

ALL DIMENSIONS IN MM.

CATALOG OUTLINE
TYPE R82



Powerex General Purpose Rectifier Diodes are designed with high blocking voltage capability and low forward voltage drop to minimize conduction losses. These are packaged in hermetic, ceramic Pow-R-Disc packages which can be mounted using commercially available clamps and heatsinks or fully assembled to a variety of air or water cooled heat exchangers.

FEATURES:

- Low On-State Voltage
- Hermetic Ceramic Package
- Excellent Surge and I^2t Ratings

APPLICATIONS:

- DC Power Supplies
- Input Rectifiers

ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.
EXAMPLE: R8205207XXOO is a 5200V-680A General Purpose Diode with a typical reverse recovery time of 30 μ s.

| PART | Voltage Rating V_{DRM} - V_{RRM} | Voltage Code | Current Rating I_{tavg} | Current Code | Reverse Recovery t_{RR} | Lead Code |
|-------------|---|--------------|------------------------------|--------------|------------------------------|-----------|
| R820 | 5200V | 52 | 690A | 07 | XX | OO |
| | 5000V | 50 | | | | |
| | 4800V | 48 | | | 30 μ s typical | |
| | 4400V | 44 | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Revised: 2/22/2008

Absolute Maximum Ratings

| Characteristic | Symbol | Rating | Units |
|---|---------------|-----------------|----------------------|
| Repetitive Peak Reverse Voltage | V_{RRM} | 5200 | Volts |
| Non-repetitive Transient Peak Reverse Voltage | V_{RSM} | $V_{RRM} + 100$ | Volts |
| Average On-State Current, $T_C = 100^\circ\text{C}$ | $I_{F(Avg.)}$ | 690 | A |
| RMS On - State Current, $T_C = 100^\circ\text{C}$ | $I_{F(RMS)}$ | 1084 | A |
| Average On-State Current, $T_C = 55^\circ\text{C}$ | $I_{F(Avg.)}$ | 1035 | A |
| RMS On - State Current, $T_C = 55^\circ\text{C}$ | $I_{F(RMS)}$ | 1626 | A |
| Peak One Cycle Surge Current, 60Hz, $V_R = V_{RRM}$ | I_{FSM} | 7,500 | A |
| Fuse Coordination I^2t , 60Hz | I^2t | 2.34E+05 | A^2s |
| Peak One Cycle Surge Current, 50Hz, $V_R = 0\text{V}$ | I_{FSM} | 6,938 | A |
| Fuse Coordination I^2t , 50Hz | I^2t | 2.41E+05 | A^2s |
| Operating Temperature | T_j | -40 to+150 | $^\circ\text{C}$ |
| Storage Temperature | $T_{Stg.}$ | -50 to+190 | $^\circ\text{C}$ |
| Approximate Weight | | 0.5 | lb |
| | | 0.23 | Kg |
| Mounting Force | | 3,000 - 3,500 | lbs |
| | | 13.3 - 15.5 | Knewtons |

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

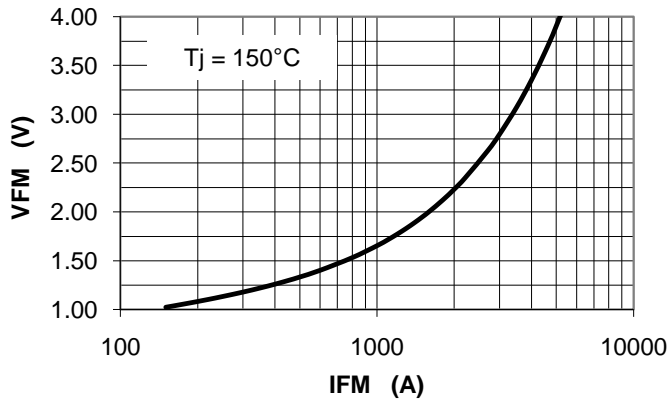
Electrical Characteristics, Tj=25°C unless otherwise specified

| Characteristic | Symbol | Test Conditions | Rating | | | Units |
|--|-----------------|---|--------|-----|-----------|-------|
| | | | min | typ | max | |
| Repetitive Peak Reverse Leakage Current | I_{RRM} | Tj=150°C, V _{RRM} =Rated | | 50 | 75 | ma |
| Peak On-State Voltage | V _{FM} | Tj=25°C, I _{FM} = 1500 A | | | 1.65 | V |
| V _{FM} Model, Low Level | V ₀ | Tj=150°C | | | 1.00 | V |
| V _{FM} = V ₀ + r•I _{FM} | r | 15% I _{FM} - π•I _{FM} | | | 6.20E-04 | Ω |
| V _{FM} Model, High Level | V ₀ | Tj=150°C | | | 1.12 | V |
| V _{FM} = V ₀ + r•I _{FM} | r | π•I _{FM} - I _{FSM} | | | 5.57E-04 | Ω |
| V _{FM} Model, 4-Term | A | Tj=150°C | | | 0.209 | |
| V _{FM} = A + B•Ln(I _{FM}) + | B | 15%I _{FM} - I _{FSM} | | | 1.69E-01 | |
| C•(I _{FM}) + D•(I _{FM}) ^{1/2} | C | | | | 5.93E-04 | |
| | D | | | | -1.00E-02 | |
| Reverse Recovery Time | t _{RR} | Tj=25°C, I _{FM} =400A di _R /dt = 25 A/μs | | 30 | | μs |

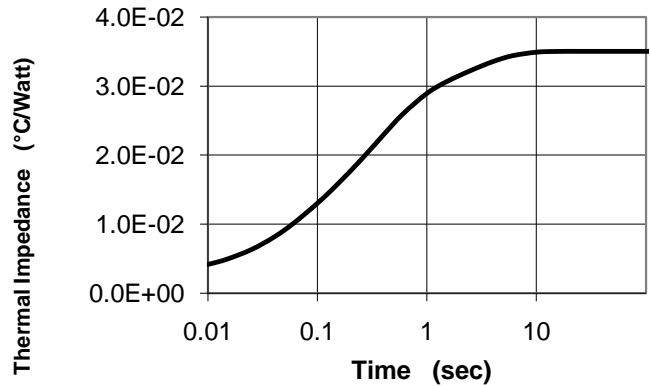
Thermal Characteristics

| Characteristic | Symbol | Test Conditions | Rating | | | Units | |
|---|------------------|--------------------|----------|-----------|-----------|-----------|-----------|
| | | | min | typ | max | | |
| Thermal Resistance | | | | | | | |
| Junction to Case | Rθ _{jc} | Double side cooled | | 0.03 | 0.035 | °C/Watt | |
| Case to Sink | Rθ _{cs} | Double side cooled | | 0.012 | 0.015 | °C/Watt | |
| Thermal Impedance Model | Zθ _{jc} | Double side cooled | | | | | |
| Zθ _{jc} (t) = Σ(A(N)•(1-exp(-t/Tau(N)))) | | where: | N = | 1 | 2 | 3 | 4 |
| | | | A(N) = | 2.536E-03 | 6.394E-03 | 1.818E-02 | 7.915E-03 |
| | | | Tau(N) = | 7.988E-04 | 5.286E-02 | 3.296E-01 | 2.391E+00 |

Maximum On-State Voltage Drop

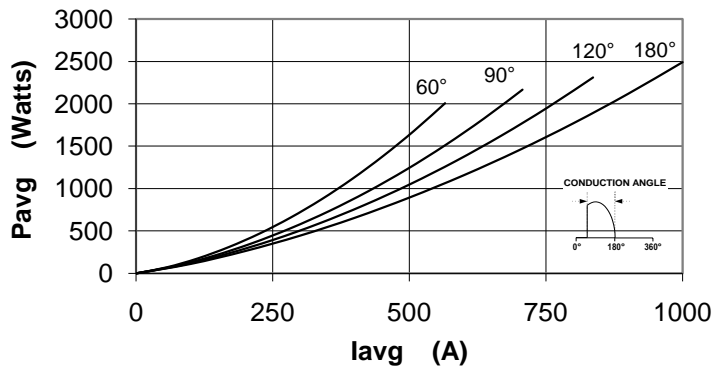


MAXIMUM TRANSIENT THERMAL IMPEDANCE



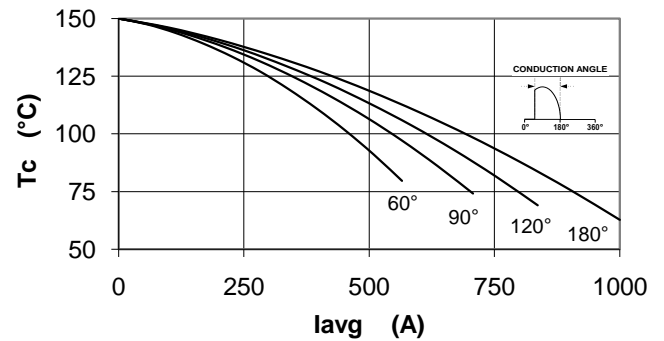
Maximum On-State Power Dissipation

Sinusoidal Waveform



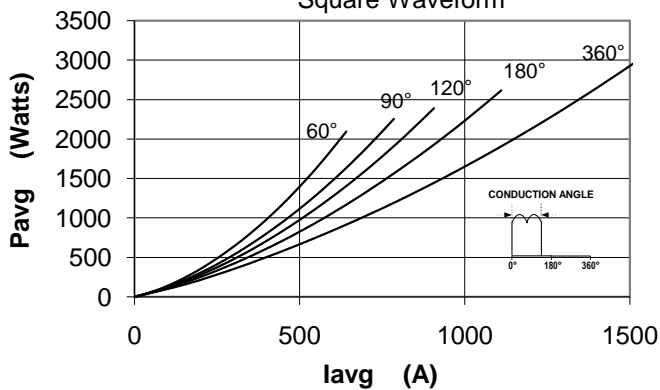
Maximum Allowable Case Temperature

Sinusoidal



Maximum On-State Power Dissipation

Square Waveform



Maximum Allowable Case Temperature

Square Waveform

