

# 1/2" (12.7 mm) Conductive Plastic and Cermet Potentiometers



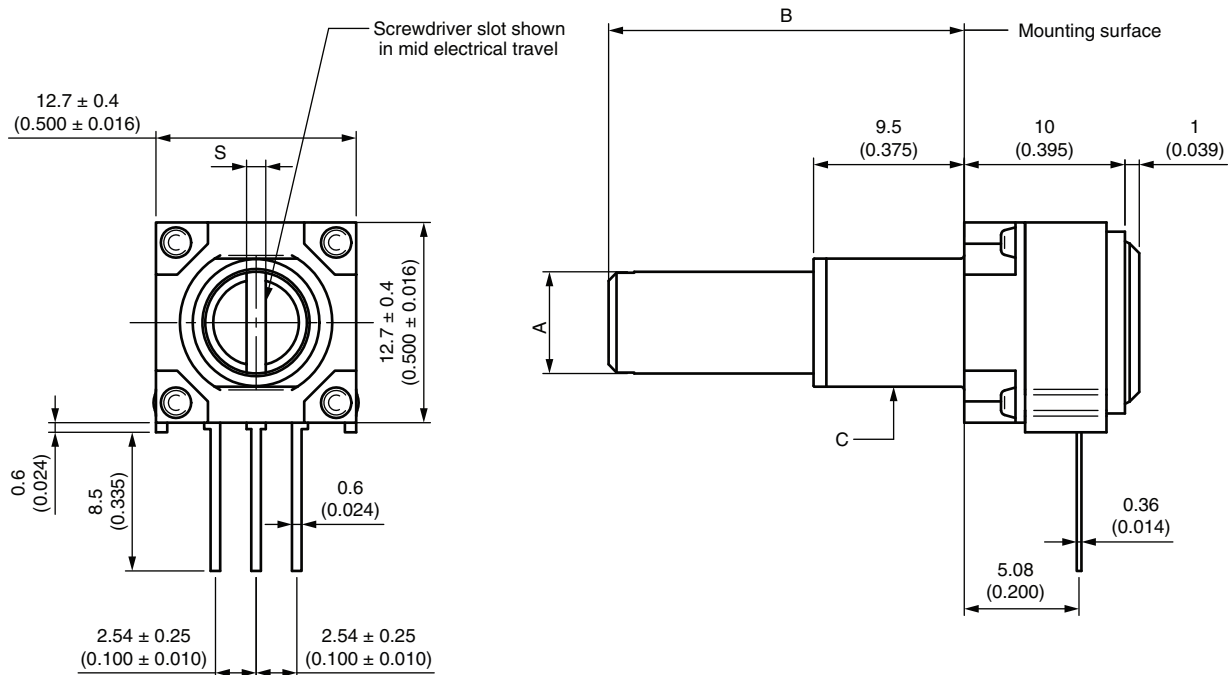
## FEATURES

- Model 248: 0.5 W at 70 °C (conductive plastic element)
- Model 249: 1 W at 70 °C (cermet element)
- Cost effective panel potentiometer
- PCB mounting
- Tests according to CECC 41000 or IEC 60393-1
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

| QUICK REFERENCE DATA    |                           |
|-------------------------|---------------------------|
| Multiple module         | No                        |
| Switch module           | n/a                       |
| Detent module           | n/a                       |
| Special electrical laws | A: linear, L: logarithmic |
| Sealing level           | IP 50                     |
| Lifespan                | 10K cycles                |

## DIMENSIONS in millimeters (inches) ± 0.5 mm (± 0.02")



| VERSION BUSHING / SHAFT | A     | B    | C       | S           |
|-------------------------|-------|------|---------|-------------|
|                         | SHAFT |      | BUSHING | SCREWDRIVER |
|                         | Ø     | L    | Ø       | SLOT        |
| B / BH                  | 1/8"  | 3/4" | 1/4"    | 0.8         |
| F / GJ                  | 1/4"  | 7/8" | 3/8"    | 1.2         |

| <b>ELECTRICAL SPECIFICATIONS</b>                |  |                            |
|---|--|----------------------------|
| PARAMETER                                       | MODEL 248                                  | MODEL 249                  |
| Element type                                    | Conductive plastic                         | Cermet                     |
| Total resistance range                          | 500 Ω to 1 MΩ                              |                            |
| Standard series                                 | 1, 2, 5                                    |                            |
| Resistance tolerance                            | ± 20 %                                     | ± 20 % (on request ± 10 %) |
| Power rating                                    | 0.5 W at 70 °C                             | 1.0 W at 70 °C             |
|   |  |                            |
| Circuit diagram                                 |  |                            |
| Temperature coefficient of resistance (typical) | ± 500 ppm/°C                               | ± 150 ppm/°C               |
| Linearity (typical)                             | ± 5 % independent                          |                            |
| Limiting element voltage                        | 300 V                                      |                            |
| Contact resistance variation (typical)          | 5 % of the total resistance                |                            |
| Insulation resistance                           | 1000 MΩ minimum, 500 V <sub>DC</sub>       |                            |
| Dielectric strength                             | 750 V <sub>RMS</sub> minimum 50 Hz / 60 Hz |                            |
| End resistance                                  | 2 Ω maximum each end                       |                            |
| Effective electrical travel                     | 265° ± 5°                                  |                            |

| <b>MECHANICAL SPECIFICATIONS</b> |   |
|----------------------------------|---|
| Mechanical travel                | 295° ± 5°   |
| Operating torque                 | 0.1 Ncm to 2 Ncm                                  |
| End stop torque                  | 35 Ncm (50 oz.-inch)                              |
| Max. tightening torque           | 150 Ncm   |
| Weight                           | 8.3 g (0.29 oz.)<br>(1/4" x 7/8" FMF metal shaft) |

| <b>ENVIRONMENTAL SPECIFICATIONS</b> |                   |
|-------------------------------------|-------------------|
| Temperature range                   | -55 °C to +125 °C |
| Climatic category                   | 55 / 125 / 4      |
| Sealing                             | IP 50             |

| <b>MARKING</b>   |
|--|
| <ul style="list-style-type: none"> <li>• Vishay model</li> <li>• Vishay logo</li> <li>• Variation law</li> <li>• SAP code for ohmic value</li> <li>• Tolerance in %</li> <li>• Date code (4 digits)</li> <li>• Terminal identification "3" for lead 3</li> </ul> |

| <b>PACKAGING</b>   |
|--|
| <ul style="list-style-type: none"> <li>• In box of 25 pieces, code BO25</li> </ul> |

**Note**

- Hardware supplied in separate bags



| PERFORMANCE             |   |                                   |                              |   |
|-------------------------|---|-----------------------------------|------------------------------|---|
| TESTS                   | CONDITIONS  | TYPICAL VALUES AND DRIFTS FOR 249 |                              |   |
|                         |   | $\Delta R_T/R_T$ (%)              | $\Delta R_{1-2}/R_{1-2}$ (%) | OTHER   |
| Electrical endurance    | 1000 h at rated power<br>90°/30° - ambient temp. 70 °C    | ± 3 %                             | ± 5 %                        | Contact res. variation: < 1 %   |
| Damp heat, steady state | 4 days<br>40 °C 93 % HR                                   | ± 2 %                             | -                            | Dielectric strength: 1000 V <sub>RMS</sub><br>Insulation resistance: > 10 <sup>4</sup> MΩ |
| Change of temperature   | 5 cycles, -55 °C at +125 °C                               | ± 1 %                             | -                            | $\Delta V_{1-2}/V_{1-3} \leq \pm 2 \%$  |
| Mechanical endurance    | 10 000 cycles   | ± 3 %                             | -                            | Contact res. variation: ≤ 2 % R <sub>n</sub>  |
| Shock                   | 50 g's at 11 ms<br>3 successive shocks<br>in 3 directions | ± 1 %                             | ± 2 %                        | -   |
| Vibration               | 10 Hz to 55 Hz, 0.75 mm or 10 g's<br>during 6 h           | ± 1 %                             | -                            | $\Delta V_{1-2}/V_{1-3} \leq \pm 2 \%$  |

**Note**

- Nothing stated herein shall be construed as a guarantee of quality or durability.

| STANDARD RESISTANCE ELEMENT DATA |                     |                      |                    |                     |                      |                    |
|----------------------------------|---------------------|----------------------|--------------------|---------------------|----------------------|--------------------|
| STANDARD RESISTANCE VALUES       | 248 LINEAR TAPER    |                      |                    | 249 LINEAR TAPER    |                      |                    |
|                                  | MAX. POWER AT 70 °C | MAX. WORKING VOLTAGE | MAX. WIPER CURRENT | MAX. POWER AT 70 °C | MAX. WORKING VOLTAGE | MAX. WIPER CURRENT |
| Ω                                | W                   | V                    | mA                 | W                   | V                    | mA                 |
| 500                              | 0.5                 | 15.8                 | 32                 | 1                   | 22.4                 | 45                 |
| 1K                               | 0.5                 | 22.4                 | 22                 | 1                   | 31.6                 | 32                 |
| 2K                               | 0.5                 | 31.6                 | 16                 | 1                   | 44.7                 | 22                 |
| 2.5K                             | 0.5                 | 35.4                 | 14                 | 1                   | 50.0                 | 20                 |
| 5K                               | 0.5                 | 50.0                 | 10                 | 1                   | 70.7                 | 14                 |
| 10K                              | 0.5                 | 70.7                 | 7                  | 1                   | 100                  | 10                 |
| 20K                              | 0.5                 | 100                  | 5.0                | 1                   | 141                  | 7                  |
| 25K                              | 0.5                 | 112                  | 4.5                | 1                   | 158                  | 6                  |
| 50K                              | 0.5                 | 158                  | 3.2                | 1                   | 224                  | 4                  |
| 100K                             | 0.5                 | 224                  | 2.2                | 0.90                | 300                  | 3.0                |
| 200K                             | 0.45                | 300                  | 1.50               | 0.45                | 300                  | 1.5                |
| 250K                             | 0.36                | 300                  | 1.20               | 0.36                | 300                  | 1.2                |
| 500K                             | 0.18                | 300                  | 0.60               | 0.18                | 300                  | 0.6                |
| 1M                               | 0.09                | 300                  | 0.30               | 0.09                | 300                  | 0.3                |



| ORDERING INFORMATION (part number)               |                          |       |           |   |                |         |                        |  |   |   |   |   |   |   |   |   |
|--|--------------------------|-------|-----------|---|----------------|---------|------------------------|--|---|---|---|---|---|---|---|---|
| 2  | 4                        | 8     | F         | G                                       | J              | S       | 0                      | X  | B | 2 | 5 | 2 | 5 | 2 | M | A |
| MODEL  | BUSHING                  | SHAFT |           | SHAFT END                               | SHAFT MATERIAL | LEADS   | PACKAGING              | RESISTANCE CODE / TOLERANCE / TAPER OR SPECIAL   |   |   |   |   |   |   |   |   |
| 248 = plastic conductive<br>249 = cermet element | F = Ø 3/8"<br>B = Ø 1/4" |       | Ø L       | S = slotted<br>R = round<br>F = flatted | 0 = metal      | X = std | B25 = box of 25 pieces | Resistance:<br>From 501 = 500 Ω to 105 = 1 MΩ<br><br>Tolerance:<br>M = 20 %;<br>On request:<br>K = 10 % (249 only)<br><br>Taper:<br>A = linear;<br>L = logarithmic |   |   |   |   |   |   |   |   |
|  |                          | GJ    | 1/4" 7/8" |   |                |         |                        |  |   |   |   |   |   |   |   |   |
|  |                          | BH    | 1/8" 3/4" |   |                |         |                        |  |   |   |   |   |   |   |   |   |

| RELATED DOCUMENTS   |  |
|---|--|
| <b>APPLICATION NOTES</b>  |  |
| Potentiometers and Trimmers                                       | <a href="http://www.vishay.com/doc?51001">www.vishay.com/doc?51001</a> |
| Guidelines for Vishay Sfernice Resistive and Inductive Components | <a href="http://www.vishay.com/doc?52029">www.vishay.com/doc?52029</a> |



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