Bulletin PD-20740 rev. B 02/06

International
IOR Rectifier

80EBU02

Ultrafast Soft Recovery Diode

Features
- Ultrafast Recovery
- 175°C Operating Junction Temperature
- Screw Mounting Only
- Lead-Free Plating

t_{rr} = 35ns
$I_{F(AV)}$ = 80Amp
V_R = 200V

Benefits
- Reduced RFI and EMI
- Higher Frequency Operation
- Reduced Snubbing
- Reduced Parts Count

Description/ Applications

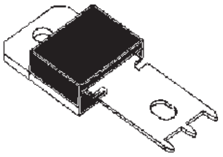
These diodes are optimized to reduce losses and EMI/ RFI in high frequency power conditioning systems.
The softness of the recovery eliminates the need for a snubber in most applications. These devices are ideally suited for HF welding, power converters and other applications where switching losses are not significant portion of the total losses.

Absolute Maximum Ratings

	Parameters	Max	Units
V_R	Cathode to Anode Voltage	200	V
$I_{F(AV)}$	Continuous Forward Current, T_C = 112°C	80	A
I_{FSM}	Single Pulse Forward Current, T_C = 25°C	800	
I_{FRM} ①	Maximum Repetitive Forward Current	160	
T_J, T_{STG}	Operating Junction and Storage Temperatures	- 55 to 175	°C

① Square Wave, 20kHz

Case Styles



Pow*IR*tab

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameters	Min	Typ	Max	Units	Test Conditions
V_{BR}, V_r	Breakdown Voltage, Blocking Voltage	200	-	-	V	I_R = 50μA
V_F	Forward Voltage	-	0.98	1.13	V	I_F = 80A
		-	0.79	0.92	V	I_F = 80A, T_J = 175°C
I_R	Reverse Leakage Current	-	-	50	μA	V_R = V_R Rated
		-	-	2	mA	T_J = 150°C, V_R = V_R Rated
C_T	Junction Capacitance	-	89	-	pF	V_R = 200V
L_S	Series Inductance	-	3.5	-	nH	Measured lead to lead 5mm from package body

Dynamic Recovery Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameters	Min	Typ	Max	Units	Test Conditions	
t_{rr}	Reverse Recovery Time	-	-	35	ns	I_F = 1.0A, di_F/dt = 200A/μs, V_R = 30V	
		-	32	-		T_J = 25°C	I_F = 80A V_R = 160V di_F /dt = 200A/μs
		-	52	-		T_J = 125°C	
I_{RRM}	Peak Recovery Current	-	4.4	-	A	T_J = 25°C	
		-	8.8	-		T_J = 125°C	
Q_{rr}	Reverse Recovery Charge	-	70	-	nC	T_J = 25°C	
			-	240	-	T_J = 125°C	

Thermal - Mechanical Characteristics

	Parameters	Min	Typ	Max	Units
R_{thJC}	Thermal Resistance, Junction to Case			0.70	K/W
R_{thCS} ②	Thermal Resistance, Case to Heatsink		0.2		
Wt	Weight			5.02	g
			0.18		(oz)
T	Mounting Torque	1.2		2.4	N * m
		10		20	lbf.in

② Mounting Surface, Flat, Smooth and Greased

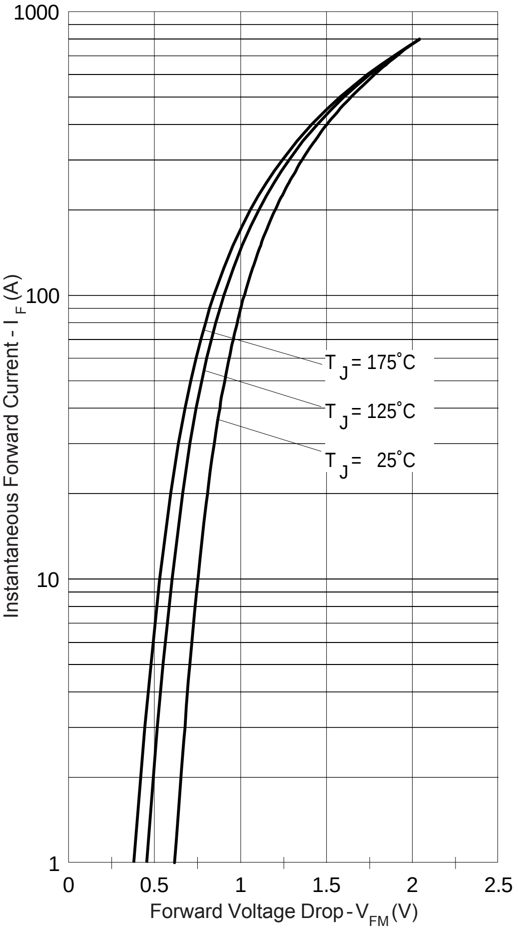


Fig. 1 - Typical Forward Voltage Drop Characteristics

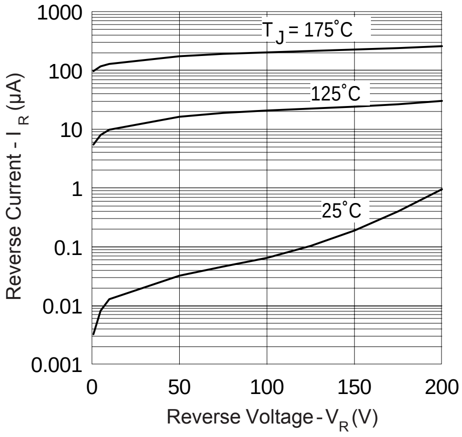


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

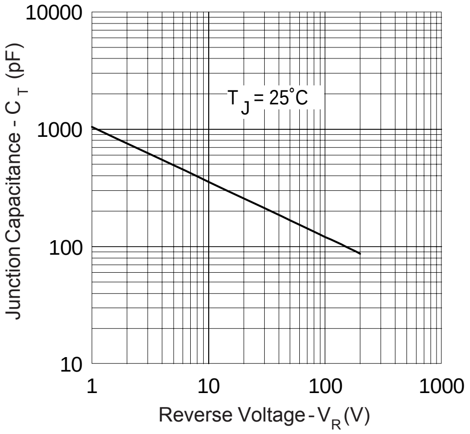


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

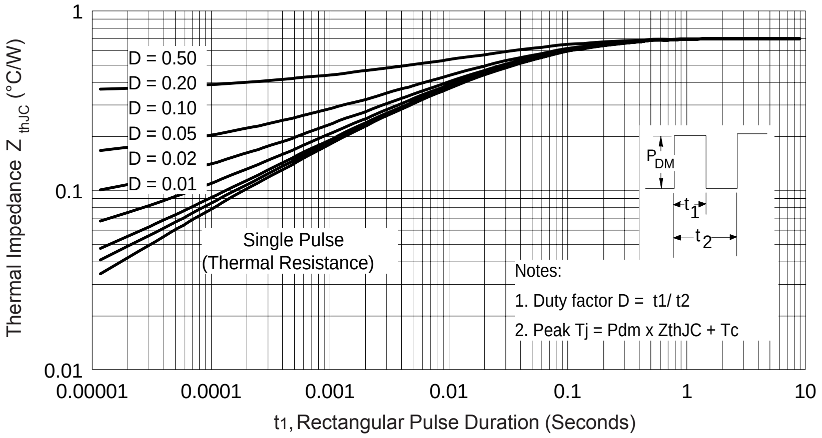


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

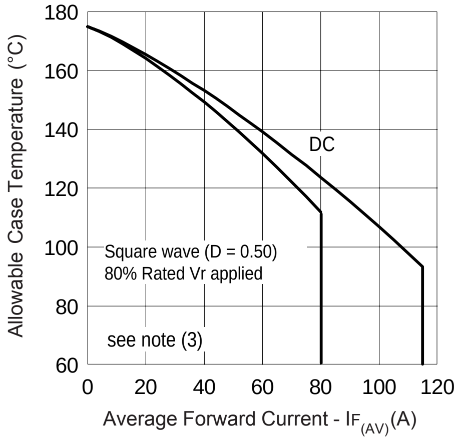


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

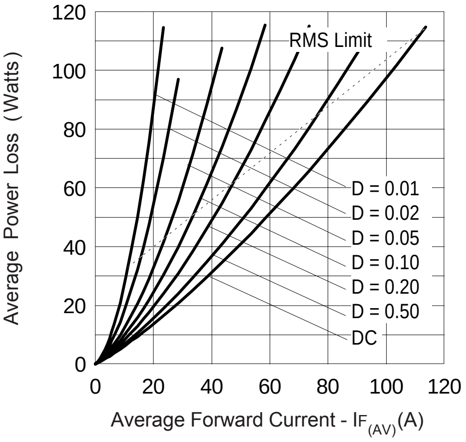


Fig. 6 - Forward Power Loss Characteristics

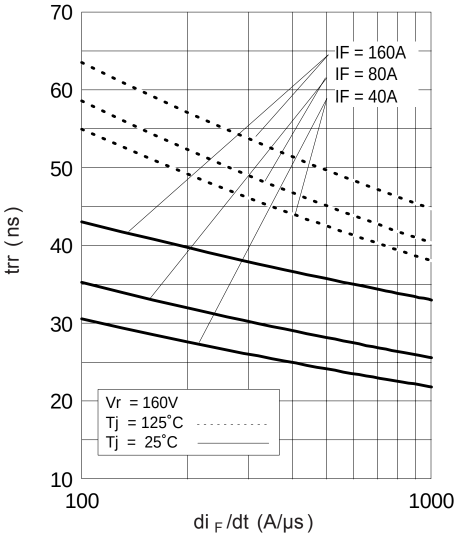


Fig. 7 - Typical Reverse Recovery time vs. di_F/dt

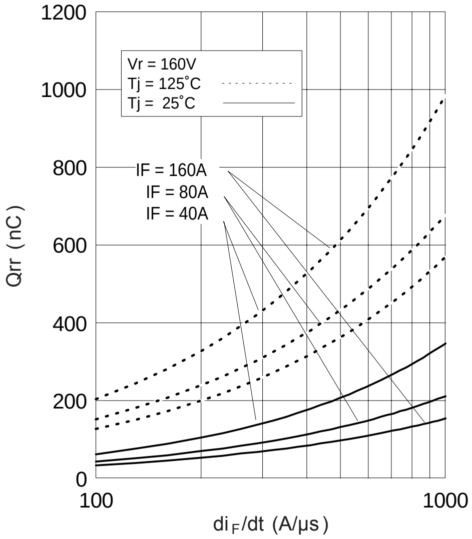


Fig. 8 - Typical Stored Charge vs. di_F/dt

(3) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM}$ @ $(I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; I_R @ V_{R1} = 80% rated V_R

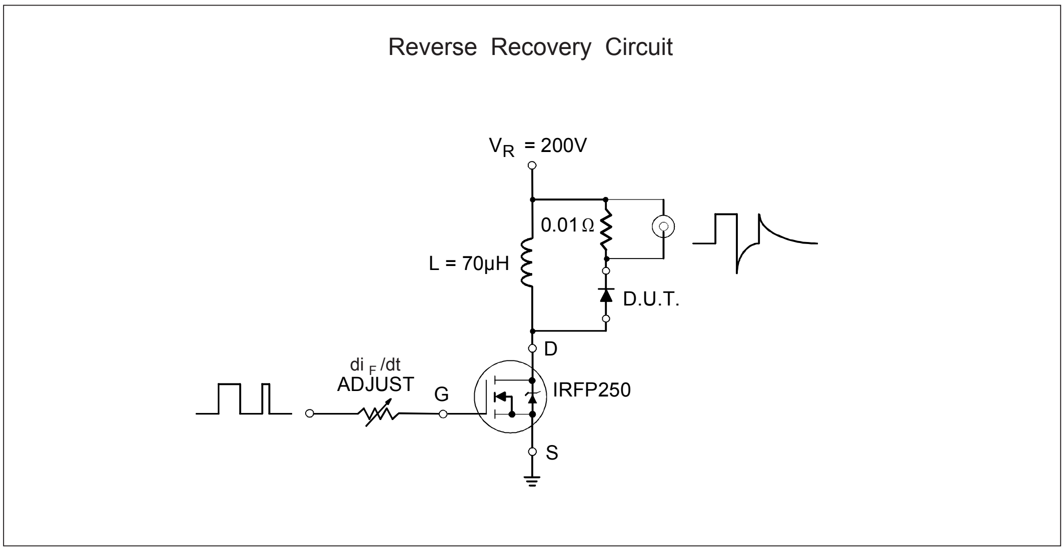
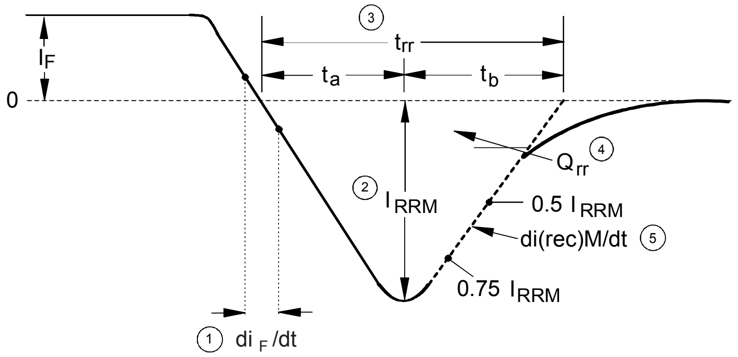


Fig. 9- Reverse Recovery Parameter Test Circuit



1. di_F/dt - Rate of change of current through zero crossing

2. I_{RRM} - Peak reverse recovery current

3. t_{rr} - Reverse recovery time measured from zero crossing point of negative going I_F to point where a line passing through 0.75 I_{RRM} and 0.50 I_{RRM} extrapolated to zero current

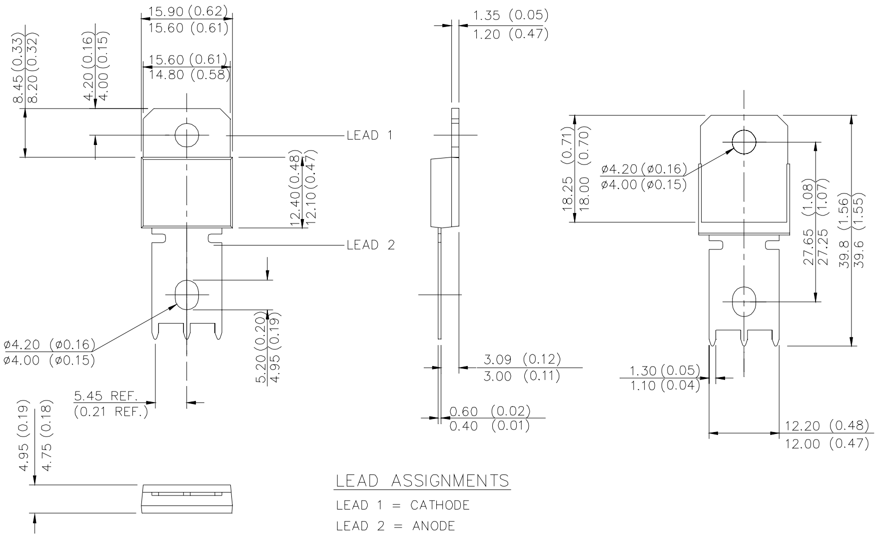
4. Q_{rr} - Area under curve defined by t_{rr} and I_{RRM}

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

5. $di_{(rec)M}/dt$ - Peak rate of change of current during t_b portion of t_{rr}

Fig. 10 - Reverse Recovery Waveform and Definitions

Outline Table



LEAD ASSIGNMENTS

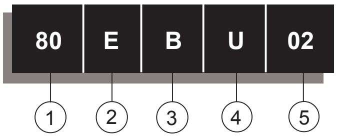
LEAD 1 = CATHODE

LEAD 2 = ANODE

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code



1 - Current Rating (80 = 80A)
2 - Single Diode
3 - Pow*IR*tab (Ultrafast/ Hyperfast only)
4 - Ultrafast Recovery
5 - Voltage Rating (02 = 200V)

International
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
02/06

Notice

The products described herein were acquired by Vishay Intertechnology, Inc., as part of its acquisition of International Rectifier's Power Control Systems (PCS) business, which closed in April 2007. Specifications of the products displayed herein are pending review by Vishay and are subject to the terms and conditions shown below.

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.

International Rectifier®, IR®, the IR logo, HEXFET®, HEXSense®, HEXDIP®, DOL®, INTERO®, and POWIRTRAIN® are registered trademarks of International Rectifier Corporation in the U.S. and other countries. All other product names noted herein may be trademarks of their respective owners.