

Powerex General Purpose Rectifier Diodes are designed with high locking 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: RBK84540XXOO is a 4500V-4000A 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>RBK8</b>	4500	<b>45</b>	4000	<b>40</b>	<b>XX</b>	<b>OO</b>
	4400	<b>44</b>				
	4200	<b>42</b>			30 $\mu$ s typical	
	4000	<b>40</b>				

Revised: 10/15/2007

## Absolute Maximum Ratings

Characteristic	Symbol	Rating	Units
Repetitive Peak Reverse Voltage	$V_{RRM}$	4500	Volts
Average On-State Current, $T_C=80^{\circ}C$	$I_{F(Avg.)}$	4000	A
RMS On-State Current, $T_C=80^{\circ}C$	$I_{F(RMS)}$	6283	A
Average On-State Current, $T_C=55^{\circ}C$	$I_{F(Avg.)}$	4600	A
RMS On-State Current, $T_C=55^{\circ}C$	$I_{F(RMS)}$	7226	A
Peak One Cycle Surge Current, 60Hz, $V_R=0.6*V_{RRM}$	$I_{FSM}$	53,700	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	1.20E+07	A <sup>2</sup> s
Peak One Cycle Surge Current, 50Hz, $V_R=0V$	$I_{FSM}$	65,514	A
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	1.79E+07	A <sup>2</sup> s
Operating Temperature	$T_j$	-40 to+175	°C
Storage Temperature	$T_{Stg.}$	-50 to+200	°C
Approximate Weight		2.5	lb
		1.13	Kg
Mounting Force		6,000 - 10,000	lbs
		26.6 - 44.4	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.

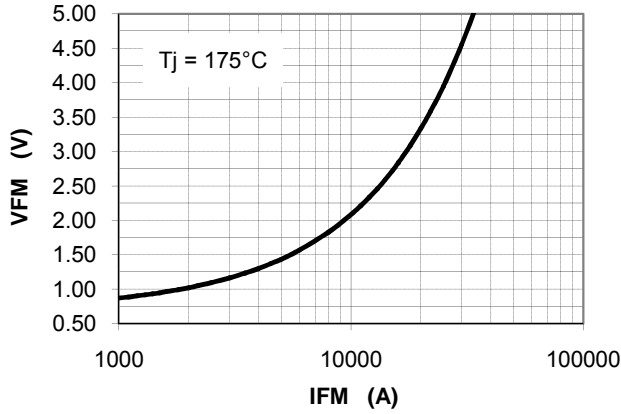
**Electrical Characteristics, Tj=25°C unless otherwise specified**

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	Tj=175°C, $V_{RRM}$ =Rated		100	150	ma
Peak On-State Voltage	$V_{FM}$	Tj=25°C, $I_{FM}$ =3000A			1.17	V
$V_{FM}$ Model, Low Level	$V_0$	Tj=175°C			0.75	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	15% $I_{FM} - \pi \cdot I_{FM}$			0.133	mΩ
$V_{FM}$ Model, High Level	$V_0$	Tj=175°C			0.88	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	$\pi \cdot I_{FM} - I_{FSM}$			0.122	mΩ
$V_{FM}$ Model, 4-Term	A	Tj=175°C			0.597	
$V_{FM} = A + B \cdot \ln(I_{FM}) +$	B	15% $I_{FM} - I_{FSM}$			0.0131	
$C \cdot (I_{FM}) + D \cdot (I_{FM})^{1/2}$	C				1.153E-04	
	D				0.00212	
Reverse Recovery Time	$t_{RR}$	Tj=25°C, $I_{FM}$ =2000A $di_R/dt = 25 \text{ A}/\mu\text{s}$		30		μs

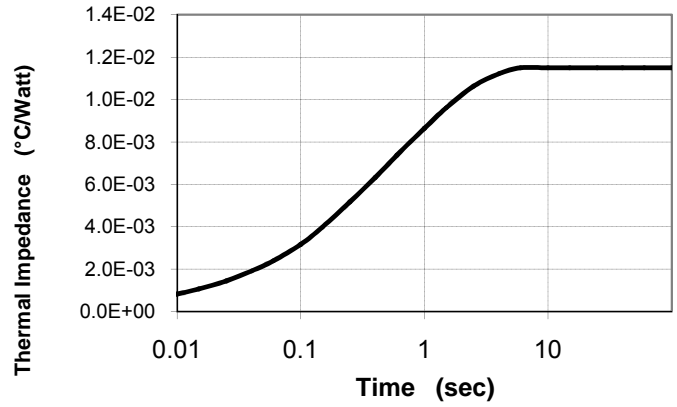
**Thermal Characteristics**

Characteristic	Symbol	Test Conditions	Rating			Units	
			min	typ	max		
Thermal Resistance							
Junction to Case	$R\theta_{jc}$	Double side cooled		0.010	0.0115	°C/Watt	
Case to Sink	$R\theta_{cs}$	Double side cooled		0.0015	0.002	°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) =	1.020E-05	8.786E-04	4.154E-03	6.431E-03
			Tau(N) =	5.860E-04	1.409E-02	1.814E-01	1.208E+00

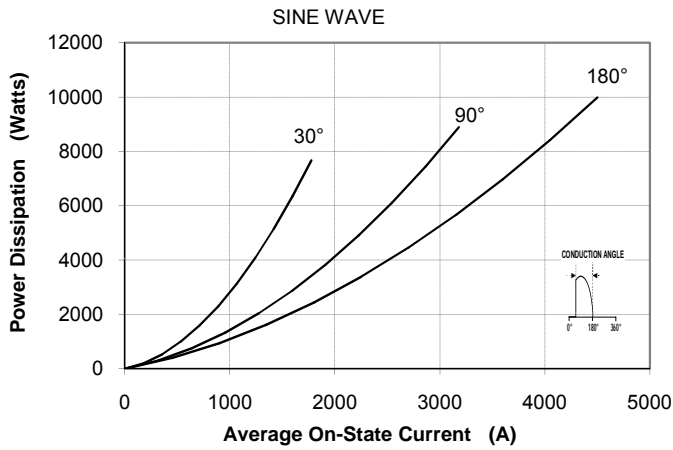
### Maximum On-State Voltage Drop



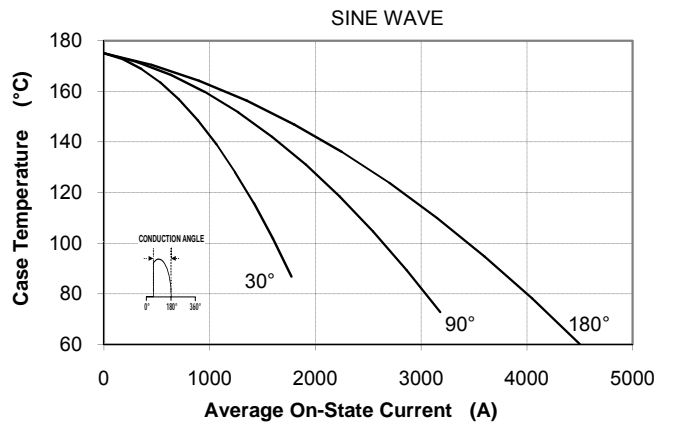
### MAXIMUM TRANSIENT THERMAL IMPEDANCE



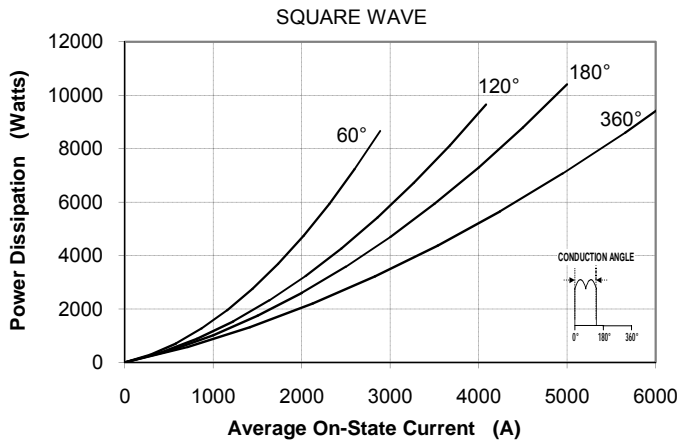
### Maximum On-State Power Dissipation



### Maximum Allowable Case Temperature



### Maximum On-State Power Dissipation



### Maximum Allowable Case Temperature

