

Features

- TO-220 housing
- Low inductance
- Ceramic backplane
- High power rating
- AEC-Q200 qualified
- RoHS compliant*

Applications

- Power supplies
- Motor drives
- Test and measurement
- Rectifiers

PWR221T-30 Series Power Resistor

General Information

Bourns® PWR221T-30 Series is a TO-220 style power resistor made using thick film on alumina ceramic technology. It is used in current limiting, capacitor discharge or current measurement circuits in power supplies for telecom and industrial applications.

Electrical & Thermal Characteristics

| Parameter | Value(s) |
|--|------------------------------|
| Resistance (See Popular Resistance Values table) | 0.02 Ω to 130 KΩ |
| Power Rating @ 25 °C Case Temperature | 30 W** |
| Tolerance | ±1 %***, ±5 % |
| TCR | |
| 0.100 Ω < R < 130.0K Ω | ±100 PPM/°C |
| 0.050 Ω < R < 0.100 Ω | ±300 PPM/°C |
| 0.020 Ω < R < 0.050 Ω | ±600 PPM/°C |
| Thermal Resistance - R _{thj} | 4.2 °C/W |
| Inductance | 0.1 μH maximum |
| Operating Voltage | √P*R with a maximum of 250 V |
| Dielectric Strength | 2 KV AC |
| Insulation Resistance | 10 GΩ |
| Operating Temperature | -55 °C to +150 °C |

** Power rating of 2.25 W when mounted free to air (no heat sink).

*** Available for most values. Check Popular Resistance Values table.

Reliability Characteristics

| Parameter | Specification |
|--|---------------|
| Short Term Overload (2x Pr for R < 2 Ω, 1.6 x Pr for R ≥ 2 Ω, V < 1.5 x Operating Voltage) | ΔR ±0.25 % |
| Load Life (2000 hours at rated power) | ΔR ±1.0 % |
| Thermal Shock (-55 °C to 155 °C, 5 cycles) | ΔR ±0.5 % |
| Resistance to Soldering Heat (10 seconds at 270 °C) | ΔR ±0.5 % |
| Vibration (20 G 10-2000 Hz .06" D.A.) | ΔR ±0.25 % |
| Terminal Strength (MIL-STD-202, Method 211 Test A1) | ΔR ±0.2 % |
| Shock (Saw Tooth: 100 g/6 ms) | ΔR ±0.5 % |
| Humidity (Steady State) 1000 hrs. 85 °C/85 % RH | ΔR ±0.5 % |
| High Temperature Exposure (100 hrs - 40 % Pr @ +125 °C) | ΔR ±0.5 % |

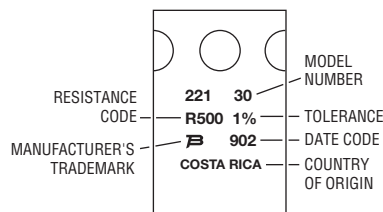
Material Characteristics

Resistor Thick film
 Substrate Alumina (AL2O3)
 Housing Epoxy
 Pins Tinned Copper (Sn/Cu)
 Flammability Conforms to UL-94V0

Packaging

..... 50 pcs./tube

Typical Part Marking



Popular Resistance Values

| Code | Resistance Value | Code | Resistance Value |
|------|------------------|------|------------------|
| R020 | 0.02 Ω*** | 1000 | 100 Ω |
| R025 | 0.025 Ω*** | 1200 | 120 Ω |
| R030 | 0.03 Ω*** | 1500 | 150 Ω |
| R033 | 0.033 Ω*** | 2000 | 200 Ω |
| R040 | 0.04 Ω*** | 2500 | 250 Ω |
| R050 | 0.05 Ω*** | 3000 | 300 Ω |
| R075 | 0.075 Ω*** | 3300 | 330 Ω |
| R100 | 0.1 Ω | 4000 | 400 Ω |
| R150 | 0.15 Ω | 4700 | 470 Ω |
| R200 | 0.2 Ω | 5000 | 500 Ω |
| R250 | 0.25 Ω | 5600 | 560 Ω |
| R300 | 0.3 Ω | 7500 | 750 Ω |
| R330 | 0.33 Ω | 1001 | 1.0 KΩ |
| R400 | 0.4 Ω | 1501 | 1.5 KΩ |
| R500 | 0.5 Ω | 2001 | 2.0 KΩ |
| R750 | 0.75 Ω | 2501 | 2.5 KΩ |
| 1R00 | 1 Ω | 3001 | 3.0 KΩ |
| 1R50 | 1.5 Ω | 3301 | 3.3 KΩ |
| 2R00 | 2 Ω | 4001 | 4.0 KΩ |
| 2R50 | 2.5 Ω | 5001 | 5.0 KΩ |
| 3R00 | 3 Ω | 7501 | 7.5 KΩ |
| 3R30 | 3.3 Ω | 1002 | 10 KΩ |
| 4R00 | 4 Ω | 1502 | 15 KΩ |
| 5R00 | 5 Ω | 2002 | 20 KΩ |
| 7R50 | 7.5 Ω | 2502 | 25 KΩ |
| 8R00 | 8 Ω | 3002 | 30 KΩ |
| 10R0 | 10 Ω | 3302 | 33 KΩ |
| 12R0 | 12 Ω | 4002 | 40 KΩ |
| 15R0 | 15 Ω | 4702 | 47 KΩ |
| 20R0 | 20 Ω | 5002 | 50 KΩ |
| 25R0 | 25 Ω | 5602 | 56 KΩ |
| 27R0 | 27 Ω | 6802 | 68 KΩ |
| 30R0 | 30 Ω | 7502 | 75 KΩ |
| 33R0 | 33 Ω | 8202 | 82 KΩ |
| 40R0 | 40 Ω | 1003 | 100 KΩ |
| 47R0 | 47 Ω | 1153 | 115 KΩ |
| 50R0 | 50 Ω | 1203 | 120 KΩ |
| 56R0 | 56 Ω | 1253 | 125 KΩ |
| 75R0 | 75 Ω | 1303 | 130 KΩ |

*** 5 % Tolerance

*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

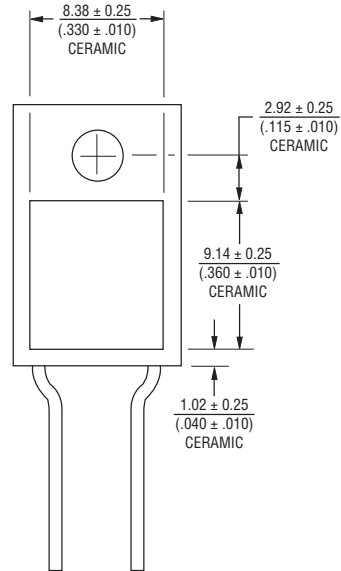
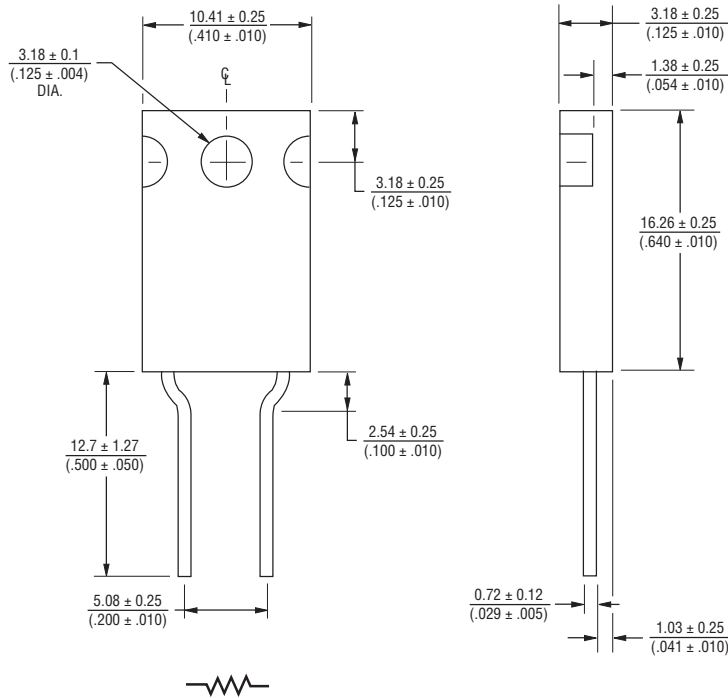
Specifications are subject to change without notice.

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.

PWR221T-30 Series Power Resistor

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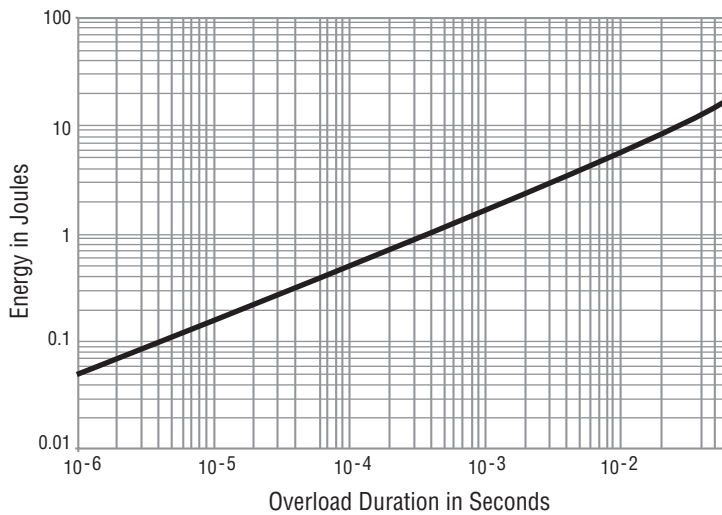
Product Dimensions



DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$

TOLERANCE: $\pm \frac{0.38}{(0.015)}$ UNLESS OTHERWISE NOTED

Pulse Power Rating



The energy absorbed by the resistor expressed in Joules can be calculated by multiplying the peak power of the pulse in watts times the length of the pulse in seconds.

The energy should not exceed the limits shown in the graph. The overload voltage should not exceed 1.5 times the maximum operating voltage.

How to Order

PWR 221 T - 30 - 10R0 F

Model _____
PWR = Power Resistor

Package _____
220 = TO-220 Style

Pin Style _____
T = Through-hole

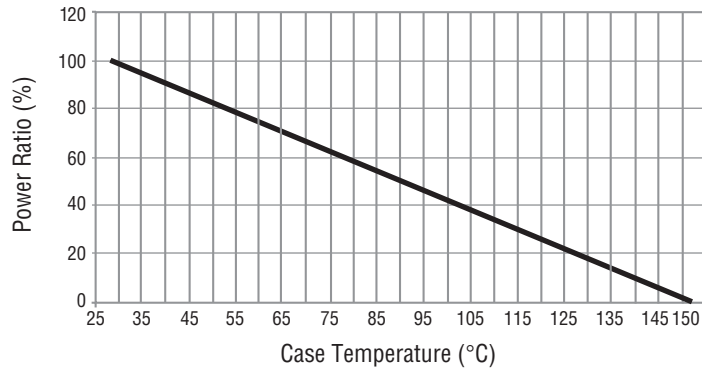
Power _____
30 = 30 W

Resistance Value _____
<100 ohms ... "R" represents decimal point (examples: 7R50 = 7.5 Ω; R500 = 0.5 Ω)
≥100 ohms... First three digits are significant, fourth digit represents number of zeros to follow (examples: 2000 = 200 ohms; 3002 = 30K ohms)

Absolute Tolerance _____
J = 5 %
F = 1 %

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Derating Curve



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