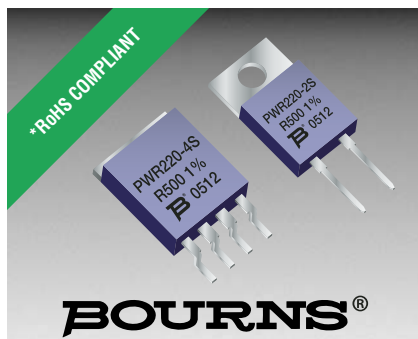




## Features

- Low TCR
- Low electrical noise
- Low inductance/capacitance
- High power rating
- Low ohmic values

## Applications

- Power supplies
- Motor drives
- Test and measurement
- Electricity meters

## PWR220/PWR221 S Series Shunt Resistor

### Material Specifications

Resistor.....Metal Foil (CuNiMn)  
 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 Version A.

### General Information

The Bourns® PWR220 S Series is a TO220 style Shunt Resistor; the PWR221 S Series is a TO221 style Shunt Resistor. Manufactured using foil on alumina ceramic, it is used in applications such as power supplies, motor drives and measurements.

### Electrical & Thermal Characteristics

| Parameter                                                                                | Symbol         | Min.                      | Nom. | Max.              | Unit   |
|------------------------------------------------------------------------------------------|----------------|---------------------------|------|-------------------|--------|
| Resistance                                                                               | R              | 0.002                     |      | 50                | Ω      |
| Power Rating<br>@ 70 °C without additional heat sink<br>@ 70 °C with adequate heat sink* |                | 10                        |      | 1.50<br>15        | W      |
| Tolerance<br>0.002 Ω < R < 0.01 Ω<br>0.01 Ω < R < 0.10 Ω<br>0.10 Ω < R < 50.0 Ω          |                | 2.0**<br>1.0***<br>0.5*** |      | 5.0<br>5.0<br>5.0 | %      |
| TCR<br>20 °C < T < 60 °C<br>-40 °C < T < +130 °C                                         |                |                           |      | ±15.0<br>±50.0    | PPM/°C |
| Thermal Resistance – Rthj (Max @ R < 50 Ω)                                               |                |                           |      | 4.8               | °C/W   |
| Stability                                                                                |                | 0.1                       |      | 0.5               | %      |
| Thermal EMF                                                                              |                |                           |      | 1.0               | μV/°C  |
| Dielectric Withstanding Voltage                                                          |                |                           |      | 300               | VDC    |
| Operating Temperature                                                                    | T <sub>J</sub> | -40                       |      | +130              | °C     |

\* Thermal junction 130 °C max.

\*\* 1 % also available with 4-pin version.

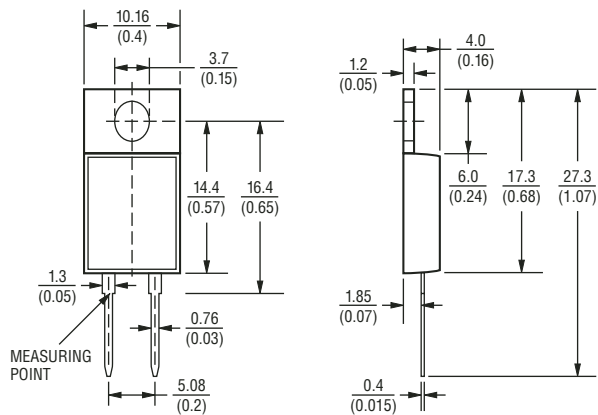
\*\*\* 0.1 % and 0.24 % also available with 4-pin version.

# PWR220/PWR221 S Series Shunt Resistor

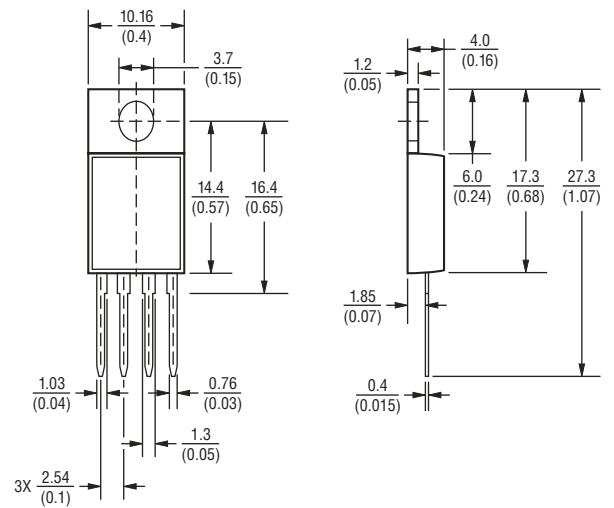
**BOURNS®**

## Product Dimensions

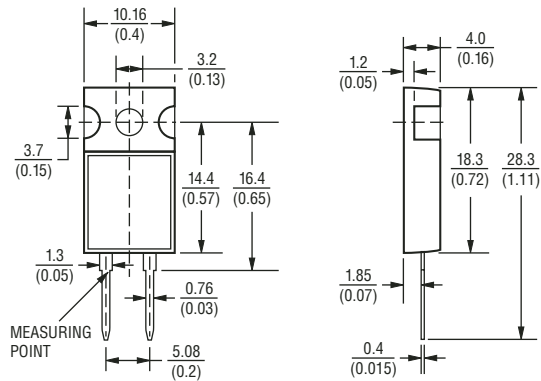
**T0220 Housing: 2-Pin**



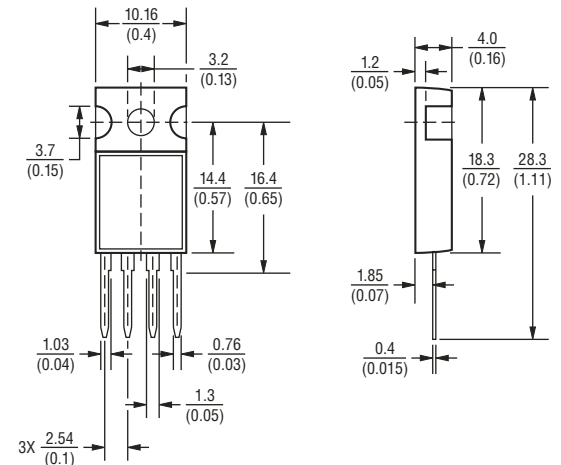
**T0220 Housing: 4-Pin**



**T0221 Casing: 2-Pin**



**T0221 Casing: 4-Pin**



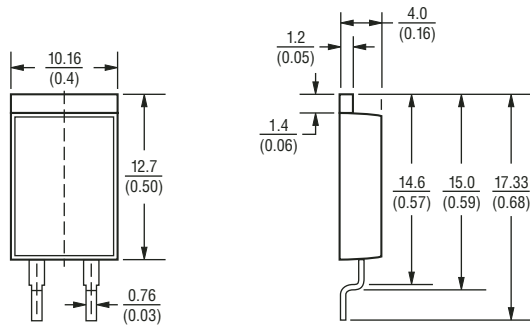
DIMENSIONS = MILLIMETERS  
(INCHES)

# PWR220/PWR221 S Series Shunt Resistor

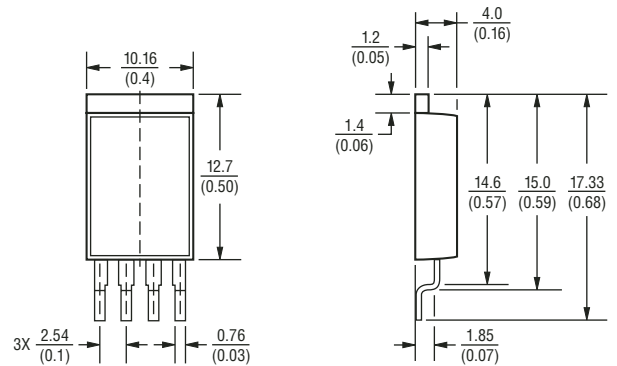
**BOURNS®**

## Product Dimensions

### T0220 Casing: 2-Pin (Surface Mount)



### T0220 Casing: 4-Pin (Surface Mount)



DIMENSIONS =  $\frac{\text{MILLIMETERS}}{\text{(INCHES)}}$

## How to Order

**PWR 220 - 2 S A R040 J E**

Model \_\_\_\_\_  
PWR = Power Resistor

Package \_\_\_\_\_  
220 = T0220  
221 = T0221

Number of Pins \_\_\_\_\_  
2 = 2    4 = 4

Function \_\_\_\_\_  
S = Shunt

Version \_\_\_\_\_  
A = Surface Mount  
B = Through Hole

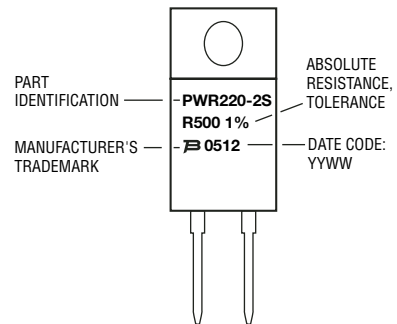
Resistor Value for all Tolerances \_\_\_\_\_  
"R" represents decimal point  
(examples: R040 = .040 ohms; 50R0 = 50.0 ohms)

Absolute Tolerance \_\_\_\_\_  
J = 5 %    G = 2 %    F = 1 %  
D = 0.5 %    \*C = 0.25 %    \*B = 0.1 %

Packaging \_\_\_\_\_  
E = Tape & Reel (Available only for Version A)  
\_\_\_\_ = Tubes

\*Available only with 4-pin versions.

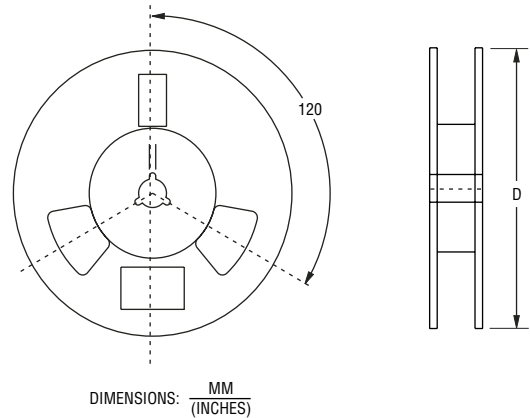
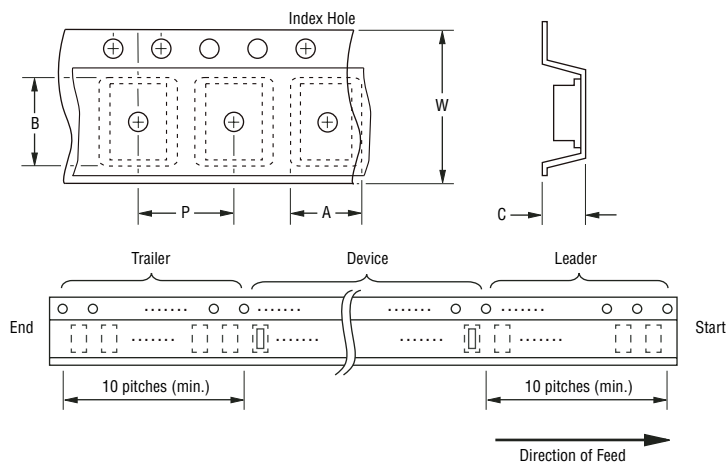
## Typical Part Marking



# PWR220/PWR221 S Series Shunt Resistor

**BOURNS®**

## 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                     |



### Asia-Pacific:

Tel: +886-2 2562-4117 • Fax: +886-2 2562-4116

### Europe:

Tel: +41-41 768 5555 • Fax: +41-41 768 5510

### The Americas:

Tel: +1-951 781-5500 • Fax: +1-951 781-5700

[www.bourns.com](http://www.bourns.com)

REV. 05/08

Specifications are subject to change without notice.  
Customers should verify actual device performance in their specific applications.