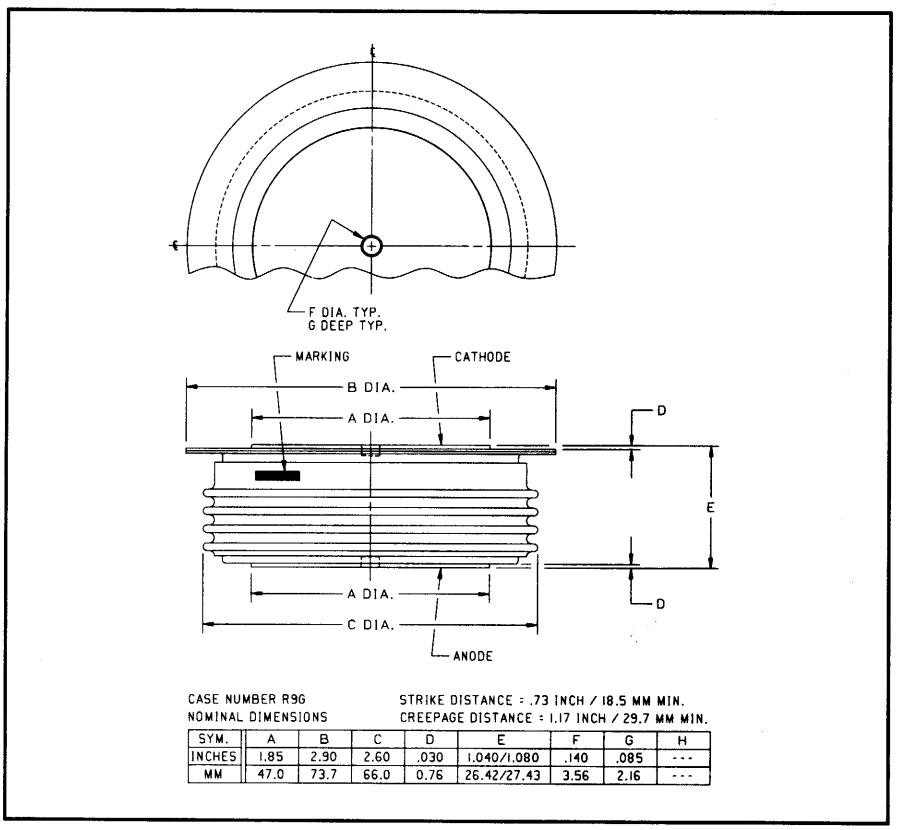
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

General Purpose Rectifier

2500 Amperes Average
2200 Volts

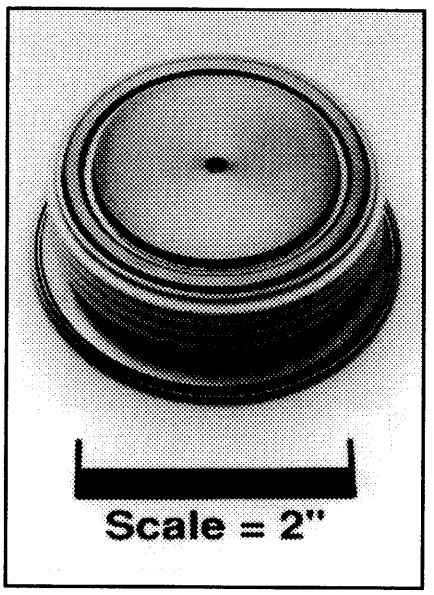


CASE NUMBER R9G
NOMINAL DIMENSIONS

STRIKE DISTANCE = .73 INCH / 18.5 MM MIN.
CREEPAGE DISTANCE = 1.17 INCH / 29.7 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	1.85	2.90	2.60	.030	1.040/1.080	.140	.085	---
MM	47.0	73.7	66.0	0.76	26.42/27.43	3.56	2.16	---

A451 (Outline Drawing)



A451 General Purpose Rectifier
2500 Amperes Average, 2200 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. A451LB is a 2200 Volt, 2500 Ampere General Purpose Rectifier.

Type	Voltage V_{RRM}	Voltage Code	Current $I_{T(av)}$
A451	1400	PD	2500
	1600	PM	
	1800	PN	
	2000	L	
	2200	LB	

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A451
General Purpose Rectifier
2500 Amperes Average, 2200 Volts

Absolute Maximum Ratings

Characteristics	Symbol	A451	Units
Non-repetitive Transient Peak Reverse Voltage	V_{RSM}	V_{RRM} + 100V	Volts
RMS Forward Current, T_C = 88°C	$I_{F(rms)}$	3925	Amperes
Average Current 180° Sine Wave, T_C = 88°C	$I_{F(av)}$	2500	Amperes
RMS Forward Current, T_C = 55°C	$I_{F(rms)}$	4830	Amperes
Average Current 180° Sine Wave, T_C = 55°C	$I_{F(av)}$	3075	Amperes
Peak One Cycle Surge Forward Current (Non-repetitive) 60Hz	I_{fsm}	30000	Amperes
Peak One Cycle Surge Forward Current (Non-repetitive) 50Hz	I_{fsm}	27300	Amperes
I^2t (for Fusing) for One Cycle, 60Hz	I^2t	1,892,250	A^2sec
Operating Temperature	T_j	-40 to +175°C	°C
Storage Temperature	T_{stg}	-40 to +200°C	°C
Approximate Weight		1	lb.
		454	g
Mounting Force		5000 to 5500	lb.
		22.2 to 24.5	kN

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Electrical Characteristics, T_j = 25°C Unless Otherwise Specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Repetitive Reverse Leakage Current	I_{RRM}	T_j = 175°C, $V_R = V_{RRM}$			50	mA
Forward Voltage Drop	V_{FM}	T_j = 25°, I_{FM} = 5000A Peak Duty Cycle < 0.1%			1.4	Volts
Threshold Voltage, Low-level	$V_{(TO)1}$	T_j = 175°C, I = 15%, $I_{T(av)}$ to $\pi I_{T(av)}$			0.66127	Volts
Slope Resistance, Low-level	r_{T1}				0.1281	mΩ
Threshold Voltage, High-level	$V_{(TO)2}$	T_j = 175°C, I = $\pi I_{T(av)}$ to I_{TSM}			0.90714	Volts
Slope Resistance, High-level	r_{T2}				0.08478	mΩ
V_{TM} Coefficients, Low-level		T_j = 175°C, I = 15% $I_{T(av)}$ to $\pi I_{T(av)}$				
					A_1 = 0.42150	
					B_1 = 0.01339	
					C_1 = 4.598E-05	
					D_1 = 0.007539	
V_{TM} Coefficients, High-level		T_j = 175°C, I = $\pi I_{T(av)}$ to I_{TSM}				
					A_2 = -1.3173	
					B_2 = 0.30858	
					C_2 = 8.988E-05	
					D_2 = -0.006564	
Maximum Reverse Recovery Charge	Q_{rr}	T_j = 175°C, I_{FM} = 1000A, di_R/dt = 25A/μsec, t_p = 1000μsec			4000	μC

Thermal Characteristics

Maximum Thermal Resistance, Double Sided Cooling						
Junction-to-Case	$R_{θ(j-c)}$				0.025	°C/W
Case-to-Sink	$R_{θ(c-s)}$				0.0075	°C/W

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A451
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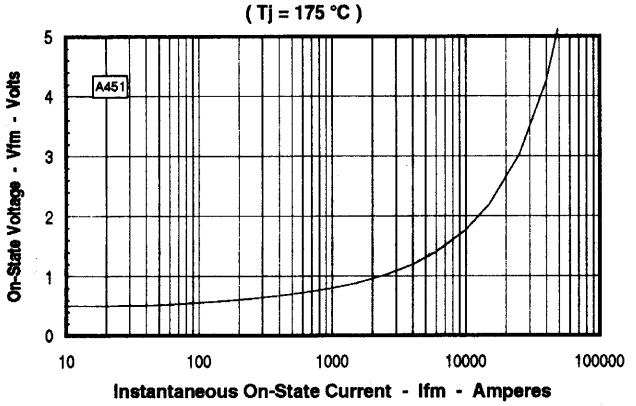
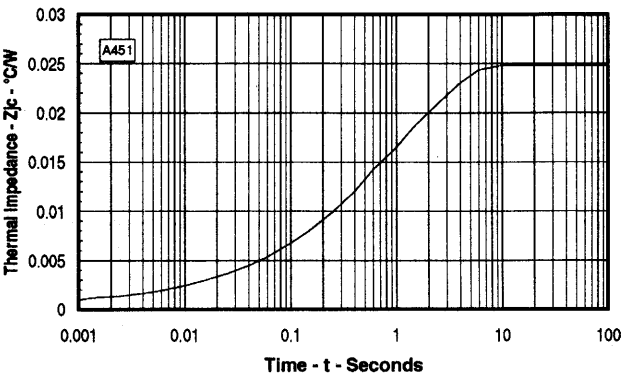
2500 Amperes Average, 2200 Volts

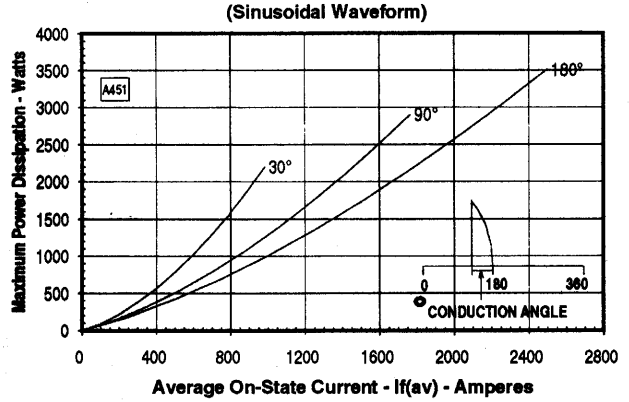
Maximum On-State Forward Voltage Drop
(Tj = 175 °C)



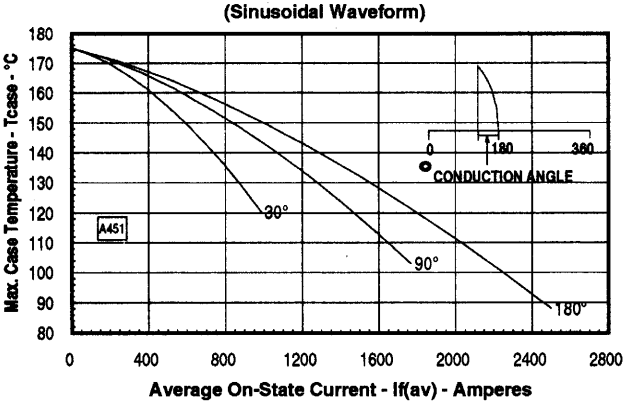
Maximum Transient Thermal Impedance
(Junction to Case)



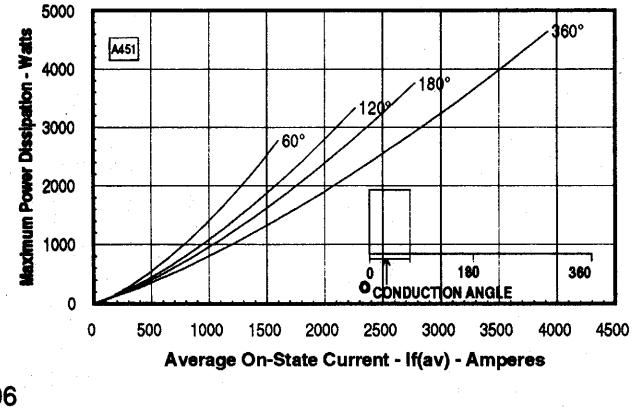
Maximum On-State Power Dissipation
(Sinusoidal Waveform)



Maximum Allowable Case Temperature
(Sinusoidal Waveform)



Maximum On-State Power Dissipation
(Rectangular Waveform)



Maximum Allowable Case Temperature
(Rectangular Waveform)