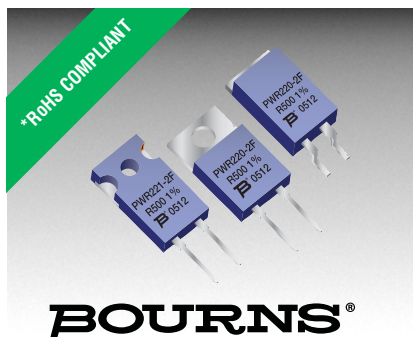




## Features

- 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

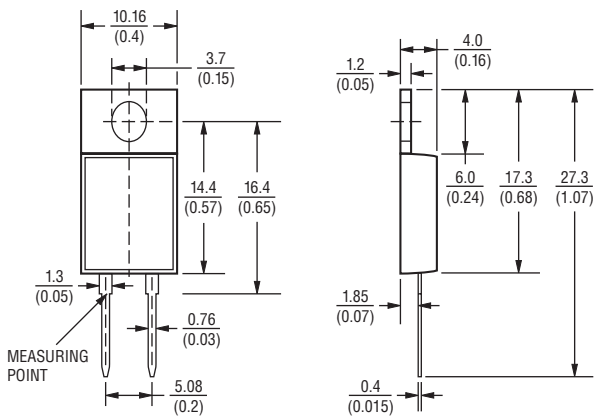
- Power supplies
- Motor drives
- Test and measurement
- Welding

## PWR220/PWR221 F Series Power Resistors

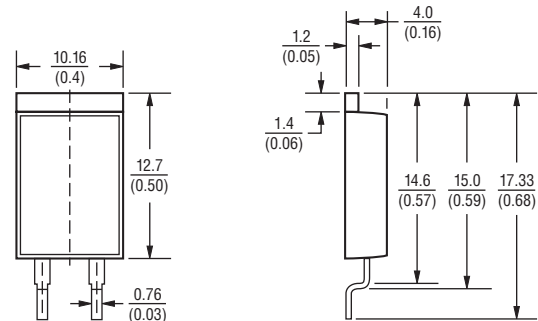
**BOURNS®**

### Product Dimensions

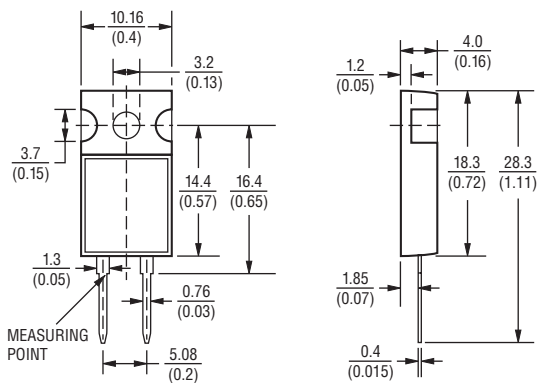
TO220 Housing: 2-Pin



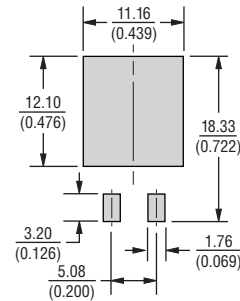
TO220 Casing: 2-Pin (Surface Mount)



TO221 Casing: 2-Pin

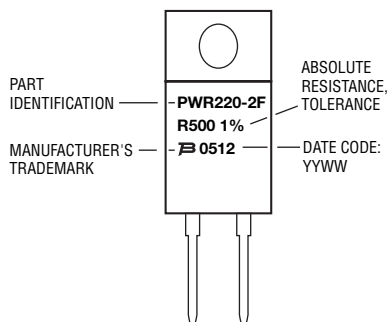


### Recommended Pad Layout



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)

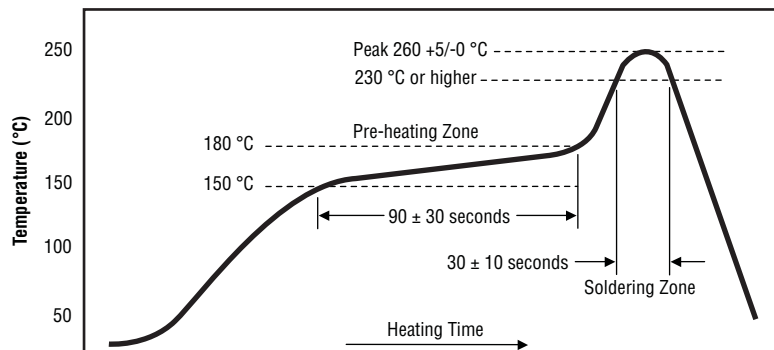
Absolute Tolerance \_\_\_\_\_  
J = 5 %    G = 2 %    F = 1 %

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

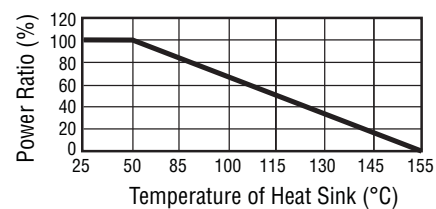
## PWR220/PWR221 F Series Power Resistors

**BOURNS®**

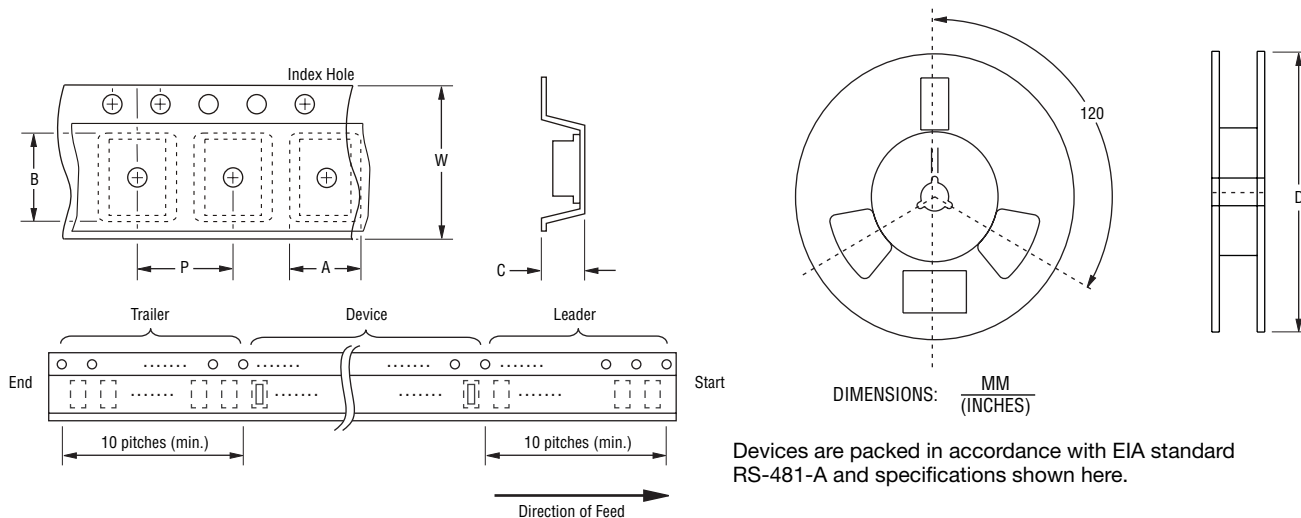
### Soldering Profile (Surface Mount Version Only)



### 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.

# Mouser Electronics

Authorized Distributor

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## Bourns:

|                                  |                                   |                                   |                                   |                                  |
|----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|----------------------------------|
| <a href="#">PWR220-2FAR0400F</a> | <a href="#">PWR220-2FB100R0J</a>  | <a href="#">PWR220-2FB10R00J</a>  | <a href="#">PWR220-2FB200R0J</a>  | <a href="#">PWR220-2FB50R00J</a> |
| <a href="#">PWR220-2FB7R500J</a> | <a href="#">PWR220-2FBR0400F</a>  | <a href="#">PWR220-2FBR1000F</a>  | <a href="#">PWR221-2FB10000F</a>  | <a href="#">PWR221-2FB10R00F</a> |
| <a href="#">PWR221-2FB20001F</a> | <a href="#">PWR221-2FB200R0J</a>  | <a href="#">PWR221-2FB7R500F</a>  | <a href="#">PWR221-2FB7R500J</a>  | <a href="#">PWR221-2FBR0400F</a> |
| <a href="#">PWR221-2FBR0400J</a> | <a href="#">PWR221-2FCR0400F</a>  | <a href="#">PWR220-2FAR0200F</a>  | <a href="#">PWR220-2FAR0300F</a>  | <a href="#">PWR220-2FAR0330F</a> |
| <a href="#">PWR220-2FAR0500F</a> | <a href="#">PWR220-2FAR1000F</a>  | <a href="#">PWR220-2FAR1500F</a>  | <a href="#">PWR220-2FAR2000F</a>  | <a href="#">PWR220-2FAR2500F</a> |
| <a href="#">PWR220-2FAR3000F</a> | <a href="#">PWR220-2FAR3300F</a>  | <a href="#">PWR220-2FAR4000F</a>  | <a href="#">PWR220-2FAR5000F</a>  | <a href="#">PWR220-2FAR7500F</a> |
| <a href="#">PWR220-2FA1R000F</a> | <a href="#">PWR220-2FA1R500F</a>  | <a href="#">PWR220-2FA10R00F</a>  | <a href="#">PWR220-2FA100R0F</a>  | <a href="#">PWR220-2FA10000F</a> |
| <a href="#">PWR220-2FA12R00F</a> | <a href="#">PWR220-2FA120R0F</a>  | <a href="#">PWR220-2FA15R00F</a>  | <a href="#">PWR220-2FA2R000F</a>  | <a href="#">PWR220-2FA2R500F</a> |
| <a href="#">PWR220-2FA20R00F</a> | <a href="#">PWR220-2FA200R0F</a>  | <a href="#">PWR220-2FA25R00F</a>  | <a href="#">PWR220-2FA250R0F</a>  | <a href="#">PWR220-2FA27R00F</a> |
| <a href="#">PWR220-2FA3R000F</a> | <a href="#">PWR220-2FA3R300F</a>  | <a href="#">PWR220-2FA30R00F</a>  | <a href="#">PWR220-2FA300R0F</a>  | <a href="#">PWR220-2FA33R00F</a> |
| <a href="#">PWR220-2FA330R0F</a> | <a href="#">PWR220-2FA4R000F</a>  | <a href="#">PWR220-2FA40R00F</a>  | <a href="#">PWR220-2FA400R0F</a>  | <a href="#">PWR220-2FA47R00F</a> |
| <a href="#">PWR220-2FA470R0F</a> | <a href="#">PWR220-2FA5R000F</a>  | <a href="#">PWR220-2FA50R00F</a>  | <a href="#">PWR220-2FA500R0F</a>  | <a href="#">PWR220-2FA56R00F</a> |
| <a href="#">PWR220-2FA560R0F</a> | <a href="#">PWR220-2FA7R500F</a>  | <a href="#">PWR220-2FA75R00F</a>  | <a href="#">PWR220-2FA750R0F</a>  | <a href="#">PWR220-2FA8R000F</a> |
| <a href="#">PWR220-2FBR0200F</a> | <a href="#">PWR220-2FBR0300F</a>  | <a href="#">PWR220-2FBR0330F</a>  | <a href="#">PWR220-2FBR0500F</a>  | <a href="#">PWR220-2FBR1500F</a> |
| <a href="#">PWR220-2FBR2000F</a> | <a href="#">PWR220-2FBR2500F</a>  | <a href="#">PWR220-2FBR3000F</a>  | <a href="#">PWR220-2FBR3300F</a>  | <a href="#">PWR220-2FBR4000F</a> |
| <a href="#">PWR220-2FBR5000F</a> | <a href="#">PWR220-2FBR7500F</a>  | <a href="#">PWR220-2FB1R000F</a>  | <a href="#">PWR220-2FB1R500F</a>  | <a href="#">PWR220-2FB10R00F</a> |
| <a href="#">PWR220-2FB100R0F</a> | <a href="#">PWR220-2FB100000F</a> | <a href="#">PWR220-2FB100010F</a> | <a href="#">PWR220-2FB12R00F</a>  | <a href="#">PWR220-2FB120R0F</a> |
| <a href="#">PWR220-2FB15R00F</a> | <a href="#">PWR220-2FB150000F</a> | <a href="#">PWR220-2FB150010F</a> | <a href="#">PWR220-2FB2R000F</a>  | <a href="#">PWR220-2FB2R500F</a> |
| <a href="#">PWR220-2FB20R00F</a> | <a href="#">PWR220-2FB200R0F</a>  | <a href="#">PWR220-2FB200000F</a> | <a href="#">PWR220-2FB200010F</a> | <a href="#">PWR220-2FB25R00F</a> |
| <a href="#">PWR220-2FB250R0F</a> | <a href="#">PWR220-2FB250000F</a> | <a href="#">PWR220-2FB250010F</a> | <a href="#">PWR220-2FB27R00F</a>  | <a href="#">PWR220-2FB3R000F</a> |