PF2200 Series
TO-220 Power Thin Film Resistors

- TO-220 Housing
- Rated Power to 50 Watts
- Resistances from 0.02 to 51K Ohms
- High Stability Film Resistance Elements
- Resistance Tolerance to ±0.1%
- TCR to ±50ppm/°C
- Low Inductance (<10nH)
- Excellent Pulse Handling
- Isolated Mounting Tab

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>Power Rating</th>
<th>Thermal Resistance</th>
<th>Resistance Range</th>
<th>Tolerances</th>
<th>Temperature Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Heatsink¹</td>
<td>Free Air²</td>
<td>Min</td>
<td>Max</td>
<td></td>
</tr>
<tr>
<td>PF2205</td>
<td>50W</td>
<td>2.3°C/W</td>
<td>0.02Ω</td>
<td>51KΩ</td>
<td>±1% ( R≥0.1Ω ) ±5%</td>
</tr>
<tr>
<td>PF2203</td>
<td>35W</td>
<td>3.3°C/W</td>
<td>0.01Ω</td>
<td>51KΩ</td>
<td>1% ( R≥0.1Ω ) ±5%</td>
</tr>
<tr>
<td>PF2202</td>
<td>20W</td>
<td>5.9°C/W</td>
<td>0.02Ω</td>
<td>51KΩ</td>
<td>0.1%, 0.25%, 0.5%, (R≥10 Ω) ±1% ( R≥0.1Ω ) ±5%</td>
</tr>
</tbody>
</table>

¹ Power rating based on 25°C Flange Temperature
² Power rating based on 25°C Ambient Temperature
³ Consult Factory for Higher or Lower Values

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Range</td>
<td>-55°C to +175°C</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>2000 VAC</td>
</tr>
<tr>
<td>Max. Operating Voltage</td>
<td>( \sqrt{P \times R} ) (500V MAX)</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>&gt;1000 Meg-Ohm</td>
</tr>
<tr>
<td>Terminal Finish</td>
<td>Tin Plated Copper</td>
</tr>
<tr>
<td>Inductance</td>
<td>PF2202 / PF2203 8.38 nH, PF2205 9.65 nH</td>
</tr>
<tr>
<td>Flammability</td>
<td>UL94 V-0</td>
</tr>
<tr>
<td>Mass</td>
<td>2.1g</td>
</tr>
</tbody>
</table>

Ordering Information

Part Description: Part Type - Resistance - Tolerance - TCR
Example: PF2203 0.5 Ohm 1% 100ppm
PF2200 Series
TO-220 Power Thin Film Resistors

SPECIFICATIONS (continued)

Environmental Performance | ΔR | Test Conditions
---|---|---
Load Life | ±1% | 25°C, 90 min ON, 30 min OFF, 1000 hr
Humidity Resistance | ±1% | 40°C, 90-95% RH, DC 0.1W, 1000 hr
Temperature Cycle | ±0.25% | -55°C for 30 min, +155°C for 30 min, 5 cycles
Solder Heat | ±0.1% | +350 / -5°C 3s
Vibration | ±0.25% | IEC60068-2-6

Power Derating

Power Rating Notes -

The PF2200 Series Thin Film Resistors must be attached to a suitable heatsink. Without a heatsink the maximum power rating is 1W ( 1/2W for the PF2201 ). The maximum internal resistor temperature is 175°C.

To specify an appropriate heatsink use the following formula :

\[
\frac{T_{\text{Max}}}{T_{\text{Amb}}} = \frac{T_{\text{Max}}}{T_{\text{Amb}}} - \frac{P}{R_{\text{Max}}} = \frac{T_{\text{Max}}}{T_{\text{Amb}}} - \frac{R_{\text{qH}}}{R_{\text{qR}}} = \frac{T_{\text{Max}}}{T_{\text{Amb}}} - \frac{R_{\text{qH}}}{R_{\text{qR}}} - T
\]

Where:
- \( R_{\text{qH}} \) = Thermal Resistance of Heatsink ( °C/W )
- \( R_{\text{qR}} \) = Thermal Resistance of Resistor ( °C/W )
- \( T_{\text{Max}} \) = Maximum Temperature of Resistor ( °C )
- \( T_{\text{Amb}} \) = Ambient Temperature of Heatsink ( °C )
- \( P \) = Power Through Resistor ( W )

Power Derating Graph

Mounting Notes -

The PF2200 Series Thin Film Resistors must be attached to a suitable heatsink. Mount resistor using thermal grease to a clean, flat surface. Use a compression washer to provide 150 to 300 pounds ( 665 to 1330N ) of mounting force. Torque mounting screw to 8 in-lbs ( 0.9 N-m ).

Mounting tab is isolated from both pins.
PULSE ENERGY DURABILITY

Tentative continuous-pulse power allowance at duty 0.01. Load life test will be necessary in actual equipment. Because curve will be changed by resistance, repetition, duty and operating temperature. Dotted shows estimation.