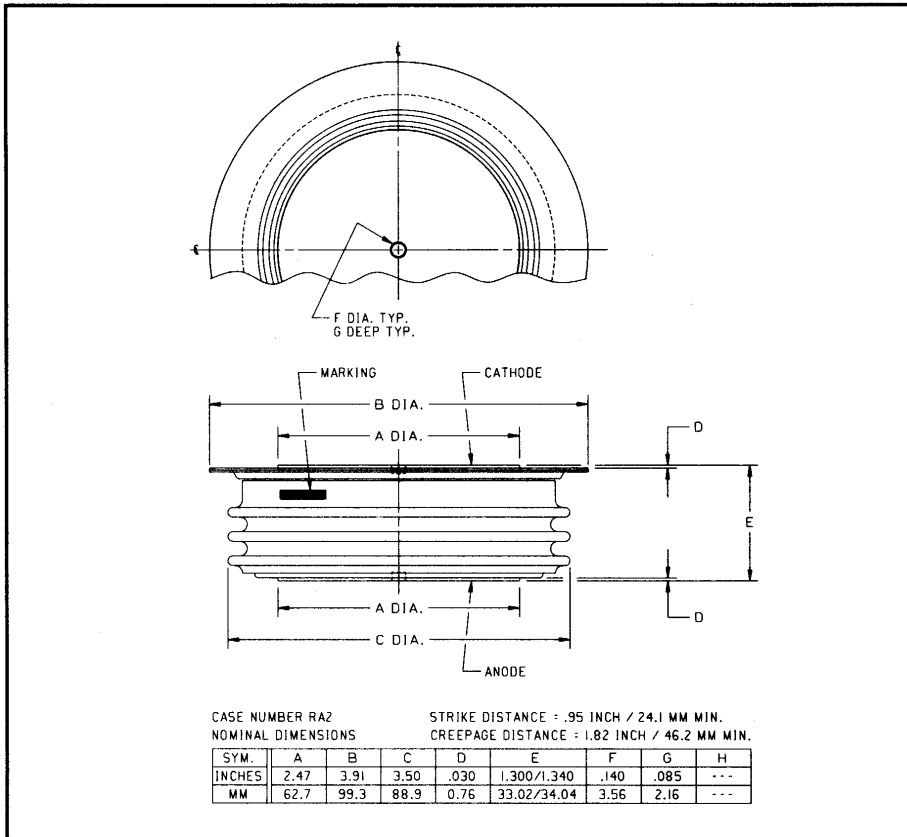
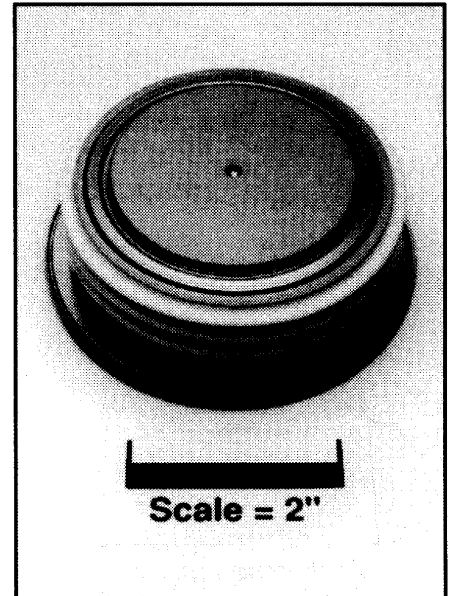


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

### General Purpose Rectifier 4800 Amperes Average 1200 Volts



RA20 4800A (Outline Drawing)



RA20 4800A General Purpose Rectifier  
 4800 Amperes Average, 1200 Volts

#### Description:

Powerex General Purpose Rectifiers are designed for high blocking voltage capability with low forward voltage to minimize conduction losses. These hermetic Pow-R-Disc devices can be mounted using commercially available clamps and heatsinks.

#### Features:

- Low Forward Voltage
- Low Thermal Impedance
- Hermetic Packaging
- Excellent Surge and  $I^2t$  Ratings

#### Applications:

- Power Supplies
- Motor Control
- Free Wheeling Diode
- Battery Chargers
- Resistance Welding

#### Ordering Information:

Select the complete 8 digit part number you desire from the table below.

Type	Voltage	Current	Typical Recovery Time
	$V_{RRM}$ (Volts)	$I_{T(av)}$ (A)	$t_{rr}$ ( $\mu$ sec)
RA20	06 through 12	48	XX
	600V through 1200V	4800A	16 $\mu$ sec

**RA20 4800A**  
**General Purpose Rectifier**  
 4800 Amperes Average, 1200 Volts

## Absolute Maximum Ratings

Characteristics	Symbol	RA20 4800A	Units
Non-repetitive Transient Peak Reverse Voltage	$V_{RSM}$	$V_{RRM} + 200V$	Volts
RMS Forward Current, $T_C = 98^\circ C$	$I_{F(rms)}$	7535	Amperes
Average Current 180° Sine Wave, $T_C = 98^\circ C$	$I_{F(av)}$	4800	Amperes
RMS Forward Current, $T_C = 55^\circ C$	$I_{F(rms)}$	9420	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_{F(av)}$	6000	Amperes
Peak One Cycle Surge Forward Current (Non-repetitive) 60Hz	$I_{fsm}$	49000	Amperes
Peak One Cycle Surge Forward Current (Non-repetitive) 50Hz	$I_{fsm}$	44600	Amperes
3 Cycle Surge Current	$I_{fsm}$	39200	Amperes
10 Cycle Surge Current	$I_{fsm}$	30600	Amperes
$I^2t$ (for Fusing) for One Cycle, 60Hz	$I^2t$	$10.0 \times 10^6$	$A^2sec$
Maximum $I^2t$ of Package ( $t = 8.3$ msec)	$I^2t$	$125 \times 10^6$	$A^2sec$
Operating Temperature	$T_j$	-40 to +190°C	°C
Storage Temperature	$T_{stg}$	-40 to +200°C	°C
Approximate Weight		2.1	lb.
		950	g
Mounting Force		9000 to 11000	lb.
		4100 to 5000	kg.

**RA20 4800A**  
**General Purpose Rectifier**  
 4800 Amperes Average, 1200 Volts

## Electrical Characteristics, $T_j = 25^\circ\text{C}$ Unless Otherwise Specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Peak Reverse Leakage Current	$I_{RRM}$	$T_j = 125^\circ\text{C}, V_R = V_{RRM}$			200	mA
Forward Voltage Drop	$V_{FM}$	$I_{FM} = 3000\text{A}, \text{Duty Cycle} < 0.1\%$			1.05	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 190^\circ\text{C}, I = 15\%, I_{T(av)}$ to $\pi I_{T(av)}$			0.65128	Volts
Slope Resistance, Low-level	$r_{T1}$				0.06315	m $\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 190^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$			1.0168	Volts
Slope Resistance, High-level	$r_{T2}$				0.0383	m $\Omega$
$V_{TM}$ Coefficients, Low-level		$T_j = 190^\circ\text{C}, I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$				
					$A_1 = 0.86976$	
					$B_1 = -0.05790$	
					$C_1 = 3.296\text{E-}05$	
					$D_1 = 0.006296$	
$V_{TM}$ Coefficients, High-level		$T_j = 190^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$				
					$A_2 = 0.18145$	
					$B_2 = 0.064997$	
					$C_2 = 2.921\text{E-}05$	
					$D_2 = 0.002657$	
Typical Reverse Recovery Time	$t_{rr}$	$T_C = 25^\circ\text{C}, I_{FM} = 1500\text{A},$ $di_F/dt = 25\text{A}/\mu\text{sec}, t_p = 190\mu\text{sec}$		16		$\mu\text{sec}$

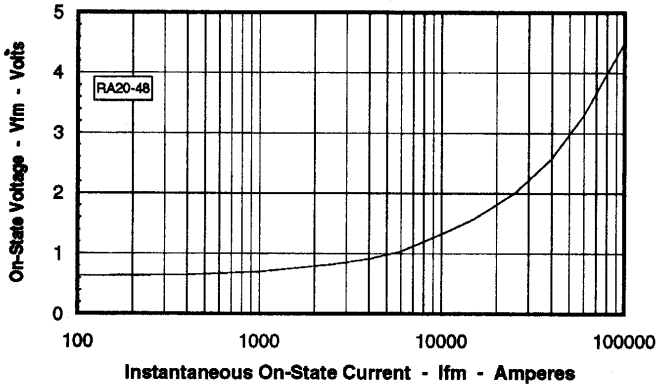
## Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling

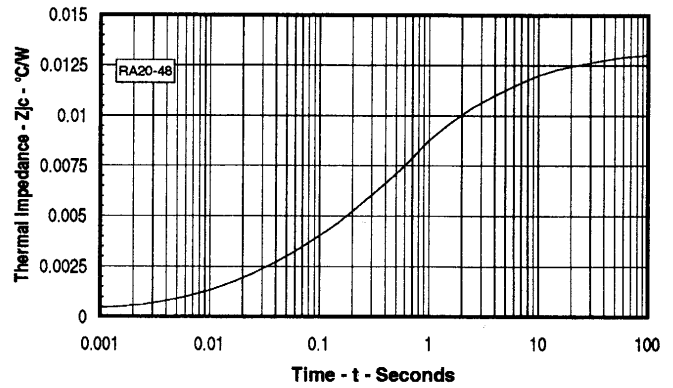
Junction-to-Case	$R_{\theta(j-c)}$		0.013	$^\circ\text{C/W}$
Case-to-Sink	$R_{\theta(c-s)}$		0.007	$^\circ\text{C/W}$

**RA20 4800A**  
**General Purpose Rectifier**  
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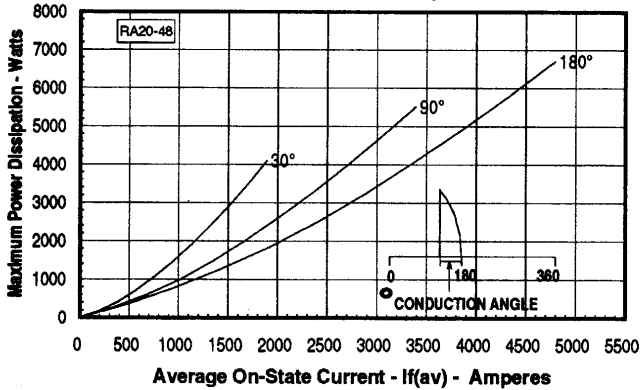
**Maximum On-State Forward Voltage Drop**  
 (T<sub>j</sub> = 190 °C)



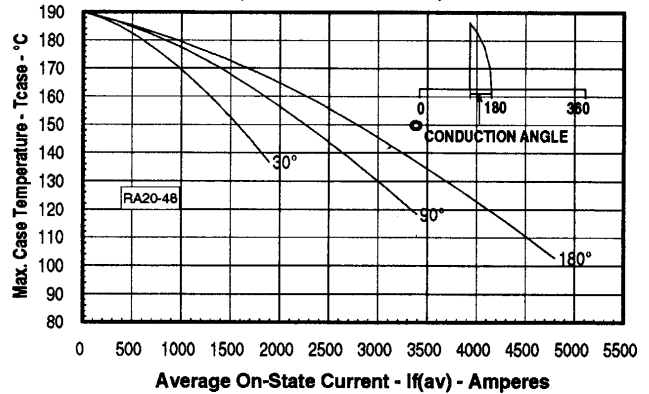
**Maximum Transient Thermal Impedance**  
 (Junction to Case)



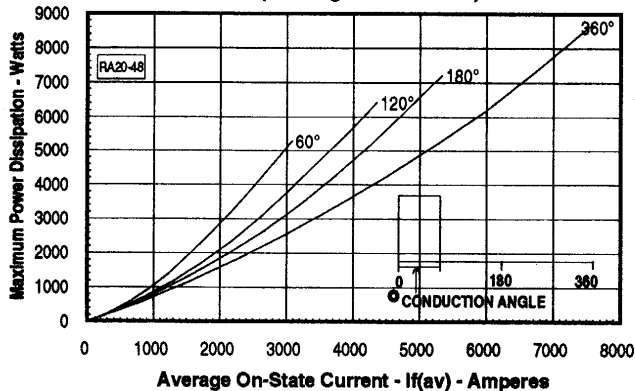
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



**Maximum Allowable Case Temperature**  
 (Sinusoidal Waveform)



**Maximum On-State Power Dissipation**  
 (Rectangular Waveform)



**Maximum Allowable Case Temperature**  
 (Rectangular Waveform)

