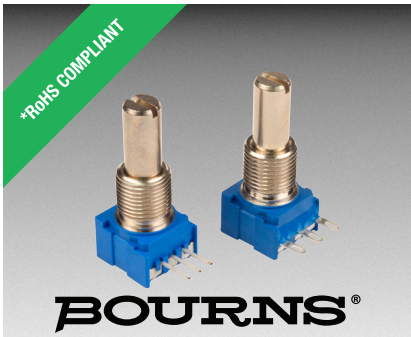




**THE DATASHEET OF
53CAA-E28-D13L**





Features

- RoHS compliant*
- Conductive plastic or cermet
- Linear and audio tapers
- PC board and bushing mount
- Gangable
- Metal bushing and shaft
- Sealed for board washing

Additional Information

Click these links for more information:



51/53 – Sealed 1/2" (12.5 mm) Square Control

Electrical Characteristics ¹	Conductive Plastic	Cermet
Standard Resistance Range		
Linear.....	1 K ohms to 1 megohm.....	150 ohms to 1 megohm
Audio.....	1 K ohms to 1 megohm.....	1 K ohms to 1 megohm
Total Resistance Tolerance		
Linear Tapers.....	±10 % or ±20 %.....	±10 % or ±5 %
Audio Tapers.....	±10 % or ±20 %.....	±10 %
Independent Linearity.....	±5 %.....	±5 %
Absolute Minimum Resistance.....	2 ohms maximum.....	2 ohms maximum
Effective Electrical Angle.....	270 ° ±5 °.....	270 ° ±5 °
Contact Resistance Variation.....	2 %.....	2 %
Dielectric Withstanding Voltage (MIL-STD-202 – Method 301)		
Sea Level.....	1,500 VAC minimum.....	1,500 VAC minimum
70,000.....	500 VAC minimum.....	500 VAC minimum
Insulation Resistance.....	1,000 megohms minimum.....	1,000 megohms minimum
Power Rating At 70 °C (Derate To 0 At 125 °C) (Voltage Limited By Power Dissipation or 350 VAC, Whichever Is Less)		
Linear Tapers.....	0.5 watt.....	1.0 watt
Audio Tapers.....	0.25 watt.....	0.5 watt
Theoretical Resolution.....	Essentially infinite.....	Essentially infinite

Environmental Characteristics ¹	Conductive Plastic	Cermet
Operating Temperature Range.....	+1 °C to +125 °C.....	+1 °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 % TRS maximum.....	±5 % TRS maximum
Rotational Life (No Load).....	50,000 cycles.....	25,000 cycles
Total Resistance Shift.....	±10 % TRS maximum.....	±10 % TRS maximum
Contact Resistance Variation @ 25,000 Cycles.....	±2 %.....	±4 %
Moisture Resistance (MIL-STD-202, Method 103, Condition B)		
Total Resistance Shift.....	±10 % TRS.....	±5 % TRS
IP Rating		
Entire Unit.....	IP64.....	IP64
Shaft/Bushing.....	IP65.....	IP65

Mechanical Characteristics	
Stop Strength.....	56 N-cm (5 lb.-in.)
Mechanical Angle.....	290 ° ±5 °
Torque	
Starting (Dual Sections).....	+0.35 N-cm (+0.5 oz.-in.) maximum
Running (Single Section).....	0.15 to 1.4 N-cm (0.2 to 2.0 oz.-in.)
Running (Dual Section).....	0.35 to 1.8 N-cm (0.5 to 2.5 oz.-in.)
Detent (Single Section).....	1.94 N-cm (2.75 oz.-in.) minimum
Mounting (Torque on Bushing).....	1.7 to 2.0 N-m (15 to 18 lb.-in.) maximum
Weight (Single Section).....	5.5 grams
(Additional Section).....	3.0 grams
Terminals.....	PC pin or solder lug
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. Part can be wave soldered at 260 °C (500 °F) for 5 seconds, no wash process with no clean flux.
Marking.....	Manufacturer's trademark, part number and date code
Ganging (Multiple Section Potentiometer).....	2 sections maximum**
Hardware.....	One lockwasher and one mounting nut is shipped with each potentiometer (Bushing A: H-37-2 & H-38-2; Bushing C: H-37-1 & H-38-1; Bushing R: H-37-4 & H-38-9; Bushing S: H-37-1 & H-38-14; Bushing U: H-37-3 & H-38-8)

¹Electrical specifications tested at 200 RPM, at room ambient: +25 °C nominal.

** Additional sections available on special request with higher minimum order quantities.



WARNING
Cancer and Reproductive Harm
www.P65Warnings.ca.gov

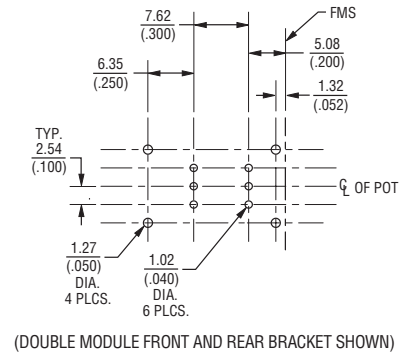
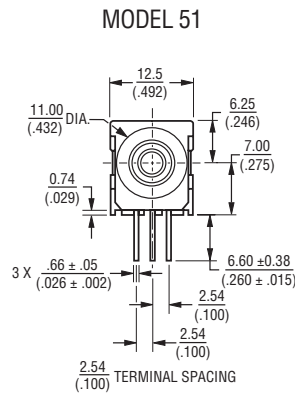
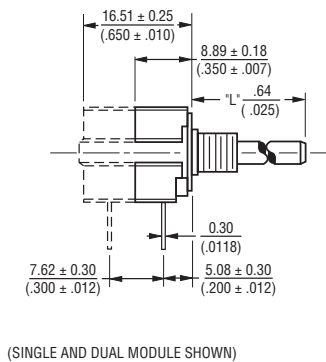
*RoHS Directive 2015/863, Mar 31, 2015 and Annex.
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51/53 – Sealed 1/2" (12.5 mm) Square Control

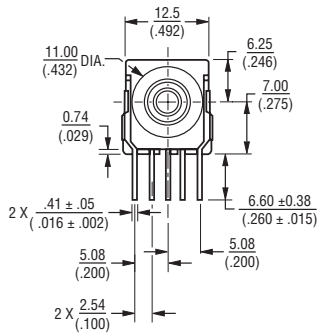
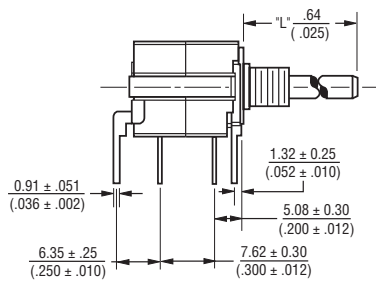


Product Dimensions

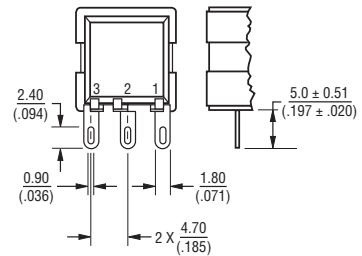
PACKAGE DIMENSIONS



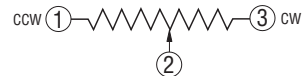
PACKAGE DIMENSIONS PCB MOUNTING BRACKET



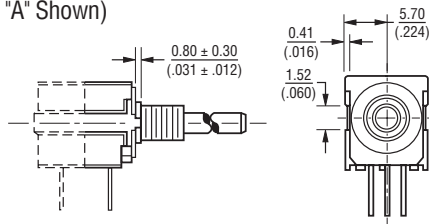
SOLDER LUG TERMINALS MODEL 53



ELECTRICAL SCHEMATIC

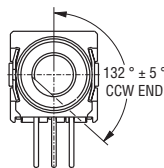


ANTI-ROTATION LUG (Style "A" Shown)

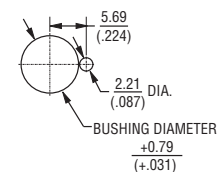


DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

SHAFT FLAT ORIENTATION



SUGGESTED PANEL LAYOUT



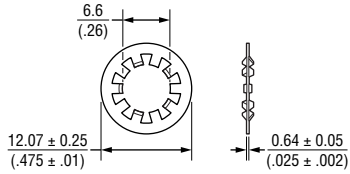
FOR TOLERANCES SHOWN: .XX = ± (.010)
 .XXX = ± (.005)
 SHAFT DIMENSIONS = ± $\frac{.80}{(1/32)}$

51/53 – Sealed 1/2" (12.5 mm) Square Control

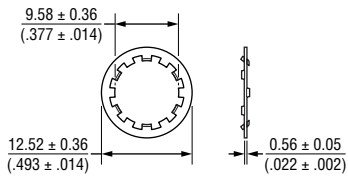
BOURNS®

Hardware

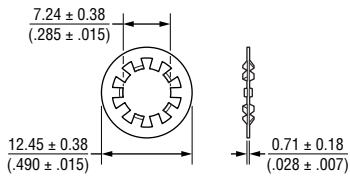
LOCKWASHER H-37-1



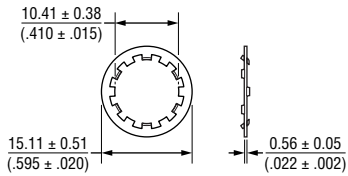
LOCKWASHER H-37-2



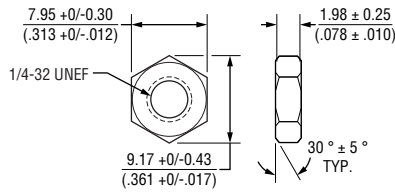
LOCKWASHER H-37-3



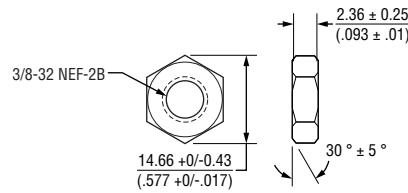
LOCKWASHER H-37-4



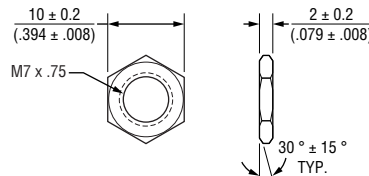
NUT H-38-1



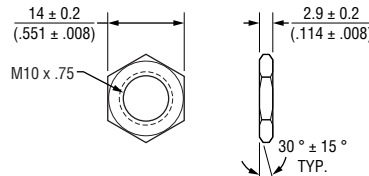
NUT H-38-2



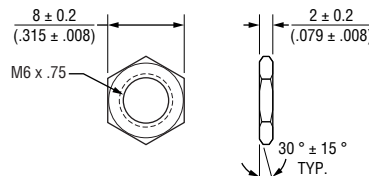
NUT H-38-8



NUT H-38-9

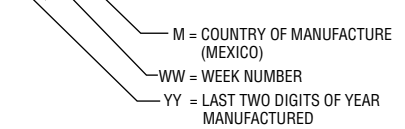


NUT H-38-14



Date Code Description

YY W W M



Specifications are subject to change without notice.

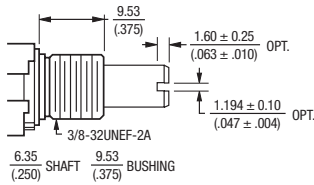
Users should verify actual device performance in their specific applications.

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51/53 – Sealed 1/2" (12.5 mm) Square Control

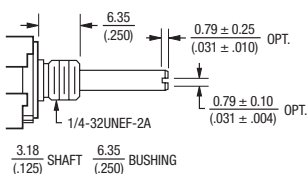


Shaft/Bushing Styles



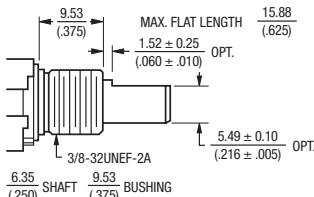
A Style Bushing

STD. LENGTH 'L'	
.500	(12.7)
.625	(15.88)
.750	(19.05)
.875	(22.23)
1.000	(25.4)



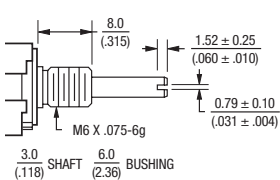
C Style Bushing

STD. LENGTH 'L'	
.375	(9.53)
.500	(12.7)
.625	(15.88)
.750	(19.05)
.875	(22.23)
1.000	(25.4)



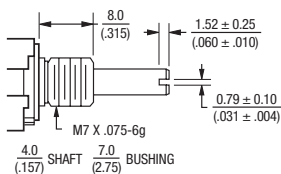
A Style Bushing - Flatted Shaft

STD. LENGTH 'L'	
.625	(15.88)
.750	(19.05)
.875	(22.23)
1.000	(25.4)



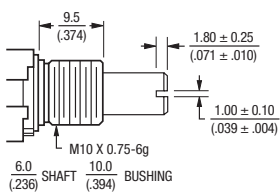
S Style Bushing

STD. LENGTH 'L'	
.630	(16.0)
.866	(22.0)
.984	(25.0)



U Style Bushing

STD. LENGTH 'L'	
.630	(16.0)
.866	(22.0)
.984	(25.0)



R Style Bushing

STD. LENGTH 'L'	
.630	(16.0)
.866	(22.0)
.984	(25.0)

DIMENSIONS: $\frac{MM}{(INCHES)}$

How To Order

51 A A D - B 28 - A 15 / A15 L

Part number for multiple section potentiometers must have a taper and resistance value for each section.

RoHS IDENTIFIER	
L	Compliant

MOUNTING BRACKET/ ANTI-ROTATION LUG

Code	Description
A	AR Lug 90 °CW
D	No AR Lug or Bracket
L	Front Bracket
M	Rear Bracket
N	Front and Rear Bracket

SECTIONS/DETENTS

Code	Description
A	Single No Detent
B	Double No Detent
E	Single w/Center Detent
F	Double w/Center Detent

BUSHING CONFIGURATION

Code	Description
A	3/8" D x 3/8" L
C	1/4" D x 1/4" L
R	10 mm D x 9.5 mm L
S	6 mm D x 8 mm L
U	7 mm D x 8 mm L

MODEL

Code	Description
51	PC Pins (.100" centers)
53	Solder Lugs

ELEMENT TAPER TYPE/TOLERANCE		RESISTANCE (CODE)	
Code	Description	VALUE IN OHMS	
(A)	Linear Cermet ±10 %	(28) – 150	(14) – 7.5 K
(H)	Linear Cermet ±5 %	(06) – 200	(15) – 10 K
		(07) – 250	(30) – 15 K
		(08) – 500	(16) – 20 K
		(09) – 750	(17) – 25 K
		(10) – 1 K	(18) – 50 K
		(29) – 1.5 K	(19) – 75 K
		(11) – 2 K	(20) – 100 K
		(12) – 2.5 K	(23) – 500 K
		(13) – 5 K	(25) – 1 M
(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
(F)	CCW Audio Cermet ±10 %	(12) – 2.5 K	(20) – 100 K
		(13) – 5 K	(23) – 500 K
		(15) – 10 K	(25) – 1 M
		(17) – 25 K	
(D)	CW Audio C-P ±20 %	(10) – 1 K	(18) – 50 K
(S)	CW Audio C-P ±10 %	(12) – 2.5 K	(20) – 100 K
		(13) – 5 K	(22) – 250 K
		(15) – 10 K	(23) – 500 K
		(17) – 25 K	(25) – 1 M
(G)	CCW Audio C-P ±20 %	(10) – 1 K	(18) – 50 K
(T)	CCW Audio C-P ±10 %	(12) – 2.5 K	(20) – 100 K
		(13) – 5 K	(22) – 250 K
		(15) – 10 K	(23) – 500 K
		(17) – 25 K	(25) – 1 M
(Y)	CW Dual Audio Taper C-P ±20 %	(10) – 1 K	(18) – 50 K
		(12) – 2.5 K	(20) – 100 K
		(13) – 5 K	(22) – 250 K
		(15) – 10 K	(23) – 500 K
		(17) – 25 K	(25) – 1 M

SHAFT TYPE		AVAILABLE ONLY IN BUSHINGS	
Code	Description	Code	Description
B	Single Slotted 1/4" D	A	24,28
C	Single Flatted 1/4" D	A	20,24,28,32
E	Single Slotted 1/8" D	C	12,16,20,24,28
R	Single Slotted 6 mm D	R	16,22,25
T	Single Slotted 4 mm D	U	16,22,25
U	Single Slotted 3 mm D	S	16,22,25

SHAFT LENGTH (FMS)		AVAILABLE ONLY IN BUSHING
Code	Description	Code
12	3/8"	C
16	1/2"	A, C
20	5/8"	A, C
24	3/4"	A, C
28	7/8"	A, C
32	1"	A, C
Metric		
16	16 mm	R, S, U
22	22 mm	R, S, U
25	25 mm	R, S, U

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Click below to explore more details on WIN SOURCE:

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 [Bourns Inc. Information](#)

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-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management