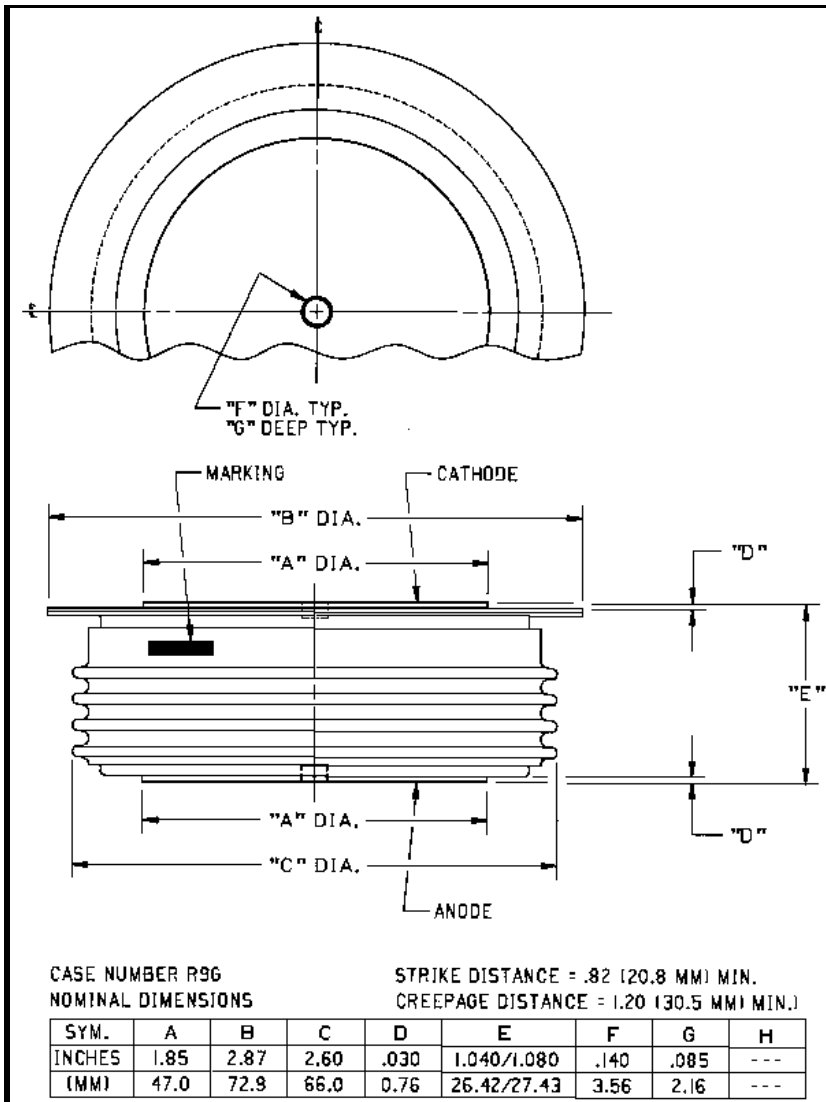


Powerex, Inc., 173 Pavilion Lane, Youngwood, Pennsylvania 15697-1800 (724) 925 7272

## Rectifier Diode 1800 Amperes/Up to 3200 Volts

### Description:

Powerex General Purpose Rectifiers are designed with high blocking voltage capability with low forward on-state voltage to minimize conduction losses. These are all-diffused, hermetic Pow-R-Disc devices which can be mounted using commercially available clamps and heatsinks..



### Features:

- Low On-State Voltage
- Low Thermal Impedance
- Hermetic Packaging
- Excellent Surge and I<sup>2</sup>t Ratings

### Applications:

- Power Supplies
- Motor Control
- Free Wheeling Diode

### Ordering Information

Select the complete 10 digit device part number from the table below.

| Type | Voltage<br>V <sub>RRM</sub> | Current<br>I <sub>T(av)</sub> | Recovery<br>Time<br>t <sub>rr</sub> |
|------|-----------------------------|-------------------------------|-------------------------------------|
| R9G0 | 12                          | 18                            | XX                                  |
|      | through                     |                               |                                     |
|      | 32                          |                               |                                     |
|      | 1200 V                      | 1800 A                        | 25 μs<br>typical                    |
|      | through                     |                               |                                     |
|      | 3200 V                      |                               |                                     |

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**R9G0****Rectifier Diode**

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**Absolute Maximum Ratings**

|  | Conditions                                    | Symbol       |                     | Units                   |
|--|---|--------------|---------------------|-------------------------|
| Repetitive Peak Reverse Blocking Voltage     |   | $V_{RRM}$    | up to 3200          | V                       |
| Non-Repetitive Peak Reverse Blocking Voltage |   | $V_{RSM}$    | $V_{RRM} + 100$     | V                       |
| RMS Forward Current                          |   | $I_{F(RMS)}$ | 2825                | A                       |
| Average Forward Current                      | 180° Conduction, $T_C=110^{\circ}\text{C}$    | $I_{F(AV)}$  | 1800                | A                       |
| Peak Half Cycle Non-Repetitive Surge Current | $t = 8.3\text{mS}$ , 100% $V_{RRM}$ reapplied | $I_{FSM}$    | 21,500              | A                       |
| Peak Half Cycle Non-Repetitive Surge Current | $t = 10\text{mS}$ , 100% $V_{RRM}$ reapplied  | $I_{FSM}$    | 19,600              | A                       |
| $I^2t$ for Fusing for One Cycle              |   | $I^2t$       | $1.925 \times 10^6$ | $\text{A}^2\text{-sec}$ |
| $I^2t$ of Package                            | $t = 8.3\text{mS}$                            | $I^2t$       | $90 \times 10^6$    | $\text{A}^2\text{-sec}$ |
| Operating Junction Temperature               |   | $T_J$        | -40 to +175         | $^{\circ}\text{C}$      |
| Storage Temperature                          |   | $T_{stg}$    | -40 to +190         | $^{\circ}\text{C}$      |
| Mounting Force                               | --  | --           | 5000 to 6000        | lb.                     |
|  |   |              | 2270 to 2700        | kg                      |
| Module Weight, Typical                       | --  | --           | 454                 | g                       |
|  |   |              | 1.0                 | lbs                     |

**R9G0**

**Rectifier Diode**

1800 Amperes / Up to 3200 Volts

**Electrical and Thermal Characteristics, T<sub>J</sub>=25°C unless otherwise specified**

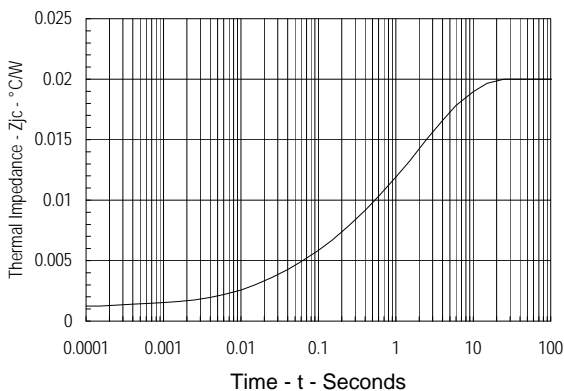
| Characteristics                          | Symbol              | Test Conditions   | Min. | Typ.   | Max       | Units  |
|--|---------------------|---|------|--|-----------|--------|
| Peak Reverse Leakage Current             | I <sub>RRM</sub>    | T <sub>J</sub> =175°C, Rated V <sub>RRM</sub>   |      |  | 150       | mA     |
| Peak On-State Voltage                    | V <sub>FM</sub>     | T <sub>J</sub> =25°C, I <sub>FM</sub> =1500A  |      |  | 1.20      | V      |
| Threshold Voltage, Low-level             | V <sub>(TO)1</sub>  | T <sub>J</sub> = 175°C, I = 15%I <sub>F(AV)</sub> to P I <sub>F(AV)</sub>                                     |      |  | .814      | V      |
| Slope Resistance, Low-level              | r <sub>T1</sub>     |   |      |  | .224      | mΩ     |
| Threshold Voltage, High-level            | V <sub>(TO)2</sub>  | T <sub>J</sub> = 175°C, I = P I <sub>F(AV)</sub> to I <sub>FSM</sub>  |      |  | 1.03      | V      |
| Slope Resistance, High-level             | r <sub>T2</sub>     |   |      |  | .198      | mΩ     |
| V <sub>FM</sub> Coefficients, Full Range |                     | T <sub>J</sub> = 175°C, I = 15%I <sub>F(AV)</sub> to I <sub>FSM</sub>   |      | A = 2.06<br>B = -0.232<br>C = 0.000130<br>D = 0.0179 |           |        |
|  |                     | V <sub>FM</sub> =A + B Ln (I <sub>FM</sub> ) + C I <sub>FM</sub> + D v(I <sub>FM</sub> )                      |      |  |           |        |
| Maximum Reverse Recovery Current         | I <sub>R(Rec)</sub> | T <sub>J</sub> = 175°C, di/dt = -1 A/μs<br>T <sub>J</sub> = 175°C, di/dt = -10A/μs                            |      |  | 70<br>250 | A<br>A |
| Typical Reverse Recovery Time            | t <sub>rr</sub>     | T <sub>C</sub> = 25°C, I <sub>FM</sub> = 1500 A<br>di <sub>R</sub> /dt = 25 A/μsec, t <sub>p</sub> = 190 μsec |      |  | 25        | μsec   |

**Thermal Characteristics**

| Characteristics                             | Symbol           | Min.  | Typ.  | Max.   | Units |
|---|------------------|-------|-------|--------|-------|
| Thermal Resistance, Junction to Case        | R <sub>TJC</sub> | ----- | ----- | 0.02   | °C/W  |
| Thermal Resistance, Case to Sink Lubricated | R <sub>TCS</sub> | ----- | ----- | 0.0075 | °C/W  |

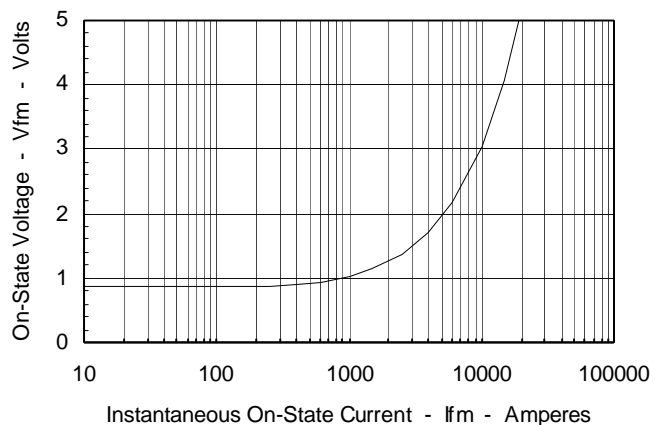
**Maximum Transient Thermal Impedance**

(Junction to Case)



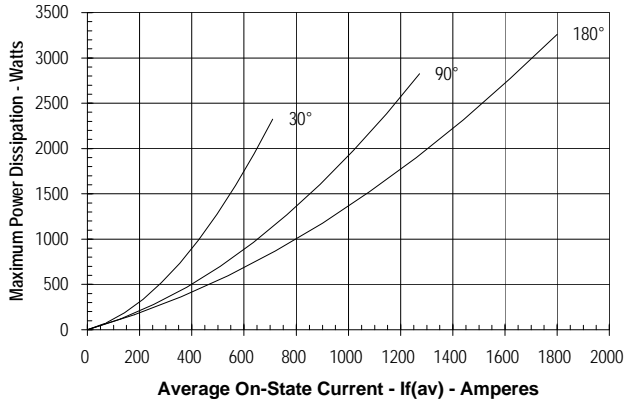
**Maximum On-State Forward Voltage Drop**

(T<sub>J</sub> = 175 °C)



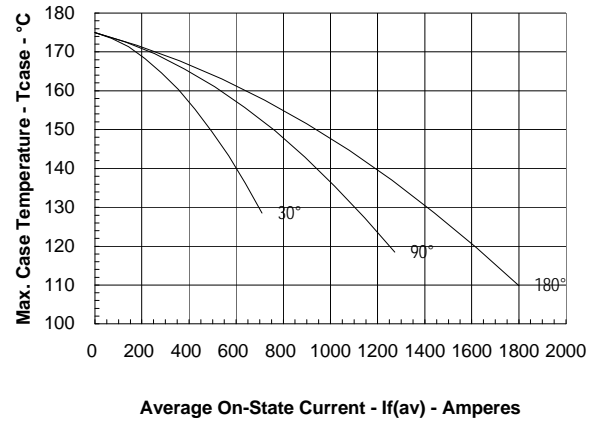
**Maximum On-State Power Dissipation**

(Sinusoidal Waveform)



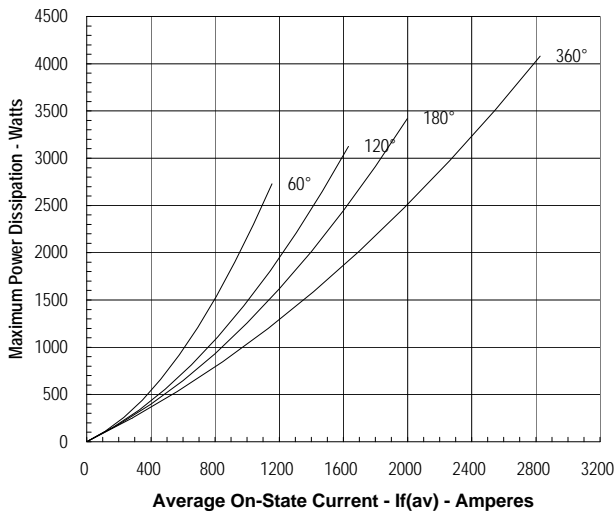
**Maximum Allowable Case Temperature**

(Sinusoidal Waveform)



**Maximum On-State Power Dissipation**

(Rectangular Waveform)



**Maximum Allowable Case Temperature**

(Rectangular Waveform)

