

ALL DIMENSIONS IN MM.

CATALOG OUTLINE  
TYPE R82



Powerex General Purpose Rectifier Diodes are designed with high blocking voltage capability and low forward voltage drop to minimize conduction losses. These are packaged in hermetic, ceramic Pow-R-Disc packages which can be mounted using commercially available clamps and heatsinks or fully assembled to a variety of air or water cooled heat exchangers.

### FEATURES:

- Low On-State Voltage
- Hermetic Ceramic Package
- Excellent Surge and  $I^2t$  Ratings

### APPLICATIONS:

- DC Power Supplies
- Input Rectifiers

### ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.  
EXAMPLE: R8205207XXOO is a 5200V-690A General Purpose Diode with a typical reverse recovery time of 30 $\mu$ s.

PART	Voltage Rating $V_{DRM}-V_{RRM}$	Voltage Code	Current Rating $I_{tavg}$	Current Code	Reverse Recovery $t_{RR}$	Lead Code
<b>R820</b>	5200V	<b>52</b>	690A	<b>07</b>	<b>XX</b>	<b>OO</b>
	5000V	<b>50</b>				
	4800V	<b>48</b>			30 $\mu$ s typical	
	4400V	<b>44</b>				

Revised: 2/22/2008

**Absolute Maximum Ratings**

Characteristic	Symbol	Rating	Units
Repetitive Peak Reverse Voltage	$V_{RRM}$	5200	Volts
Non-repetitive Transient Peak Reverse Voltage	$V_{RSM}$	$V_{RRM} + 100$	Volts
Average On-State Current, $T_C = 100^\circ\text{C}$	$I_{F(Avg.)}$	690	A
RMS On - State Current, $T_C = 100^\circ\text{C}$	$I_{F(RMS)}$	1084	A
Average On-State Current, $T_C = 55^\circ\text{C}$	$I_{F(Avg.)}$	1035	A
RMS On - State Current, $T_C = 55^\circ\text{C}$	$I_{F(RMS)}$	1626	A
Peak One Cycle Surge Current, 60Hz, $V_R = V_{RRM}$	$I_{FSM}$	7,500	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	2.34E+05	$\text{A}^2\text{s}$
Peak One Cycle Surge Current, 50Hz, $V_R = 0\text{V}$	$I_{FSM}$	6,938	A
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	2.41E+05	$\text{A}^2\text{s}$
Operating Temperature	$T_j$	-40 to+150	$^\circ\text{C}$
Storage Temperature	$T_{Stg.}$	-50 to+190	$^\circ\text{C}$
Approximate Weight		0.5	lb
		0.23	Kg
Mounting Force		3,000 - 3,500	lbs
		13.3 - 15.5	Knewtons

Information presented is based upon manufacturers testing and projected capabilities. This information is subject to change without notice. The manufacturer makes no claim as to suitability for use, reliability, capability or future availability of this product.

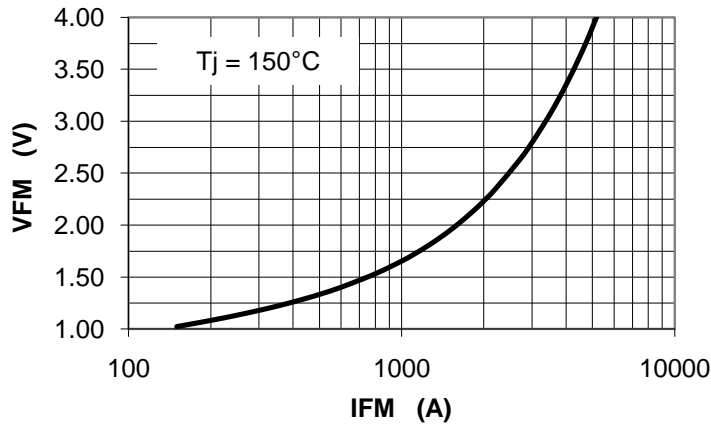
**Electrical Characteristics, Tj=25°C unless otherwise specified**

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	Tj=150°C, $V_{RRM}$ =Rated		50	75	ma
Peak On-State Voltage	$V_{FM}$	Tj=25°C, $I_{FM}$ = 1500 A			1.65	V
$V_{FM}$ Model, Low Level	$V_0$	Tj=150°C			1.00	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	15% $I_{FM}$ - $\pi \cdot I_{FM}$			6.20E-04	$\Omega$
$V_{FM}$ Model, High Level	$V_0$	Tj=150°C			1.12	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	$\pi \cdot I_{FM} - I_{FSM}$			5.57E-04	$\Omega$
$V_{FM}$ Model, 4-Term	A	Tj=150°C			0.209	
$V_{FM} = A + B \cdot \ln(I_{FM}) +$	B	15% $I_{FM}$ - $I_{FSM}$			1.69E-01	
$C \cdot (I_{FM}) + D \cdot (I_{FM})^{1/2}$	C				5.93E-04	
	D				-1.00E-02	
Reverse Recovery Time	$t_{RR}$	Tj=25°C, $I_{FM}$ =400A $di_R/dt = 25$ A/ $\mu$ s		30		$\mu$ s

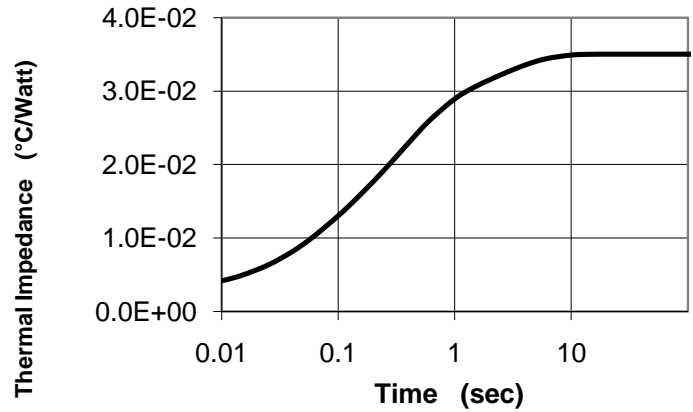
**Thermal Characteristics**

Characteristic	Symbol	Test Conditions	min	Rating		Units
				typ	max	
Thermal Resistance						
Junction to Case	$R\theta_{jc}$	Double side cooled		0.03	0.035	°C/Watt
Case to Sink	$R\theta_{cs}$	Double side cooled		0.012	0.015	°C/Watt
Thermal Impedance Model	$Z\theta_{jc}$	Double side cooled				
$Z\theta_{jc}(t) = \sum(A(N) \cdot (1 - \exp(-t/\text{Tau}(N))))$						
where: N = 1      2      3      4						
$A(N) =$ 2.536E-03    6.394E-03    1.818E-02    7.915E-03						
$\text{Tau}(N) =$ 7.988E-04    5.286E-02    3.296E-01    2.391E+00						

#### Maximum On-State Voltage Drop

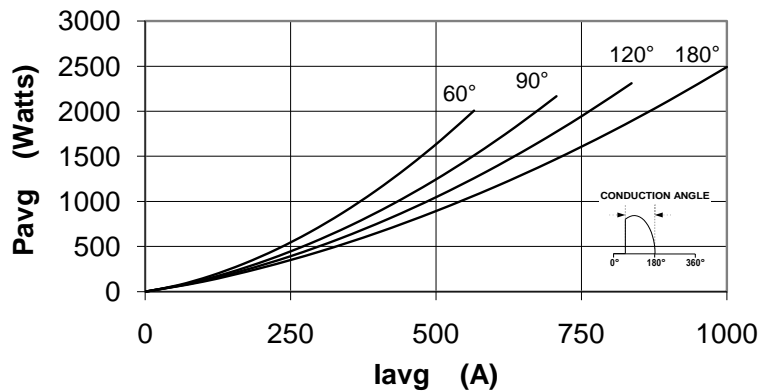


#### MAXIMUM TRANSIENT THERMAL IMPEDANCE



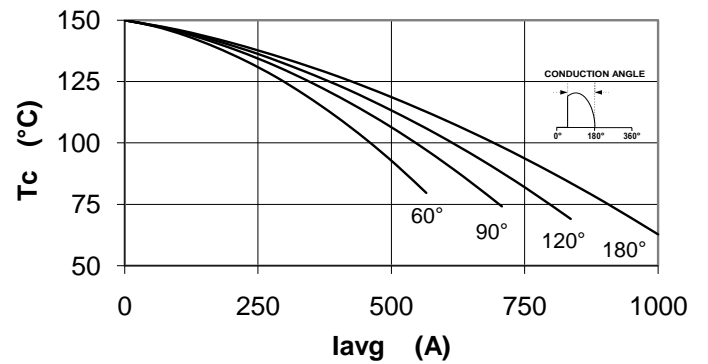
#### Maximum On-State Power Dissipation

Sinusoidal Waveform



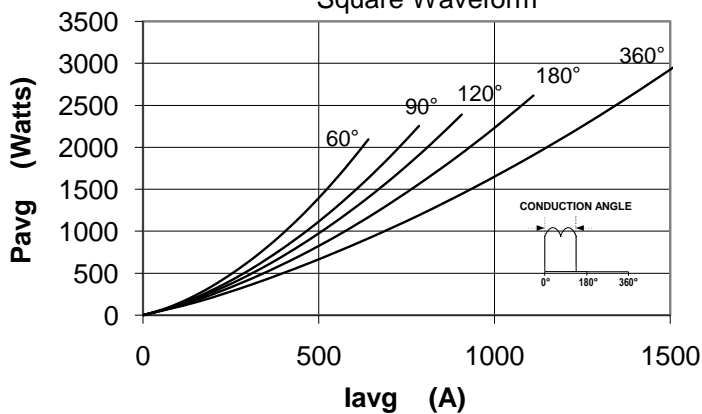
#### Maximum Allowable Case Temperature

Sinusoidal



#### Maximum On-State Power Dissipation

Square Waveform



#### Maximum Allowable Case Temperature

Square Waveform

