 oz.

* T.M. Dow Chemical Co.

**T.M. Dupont

Series 308/309 Operational Specifications

Operating Temperature Range

Series 308: -40°C to +120°C

Series 309: -40°C to +150°C

Storage Temperature Range

Series 308: -55°C to +120°C

Series 309: -55°C to +150°C

Rotational Life

Series 308: linear control, 50,000 cycles under load, (plain bushing).

Change not to exceed 10% R.

Trimmer life under load is 5,000 cycles.

Series 309: linear control, 25,000 cycles under load, (plain bushing).

Change not to exceed 5% R.

Trimmer life under load is 5,000 cycles.

AL Switch Specifications

Rating

125ma 28Vdc (dry circuit)

Rotational Life

25,000 cycles under rated load

BL and BLM Switch Specifications

Rating

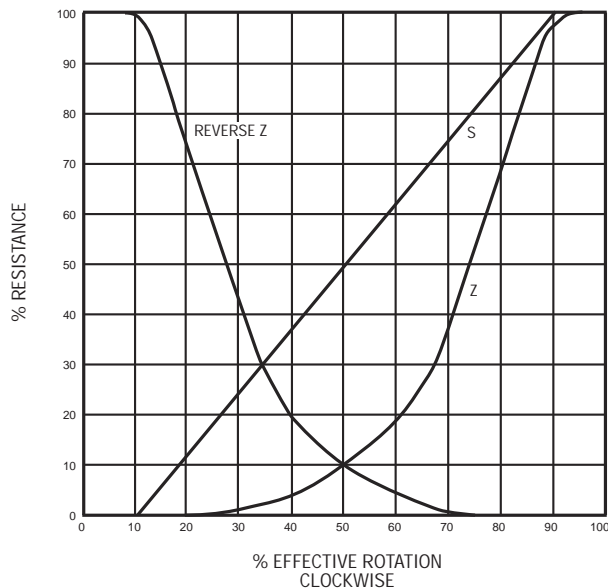
125ma 30Vdc (dry circuit)

Rotational Life

15,000 cycles under rated load

Figure 1

Chart A



Curves Standard

The "S" taper is linear, the change in resistance value being directly proportional to the degree of rotation. It can be used either as right-hand or left-hand taper.

The "Z" taper attains 10% resistance value at 50% of clockwise rotation (left hand).

The reverse "Z" taper attains 10% resistance value at 50% of counter-clockwise rotation (right-hand).

For conformity and special output curves, contact State Electronics.

Figure 2

Chart B

POWER DERATING GRAPH

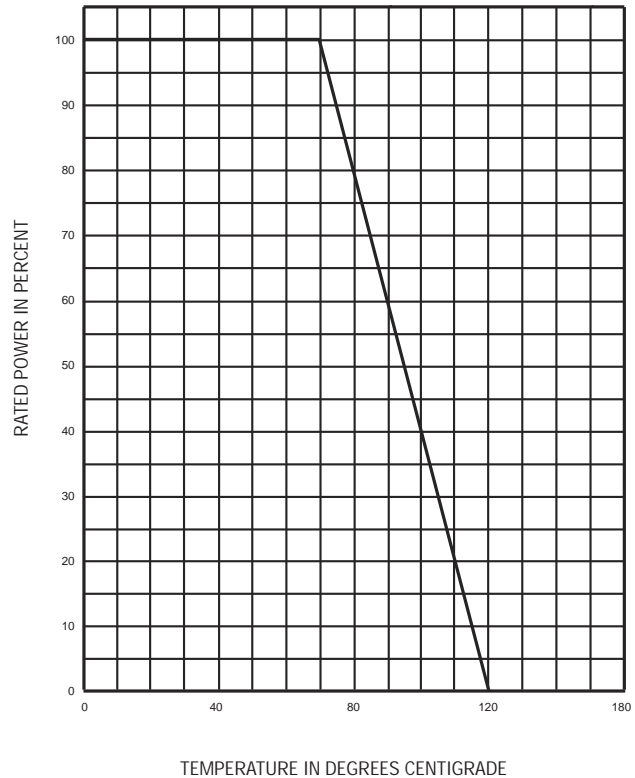


Figure 3
Chart C

Nominal Resistance	Maximum Percent Temporary Resistance Change From 25°						
	-55°C	-40°C	0°C	+25°C	+85°C	+105°C	+120°C
100 Ohms	±5.0	±4.0	±1.5	0	±1.5	±2.0	±3.5
10K Ohms	+7.0	+5.5	+2.0	0	±1.5	±2.5	±5.5
100K Ohms	+8.0	+6.0	+2.5	0	±2.0	±3.5	±6.0
1 Megohm	+10.0	+8.0	+3.0	0	±2.5	±4.0	±7.5

For non-linear tapers, multiply chart values by 1.25

Tolerance specifications apply to all layout drawings unless otherwise specified:
 fractions $\pm 1/64$ in. (.379mm);
 $\pm 1/32$ in. (.794mm) over 1 in. (25.4mm);
 decimals $\pm .005$ in. (.127mm);
 PC board layout $\pm .010$ in. (.254mm).

Figure 4
Series 308/309

Single, Dual or Triple
 (Second or Third Section May Be AL Series Rotary Switch)
 Printed Circuit – Type B-22
 "C" Terminal Length: .875" (22.3mm) Maximum
 Standard PC Terminal Length: .250" (6.36mm)

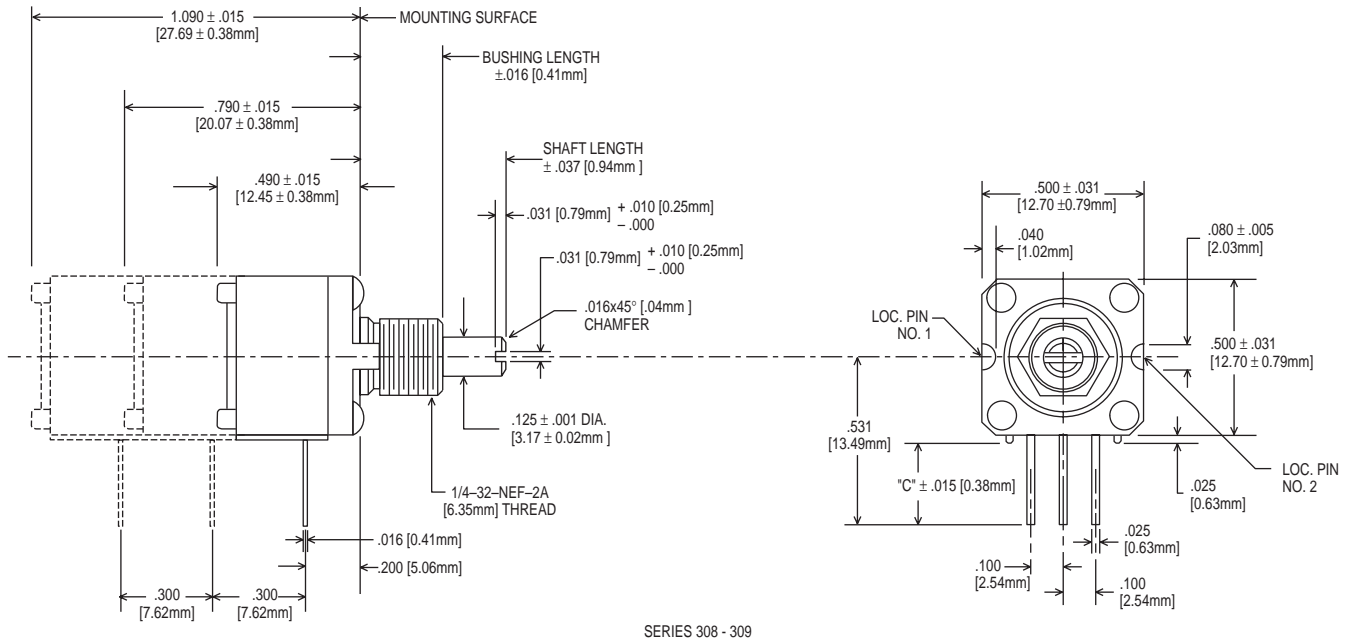


Figure 5
Series 308/309 Solder Lug Terminals

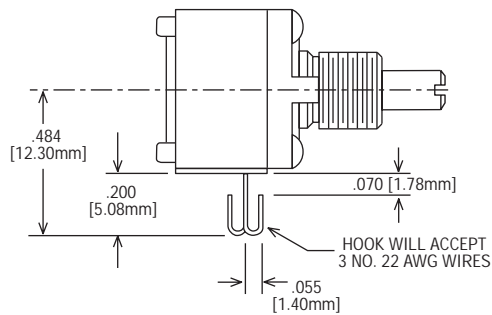


Figure 6
Series 308/309 Bushingless Trimmer

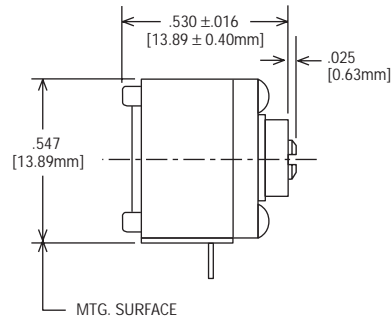


Figure 7

Series 308/309 Single, Dual, or Triple with Panel and Rear Support Plates, Horizontal Mounting

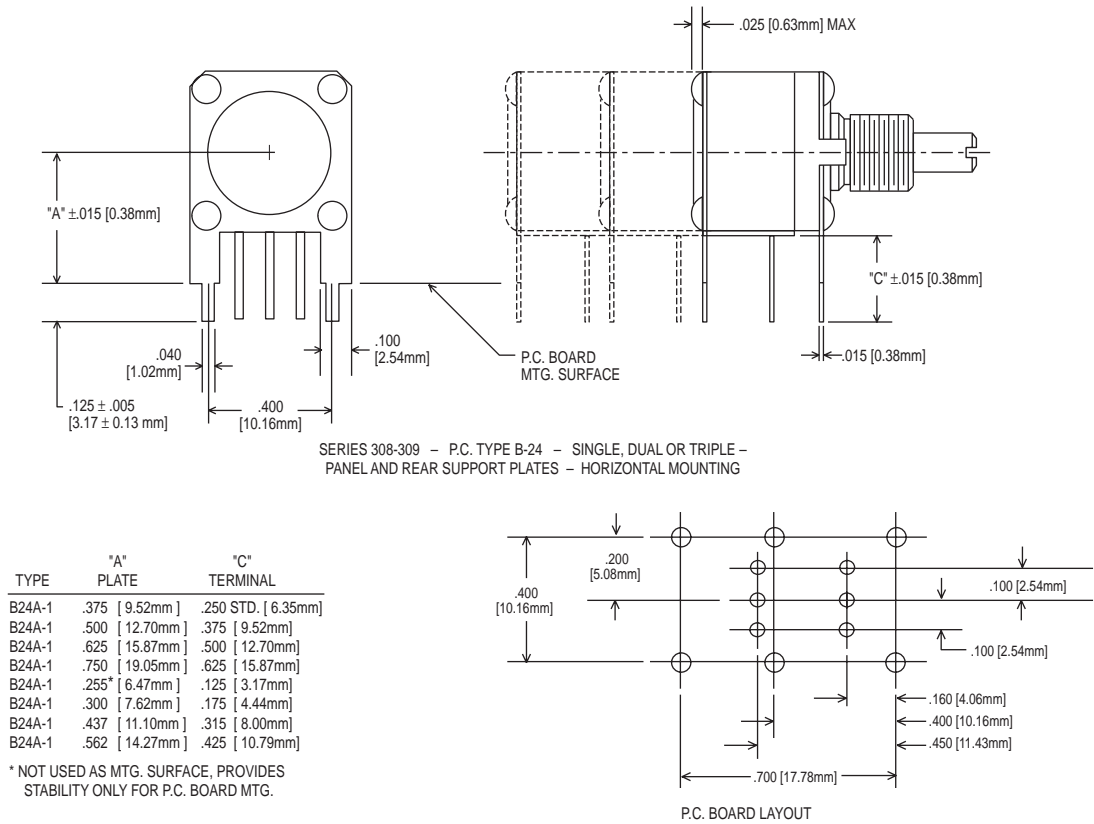


Figure 8

Series 308/309 Single or Dual

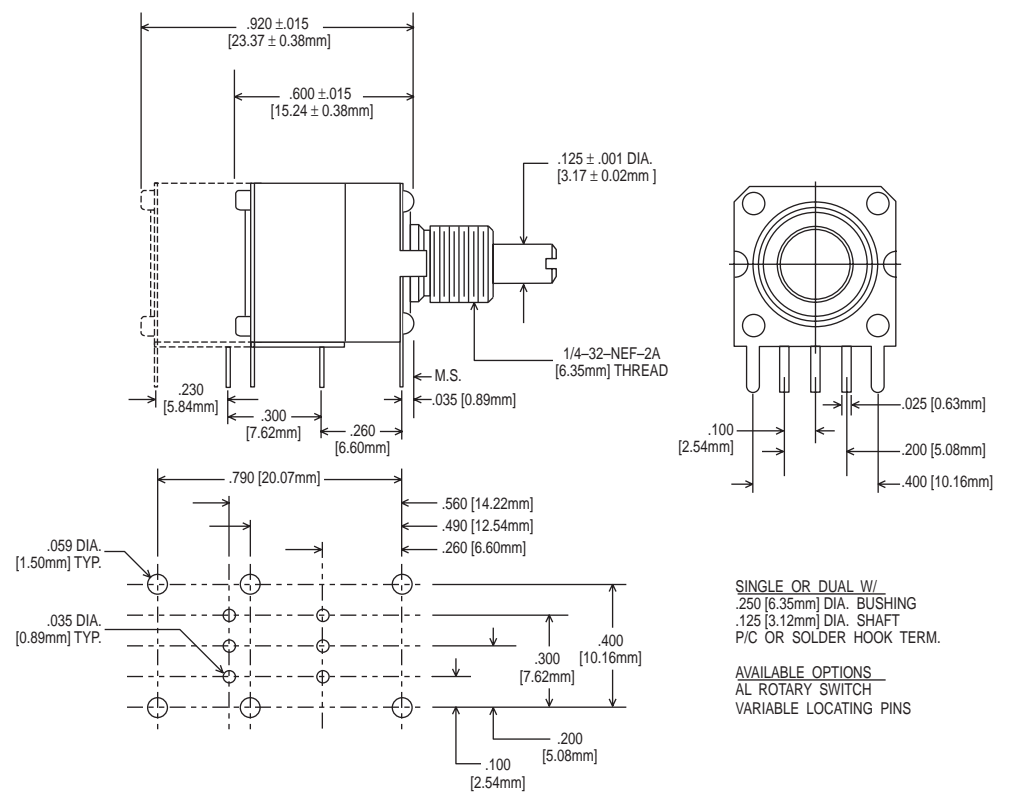


Figure 9

Series 308/309 Single or Dual

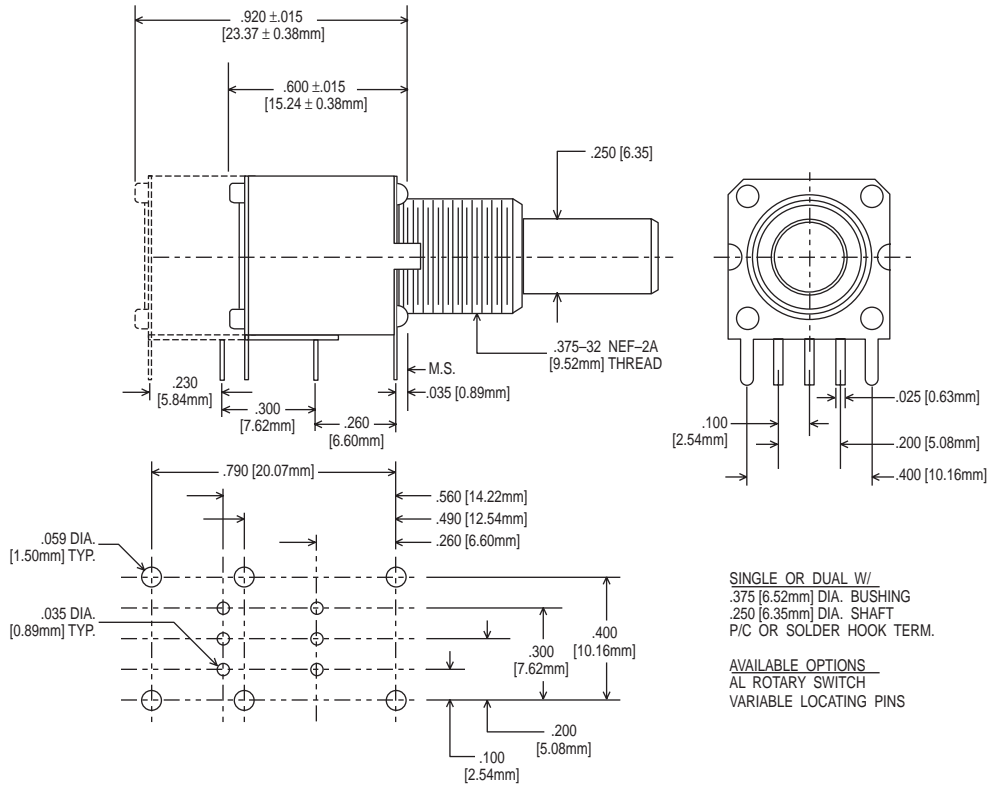


Figure 10

Series 308/309 Single or Triple with High Rotational Torque

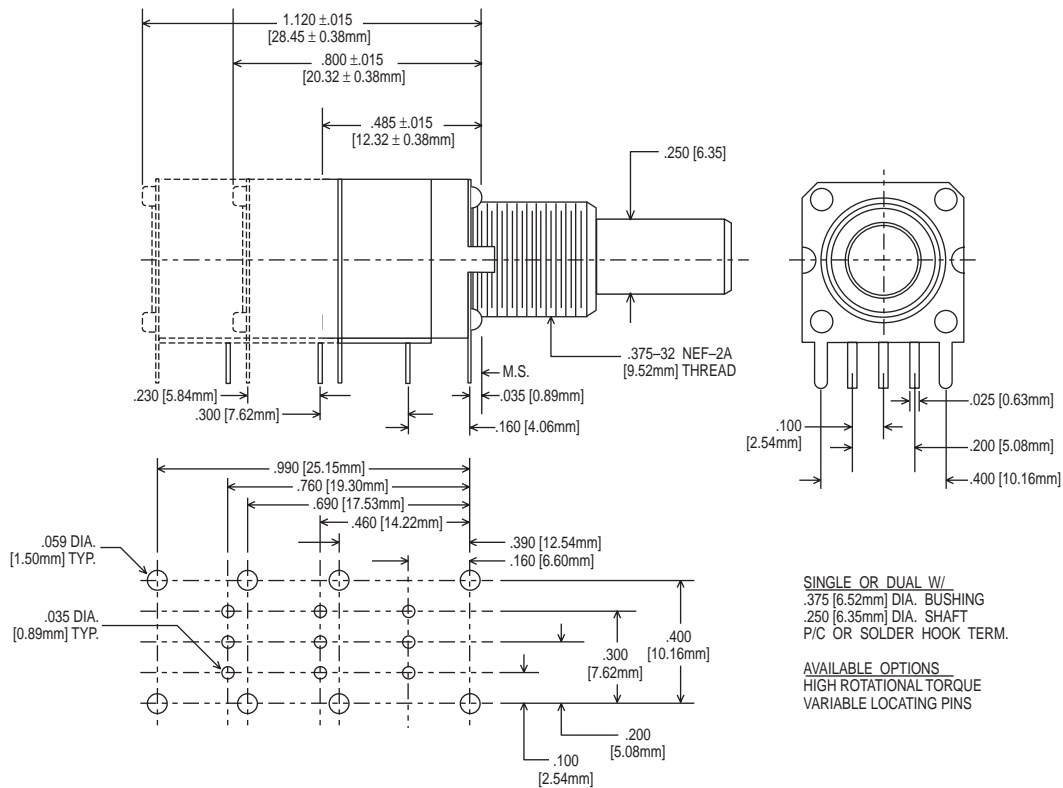


Figure 11

Series 308/309 Dual Concentric

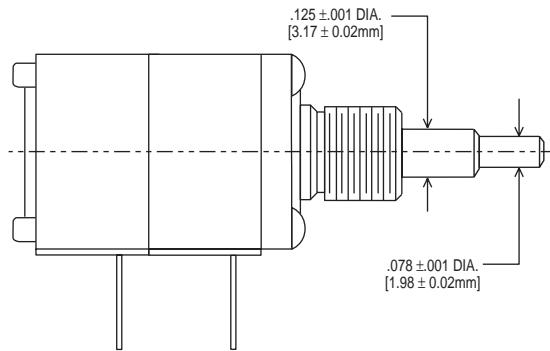


Figure 12

Series 308/309 Type C-10A Printed Circuit Terminals

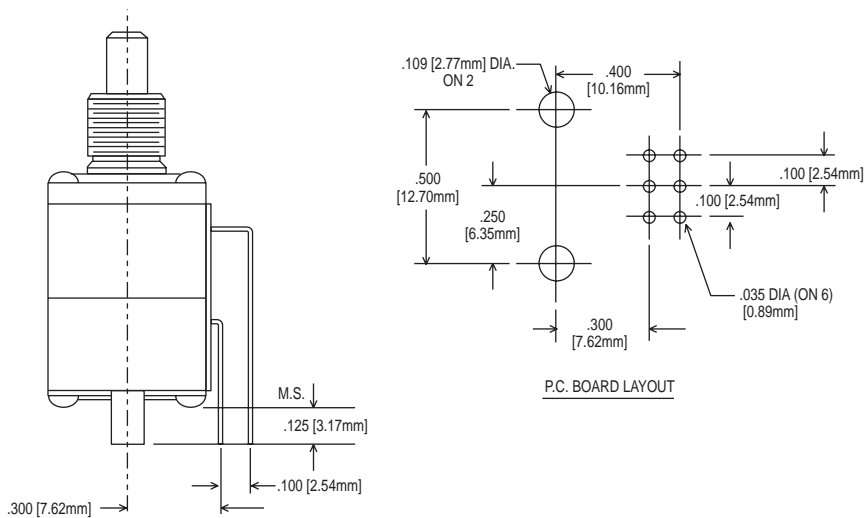


Figure 13

Series 308/309 Type A-18A Printed Circuit Terminals

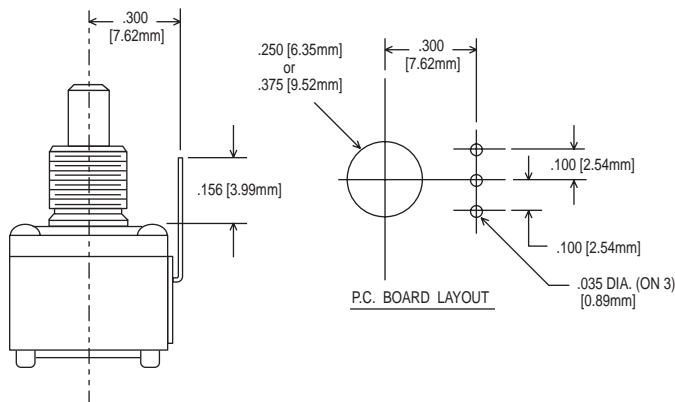


Figure 14

Series 308/309 Type C-8A Printed Circuit Terminals

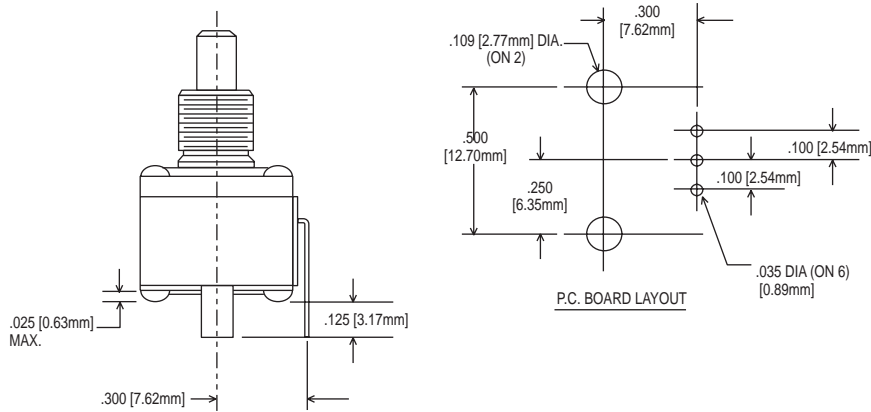
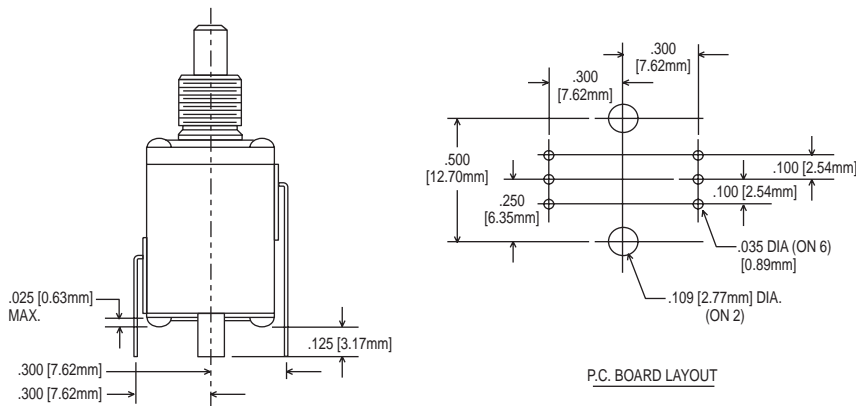


Figure 15

Series 308/309 Type C-9A Printed Circuit Terminals



Series 308/309 Standard Resistance Values Series 308/309 How to Order

Stock Values (Ohms)

308N				
100	1000	10K	100K	1Meg
250	2500	25K	250K	2.5Meg
500	5000	50K	500K	5Meg

308N - PC				
100	1000	10K	100K	1Meg
250	2500	25K	250K	2.5Meg
500	5000	50K	500K	5Meg

308L				
500	10K	100K		
1000	25K	250K		
5000	50K	500K		

309N				
100	1000	10K	100K	1Meg
250	2500	25K	250K	2.5Meg
500	5000	50K	500K	5Meg

309L/D308/T308/D309/T309

Please contact State Electronics for price and delivery

Example: D308-N-PPS-100-Z

<p>D308</p> <p>Series 308 = Single Conductive Plastic - 1/2 watt</p> <p>D308 = Dual Conductive Plastic - 1/2 watt</p> <p>T308 = Triple Conductive Plastic - 1/2 watt</p> <p>309 = Single Cermet - 1 watt</p> <p>D309 = Dual Cermet - 1 watt</p> <p>T309 = Triple Cermet - 1 watt</p>	<p>N</p> <p>Shaft & Bushing</p> <p>N = Shaft: 1/8 in. (3.18mm) diameter x 3/4 in. (19.05mm) FMS screwdriver slotted</p> <p>Bushing: 1/4 in. (6.35mm) diameter x 1/4 in. (6.35mm) length</p> <p>L = Shaft: 1/8 in. (3.17mm) diameter x 7/16 in. (11.11mm) FMS screwdriver slotted</p> <p>Locking Bushing: 3/8 in. (9.52mm) x 1/4 in. (6.35mm) - 32-NEF 2A thread</p>	<p>PPS</p> <p>Switches</p> <p>S = Rotary switch S.P.D.T.</p> <p>PM = Push Momentary S.P.S.T.</p> <p>PPS = Push/pull switch S.P.D.T.</p> <p>No switch requirement = Blank</p>	<p>100K</p> <p>Resistance Value (Ohms)</p>	<p>Z</p> <p>Taper</p> <p>Z = Log</p> <p>RZ = Reverse Log</p> <p>S = Linear</p>
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