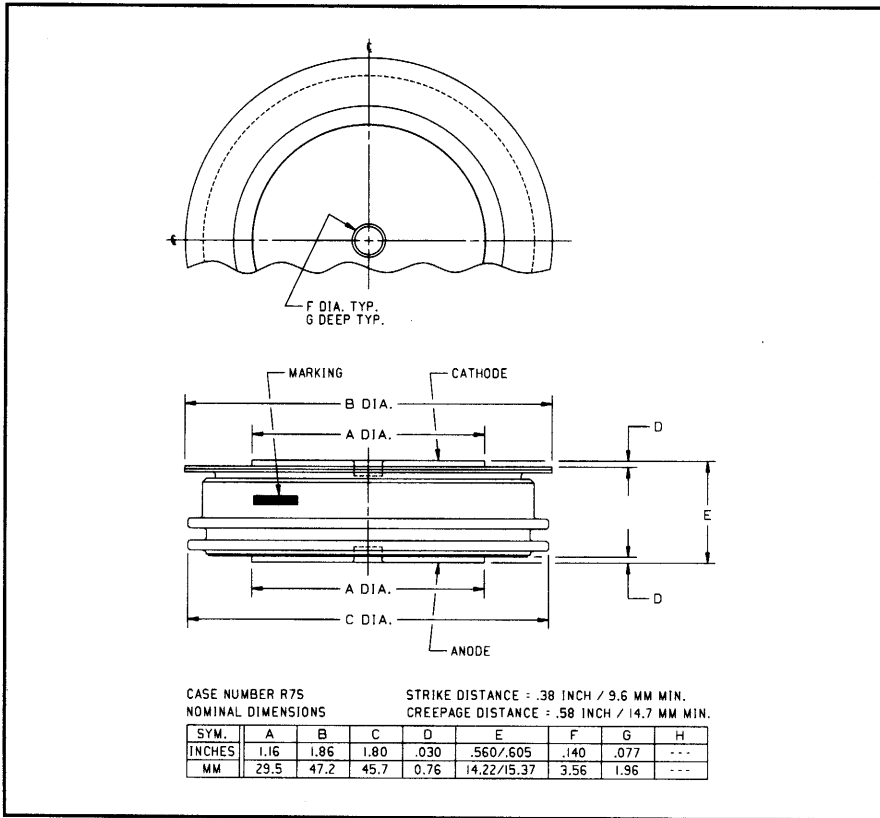


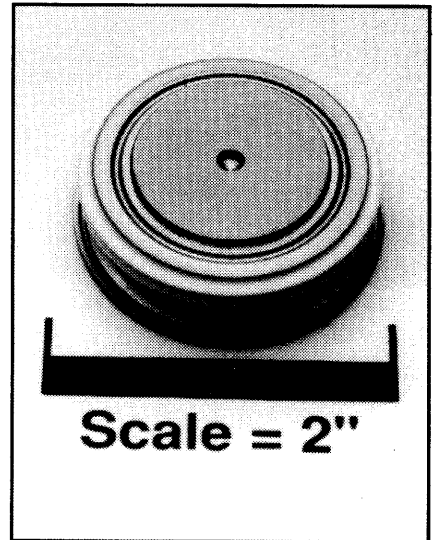
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

General Purpose Rectifier

1200 Amperes Average
2400 Volts



R7S0 1200A (Outline Drawing)



R7S0 1200A General Purpose Rectifier
1200 Amperes Average, 2400 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 | Current | Typical Recovery Time |
|------|---------------------|-----------------|-----------------------|
| | V_{RRM} (Volts) | $I_{T(av)}$ (A) | t_{rr} (μ sec) |
| R7S0 | 18 through 24 | 12 | XX |
| | 1800V through 2400V | 1200A | 10 μ sec |



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R7S0 1200A
General Purpose Rectifier
1200 Amperes Average, 2400 Volts

Absolute Maximum Ratings

| Characteristics | Symbol | R7S0 1200A | Units |
|--|--------------|------------------|----------|
| Non-repetitive Transient Peak Reverse Voltage | V_{RSM} | $V_{RRM} + 200V$ | Volts |
| RMS Forward Current, $T_C = 86^\circ C$ | $I_{F(rms)}$ | 1875 | Amperes |
| Average Current 180° Sine Wave, $T_C = 86^\circ C$ | $I_{F(av)}$ | 1200 | Amperes |
| RMS Forward Current, $T_C = 55^\circ C$ | $I_{F(rms)}$ | 2355 | Amperes |
| Average Current 180° Sine Wave, $T_C = 55^\circ C$ | $I_{F(av)}$ | 1500 | Amperes |
| Peak One Cycle Surge Forward Current (Non-repetitive) 60Hz | I_{fsm} | 9000 | Amperes |
| Peak One Cycle Surge Forward Current (Non-repetitive) 50Hz | I_{fsm} | 8200 | Amperes |
| 3 Cycle Surge Current | I_{fsm} | 6485 | Amperes |
| 10 Cycle Surge Current | I_{fsm} | 5600 | Amperes |
| I^2t (for Fusing) for One Cycle, 60Hz | I^2t | 337,500 | A^2sec |
| Maximum I^2t of Package ($t = 8.3$ msec) | I^2t | 80×10^6 | A^2sec |
| Operating Temperature | T_j | -65 to +175°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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R7S0 1200A
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 1200 Amperes Average, 2400 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} | $T_j = 125^\circ\text{C}, V_R = V_{RRM}$ | | | 50 | mA |
| Forward Voltage Drop | V_{FM} | $I_{FM} = 1500\text{A}, \text{Duty Cycle} < 0.1\%$ | | | 1.60 | Volts |
| Threshold Voltage, Low-level | $V_{(TO)1}$ | $T_j = 175^\circ\text{C}, I = 15\%, I_{T(av)}$ to $\pi I_{T(av)}$ | | | 0.38717 | Volts |
| Slope Resistance, Low-level | r_{T1} | | | | 0.4301 | m Ω |
| Threshold Voltage, High-level | $V_{(TO)2}$ | $T_j = 175^\circ\text{C}, I = \pi I_{T(av)}$ to I_{TSM} | | | 0.79286 | Volts |
| Slope Resistance, High-level | r_{T2} | | | | 0.41857 | m Ω |
| V_{TM} Coefficients, Low-level | | $T_j = 175^\circ\text{C}, I = 15\% I_{T(av)}$ to $\pi I_{T(av)}$ | | | | $A_1 = 2.3948$ $B_1 = -0.44937$ $C_1 = -6.159\text{E-}05$ $D_1 = 0.06475$ |
| V_{TM} Coefficients, High-level | | $T_j = 175^\circ\text{C}, I = \pi I_{T(av)}$ to I_{TSM} | | | | $A_2 = 7.6844$ $B_2 = -0.85143$ $C_2 = 5.913\text{E-}04$ $D_2 = -0.00755$ |
| Typical Reverse Recovery Time | t_{rr} | $T_C = 25^\circ\text{C}, I_{FM} = 1500\text{A},$ $di_R/dt = 25\text{A}/\mu\text{sec}, t_p = 190\mu\text{sec}$ | | 10 | | μsec |

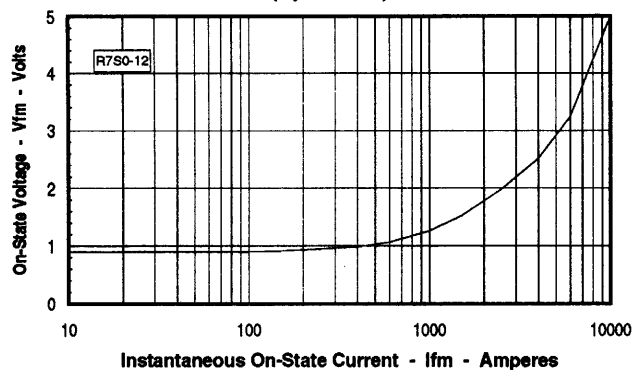
Thermal Characteristics

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

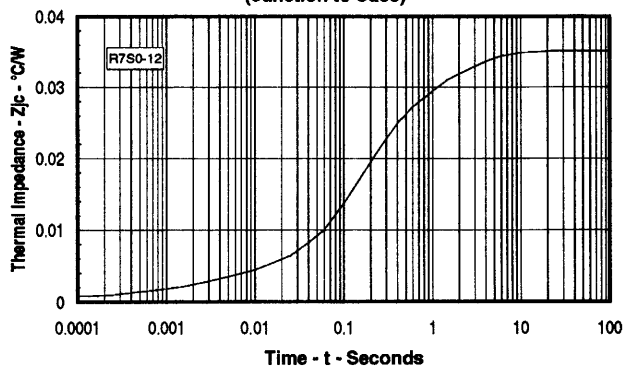
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R7S0 1200A
General Purpose Rectifier
 1200 Amperes Average, 2400 Volts

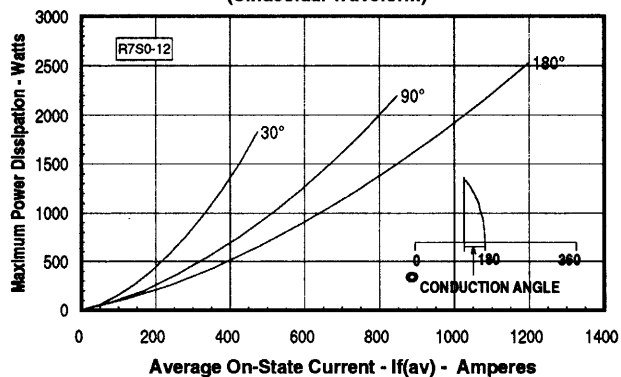
Maximum On-State Forward Voltage Drop
 ($T_j = 175^\circ\text{C}$)



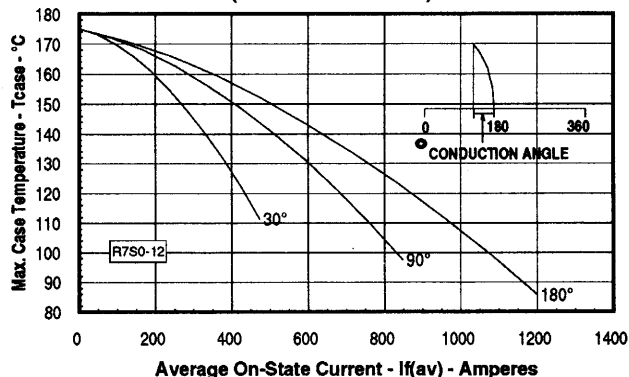
Maximum Transient Thermal Impedance
 (Junction to Case)



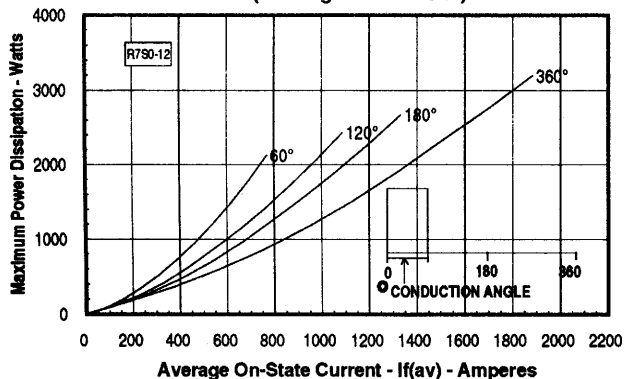
Maximum On-State Power Dissipation
 (Sinusoidal Waveform)



Maximum Allowable Case Temperature
 (Sinusoidal Waveform)



Maximum On-State Power Dissipation
 (Rectangular Waveform)



Maximum Allowable Case Temperature
 (Rectangular Waveform)

