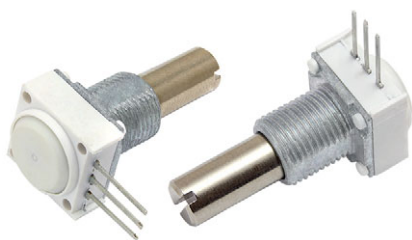


# 1/2" (12.7 mm) Conductive Plastic and Cermet Potentiometers



## FEATURES

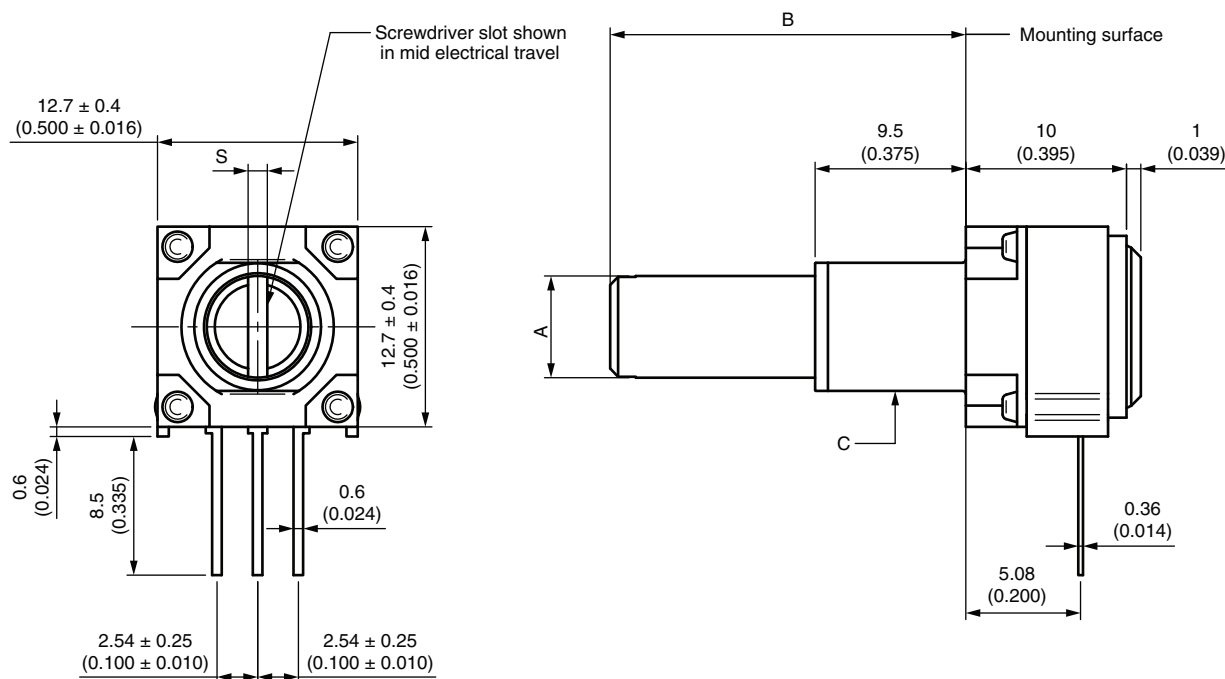
- Model 248: 0.5 W at 70 °C (conductive plastic element)
- Model 249: 1 W at 70 °C (cermet element)
- Cost effective panel potentiometer
- PCB mounting
- Tests according to CECC 41000 or IEC 60393-1
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

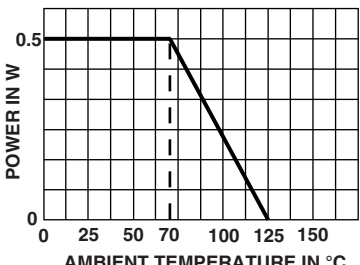
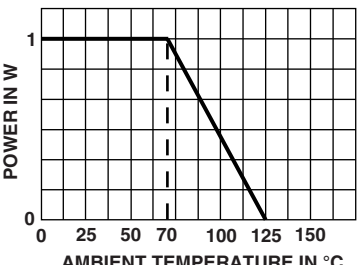
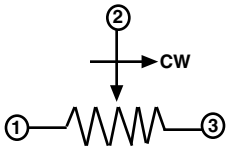
## QUICK REFERENCE DATA

|                         |                           |
|-------------------------|---------------------------|
| 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                          | 1 k $\Omega$ to 500 k $\Omega$                                                     | 500 $\Omega$ to 1 M $\Omega$                                                        |
| Standard series                                 | 1, 2, 5                                                                            |                                                                                     |
| Resistance tolerance                            | $\pm 20\%$                                                                         | $\pm 20\%$ (on request $\pm 10\%$ )                                                 |
| Power rating                                    | 0.5 W at 70 °C                                                                     | 1.0 W at 70 °C                                                                      |
|                                                 |  |  |
| Circuit diagram                                 |  |                                                                                     |
| Temperature coefficient of resistance (typical) | $\pm 500$ ppm/°C                                                                   | $\pm 150$ ppm/°C                                                                    |
| Linearity (typical)                             | $\pm 5\%$ independent                                                              |                                                                                     |
| Limiting element voltage                        | 300 V                                                                              |                                                                                     |
| Contact resistance variation (typical)          | 5 % of the total resistance                                                        |                                                                                     |
| Insulation resistance                           | 1000 M $\Omega$ minimum, 500 V <sub>DC</sub>                                       |                                                                                     |
| Dielectric strength                             | 750 V <sub>RMS</sub> minimum 50 Hz / 60 Hz                                         |                                                                                     |
| End resistance                                  | 2 $\Omega$ maximum each end                                                        |                                                                                     |
| Effective electrical travel                     | 265° $\pm$ 5°                                                                      |                                                                                     |

| <b>MECHANICAL SPECIFICATIONS</b> |                                                   |
|----------------------------------|---------------------------------------------------|
| Mechanical travel                | 295° $\pm$ 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<br>RESISTANCE<br>VALUES | 248 LINEAR TAPER          |                            |                          | 249 LINEAR TAPER          |                            |                          |
|                                  | MAX.<br>POWER<br>AT 70 °C | MAX.<br>WORKING<br>VOLTAGE | MAX.<br>WIPER<br>CURRENT | MAX.<br>POWER<br>AT 70 °C | MAX.<br>WORKING<br>VOLTAGE | MAX.<br>WIPER<br>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 or P = metal |   | X = std | B25 = box of 25 pieces | Resistance:<br>From 501 = 500 Ω<br>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" |                                         |   |                |   |         |                        |                                                                                                                                                                       |   |   |   |   |   |

**ACCESSORIES**

Additional Accessories (to order separately)

[www.vishay.com/doc?51051](http://www.vishay.com/doc?51051)

**RELATED DOCUMENTS**

**APPLICATION NOTES**

Potentiometers and Trimmers

[www.vishay.com/doc?51001](http://www.vishay.com/doc?51001)

Guidelines for Vishay Sfernice Resistive and Inductive Components

[www.vishay.com/doc?52029](http://www.vishay.com/doc?52029)



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