

# Axial Lead Rectifiers

... employing the Schottky Barrier principle in a large area metal-to-silicon power diode. State-of-the-art geometry features epitaxial construction with oxide passivation and metal overlap contact. Ideally suited for use as rectifiers in low-voltage, high-frequency inverters, free wheeling diodes, and polarity protection diodes.

- Extremely Low  $v_F$
- Low Power Loss/High Efficiency
- Highly Stable Oxide Passivated Junction
- Low Stored Charge, Majority Carrier Conduction

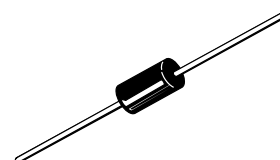
## Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 1.1 gram (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 220°C Max. for 10 Seconds, 1/16" from case
- Shipped in plastic bags, 5,000 per bag
- Available Tape and Reeled, 1500 per reel, by adding a "RL" suffix to the part number
- Polarity: Cathode indicated by Polarity Band
- Marking: B320, B330, B340, B350, B360

**MBR320**  
**MBR330**  
**MBR340**  
**MBR350**  
**MBR360**

MBR340 and MBR360 are  
Motorola Preferred Devices

**SCHOTTKY BARRIER**  
**RECTIFIERS**  
**3.0 AMPERES**  
**20, 30, 40, 50, 60 VOLTS**



**CASE 267-03**  
**PLASTIC**

## MAXIMUM RATINGS

| Rating                                                                                                                                         | Symbol                          | MBR320        | MBR330 | MBR340 | MBR350 | MBR360 | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------|--------|--------|--------|--------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                                                         | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 20            | 30     | 40     | 50     | 60     | V    |
| Average Rectified Forward Current, $T_A = 65^\circ\text{C}$<br>( $R_{\theta JA} = 28^\circ\text{C/W}$ , P.C. Board Mounting, see Note 3)       | $I_O$                           | 3.0           |        |        |        |        | A    |
| Non-Repetitive Peak Surge Current (2)<br>(Surge applied at rated load conditions, half wave,<br>single phase 60 Hz, $T_L = 75^\circ\text{C}$ ) | $I_{FSM}$                       | 80            |        |        |        |        | A    |
| Operating and Storage Junction<br>Temperature Range (Reverse Voltage applied)                                                                  | $T_J, T_{stg}$                  | - 65 to 150°C |        |        |        |        | °C   |
| Peak Operating Junction Temperature<br>(Forward Current applied)                                                                               | $T_{J(pk)}$                     | 150           |        |        |        |        | °C   |

## THERMAL CHARACTERISTICS

| Characteristic                                                          | Symbol          | Max | Unit |
|-------------------------------------------------------------------------|-----------------|-----|------|
| Thermal Resistance, Junction to Ambient (see Note 3, Mounting Method 3) | $R_{\theta JA}$ | 28  | °C/W |

## ELECTRICAL CHARACTERISTICS ( $T_L = 25^\circ\text{C}$ unless otherwise noted) (2)

| Characteristic                                                                                                               | Symbol | MBR320                  | MBR330 | MBR340 | MBR350                  | MBR360 | Unit |
|------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------|--------|--------|-------------------------|--------|------|
| Maximum Instantaneous Forward Voltage (1)<br>( $i_F = 1.0$ Amp)<br>( $i_F = 3.0$ Amp)<br>( $i_F = 9.4$ Amp)                  | $v_F$  | 0.500<br>0.600<br>0.850 |        |        | 0.600<br>0.740<br>1.080 |        | V    |
| Maximum Instantaneous Reverse Current @ Rated dc<br>Voltage (1)<br>$T_L = 25^{\circ}\text{C}$<br>$T_L = 100^{\circ}\text{C}$ | $i_R$  | 0.60<br>20              |        |        |                         |        | mA   |

(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle = 2.0%.

(2) Lead Temperature reference is cathode lead 1/32" from case.

**Preferred** devices are Motorola recommended choices for future use and best overall value.



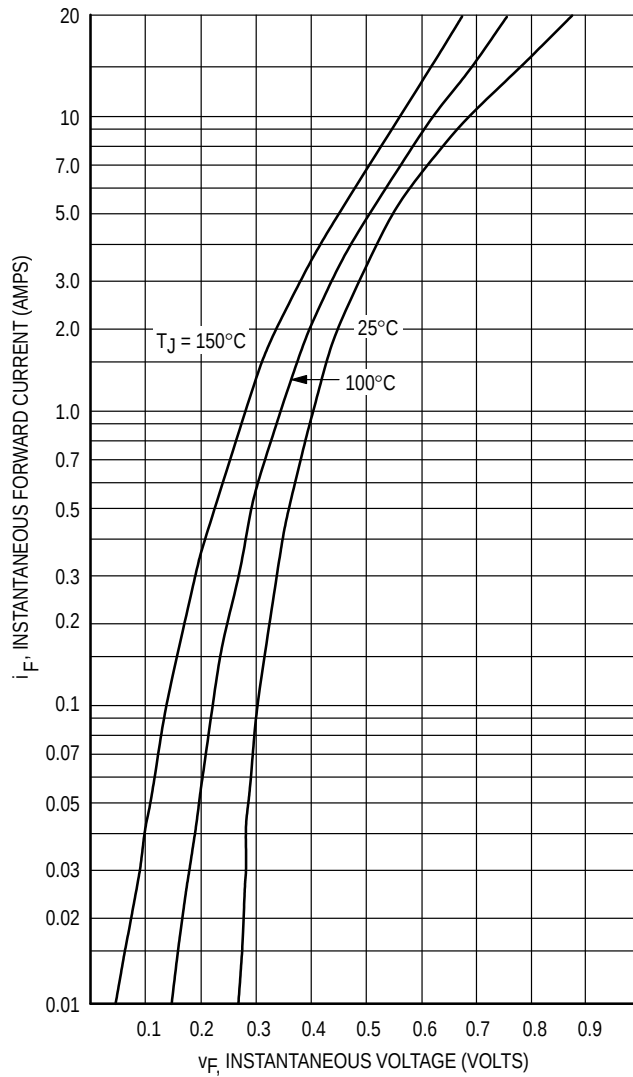


Figure 1. Typical Forward Voltage

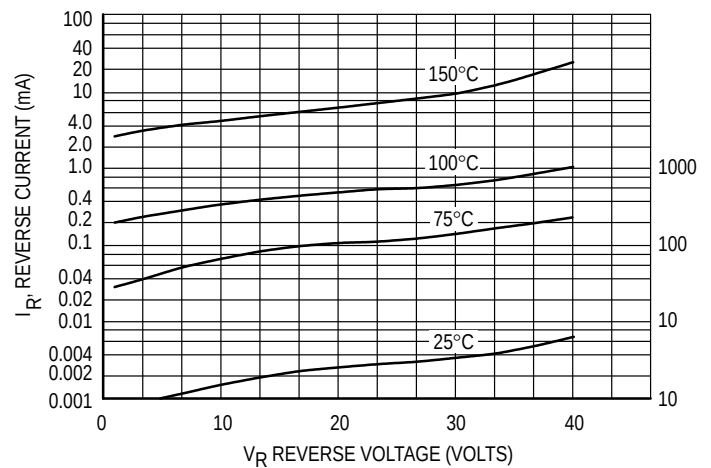


Figure 2. Typical Reverse Current\*

\*The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if  $V_R$  is sufficiently below rated  $V_R$ .

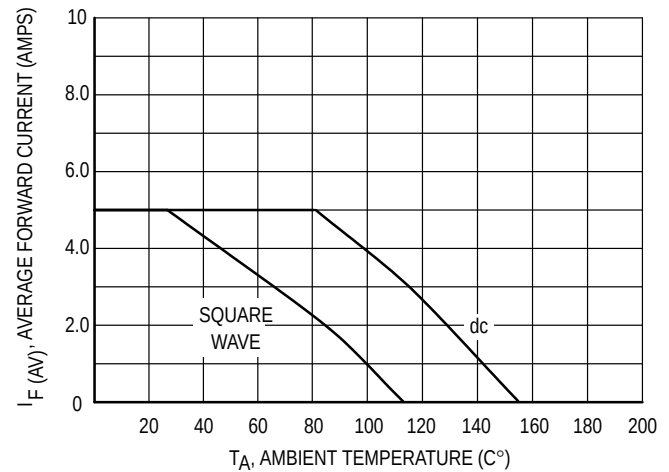


Figure 3. Current Derating  
(Mounting method #3 per note 1)

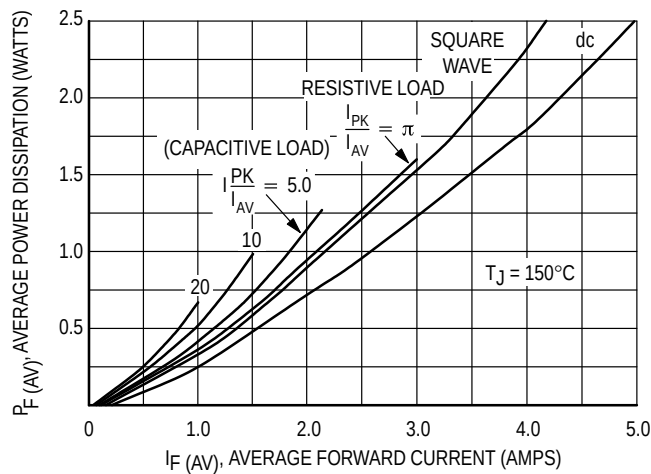


Figure 4. Power Dissipation

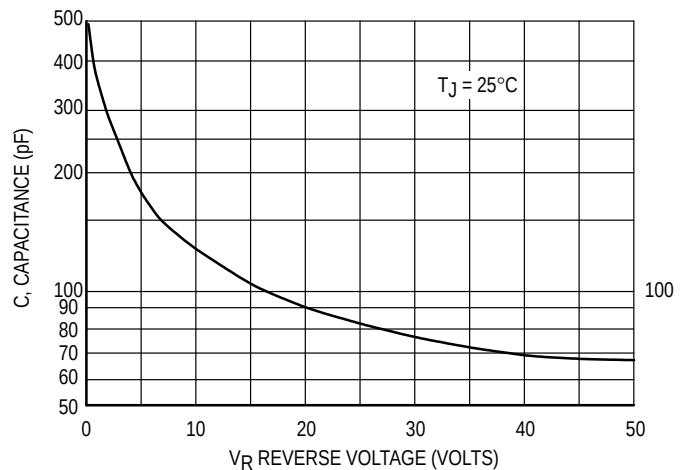


Figure 5. Typical Capacitance

MBR350 AND 360

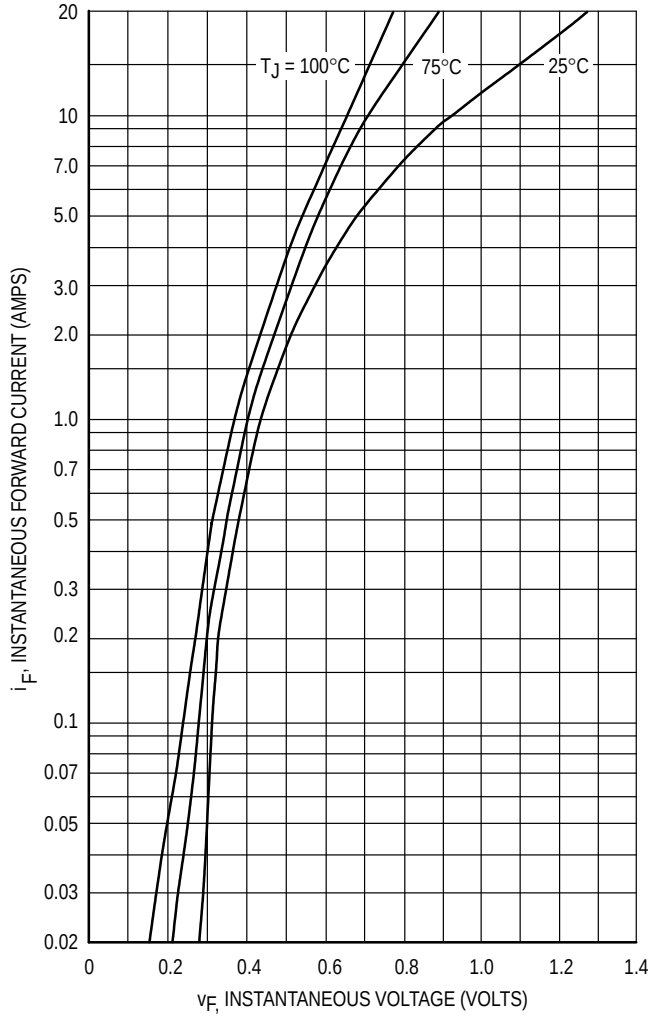


Figure 6. Typical Forward Voltage

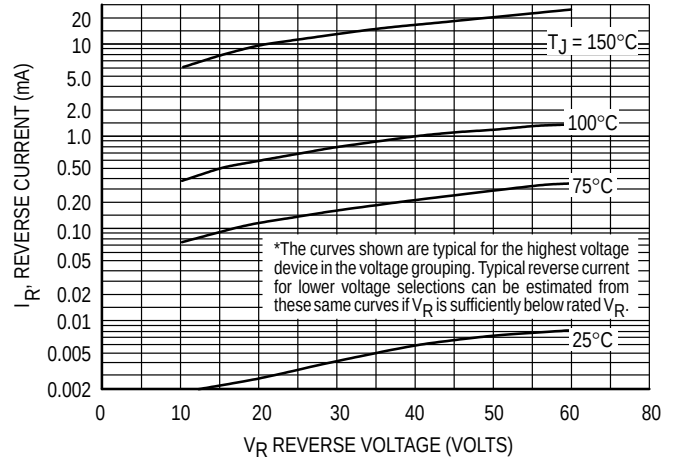


Figure 7. Typical Reverse Current\*

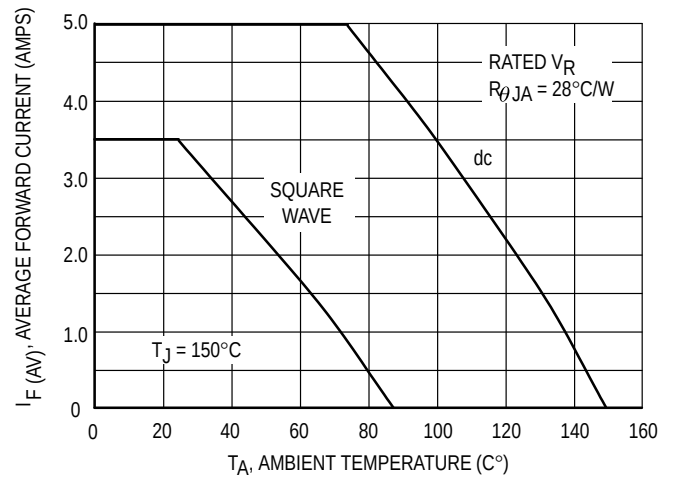


Figure 8. Current Derating Ambient  
(Mounting method #3 per note 1)

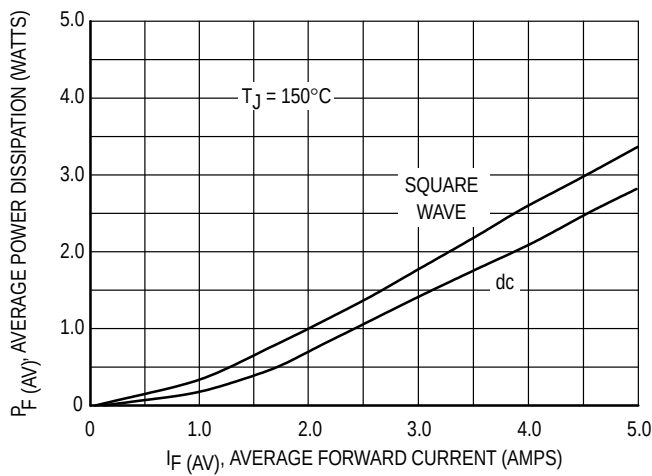


Figure 9. Power Dissipation

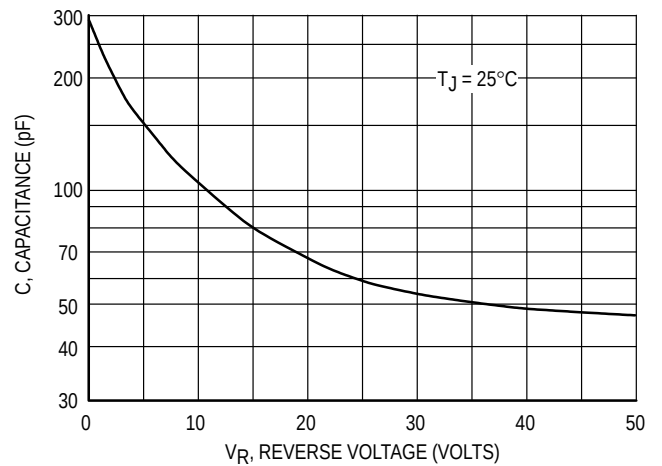


Figure 10. Typical Capacitance

**NOTE 1 — MOUNTING DATA**

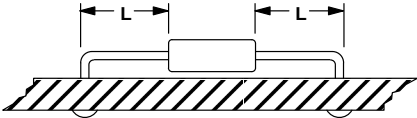
Data shown for thermal resistance junction-to-ambient ( $R_{\theta JA}$ ) for the mountings shown is to be used as typical guideline values for preliminary engineering, or in case the tie point temperature cannot be measured.

**TYPICAL VALUES FOR  $R_{\theta JA}$  IN STILL AIR**

| Mounting Method | Lead Length, L (in) |     |     |     | $R_{\theta JA}$      |
|-----------------|---------------------|-----|-----|-----|----------------------|
|                 | 1/8                 | 1/4 | 1/2 | 3/4 |                      |
| 1               | 50                  | 51  | 53  | 55  | $^{\circ}\text{C/W}$ |
| 2               | 58                  | 59  | 61  | 63  | $^{\circ}\text{C/W}$ |
| 3               | 28                  |     |     |     | $^{\circ}\text{C/W}$ |

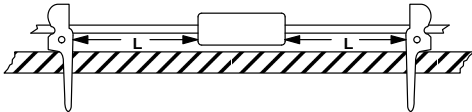
**Mounting Method 1**

P.C. Board where available copper surface is small.



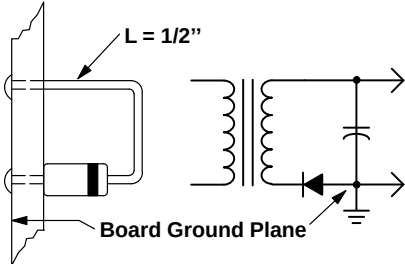
**Mounting Method 2**

Vector Push-In  
Terminals T-28

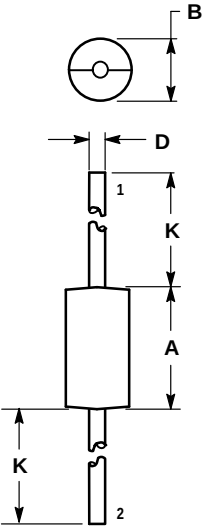


**Mounting Method 3**

P.C. Board with  
2-1/2" X 2-1/2"  
copper surface.



PACKAGE DIMENSIONS



- NOTES:
- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  - 2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES |       | MILLIMETERS |      |
|-----|--------|-------|-------------|------|
|     | MIN    | MAX   | MIN         | MAX  |
| A   | 0.370  | 0.380 | 9.40        | 9.65 |
| B   | 0.190  | 0.210 | 4.83        | 5.33 |
| D   | 0.048  | 0.052 | 1.22        | 1.32 |
| K   | 1.000  | —     | 25.40       | —    |

STYLE 1:  
PIN 1. CATHODE  
2. ANODE

CASE 267-03  
ISSUE C

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**MBR320/D**