

International
ICR Rectifier

SCHOTTKY RECTIFIER

MBRD320
 MBRD330
 MBRD340

3.0 Amp

$I_{F(AV)} = 3.0\text{Amp}$
 $V_R = 20/40\text{V}$

Major Ratings and Characteristics

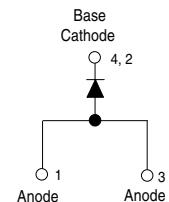
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.0	A
V_{RRM}	20/40	V
I_{FSM} @ $t_p = 5\text{ }\mu\text{s}$ sine	490	A
V_F @ 3Apk, $T_J = 125^\circ\text{C}$	0.49	V
T_J	-40 to 150	$^\circ\text{C}$

Description/ Features

The MBRD320, MBRD330, MBRD340 surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- Popular D-PAK outline
- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles



D-PAK (TO-252AA)

Voltage Ratings

Part number	MBRD320	MBRD330	MBRD340
V_R Max. DC Reverse Voltage (V)	20	30	40
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	Value	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	3.0	A	50% duty cycle @ $T_L = 133^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	490		5μs Sine or 3μs Rect. pulse
	75		Following any rated load condition and with rated V_{RRM} applied
E_{AS} Non Repetitive Avalanche Energy	8.0	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1\text{Amp}$, $L = 16\text{mH}$
I_{AR} Repetitive Avalanche Current	1.0	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_a = 1.5 \times V_r$ typical

Electrical Specifications

Parameters	Typ.	Max.	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1) See Fig. 1	0.48	0.6	V	$T_J = 25^\circ\text{C}$
	0.58	0.7	V	
	0.41	0.49	V	$T_J = 125^\circ\text{C}$
	0.55	0.625	V	
I_{RM} Max. Reverse Leakage Current (1) See Fig. 2	0.02	0.2	mA	$V_R = \text{rated } V_R$
	10.7	20	mA	
C_T Typical Junction Capacitance	189	-	pF	$V_R = 5V_{DC}$ (test signal range 100kHz to 1Mhz), @ 25°C
L_S Typical Series Inductance	5.0	-	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	-	10000	V/ μs	(Rated V_R)

(1) Pulse Width < 300μs, Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters	Value	Units	Conditions
T_J Max. Junction Temperature Range (*)	-40 to 150	°C	
T_{stg} Max. Storage Temperature Range	-40 to 175	°C	
R_{thJC} Max. Thermal Resistance Junction to Case	6.0	°C/W	DC operation * See Fig. 4
R_{thJA} Max. Thermal Resistance Junction to Ambient	80	°C/W	
wt Approximate Weight	0.3 (0.01)	g (oz.)	
Case Style	D - PAK		Similar to TO-252AA
Device Marking	MBRD340		

$$(*) \frac{dP_{tot}}{dT_J} < \frac{1}{R_{th(j-a)}} \text{ thermal runaway condition for a diode on its own heatsink}$$

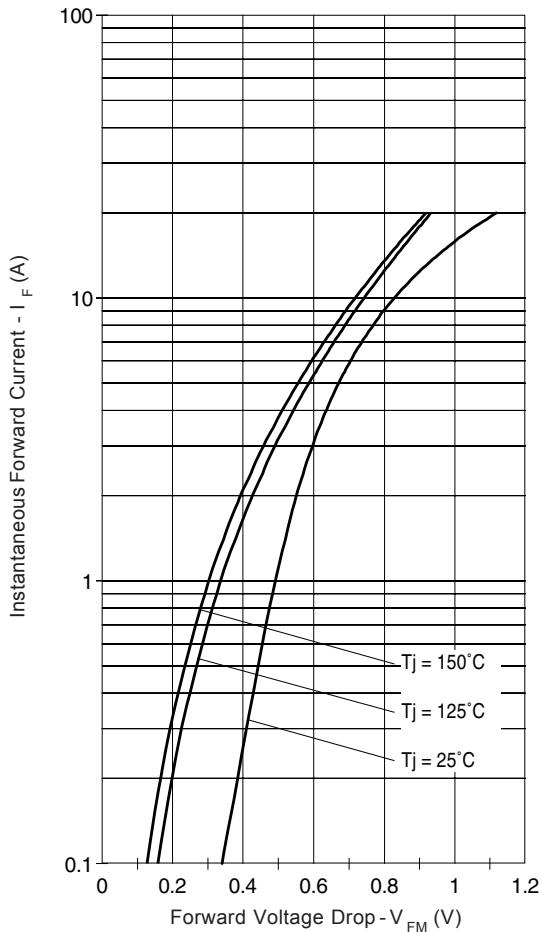


Fig. 1 - Maximum Forward Voltage Drop Characteristics

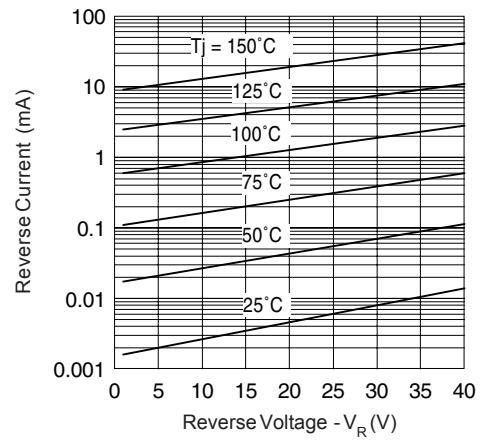


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

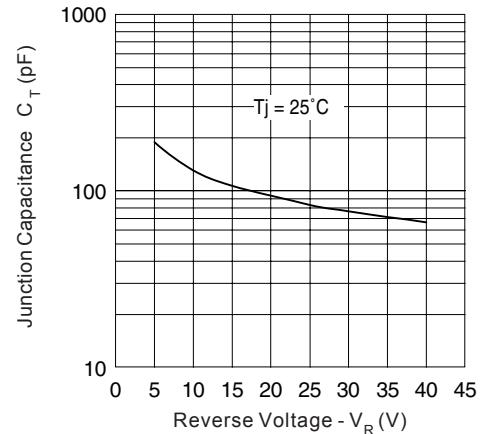


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

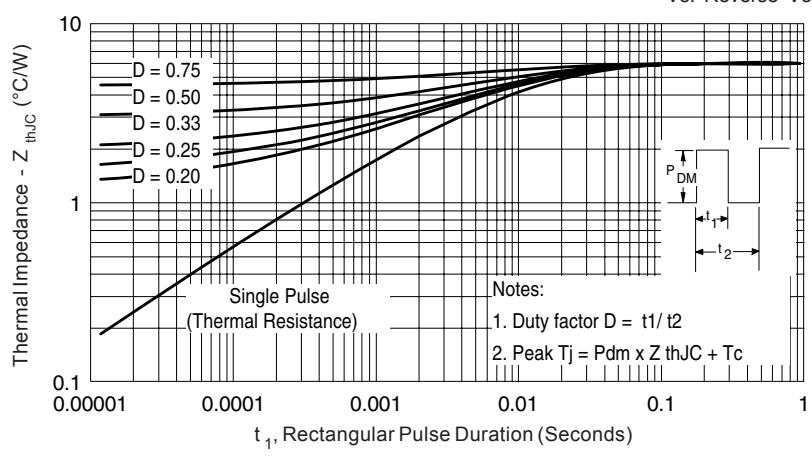


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

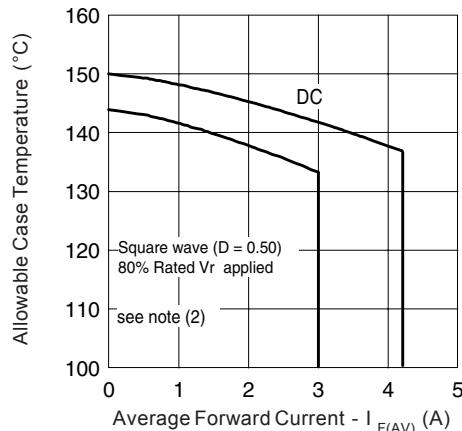
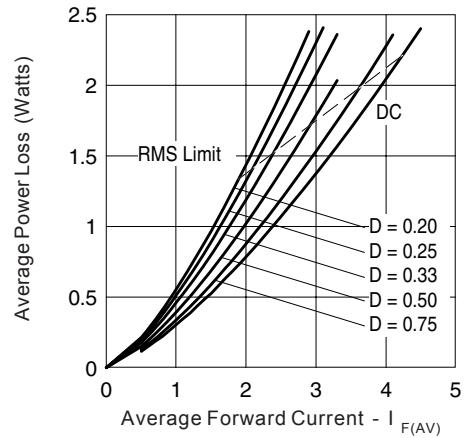
Fig. 5 - Maximum Allowable Case Temperature
Vs. Average Forward Current

Fig. 6 - Forward Power Loss Characteristics

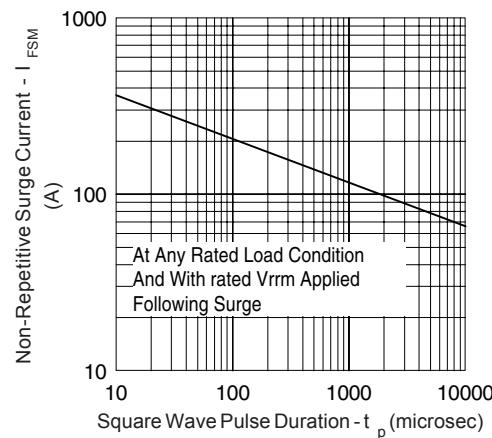
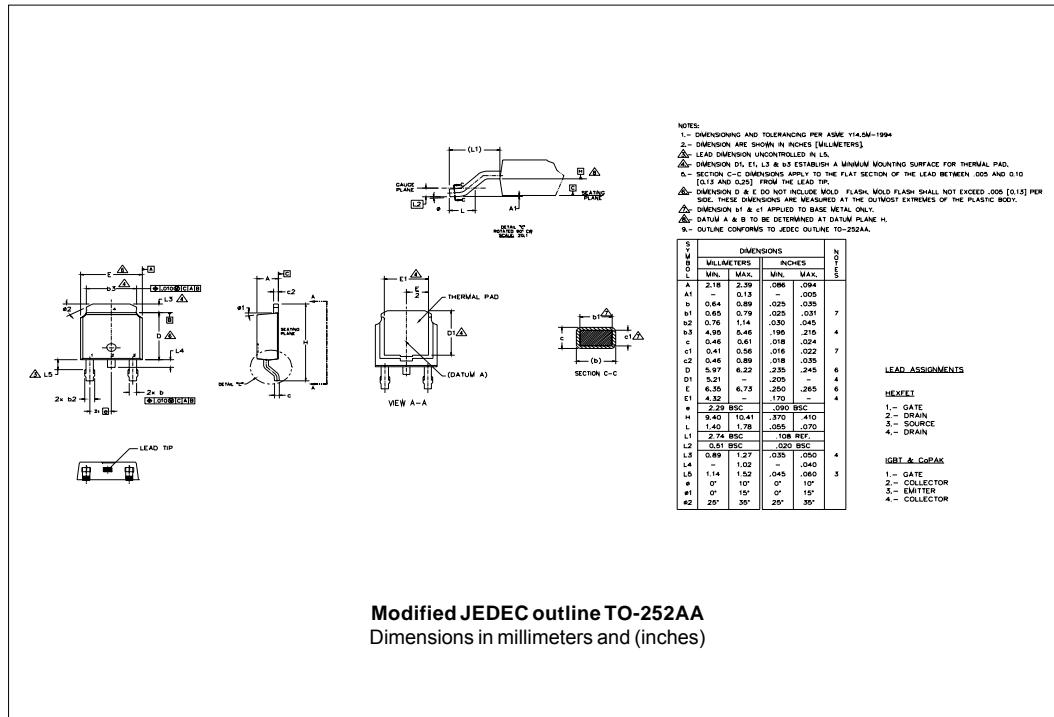


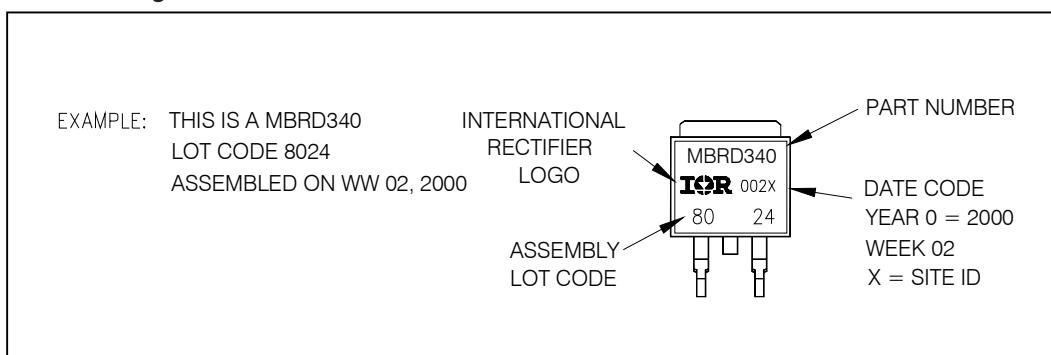
Fig. 7 - Maximum Non-Repetitive Surge Current

(2) Formula used: $T_c = T_j - (P_d + P_{d,REV}) \times R_{thJC}$;
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)}/D)$ (see Fig. 6);
 $P_{d,REV} = \text{Inverse Power Loss} = V_{R1} \times I_R (1-D); I_R @ V_{R1} = 80\% \text{ rated } V_R$

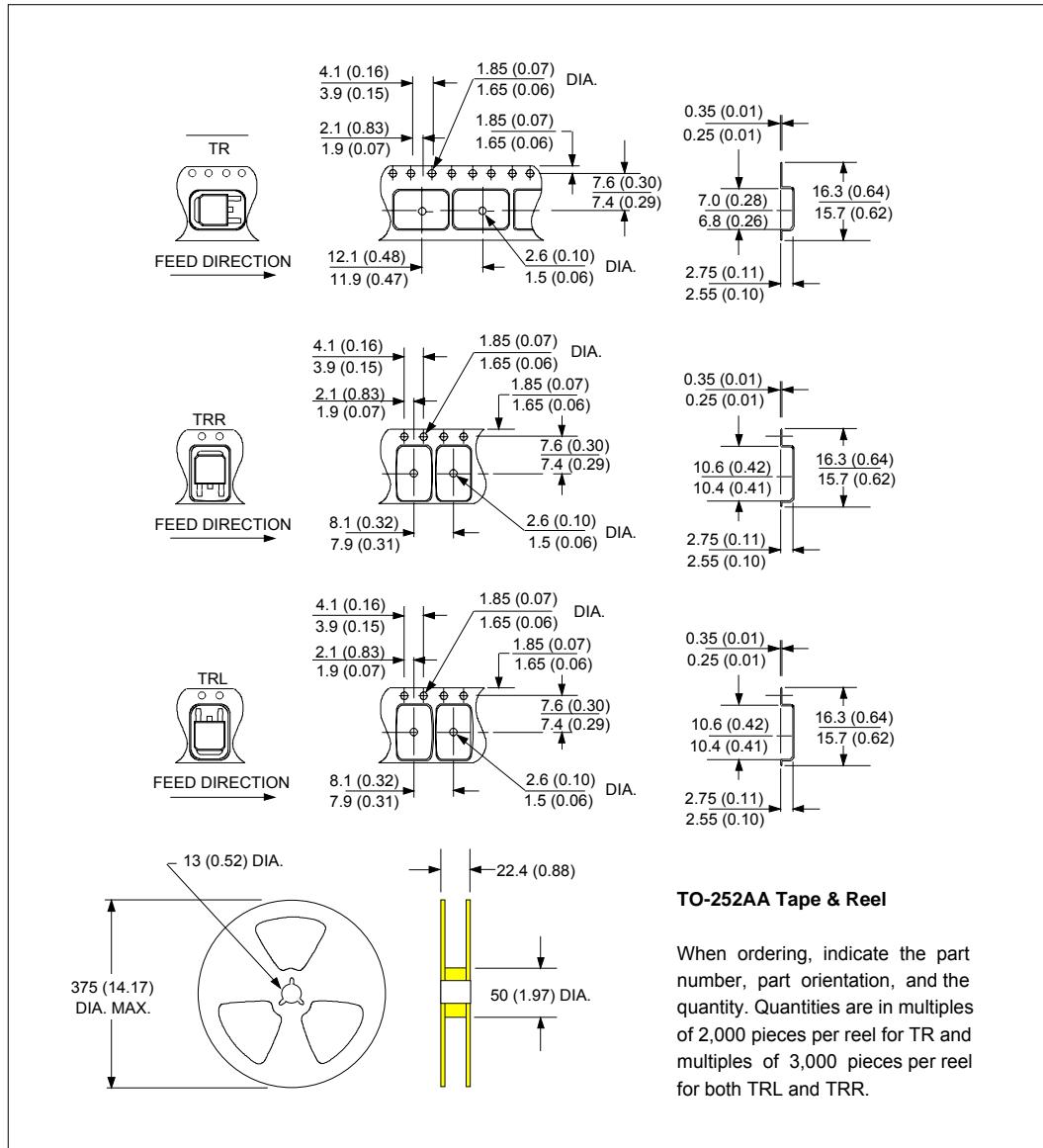
Outline Table



Part Marking Information



Tape & Reel Information



Ordering Information Table

Device Code	MBR	D	3	40	TR	-
1						
2						
3						
4						
5						
6						

1 - Schottky MBR Series
2 - D = D-Pak (TO-252AA)
3 - Current Rating (3 = 3A)
4 - Voltage Ratings
5 - • none = Tube (50 pieces)
• TR = Tape & Reel
• TRL = Tape & Reel (Left Oriented)
• TRR = Tape & Reel (Right Oriented)
6 - • none = Standard Production
• PbF = Lead-Free

20 = 20V
30 = 30V
40 = 40V

Data and specifications subject to change without notice.
This product has been designed and qualified for AEC Q101 Level.
Qualification Standards can be found on IR's Web site.

International
IR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
05/06



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.