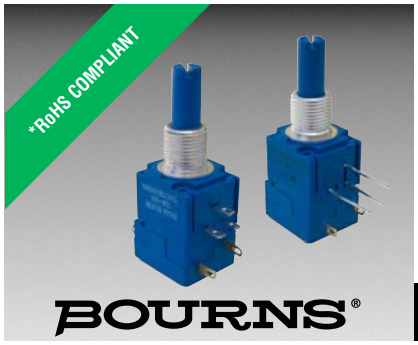



## Features

- Virtually infinite electrical circuit isolation
- Metal or plastic shaft options
- DPST and DPDT switch options
- RoHS compliant*

# Model 97 & 99 - 5/8 " Square Single-Turn Panel Control with Rotary Switch

## Potentiometer Specifications

| Initial Electrical Characteristics[1] | Conductive Plastic Element | Cermet Element |
|---|---|---|
| Standard Resistance Range | | |
| Linear Tapers (A, B, E, & H) | (B & E) 1 K ohms to 1 megohm | (A & H) 100 ohms to 1 megohm |
| Audio Tapers (C, D, F, G, S, & T) | (D,G,S, & T) 1 K ohms to 1 megohm | (C & F) 1 K ohms to 1 megohm |
| Total Resistance Tolerance | 10 % or 20 % | 5% or 10% |
| Independent Linearity | ±5 % | ±5 % |
| Absolute Minimum Resistance | 2 ohms maximum | 2 ohms maximum |
| Effective Electrical Angle | (Linear tapers) 240 ° ± 5 ° | (Linear tapers) 240 ° ± 6 ° |
| | (Audio tapers) 225 ° ± 5 ° | (Audio tapers) 225 ° ± 6 ° |
| Contact Resistance Variation | ±1 % | ±1 % or 3 ohms (whichever is greater) |
| Dielectric Withstanding Voltage (MIL-STD-202, Method 301) | | |
| Sea Level | 1,500 VAC minimum | 1,500 VAC minimum |
| 70,000 Feet | 500 VAC minimum | 500 VAC minimum |
| Insulation Resistance (500 VDC) | 1,000 megohms minimum | 1,000 megohms minimum |
| Power Rating (Voltage Limited By Power Dissipation or 350 VAC, Whichever Is Less) | | |
| +70 °C Single Section Assembly | (Linear tapers) 1 watt | (Linear tapers) 2 watts |
| | (Audio tapers) 0.5 watt | (Audio tapers) 1 watt |
| +70 °C Multiple Section Assembly | (Linear tapers) 0.5 watt/section | (Linear tapers) 1 watt/section |
| | (Audio tapers) 0.25 watt/section | (Audio tapers) 0.5 watt/section |
| +125 °C | 0 watt | 0 watt |
| Theoretical Resolution | Essentially infinite | Essentially infinite |

## Environmental Characteristics[1]

| | | |
|---|---|---|
| Operating Temperature Range | -40 °C to +125 °C | -40 °C to +125 °C |
| Storage Temperature Range | -55 °C to +125 °C | -55 °C to +125 °C |
| Temperature Coefficient Over Storage Temperature Range | ±1,000 ppm/°C | ±150 ppm/°C |
| Vibration (Single Section) | 15 G | 15 G |
| Total Resistance Shift | ±2 % maximum | ±2 % maximum |
| Voltage Ratio Shift | ±5 % maximum | ±5 % maximum |
| Shock (Single Section) | 30 G | 30 G |
| Total Resistance Shift | ±2 % maximum | ±2 % maximum |
| Voltage Ratio Shift | ±5 % maximum | ±5 % maximum |
| Load Life | 1,000 hours | 1,000 hours |
| Total Resistance Shift | ±10 % maximum | ±5 % maximum |
| Rotational Life (No Load) | 100,000 cycles | 100,000 cycles |
| Total Resistance Shift | (Linear tapers) 10 ohms or ±15 % TRS max. (whichever is greater) | (All tapers) ±5 % TRS max. |
| | (Audio tapers) ±20 % maximum | |
| Contact Resistance Variation @ 50,000 cycles | (Linear tapers) ±2 % | ±2 % |
| | (Audio tapers) ±3 % | ±3 % |
| Moisture Resistance (MIL-STD-202, Method 103, Condition B) | | |
| Total Resistance Shift | (Linear tapers) ±10 % TRS maximum | (All tapers) ±5 % TRS maximum |
| | (Audio tapers) ±20 % TRS maximum | |
| Insulation Resistance (500 VDC) | 100 megohms minimum | 100 megohms minimum |
| IP Rating | IP 40 | IP 40 |

*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

## Potentiometer Specifications

### Mechanical Characteristics[1]

| | |
|---|---|
| Stop Strength (1/4 ” D shaft) | 45.19 N-cm (4 lb.-in.) |
| (1/8 ” D shaft) | 33.89 N-cm (3 lb.-in.) |
| Mechanical Angle | 300 ° ±5 ° |
| Torque | |
| Starting | 0.3 max. above average running torque |
| Running Torque | |
| Single or Dual Section (A & R Bushings) | 0.21 to 1.06 N-cm (0.3 to 1.5 oz.-in.) |
| Single or Dual Section (C & U Bushings) | 0.14 to 1.06 N-cm (0.2 to 1.5 oz.-in.) |
| Mounting | 1.7-2.0 N-m (15-18 lb.-in.) maximum |
| Variation | 0.35 N-cm (0.5 oz.-in.) maximum in 45 ° shaft travel |
| Weight (Single Section, Metal Bushing) | 12.7 grams nominal |
| (Each Additional Section) | 4 grams nominal |
| Terminals | Printed circuit terminals, J-Hooks or solder lugs |
| Soldering Condition | Recommended hand soldering using Sn95/Ag5 no clean solder, 0.025 ” wire diameter. Maximum temperature 399 °C (750 °F) for 3 seconds. No wash process to be used with no clean flux. |
| Marking | Manufacturer’s trademark, date code, resistance, manufacturer’s part number |
| Ganging (Multiple Section Potentiometers) | 2 cups maximum |
| Hardware | One lockwasher and one mounting nut is shipped with each potentiometer, except where noted in the part number. |

NOTE: Performance specifications do not apply to units subjected to printed circuit board cleaning procedures.

[1]At room ambient: +25 °C nominal and 50 % relative humidity nominal, except as noted.

## Rotary Switch Specifications

### Initial Electrical Characteristics[1]

Contacts:
- DPST ..... N.O/N.O., N.C./N.C. or N.O./N.C.
- DPDT ..... 2 N.O./N.C. (break before make)

Power Rating (Resistive Load):
- DPST ..... 2 A @ 125 volts RMS-60 Hz or 2 A @ 28 VDC, 1 A @ 250 volts RMS-60 Hz
- DPDT ..... 1 A @ 125 volts RMS-60 Hz or 1 A @ 28 VDC

Contact Resistance (0.1 VDC-10 mA) ..... 10 milliohms nominal
Contact Bounce ..... 5 milliseconds maximum
Dielectric Withstanding Voltage (MIL-STD-202, Method 301)
- Sea Level ..... 1500 VAC minimum

Insulation Resistance ..... 1000 megohms minimum

### Environmental Characteristics[1]

Operating Temperature Range ..... 0 °C to +70 °C
Exposure Temperature Range ..... -65 °C to +125 °C
Vibration (Dual Section) ..... 8 G
- Contact Resistance ..... 10 milliohms maximum
- Contact Bounce ..... 0.1 millisecond maximum

Shock (Dual Section) ..... 20 G
- Contact Resistance ..... 10 milliohms maximum
- Contact Bounce ..... 0.1 millisecond maximum

Rotational Life ..... 25,000 cycles
- Switch Actuating Torque (50% Duty cycle @ Rated Power Load) ..... 1.41 to 4.94 N-cm (2 to 7 oz.-in.)
- Contact Resistance ..... 100 milliohms maximum

Moisture Resistance (MIL-STD-202, Method 106, Condition B)
- Contact Resistance (0.1 VDC-10 mA) ..... 10 milliohms maximum
- Insulation Resistance (After 24 Hours @ Room Temperature) (500 VDC) ..... 100 megohms minimum

Housing Material ..... High temperature, flame retardant, thermosetting plastic

### Mechanical Characteristics[1]

Actuating Torque (Each Section, Switch Module Only) ..... 3.53 to 10.59 N-cm (5 to 15 oz.-in.)
Running Torque (Out of Detent, 2-4 Module Assembly) ..... 0.21 to 1.41 N-cm (0.3 to 2 oz.-in.)
Detent ..... CW or CCW standard
Actuation Angle ..... 20 ° ±5 °
Contact Materials ..... Fine silver with gold overlay
Terminal Styles ..... Solder lug only
- Standard Orientation ..... In-line with control terminals
- Optional ..... Rotated 90 ° CCW from standard

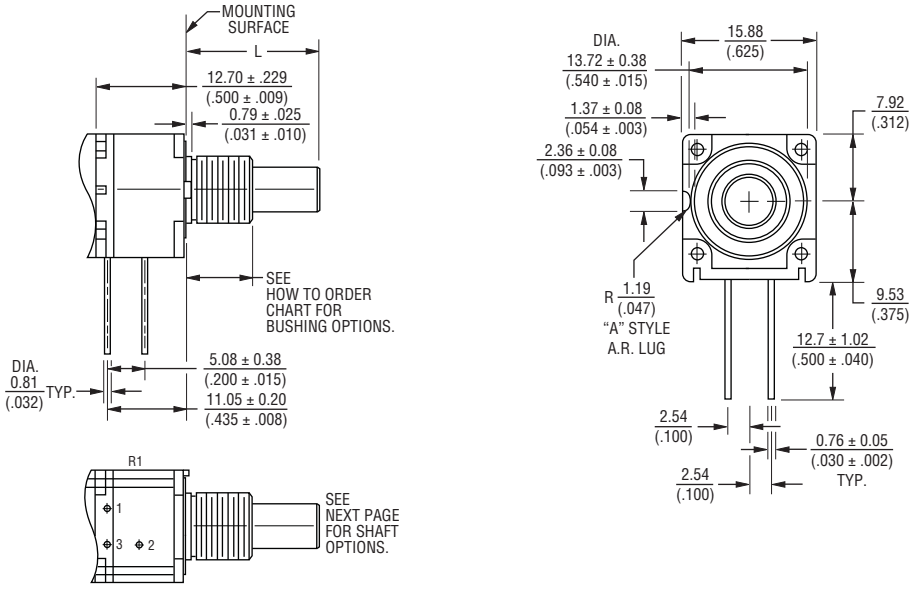
Terminal Strength (Before and After Soldering Heat Exposure) ..... 0.9 kg (2 lbs.) minimum

NOTE: Performance specifications do not apply to units subjected to printed circuit board cleaning procedures.

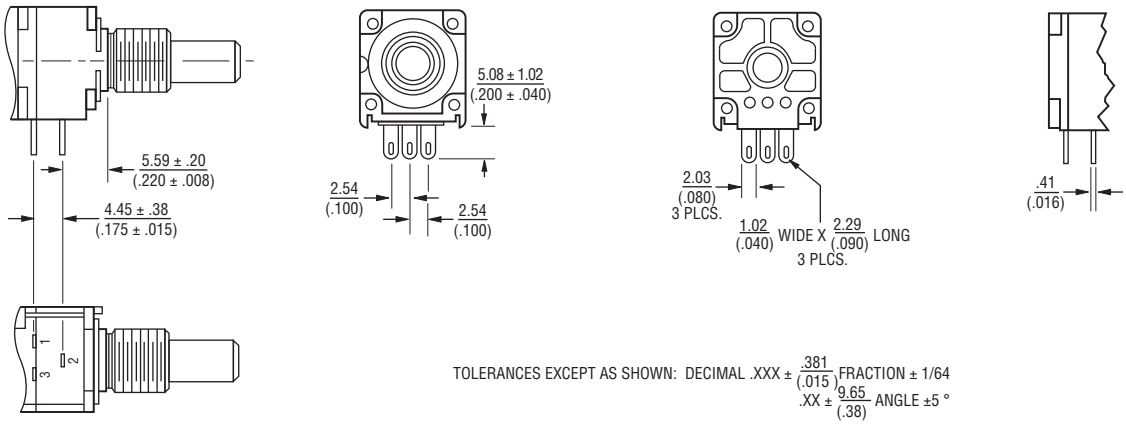
[1]At room ambient: +25 °C nominal and 50 % relative humidity nominal, except as noted.

## Product Dimensions

### Model 97 PC Pin Terminals, “L” Pattern



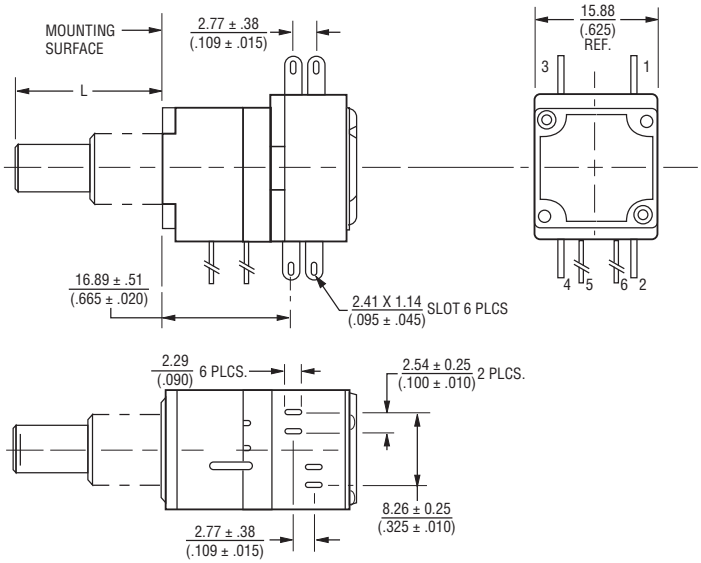

### Model 99 Solder Lug Terminals, "Triangular" Pattern



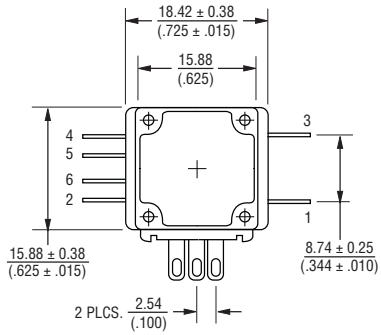

TOLERANCES EXCEPT AS SHOWN: DECIMAL .XXX ± .381 (.015) FRACTION ± 1/64
.XX ± 9.65 (.38) ANGLE ±5 °

## Product Dimensions

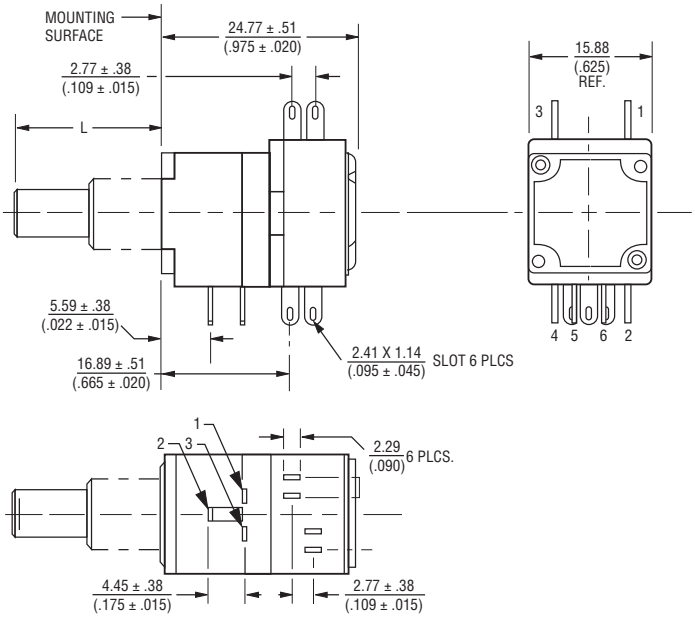
**Model 97**
**(2nd Cup - Switch)**



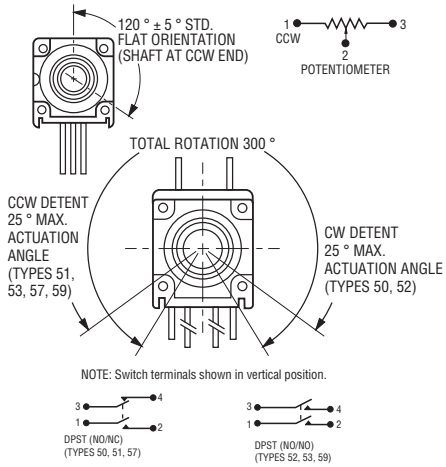

**Horizontal Term.**
**(Switch Types R57, R59)**




**Model 99**
**(2nd Cup - Switch)**




**Switch Module Variations**
**Shaft Flat Orientation**



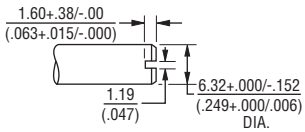

TOLERANCES EXCEPT AS SHOWN: DECIMAL .XXX ± .381 (.015) FRACTION ± 1/64
.XX ± 9.65 (.38) ANGLE ±5 °

DIMENSIONS: MM (INCHES)

## Product Dimensions

### Plastic Shaft Styles

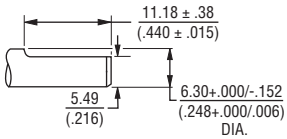
**SHAFT TYPE "B"** (USES BUSHING A)




STD. LENGTHS:

| | | | |
|---|---|---|---|
| 12.70 (.500) | 15.88 (.625) | 19.05 (.750) | 22.23 (.875) |

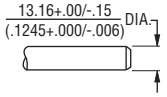
**SHAFT TYPE "C"** (USES BUSHING A)




STD. LENGTHS:

| | |
|---|---|
| 19.05 (.750) | 22.23 (.875) |

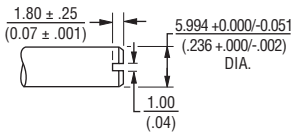
**SHAFT TYPE "D"** (USES BUSHING C)




STD. LENGTHS:

| | | |
|---|---|---|
| 12.70 (.500) | 15.88 (.625) | 19.05 (.750) |

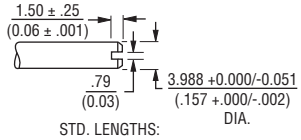
**SHAFT TYPE "R"** (USES BUSHING R)




STD. LENGTHS:

| | |
|---|---|
| 16.0 (.630) | 22.0 (.866) |

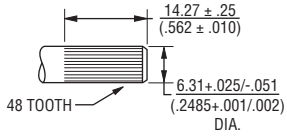
**SHAFT TYPE "T"** (USES BUSHING U)




STD. LENGTHS:

| | |
|---|---|
| 16.0 (.630) | 22.0 (.866) |

**SHAFT TYPE "W"** (USES BUSHING A)

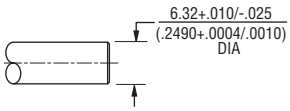



STD. LENGTHS:

| |
|---|
| 25.40 (1.00) |

### Metal Shaft Styles

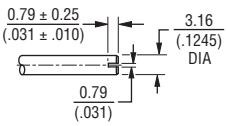
**SHAFT TYPE "A"** (USES BUSHING A)




STD. LENGTHS:

| | | | | |
|---|---|---|---|---|
| 12.70 (.500) | 15.88 (.625) | 19.05 (.750) | 22.23 (.875) | 25.4 (1.000) |

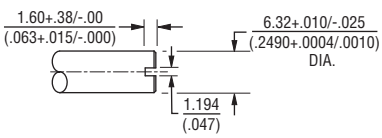
**SHAFT TYPE "E"** (USES BUSHING C)




STD. LENGTHS:

| | | |
|---|---|---|
| 12.0 (.500) | 16.0 (.625) | 19.0 (.750) |

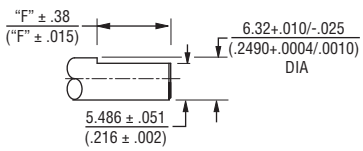
**SHAFT TYPE "G"** (USES BUSHING A)




STD. LENGTHS:

| | | | |
|---|---|---|---|
| 12.70 (.500) | 15.88 (.625) | 19.05 (.750) | 22.23 (.875) |

**SHAFT TYPE "H"** (USES BUSHING A)



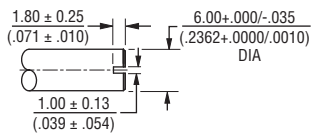

STD. LENGTHS:

| | |
|---|---|
| 19.05 (.750) | 22.23 (.875) |

FLAT LENGTH "F":

| | |
|---|---|
| 7.95 (.313) | 11.13 (.438) |

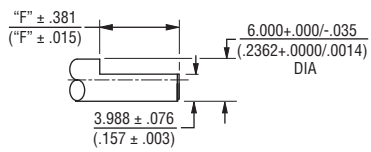
**SHAFT TYPE "J"** (USES BUSHING R)




STD. LENGTHS:

| | |
|---|---|
| 16.0 (.630) | 22.0 (.866) |

**SHAFT TYPE "S"** (USES BUSHING R)



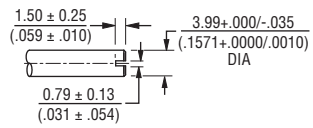

STD. LENGTHS:

| | |
|---|---|
| 19.05 (.750) | 22.23 (.875) |

FLAT LENGTH "F":

| | |
|---|---|
| 9.98 (.393) | 12.98 (.511) |

**SHAFT TYPE "V"** (USES BUSHING U)




STD. LENGTHS:

| | |
|---|---|
| 19.05 (.750) | 22.23 (.875) |

TOLERANCES EXCEPT AS SHOWN: .XX = ± .02 (.050)

.XXX = ± .005 (.127)

.XXXX = ± .0005 (.0127)

DIMENSIONS: MM (INCHES)

Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

# How to Order Model 97 & 99 Panel Controls

BOURNS®

| 99 | A | 2 | A | - | B | 28 | - | A | 15 | / | R51 | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| ANTI-ROTATION LUG | |
|---|---|
| **A** | **Single .305 ” (7.8 mm) R, 90 °CW** |
| **D** | **No Lug** |

| # SECTIONS | | |
|---|---|---|
| 2 | Dual | 2nd Section is a Switch |

| BUSHING | |
|---|---|
| **A** | **Metal Plain 3/8 ” (9.53 mm) D x 3/8 ” (9.53 mm) L** |
| C | Metal Plain 1/4 ” (6.35 mm) D x 1/4 ” (6.35 mm) L |
| R | Metal Plain 10 mm D x 9 mm L |

| MODEL | |
|---|---|
| 97 | Single-Turn, L-Pattern PC Pins w/Switch |
| **99** | **Single-Turn, Triangle-Pattern Solder Lugs w/Switch** |

| SHAFT LENGTH (FMS) | | AVAILABLE ONLY IN BUSHING |
|---|---|---|
| **Code** | **Description** | **Code** |
| 16 | 1/2 ”L | A, C |
| 20 | 5/8 ”L | A, C |
| **24** | **3/4 ”L** | A, C |
| **28** | **7/8 ”L** | **A** |
| 32 | 1 ”L | A |
| | **METRIC** | |
| 16 | 16 mmL | R |
| **22** | **22 mmL** | R |

| SHAFT TYPE | | AVAILABLE ONLY IN LENGTHS (CODE) | AVAILABLE ONLY IN BUSHINGS (CODE) |
|---|---|---|---|
| **B** | **Plastic Single Slotted 1/4 " (6.35 mm) D** | 16, 20, 24, 28 | **A** |
| **C** | **Plastic Single Flatted 1/4" (6.35 mm) D** | 24, 28 | **A** |
| D | Plastic Single Plain 1/8" (3.18 mm) D | 16, 20, 24 | C |
| **R** | **Plastic Single Slotted 6 mm D** | Metric 16, 22 | R |
| **T** | **Plastic Single Slotted 4 mm D** | Metric 16, 22 | U |
| W | Plastic Single Knurled 1/4" (6.35 mm) D | 32 | **A** |
| **A** | **Metal Single Plain 1/4" (6.35 mm) D** | 16, 20, 24 | **A** |
| **E** | **Metal Single Slotted 1/8" (3.18 mm) D** | 16, 20, 24 | **C** |
| **G** | **Metal Single Slotted 1/4" (6.35 mm) D** | 16, 20, 24, 28 | **A** |
| **H** | **Metal Single Flatted 1/4" (6.35 mm) D** | 24, 28 | **A** |
| **J** | **Metal Single Slotted 6 mm D** | Metric16, 22 | R |
| **S** | **Metal Single Flatted 6 mm D** | Metric 16, 22 | R |
| **V** | **Metal Single Slotted 4 mm D** | Metric 16, 22 | U |

| RoHS IDENTIFIER | |
|---|---|
| **L** | **Compliant** |

| SWITCH TYPE | |
|---|---|
| **(R50)** | **DPST N.O./N.C. CW Detent In-Line Term** |
| (R51) | DPST N.O./N.C. CCW Detent In-Line Term |
| (R52) | DPST N.O./N.O. CW Detent In-Line Term |
| (R53) | DPST N.O./N.O. CCW Detent In-Line Term |
| (R57) | DPST N.O./N.C. CCW Detent Horz Term |
| (R59) | DPST N.O./N.O. CCW Detent Horz Term |

| ELEMENT TAPER TYPE/TOLERANCE | | RESISTANCE CODE VALUE IN OHMS | |
|---|---|---|---|
| **(A)** | **Linear Cermet ±10 %** | (05) - 100 | (30) - 15 K |
| (H) | Linear Cermet ±5 % | (28) - 150 | (16) - 20 K |
| | | (06) - 200 | (17) - 25 K |
| | | (07) - 250 | **(18) - 50 K** |
| | | (08) - 500 | **(20) - 100 K** |
| | | **(10) - 1 K** | (21) - 200 K |
| | | (11) - 2 K | (22) - 250 K |
| | | (12) - 2.5 K | (23) - 500 K |
| | | **(13) - 5 K** | (25) - 1 M |
| | | **(15) - 10 K** | |
| **(B)** | **Linear C-P ±20 %** | **(10) - 1 K** | **(18) - 50 K** |
| (E) | Linear C-P ±10 % | (12) - 2.5 K | **(20) - 100 K** |
| | | **(13) - 5 K** | (22) - 250 K |
| | | **(15) - 10 K** | (23) - 500 K |
| | | (16) - 20 K | (25) - 1 M |
| | | (17) - 25 K | |
| (C) | CW Audio Cermet ±10 % | (10) - 1 K | (18) - 50 K |
| (D) | CW Audio C-P ±20 % | (12) - 2.5 K | (20) - 100 K |
| (F) | CCW Audio Cermet ±10 % | (13) - 5 K | (22) - 250 K |
| (G) | CCW Audio C-P ±20 % | (15) - 10 K | (23) - 500 K |
| (S) | CW Audio C-P ±10 % | (17) - 25 K | (25) - 1 M |
| (T) | CCW Audio C-P ± 10 % | | |

*Boldface features are Bourns standard options. All others are available with higher minimum order quantities.*

REV. 10/12

Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

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