

**BOURNS®**

## 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 (AL203)  
 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 – R <sub>thj</sub> (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



**WARNING** Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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## Applications

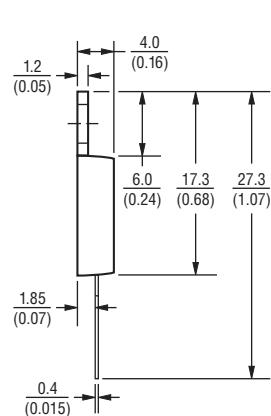
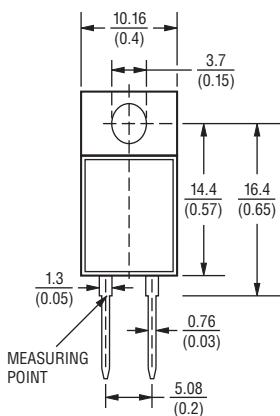
- Power supplies
- Motor drives
- Test and measurement
- Welding

## PWR220/PWR221 F Series Power Resistors

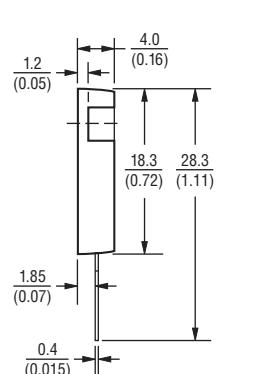
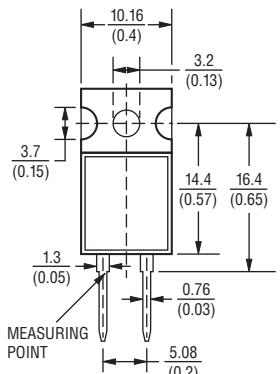
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### Product Dimensions

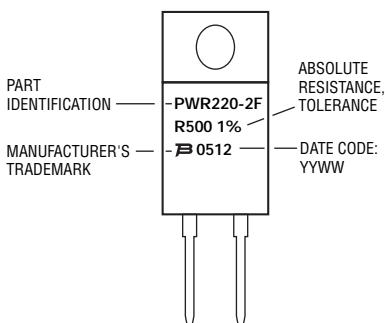
TO220 Housing: 2-Pin



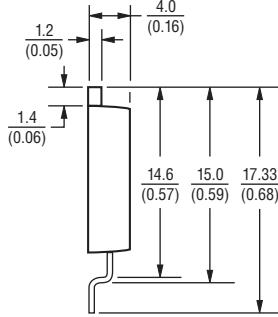
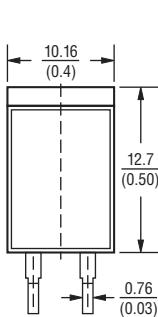
TO221 Casing: 2-Pin



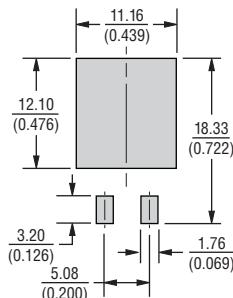
### Typical Part Marking



TO220 Casing: 2-Pin (Surface Mount)



### Recommended Pad Layout



DIMENSIONS: **MM (INCHES)**

### How to Order

Model	PWR 220 - 2 F B R040 J E
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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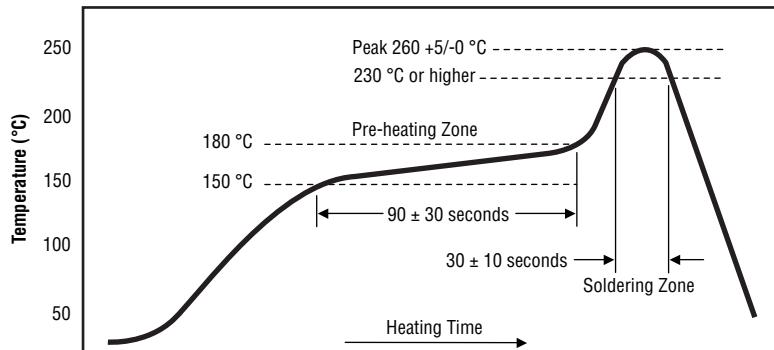
Users should verify actual device performance in their specific applications.

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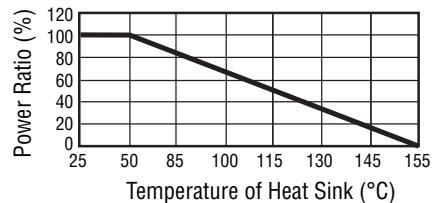
## PWR220/PWR221 F Series Power Resistors

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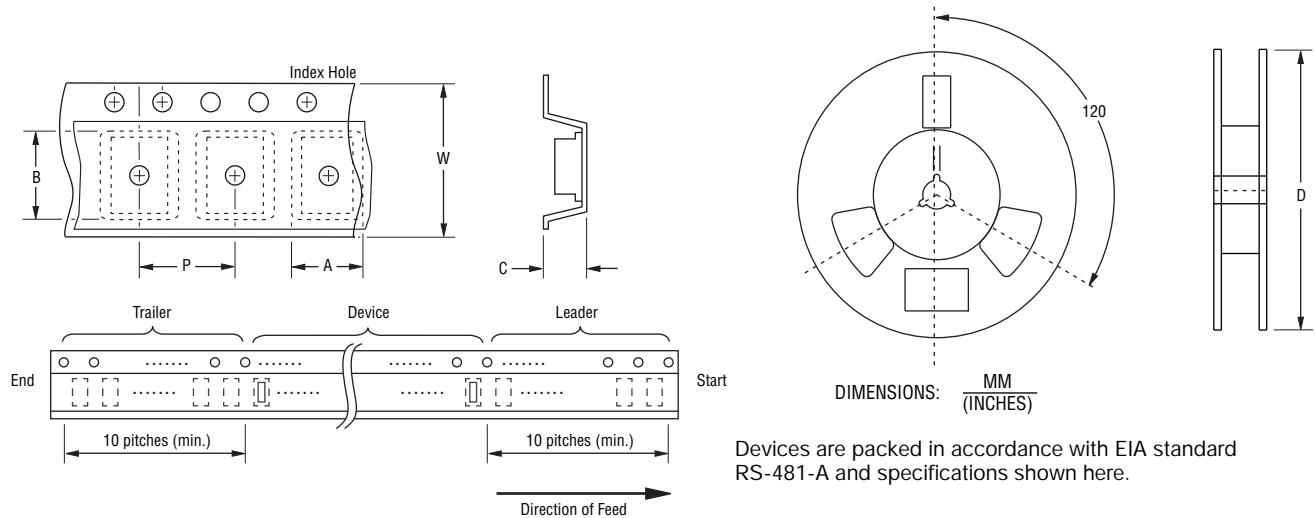
### Soldering Profile (Surface Mount Version Only)



### 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	10.4 (0.409)
Carrier Length	B	18.4 (0.724)
Carrier Depth	C	4.4 (0.173)
Reel Outside Diameter	D	330 (12.992)
Punch Hole Pitch	P	16.00 (0.630)
Tape Width	W	32 (1.260)
Quantity per Reel	—	500

**BOURNS®**

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REV. 09/19

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