



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: [info@chipsmall.com](mailto:info@chipsmall.com) Web: [www.chipsmall.com](http://www.chipsmall.com)

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





## 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 < 130.0 K 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 <sub>thj</sub>            | 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 %     |

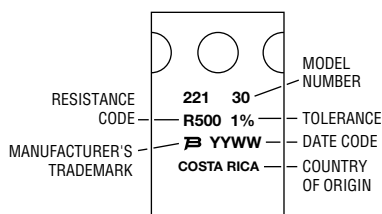
## Material Characteristics

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.

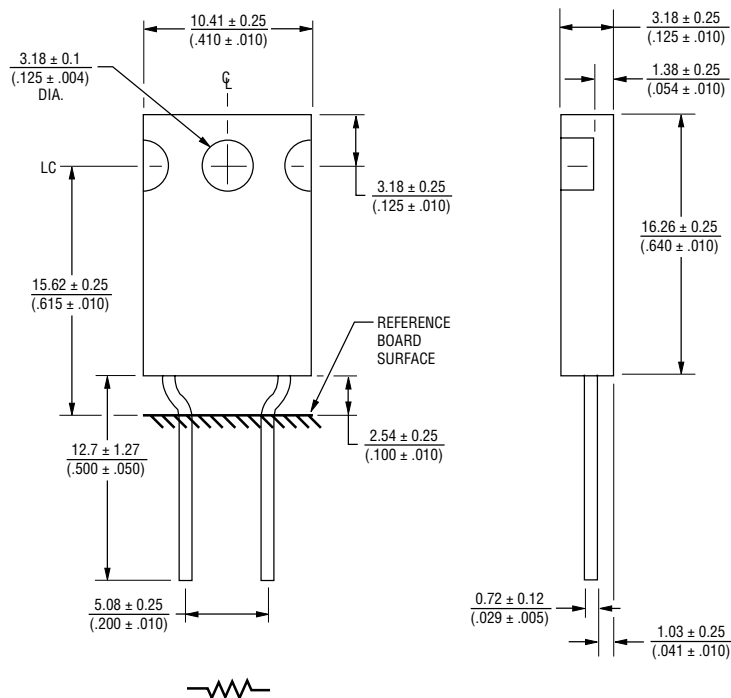
Specifications are subject to change without notice.

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

**BOURNS®**

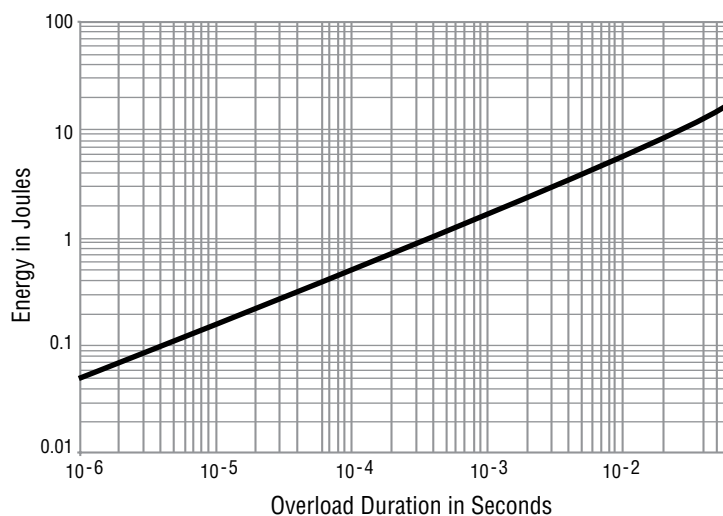
## Product Dimensions



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  $\Omega$ ; R500 = 0.5  $\Omega$ )  
 $\geq$ 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 %

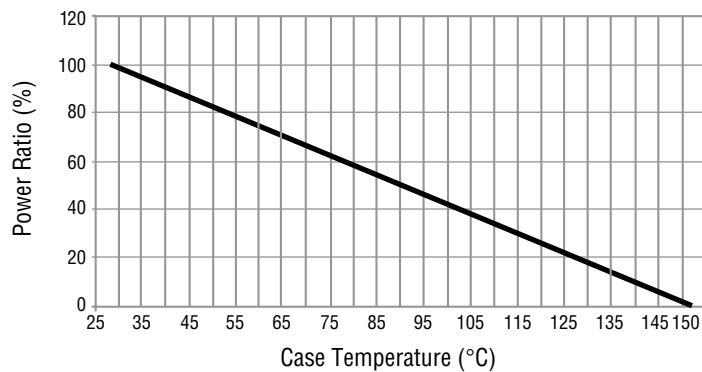
Specifications are subject to change without notice. The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.



## PWR221T-30 Series Power Resistor

**BOURNS®**

### Derating Curve



**BOURNS®**

**Asia-Pacific:** Tel: +886-2 2562-4117 • Email: [asiacus@bourns.com](mailto:asiacus@bourns.com)

**EMEA:** Tel: +36 88 520 390 • Email: [eurocus@bourns.com](mailto:eurocus@bourns.com)

**The Americas:** Tel: +1-951 781-5500 • Email: [americus@bourns.com](mailto:americus@bourns.com)

[www.bourns.com](http://www.bourns.com)

REV. 07/16

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.