



## Features

- Repeatable settings
- Resolution to 0.001 %
- Digital display provides excellent readability
- Snap-in panel mount
- RoHS compliant\*

## 3680 Family - Precision Potentiometer

### Electrical Characteristics<sup>1</sup>

|   |  |
|---|--|
| Standard Resistance Range.....  | 10 ohms to 1 megohm                            |
| Total Resistance Tolerance.....   | ±3 %   |
| Dielectric Withstanding Voltage (MIL-STD-202, Method 301)<br>Sea Level .....      | 1,000 VAC minimum                              |
| Power Rating (Voltage Limited By Power Dissipation or 500 VAC, Whichever is Less) |  |
| +25 °C .....  | 2 watts  |
| +85 °C .....  | 0 watt   |
| Insulation Resistance (500 VDC) .....   | 1,000 megohms minimum                          |
| Resolution  |  |
| 3681 .....  | 10 %   |
| 3682 .....  | 1 %  |
| 3683 .....  | 0.1 %  |
| 3684 .....  | 0.01 %   |
| 3685 .....  | 0.001 %  |
| Absolute Minimum Resistance .....   | 3 ohms or 0.2 % maximum (whichever is greater) |
| Accuracy (Dial Reading to Output Ratio).....                                      | ±1.0 % full scale                              |

### Environmental Characteristics<sup>1</sup>

|  |                                      |
|--|--------------------------------------|
| Operating Temperature Range .....                            | -25 °C to +85 °C                     |
| Storage Temperature Range .....                              | -25 °C to +85 °C                     |
| Temperature Coefficient Over Storage Temperature Range ..... | ±100 ppm/°C maximum                  |
| Vibration .....  | 10 G                                 |
| Wiper Bounce .....   | 0.1 millisecond maximum              |
| Total Resistance Shift.....                                  | ±1 % maximum                         |
| Voltage Ratio Shift .....                                    | ±0.2 % maximum                       |
| Shock.....   | 50 G                                 |
| Wiper Bounce .....   | 0.1 millisecond maximum              |
| Total Resistance Shift.....                                  | ±1 % maximum                         |
| Voltage Ratio Shift .....                                    | ±0.2 % maximum                       |
| Load Life.....   | 1,000 hours, 2 watts                 |
| Total Resistance Shift.....                                  | ±2 % maximum                         |
| Rotational Life.....   | 75,000 button operations each decade |
| Total Resistance Shift.....                                  | ±2 % maximum                         |
| IP Rating.....   | IP 40                                |

### Mechanical Characteristics<sup>1</sup>

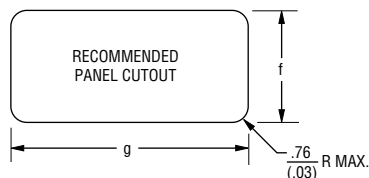
|   |   |
|---|---|
| Weight .....                                    | 3681 (9 gm); 3682 (16 gm); 3683 (23 gm); 3684 (30 gm); 3685 (37 gm)                               |
| Terminals .....                                 | 2.79 mm (0.11 in.) wide x .41 mm (.016 in.) thick,<br>tinned solder lugs for 3 #20 AWG wires      |
| Soldering Condition                             |   |
| Manual Soldering.....                           | 96.5Sn/3.0Ag/0.5Cu solid wire or no-clean<br>rosin cored wire; 370 °C (700 °F) max. for 3 seconds |
| Wave Soldering .....                            | 96.5Sn/3.0Ag/0.5Cu solder with no-clean flux; 260 °C (500 °F) max.<br>for 5 seconds               |
| Wash processes .....                            | Not recommended   |
| Marking.....                                    | Manufacturer's name and part number, resistance value and date code.                              |
| Ganging (Multiple Section Potentiometers) ..... | Up to 5 decades maximum   |
| Readout Marking .....                           | 10 positions, 0-9   |
| Actuating Force .....                           | 19 to 29 oz. on detent decades  |
| Actuating Force Variation .....                 | 4 oz. maximum   |

<sup>1</sup> At room ambient: +25 °C nominal and 50 % relative humidity nominal, except as noted.  
NOTE: Terminals 1 & 3 are reversed from illustration for models 3682 and 3684.

### Product Dimensions

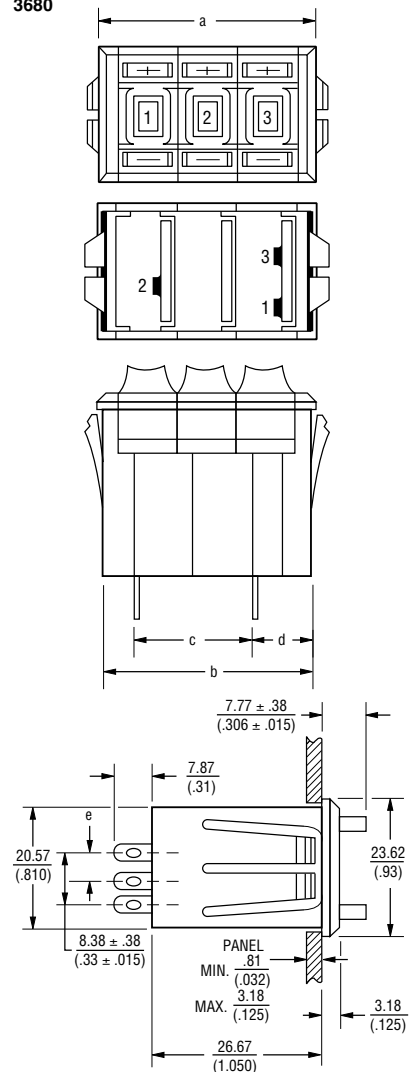
| Model | Dimensions    |               |               |             |                 | Weight (Approx.) |      |
|-------|---------------|---------------|---------------|-------------|-----------------|------------------|------|
|       | a             | b             | c             | d           | e ±.381 (±.015) | oz.              | gms. |
| 3681  | 16.51 (.650)  | 14.99 (.590)  | —             | 9.91 (.39)  | 4.19 (.165)     | .336             | 9.5  |
| 3682  | 26.67 (1.05)  | 25.15 (.99)   | 10.67 (.42)   | 11.94 (.47) | 8.38 (.330)     | .576             | 16.5 |
| 3683  | 37.08 (1.46)  | 35.31 (1.39)  | 18.54 (.73)   | 11.94 (.47) | 4.19 (.165)     | .824             | 23.5 |
| 3684  | 47.50 (1.87)  | 45.47 (1.79)  | 30.73 (1.21)  | 11.94 (.47) | 8.38 (.330)     | 1.072            | 30.5 |
| 3685  | 57.66 (2.270) | 55.63 (2.190) | 39.12 (1.540) | 11.94 (.47) | 4.19 (.165)     | 1.320            | 37.5 |

| Model | Dimensions      |                 |
|-------|-----------------|-----------------|
|       | f ±.010 (±.254) | g ±.010 (±.254) |
| 3681  | 21.08 (.830)    | 15.75 (.620)    |
| 3682  | 21.08 (.830)    | 25.91 (1.020)   |
| 3683  | 21.08 (.830)    | 36.07 (1.420)   |
| 3684  | 21.08 (.830)    | 46.23 (1.820)   |
| 3685  | 21.08 (.830)    | 56.39 (2.220)   |

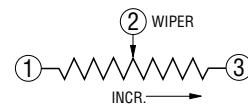


### Product Dimensions

3680



TOLERANCES: EXCEPT WHERE NOTED  
 DECIMALS: XX ± .38 (.015), .XXX ± .13 (.005)  
 FRACTIONS: ±1/64  
 DIMENSIONS: MM (IN.)



\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011. Specifications are subject to change without notice. The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# 3680 Family - Precision Potentiometer

**BOURNS®**

## Recommended Part Numbers

| Resistance<br>( $\Omega$ ) | 3681S-1<br>1<br>Decade | 3682S-1<br>2<br>Decade | 3683S-1<br>3<br>Decade | 3684S-1<br>4<br>Decade | 3685S-1<br>5<br>Decade |
|----------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 50                         | -500L                  |                        |                        |                        |                        |
| 100                        | -101L                  |                        |                        |                        |                        |
| 200                        | -201L                  |                        |                        |                        |                        |
| 500                        | -501L                  | -501L                  |                        |                        |                        |
| <b>1,000</b>               | -102L                  | <b>-102L</b>           | <b>-102L</b>           |                        |                        |
| 2,000                      | -202L                  | -202L                  | -202L                  |                        |                        |
| <b>5,000</b>               | -502L                  | <b>-502L</b>           | <b>-502L</b>           |                        |                        |
| <b>10 K</b>                | -103L                  | <b>-103L</b>           | <b>-103L</b>           | -103L                  |                        |
| 20 K                       |                        | -203L                  | -203L                  | -203L                  |                        |
| 50 K                       |                        | -503L                  | -503L                  | -503L                  |                        |
| 100 K                      | -104L                  | -104L                  | -104L                  | -104L                  | -104L                  |
| 500 K                      |                        |                        | -504L                  | -504L                  | -504L                  |
| 1 Meg                      |                        | -105L                  | -105L                  | -105L                  | -105L                  |

**BOLDFACE** LISTINGS ARE IN STOCK AND READILY AVAILABLE THROUGH DISTRIBUTION.

FOR OTHER OPTIONS CONSULT FACTORY.

ROHS IDENTIFIER:  
L = COMPLIANT

REV. 09/13

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