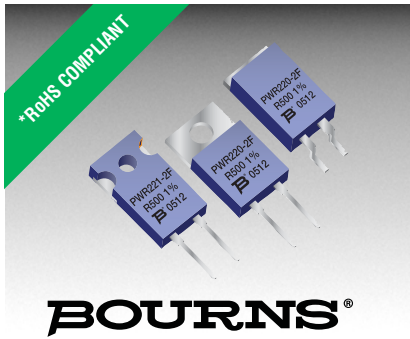




## Features

- TO220 or TO221 housing
- Low inductance
- SMD and through hole versions
- High power rating



Models PWR220-2FB, PWR221-2FB, and PWR220-2FA are not available and not recommended for new designs.

Models **PWR220T-35**, **PWR221T-30**, and **PWR263S-35** are suggested alternatives.

## PWR220/PWR221 F Series Power Resistors

### Material Specifications

Resistor ..... Thick film  
 Substrate ..... Alumina (AL2O<sub>3</sub>)  
 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 Versions A and D.

### General Information

The Bourns® PWR220 F Series is a TO220 style Power Resistor; PWR221 F is a TO221 style Power Resistor. Manufactured using thick film on Alumina ceramic technology, it is used in applications such as power supplies, motor drives and measurements.

### Electrical & Thermal Characteristics

| Parameter                                                                                                  | Symbol         | Min.         | Nom.       | Max.                 | Unit                       |
|------------------------------------------------------------------------------------------------------------|----------------|--------------|------------|----------------------|----------------------------|
| Resistance<br>(Version A)<br>(Version C & D)                                                               | R<br>R         | 0.02<br>0.02 |            | 100K<br>15K          | Ω<br>Ω                     |
| Power Rating @ 70 °C in Free Air<br>Power Rating with External Heat Sink<br>(Version A)<br>(Version C & D) |                |              |            | 1.50<br>30<br>50     | W<br>W<br>W                |
| Tolerance<br>0.02 Ω < R < 1.0 Ω<br>1.0 Ω < R < 100K Ω                                                      |                | 2.0<br>1.0   |            | 5.0<br>5.0           | %<br>%                     |
| TCR<br>0.1 Ω < R < 100.0K Ω<br>0.05 Ω < R < 0.099 Ω<br>0.02 Ω < R < 0.049 Ω                                |                |              |            | ±100<br>±300<br>±600 | PPM/°C<br>PPM/°C<br>PPM/°C |
| Thermal Resistance – R <sub>thj</sub><br>(Version A)<br>(Version C & D)                                    |                |              | 3.5<br>2.1 |                      | °C/W<br>°C/W               |
| Stability                                                                                                  |                |              | 0.5        |                      | %                          |
| Dielectric Withstanding Voltage                                                                            |                |              |            | 2                    | kV DC                      |
| Operating Temperature                                                                                      | T <sub>J</sub> | -40          |            | +155                 | °C                         |

\*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

## Applications

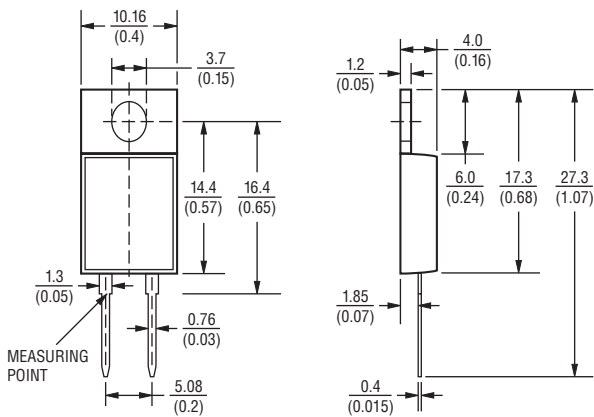
- Power supplies
- Motor drives
- Test and measurement
- Welding

## PWR220/PWR221 F Series Power Resistors

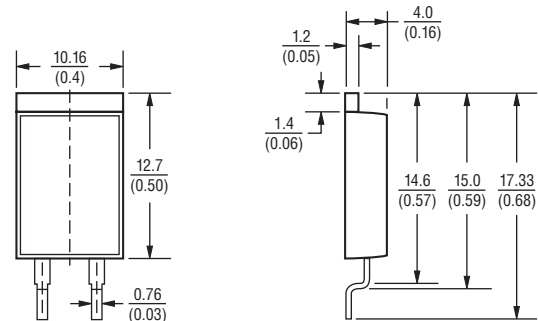
**BOURNS®**

### Product Dimensions

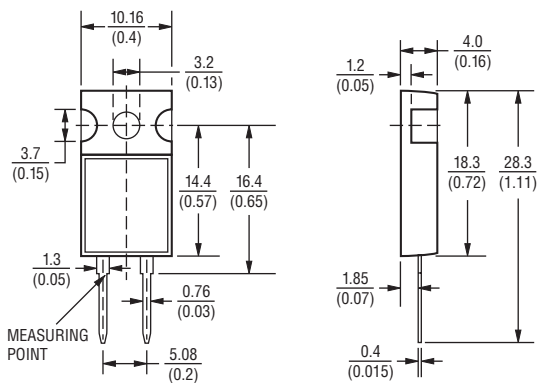
TO220 Housing: 2-Pin



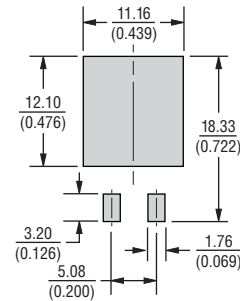
TO220 Casing: 2-Pin (Surface Mount)



TO221 Casing: 2-Pin

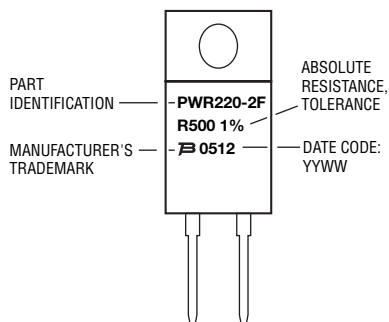


### Recommended Pad Layout



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

### Typical Part Marking



### How to Order

**PWR 220 - 2 F B R040 J E**

Model \_\_\_\_\_  
 PWR = Power Resistor

Package \_\_\_\_\_  
 220 = TO220  
 221 = TO221

Number of Pins \_\_\_\_\_  
 2 = 2

Function \_\_\_\_\_  
 F = Thick Film

Version \_\_\_\_\_  
 A = TO221 Housing, Surface Mount, 30 W (w/Heat Sink)  
 C = TO220 Housing/TO221 Housing, Through-Hole, 50 W (w/Heat Sink)  
 D = TO220 Housing, Surface Mount, 50 W (w/Heat Sink)

Resistor Value for all Tolerances \_\_\_\_\_  
 <100 ohms ..... "R" represents decimal point  
 (examples: 7R50 = 7.5 ohms; R040 = 0.040 ohms)  
 ≥100 ohms ..... First three digits are significant, fourth digit represents number of zeros to follow  
 (examples: 2000 = 200 ohms; 2002 = 20K ohms)

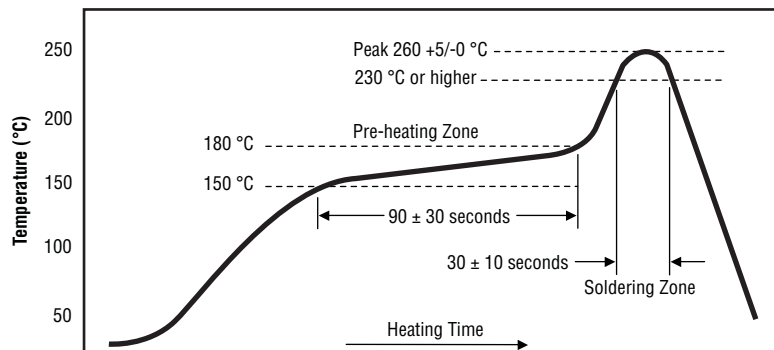
Absolute Tolerance \_\_\_\_\_  
 J = 5 %    G = 2 %    F = 1 %

Packaging \_\_\_\_\_  
 E = Tape & Reel (Available only for Versions A and D)  
 \_\_\_\_\_ = Tubes

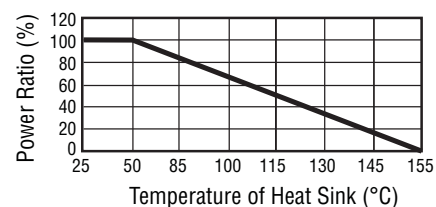
## PWR220/PWR221 F Series Power Resistors

**BOURNS®**

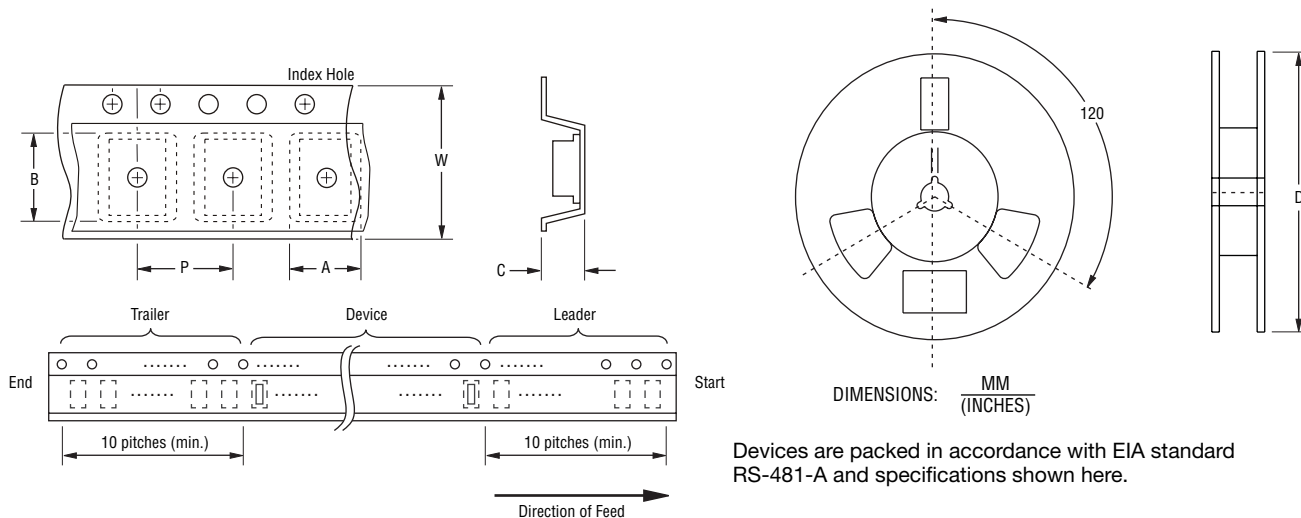
### Soldering Profile (Surface Mount Version Only)



### Derating Curve



### Packaging Dimensions



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

| Item                  | Symbol | Dimensions              |
|-----------------------|--------|-------------------------|
| Carrier Width         | A      | $\frac{10.4}{(0.409)}$  |
| Carrier Length        | B      | $\frac{18.4}{(0.724)}$  |
| Carrier Depth         | C      | $\frac{4.4}{(0.173)}$   |
| Reel Outside Diameter | D      | $\frac{330}{(12.992)}$  |
| Punch Hole Pitch      | P      | $\frac{16.00}{(0.630)}$ |
| Tape Width            | W      | $\frac{32}{(1.260)}$    |
| Quantity per Reel     | —      | 500                     |

REV. 06/11

Specifications are subject to change without notice.  
Customers should verify actual device performance in their specific applications.