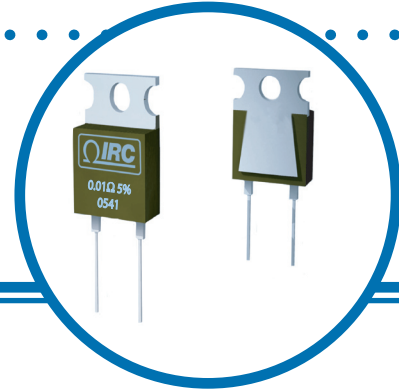


# TO-220

## Power Resistor

### T0220 Series

- TO-220 housing
- Low inductance (<50nH)
- Available in 20W or 30W
- Resistance from 0.01 to 51KΩ
- High stability film resistance elements



IRC's TO-220 power film resistors satisfy demanding applications for accurate and stable power resistors housed in the convenient TO-220 case. The resistance element is isolated from the mounting tab by an alumina ceramic layer, providing very low thermal resistance and ensuring high insulation resistance between terminals and tab. The non-inductive design makes these products especially useful in high frequency and high speed pulse applications.

## Electrical Data

Type	Power Rating <sup>4,5</sup>		Thermal Resistance	Resistance Range <sup>3</sup>		Tolerances	Temperature Coefficient
	Heat-sink <sup>1</sup>	Free Air <sup>2</sup>		Min	Max		
TO222-30	30W	1W	2.3°C/W	0.1Ω	220Ω	±1%	±100ppm/°C
				0.01Ω	220Ω	±5%	±250ppm/°C
	30W	1W	2.3°C/W	220Ω	51KΩ	±1%, ±5%	±100ppm/°C
TO220-20	20W	1W	3.3°C/W	0.1Ω	220Ω	±1%	±100ppm/°C
				0.01Ω	220Ω	±5%	±250ppm/°C
	20W	1W	3.3°C/W	220Ω	51KΩ	±1%, ±5%	±100ppm/°C

<sup>1</sup>Power rating based on 25°C flange temperature.  
<sup>5</sup>Max voltage 500V or  $\sqrt{P \times R}$

<sup>2</sup>Power rating based on 25°C ambient temperature.

<sup>3</sup>Consult factory for higher or lower values.

<sup>4</sup>Max current 25 amps

### General Note

IRC reserves the right to make changes in product specification without notice or liability. All information is subject to IRC's own data and is considered accurate at time of going to print.

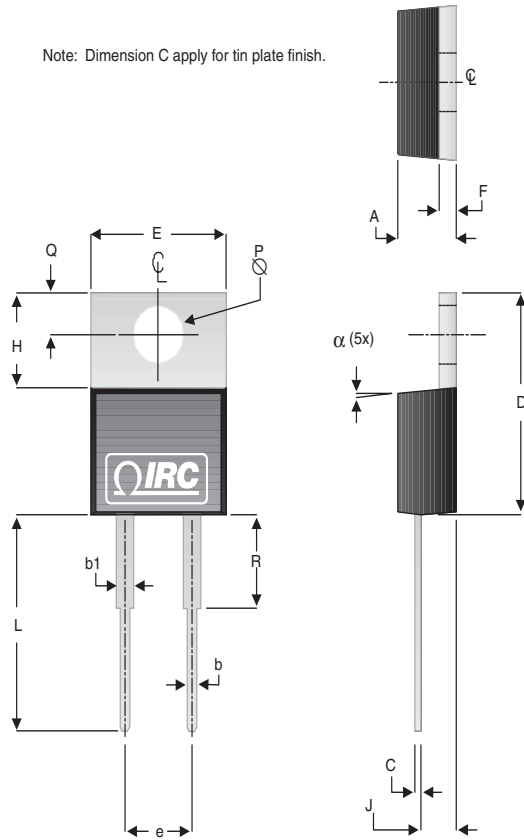
# TO-220

## Power Resistor

### Physical Data

POS	Inches		Millimeters				
	Min	Max	Min	Max			
<b>A</b>	0.160	0.190	4.06	4.83			
<b>b</b>	0.025	0.040	0.63	1.02			
<b>c</b>	0.015	0.022	0.38	0.56			
<b>D</b>	0.560	0.590	14.22	14.99			
<b>E</b>	0.385	0.415	9.78	10.54			
<b>e</b>	0.190	0.210	4.83	5.33			
<b>F</b>	0.045	0.055	1.14	1.40			
<b>H</b>	0.234	0.258	5.94	6.55			
<b>J</b>	0.090	0.115	2.28	2.92			
$\varnothing$ <b>P</b>	0.146	0.156	3.71	3.96			
<b>Q</b>	0.103	0.113	2.62	2.87			
<b>L</b>	0.540	0.560	13.72	14.22			
Lead material	Tinned copper		$\alpha$	3°	7°	3°	7°
Substrate material	96% alumina ceramic		<b>b1</b>	0.045	0.060	1.14	1.52
Resistor construction	Proprietary film conductors and proprietary alloy resistors		<b>R</b>	0.243 REF		6.17 REF	

Note: Dimension C apply for tin plate finish.

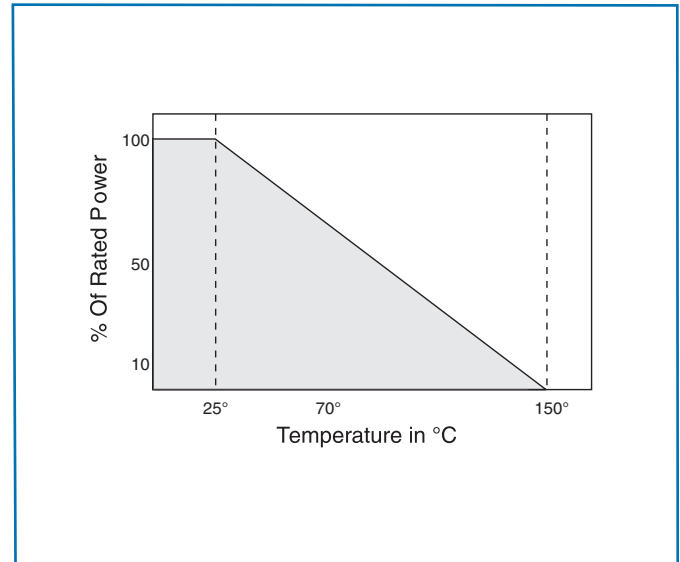


# TO-220 Power Resistor

## Environmental

TEST	MAX $\Delta R$
<b>Thermal Shock</b> Mil-Std-202 Method 107 Cond. F	$\pm 0.30\%$ +0.5m $\Omega$
<b>Thermal Strength</b> Mil-Std-202 Method 211 Cond. A (5165)	$\pm 0.20\%$ +0.5m $\Omega$
<b>Short-Time Overload</b> 5 sec 2xRated Power	$\pm 0.30\%$ +0.5m $\Omega$
<b>Moisture Resistance</b> Mil-Std-202 Method 106	$\pm 1.0\%$ +0.5m $\Omega$
<b>Mechanical Shock Method</b> Mil-Std-202 Method 213 Cond. I	$\pm 0.25\%$ +0.5m $\Omega$
<b>Vibration</b> Mil-Std-202 Method 204 Cond. D	$\pm 0.25\%$ +0.5m $\Omega$
<b>Load Life</b> MIL-Std-202 Method 108 1,000 Hours	$\pm 1.00\%$ +0.5m $\Omega$
<b>Resistance To Solder Heat</b> Mil-Std-202 Method 210F Cond. B	$\pm 0.25\%$ +0.5m $\Omega$

## Power Derating Curve



## Ordering Data

Prefix	TFP
Style	TO220
Power	30
Resistance Code	1R50
Absolute Tolerance Code	J
Absolute TCR	100

**Power**  
 20 = 20 Watts  
 30 = 30 Watts

**Resistance Code**  
 4-digit resistance code.  
 Ex: 10R0 = 10 $\Omega$ , 1001 = 1K $\Omega$

**Absolute Tolerance Code**  
 J =  $\pm 5\%$ ; F =  $\pm 1\%$

**Absolute TCR**  
 $\pm 100$ ppm/ $^{\circ}$ C;  $\pm 250$ ppm/ $^{\circ}$ C

For additional information or to discuss your specific requirements, please contact our Applications Team using the contact details below.