

Powerex General Purpose Rectifier Diode Elements are for low forward voltage drop to minimize conduction losses. They are made with molybdenum anode and cathode contacts to minimize thermal stresses during operation. They can be mounted directly to an air or water cooled heat exchangers to achieve high current handling capability.

### FEATURES:

- Low On-State Voltage
- Excellent Surge and  $I^2t$  Ratings

### APPLICATIONS:

- DC Power Supplies
- Welding Supplies
- Plating Supplies

### ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.  
Example: R9XSMD0463XX is a 400V 6300A Welder diode element with a typical reverse recovery time of 25 $\mu$ s.

PART	Voltage Rating $V_{DRM}$ - $V_{RRM}$	Voltage Code	Current Rating $I_{avg}$	Current Code	Reverse Recovery $t_{RR}$	Lead Code
R9XSMD	400V	04	6300	63	XX	00
					25 $\mu$ s typical	

Revised: 11/30/2010

**Absolute Maximum Ratings**

Characteristic	Symbol	Rating	Units
Repetitive Peak Reverse Voltage	$V_{RRM}$	400	Volts
Average On-State Current, $T_S=40^\circ\text{C}$	$I_{F(Avg.)}$	6300	A
RMS On-State Current, $T_S=40^\circ\text{C}$	$I_{F(RMS)}$	9896	A
Average On-State Current, $T_S=84^\circ\text{C}$	$I_{F(Avg.)}$	4875	A
RMS On-State Current, $T_S=84^\circ\text{C}$	$I_{F(RMS)}$	7658	A
Peak One Cycle Surge Current, 60Hz, $V_R=V_{RRM}$	$I_{FSM}$	35,000	A
Fuse Coordination $I^2t$ , 60Hz	$I^2t$	5.10E+06	A <sup>2</sup> s
Peak One Cycle Surge Current, 50Hz, $V_R=0V$	$I_{FSM}$	33,600	A
Fuse Coordination $I^2t$ , 50Hz	$I^2t$	5.64E+06	A <sup>2</sup> s
Operating Temperature	$T_j$	-40 to+175	°C
Storage Temperature	$T_{Stg.}$	-50 to+200*	°C
Approximate Weight		0.2	lb
Mounting Force		0.08	Kg
		5,000 - 6,000	lbs
		22.2 - 26.7	Knewtons

\* Limit to 50°C prior to assembly.

**Mounting Recommendations**

Contact surfaces of this diode element are subject to oxidation at high temperatures. It is recommended that these elements be sealed in the assembly using an o-ring or similar sealing mechanism. Contacts can be further protected by coating with a thin layer of high temperature silicon based oil.

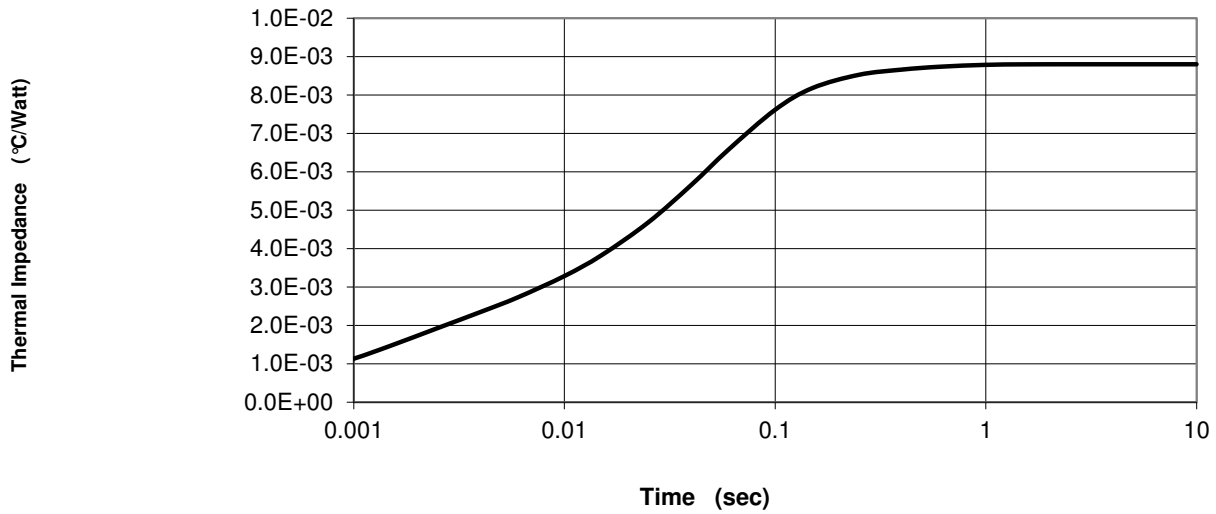
Information presented is based upon manufacturers testing and projected capabilities. This information is subject to change without notice. The manufacturer makes no claim as to suitability for use, reliability, capability or future availability of this product.

**Electrical Characteristics, T<sub>j</sub>=25°C unless otherwise specified**

Characteristic	Symbol	Test Conditions	Rating			Units
			min	typ	max	
Repetitive Peak Reverse Leakage Current	I <sub>RRM</sub>	T <sub>j</sub> =175°C, V <sub>RRM</sub> =Rated		15	75	ma
Peak On-State Voltage	V <sub>FM</sub>	T <sub>j</sub> =25°C, I <sub>FM</sub> =4000A			1.10	V
V <sub>FM</sub> Model, Low Level	V <sub>0</sub>	T <sub>j</sub> =175°C			0.701	V
V <sub>FM</sub> = V <sub>0</sub> + r•I <sub>FM</sub>	r	15% I <sub>FM</sub> - π•I <sub>FM</sub>			5.30E-02	mΩ
V <sub>FM</sub> Model, 4-Term	A	T <sub>j</sub> =175°C			0.395	
V <sub>FM</sub> = A + B•Ln(I <sub>FM</sub> ) +	B	15%I <sub>FM</sub> - I <sub>FSM</sub>			0.0453	
C•(I <sub>FM</sub> ) + D•(I <sub>FM</sub> ) <sup>1/2</sup>	C				0.0000548	
	D				-0.00124	
Reverse Recovery Time	t <sub>RR</sub>	T <sub>j</sub> =25°C, I <sub>FM</sub> =400A di <sub>R</sub> /dt = 25 A/μs		25		μs

**Thermal Characteristics**

Characteristic	Symbol	Test Conditions	Rating			Units	
			min	typ	max		
Thermal Resistance							
Junction to Case	RΘ <sub>Jc</sub>	Double side cooled			0.009	°C/Watt	
Case to Sink	RΘ <sub>cs</sub>	Double side cooled			0.005	°C/Watt	
Thermal Impedance Model	ZΘ <sub>Jc</sub>	Double side cooled					
ZΘ <sub>Jc</sub> (t) = Σ(A(N)•(1-exp(-t/Tau(N))))		where:	N =	1	2	3	4
			A(N) =	1.42E-03	8.35E-04	5.95E-03	5.84E-03
			Tau(N) =	1.11E-03	4.48E-03	4.89E-02	2.71E-01

**MAXIMUM TRANSIENT THERMAL IMPEDANCE,  $R\theta_{JC}$** **Maximum On-State Voltage Drop**