

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
- Plating Supplies

ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.
EXAMPLE: RDK86040XXOO is a 6000V-4000A General Purpose Diode with a typical reverse recovery time of 25 μ s.

| PART | Voltage Rating | Voltage Code | Current Rating | Current Code | Reverse Recovery | Lead Code |
|-------------|-------------------|--------------|----------------|--------------|--------------------|-----------|
| | $V_{DRM}-V_{RRM}$ | | I_{TAVG} | | t_{RR} | |
| RDS8 | 6000V | 60 | 4000A | 40 | XX | OO |
| | 5600V | 56 | | | | |
| | 5200V | 52 | | | 25 μ s typical | |
| | 4800V | 48 | | | | |
| | | | | | | |
| | | | | | | |

Absolute Maximum Ratings

| Characteristic | Symbol | Rating | Units |
|---------------------------------------------------|---------------|-----------------|----------------------|
| Repetitive Peak Reverse Voltage | V_{RRM} | 6000 | Volts |
| Non-repetitive Transient Peak Reverse Voltage | V_{RSM} | $V_{RRM} + 100$ | Volts |
| Average On-State Current, $T_C 68^\circ\text{C}$ | $I_{F(Avg.)}$ | 4000 | A |
| RMS On - State Current, $T_C 68^\circ\text{C}$ | $I_{F(RMS)}$ | 6283 | A |
| Peak One Cycle Surge Current, 60Hz, $V_R=V_{RRM}$ | I_{FSM} | 60,000 | A |
| Fuse Coordination I^2t , 60Hz | I^2t | 1.50E+07 | A^2s |
| Peak One Cycle Surge Current, 50Hz, $V_R=0V$ | I_{FSM} | 55,500 | A |
| Fuse Coordination I^2t , 50Hz | I^2t | 1.28E+07 | A^2s |
| Operating Temperature | T_j | -40 to+150 | $^\circ\text{C}$ |
| Storage Temperature | $T_{Stg.}$ | -50 to+190 | $^\circ\text{C}$ |
| Approximate Weight | | 6.5 | lb |
| | | 2.95 | Kg |
| Mounting Force | | 16,000 - 20,000 | lbs |
| | | 71.2 - 89.0 | Knewtons |

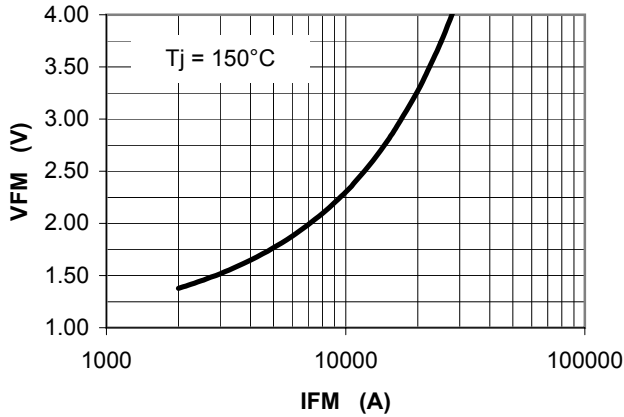
Electrical Characteristics, Tj=25°C unless otherwise specified

| Characteristic | Symbol | Test Conditions | Rating | | | Units |
|---------------------------------------------|-----------|---------------------------------------------------|--------|-----|----------|----------|
| | | | min | typ | max | |
| Repetitive Peak Reverse Leakage Current | I_{RRM} | Tj=150°C, V_{RRM} =Rated | | 150 | 300 | ma |
| Peak On-State Voltage | V_{FM} | Tj=150°C, I_{FM} = 4000 A | | | 1.65 | V |
| V_{FM} Model, Low Level | V_0 | Tj=150°C | | | 1.13 | V |
| $V_{FM} = V_0 + r \cdot I_{FM}$ | r | 15% $I_{FM} - \pi \cdot I_{FM}$ | | | 1.17E-04 | Ω |
| V_{FM} Model, High Level | V_0 | Tj=150°C | | | 1.44 | V |
| $V_{FM} = V_0 + r \cdot I_{FM}$ | r | $\pi \cdot I_{FM} - I_{FSM}$ | | | 9.12E-05 | Ω |
| V_{FM} Model, 4-Term | A | Tj=150°C | | | 0.220 | |
| $V_{FM} = A + B \cdot \ln(I_{FM}) +$ | B | 15% $I_{FM} - I_{FSM}$ | | | 1.25E-01 | |
| $C \cdot (I_{FM}) + D \cdot (I_{FM})^{1/2}$ | C | | | | 8.50E-05 | |
| | D | | | | 8.00E-04 | |
| Reverse Recovery Time | t_{RR} | Tj=25°C, I_{FM} =400A $di_R/dt = 25 A/\mu s$ | | 25 | | μs |

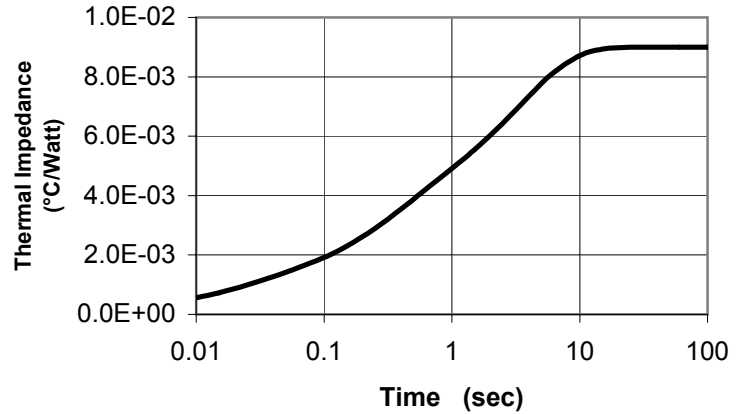
Thermal Characteristics

| Characteristic | Symbol | Test Conditions | Rating | | | Units |
|----------------------------------------------------------------------------|----------------|--------------------|-----------|-----------|-----------|-----------|
| | | | min | typ | max | |
| Thermal Resistance | | | | | | |
| Junction to Case | $R\theta_{jc}$ | Double side cooled | | 0.0075 | 0.0090 | °C/Watt |
| Case to Sink | $R\theta_{cs}$ | Double side cooled | | 0.001 | 0.0015 | °C/Watt |
| Thermal Impedance Model | $Z\theta_{jc}$ | Double side cooled | | | | |
| $Z\theta_{jc}(t) = \Sigma(A(N) \cdot (1 - \exp(-t/\text{Tau}(N))))$ where: | | | | | | |
| | | N = | 1 | 2 | 3 | 4 |
| | | A(N) = | 1.426E-04 | 9.077E-04 | 2.600E-03 | 5.350E-03 |
| | | Tau(N) = | 2.622E-03 | 2.313E-02 | 3.049E-01 | 3.396E+00 |

Maximum On-State Voltage Drop

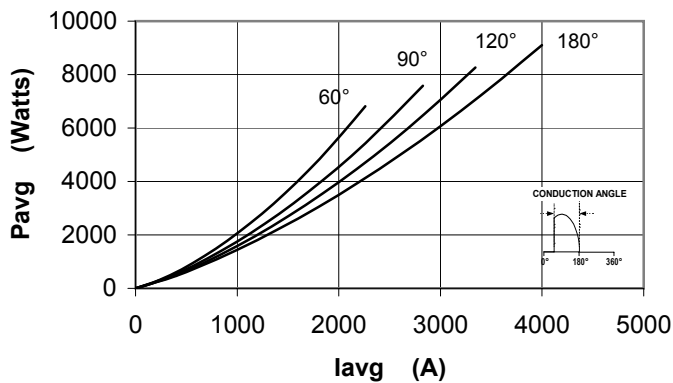


MAXIMUM TRANSIENT THERMAL IMPEDANCE



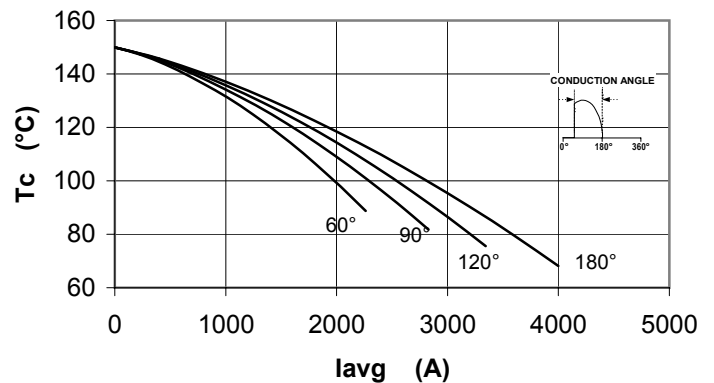
Maximum On-State Power Dissipation

Sinusoidal



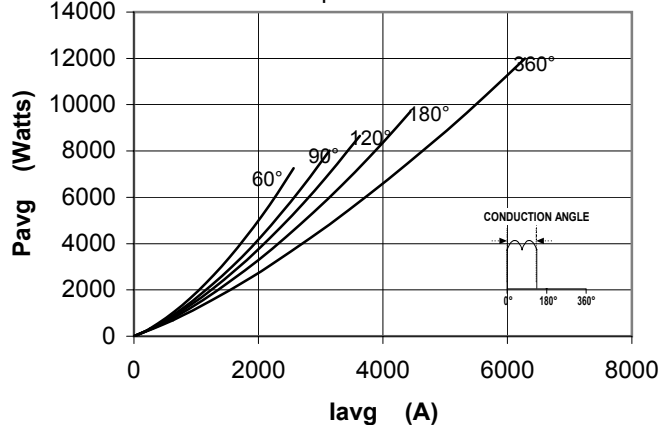
Maximum Allowable Case Temperature

Sinusoidal Waveform



Maximum On-State Power Dissipation

Square Waveform



Maximum Allowable Case Temperature

Square Waveform

