

International
IOR Rectifier

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 μ 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

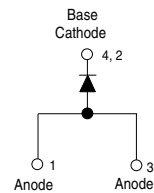
The MBRD320, MBRD330, MBRD340 surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- 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 _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°C, rectangular wave form
I _{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	490	A	5µs Sine or 3µs Rect. pulse
	75		10ms Sine or 6ms Rect. pulse
E _{AS} Non Repetitive Avalanche Energy	8.0	mJ	T _J = 25 °C, I _{AS} = 1Amp, L = 16mH
I _{AR} Repetitive Avalanche Current	1.0	A	Current decaying linearly to zero in 1 µsec Frequency limited by T _J max. Va = 1.5 x Vr typical

Electrical Specifications

Parameters	Typ.	Max.	Units	Conditions
V _{FM} 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 _{RM} Max. Reverse Leakage Current (1) See Fig. 2	0.02	0.2	mA	T _J = 25 °C
	10.7	20	mA	T _J = 125 °C
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		

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

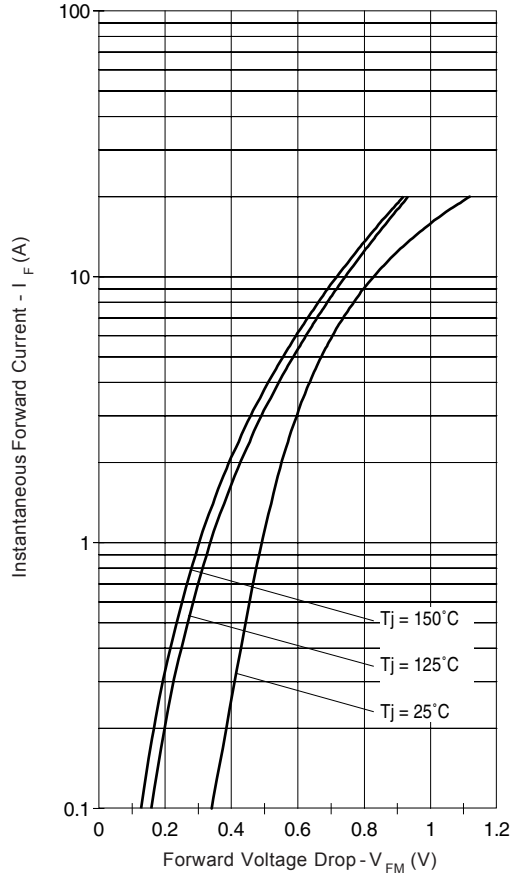


Fig. 1 - Maximum Forward Voltage Drop Characteristics

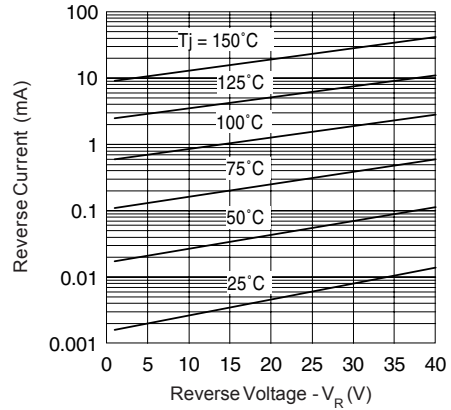


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

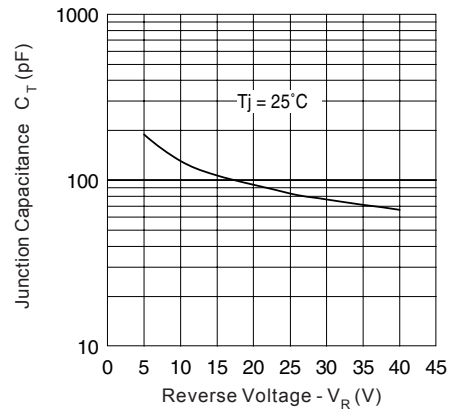


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

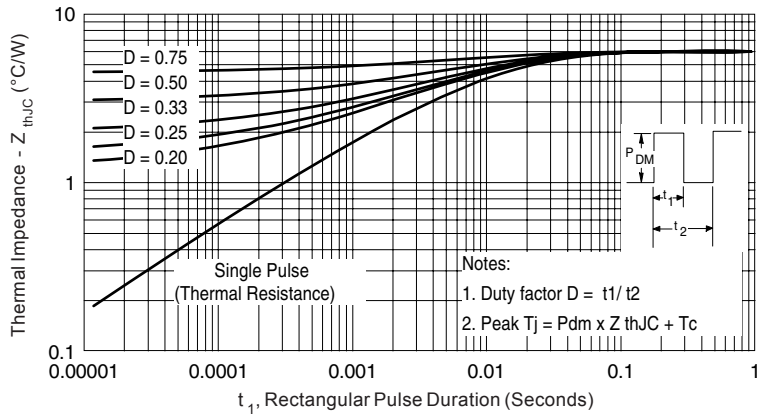


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

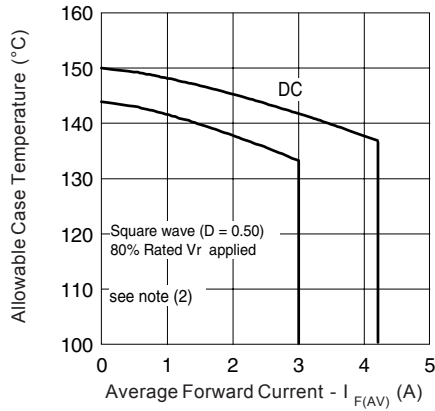


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

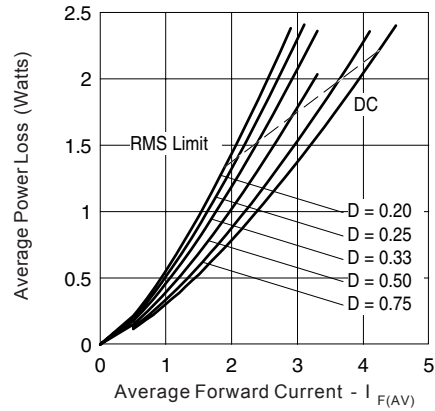


Fig. 6 - Forward Power Loss Characteristics

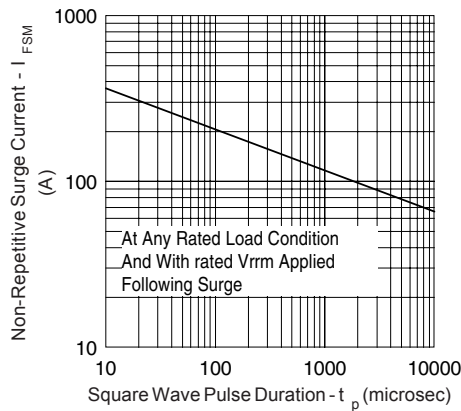


Fig. 7 - Maximum Non-Repetitive Surge Current

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

Outline Table

NOTES:

- 1.- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
- 2.- DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS]
- 3.- LEAD DIMENSION UNCONTROLLED IN L.S.
- 4.- DIMENSION D1, E1, L3 & R3 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD.
- 5.- SECTION C-C DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN .005 AND 0.10 [0.13 AND .025] FROM THE LEAD TIP.
- 6.- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005 [0.13] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
- 7.- DIMENSION S1 & S2 APPLIED TO BASE METAL ONLY.
- 8.- DATUM A & B TO BE DETERMINED AT DATUM PLANE M.
- 9.- OUTLINE CONFORMS TO JEDEC OUTLINE TO-252AA.

DIMENSION	MILLIMETERS		INCHES		TYPICAL
	MIN.	MAX.	MIN.	MAX.	
A	2.18	2.30	.086	.091	
A1	-	0.13	-	.005	
B	0.64	0.80	.025	.031	7
B1	0.63	0.79	.025	.031	7
B2	0.76	1.14	.030	.045	4
B3	4.90	5.46	.193	.215	4
C	0.40	0.61	.016	.024	7
C1	0.41	0.56	.016	.022	7
C2	0.48	0.89	.018	.035	6
D	0.97	0.22	.038	.009	4
D1	0.21	-	.008	-	4
E	0.20	0.73	.008	.029	6
E1	4.32	-	.170	-	4
F	2.28	85C	.090	85C	
H	8.40	10.41	.330	.410	
L	1.40	1.78	.055	.070	
L1	2.74	85C	.108	85C	
L2	0.51	85C	.020	85C	
L3	0.89	1.27	.035	.050	4
L4	-	1.02	-	.040	3
L5	1.14	1.52	.045	.060	4
M	0°	10°	0°	10°	
M1	0°	15°	0°	15°	
M2	20°	30°	20°	30°	

LEAD ASSIGNMENTS

JEDEC

- 1.- CATE
- 2.- DRAIN
- 3.- SOURCE
- 4.- DRAIN

ISBT & CADAC

- 1.- CATE
- 2.- COLLECTOR
- 3.- EMITTER
- 4.- COLLECTOR

Modified JEDEC outline TO-252AA
Dimensions in millimeters and (inches)

Part Marking Information

EXAMPLE: THIS IS A MBRD340
LOT CODE 8024
ASSEMBLED ON WW 02, 2000

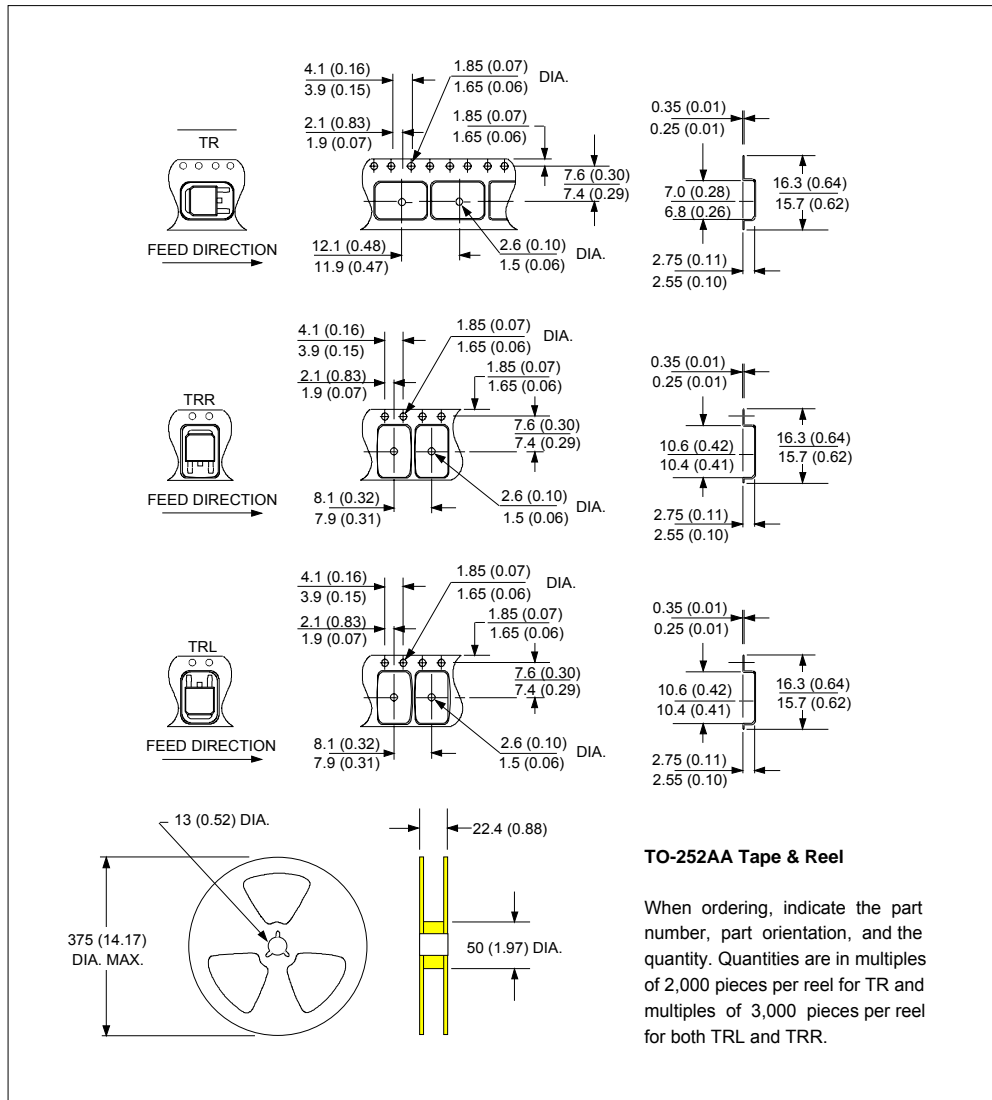
INTERNATIONAL
RECTIFIER
LOGO

ASSEMBLY
LOT CODE

PART NUMBER

DATE CODE
YEAR 0 = 2000
WEEK 02
X = SITE ID

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
1	- Schottky MBR Series
2	- D = D-Pak (TO-252AA)
3	- Current Rating (3 = 3A)
4	- Voltage Ratings
5	- <ul style="list-style-type: none"> • none = Tube (50 pieces) • TR = Tape & Reel • TRL = Tape & Reel (Left Oriented) • TRR = Tape & Reel (Right Oriented)
6	- <ul style="list-style-type: none"> • 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.



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.

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