



**MBRD320**  
**MBRD330**  
**MBRD340**

**SCHOTTKY RECTIFIER**

**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
$I_{FSM}$ @tp = 5 $\mu$ s sine	490	A
$V_F$ @3 Apk, $T_J = 125^\circ\text{C}$	0.49	V
$T_J$	-40 to 150	$^\circ\text{C}$

**Description/ Features**

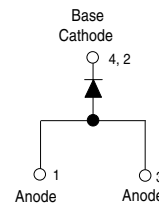
The MBRD320, MBRD330, MBRD340 surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- 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 <sub>R</sub> Max. DC Reverse Voltage (V)	20	30	40
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)			

**Absolute Maximum Ratings**

Parameters	Value	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current	3.0	A	50% duty cycle @ T <sub>L</sub> = 133°C, rectangular wave form
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current	490		5µs Sine or 3µs Rect. pulse
	75		10ms Sine or 6ms Rect. pulse
E <sub>AS</sub> Non Repetitive Avalanche Energy	8.0	mJ	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 1Amp, L = 16mH
I <sub>AR</sub> Repetitive Avalanche Current	1.0	A	Current decaying linearly to zero in 1 µsec Frequency limited by T <sub>J</sub> max. Va = 1.5 x Vr typical

**Electrical Specifications**

Parameters	Typ.	Max.	Units	Conditions
V <sub>FM</sub> Max. Forward Voltage Drop (1) See Fig. 1	0.48	0.6	V	@ 3A
	0.58	0.7	V	@ 6A
	0.41	0.49	V	@ 3A
	0.55	0.625	V	@ 6A
I <sub>RM</sub> Max. Reverse Leakage Current (1) See Fig. 2	0.02	0.2	mA	T <sub>J</sub> = 25 °C
	10.7	20	mA	T <sub>J</sub> = 125 °C
C <sub>T</sub> Typical Junction Capacitance	189	-	pF	V <sub>R</sub> = 5V <sub>DC</sub> (test signal range 100kHz to 1Mhz), @ 25°C
L <sub>S</sub> 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 <sub>R</sub> )

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

**Thermal-Mechanical Specifications**

Parameters	Value	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range(*)	-40 to 150	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-40 to 175	°C	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case	6.0	°C/W	DC operation * See Fig. 4
R <sub>thJA</sub> 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		

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

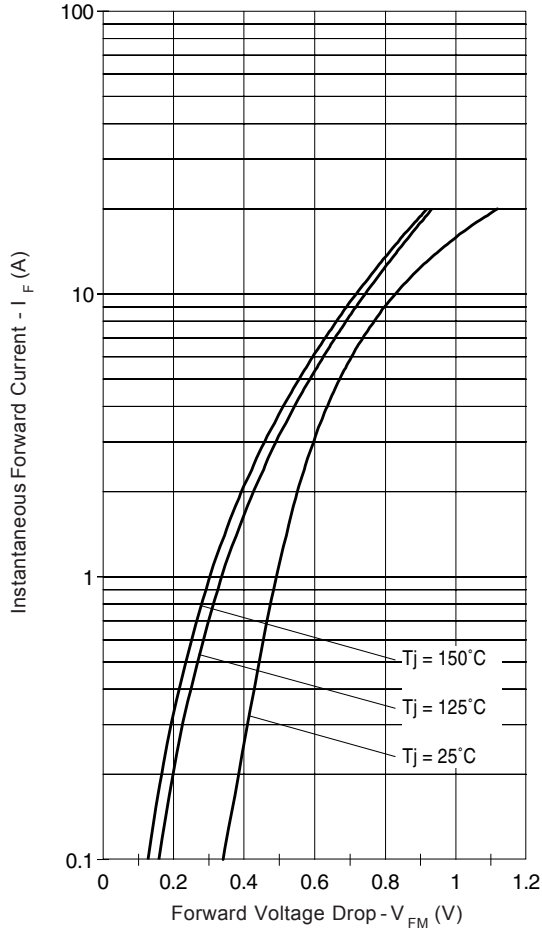


Fig. 1 - Maximum Forward Voltage Drop Characteristics

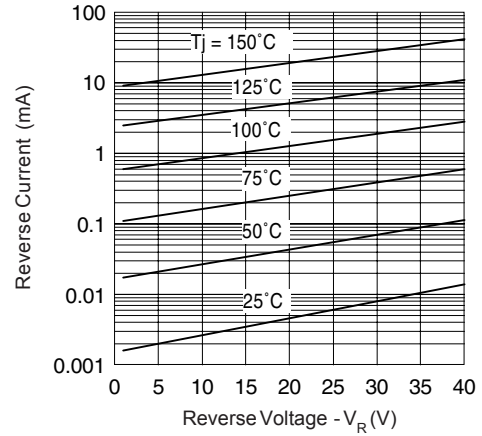


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

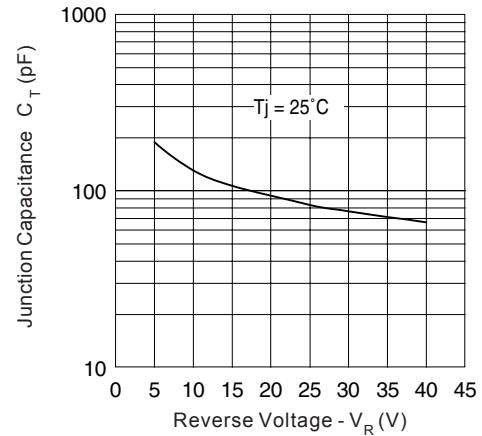


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

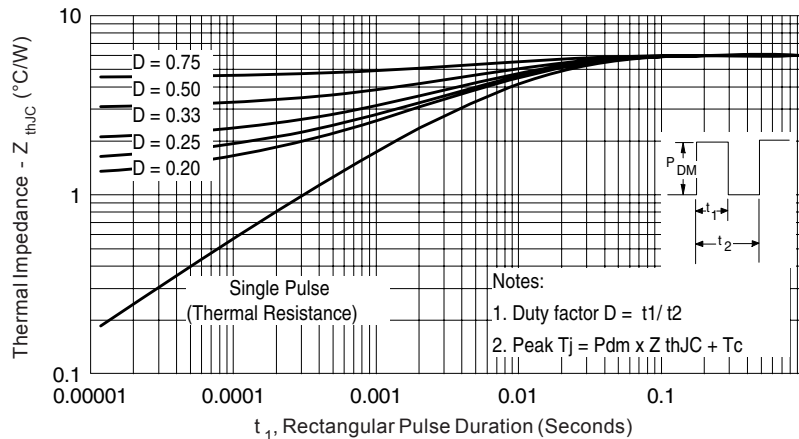


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

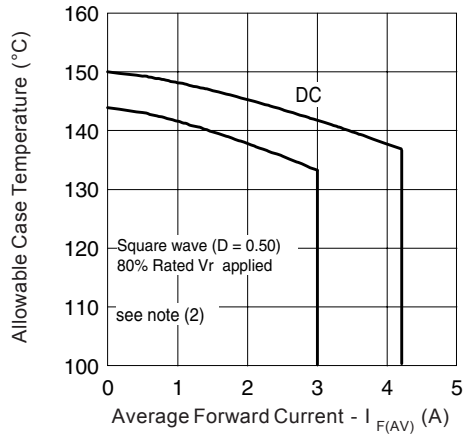


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

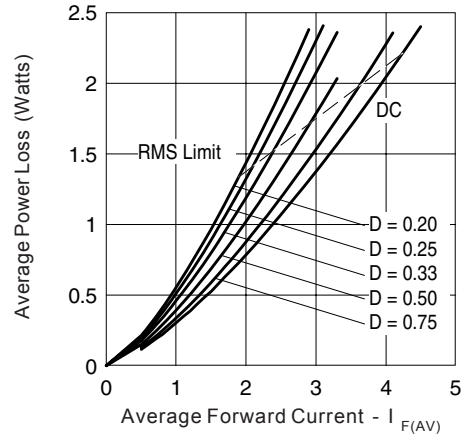


Fig. 6 - Forward Power Loss Characteristics

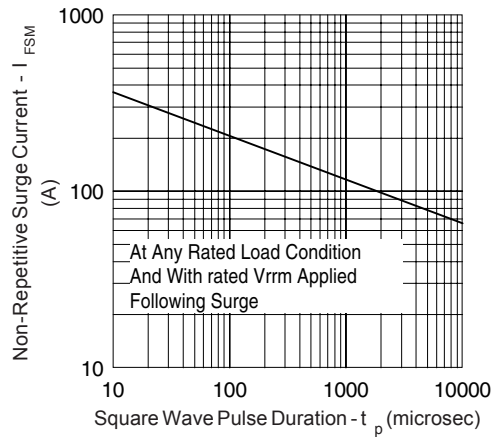


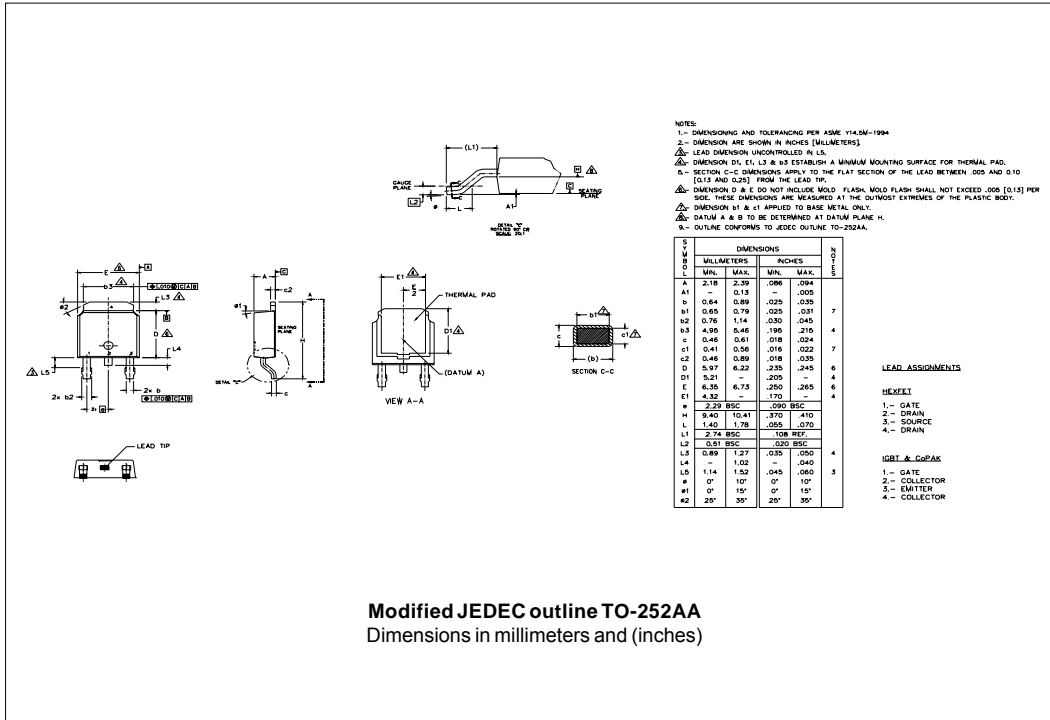
Fig. 7 - Maximum Non-Repetitive Surge Current

(2) Formula used:  $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$ ;

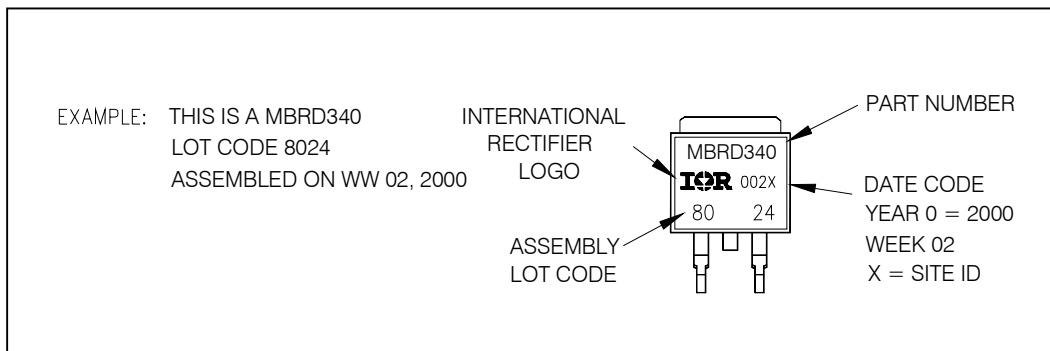
$Pd$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

$Pd_{REV}$  = Inverse Power Loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 80\%$  rated  $V_R$

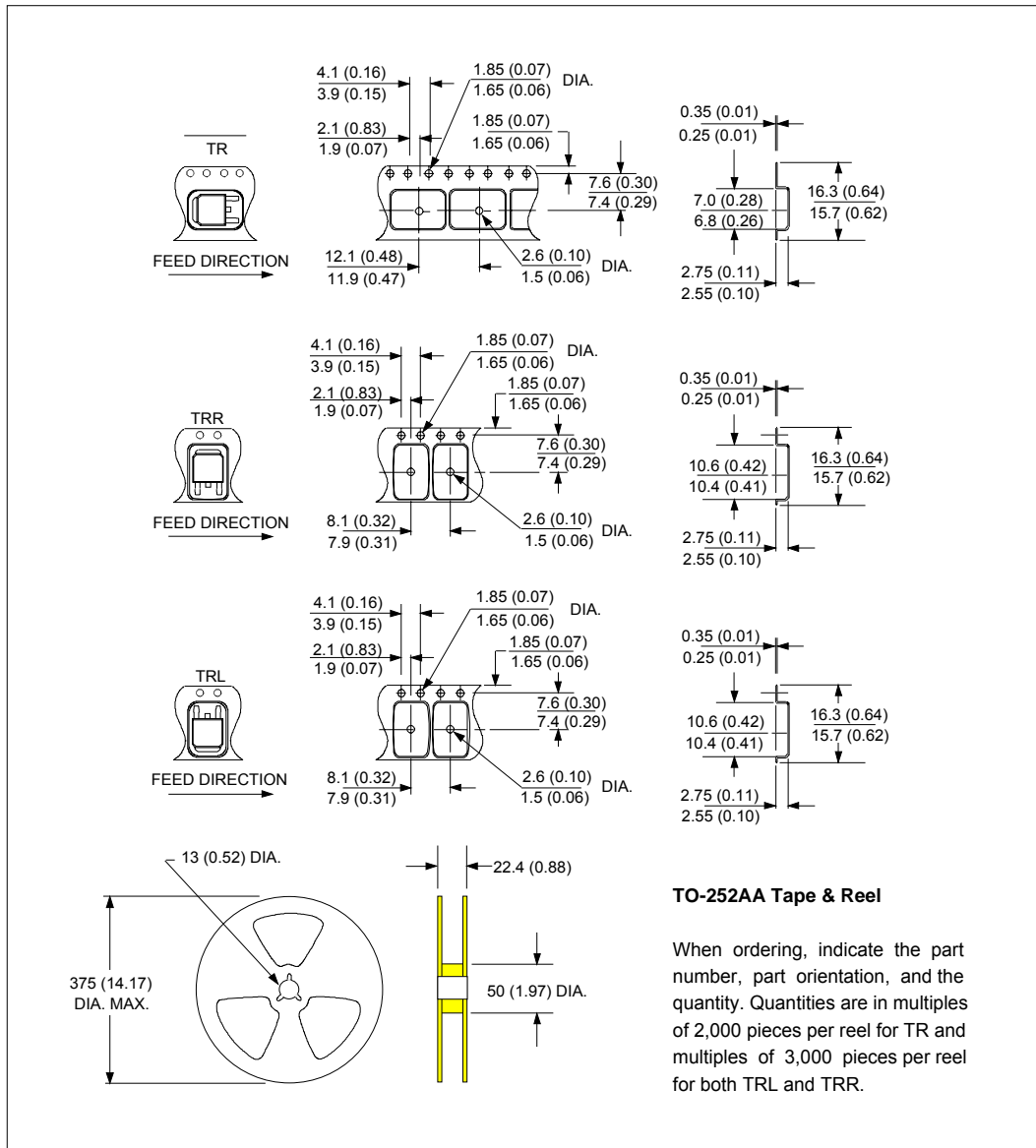
Outline Table



Part Marking Information



Tape & Reel Information



**TO-252AA Tape & Reel**

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 2,000 pieces per reel for TR and multiples of 3,000 pieces per reel for both TRL and TRR.

Ordering Information Table

Device Code					
MBR	D	3	40	TR	-
①	②	③	④	⑤	⑥
<b>1</b>	-	Schottky MBR Series			
<b>2</b>	-	D = D-Pak (TO-252AA)			
<b>3</b>	-	Current Rating (3 = 3A)			
<b>4</b>	-	Voltage Ratings			
<b>5</b>	-	<ul style="list-style-type: none"> <li>• none = Tube (50 pieces)</li> <li>• TR = Tape &amp; Reel</li> <li>• TRL = Tape &amp; Reel (Left Oriented)</li> <li>• TRR = Tape &amp; Reel (Right Oriented)</li> </ul>			
<b>6</b>	-	<ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>			

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.



## 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.