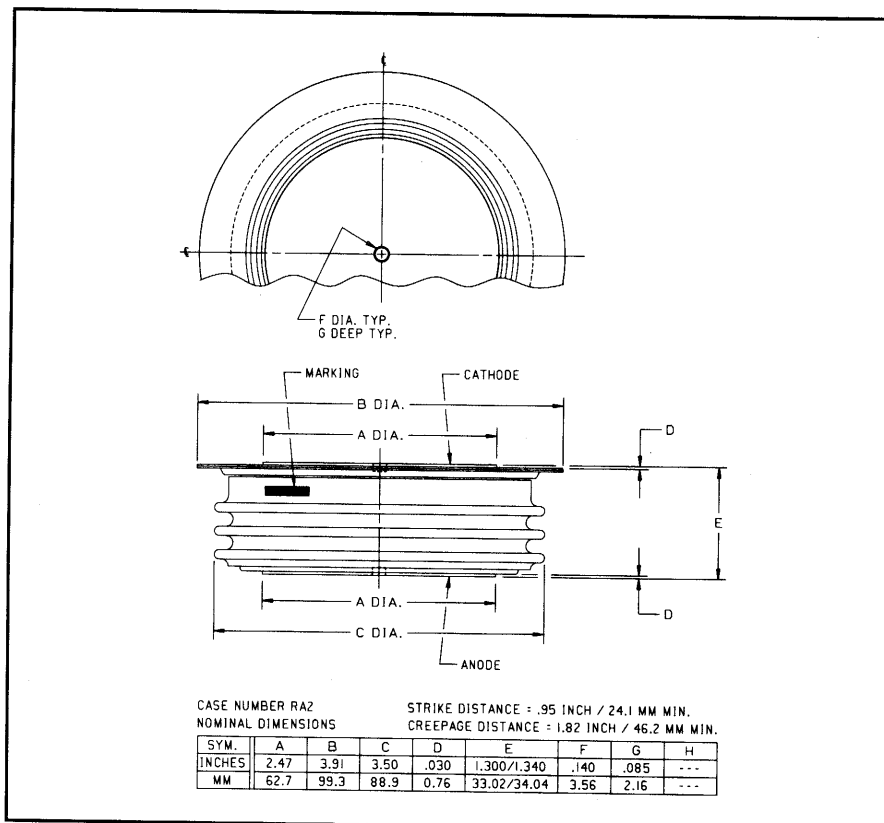
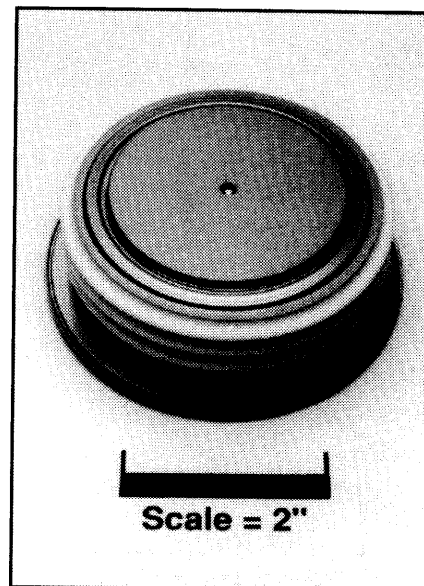


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

**General Purpose
Rectifier**
2000 Amperes Average
5400 Volts



RA20 2000A (Outline Drawing)



RA20 2000A General Purpose Rectifier
2000 Amperes Average, 5400 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 V_{RRM} (Volts)	Current $I_{T(av)}$ (A)	Typical Recovery Time t_{rr} (μ sec)
RA20	10 through 54	20	XX
	1000V through 5400V	2000A	25 μ sec



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RA20 2000A
General Purpose Rectifier
2000 Amperes Average, 5400 Volts

Absolute Maximum Ratings

Characteristics	Symbol	RA20 2000A	Units
Non-repetitive Transient Peak Reverse Voltage	V_{RSM}	$V_{RRM} + 200V$	Volts
RMS Forward Current, $T_C = 99^\circ C$	$I_{F(rms)}$	3140	Amperes
Average Current 180° Sine Wave, $T_C = 99^\circ C$	$I_{F(av)}$	2000	Amperes
RMS Forward Current, $T_C = 55^\circ C$	$I_{F(rms)}$	4710	Amperes
Average Current 180° Sine Wave, $T_C = 55^\circ C$	$I_{F(av)}$	3000	Amperes
Peak One Cycle Surge Forward Current (Non-repetitive) 60Hz	I_{fsm}	24000	Amperes
Peak One Cycle Surge Forward Current (Non-repetitive) 50Hz	I_{fsm}	21800	Amperes
3 Cycle Surge Current	I_{fsm}	19000	Amperes
10 Cycle Surge Current	I_{fsm}	15000	Amperes
I^2t (for Fusing) for One Cycle, 60Hz	I^2t	2.40×10^6	A^2sec
Maximum I^2t of Package ($t = 8.3$ msec)	I^2t	125×10^6	A^2sec
Operating Temperature	T_j	-40 to +150°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.



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RA20 2000A
General Purpose Rectifier
 2000 Amperes Average, 5400 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}	$I_{FM} = 3000\text{A}$, Duty Cycle < 0.1%			1.45	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_j = 150^\circ\text{C}$, $I = 15\%$, $I_{T(av)}$ to $\pi I_{T(av)}$			0.96347	Volts
Slope Resistance, Low-level	r_{T1}				0.20721	m Ω
Threshold Voltage, High-level	$V_{(TO)2}$	$T_j = 150^\circ\text{C}$, $I = \pi I_{T(av)}$ to I_{TSM}			1.76654	Volts
Slope Resistance, High-level	r_{T2}				0.12481	m Ω
V_{TM} Coefficients, Low-level		$T_j = 150^\circ\text{C}$, $I = 15\%$ $I_{T(av)}$ to $\pi I_{T(av)}$			$A_1 = 0.87099$ $B_1 = 0.01029$ $C_1 = 1.852\text{E-}04$ $D_1 = 1.589\text{E-}03$	
V_{TM} Coefficients, High-level		$T_j = 150^\circ\text{C}$, $I = \pi I_{T(av)}$ to I_{TSM}			$A_2 = 10.9312$ $B_2 = -1.82561$ $C_2 = -1.435\text{E-}04$ $D_2 = 0.10336$	
Typical Reverse Recovery Time	t_{rr}	$T_C = 25^\circ\text{C}$, $I_{FM} = 1500\text{A}$, $di_F/dt = 25\text{A}/\mu\text{sec}$, $t_p = 190\mu\text{sec}$		25		μsec

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	$^\circ\text{C/W}$



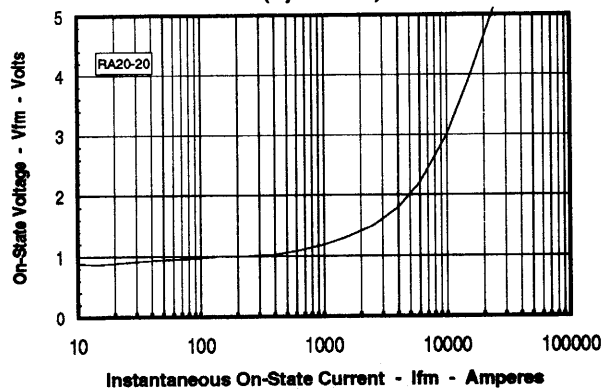
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RA20 2000A

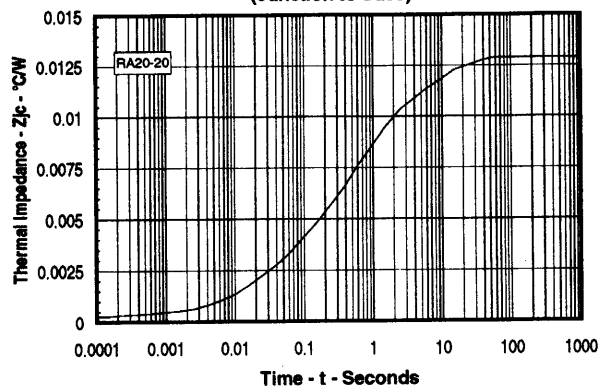
General Purpose Rectifier

2000 Amperes Average, 5400 Volts

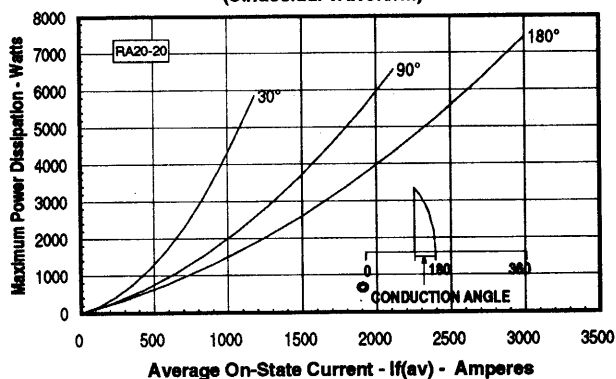
Maximum On-State Forward Voltage Drop
($T_J = 150^\circ\text{C}$)



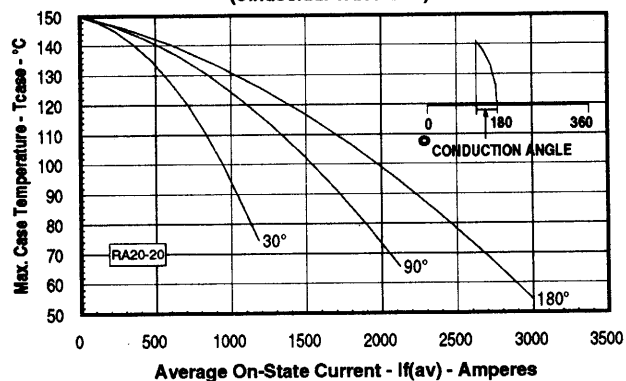
Maximum Transient Thermal Impedance
(Junction to Case)



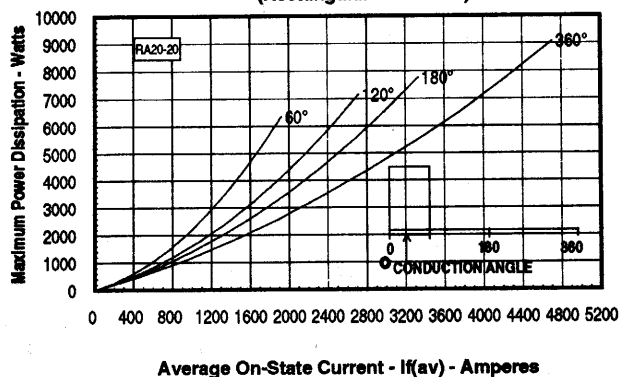
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

