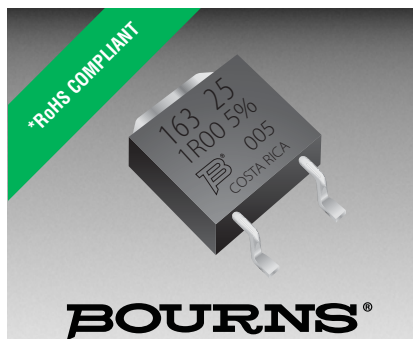




## Features

- Smaller than a D<sup>2</sup>PAK package
- Low inductance
- Resistor electrically isolated from the backplate
- High power rating
- Compatible with lead free solder reflow temperatures

- RoHS compliant\*

## Applications

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

## PWR163 Series Power Resistor

### General Information

The PWR163 Series is a DPAK style surface mount power resistor. It has a very low inductance making it ideal for high frequency applications such as amplifiers for audio or wireless base stations. It has excellent pulse characteristics as well, allowing it to be used in current limiting or capacitor discharge circuits.

### Electrical & Thermal Characteristics

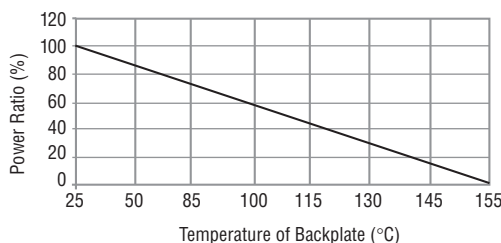
| Parameter                                           | Value(s)                                   |
|-----------------------------------------------------|--------------------------------------------|
| Resistance<br>(See Popular Resistance Values table) | 0.02 $\Omega$ to 130 K $\Omega$            |
| Power Rating @ 25 °C Case Temperature               | 25 W                                       |
| Tolerance                                           | $\pm 1\%$ **, $\pm 5\%$                    |
| TCR<br>0.02 $\Omega$ < R < 130.0K $\Omega$          | $\pm 100$ PPM/°C                           |
| Thermal Resistance - R <sub>thj</sub>               | 5.2 °C/W                                   |
| Inductance                                          | 0.1 $\mu$ H maximum                        |
| Operating Voltage                                   | $\sqrt{P \cdot R}$ with a maximum of 250 V |
| Dielectric Strength                                 | 2 KV AC                                    |
| Insulation Resistance                               | 10 G $\Omega$                              |
| Operating Temperature                               | -55 °C to 155 °C                           |

\*\* Available for most values. Check Popular Resistance Values table.

### Reliability Characteristics

| Parameter                                                                                                       | Specification           |
|-----------------------------------------------------------------------------------------------------------------|-------------------------|
| Short Term Overload (2x Pr for R < 2 $\Omega$ , 1.6 x Pr for R $\geq$ 2 $\Omega$ , V < 1.5 x Operating Voltage) | $\Delta R$ $\pm 0.25\%$ |
| Load Life (1000 hours at rated power)                                                                           | $\Delta R$ $\pm 1.0\%$  |
| Thermal Shock (-55 °C to 155 °C, 5 cycles)                                                                      | $\Delta R$ $\pm 0.5\%$  |
| Resistance to Soldering Heat (10 seconds at 270 °C)                                                             | $\Delta R$ $\pm 0.5\%$  |
| Vibration (20 G 10-2000 Hz .06 " D.A.)                                                                          | $\Delta R$ $\pm 0.25\%$ |
| Moisture Sensitivity Level                                                                                      | 1                       |

### Derating Curve



\*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. Customers should verify actual device performance in their specific applications.

### Material Characteristics

Resistor ..... Thick film  
Substrate ..... Alumina (AL2O3)  
Housing ..... Epoxy  
Pins ..... Tinned Copper (Sn/Cu)  
Flammability ..... Conforms to UL-94V0

### Popular Resistance Values

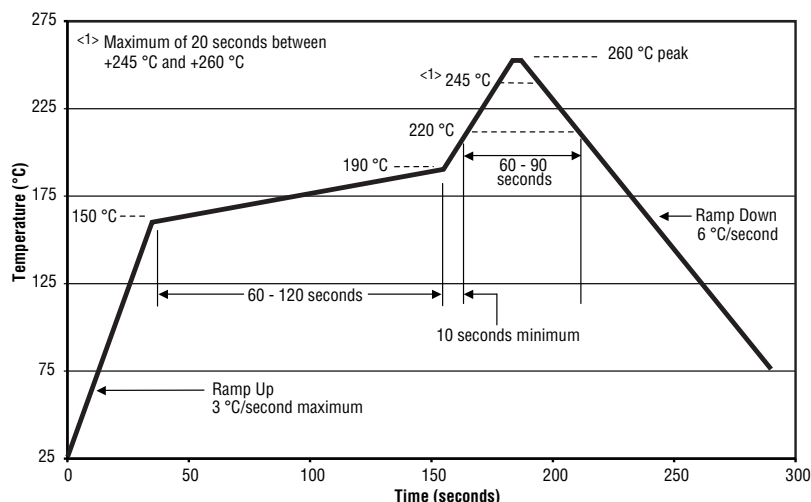
| Code | Resistance Value   | Code | Resistance Value |
|------|--------------------|------|------------------|
| R020 | 0.02 $\Omega$ ***  | 1000 | 100 $\Omega$     |
| R025 | 0.025 $\Omega$ *** | 1200 | 120 $\Omega$     |
| R030 | 0.03 $\Omega$ ***  | 1500 | 150 $\Omega$     |
| R033 | 0.033 $\Omega$ *** | 2000 | 200 $\Omega$     |
| R040 | 0.04 $\Omega$ ***  | 2500 | 250 $\Omega$     |
| R050 | 0.05 $\Omega$ ***  | 3000 | 300 $\Omega$     |
| R075 | 0.075 $\Omega$ *** | 3300 | 330 $\Omega$     |
| R100 | 0.1 $\Omega$       | 4000 | 400 $\Omega$     |
| R150 | 0.15 $\Omega$      | 4700 | 470 $\Omega$     |
| R200 | 0.2 $\Omega$       | 5000 | 500 $\Omega$     |
| R250 | 0.25 $\Omega$      | 5600 | 560 $\Omega$     |
| R300 | 0.3 $\Omega$       | 7500 | 750 $\Omega$     |
| R330 | 0.33 $\Omega$      | 1001 | 1.0 K $\Omega$   |
| R400 | 0.4 $\Omega$       | 1501 | 1.5 K $\Omega$   |
| R500 | 0.5 $\Omega$       | 2001 | 2.0 K $\Omega$   |
| R750 | 0.75 $\Omega$      | 2501 | 2.5 K $\Omega$   |
| 1R00 | 1 $\Omega$         | 3001 | 3.0 K $\Omega$   |
| 1R50 | 1.5 $\Omega$       | 3301 | 3.3 K $\Omega$   |
| 2R00 | 2 $\Omega$         | 4001 | 4.0 K $\Omega$   |
| 2R50 | 2.5 $\Omega$       | 5001 | 5.0 K $\Omega$   |
| 3R00 | 3 $\Omega$         | 7501 | 7.5 K $\Omega$   |
| 3R30 | 3.3 $\Omega$       | 1002 | 10 K $\Omega$    |
| 4R00 | 4 $\Omega$         | 1502 | 15 K $\Omega$    |
| 5R00 | 5 $\Omega$         | 2002 | 20 K $\Omega$    |
| 7R50 | 7.5 $\Omega$       | 2502 | 25 K $\Omega$    |
| 8R00 | 8 $\Omega$         | 3002 | 30 K $\Omega$    |
| 10R0 | 10 $\Omega$        | 3302 | 33 K $\Omega$    |
| 12R0 | 12 $\Omega$        | 4002 | 40 K $\Omega$    |
| 15R0 | 15 $\Omega$        | 4702 | 47 K $\Omega$    |
| 20R0 | 20 $\Omega$        | 5002 | 50 K $\Omega$    |
| 25R0 | 25 $\Omega$        | 5602 | 56 K $\Omega$    |
| 27R0 | 27 $\Omega$        | 6802 | 68 K $\Omega$    |
| 30R0 | 30 $\Omega$        | 7502 | 75 K $\Omega$    |
| 33R0 | 33 $\Omega$        | 8202 | 82 K $\Omega$    |
| 40R0 | 40 $\Omega$        | 1003 | 100 K $\Omega$   |
| 47R0 | 47 $\Omega$        | 1153 | 115 K $\Omega$   |
| 50R0 | 50 $\Omega$        | 1203 | 120 K $\Omega$   |
| 56R0 | 56 $\Omega$        | 1253 | 125 K $\Omega$   |
| 75R0 | 75 $\Omega$        | 1303 | 130 K $\Omega$   |

\*\*\* 5 % Tolerance

# PWR163 Series Power Resistor

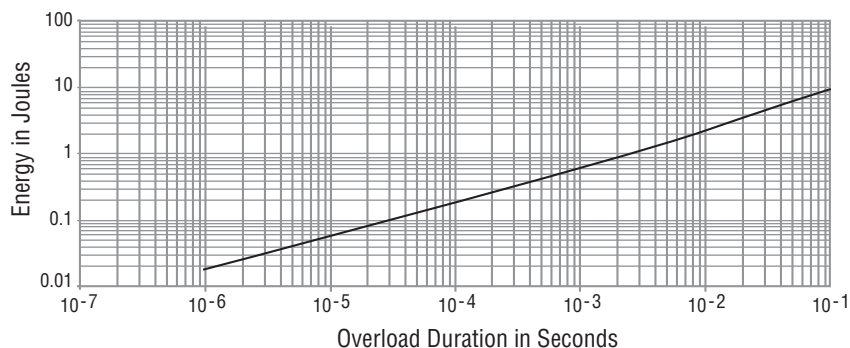
**BOURNS®**

## Soldering Profile



Power dissipation is 2.8 W at an ambient temperature of 25 °C when mounted on a double-sided copper board using FR4 standard, 70  $\mu$ m of copper, 39 x 30 x 1.6 mm.

## Pulse Power Rating



The energy absorbed by the resistor expressed in Joules can be calculated by multiplying the peak power of the pulse in watts times the length of the pulse in seconds.

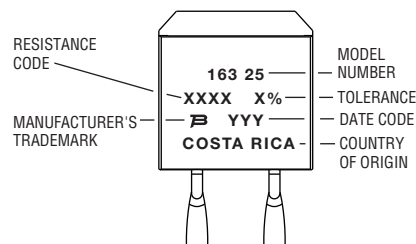
The energy should not exceed the limits shown in the graph. The overload voltage should not exceed 1.5 times the maximum operating voltage.

## How to Order

### PWR 163 S - 25 - 10R0 J E

Model \_\_\_\_\_  
PWR = Power Resistor  
Package \_\_\_\_\_  
163 = DPAK Style  
Pin Style \_\_\_\_\_  
S = Surface Mount  
Power \_\_\_\_\_  
25 = 25 W  
Resistance Value \_\_\_\_\_  
<100 ohms ... "R" represents decimal point (examples: 7R50 = 7.5  $\Omega$ ; R500 = 0.5  $\Omega$ )  
 $\geq$ 100 ohms... First three digits are significant, fourth digit represents number of zeros to follow (examples: 2000 = 200 ohms; 3002 = 30K ohms)  
Absolute Tolerance \_\_\_\_\_  
J = 5 %  
F = 1 %  
Packaging \_\_\_\_\_  
E = Tape & Reel  
Blank = Tubes

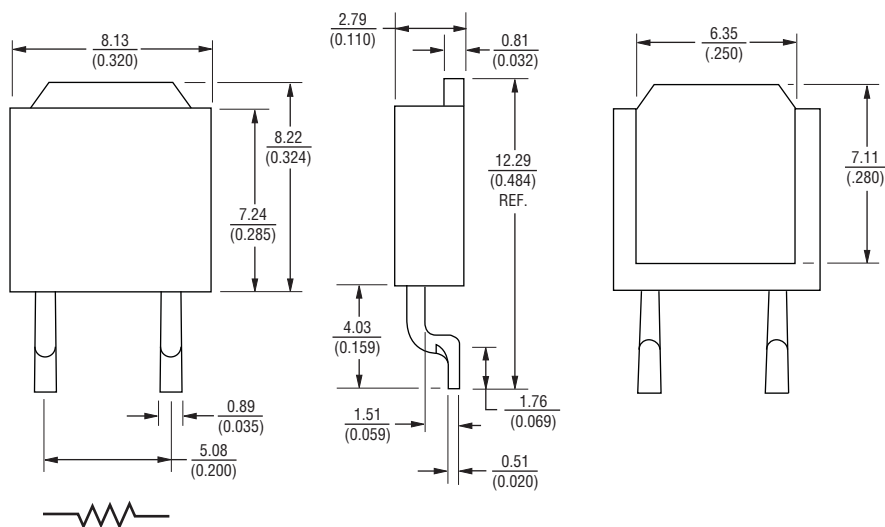
## Typical Part Marking



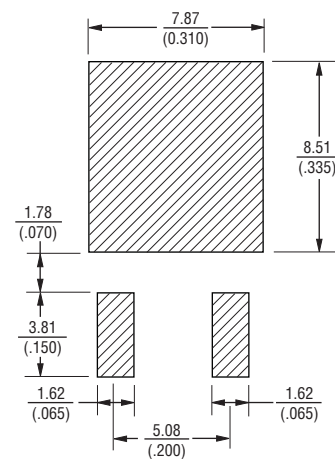
# PWR163 Series Power Resistor

**BOURNS®**

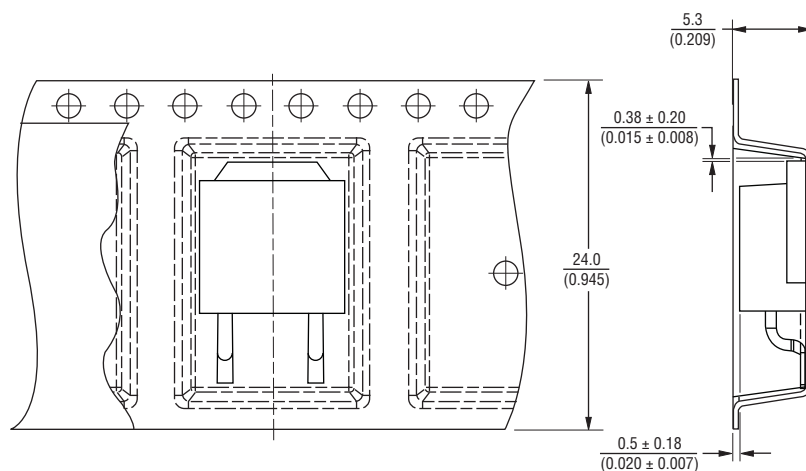
## Product Dimensions



## Recommended Pad Layout



## Packaging Specifications



DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$   
 TOLERANCE:  $\pm 0.38$  UNLESS OTHERWISE NOTED  
 $(\pm 0.015)$

**BOURNS®**

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. 11/12

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