

## Features

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



This series is unavailable and not recommended for new designs.

## PWR220/PWR221 F Series Power Resistors

### Material Specifications

Resistor ..... Thick film  
 Substrate ..... Alumina (AL2O3)  
 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 (Version A) (Version C & D)	R R	0.02 0.02		100K 15K	Ω Ω
Power Rating @ 70 °C in Free Air Power Rating with External Heat Sink (Version A) (Version C & D)				1.50 30 50	W W W
Tolerance 0.02 Ω < R < 1.0 Ω 1.0 Ω < R < 100K Ω		2.0 1.0		5.0 5.0	% %
TCR 0.1 Ω < R < 100.0K Ω 0.05 Ω < R < 0.099 Ω 0.02 Ω < R < 0.049 Ω				±100 ±300 ±600	PPM/°C PPM/°C PPM/°C
Thermal Resistance – Rthj (Version A) (Version C & D)			3.5 2.1		°C/W °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 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.

## Applications

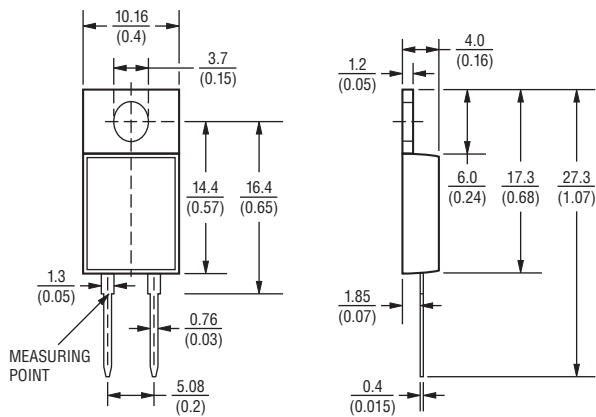
- Power supplies
- Motor drives
- Test and measurement
- Welding

## PWR220/PWR221 F Series Power Resistors

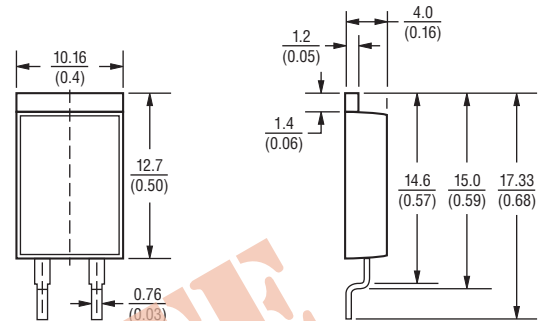
**BOURNS®**

### Product Dimensions

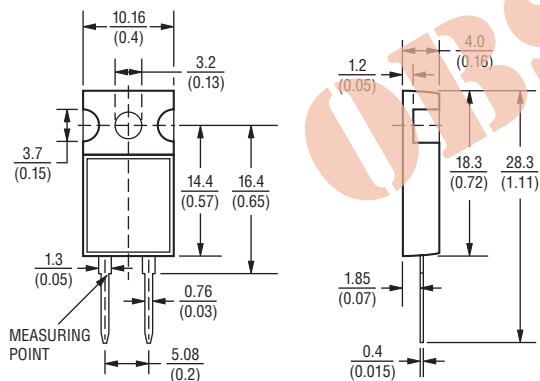
TO220 Housing: 2-Pin



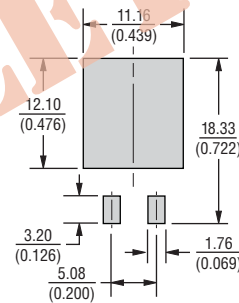
TO220 Casing: 2-Pin (Surface Mount)



TO221 Casing: 2-Pin

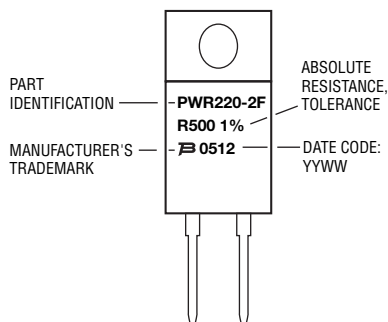


### Recommended Pad Layout



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 %

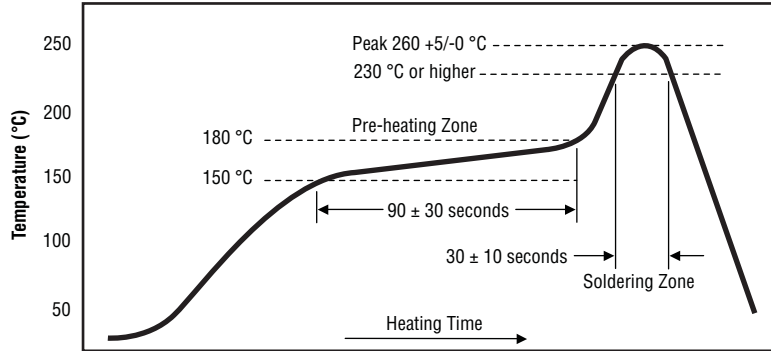
Packaging \_\_\_\_\_  
 E = Tape & Reel (Available only for Versions A and D)  
 \_\_\_\_\_ = Tubes

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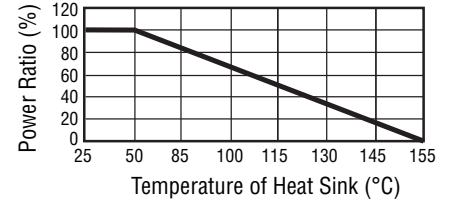
# PWR220/PWR221 F Series Power Resistors



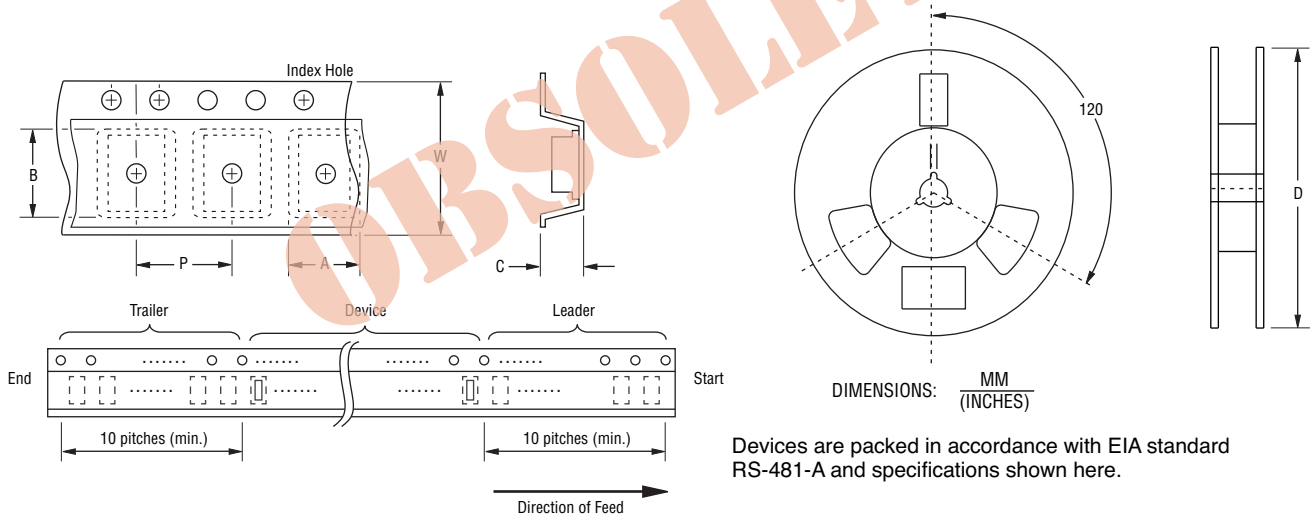
## Soldering Profile (Surface Mount Version Only)



## Derating Curve



## Packaging Dimensions



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. 10/15

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