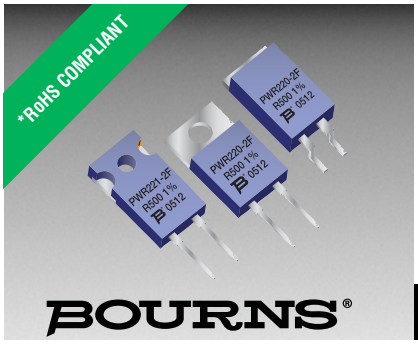



## Features

- 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 (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) | 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 with External Heat Sink | | | | | |
| (Version A) | | | | 30 | W |
| (Version C & D) | | | | 50 | W |
| 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) | | | 3.5 | | °C/W |
| (Version C & D) | | | 2.1 | | °C/W |
| Stability | | | 0.5 | | % |
| Dielectric Withstanding Voltage | | | | 2 | kV DC |
| Operating Temperature | $T_J$ | -40 | | +155 | °C |

OBSOLETE

*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

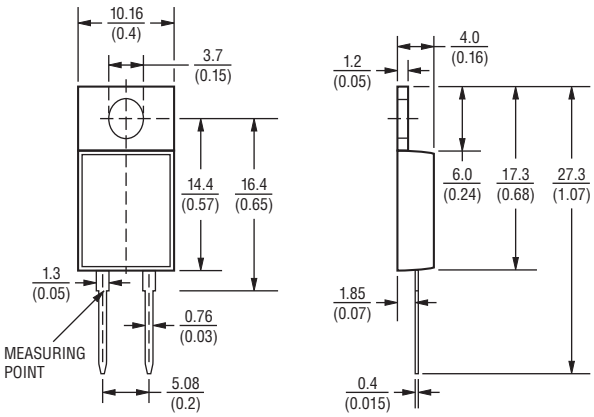
- Power supplies
- Motor drives
- Test and measurement
- Welding

# PWR220/PWR221 F Series Power Resistors

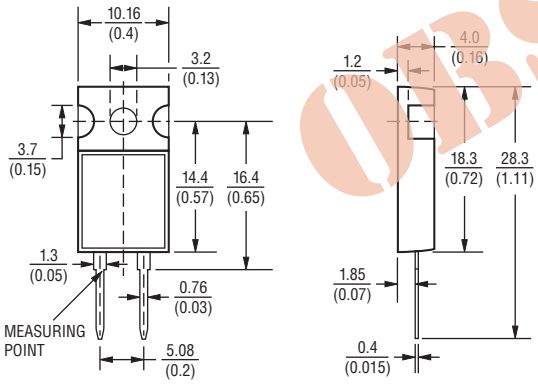
BOURNS®

## Product Dimensions

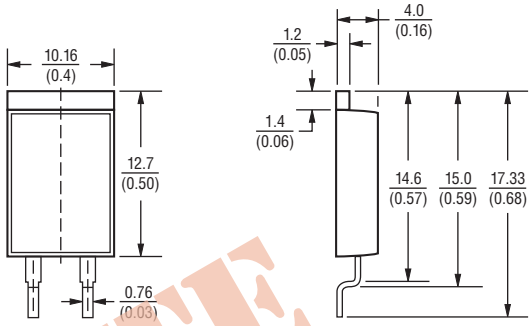
**TO220 Housing: 2-Pin**



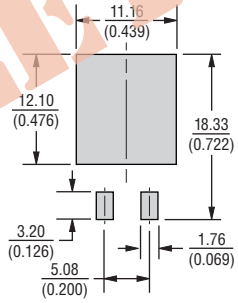

**TO221 Casing: 2-Pin**




**TO220 Casing: 2-Pin (Surface Mount)**



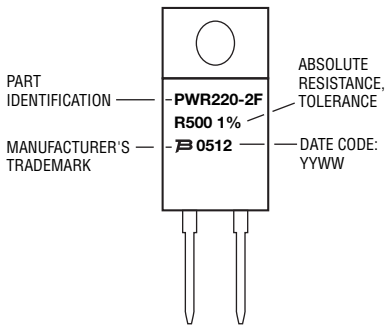

## Recommended Pad Layout




DIMENSIONS: MM (INCHES)

OBSOLETE

## 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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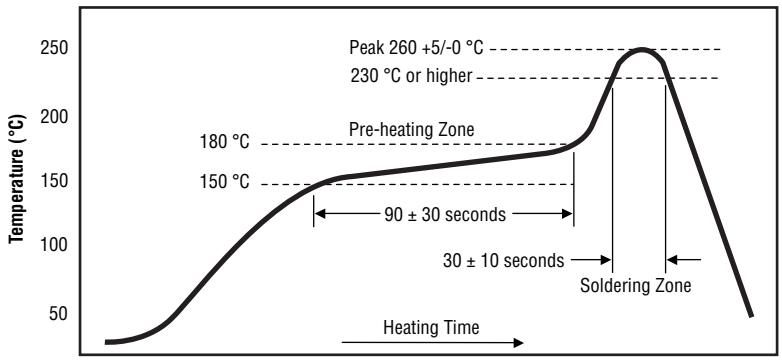
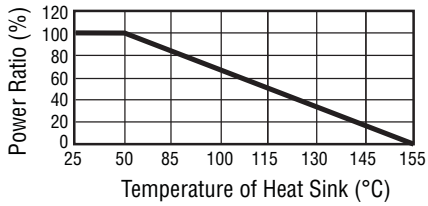
## Soldering Profile (Surface Mount Version Only)

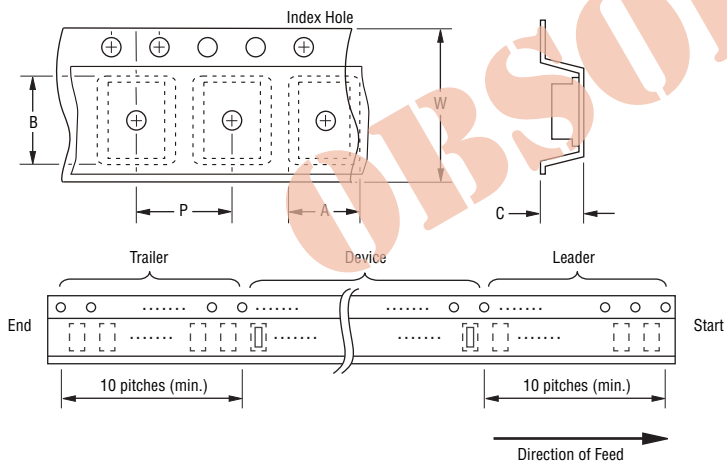


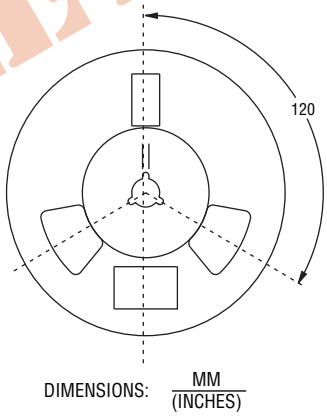

## Derating Curve

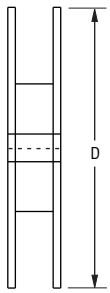



## Packaging Dimensions

OBSOLETE




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 |

REV. 10/15

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