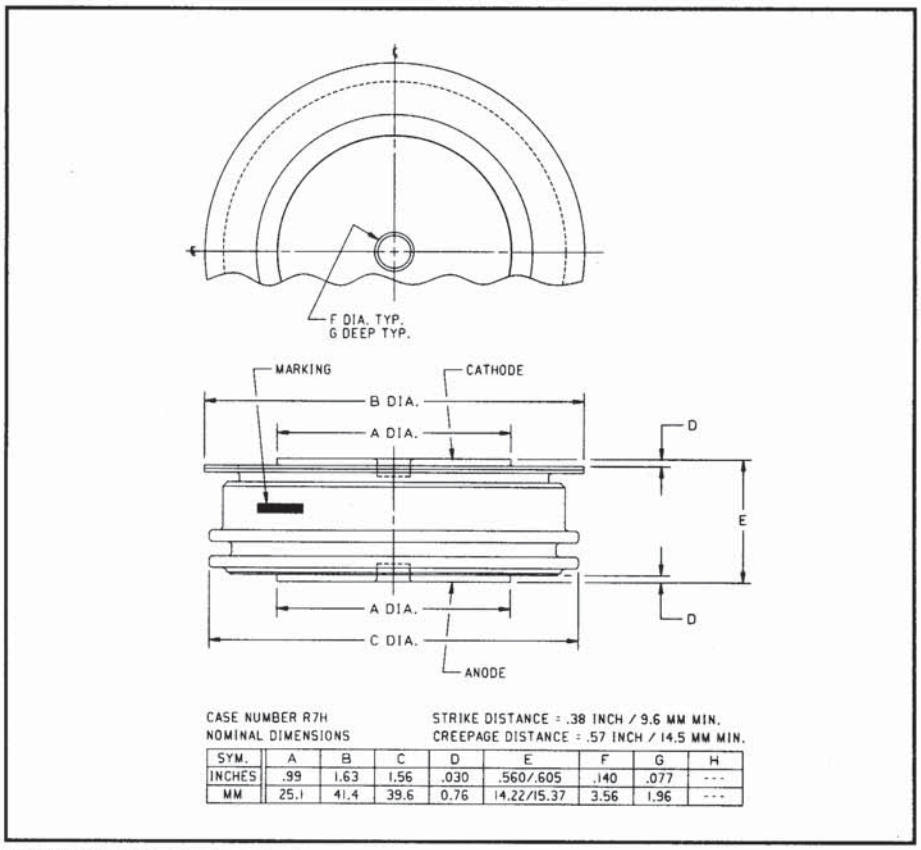
# R7S0
# 1600A

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

## *General Purpose Rectifier*
***1600 Amperes Average***
***1800 Volts***

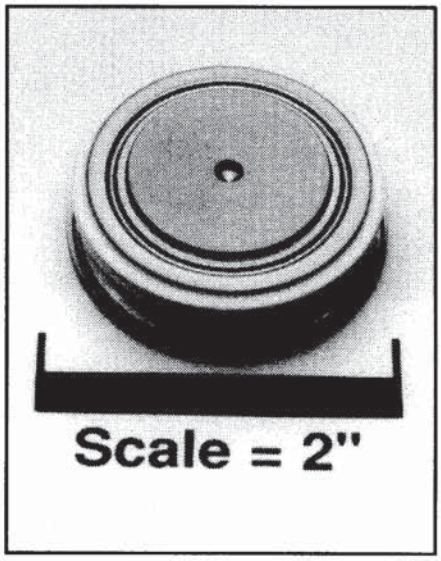



CASE NUMBER R7H
NOMINAL DIMENSIONS

STRIKE DISTANCE = .38 INCH / 9.6 MM MIN.
CREEPAGE DISTANCE = .57 INCH / 14.5 MM MIN.

| SYM. | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| INCHES | .99 | 1.63 | 1.56 | .030 | .560/.605 | .140 | .077 | --- |
| MM | 25.1 | 41.4 | 39.6 | 0.76 | 14.22/15.37 | 3.56 | 1.96 | --- |

**R7S0 1600A** (Outline Drawing)

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1600 Amperes Average, 1800 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
- ☐ Low Profile Package
- ☐ 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 $V_{RRM}$ (Volts) | Current $I_{T(av)}$ (A) | Typical Recovery Time $t_{rr}$ (µsec) |
|---|---|---|---|
| R7S0 | 02 through 18 | 16 | XX |
| | 200V through 1800V | 1600A | 7µsec |

Revision Date: 01/04/2013

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## Absolute Maximum Ratings

| Characteristics | Symbol | R7S0 1600A | Units |
|---|---|---|---|
| Non-repetitive Transient Peak Reverse Voltage | $V_{RSM}$ | $V_{RRM}$ + 100V | Volts |
| RMS Forward Current, $T_C$ = 98°C | $I_{F(rms)}$ | 2500 | Amperes |
| Average Current 180° Sine Wave, $T_C$ = 98°C | $I_{F(av)}$ | 1600 | Amperes |
| RMS Forward Current, $T_C$ = 55°C | $I_{F(rms)}$ | 3170 | Amperes |
| Average Current 180° Sine Wave, $T_C$ = 55°C | $I_{F(av)}$ | 2020 | Amperes |
| Peak One Cycle Surge Forward Current (Non-repetitive) 60Hz | $I_{fsm}$ | 14000 | Amperes |
| Peak One Cycle Surge Forward Current (Non-repetitive) 50Hz | $I_{fsm}$ | 12800 | Amperes |
| 3 Cycle Surge Current | $I_{fsm}$ | 10000 | Amperes |
| 10 Cycle Surge Current | $I_{fsm}$ | 8640 | Amperes |
| $I^2t$ (for Fusing) for One Cycle, 60Hz | $I^2t$ | 816,700 | $A^2sec$ |
| Maximum $I^2t$ of Package (t = 8.3 msec) | $I^2t$ | 80 x $10^6$ | $A^2sec$ |
| Operating Temperature | $T_j$ | -65 to +200°C | °C |
| Storage Temperature | $T_{stg}$ | -65 to +200°C | °C |
| Approximate Weight | | 4 | oz. |
| | | 113 | g |
| Mounting Force | | 2000 to 2400 | lb. |
| | | 900 to 1090 | kg. |

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## Electrical Characteristics, $T_j$ = 25°C Unless Otherwise Specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Peak Reverse Leakage Current | $I_{RRM}$ | $T_j$ = 125°C, $V_R = V_{RRM}$ | | | 50 | mA |
| Forward Voltage Drop | $V_{FM}$ | $I_{FM}$ = 1500A, Duty Cycle < 0.1% | | | 1.20 | Volts |
| Threshold Voltage, Low-level | $V_{(TO)1}$ | $T_j$ = 200°C, I = 15%, $I_{T(av)}$ to $\pi I_{T(av)}$ | | | 0.62955 | Volts |
| Slope Resistance, Low-level | $r_{T1}$ | | | | 0.2929 | mΩ |
| Threshold Voltage, High-level | $V_{(TO)2}$ | $T_j$ = 200°C, I = $\pi I_{T(av)}$ to $I_{TSM}$ | | | 0.32969 | Volts |
| Slope Resistance, High-level | $r_{T2}$ | | | | 0.3533 | mΩ |
| $V_{TM}$ Coefficients, Low-level | | $T_j$ = 200°C, I = 15% $I_{T(av)}$ to $\pi I_{T(av)}$ | | | | |
| | | | | | $A_1$ = 1.5051 | |
| | | | | | $B_1$ = -0.2286 | |
| | | | | | $C_1$ = 1.138E-04 | |
| | | | | | $D_1$ = 0.02747 | |
| $V_{TM}$ Coefficients, High-level | | $T_j$ = 200°C, I = $\pi I_{T(av)}$ to $I_{TSM}$ | | | | |
| | | | | | $A_2$ = 15.405 | |
| | | | | | $B_2$ = -2.4898 | |
| | | | | | $C_2$ = 8.376E-05 | |
| | | | | | $D_2$ = 0.10548 | |
| Typical Reverse Recovery Time | $t_{rr}$ | $T_C$ = 25°C, $I_{FM}$ = 1500A, $di_R/dt$ = 25A/µsec, $t_p$ = 190µsec | | 7 | | µsec |

### Thermal Characteristics

| | | | | | | |
|---|---|---|---|---|---|---|
| Maximum Thermal Resistance, Double Sided Cooling | | | | | | |
| Junction-to-Case | $R_{\theta(j-c)}$ | | | | 0.035 | °C/W |
| Case-to-Sink | $R_{\theta(c-s)}$ | | | | 0.02 | °C/W |

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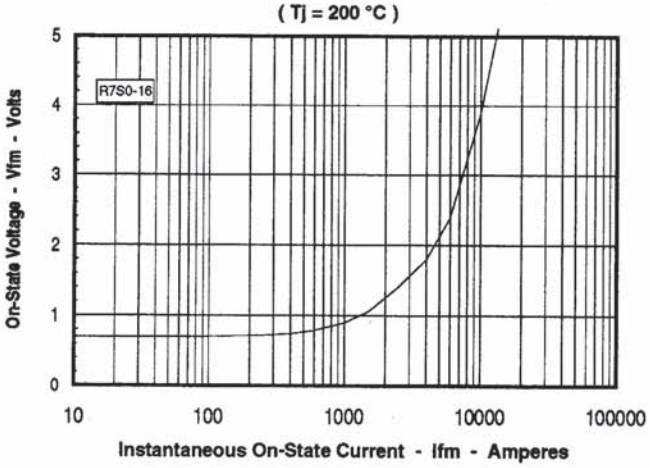
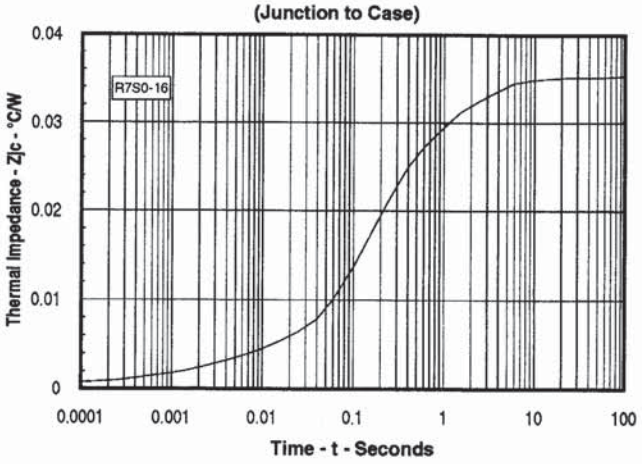
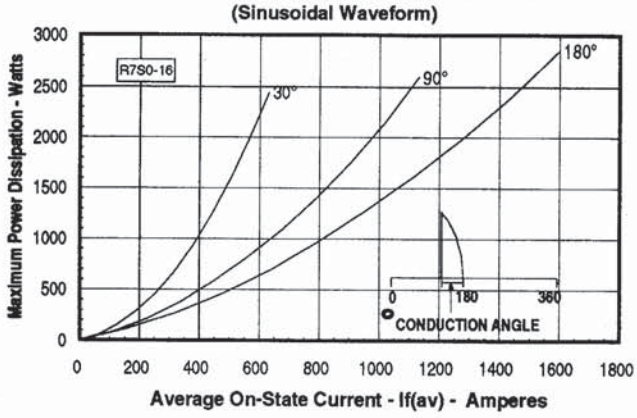
**Maximum On-State Forward Voltage Drop**
**( Tj = 200 °C )**



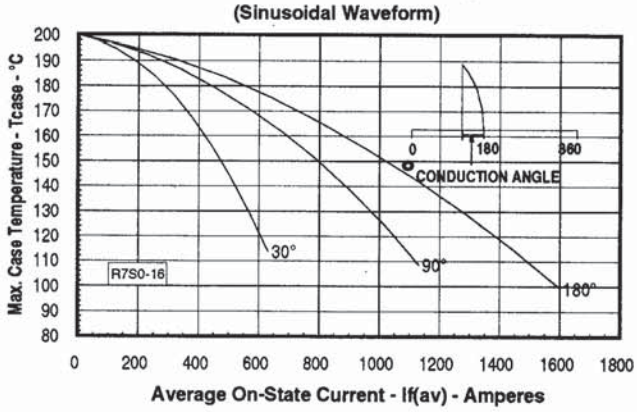

**Maximum Transient Thermal Impedance**
**(Junction to Case)**



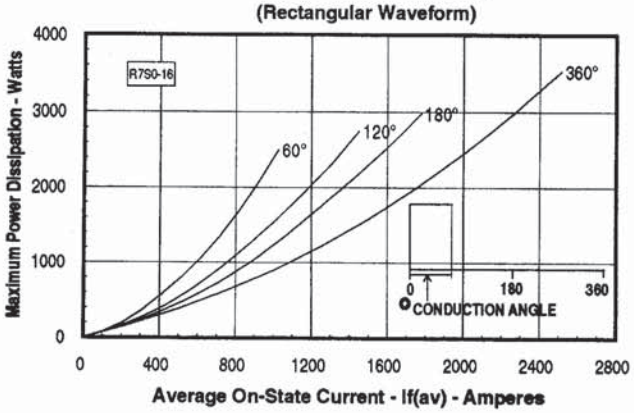

**Maximum On-State Power Dissipation**
**(Sinusoidal Waveform)**



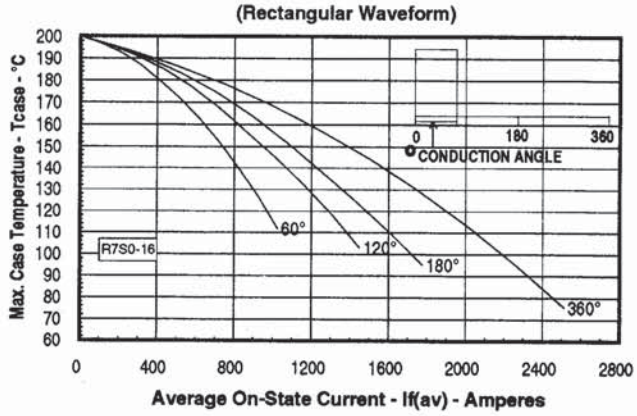

**Maximum Allowable Case Temperature**
**(Sinusoidal Waveform)**




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




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

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