Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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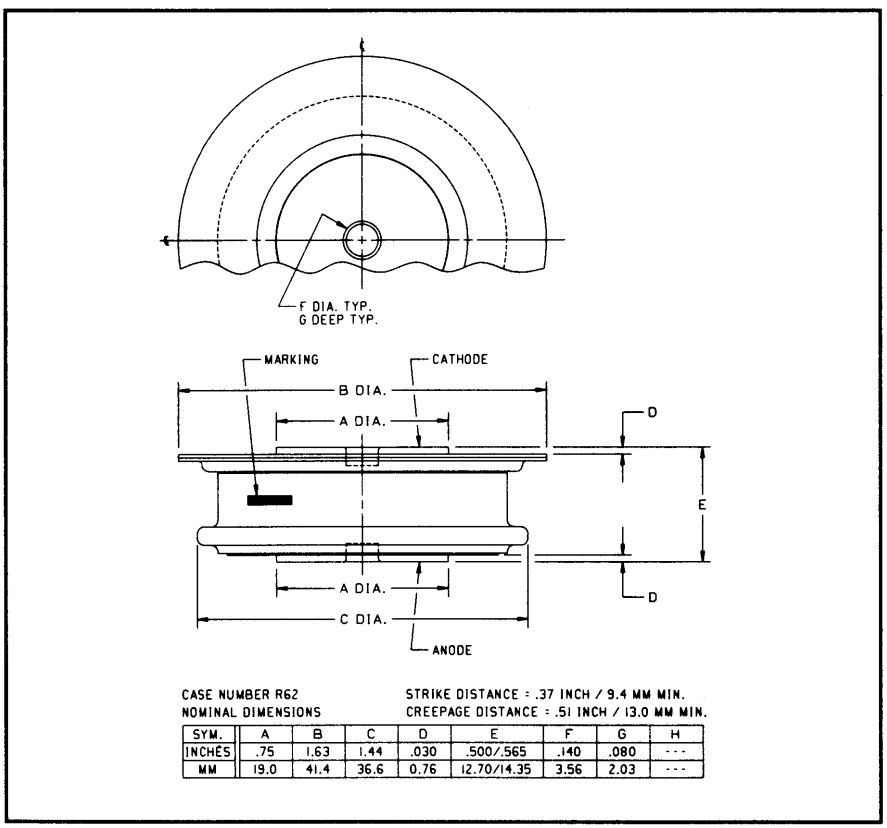
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272
Powerex, Europe, S.A. 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Fast Recovery Rectifier

400 Amperes Average
1600 Volts

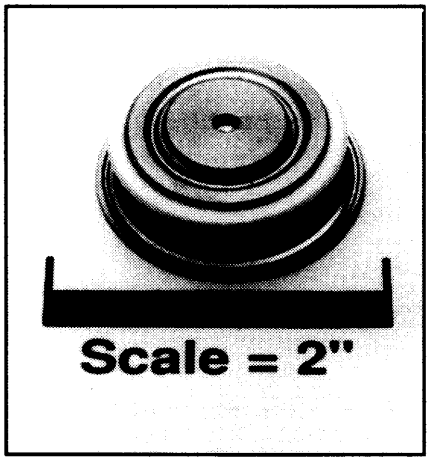


CASE NUMBER R62
NOMINAL DIMENSIONS

STRIKE DISTANCE = .37 INCH / 9.4 MM MIN.
CREEPAGE DISTANCE = .51 INCH / 13.0 MM MIN.

SYM.	A	B	C	D	E	F	G	H
INCHES	.75	1.63	1.44	.030	.500/.565	.140	.080	---
MM	19.0	41.4	36.6	0.76	12.70/14.35	3.56	2.03	---

R622_ _40 (Outlne Drawing)



R622_ _40
Fast Recovery Rectifier
400 Amperes Average, 1600 Volts

Ordering Information:

Select the complete part number you desire from the following table:

Type	Voltage V_{RRM} (Volts)	Code	Current $I_{F(av)}$ (A)	Code	Recovery Time t_{rr} (µsec)	Code	Leads Case	Code
R622	400	04	400	40	1.0	HS	R62	OO
	600	06						
	800	08						
	1000	10						
	1200	12						
	1400	14						
	1600	16						

Example: Type R622 rated at 400A average with V_{RRM} = 1600V, Recovery Tme = 1.0µsec, order as:

Type				Voltage		Current		Time	Leads	
R	6	2	2	1	6	4	0	HS	O	O

Features:

- ☐ Fast Recovery Times
- ☐ Soft Recovery Characteristics
- ☐ High Surge Current Ratings
- ☐ High Rated Blocking Voltages
- ☐ Special Electrical Selection for Parallel and Series Operation
- ☐ Single or Double-sided Cooling
- ☐ Long Creepage and Strike Paths
- ☐ Hermetic Seal
- ☐ Special Selection of Recovery Characteristics Available

Applications:

- ☐ Inverters
- ☐ Choppers
- ☐ Transmitters
- ☐ Free Wheeling Diode

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R622_ _40
Fast Recovery Rectifier
400 Amperes Average, 1600 Volts

Absolute Maximum Ratings

Characteristics	Symbol	R622_ _40	Units
RMS Forward Current	$I_{F(rms)}$	625	Amperes
Average Forward Current	$I_{F(av)}$	400	Amperes
One-half Cycle Surge Current	I_{FSM}	4500	Amperes
I^2t (for Fusing), Times = 8.3 milliseconds	I^2t	85000	A^2sec
Max. I^2t of Package (for Times = 8.3 milliseconds)	I^2t	20×10^6	A^2sec
Storage Temperature	T_{stg}	40 to +190	°C
Operating Temperature	T_j	40 to +150	°C
Mounting Force		1000 to 1400	lbs

Electrical and Thermal Characteristics

Characteristics	Symbol	Test Conditions	R622_ _40	Units
Current - Conducting State Maximums				
Forward Voltage Drop	V_{FM}	T_j = 25°C, I_{FM} = 800A	2.0	Volts
Voltage - Blocking State Maximums				
Repetitive Peak Reverse Voltage (Rated Limit)	V_{RRM}		1600	Volts
Non-rep. Trans. Peak Rev. Voltage (Rated Limit)	V_{RSM}	t ≤ 5.0msec	1800	Volts
Reverse Leakage Current, mA peak	I_{RRM}	T_j at max., V_{RRM} = Rated	50	mA
Switching				
Maximum Reverse Recovery Time	t_{rr}	I_{FM} = 785A, t_p = 100µsec, di_R/dt = 25A/µsec, T_C = 25°C	1.0	µsec
Thermal				
Maximum Resistance, Junction to Case	$R_{\theta(j-c)}$		0.095	°C/Watt
Maximum Resistance, Case to Sink (Lubricated)	$R_{\theta(c-s)}$		0.025	°C/Watt

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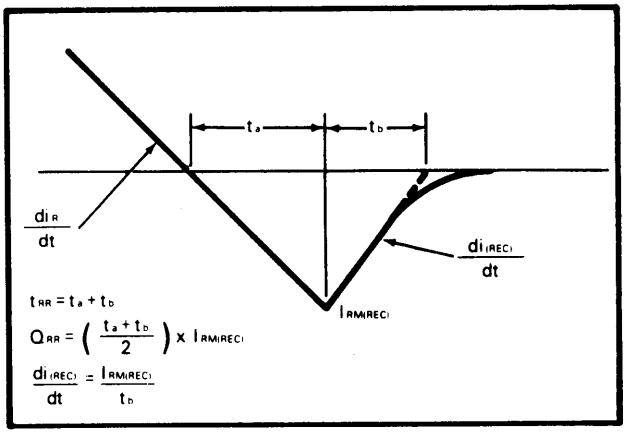
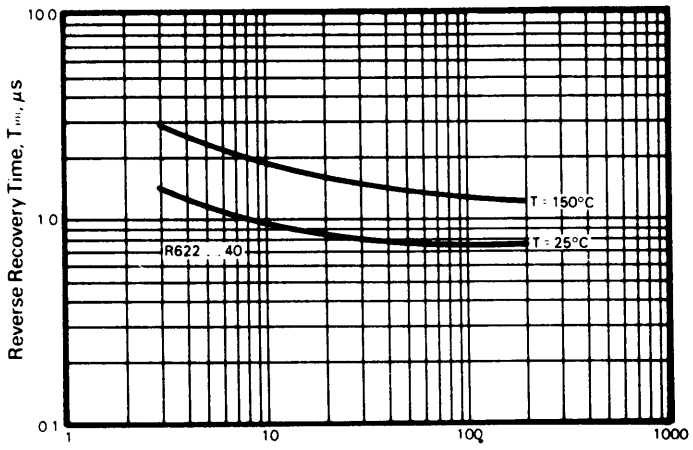
R622_ _40
Fast Recovery Rectifier
400 Amperes Average, 1600 Volts

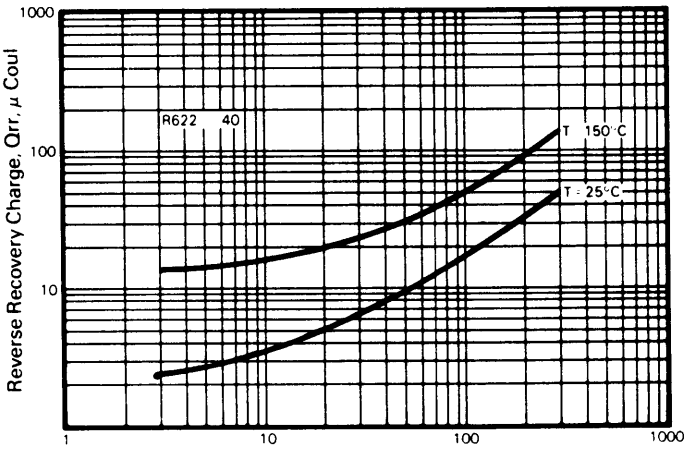
Reverse Recovery Wave Form



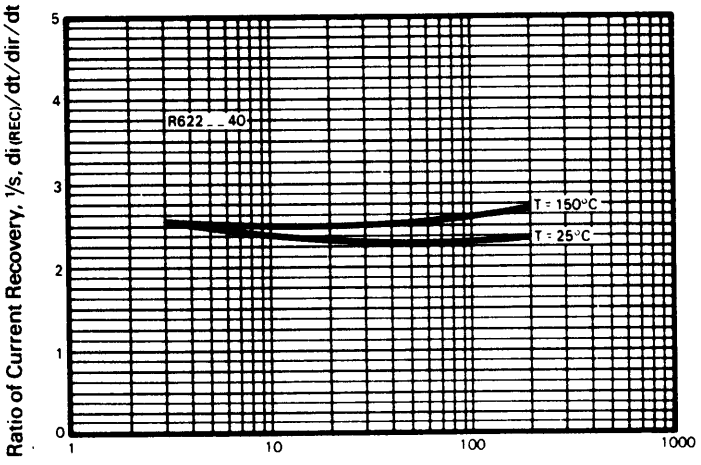
Typical Reverse Recovery Time Vs. Rate of Current Fall



Typical Reverse Recovery Charge Vs. Rate of Current Fall



Typical Ratio of Current Recovery to Rate of Current Fall



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R622__40
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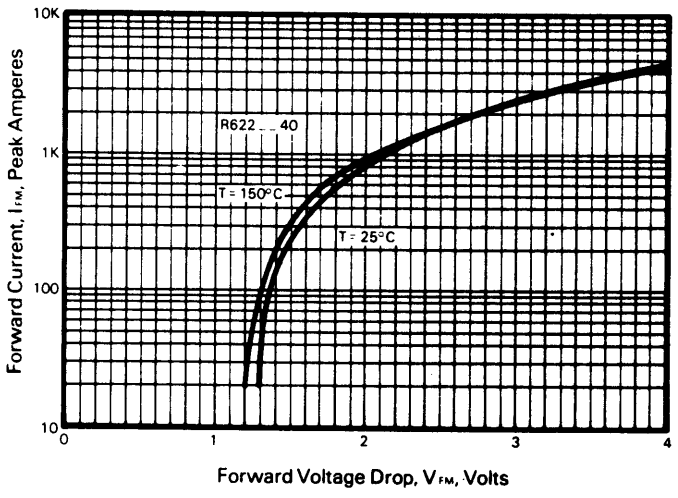
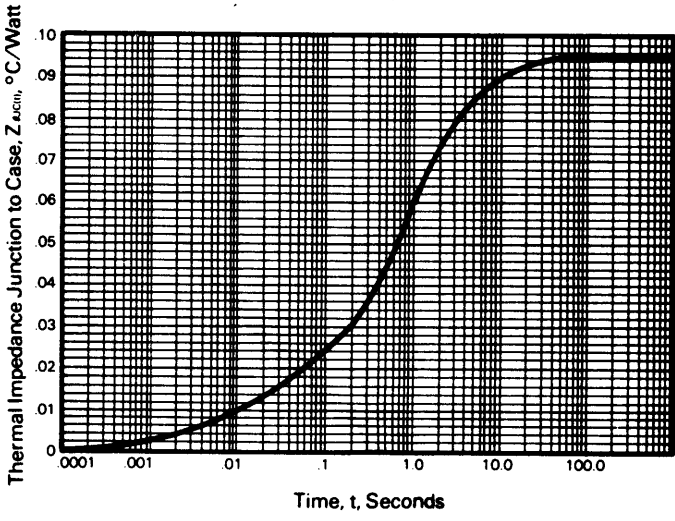
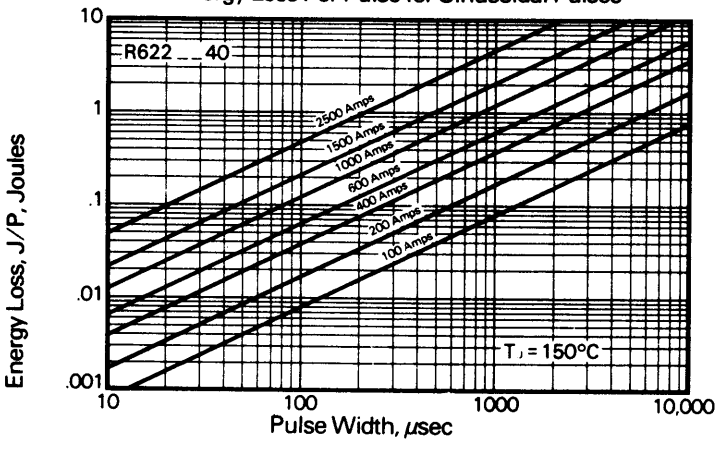
Forward Current Vs. Forward Voltage Drop



Transient Thermal Impedance Vs. Time



Energy Loss Per Pulse for Sinusoidal Pulses



Calculation of Fast Recovery Diodes and Allowable Case Temperature

1. Conduction Losses
   $P_{av(cond)} = J/P \times F$

2. Reverse Recovery Losses (Approximate)
   $$P_{av(sw)} = 1/4 \times V_R \times \frac{di_R}{dt} \times T_{rr}^2 \times \left(\frac{1/s}{1 + 1/s}\right)^2 \times F \times 1x10^{-6}$$

3. Maximum Allowable Case Temperature
   $T_{C(max)} = T_j - (P_{av(cond)} + P_{av(sw)} \times R_{\theta(j-c)})$
   Where:
   $P_{av(cond)}$ = Forward Conduction Power Loss in Watts
   $P_{av(sw)}$ = Reverse Recovery Power Loss in Watts
   J/P = Energy Loss per Pulse in Joules
   F = Frequency in Hertz
   V_R = Steady State Reverse Operating Voltage in Volts
   di_R/dt = Rate of Decay of Forward Current in Amperes/μsec
   T_{rr} = Reverse Recovery Time in Microseconds
   $\frac{1}{\text{"S"}}$ = Ratio of Recovery $di/dt\left(\frac{di_F/dt}{di_R/dt}\right)$
   F = Operating Frequency in Hertz
   $T_{C(max)}$ = Maximum Allowable Case Temperature in °C.
   T_j = Maximum Operating Junction Temperature in °C.
   $R_{\theta(j-c)}$ = DC Junction to Case Thermal Impedance in °C/Watt.