

Powerex General Purpose, Low Profile Rectifier Diode 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<sup>2</sup>t Ratings

**APPLICATIONS:**

- DC Power Supplies

**ORDERING INFORMATION**

Select the complete 12 digit Part Number using the table below.  
 EXAMPLE: R9S02630XXOO is a 2600V-3000A General Purpose Diode with a typical reverse recovery time of 25µs.

PART	Voltage Rating $V_{DRM}-V_{RRM}$	Voltage Code	Current Rating $I_{avg}$	Current Code	Reverse Recovery $t_{RR}$	Lead Code
<b>R9S0</b>	2600V	<b>26</b>	3000A	<b>30</b>	<b>XX</b>	<b>OO</b>
	2400V	<b>24</b>				
	2200V	<b>22</b>			25µs typical	
	2000V	<b>20</b>				
	1800V	<b>18</b>				

Revised: 8/16/2007

**Absolute Maximum Ratings**

Characteristic	Symbol	Rating	Units
Repetitive Peak Reverse Voltage	$V_{RRM}$	2600	Volts
Average On-State Current, $T_C=115\text{ }^\circ\text{C}$	$I_{F(Avg.)}$	3000	A
RMS On-State Current, $T_C=115\text{ }^\circ\text{C}$	$I_{F(RMS)}$	4712	A
Average On-State Current, $T_C=85\text{ }^\circ\text{C}$	$I_{F(Avg.)}$	3935	A
RMS On-State Current, $T_C=85\text{ }^\circ\text{C}$	$I_{F(RMS)}$	6181	A
Peak One Cycle Surge Current <sup>†</sup> , 60Hz, $V_R=V_{RRM}$	$I_{FSM}$	22,000	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	2.02E+06	A <sup>2</sup> s
Peak One Cycle Surge Current <sup>†</sup> , 60Hz, $V_R=0V$	$I_{FSM}$	28,600	A
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	3.41E+06	A <sup>2</sup> s
Peak 3 Cycle Surge Current, 60Hz, $V_R=0V$	$I_{FSM}$	25,080	A
Peak 10 Cycle Surge Current, 60Hz, $V_R=0V$	$I_{FSM}$	20,130	A
Operating Temperature	$T_J$	-40 to+175	°C
Storage Temperature	$T_{Stg.}$	-50 to+200	°C
Approximate Weight		0.6	lb
		0.27	Kg
Mounting Force		5500-6000	lbs
		24.5 - 26.7	Knewtons

<sup>†</sup> Per NEMA Std. RS-282

Information presented is based upon limited testing or 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.



# R9S0\_\_30XX

## GENERAL PURPOSE RECTIFIER DIODE

Powerex, Inc., 173 Pavilion Ln, Youngwood, Pa 15697-1800 (724)925-7272 WWW.PWRX.COM

**3000 Amperes 2600 Volts**

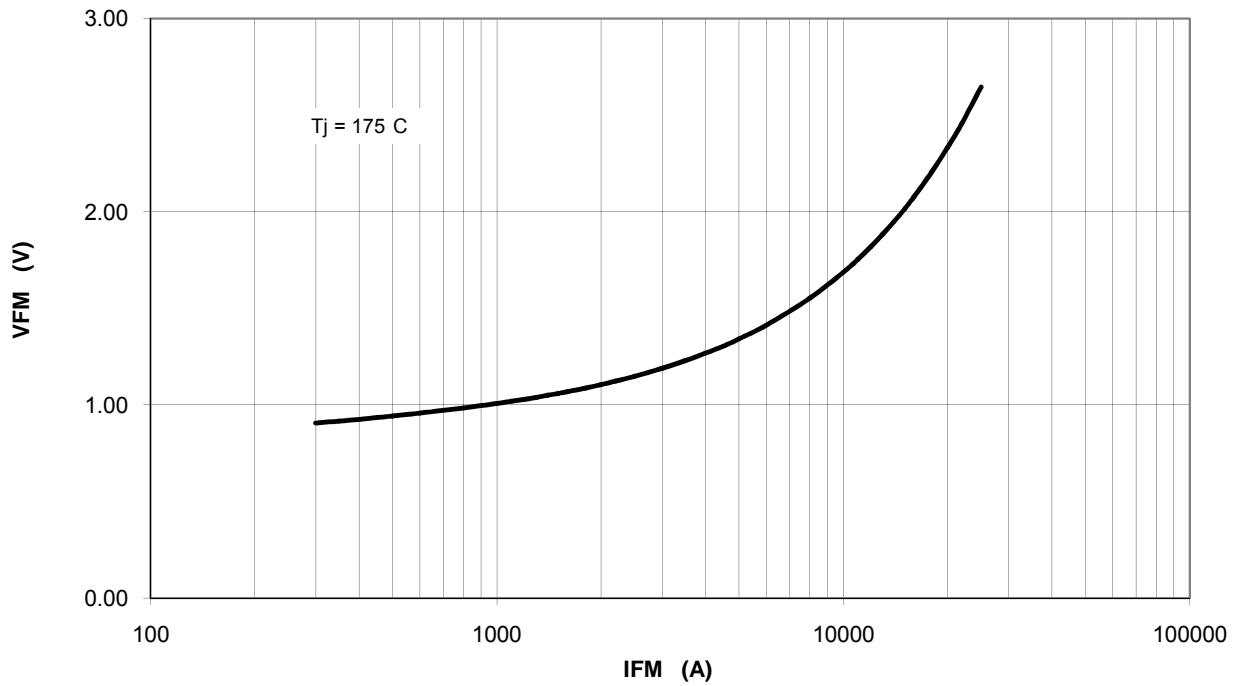
### Electrical Characteristics, Tj=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Reverse Leakage Current	$I_{RRM}$	Tj=175°C, $V_{RRM}$ =Rated			75	ma
Peak On-State Voltage	$V_{FM}$	Tj=25°C, $I_{FM}$ =1500A			1.10	V
$V_{FM}$ Model, Low Level	$V_0$	Tj=175°C			0.912	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	15% $I_{FM} - \pi \cdot I_{FM}$			8.85E-02	mΩ
$V_{FM}$ Model, High Level	$V_0$	Tj=175°C			1.059	V
$V_{FM} = V_0 + r \cdot I_{FM}$	r	$\pi \cdot I_{FM} - I_{FSM}$			6.32E-02	mΩ
$V_{FM}$ Model, 4-Term	A	Tj=175°C			0.652	
$V_{FM} = A + B \cdot \ln(I_{FM}) +$	B	15% $I_{FM} - I_{FSM}$			0.0381	
$C \cdot (I_{FM}) + D \cdot (I_{FM})^{1/2}$	C				5.730E-05	
	D				0.00111	
Reverse Recovery Time	$t_{RR}$	Tj=25°C, $I_{FM}$ =1500A $di_R/dt = 25 \text{ A}/\mu\text{s}$			25	μs

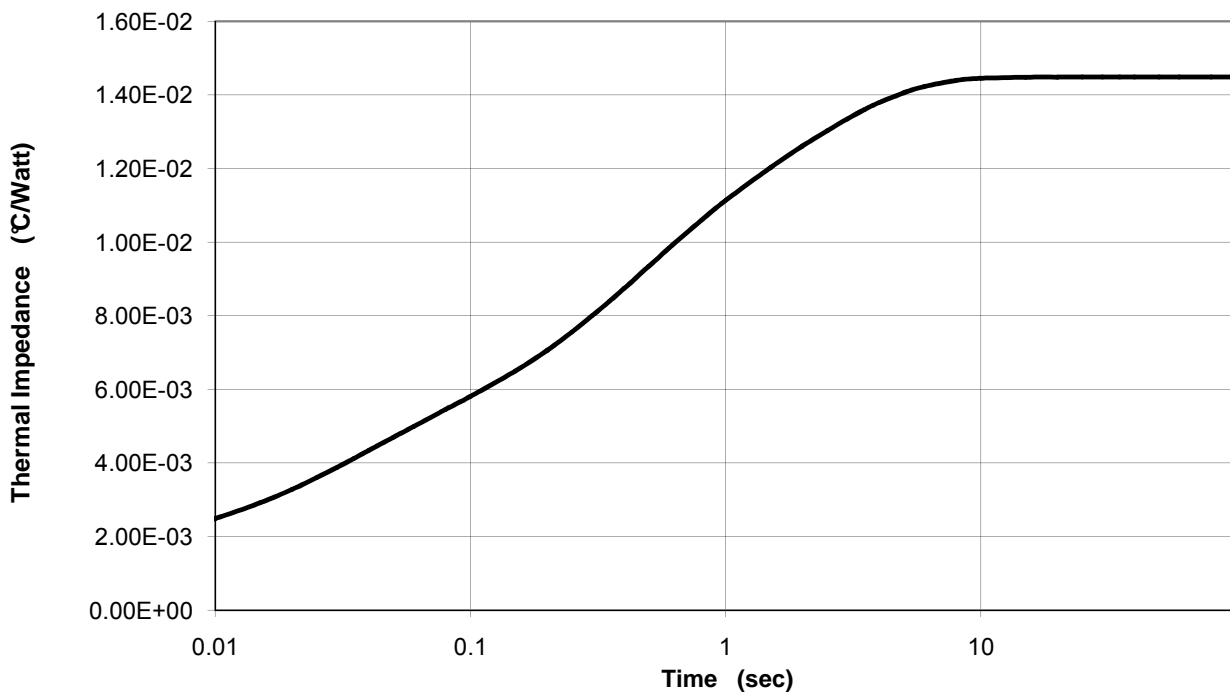
### Thermal Characteristics

Characteristic	Symbol	Test Conditions	Rating			Units															
			min	typ	max																
Thermal Resistance																					
Junction to Case	$R\theta_{jc}$	Double side cooled		0.012	0.0145	°C/Watt															
Case to Sink	$R\theta_{cs}$	Double side cooled		0.004	0.006	°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: <table style="display: inline-table; vertical-align: middle;"> <tr> <td>N =</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>A(N) =</td> <td>1.418E-03</td> <td>2.968E-03</td> <td>6.066E-03</td> <td>9.527E-03</td> </tr> <tr> <td>Tau(N) =</td> <td>5.947E-05</td> <td>2.762E-02</td> <td>4.011E-01</td> <td>4.012E+00</td> </tr> </table>							N =	1	2	3	4	A(N) =	1.418E-03	2.968E-03	6.066E-03	9.527E-03	Tau(N) =	5.947E-05	2.762E-02	4.011E-01	4.012E+00
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### Maximum On-State Voltage Drop

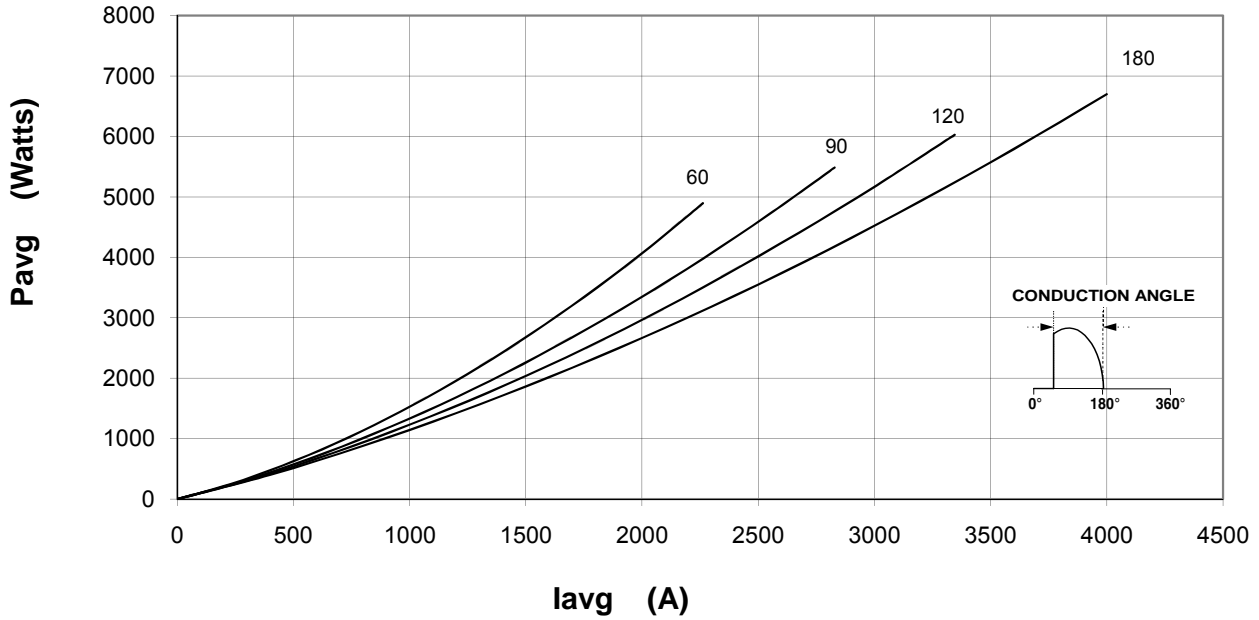


### MAXIMUM TRANSIENT THERMAL IMPEDANCE



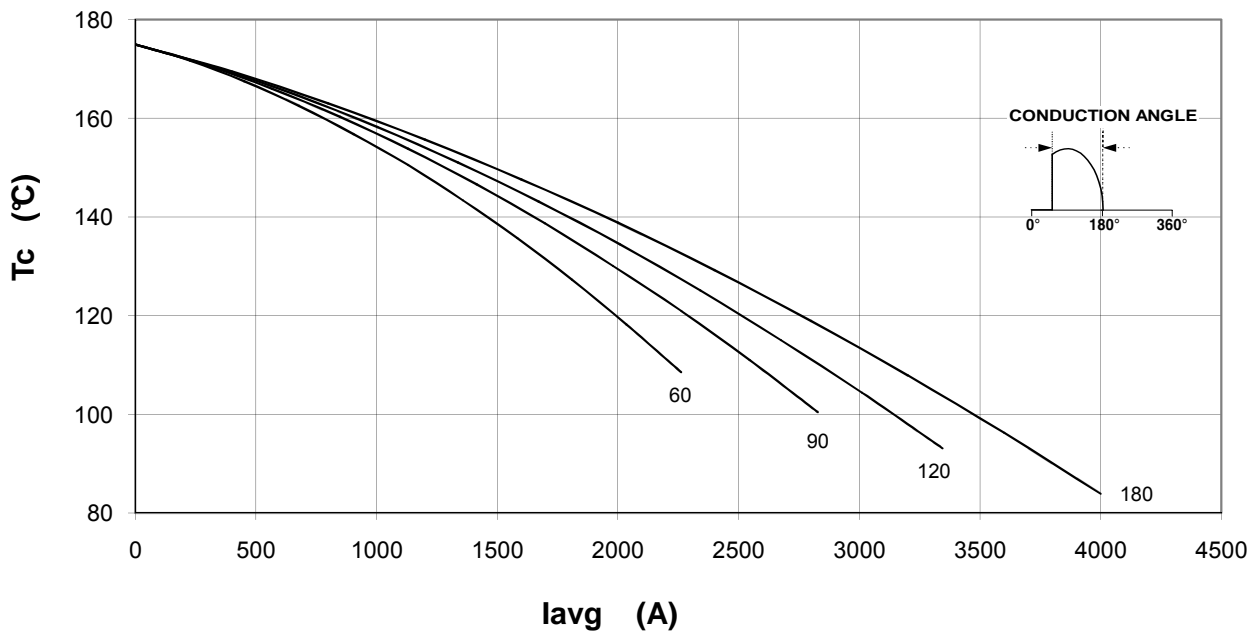
### Maximum On-State Power Dissipation

Sinusoidal Waveform

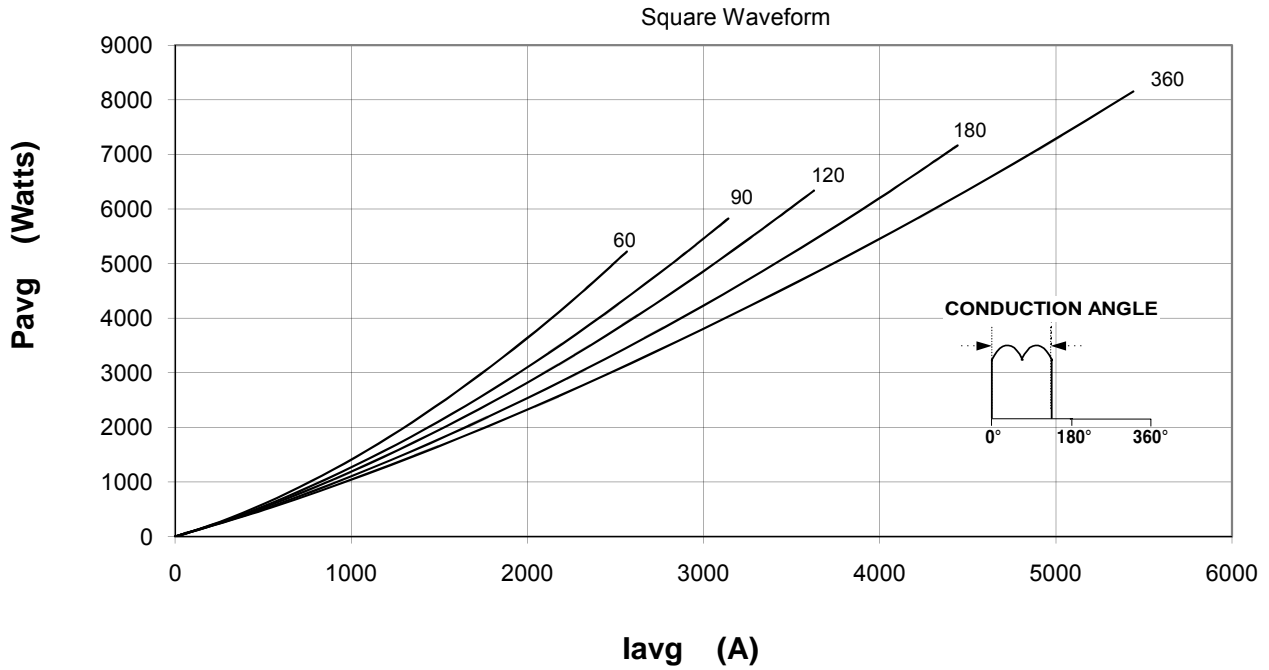


### Maximum Allowable Case Temperature

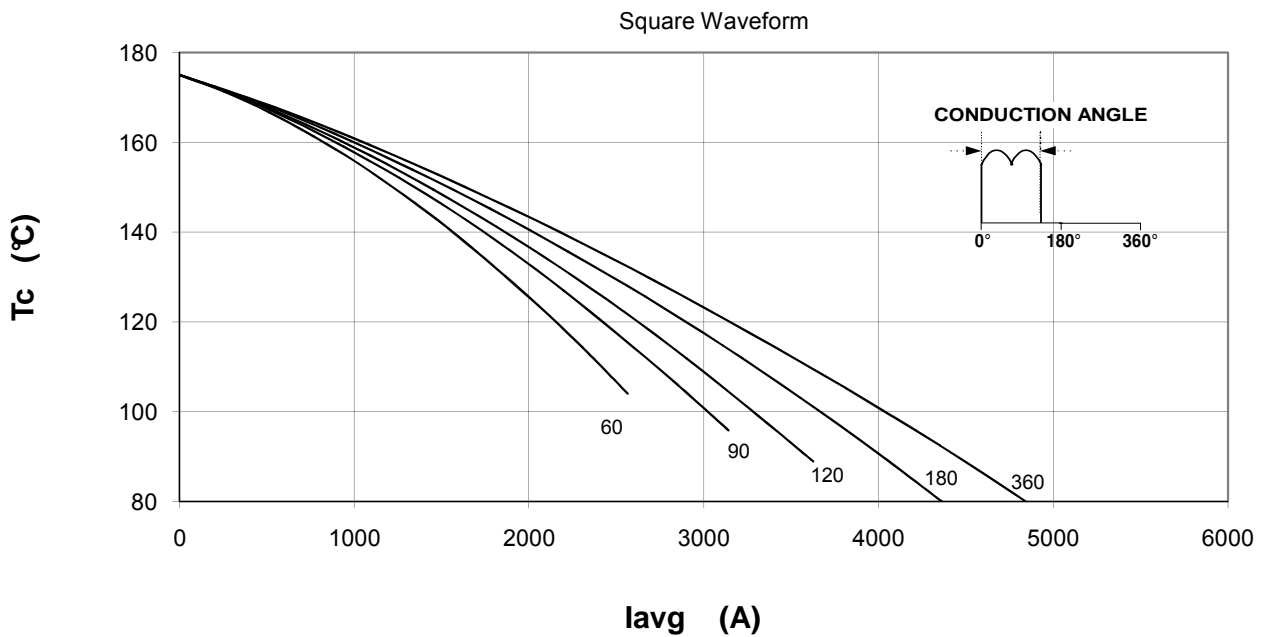
Sinusoidal Waveform



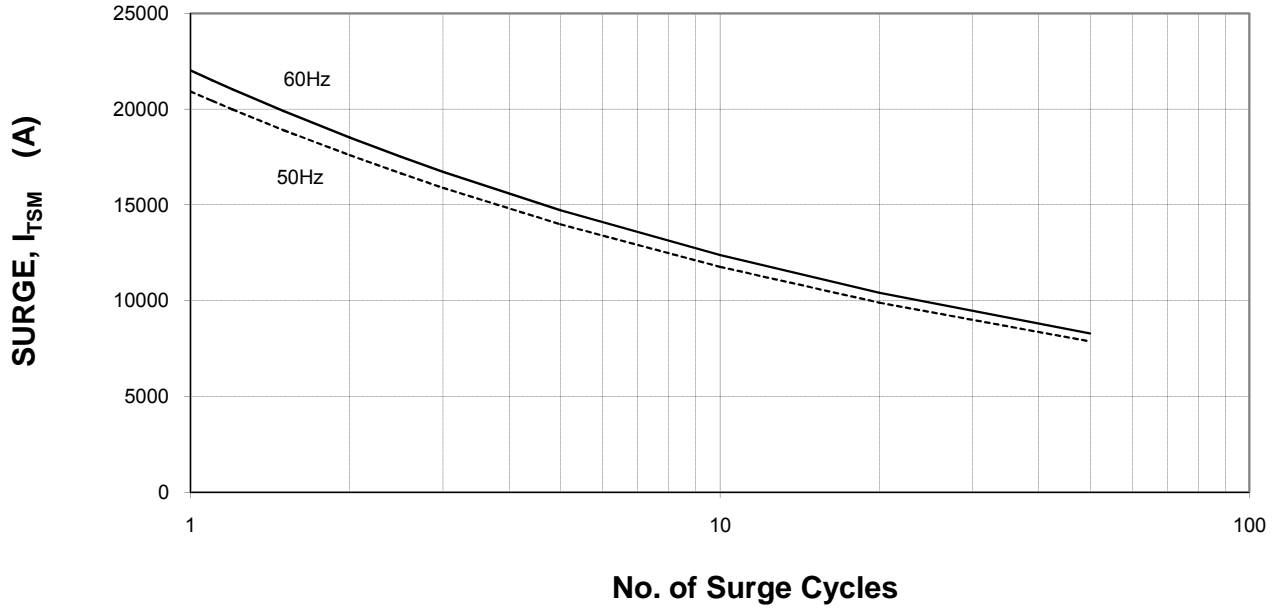
### Maximum On-State Power Dissipation



### Maximum Allowable Case Temperature



### MULTI-CYCLE SURGE



### SUB-CYCLE SURGE -- $I^2t$

