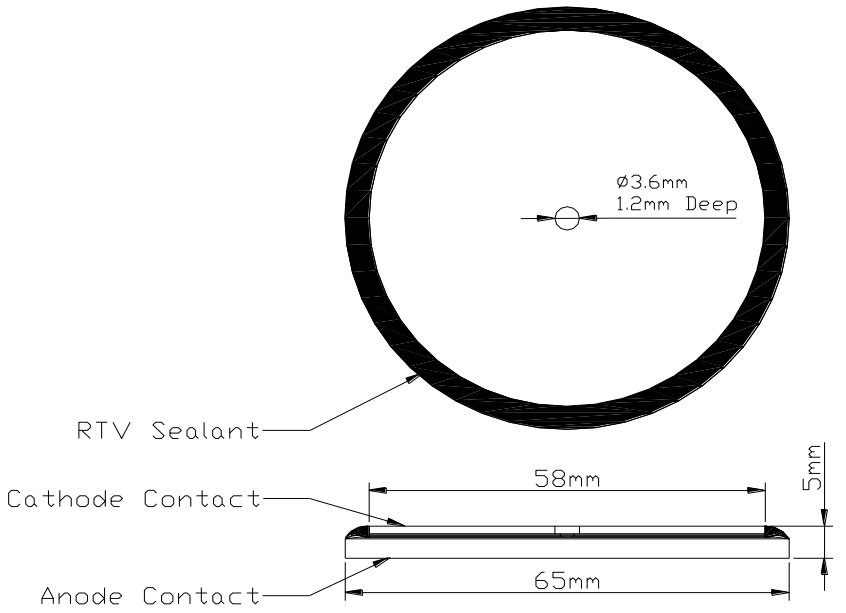
Powerex, Inc., 173 Pavilion Ln, Youngwood, PA 15697-1800 724 925-7272 www.pwrx.com

RAXMGC0412XX

WELDING DIODE ELEMENT

12,000 Amperes 400 Volts



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:

- Welding Supplies
- DC Power Supplies
- Plating Supplies

ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.
Example: RAXMGC0412XX is a 400V 12,000A Welding Diode element with a typical reverse recovery time of 25µs.

PART	Voltage Rating	Voltage Code	Current Rating	Current Code	Reverse Recovery	Lead Code
	V_{DRM}-V_{RRM}		I_{tavg}		t_{RR}	
RAXMGC	400V	**04**	12000A	**12**	**XX**	**OO**
					25µs typical	

Revised: 1/14/2013

Absolute Maximum Ratings

Characteristic	Symbol	Rating	Units
Repetitive Peak Reverse Voltage	V_{RRM}	400	Volts
Average On-State Current, T_c=79°C	$I_{F(Avg.)}$	12000	A
RMS On-State Current, T_c=79°C	$I_{F(RMS)}$	18850	A
Peak One Cycle Surge Current, 60Hz, V_R=V_{RRM}	I_{FSM}	60,000	A
Fuse Coordination I^2t, 60Hz	I^2t	1.50E+07	A^2s
Peak One Cycle Surge Current, 50Hz, V_R=0V	I_{FSM}	57,300	A
Fuse Coordination I^2t, 50Hz	I^2t	1.64E+07	A^2s
Operating Temperature	Tj	-40 to+175	°C
Storage Temperature	$T_{Stg.}$	-50 to+200*	°C
		* Limit to 50°C prior to assembly.	
Approximate Weight		0.3	lb
		0.14	Kg
Mounting Force		9,000 - 11,000	lbs
		40 - 48.9	Knewtons

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.

Electrical Characteristics, Tj=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Rating min	Rating typ	Rating max	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	Tj=175°C, V_{RRM}=Rated		15	100	ma
Peak On-State Voltage	V_{FM}	Tj=25°C, I_{FM}=4000A			0.95	V
V_{FM} Model, Low Level	V_0	Tj=175°C			0.977	V
$VFM = V_O + r \bullet I_{FM}$	r	15% I_{FM} - $\pi \bullet I_{FM}$			9.15E-03	mΩ
V_{FM} Model, High Level	V_0	Tj=175°C			0.974	V
$VFM = V_O + r \bullet I_{FM}$	r	$\pi \bullet I_{FM}$ - I_{FSM}			9.01E-03	mΩ
V_{FM} Model, 4-Term	A	Tj=175°C			-0.321	
V_{FM}= A + B•Ln(I_{FM}) +	B	15%I_{FM} - I_{FSM}			0.172	
C•(I_{FM}) + D•(I_{FM})^{½}	C				0.0000130	
	D				-0.00343	
Reverse Recovery Time	t_{RR}	Tj=25°C, I_{FM}=400A di_R/dt = 25 A/µs		25		µs

Thermal Characteristics

Characteristic	Symbol	Test Conditions	Rating min	Rating typ	Rating max	Units
Thermal Resistance						
Junction to Case	$R\Theta_{jc}$	Double side cooled			0.005	°C/Watt
Case to Sink	$R\Theta_{cs}$	Double side cooled			0.003	°C/Watt
Thermal Impedance Model	$Z\Theta_{jc}$	Double side cooled				

$Z\Theta_{jc}(t) = \Sigma(A(N) \bullet (1-\exp(-t/Tau(N))))$ where:

N =	1	2	3	4
A(N) =	8.117E-04	4.774E-04	3.402E-03	3.423E-04
Tau(N) =	1.112E-03	4.481E-03	4.894E-02	2.710E-01

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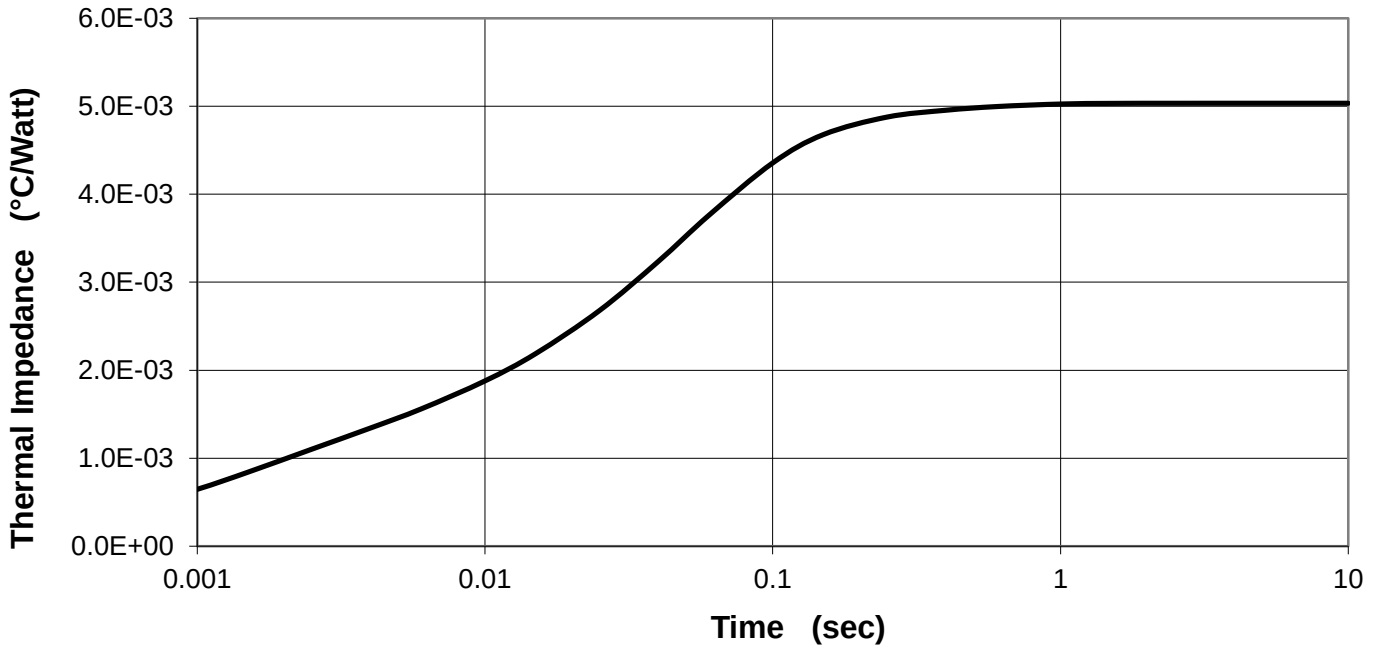
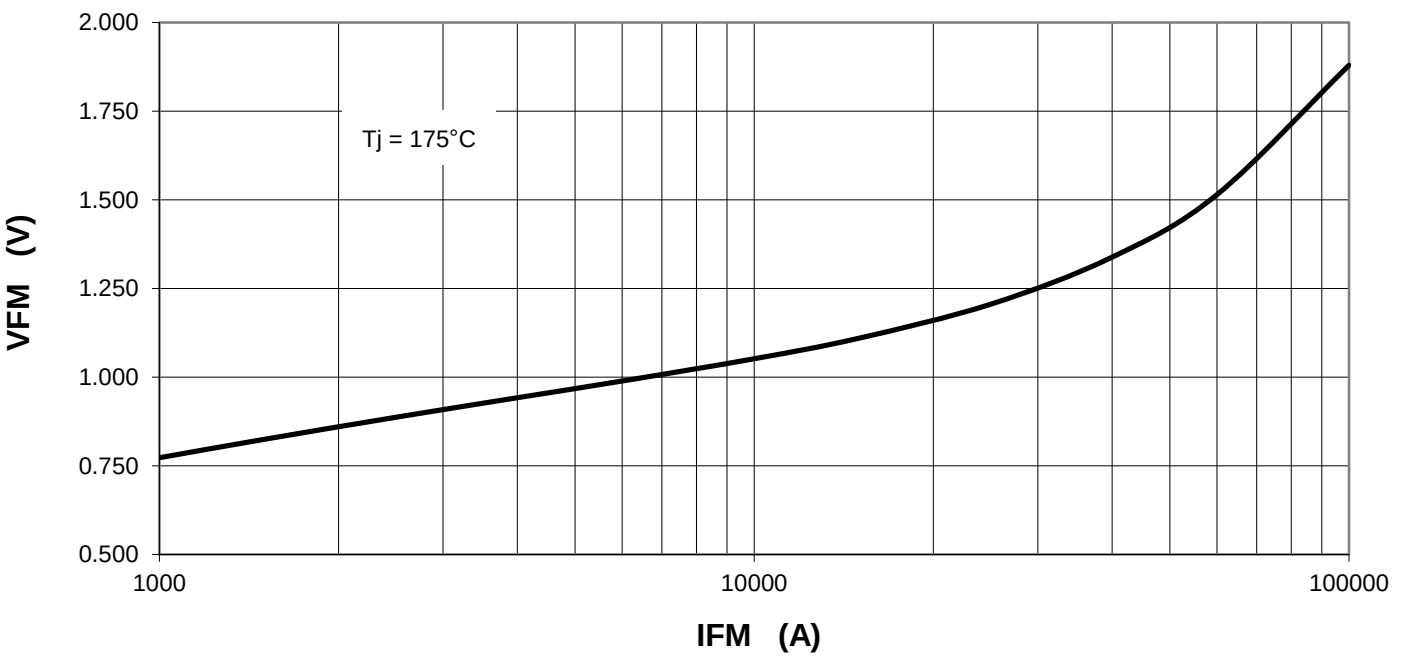
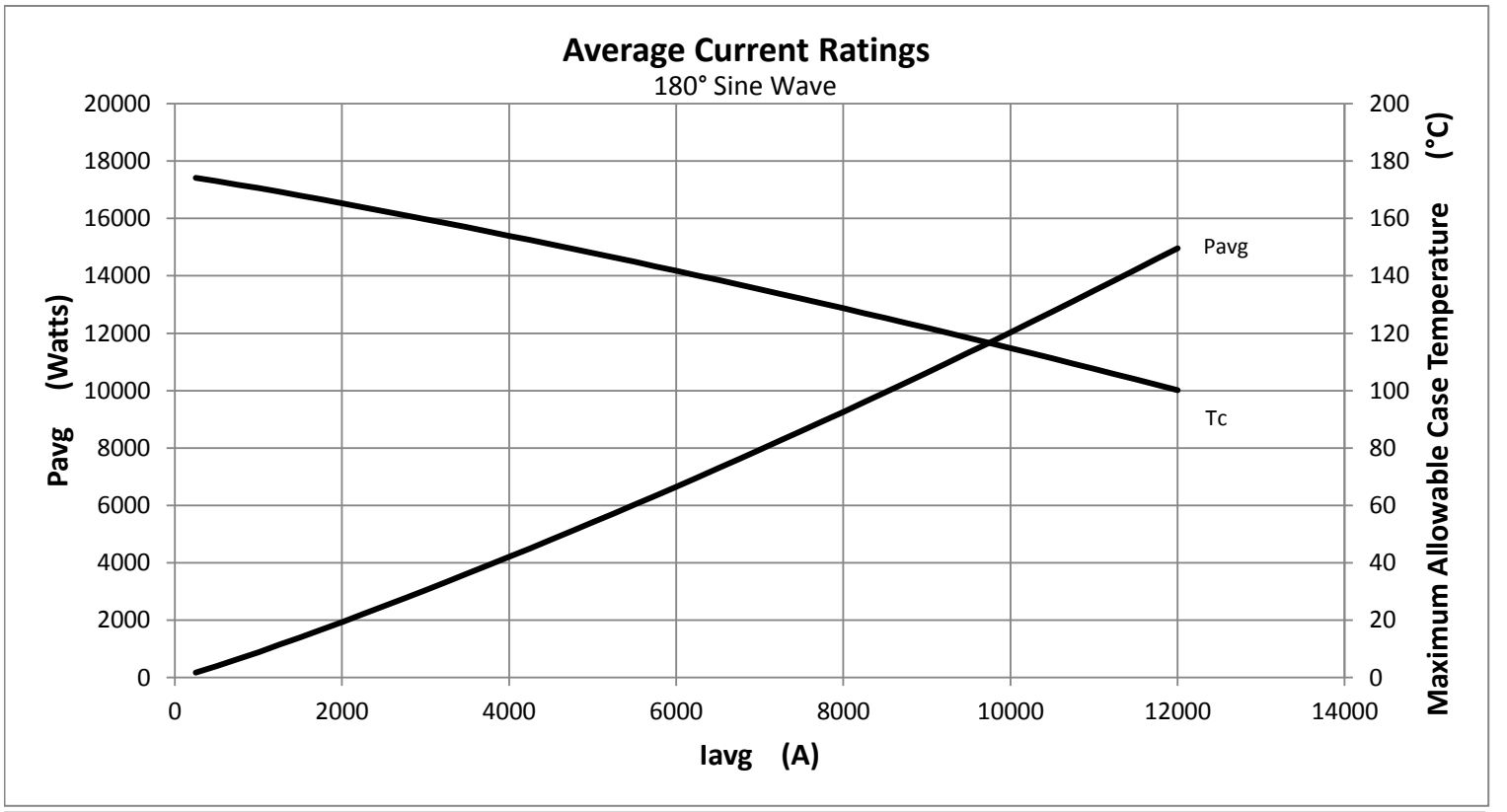
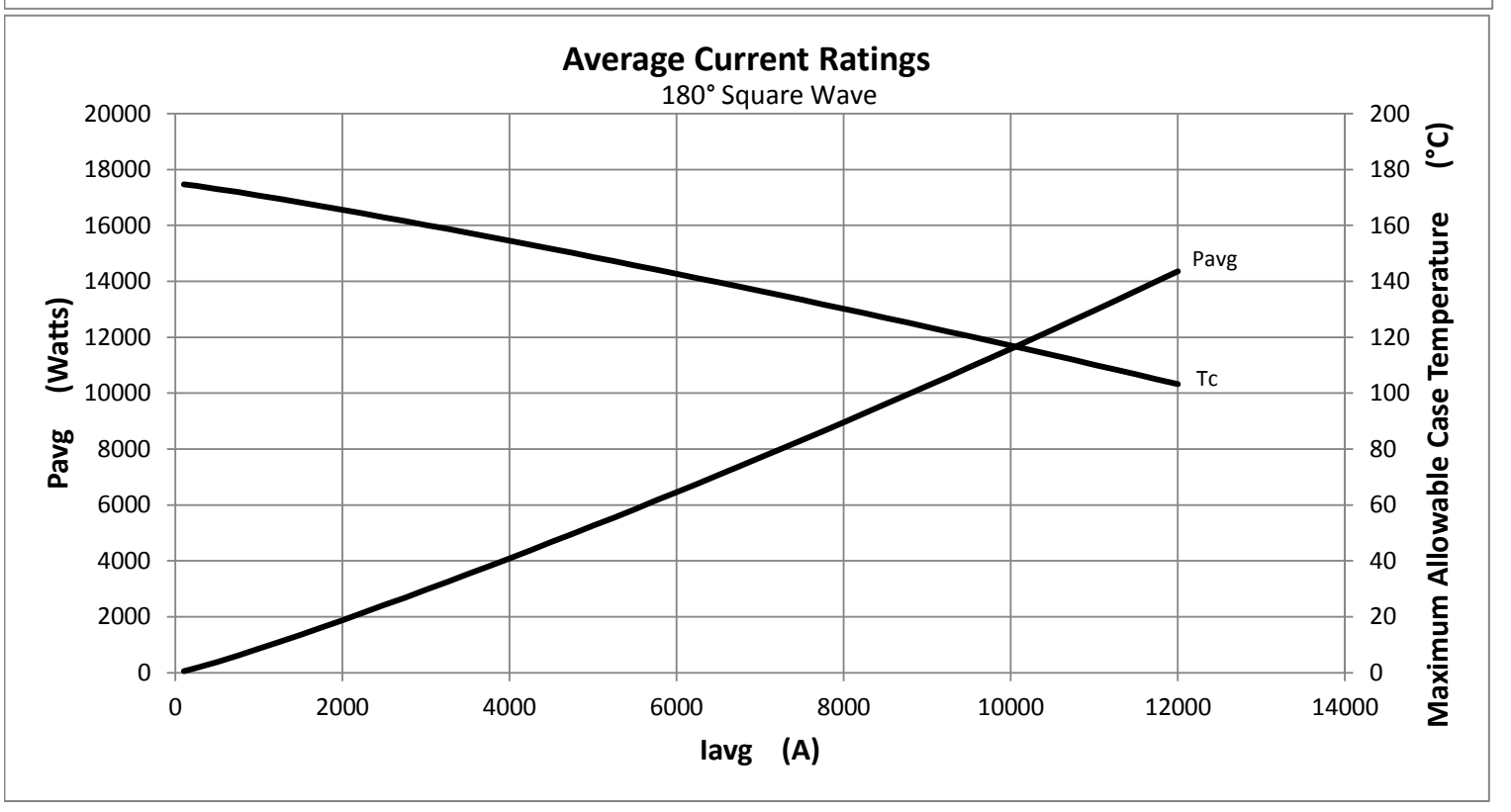
MAXIMUM TRANSIENT THERMAL IMPEDANCE



Maximum On-State Voltage Drop




Average Current Ratings
180° Sine Wave
Pavg (Watts)
Maximum Allowable Case Temperature (°C)
Iavg (A)
Pavg
Tc
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000
0
20
40
60
80
100
120
140
160
180
200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