

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
- Plating Supplies

#### ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.  
 EXAMPLE: R8202616XXOO is a 2600V-1600A General Purpose Diode with a typical reverse recovery time of 25 $\mu$ s.

PART	Voltage Rating	Voltage Code	Current Rating	Current Code	Reverse Recovery	Lead Code
	$V_{DRM}-V_{RRM}$		$I_{tavg}$		$t_{RR}$	
<b>R820</b>	2600V	<b>26</b>	1600A	<b>16</b>	<b>XX</b>	<b>OO</b>
	2400V	<b>24</b>				
	2200V	<b>22</b>			25 $\mu$ s typical	
	2000V	<b>20</b>				

Revised:

9/30/2003



# R820\_\_16XX

## GENERAL PURPOSE RECTIFIER DIODE

Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724)925-7272

1600 Amperes 2600 Volts

### Absolute Maximum Ratings

Characteristic	Symbol	Rating	Units
Repetitive Peak Reverse Voltage	$V_{RRM}$	2600	Volts
Non-repetitive Transient Peak Reverse Voltage	$V_{RSM}$	$V_{RRM} + 100$	Volts
Average On-State Current, $T_C = 82^\circ\text{C}$	$I_{F(Avg.)}$	1600	A
RMS On - State Current, $T_C = 82^\circ\text{C}$	$I_{F(RMS)}$	2513	A
Peak One Cycle Surge Current, 60Hz, $V_R = V_{RRM}$	$I_{FSM}$	14,000	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	8.17E+05	$\text{A}^2\text{s}$
Peak One Cycle Surge Current, 50Hz, $V_R = 0\text{V}$	$I_{FSM}$	12,950	A
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	6.99E+05	$\text{A}^2\text{s}$
Operating Temperature	$T_j$	-40 to+175	$^\circ\text{C}$
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

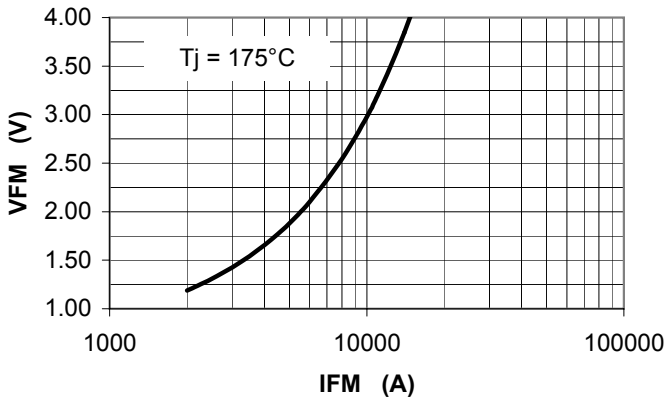
### Electrical Characteristics, Tj=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	Tj=175°C, $V_{RRM}$ =Rated		50	75	ma
Peak On-State Voltage	$V_{FM}$	Tj=25°C, $I_{FM}$ = 1500 A			1.20	V
$V_{FM}$ Model, Low Level	$V_0$	Tj=175°C			0.68	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	15% $I_{FM}$ - $\pi \cdot I_{FM}$			2.47E-04	$\Omega$
$V_{FM}$ Model, High Level	$V_0$	Tj=175°C			0.85	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	$\pi \cdot I_{FM} - I_{FSM}$			2.13E-04	$\Omega$
$V_{FM}$ Model, 4-Term	A	Tj=175°C			0.327	
$V_{FM} = A + B \cdot \ln(I_{FM}) +$	B	15% $I_{FM}$ - $I_{FSM}$			5.68E-02	
$C \cdot (I_{FM}) + D \cdot (I_{FM})^{1/2}$	C				2.11E-04	
	D				2.21E-04	
Reverse Recovery Time	$t_{RR}$	Tj=25°C, $I_{FM}$ =400A $di_R/dt = 25$ A/ $\mu$ s		25		$\mu$ s

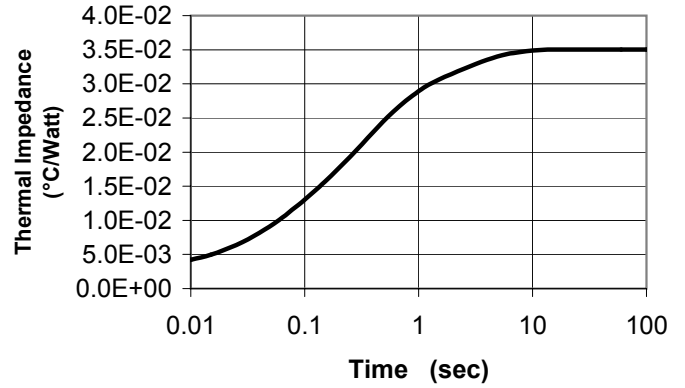
### Thermal Characteristics

Characteristic	Symbol	Test Conditions	Rating			Units	
			min	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					
$Z\theta_{jc}(t) = \Sigma(A(N) \cdot (1 - \exp(-t/\text{Tau}(N))))$		where:	N =	1	2	3	4
			A(N) =	2.536E-03	6.394E-03	1.818E-02	7.915E-03
			Tau(N) =	7.988E-04	5.286E-02	3.296E-01	2.391E+00

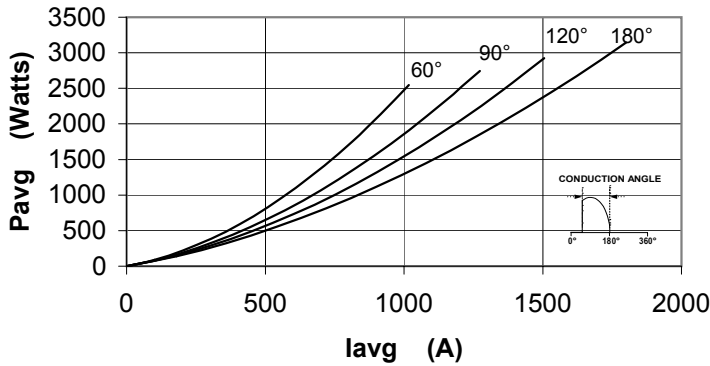
**Maximum On-State Voltage Drop**



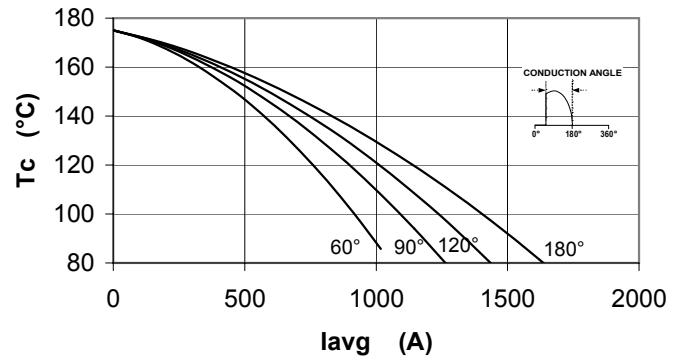
**MAXIMUM TRANSIENT THERMAL IMPEDANCE**



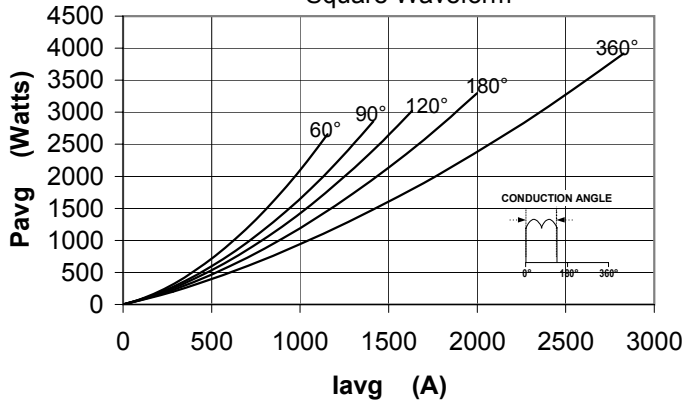
**Maximum On-State Power Dissipation**  
Sinusoidal



**Maximum Allowable Case Temperature**  
Sinusoidal Waveform



**Maximum On-State Power Dissipation**  
Square Waveform



**Maximum Allowable Case Temperature**  
Square Waveform

