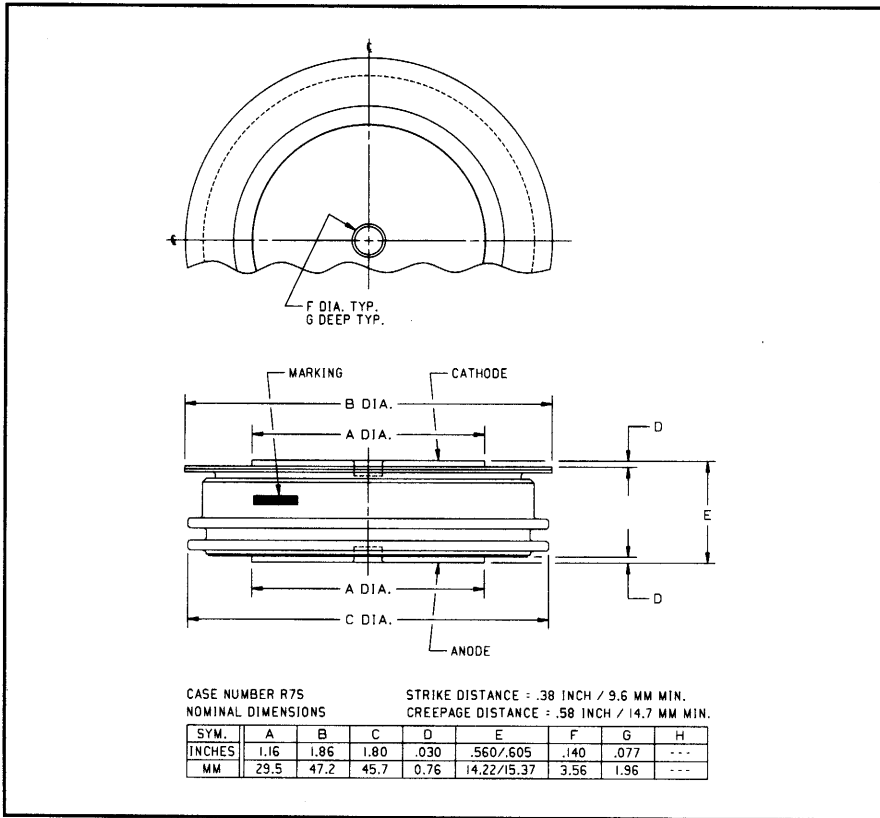


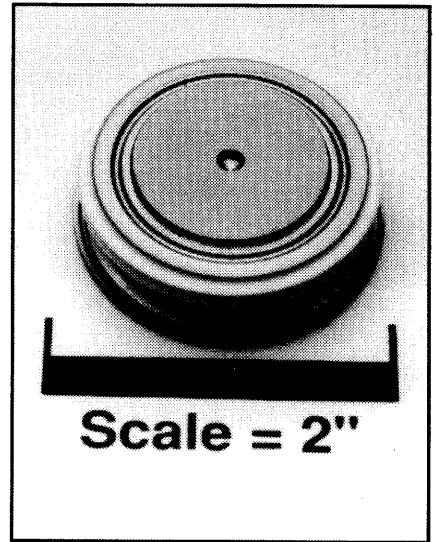
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272  
 Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

### 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)	$t_{rr}$ ( $\mu$ sec)
R7S0	18 through 24	12	XX
	1800V through 2400V	1200A	10 $\mu$ 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)	$I^2t$	$80 \times 10^6$	$A^2sec$
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**  
**General Purpose Rectifier**  
 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 $\Omega$
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 $\Omega$
$V_{TM}$ 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		$\mu\text{sec}$

**Thermal Characteristics**

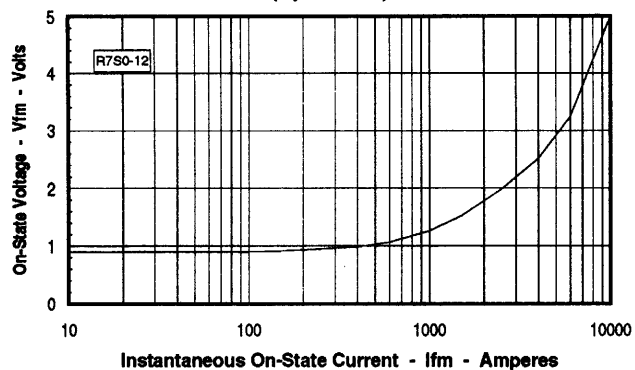
Maximum Thermal Resistance, Double Sided Cooling

Junction-to-Case	$R_{\theta(j-c)}$		0.035	$^\circ\text{C}/\text{W}$
Case-to-Sink	$R_{\theta(c-s)}$		0.02	$^\circ\text{C}/\text{W}$

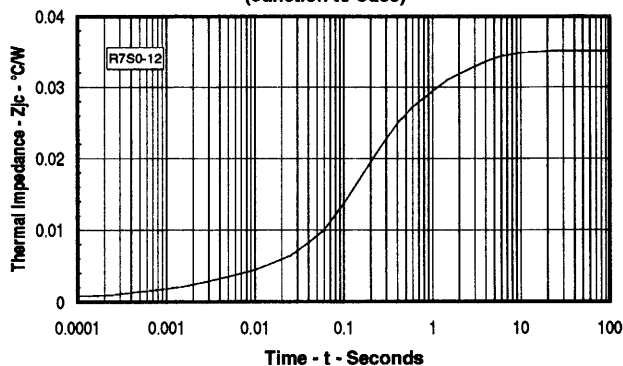
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**R7S0 1200A**  
**General Purpose Rectifier**  
 1200 Amperes Average, 2400 Volts

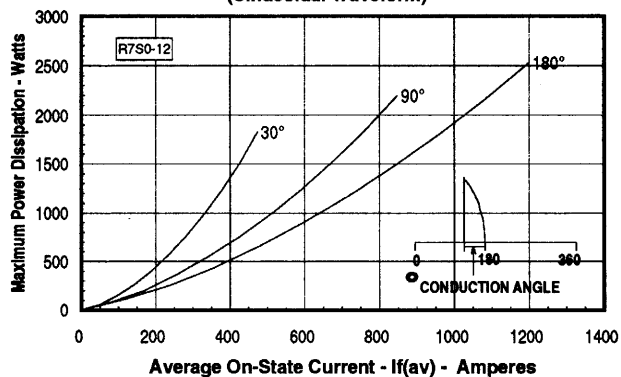
**Maximum On-State Forward Voltage Drop**  
 ( $T_j = 175^\circ\text{C}$ )



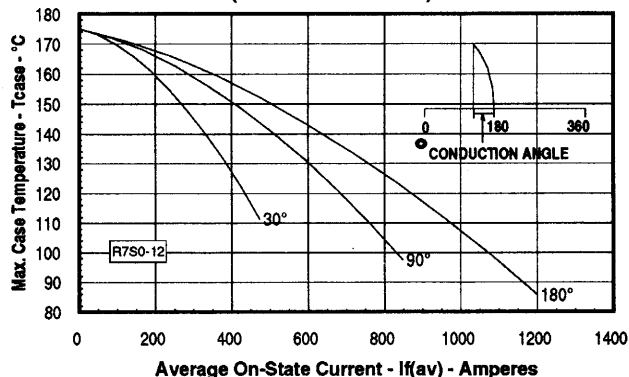
**Maximum Transient Thermal Impedance**  
 (Junction to Case)



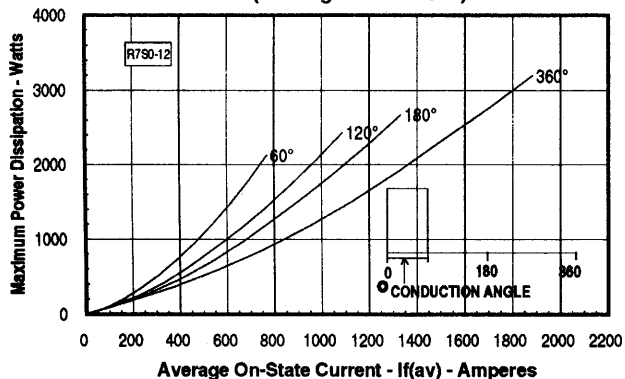
**Maximum On-State Power Dissipation**  
 (Sinusoidal Waveform)



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



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



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

