

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..

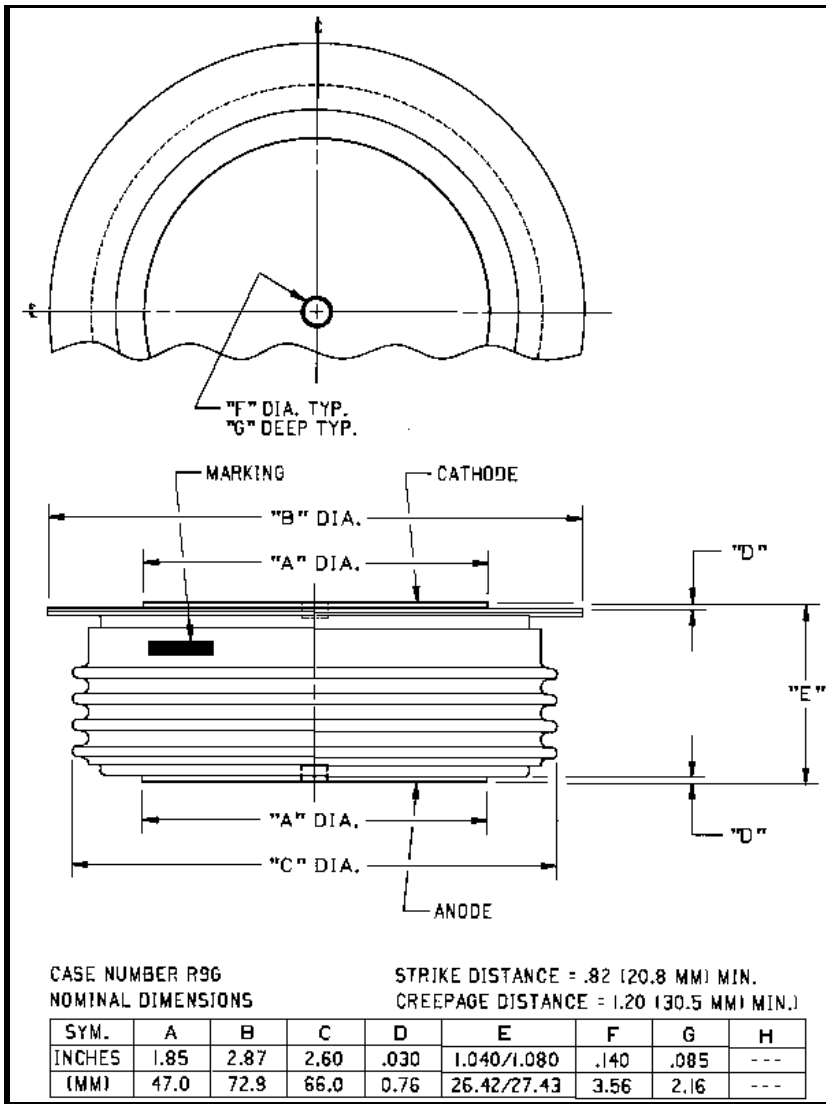


### Features:

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

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

**R9G0**
**Rectifier Diode**

1800 Amperes / Up to 3200 Volts

**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, $T_C=110^{\circ}C$	$I_{F(AV)}$	1800	A
Peak Half Cycle Non-Repetitive Surge Current	$t = 8.3mS$ , 100% $V_{RRM}$ reapplied	$I_{FSM}$	21,500	A
Peak Half Cycle Non-Repetitive Surge Current	$t = 10mS$ , 100% $V_{RRM}$ reapplied	$I_{FSM}$	19,600	A
$I^2t$ for Fusing for One Cycle		$I^2t$	$1.925 \times 10^6$	$A^2\text{-sec}$
$I^2t$ of Package	$t = 8.3mS$	$I^2t$	$90 \times 10^6$	$A^2\text{-sec}$
Operating Junction Temperature		$T_J$	-40 to +175	$^{\circ}C$
Storage Temperature		$T_{stg}$	-40 to +190	$^{\circ}C$
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,  $T_J=25^\circ\text{C}$  unless otherwise specified**

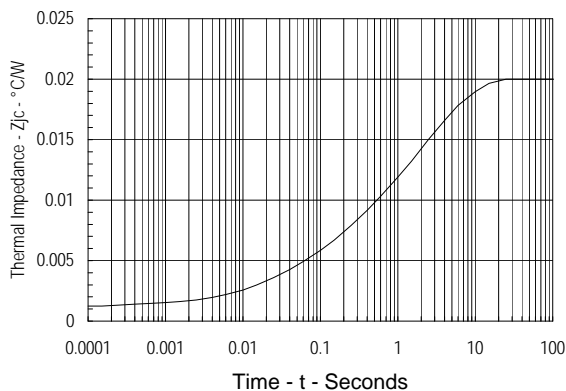
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max	Units
Peak Reverse Leakage Current	$I_{RRM}$	$T_J=175^\circ\text{C}$ , Rated $V_{RRM}$			150	mA
Peak On-State Voltage	$V_{FM}$	$T_J=25^\circ\text{C}$ , $I_{FM}=1500\text{A}$			1.20	V
Threshold Voltage, Low-level	$V_{(TO)1}$	$T_J = 175^\circ\text{C}$ , $I = 15\%I_{F(AV)}$ to $\rho I_{F(AV)}$			.814	V
Slope Resistance, Low-level	$r_{T1}$				.224	m $\Omega$
Threshold Voltage, High-level	$V_{(TO)2}$	$T_J = 175^\circ\text{C}$ , $I = \rho I_{F(AV)}$ to $I_{FSM}$			1.03	V
Slope Resistance, High-level	$r_{T2}$				.198	m $\Omega$
$V_{FM}$ Coefficients, Full Range		$T_J = 175^\circ\text{C}$ , $I = 15\%I_{F(AV)}$ to $I_{FSM}$		A = 2.06 B = -0.232 C = 0.000130 D = 0.0179		
		$V_{FM}=A + B \ln(I_{FM}) + C I_{FM} + D \sqrt{I_{FM}}$				
Maximum Reverse Recovery Current	$I_{R(Rec)}$	$T_J = 175^\circ\text{C}$ , $di/dt = -1 \text{ A}/\mu\text{s}$ $T_J = 175^\circ\text{C}$ , $di/dt = -10\text{A}/\mu\text{s}$			70 250	A A
Typical Reverse Recovery Time	$t_{rr}$	$T_C = 25^\circ\text{C}$ , $I_{FM} = 1500 \text{ A}$ $di_R/dt = 25 \text{ A}/\mu\text{sec}$ , $t_p = 190 \mu\text{sec}$			25	$\mu\text{sec}$

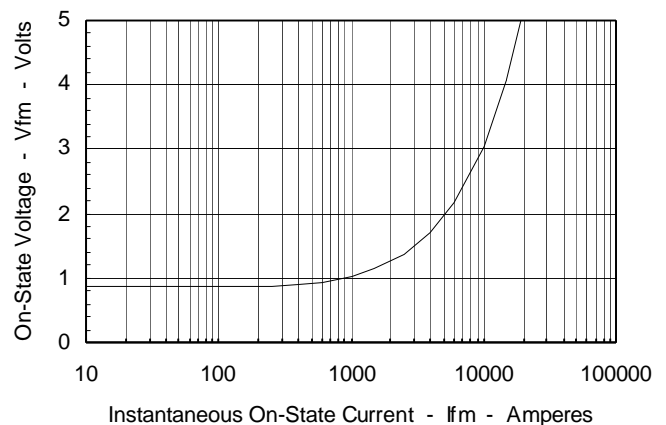
**Thermal Characteristics**

Characteristics	Symbol	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{TJC}$	-----	-----	0.02	$^\circ\text{C}/\text{W}$
Thermal Resistance, Case to Sink Lubricated	$R_{TCS}$	-----	-----	0.0075	$^\circ\text{C}/\text{W}$

**Maximum Transient Thermal Impedance**

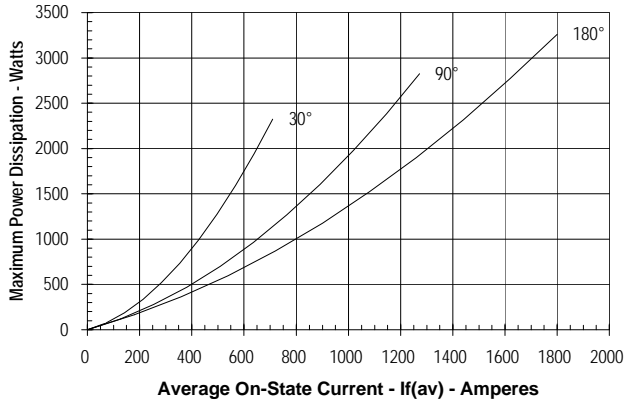
(Junction to Case)


**Maximum On-State Forward Voltage Drop**

 ( $T_J = 175^\circ\text{C}$ )


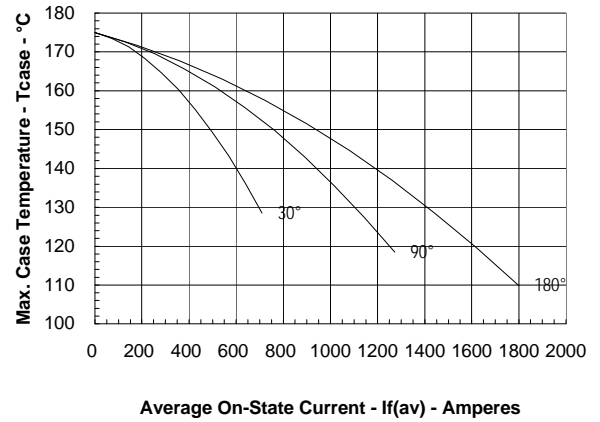
### Maximum On-State Power Dissipation

(Sinusoidal Waveform)



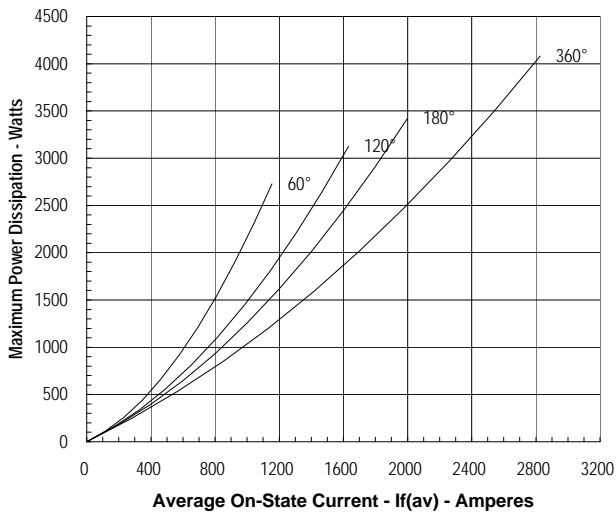
### Maximum Allowable Case Temperature

(Sinusoidal Waveform)



### Maximum On-State Power Dissipation

(Rectangular Waveform)



### Maximum Allowable Case Temperature

(Rectangular Waveform)

