Bulletin PD-21096 rev. B 08/06

International
IOR Rectifier

MBRD3..PbF SERIES

SCHOTTKY RECTIFIER 3.0 Amp

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

Major Ratings and Characteristics

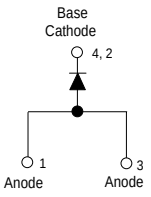
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.0	A
V_{RRM}	20/40	V
I_{FSM} @tp = 5 µs sine	490	A
V_F @3 Apk, T_J = 125°C	0.49	V
T_J	-40 to 150	°C

Description/ Features

The MBRD320PbF, MBRD330PbF, MBRD340PbF 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
- Lead-Free ("PbF" suffix)

Case Styles



D-PAK (TO-252AA)

Voltage Ratings

	Part number	MBRD320PbF	MBRD330PbF	MBRD340PbF
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	490		5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current	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)	0.48	0.6	V	@ 3A	T_J = 25 °C
	See Fig. 1	0.58	0.7	V	@ 6A	
		0.41	0.49	V	@ 3A	T_J = 125 °C
		0.55	0.625	V	@ 6A	
I_{RM}	Max. Reverse Leakage Current (1)	0.02	0.2	mA	T_J = 25 °C	V_R = rated V_R
	See Fig. 2	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		

(*) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink

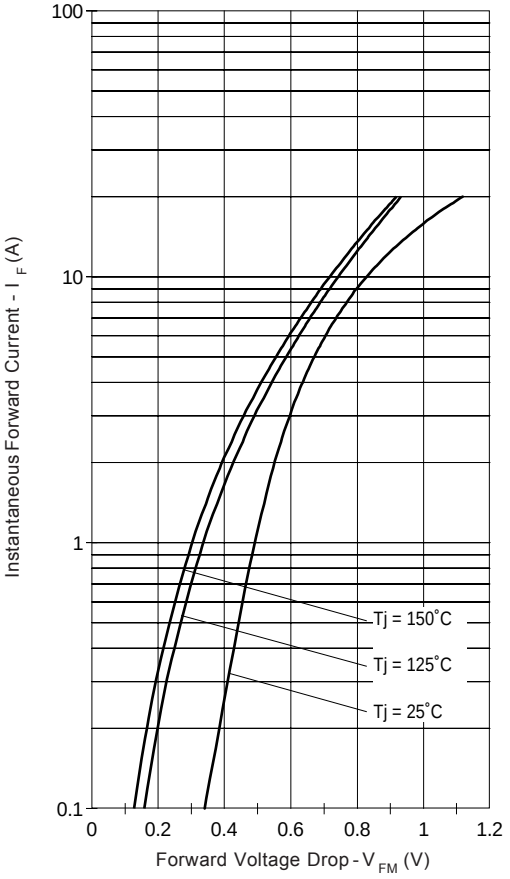


Fig. 1 - Maximum Forward Voltage Drop Characteristics

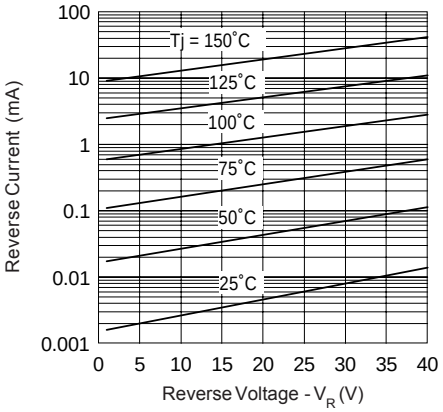


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

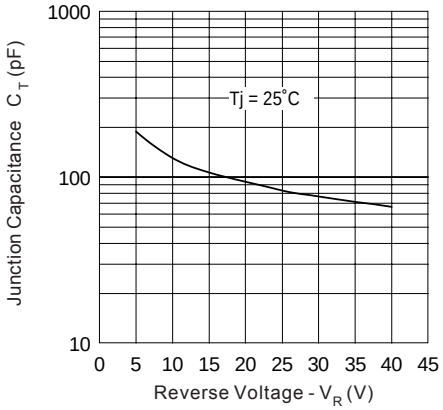


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

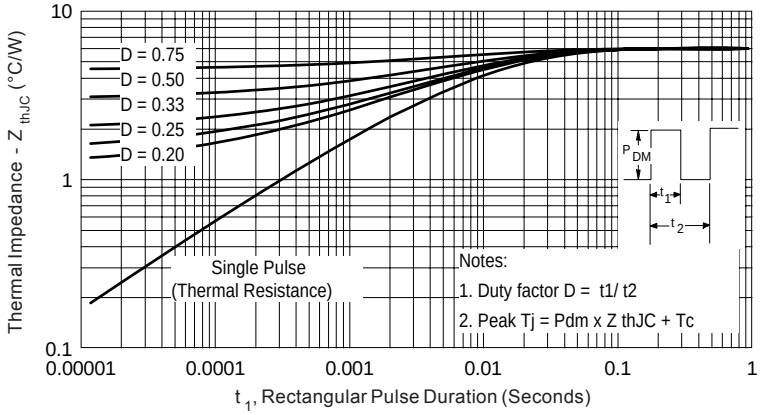


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

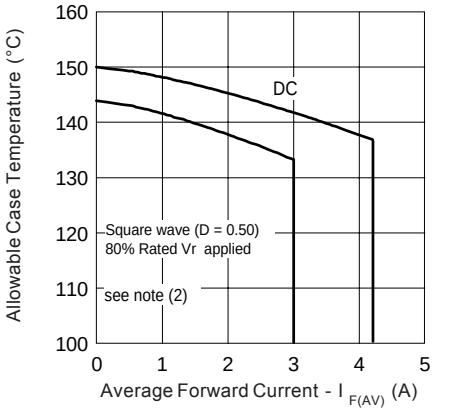


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

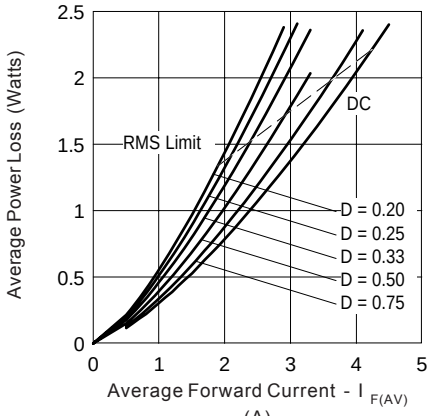


Fig. 6 - Forward Power Loss Characteristics

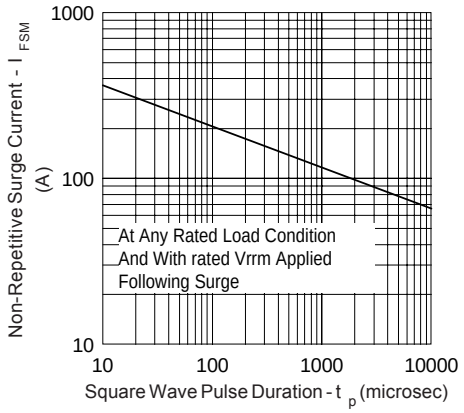
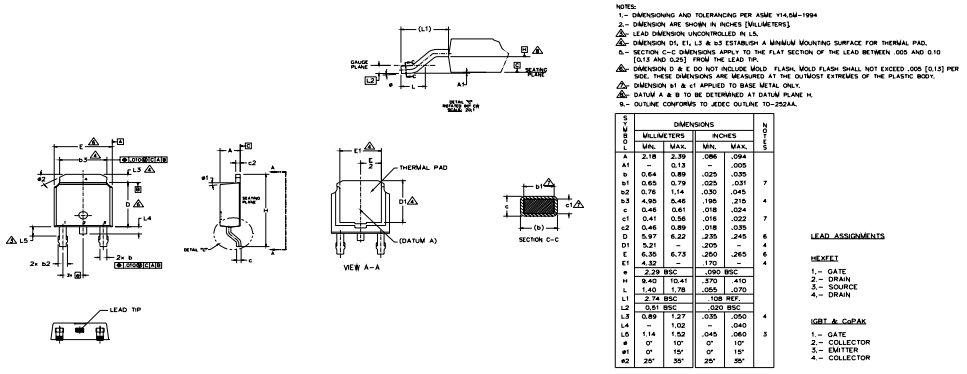


Fig. 7 - Maximum Non-Repetitive Surge Current

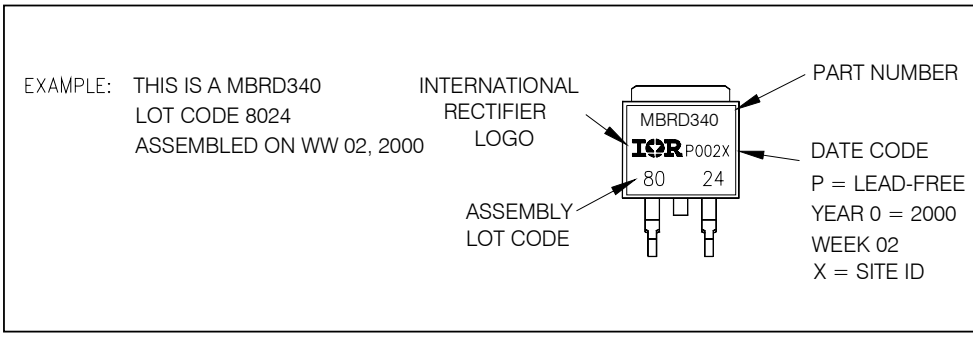
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Outline Table

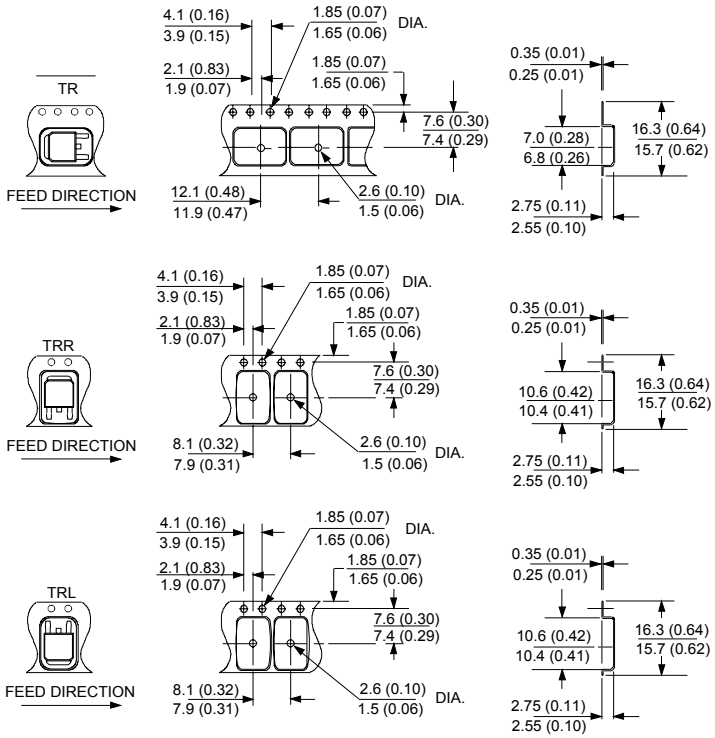


Modified JEDEC outline TO-252AA
Dimensions in millimeters and (inches)

Part Marking Information



Tape & Reel Information

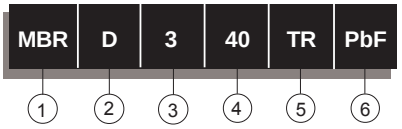


TO-252AA Tape & Reel

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



1	-	Schottky MBR Series
2	-	D = TO252AA (D-Pak)
3	-	Currrent Rating (3 = 3A)
4	-	Voltage Ratings — 20 = 20V, 30 = 30V, 40 = 40V
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

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

International
IOR Rectifier

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05/06

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