

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} @ $t_p = 5\mu\text{s}$ 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

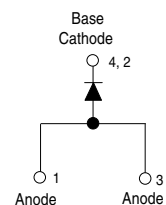
The MBRD320, MBRD330, MBRD340 surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- 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 @ $T_L = 133^\circ\text{C}$, rectangular wave form |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current | 490 75 | | 5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse |
| 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 | @ 3A $T_J = 25^\circ\text{C}$ |
| | 0.58 | 0.7 | V | @ 6A |
| | 0.41 | 0.49 | V | @ 3A $T_J = 125^\circ\text{C}$ |
| | 0.55 | 0.625 | V | @ 6A |
| I_{RM} Max. Reverse Leakage Current (1) See Fig. 2 | 0.02 | 0.2 | mA | $T_J = 25^\circ\text{C}$ |
| | 10.7 | 20 | mA | $T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$ |
| 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 < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

| Parameters | Value | Units | Conditions |
|--|------------|--------------------|---------------------------|
| T_J Max. Junction Temperature Range (*) | -40 to 150 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -40 to 175 | $^\circ\text{C}$ | |
| R_{thJC} Max. Thermal Resistance Junction to Case | 6.0 | $^\circ\text{C/W}$ | DC operation * See Fig. 4 |
| R_{thJA} Max. Thermal Resistance Junction to Ambient | 80 | $^\circ\text{C/W}$ | |
| 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

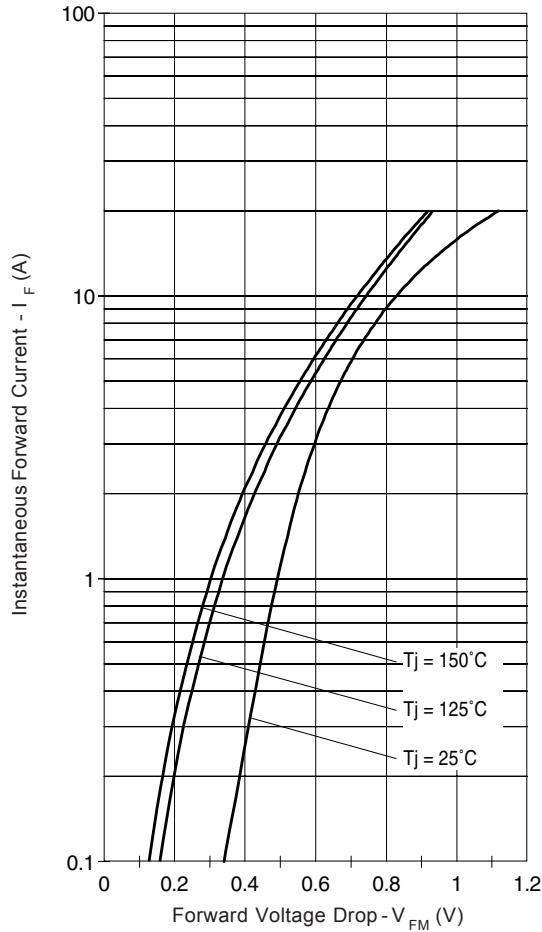


Fig. 1 - Maximum Forward Voltage Drop Characteristics

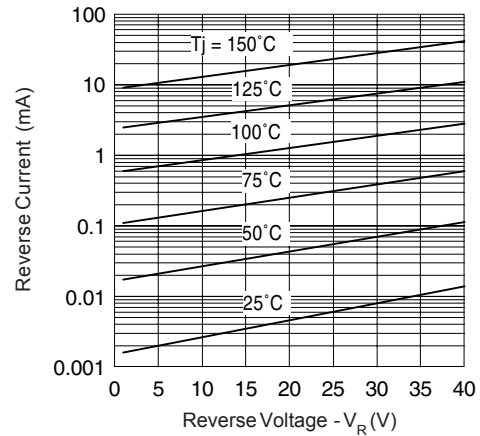


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

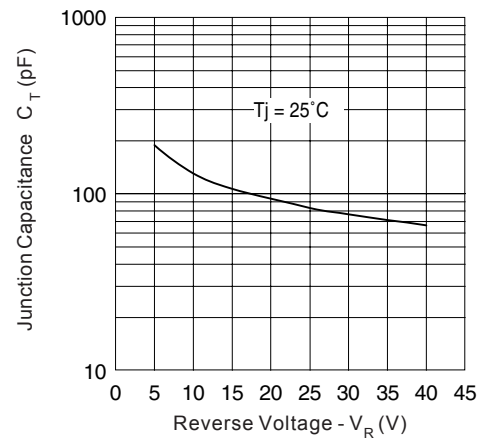


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

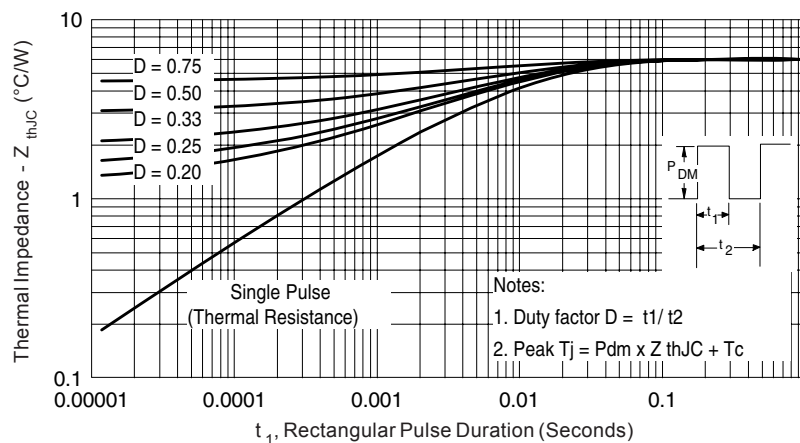


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

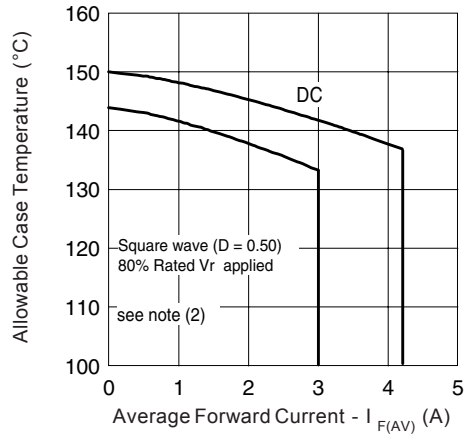


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

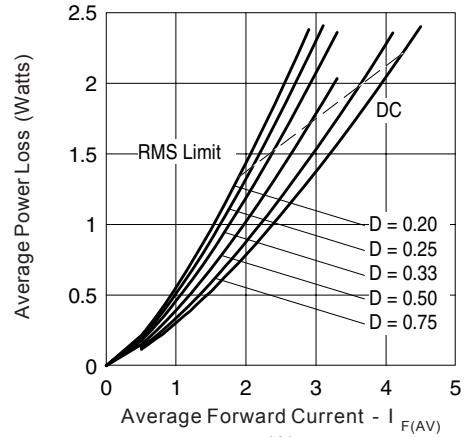


Fig. 6 - Forward Power Loss Characteristics

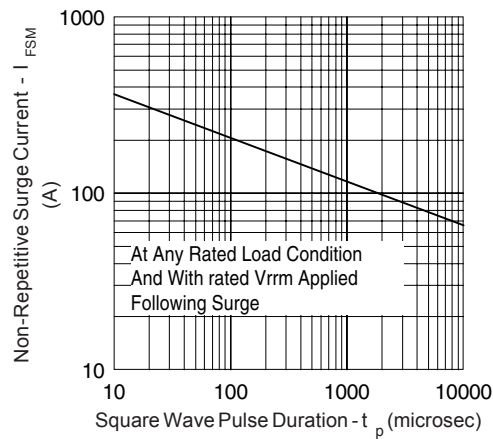


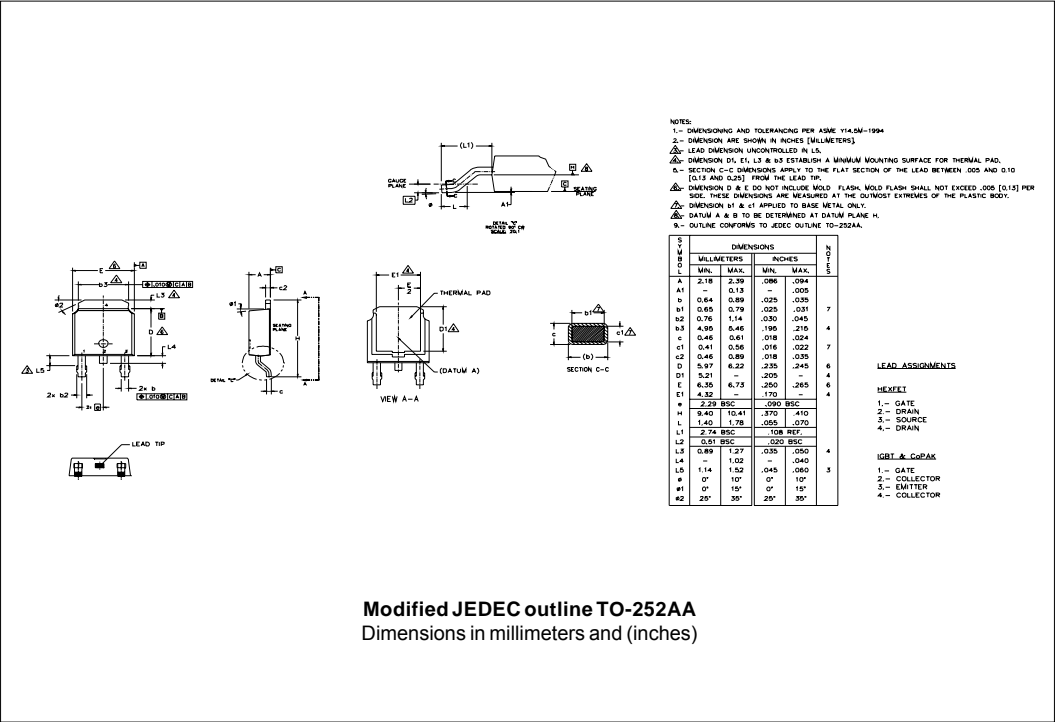
Fig. 7 - Maximum Non-Repetitive Surge Current

(2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

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

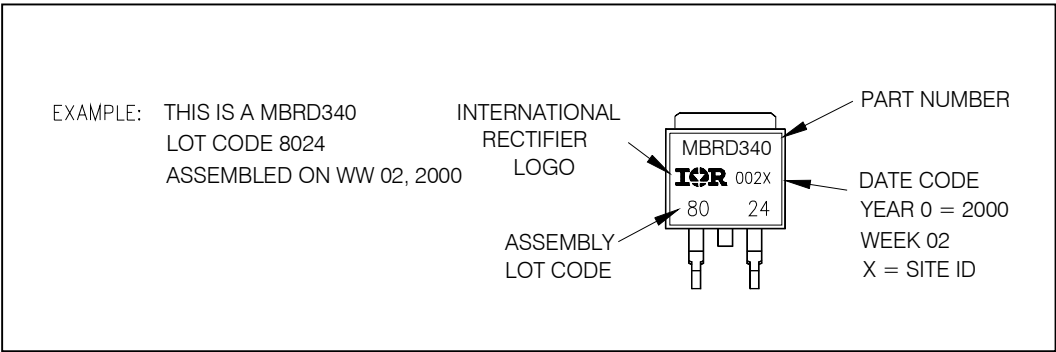
$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R

Outline Table

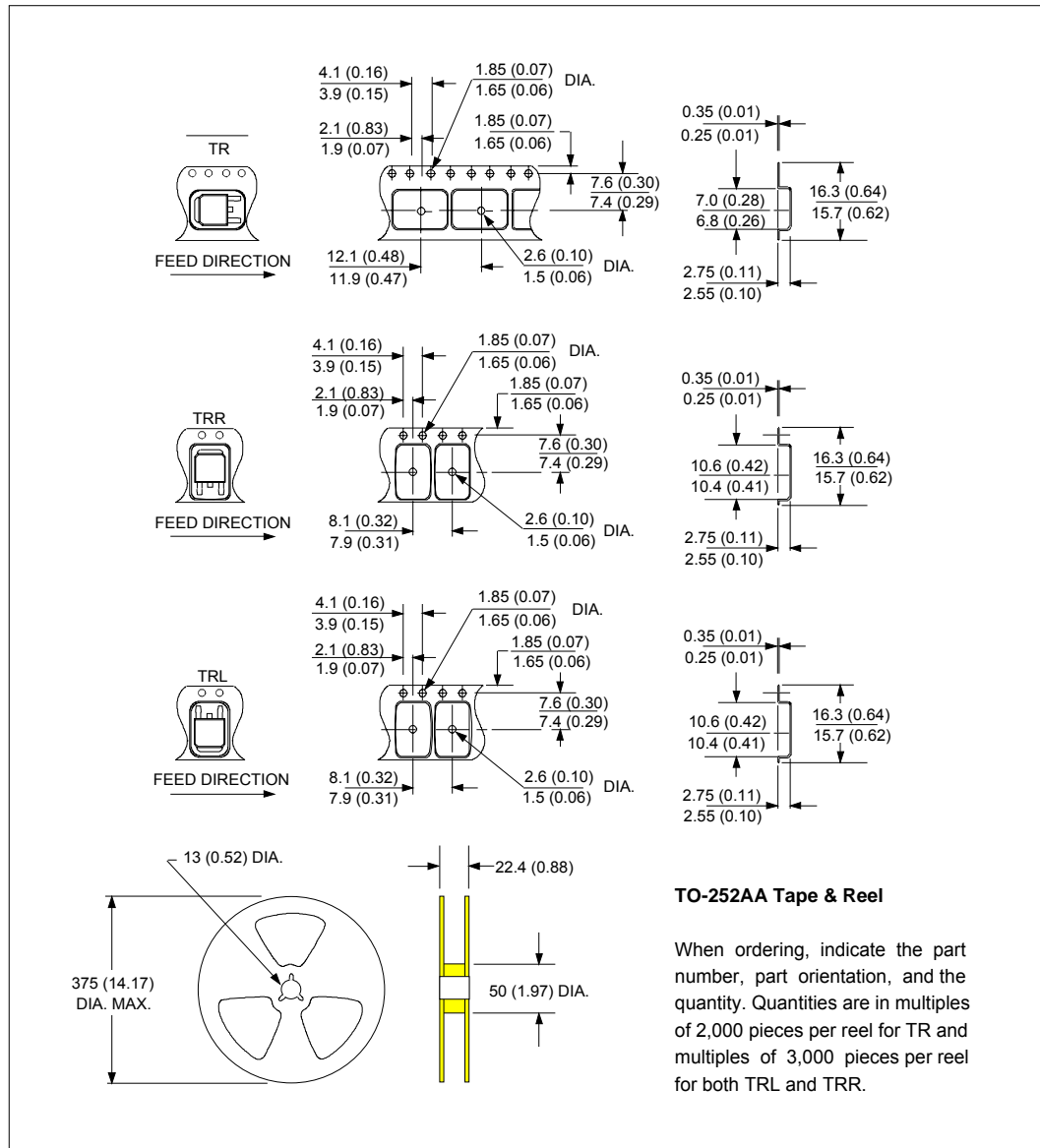


Modified JEDEC outline TO-252AA
Dimensions in millimeters and (inches)

Part Marking Information



Tape & Reel Information



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.

International
IR Rectifier

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