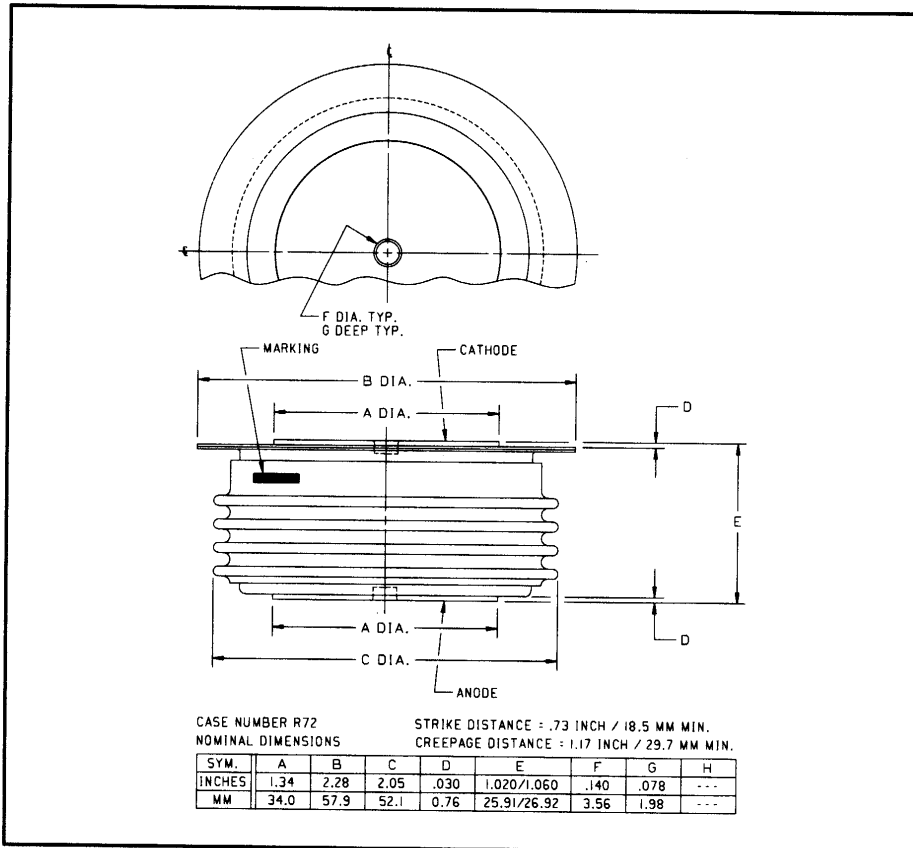


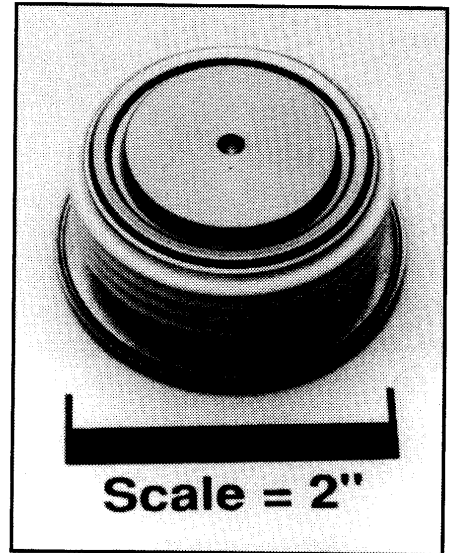
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

### General Purpose Rectifier

1000 Amperes Average  
 1500 Volts



A430 (Outline Drawing)



A430 General Purpose Rectifier  
 1000 Amperes Average, 1500 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 Diodes
- Battery Chargers
- Resistance Welding

#### Ordering Information:

Select the complete five or six digit part number you desire from the table, i.e. A430PE is a 1500 Volt, 1000 Ampere General Purpose Rectifier.

| Type | Voltage   |      | Current<br>$I_{T(av)}$ |
|------|-----------|------|------------------------|
|      | $V_{RRM}$ | Code |                        |
| A430 | 600       | M    | 1000                   |
|      | 800       | N    |                        |
|      | 1000      | P    |                        |
|      | 1200      | PB   |                        |
|      | 1400      | PD   |                        |
|      | 1500      | PE   |                        |



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**A430**  
**General Purpose Rectifier**  
 1000 Amperes Average, 1500 Volts

### Absolute Maximum Ratings

| Characteristics  | Symbol       | A430             | Units    |
|--|--------------|------------------|----------|
| Non-repetitive Transient Peak Reverse Voltage              | $V_{RSM}$    | $V_{RRM} + 100V$ | Volts    |
| RMS Forward Current, $T_C = 124^\circ C$                   | $I_{F(rms)}$ | 1570             | Amperes  |
| Average Current 180° Sine Wave, $T_C = 124^\circ C$        | $I_{F(av)}$  | 1000             | Amperes  |
| RMS Forward Current, $T_C = 55^\circ C$                    | $I_{F(rms)}$ | 2160             | Amperes  |
| Average Current 180° Sine Wave, $T_C = 55^\circ C$         | $I_{F(av)}$  | 1375             | Amperes  |
| Peak One Cycle Surge Forward Current (Non-repetitive) 60Hz | $I_{fsm}$    | 10000            | Amperes  |
| Peak One Cycle Surge Forward Current (Non-repetitive) 50Hz | $I_{fsm}$    | 9125             | Amperes  |
| $I^2t$ (for Fusing) for One Cycle, 60Hz                    | $I^2t$       | 415,000          | $A^2sec$ |
| $I^2t$ for $t_p \geq 1.5$ msec (Non-repetitive)            | $I^2t$       | 200,000          | $A^2sec$ |
| Operating Temperature                                      | $T_j$        | -40 to +200°C    | °C       |
| Storage Temperature  | $T_{stg}$    | -40 to +200°C    | °C       |
| Approximate Weight   |              | 8                | oz.      |
|  |              | 227              | g        |
| Mounting Force   |              | 1800 to 2200     | lb.      |
|  |              | 8 to 9.8         | kN       |



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**A430**  
**General Purpose Rectifier**  
 1000 Amperes Average, 1500 Volts

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

| Characteristics                         | Symbol      | Test Conditions  | Min. | Typ. | Max.                      | Units           |
|---|-------------|--|------|------|---------------------------|-----------------|
| Repetitive Peak Reverse Leakage Current | $I_{RRM}$   | $T_j = 200^\circ\text{C}, V_R = V_{RRM}$   |      |      | 50                        | mA              |
| Forward Voltage Drop                    | $V_{FM}$    | $T_C = 113^\circ\text{C}, I_{FM} = 3140\text{A Peak}$<br>Duty Cycle < 0.1%                                       |      |      | 1.42                      | Volts           |
| Threshold Voltage, Low-level            | $V_{(TO)1}$ | $T_j = 200^\circ\text{C}, I = 15\%, I_{T(av)}$ to $\pi I_{T(av)}$  |      |      | 0.62038                   | Volts           |
| Slope Resistance, Low-level             | $r_{T1}$    |  |      |      | 0.2540                    | m $\Omega$      |
| Threshold Voltage, High-level           | $V_{(TO)2}$ | $T_j = 200^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$  |      |      | 0.91468                   | Volts           |
| Slope Resistance, High-level            | $r_{T2}$    |  |      |      | 0.1641                    | m $\Omega$      |
| $V_{TM}$ Coefficients, Low-level        |             | $T_j = 200^\circ\text{C}, I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$   |      |      |                           |                 |
|   |             |  |      |      | $A_1 = 0.84432$           |                 |
|   |             |  |      |      | $B_1 = -0.11705$          |                 |
|   |             |  |      |      | $C_1 = -2.953\text{E-}05$ |                 |
|   |             |  |      |      | $D_1 = 0.02886$           |                 |
| $V_{TM}$ Coefficients, High-level       |             | $T_j = 200^\circ\text{C}, I = \pi I_{T(av)}$ to $I_{TSM}$  |      |      |                           |                 |
|   |             |  |      |      | $A_2 = 3.7691$            |                 |
|   |             |  |      |      | $B_2 = -0.57841$          |                 |
|   |             |  |      |      | $C_2 = -5.094\text{E-}06$ |                 |
|   |             |  |      |      | $D_2 = 0.04152$           |                 |
| Typical Reverse Recovery Time           | $t_{rr}$    | $T_C = 25^\circ\text{C}, I_{FM} = 1500\text{A},$<br>$di_F/dt = 25\text{A}/\mu\text{sec}, t_p = 190\mu\text{sec}$ |      | 10   |                           | $\mu\text{sec}$ |

**Thermal Characteristics**

Maximum Thermal Resistance, Double Sided Cooling

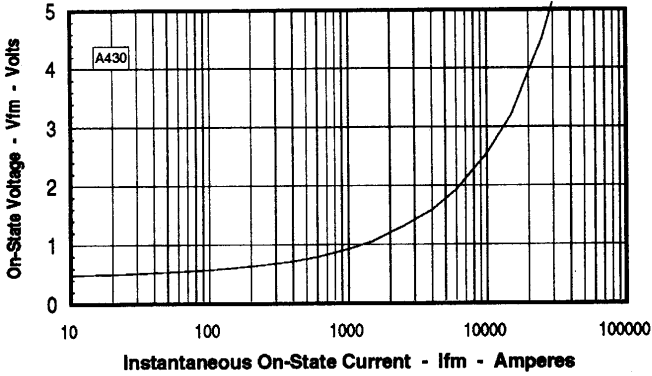
|                  |                   |      |                    |
|------------------|-------------------|------|--------------------|
| Junction-to-Case | $R_{\theta(j-c)}$ | 0.06 | $^\circ\text{C/W}$ |
| Case-to-Sink     | $R_{\theta(c-s)}$ | 0.02 | $^\circ\text{C/W}$ |



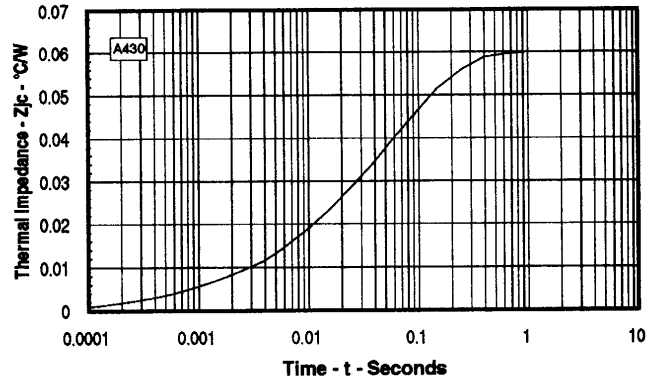
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**A430**  
**General Purpose Rectifier**  
 1000 Amperes Average, 1500 Volts

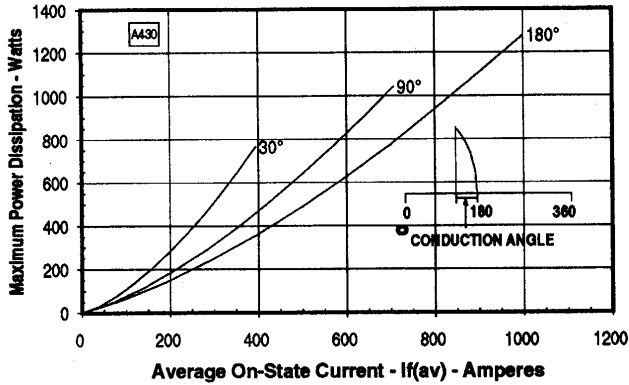
**Maximum On-State Forward Voltage Drop**  
 (T<sub>J</sub> = 200 °C)



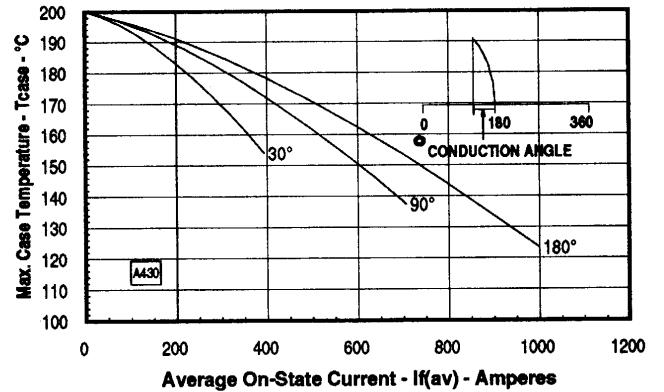
**Maximum Transient Thermal Impedance**  
 (Junction to Case)



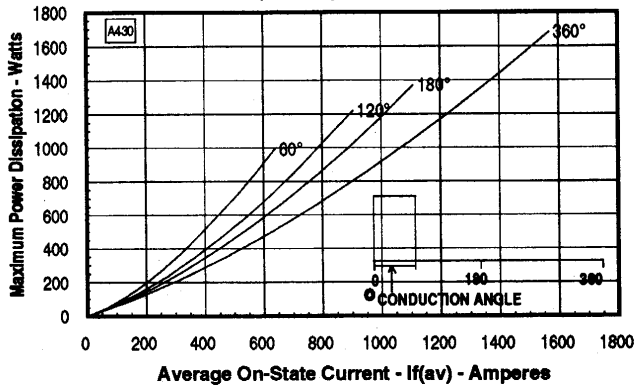
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



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



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



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

