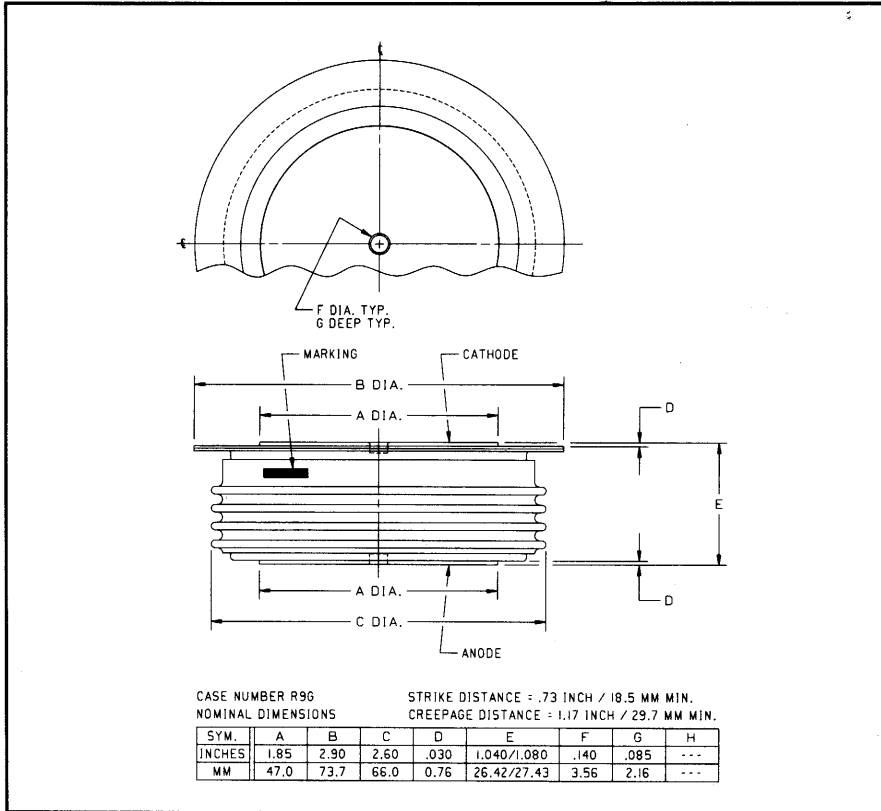
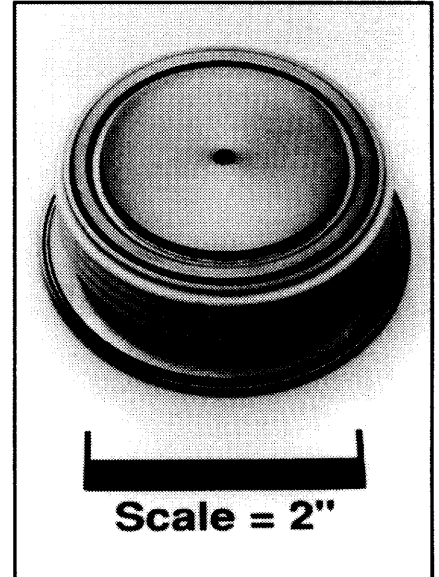


Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

### General Purpose Rectifier 1200 Amperes Average 5400 Volts



R9G0 1200A (Outline Drawing)



R9G0 1200A General Purpose Rectifier  
 1200 Amperes Average, 5400 Volts

#### Description:

Powerex General Purpose Rectifiers are designed for high blocking voltage capability with low forward voltage to minimize conduction losses. These 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 8 digit part number you desire from the table below.

| Type | Voltage                   | Current          | Typical Recovery Time    |
|------|---------------------------|------------------|--------------------------|
|      | $V_{RRM}$<br>(Volts)      | $I_T(av)$<br>(A) | $t_{rr}$<br>( $\mu$ sec) |
| R9G0 | 10<br>through<br>54       | 12               | XX                       |
|      | 1000V<br>through<br>5400V | 1200A            | 25<br>$\mu$ sec          |



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**R9G0 1200A**  
**General Purpose Rectifier**  
1200 Amperes Average, 5400 Volts

### Absolute Maximum Ratings

| Characteristics  | Symbol       | R9G0 1200A       | Units    |
|--|--------------|------------------|----------|
| Non-repetitive Transient Peak Reverse Voltage              | $V_{RSM}$    | $V_{RRM} + 200V$ | Volts    |
| RMS Forward Current, $T_C = 102^\circ C$                   | $I_{F(rms)}$ | 1880             | Amperes  |
| Average Current 180° Sine Wave, $T_C = 102^\circ C$        | $I_{F(av)}$  | 1200             | Amperes  |
| RMS Forward Current, $T_C = 55^\circ C$                    | $I_{F(rms)}$ | 2640             | Amperes  |
| Average Current 180° Sine Wave, $T_C = 55^\circ C$         | $I_{F(av)}$  | 1680             | Amperes  |
| Peak One Cycle Surge Forward Current (Non-repetitive) 60Hz | $I_{fsm}$    | 16000            | Amperes  |
| Peak One Cycle Surge Forward Current (Non-repetitive) 50Hz | $I_{fsm}$    | 14600            | Amperes  |
| 3 Cycle Surge Current                                      | $I_{fsm}$    | 12000            | Amperes  |
| 10 Cycle Surge Current                                     | $I_{fsm}$    | 10000            | Amperes  |
| $I^2t$ (for Fusing) for One Cycle, 60Hz                    | $I^2t$       | 1,100,000        | $A^2sec$ |
| Maximum $I^2t$ of Package ( $t = 8.3$ msec)                | $I^2t$       | $90 \times 10^6$ | $A^2sec$ |
| Operating Temperature                                      | $T_j$        | -40 to +190°C    | °C       |
| Storage Temperature  | $T_{stg}$    | -40 to +190°C    | °C       |
| Approximate Weight   |              | 1                | lb.      |
|  |              | 454              | g        |
| Mounting Force   |              | 5000 to 6000     | lb.      |
|  |              | 2270 to 2700     | kg.      |

**R9G0 1200A**

**General Purpose Rectifier**  
 1200 Amperes Average, 5400 Volts

**Electrical Characteristics,  $T_j = 25^\circ\text{C}$  Unless Otherwise Specified**

| Characteristics                   | Symbol      | Test Conditions   | Min. | Typ. | Max.    | Units  |
|-----------------------------------|-------------|---|------|------|---------|--|
| Peak Reverse Leakage Current      | $I_{RRM}$   | $T_j = 125^\circ\text{C}$ , $V_R = V_{RRM}$   |      |      | 150     | mA   |
| Forward Voltage Drop              | $V_{FM}$    | $I_{FM} = 1500\text{A}$ , Duty Cycle < 0.1%   |      |      | 1.45    | Volts  |
| Threshold Voltage, Low-level      | $V_{(TO)1}$ | $T_j = 190^\circ\text{C}$ , $I = 15\%$ , $I_{T(av)}$ to $\pi I_{T(av)}$   |      |      | 1.07197 | Volts  |
| Slope Resistance, Low-level       | $r_{T1}$    |   |      |      | 0.32357 | m $\Omega$   |
| Threshold Voltage, High-level     | $V_{(TO)2}$ | $T_j = 190^\circ\text{C}$ , $I = \pi I_{T(av)}$ to $I_{TSM}$  |      |      | 1.32168 | Volts  |
| Slope Resistance, High-level      | $r_{T2}$    |   |      |      | 0.28547 | m $\Omega$   |
| $V_{TM}$ Coefficients, Low-level  |             | $T_j = 190^\circ\text{C}$ , $I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$   |      |      |         | $A_1 = 1.35256$<br>$B_1 = -0.07539$<br>$C_1 = 2.5757\text{E-}04$<br>$D_1 = 9.591\text{E-}03$ |
| $V_{TM}$ Coefficients, High-level |             | $T_j = 190^\circ\text{C}$ , $I = \pi I_{T(av)}$ to $I_{TSM}$  |      |      |         | $A_2 = -4.04314$<br>$B_2 = 0.74639$<br>$C_2 = 2.726\text{E-}04$<br>$D_2 = -0.01249$          |
| Typical Reverse Recovery Time     | $t_{rr}$    | $T_C = 25^\circ\text{C}$ , $I_{FM} = 1500\text{A}$ ,<br>$di_F/dt = 25\text{A}/\mu\text{sec}$ , $t_p = 190\mu\text{sec}$ |      | 25   |         | $\mu\text{sec}$  |

**Thermal Characteristics**

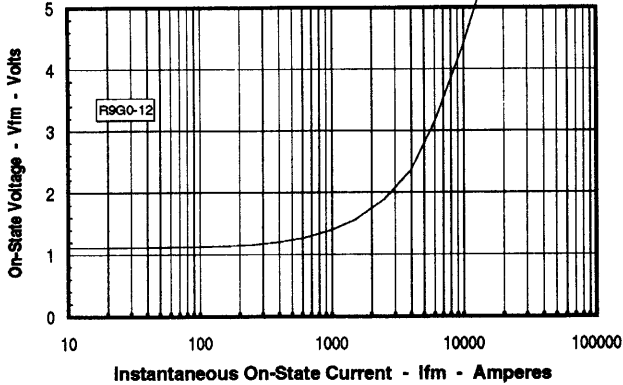
|  |                   |  |  |  |        |                           |
|--|-------------------|--|--|--|--------|---------------------------|
| Maximum Thermal Resistance, Double Sided Cooling |                   |  |  |  |        |                           |
| Junction-to-Case                                 | $R_{\theta(j-c)}$ |  |  |  | 0.020  | $^\circ\text{C}/\text{W}$ |
| Case-to-Sink                                     | $R_{\theta(c-s)}$ |  |  |  | 0.0075 | $^\circ\text{C}/\text{W}$ |



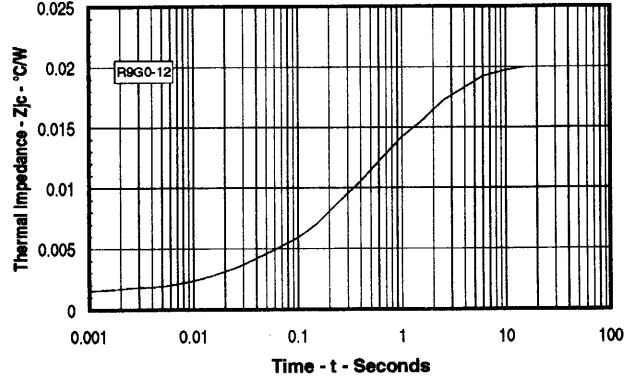
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**R9G0 1200A**  
 General Purpose Rectifier  
 1200 Amperes Average, 5400 Volts

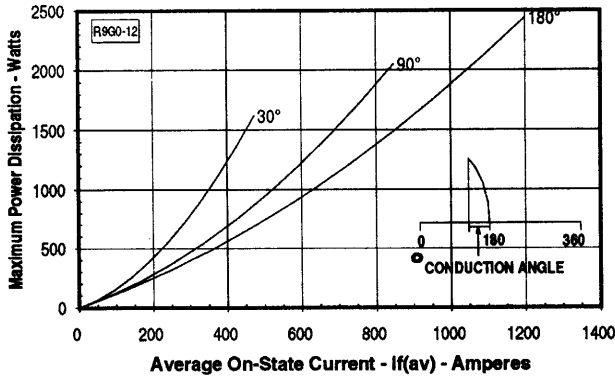
**Maximum On-State Forward Voltage Drop**  
 ( $T_J = 150^\circ\text{C}$ )



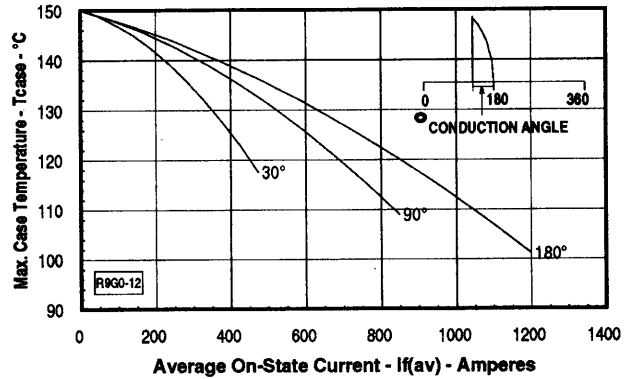
**Maximum Transient Thermal Impedance**  
 (Junction to Case)



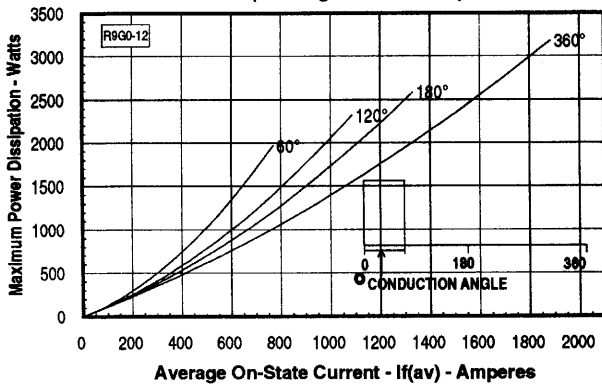
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



**Maximum Allowable Case Temperature**  
 (Sinusoidal Waveform)



**Maximum On-State Power Dissipation**  
 (Rectangular Waveform)



**Maximum Allowable Case Temperature**  
 (Rectangular Waveform)

