

## Features

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

## Applications

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

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

\*Thermal junction 130 °C max.

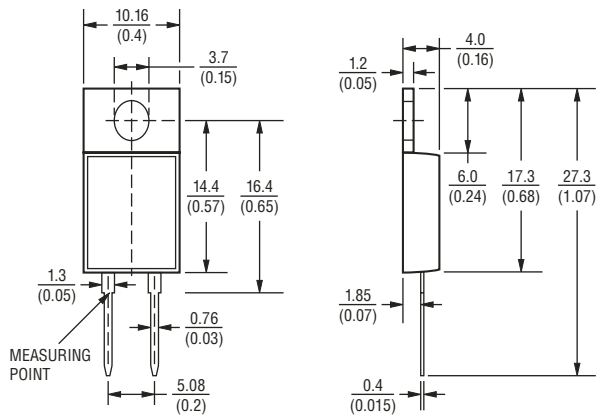
\*RoHS Directive 2002/95/EC Jan 27 2003, including Annex  
 Specifications are subject to change without notice.  
 Customers should verify actual device performance in their specific applications.

# PWR220/PWR221 F Series Power Resistors

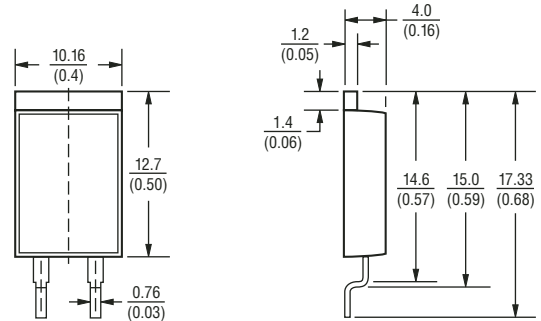


## Product Dimensions

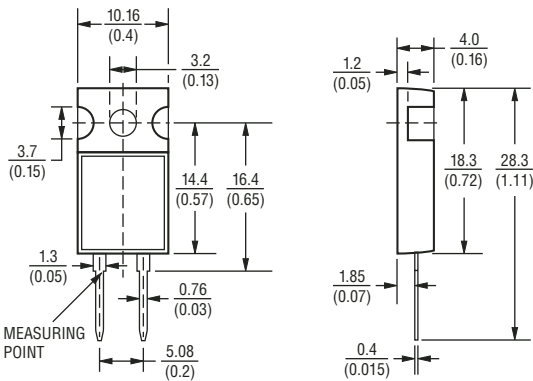
T0220 Housing: 2-Pin



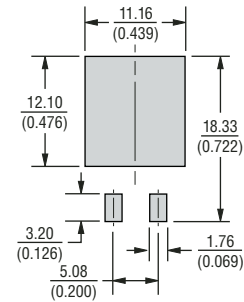
T0220 Casing: 2-Pin (Surface Mount)



T0221 Casing: 2-Pin



## Recommended Pad Layout



## 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

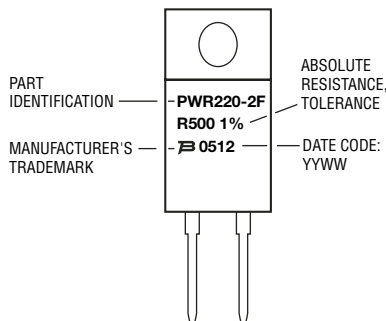
Version \_\_\_\_\_  
 A = TO220 Housing, Surface Mount, 30 W (w/Heat Sink)  
 B = TO220 Housing/TO221 Housing, Through-Hole, 30 W (w/Heat Sink)  
 C = TO220 Housing/TO221 Housing, Through-Hole, 50 W (w/Heat Sink)  
 D = TO220 Housing, Surface Mount, 50 W (w/Heat Sink)

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

## Typical Part Marking



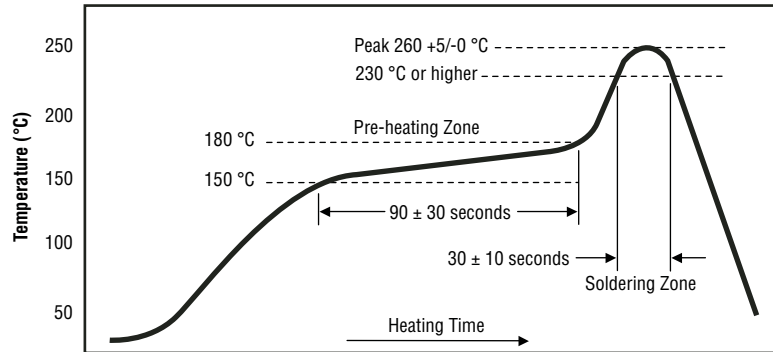
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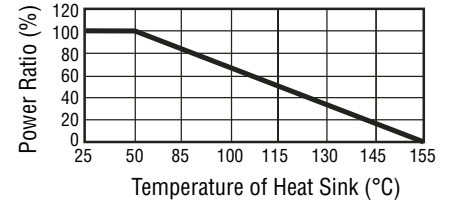
# PWR220/PWR221 F Series Power Resistors

**BOURNS®**

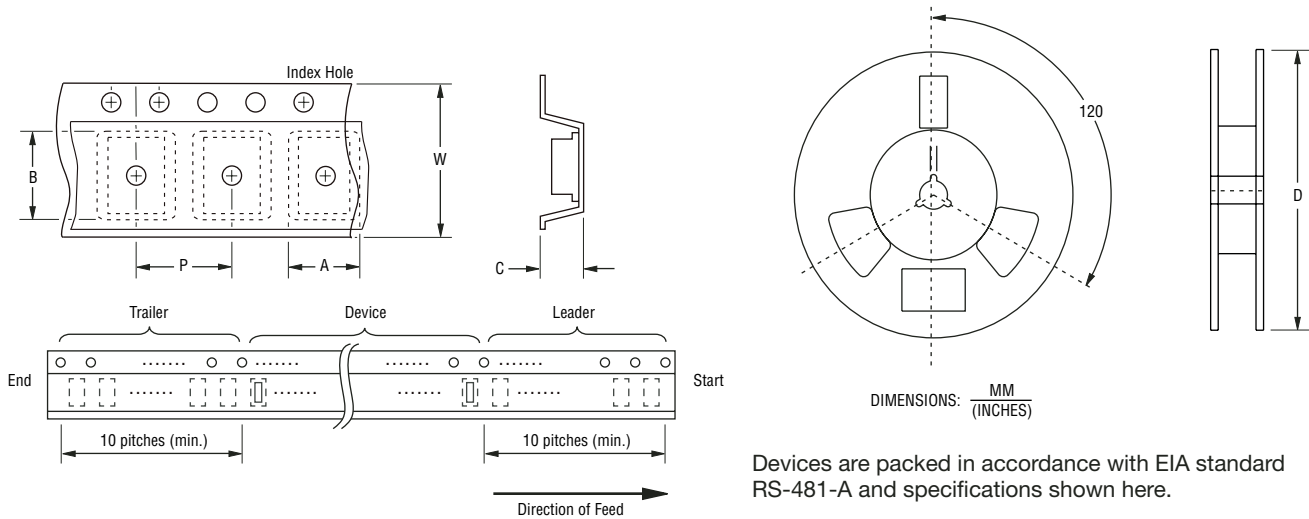
## Soldering Profile (Surface Mount Version Only)



## 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. 06/08

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