Features
- Low TCR
- Low electrical noise
- Low inductance/capacitance
- High power rating
- Low ohmic values

Material Specifications
- Resistor: Metal Foil (CuNiMn)
- Substrate: Alumina (AL203)
- Housing: Epoxy/PPS
- Lead Frame: Tinned Copper (Sn/Cu)
- Maximum Torque: 1.0 Nm

Packaging
- Tubes: 50 pcs./tube
- Tape & Reel*: 500 pcs./reel

**Tape & Reel is only available for Version A.

General Information
The Bourns® PWR220 S Series is a TO220 style Shunt Resistor; the PWR221 S Series is a TO221 style Shunt Resistor. Manufactured using foil on alumina ceramic, it is used in applications such as power supplies, motor drives and measurements.

Electrical & Thermal Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Nom.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance</td>
<td>R</td>
<td>0.002</td>
<td>50</td>
<td></td>
<td>Ω</td>
</tr>
<tr>
<td>Power Rating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ 70 °C without additional heat sink</td>
<td></td>
<td></td>
<td>1.50</td>
<td>15</td>
<td>W</td>
</tr>
<tr>
<td>@ 70 °C with adequate heat sink*</td>
<td></td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tolerance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.002 Ω &lt; R &lt; 0.01 Ω</td>
<td></td>
<td>2.0**</td>
<td>5.0</td>
<td>5.0</td>
<td>%</td>
</tr>
<tr>
<td>0.01 Ω &lt; R &lt; 0.10 Ω</td>
<td></td>
<td>1.0***</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.10 Ω &lt; R &lt; 50.0 Ω</td>
<td></td>
<td>0.5**</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCR</td>
<td></td>
<td></td>
<td>±15.0</td>
<td>±50.0</td>
<td>PPM/°C</td>
</tr>
<tr>
<td>Thermal Resistance – Rthj (Max @ R &lt; 50 Ω)</td>
<td></td>
<td>4.8</td>
<td></td>
<td></td>
<td>°C/W</td>
</tr>
<tr>
<td>Stability</td>
<td></td>
<td>0.1</td>
<td></td>
<td>0.5</td>
<td>%</td>
</tr>
<tr>
<td>Thermal EMF</td>
<td></td>
<td>1.0</td>
<td></td>
<td>0.24%</td>
<td>µV/°C</td>
</tr>
<tr>
<td>Dielectric Withstanding Voltage</td>
<td></td>
<td>300</td>
<td></td>
<td></td>
<td>VDC</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>TJ</td>
<td>-40</td>
<td>+130</td>
<td></td>
<td>°C</td>
</tr>
</tbody>
</table>

* Thermal junction 130 °C max.
** 1 % also available with 4-pin version.
*** 0.1 % and 0.24 % also available with 4-pin version.

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.
Applications
■ Power supplies
■ Motor drives
■ Test and measurement
■ Electricity meters

**PWR220/PWR221 S Series Shunt Resistor**

**Product Dimensions**

**T0220 Housing: 2-Pin**

**T0220 Housing: 4-Pin**

**T0221 Casing: 2-Pin**

**T0221 Casing: 4-Pin**

**Specifications**
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PWR220/PWR221 S Series Shunt Resistor

Product Dimensions

TO220 Casing: 2-Pin (Surface Mount)

TO220 Casing: 4-Pin (Surface Mount)

How to Order

Model
PWR = Power Resistor

Package
220 = TO220
221 = TO221

Number of Pins
2 = 2
4 = 4

Function
S = Shunt

Version
A = Surface Mount
B = Through Hole

Resistor Value for all Tolerances
"R" represents decimal point
(examples: R040 = .040 ohms; 50R0 = 50.0 ohms

Absolute Tolerance
J = 5 %
G = 2 %
F = 1 %
D = 0.5 %
C = 0.25 %
B = 0.1 %

Packaging
E = Tape & Reel (Available only for Version A)
___ = Tubes

*Available only with 4-pin versions.

Typical Part Marking

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Packaging Dimensions

Devices are packed in accordance with EIA standard RS-481-A and specifications shown here.

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier Width</td>
<td>A</td>
<td>10.4 (0.409)</td>
</tr>
<tr>
<td>Carrier Length</td>
<td>B</td>
<td>18.4 (0.724)</td>
</tr>
<tr>
<td>Carrier Depth</td>
<td>C</td>
<td>4.4 (0.173)</td>
</tr>
<tr>
<td>Reel Outside Diameter</td>
<td>D</td>
<td>330 (12.992)</td>
</tr>
<tr>
<td>Punch Hole Pitch</td>
<td>P</td>
<td>16.00 (0.630)</td>
</tr>
<tr>
<td>Tape Width</td>
<td>W</td>
<td>32 (1.260)</td>
</tr>
<tr>
<td>Quantity per Reel</td>
<td></td>
<td>500</td>
</tr>
</tbody>
</table>

REV. 10/15

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