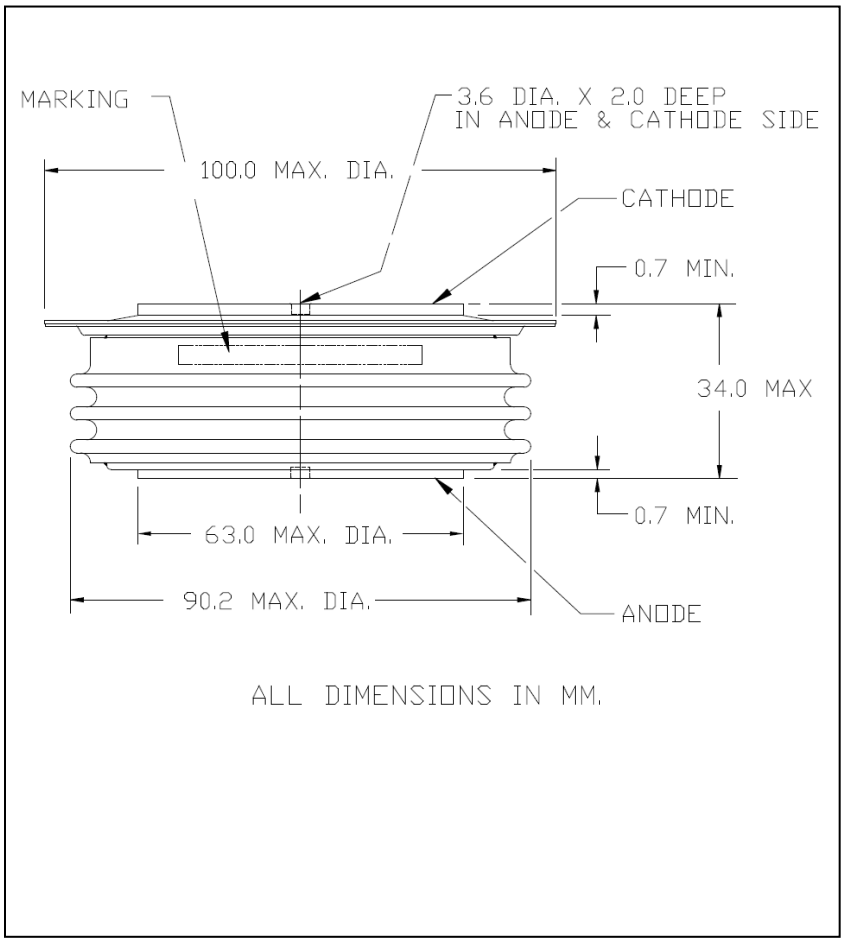
RA20
3600A

Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697 (724) 925-7272
www.pwrx.com

General Purpose Rectifier
3600 Amperes Average
2400 Volts



RA20 3600A (Outline Drawing)

RA20 3600A General Purpose Rectifier
3600 Amperes Average, 2400 Volts

Description:
Powerex General Purpose Rectifiers are designed for high blocking voltage capability with low forward voltage to minimize conduction losses. The 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 ten digit module part number from the table below.
Example: RA201836XX is a 1800V 3600 A General Purpose Rectifier

Type	Voltage V_{RRM} (Volts)	Current $I_{T(av)}$ (A)	Typical Recovery Time t_{RR} (µsec)
RA20	10 through 24	36	XX
	1000V through 2400V	3600A	22 µsec typical

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Absolute Maximum Ratings

Characteristics	Symbol		Units
Non-Repetitive Transient Peak Reverse Blocking Voltage	V_{RSM}	V_{RRM} + 200V	Volts
RMS Forward Current, T_C = 100°C	$I_{F(RMS)}$	5650	Amperes
Average Current 180° Sine Wave, T_C = 100°C	$I_{F(AV)}$	3600	Amperes
RMS Forward Current, T_C = 55°C	$I_{F(RMS)}$	7540	Amperes
Average Current 180° Sine Wave, T_C = 55°C	$I_{F(AV)}$	4800	Amperes
Peak One Cycle Surge Forward Current (Non-Repetitive) 60 Hz	I_{FSM}	40000	Amperes
Peak One Cycle Surge Forward Current (Non-Repetitive) 50 Hz	I_{FSM}	36500	Amperes
3 Cycle Surge Current	I_{FSM}	32000	Amperes
10 Cycle Surge Current	I_{FSM}	25000	Amperes
I^2t (for Fusing) for One Cycle, 60 Hz	I^2t	6.67×10^6	A^2 sec
Maximum I^2t of Package (t = 8.3 msec)	I^2t	125×10^6	A^2 sec
Operating Temperature	T_J	-40 to +175	°C
Storage Temperature	T_{stg}	-40 to +200	°C
Approximate Weight		2.1	lb.
		950	G
Mounting Force		9000 to 11000	lb.
		4100 to 5000	kg.

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 the suitability of use, reliability, capability,
or future availability of this product.

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Electrical Characteristics, T_J=25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Max.	Units
Repetitive Peak Reverse Leakage Current	I_{RRM}	T_J=150°C, $V_R = V_{RRM}$		150	mA
Peak On-State Voltage	V_{FM}	I_{FM}=3000A, Duty Cycle < 0.1 %		1.15	V
Threshold Voltage, Low-level Slope Resistance, Low-level	$V_{(TO)1}$ r_{T1}	T_J = 175°C, I = 15%$I_{F(AV)}$ to π$I_{F(AV)}$		0.66324 0.1134	V mΩ
Threshold Voltage, High-level Slope Resistance, High-level	$V_{(TO)2}$ r_{T2}	T_J = 175°C, I = π$I_{F(AV)}$to I_{FSM}		0.64165 0.1160	V mΩ
V_{TM} Coefficients, Low-level		T_J = 175°C, I = 15%$I_{F(AV)}$ to π$I_{F(AV)}$ V_{FM} = A+ B Ln I +C I + D Sqrt I	A_1 = B_1 = C_1 = D_1 =	0.056048 0.14223 1.722E-04 -0.013138	
V_{TM} Coefficients, High-level		T_J = 175°C, I = π$I_{F(AV))}$ to I_{FSM} V_{FM} = A+ B Ln I +C I + D Sqrt I	A_2 = B_2 = C_2 = D_2 =	16.559 -2.4893 -6.092E-05 0.087387	
Diode Reverse Recovery Time (Typical)	t_{rr}	T_C = 25°C, I_{FM} = 1500A, di_R/dt = -25A/µs, T_p = 190 µs		22 (Typical)	µs

Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling		Max.	Units
Junction-to-Case	$R_{Θ(J-C)}$	0.013	°C/W
Case-to-Sink	$R_{Θ(C-S)}$	0.007	°C/W

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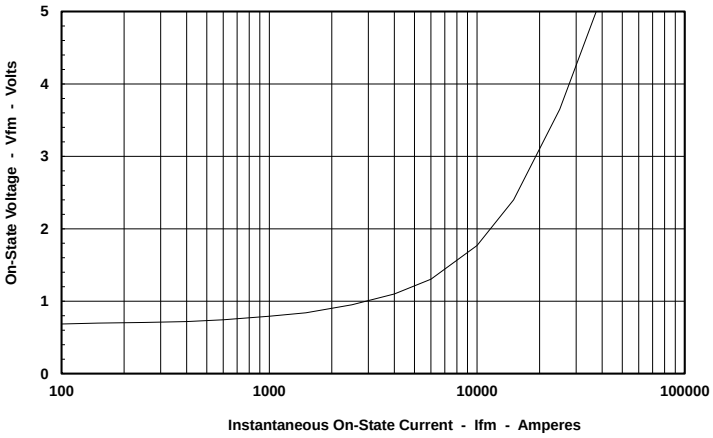
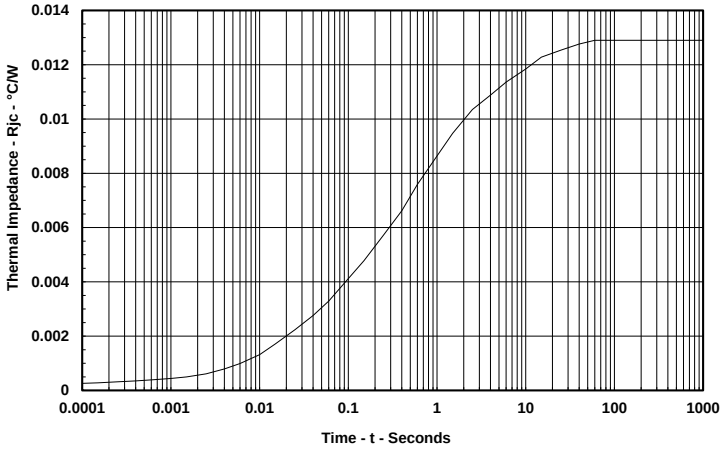
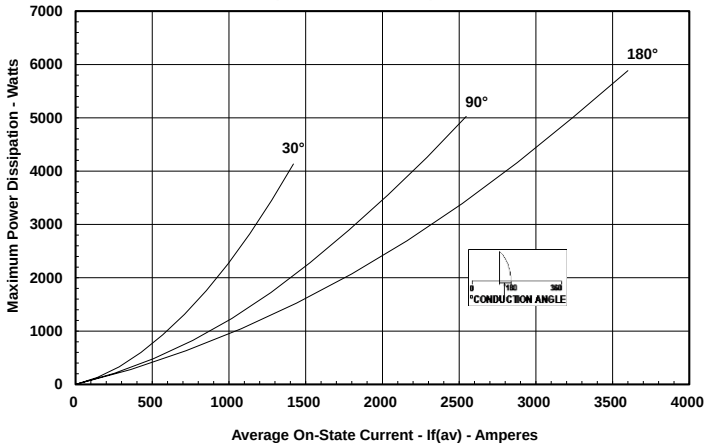
Maximum On-State Forward Voltage Drop
(Tj = 175 °C)



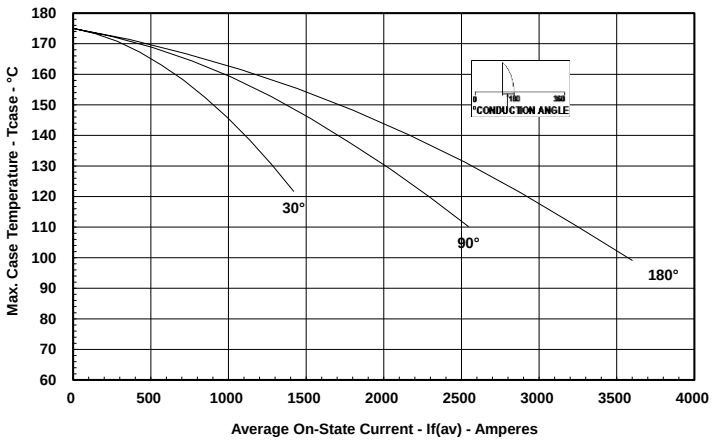
Maximum Transient Thermal Impedance
(Junction to Case)



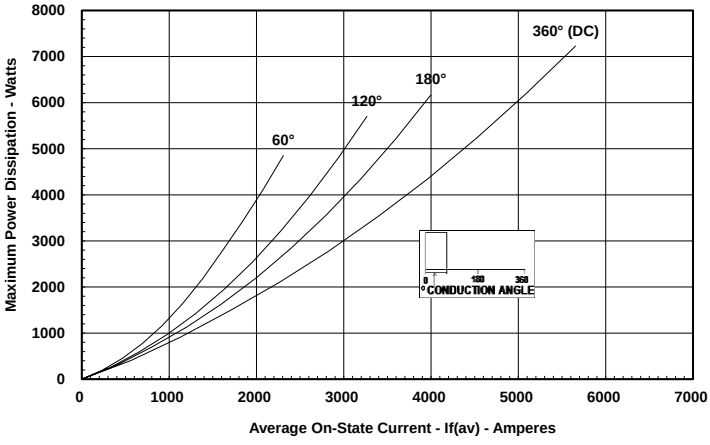
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



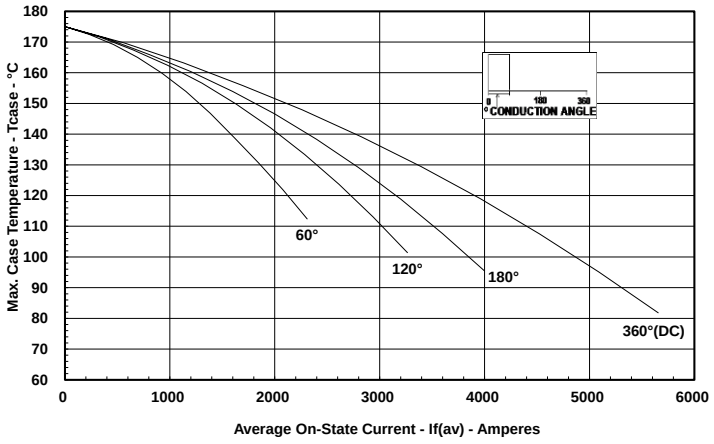
Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)



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