

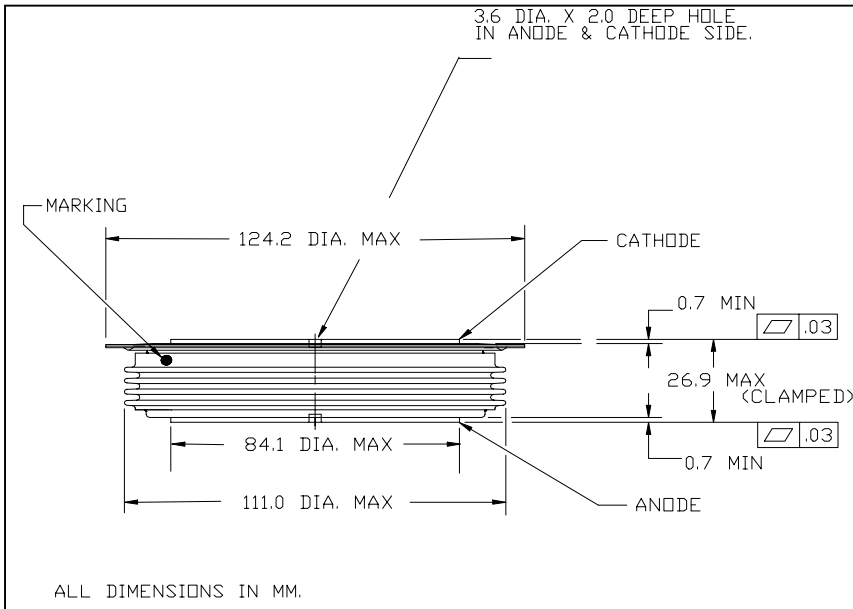


**PRELIMINARY**

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

**RCS8\_80XX**  
**GENERAL PURPOSE RECTIFIER DIODE**

**8000 Amperes 1400 Volts**



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: RCS81480XXOO is a 1400V-8000A General Purpose Diode with a typical reverse recovery time of 25 $\mu$ s.

PART	Voltage Rating $V_{DRM}-V_{RRM}$	Voltage Code	Current Rating $I_{TAVG}$	Current Code	Reverse Recovery $t_{RR}$	Lead Code
<b>RCS8</b>	1400	<b>14</b>	8000	<b>80</b>	<b>XX</b>	<b>OO</b>
	1200	<b>12</b>				
	1000	<b>10</b>			25 $\mu$ s typical	

Revised: 4/20/2004



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**Absolute Maximum Ratings**

Characteristic	Symbol	Rating	Units
Repetitive Peak Reverse Voltage	$V_{RRM}$	1,400	Volts
Average On-State Current, $T_C=84^\circ\text{C}$	$I_{F(Avg.)}$	8,000	A
RMS On-State Current, $T_C=84^\circ\text{C}$	$I_{F(RMS)}$	12,566	A
Average On-State Current, $T_C=55^\circ\text{C}$	$I_{F(Avg.)}$	9,000	A
RMS On-State Current, $T_C=55^\circ\text{C}$	$I_{F(RMS)}$	14,137	A
Peak One Cycle Surge Current, 60Hz, $V_R=0.6*V_{RRM}$	$I_{FSM}$	125,000	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	6.51E+07	$A^2s$
Peak One Cycle Surge Current, 50Hz, $V_R=0V$	$I_{FSM}$	152,500	A
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	9.69E+07	$A^2s$
Operating Temperature	$T_j$	-40 to+180	$^\circ\text{C}$
Storage Temperature	$T_{Stg.}$	-50 to+200	$^\circ\text{C}$
Approximate Weight		4.6	lb
		2.09	Kg
Mounting Force		12,000-15,000	lbs
		53 - 67	Knewtons



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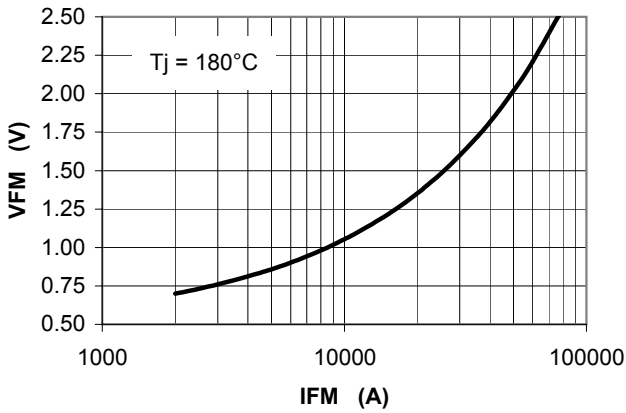
**Electrical Characteristics, Tj=25°C unless otherwise specified**

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	Tj=180°C, $V_{RRM}$ =Rated		100	200	ma
Peak On-State Voltage	$V_{FM}$	Tj=180°C, $I_{FM}$ =4000A			0.81	V
$V_{FM}$ Model, Low Level	$V_0$	Tj=180°C			0.650	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	15% $I_{FM} - \pi \cdot I_{FM}$			3.80E-05	$\Omega$
$V_{FM}$ Model, High Level	$V_0$	Tj=180°C			1.055	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	$\pi \cdot I_{FM} - I_{FSM}$			1.87E-05	$\Omega$
$V_{FM}$ Model, 4-Term	A	Tj=180°C			0.537	
$V_{FM} = A + B \cdot \ln(I_{FM}) +$	B	15% $I_{FM} - I_{FSM}$			-0.0147	
$C \cdot (I_{FM}) + D \cdot (I_{FM})^{1/2}$	C				6.681E-06	
	D				0.00584	
Reverse Recovery Time	$t_{RR}$	Tj=25°C, $I_{FM}$ =1000A $di_R/dt = 25 A/\mu s$		25		$\mu s$

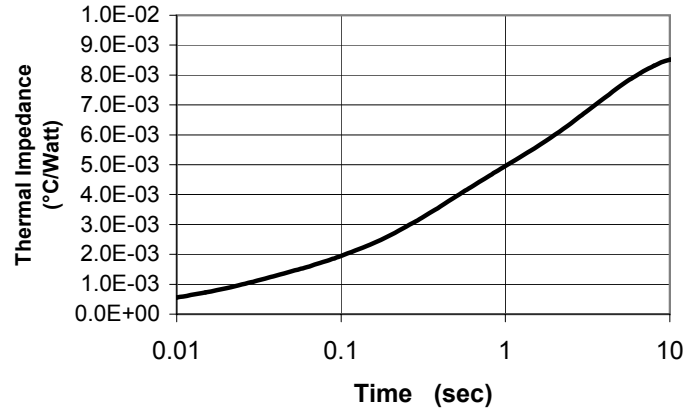
**Thermal Characteristics**

Characteristic	Symbol	Test Conditions	Rating			Units	
			min	typ	max		
Thermal Resistance							
Junction to Case	$R\theta_{jc}$	Double side cooled		0.008	0.0088	°C/Watt	
Case to Sink	$R\theta_{cs}$	Double side cooled		0.0015	0.0018	°C/Watt	
Thermal Impedance Model	$Z\theta_{jc}$	Double side cooled					
$Z\theta_{jc}(t) = \sum(A(N) \cdot (1 - \exp(-t/\tau(N))))$		where:	N =	1	2	3	4
			A(N) =	1.43E-04	9.08E-04	2.73E-03	5.00E-03
			Tau(N) =	2.62E-03	2.31E-02	3.05E-01	3.40E+00

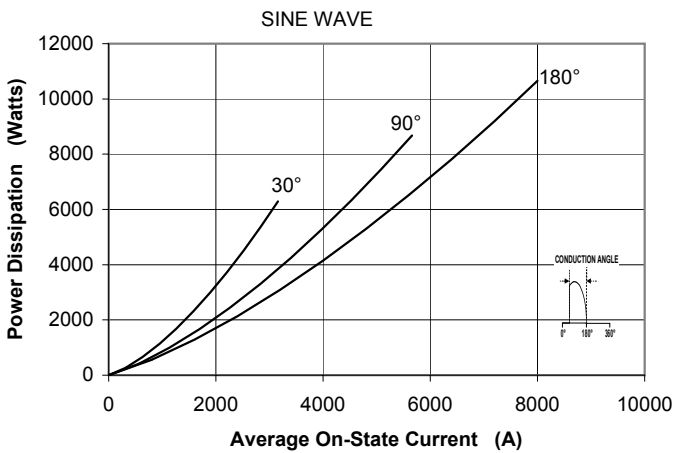
**Maximum On-State Voltage Drop**



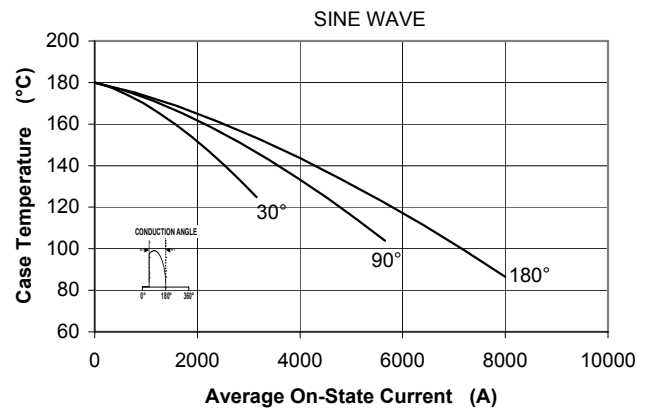
**MAXIMUM TRANSIENT THERMAL IMPEDANCE**



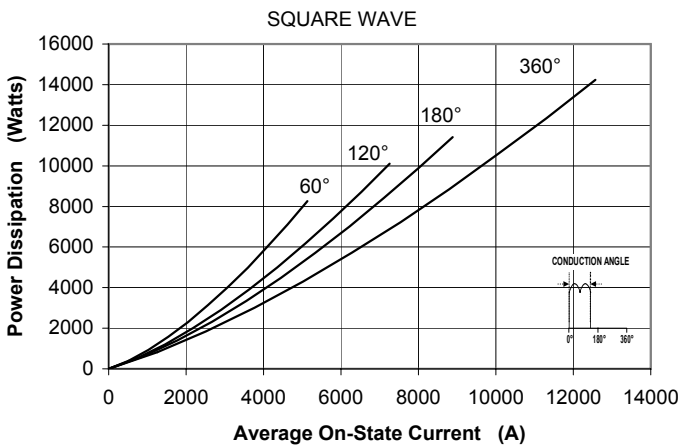
**Maximum On-State Power Dissipation**



**Maximum Allowable Case Temperature**



**Maximum On-State Power Dissipation**



**Maximum Allowable Case Temperature**

