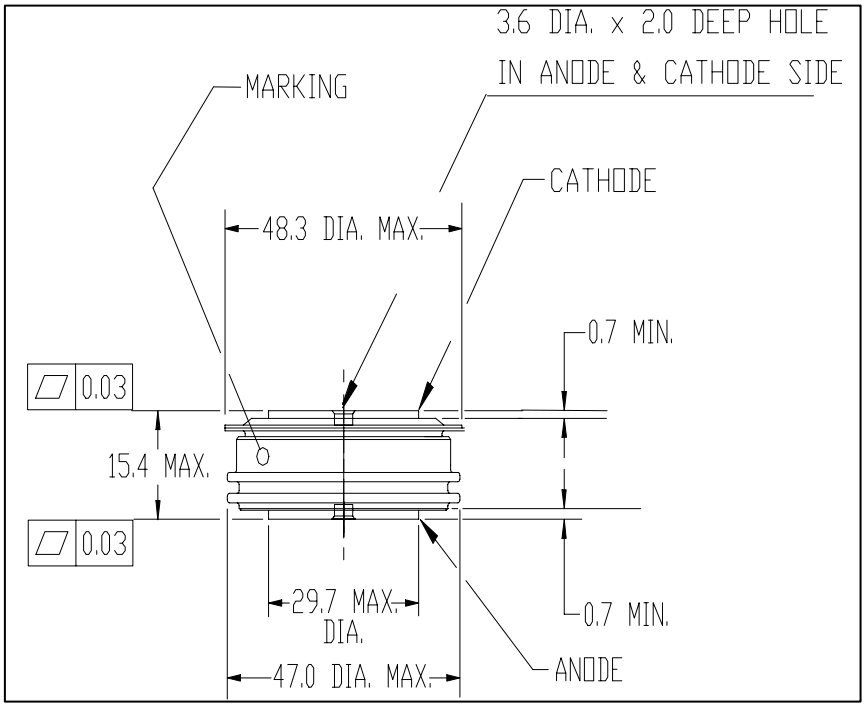
# R7S0___

## GENERAL PURPOSE RECTIFIER DIODE

*Powerex, Inc., 173 Pavilion Ln, Youngwood, Pa 15697-1800 (724)925-7272 WWW.PWRX.COM*

**1550 Amperes 2400 Volts**





Powerex General Purpose Rectifier Diodes are designed with high locking 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

ORDERING INFORMATION

Select the complete 12 digit Part Number using the table below.
EXAMPLE: R7S02215XXOO is a 2200V-1550A General Purpose Diode with a typical reverse recovery time of 25µs.

| PART | Voltage Rating | Voltage Code | Current Rating | Current Code | Reverse Recovery | Lead Code |
|---|---|---|---|---|---|---|
| | $V_{DRM}$-$V_{RRM}$ | | $I_{tavg}$ | | $t_{RR}$ | |
| **R7S0** | 2400 | **24** | 1550 | **15** | **XX** | **OO** |
| | 2200 | **22** | | | | |
| | 2000 | **20** | | | 25µs typical | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Revised: 4/6/2006

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## Absolute Maximum Ratings

| Characteristic | Symbol | Rating | Units |
|---|---|---|---|
| Repetitive Peak Reverse Voltage | $V_{RRM}$ | 2400 | Volts |
| Average On-State Current, $T_C$= 90 °C | $I_{F(Avg.)}$ | 1550 | A |
| RMS On-State Current, $T_C$= 90 °C | $I_{F(RMS)}$ | 2435 | A |
| Average On-State Current, $T_C$= 55 °C | $I_{F(Avg.)}$ | 1830 | A |
| RMS On-State Current, $T_C$= 55 °C | $I_{F(RMS)}$ | 2875 | A |
| Peak 1 Cycle Surge Current†, 60Hz, $V_R$=0.6*$V_{RRM}$ | $I_{FSM}$ | 8,162 | A |
| Fuse Coordination $I^2t$, 60Hz | $I^2t$ | 2.78E+05 | $A^2s$ |
| Peak 1 Cycle Surge Current†, 60Hz, $V_R$=0V | $I_{FSM}$ | 10,600 | A |
| Fuse Coordination $I^2t$, 50Hz | $I^2t$ | 4.68E+05 | $A^2s$ |
| Peak 3 Cycle Surge Current, 60Hz, $V_R$=0V | $I_{FSM}$ | 8,056 | A |
| Peak 10 Cycle Surge Current, 60Hz, $V_R$=0V | $I_{FSM}$ | 5,936 | A |
| Operating Temperature | Tj | -40 to+200 | °C |
| Storage Temperature | $T_{Stg.}$ | -50 to+200 | °C |
| Approximate Weight | | 0.25 | lb |
| | | 0.11 | Kg |
| Mounting Force | | 2000-2400 | lbs |
| | | 8.9 - 10.6 | Knewtons |

† Per NEMA Std. RS-282

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## Electrical Characteristics, Tj=25°C unless otherwise specified

| Characteristic | Symbol | Test Conditions | Rating min | Rating typ | Rating max | Units |
|---|---|---|---|---|---|---|
| Repetitive Peak Reverse Leakage Current | $I_{RRM}$ | Tj=200°C, $V_{RRM}$=Rated | | | 150 | ma |
| Peak On-State Voltage | $V_{FM}$ | Tj=25°C, $I_{FM}$=1500A | | | 1.35 | V |
| $V_{FM}$ Model, Low Level | $V_0$ | Tj=200°C | | | 0.754 | V |
| VFM = $V_O$ + r•$I_{FM}$ | r | 15% $I_{FM}$ - π•$I_{FM}$ | | | 0.336 | mΩ |
| $V_{FM}$ Model, High Level | $V_0$ | Tj=200°C | | | 0.946 | V |
| VFM = $V_O$ + r•$I_{FM}$ | r | π•$I_{FM}$ - $I_{FSM}$ | | | 0.292 | mΩ |
| $V_{FM}$ Model, 4-Term | A | Tj=200°C | | | 0.449 | |
| $V_{FM}$= A + B•Ln($I_{FM}$) + | B | 15%$I_{FM}$ - $I_{FSM}$ | | | 0.0256 | |
| C•($I_{FM}$) + D•($I_{FM}$)$^{½}$ | C | | | | 2.454E-04 | |
| | D | | | | 0.00726 | |
| Reverse Recovery Time | $t_{RR}$ | Tj=25°C, $I_{FM}$=1500A<br>$di_R/dt$ = 25 A/µs | | 25 | | µs |

## Thermal Characteristics

| Characteristic | Symbol | Test Conditions | Rating min | Rating typ | Rating max | Units |
|---|---|---|---|---|---|---|
| Thermal Resistance | | | | | | |
| Junction to Case | $R\Theta_{jc}$ | Double side cooled | | 0.03 | 0.035 | °C/Watt |
| Case to Sink | $R\Theta_{cs}$ | Double side cooled | | 0.018 | 0.02 | °C/Watt |
| Thermal Impedance Model | $Z\Theta_{jc}$ | Double side cooled | | | | |

$Z\Theta_{jc}(t) = \Sigma(A(N)\bullet(1-\exp(-t/Tau(N))))$ where:

| N = | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| A(N) = | 2.54E-03 | 6.39E-03 | 1.82E-02 | 7.91E-03 |
| Tau(N) = | 7.99E-04 | 5.29E-02 | 3.30E-01 | 2.39E+00 |

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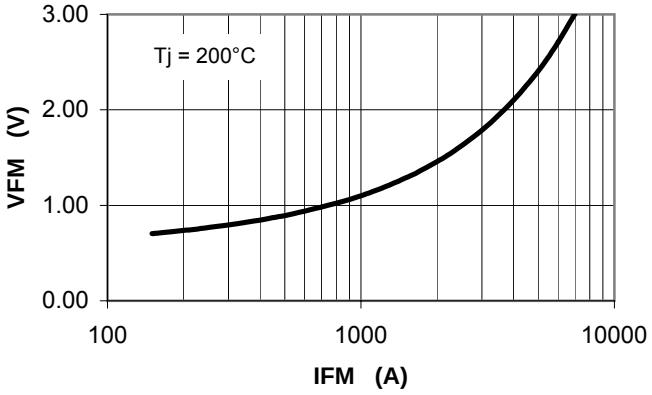
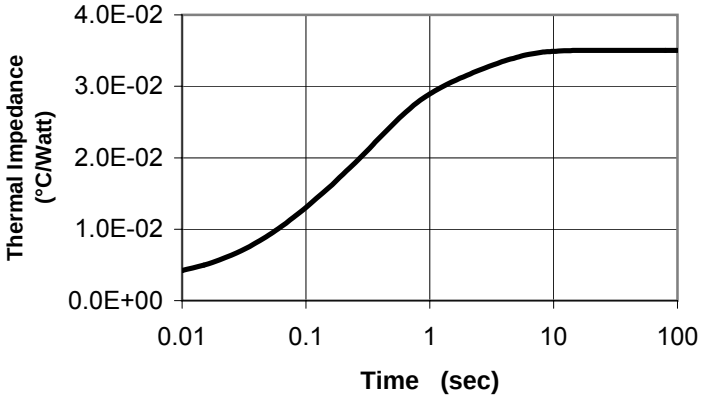
### Maximum On-State Voltage Drop

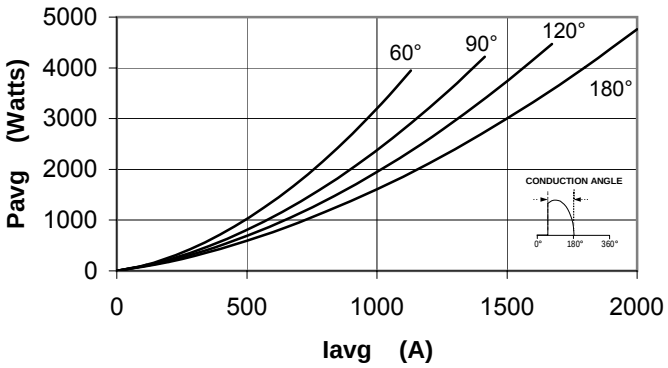



### MAXIMUM TRANSIENT THERMAL IMPEDANCE



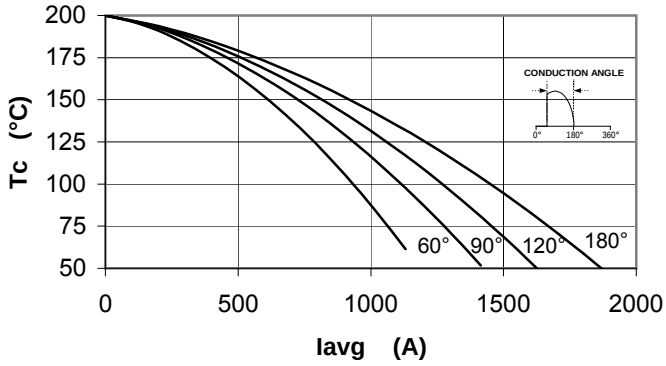

### Maximum On-State Power Dissipation

Sinusoidal



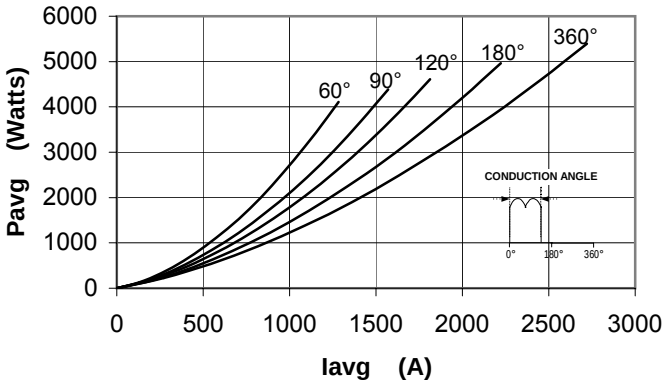

### Maximum Allowable Case Temperature

Sinusoidal Waveform




### Maximum On-State Power Dissipation

Square Waveform




### Maximum Allowable Case Temperature

Square Waveform