

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 μ s.

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

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	A^2s
Peak One Cycle Surge Current, 50Hz, $V_R = 0V$	I_{FSM}	12,950	A
Fuse Coordination I^2t , 50Hz	I^2t	6.99E+05	A^2s
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



R820_16XX

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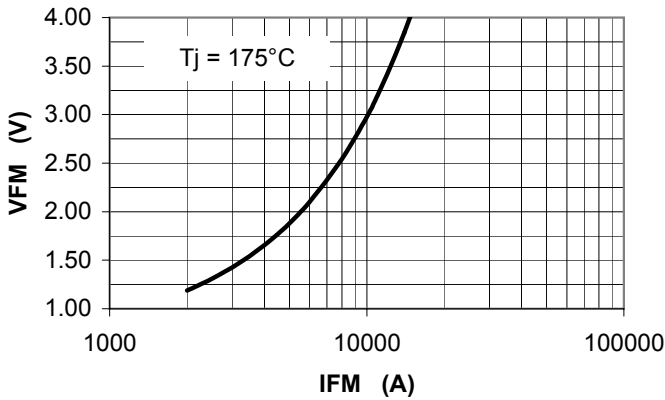
Electrical Characteristics, Tj=25°C unless otherwise specified

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	Ω
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	Ω
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/ μ s		25		μ s

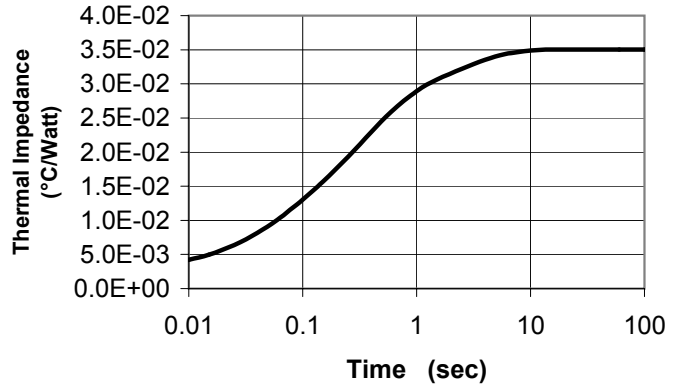
Thermal Characteristics

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

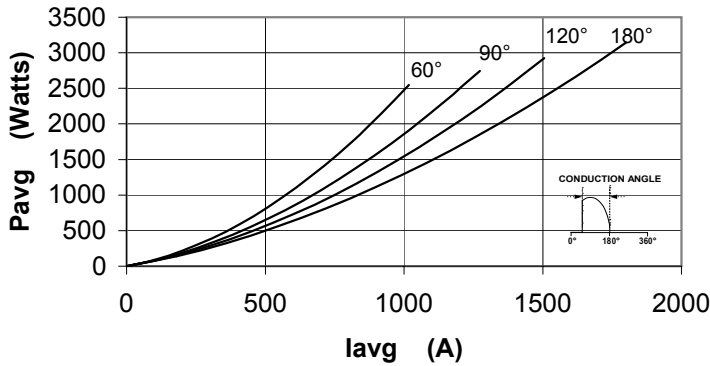
Maximum On-State Voltage Drop



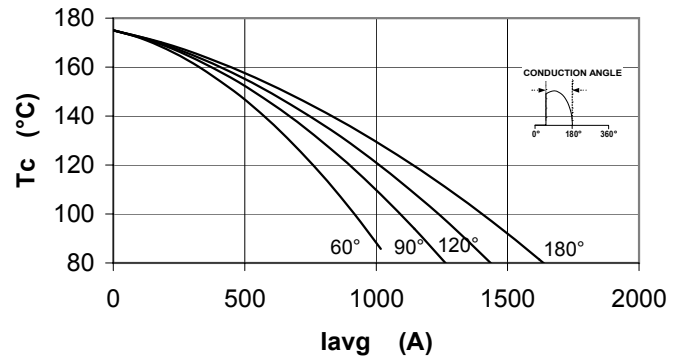
MAXIMUM TRANSIENT THERMAL IMPEDANCE



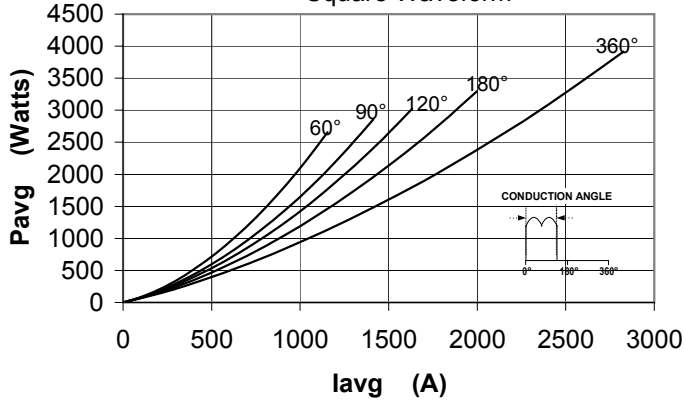
Maximum On-State Power Dissipation Sinusoidal



Maximum Allowable Case Temperature Sinusoidal Waveform



Maximum On-State Power Dissipation Square Waveform



Maximum Allowable Case Temperature Square Waveform

