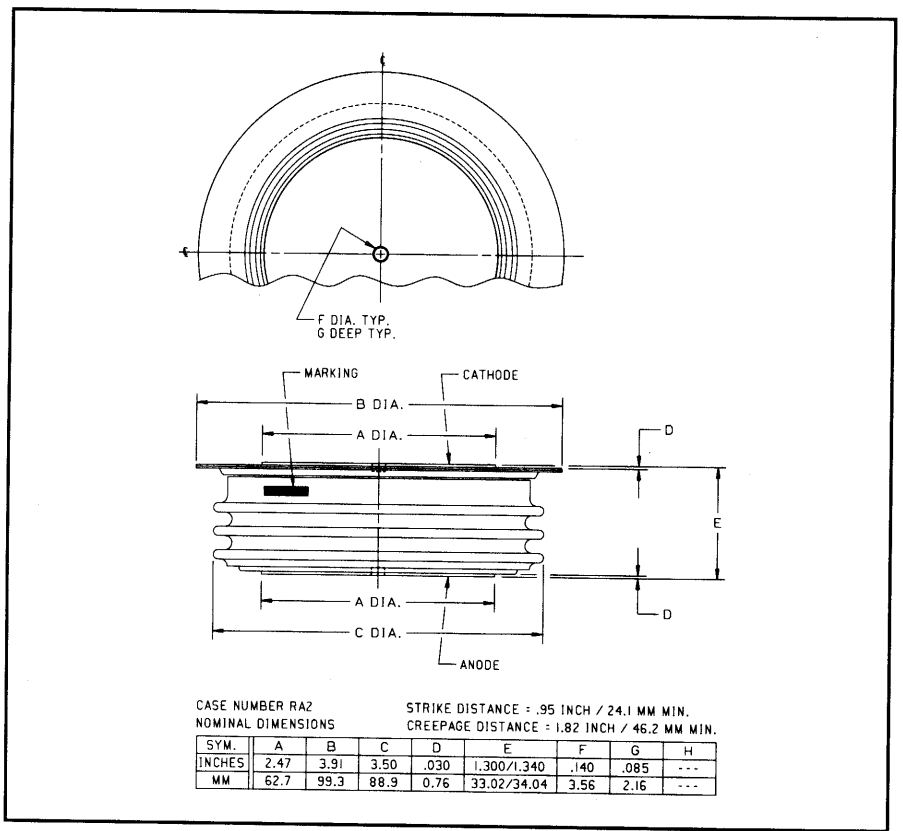
RA20
2000A

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



CASE NUMBER RA2
NOMINAL DIMENSIONS

STRIKE DISTANCE = .95 INCH / 24.1 MM MIN.
CREEPAGE DISTANCE = 1.82 INCH / 46.2 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	2.47	3.91	3.50	.030	1.300/1.340	.140	.085	---
MM	62.7	99.3	88.9	0.76	33.02/34.04	3.56	2.16	---

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.

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} (µsec)
RA20	10 through 54	20	XX
	1000V through 5400V	2000A	25µsec

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

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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°C	$I_{F(rms)}$	3140	Amperes
Average Current 180° Sine Wave, T_C = 99°C	$I_{F(av)}$	2000	Amperes
RMS Forward Current, T_C = 55°C	$I_{F(rms)}$	4710	Amperes
Average Current 180° Sine Wave, T_C = 55°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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Electrical Characteristics, T_j = 25°C Unless Otherwise Specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Peak Reverse Leakage Current	I_{RRM}	T_j = 125°C, $V_R = V_{RRM}$			200	mA
Forward Voltage Drop	V_{FM}	I_{FM} = 3000A, Duty Cycle < 0.1%			1.45	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	T_j = 150°C, I = 15%, $I_{T(av)}$ to $\pi I_{T(av)}$			0.96347	Volts
Slope Resistance, Low-level	r_{T1}				0.20721	mΩ
Threshold Voltage, High-level	$V_{(TO)2}$	T_j = 150°C, I = $\pi I_{T(av)}$ to I_{TSM}			1.76654	Volts
Slope Resistance, High-level	r_{T2}				0.12481	mΩ
V_{TM} Coefficients, Low-level		T_j = 150°C, I = 15% $I_{T(av)}$ to $\pi I_{T(av)}$				
					A_1 = 0.87099	
					B_1 = 0.01029	
					C_1 = 1.852E-04	
					D_1 = 1.589E-03	
V_{TM} Coefficients, High-level		T_j = 150°C, I = $\pi I_{T(av)}$ to I_{TSM}				
					A_2 = 10.9312	
					B_2 = -1.82561	
					C_2 = -1.435E-04	
					D_2 = 0.10336	
Typical Reverse Recovery Time	t_{rr}	T_C = 25°C, I_{FM} = 1500A, di_R/dt = 25A/µsec, t_p = 190µsec		25		µsec

Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling						
Junction-to-Case	$R_{\theta(j-c)}$				0.013	°C/W
Case-to-Sink	$R_{\theta(c-s)}$				0.007	°C/W

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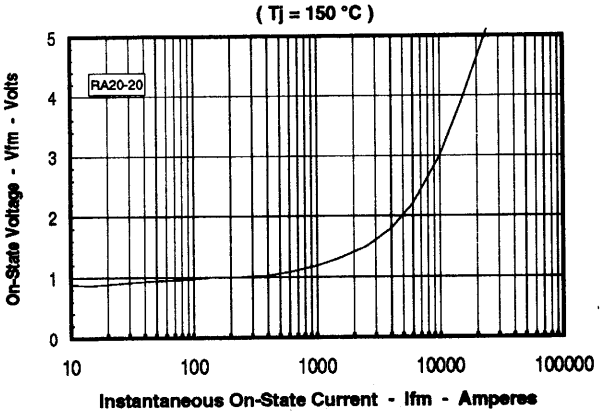
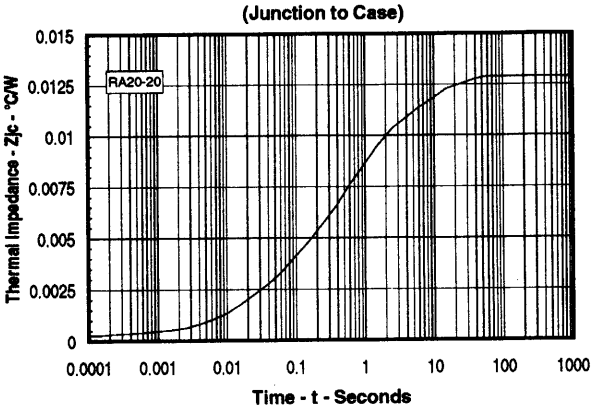
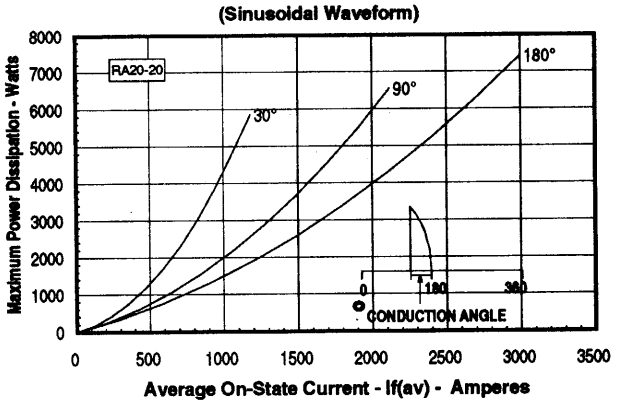
Maximum On-State Forward Voltage Drop
(Tj = 150 °C)



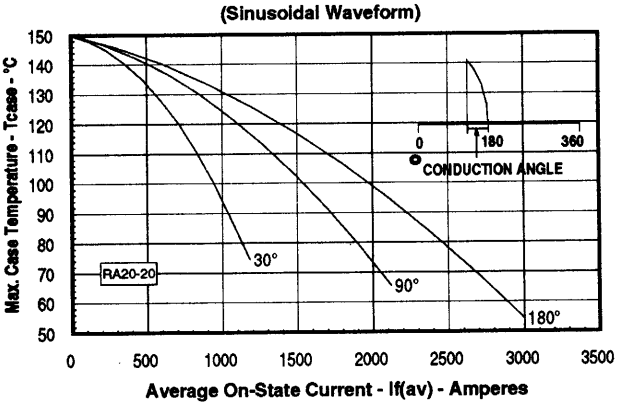
Maximum Transient Thermal Impedance
(Junction to Case)



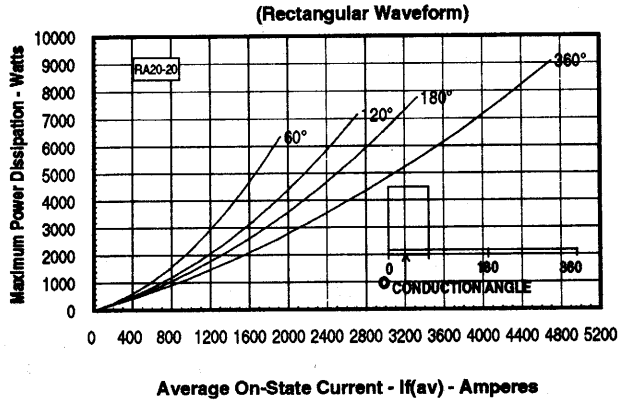
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)