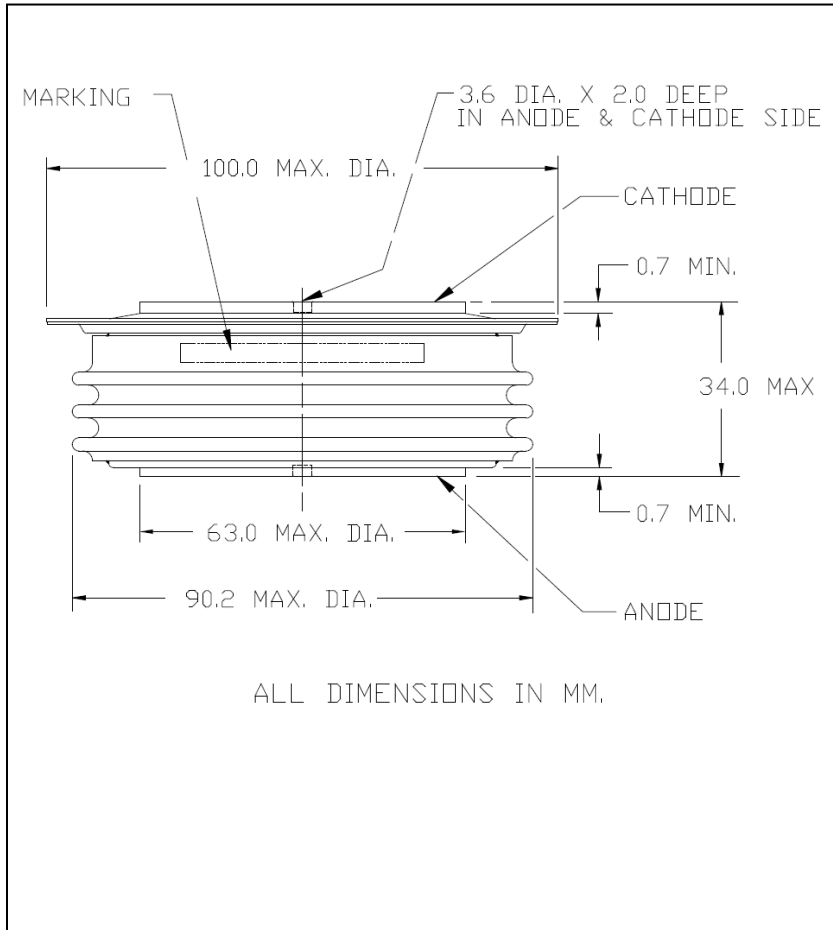


**General Purpose Rectifier
4800 Amperes Average
1200 Volts**



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. 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: RA201248XX is a 1200V 4800 A General Purpose Rectifier

| Type | Voltage V_{RRM} (Volts) | Current $I_{T(av)}$ (A) | Typical Recovery Time t_{RR} (μ sec) |
|------|---------------------------------|-------------------------------|--|
| RA20 | 06 through 12 | 48 | XX |
| | 600V through 1200V | 4800A | 16 μ sec typical |



**RA20
4800A**

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

**General Purpose Rectifier
4800 Amperes Average
1200 Volts**

Absolute Maximum Ratings

| Characteristics | Symbol | Units |
|---|----------------------------|---------------------------------------|
| Non-Repetitive Transient Peak Reverse Blocking 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) 60 Hz | I_{FSM} | 49000 Amperes |
| Peak One Cycle Surge Forward Current (Non-Repetitive) 50 Hz | 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, 60 Hz | I^2t | 10.0×10^6 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 +190 °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.

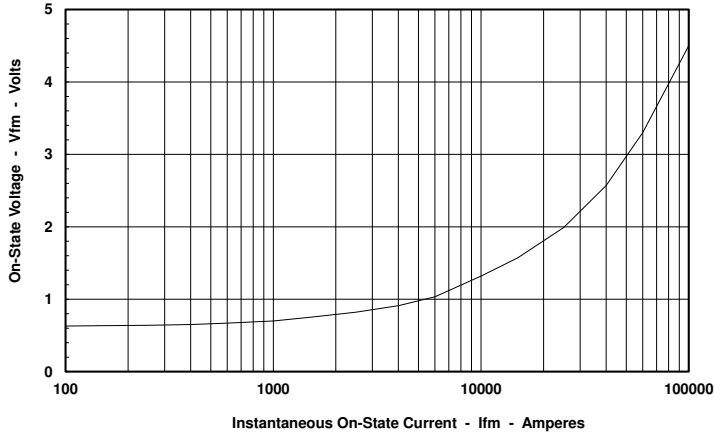
Electrical Characteristics, $T_J=25^\circ\text{C}$ unless otherwise specified

| Characteristics | Symbol | Test Conditions | Min. | Max. | Units |
|---|-------------|---|---------|-----------------|------------------|
| Repetitive Peak Reverse Leakage Current | I_{RRM} | $T_J=150^\circ\text{C}$, $V_R = V_{RRM}$ | | 150 | mA |
| Peak On-State Voltage | V_{FM} | $I_{FM}=3000\text{A}$, Duty Cycle < 0.1 % | | 1.05 | V |
| Threshold Voltage, Low-level | $V_{(TO)1}$ | $T_J = 190^\circ\text{C}$, $I = 15\%I_{F(AV)}$ to $\pi I_{F(AV)}$ | | 0.65128 | V |
| Slope Resistance, Low-level | r_{T1} | | | 0.06315 | $\text{m}\Omega$ |
| Threshold Voltage, High-level | $V_{(TO)2}$ | $T_J = 190^\circ\text{C}$, $I = \pi I_{F(AV)}$ to I_{FSM} | | 1.0168 | V |
| Slope Resistance, High-level | r_{T2} | | | 0.0383 | $\text{m}\Omega$ |
| V_{TM} Coefficients, Low-level | | $T_J = 190^\circ\text{C}$, $I = 15\%I_{F(AV)}$ to $\pi I_{F(AV)}$ | $A_1 =$ | 0.86976 | |
| | | | $B_1 =$ | -0.05790 | |
| | | $V_{FM} = A + B \ln I + C I + D \text{ Sqrt } I$ | $C_1 =$ | 3.296E-05 | |
| | | | $D_1 =$ | 0.006296 | |
| V_{TM} Coefficients, High-level | | $T_J = 190^\circ\text{C}$, $I = \pi I_{F(AV)}$ to I_{FSM} | $A_2 =$ | 0.18145 | |
| | | | $B_2 =$ | 0.064997 | |
| | | $V_{FM} = A + B \ln I + C I + D \text{ Sqrt } I$ | $C_2 =$ | 2.921E-05 | |
| | | | $D_2 =$ | 0.002657 | |
| Diode Reverse Recovery Time (Typical) | t_{rr} | $T_C = 25^\circ\text{C}$, $I_{FM} = 1500\text{A}$, $di_R/dt = -25\text{A}/\mu\text{s}$, $T_p = 190 \mu\text{s}$ | | 16 (Typical) | μs |

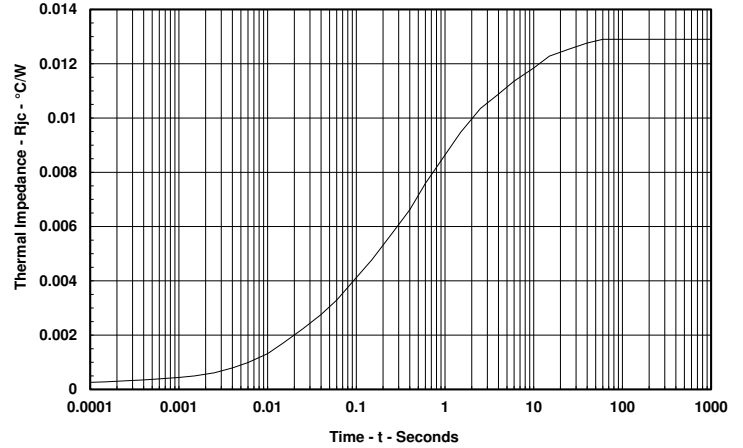
Thermal Characteristics

| Maximum Thermal Resistance, Double Sided Cooling | | Max. | Units |
|--|-------------------|-------|---------------------------|
| Junction-to-Case | $R_{\theta(J-C)}$ | 0.013 | $^\circ\text{C}/\text{W}$ |
| Case-to-Sink | $R_{\theta(C-S)}$ | 0.007 | $^\circ\text{C}/\text{W}$ |

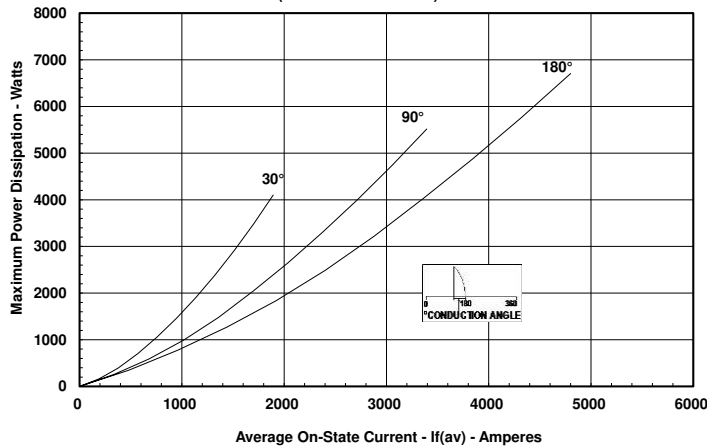
Maximum On-State Forward Voltage Drop
($T_j = 190^\circ\text{C}$)



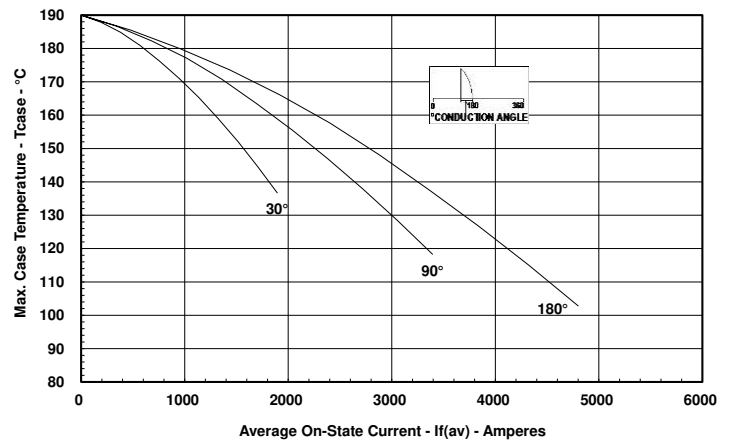
Maximum Transient Thermal Impedance
(Junction to Case)



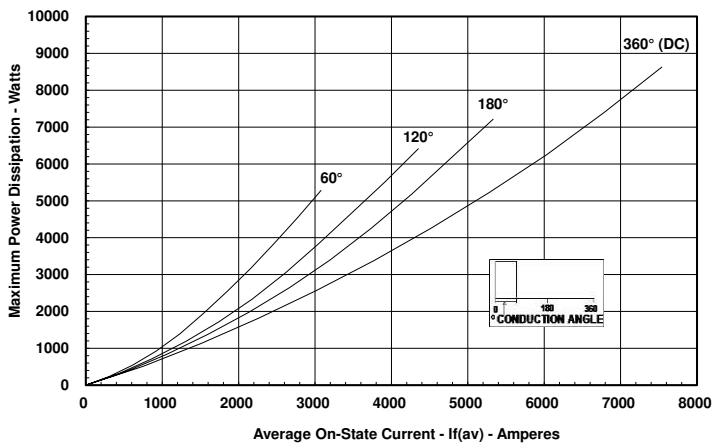
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)

