

# MBRD320G, SBRD8320G, MBRD330G, SBRD8330G, MBRD340G, SBRD8340G, MBRD350G, SBRD8350G, MBRD360G, SBRD8360G

MBRD320, MBRD340 and MBRD360 are Preferred Devices

## SWITCHMODE Power Rectifiers

### DPAK Surface Mount Package

These state-of-the-art devices are designed for use as output rectifiers, free wheeling, protection and steering diodes in switching power supplies, inverters and other inductive switching circuits.

#### Features

- Extremely Fast Switching
- Extremely Low Forward Drop
- Platinum Barrier with Avalanche Guardrings
- AEC-Q101 Qualified and PPAP Capable
- SBRD8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

#### Mechanical Characteristics:

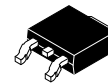
- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes; 260°C Max. for 10 Seconds
- ESD Ratings:
  - ◆ Machine Model = C
  - ◆ Human Body Model = 3B



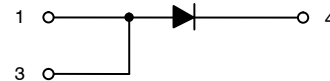
ON Semiconductor®

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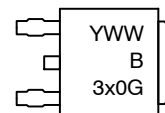
### SCHOTTKY BARRIER RECTIFIERS 3.0 AMPERES, 20 – 60 VOLTS



DPAK  
CASE 369C



#### MARKING DIAGRAM



Y = Year  
WW = Work Week  
B3x0 = Device Code  
x = 2, 3, 4, 5, or 6  
G = Pb-Free Package

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

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

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

**MBRD320G, SBRD8320G, MBRD330G, SBRD8330G, MBRD340G, SBRD8340G,  
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**MAXIMUM RATINGS**

| Rating   | Symbol                          | MBRD/SBRD8  |     |     |     |     | Unit             |
|--|---------------------------------|-------------|-----|-----|-----|-----|------------------|
|  |                                 | 320         | 330 | 340 | 350 | 360 |                  |
| 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 ( $T_C = +125^\circ\text{C}$ , Rated $V_R$ )                             | $I_{F(AV)}$                     | 3           |     |     |     |     | A                |
| Peak Repetitive Forward Current, $T_C = +125^\circ\text{C}$<br>(Rated $V_R$ , Square Wave, 20 kHz)         | $I_{FRM}$                       | 6           |     |     |     |     | A                |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 75          |     |     |     |     | A                |
| Peak Repetitive Reverse Surge Current (2 $\mu\text{s}$ , 1 kHz)  | $I_{RRM}$                       | 1           |     |     |     |     | A                |
| Operating Junction Temperature Range (Note 1)  | $T_J$                           | -65 to +175 |     |     |     |     | $^\circ\text{C}$ |
| Storage Temperature Range  | $T_{stg}$                       | -65 to +175 |     |     |     |     | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated $V_R$ )  | $dv/dt$                         | 10,000      |     |     |     |     | V/ $\mu\text{s}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient:  $dP_D/dT_J < 1/R_{\theta JA}$ .

**THERMAL CHARACTERISTICS**

| Characteristic   | Symbol          | Value | Unit                      |
|--|-----------------|-------|---------------------------|
| Maximum Thermal Resistance, Junction-to-Case             | $R_{\theta JC}$ | 6     | $^\circ\text{C}/\text{W}$ |
| Maximum Thermal Resistance, Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 80    | $^\circ\text{C}/\text{W}$ |

2. Rating applies when surface mounted on the minimum pad size recommended.

**ELECTRICAL CHARACTERISTICS**

| Characteristic   | Symbol | Value                       | Unit |
|--|--------|-----------------------------|------|
| Maximum Instantaneous Forward Voltage (Note 3)<br>$i_F = 3$ Amps, $T_C = +25^\circ\text{C}$<br>$i_F = 3$ Amps, $T_C = +125^\circ\text{C}$<br>$i_F = 6$ Amps, $T_C = +25^\circ\text{C}$<br>$i_F = 6$ Amps, $T_C = +125^\circ\text{C}$ | $V_F$  | 0.6<br>0.45<br>0.7<br>0.625 | V    |
| Maximum Instantaneous Reverse Current (Note 3)<br>(Rated dc Voltage, $T_C = +25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_C = +125^\circ\text{C}$ )  | $i_R$  | 0.2<br>20                   | mA   |

3. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

**ORDERING INFORMATION**

| Device      | Package           | Shipping <sup>†</sup> |
|-------------|-------------------|-----------------------|
| MBRD320G    | DPAK<br>(Pb-Free) | 75 Units / Rail       |
| SBRD8320G   | DPAK<br>(Pb-Free) | 75 Units / Rail       |
| MBRD320RLG  | DPAK<br>(Pb-Free) | 1,800 Tape & Reel     |
| MBRD320T4G  | DPAK<br>(Pb-Free) | 2,500 Tape & Reel     |
| SBRD8320T4G | DPAK<br>(Pb-Free) | 2,500 Tape & Reel     |
| MBRD330G    | DPAK<br>(Pb-Free) | 75 Units / Rail       |
| SBRD8330G   | DPAK<br>(Pb-Free) | 75 Units / Rail       |

**MBRD320G, SBRD8320G, MBRD330G, SBRD8330G, MBRD340G, SBRD8340G,  
MBRD350G, SBRD8350G, MBRD360G, SBRD8360G**

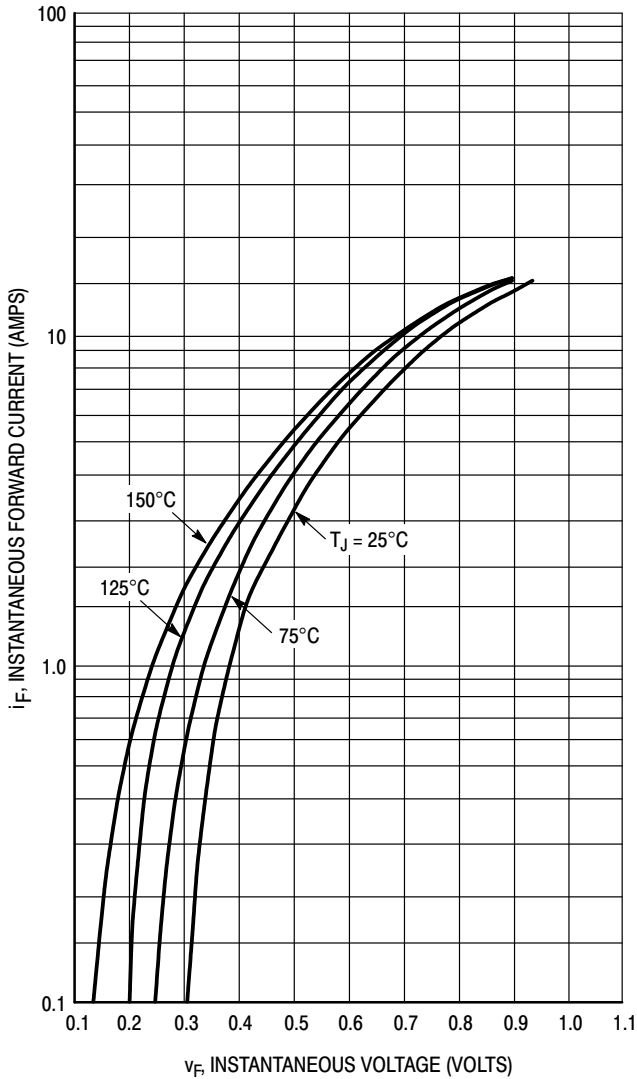
**ORDERING INFORMATION**

| <b>Device</b> | <b>Package</b>    | <b>Shipping†</b>  |
|---------------|-------------------|-------------------|
| MBRD330RLG    | DPAK<br>(Pb-Free) | 1,800 Tape & Reel |
| MBRD330T4G    | DPAK<br>(Pb-Free) | 2,500 Tape & Reel |
| SBRD8330T4G   | DPAK<br>(Pb-Free) | 2,500 Tape & Reel |
| MBRD340G      | DPAK<br>(Pb-Free) | 75 Units / Rail   |
| SBRD8340G     | DPAK<br>(Pb-Free) | 75 Units / Rail   |
| MBRD340RLG    | DPAK<br>(Pb-Free) | 1,800 Tape & Reel |
| MBRD340T4G    | DPAK<br>(Pb-Free) | 2,500 Tape & Reel |
| SBRD8340T4G   | DPAK<br>(Pb-Free) | 2,500 Tape & Reel |
| MBRD350G      | DPAK<br>(Pb-Free) | 75 Units / Rail   |
| SBRD8350G     | DPAK<br>(Pb-Free) | 75 Units / Rail   |
| MBRD350RLG    | DPAK<br>(Pb-Free) | 1,800 Tape & Reel |
| SBRD8350RLG   | DPAK<br>(Pb-Free) | 1,800 Tape & Reel |
| MBRD350T4G    | DPAK<br>(Pb-Free) | 2,500 Tape & Reel |
| SBRD8350T4G   | DPAK<br>(Pb-Free) | 2,500 Tape & Reel |
| MBRD360G      | DPAK<br>(Pb-Free) | 75 Units / Rail   |
| SBRD8360G     | DPAK<br>(Pb-Free) | 75 Units / Rail   |
| MBRD360RLG    | DPAK<br>(Pb-Free) | 1,800 Tape & Reel |
| SBRD8360RLG   | DPAK<br>(Pb-Free) | 1,800 Tape & Reel |
| MBRD360T4G    | DPAK<br>(Pb-Free) | 2,500 Tape & Reel |
| SBRD8360T4G   | DPAK<br>(Pb-Free) | 2,500 Tape & Reel |

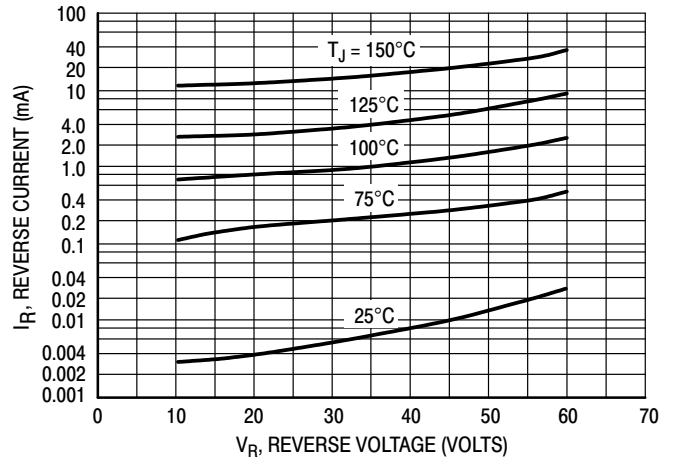
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

**MBRD320G, SBRD8320G, MBRD330G, SBRD8330G, MBRD340G, SBRD8340G,  
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**TYPICAL CHARACTERISTICS**

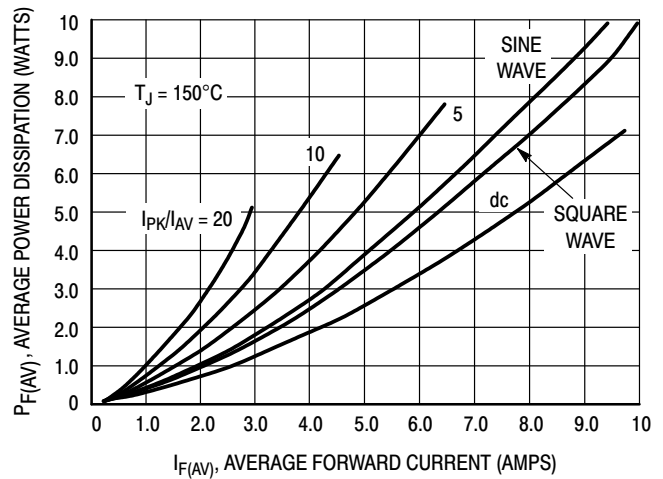


**Figure 1. Typical Forward Voltage**



\*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 curves if  $V_R$  is sufficient below rated  $V_R$ .

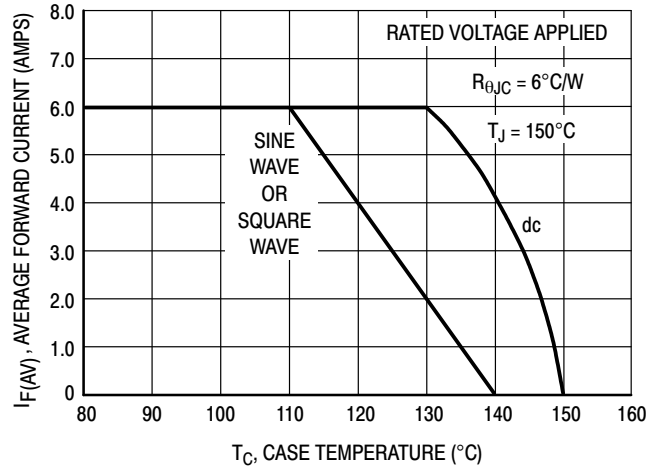
**Figure 2. Typical Reverse Current**



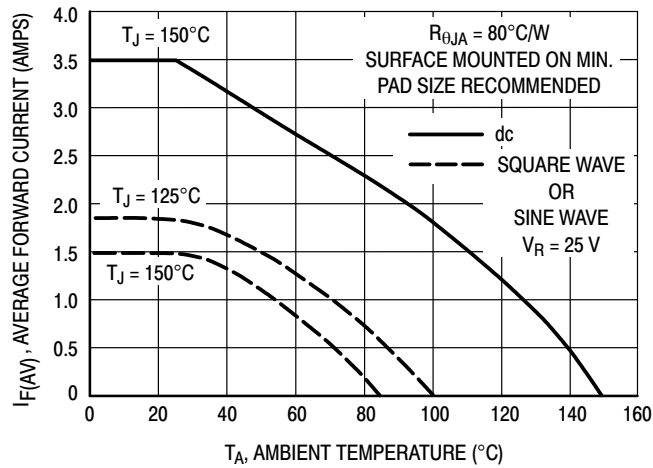
**Figure 3. Average Power Dissipation**

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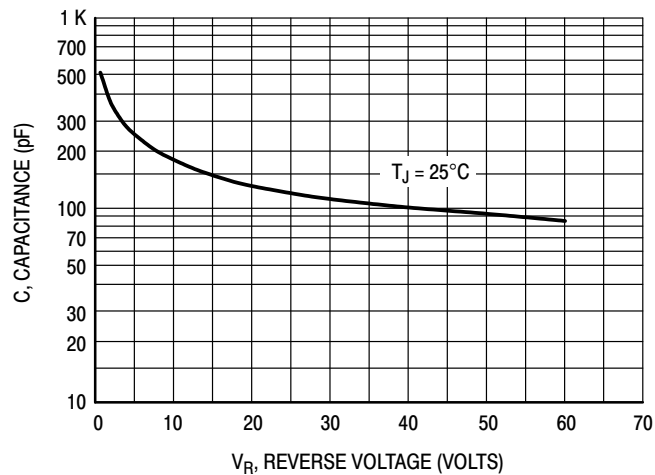
**TYPICAL CHARACTERISTICS**



**Figure 4. Current Derating, Case**



**Figure 5. Current Derating, Ambient**

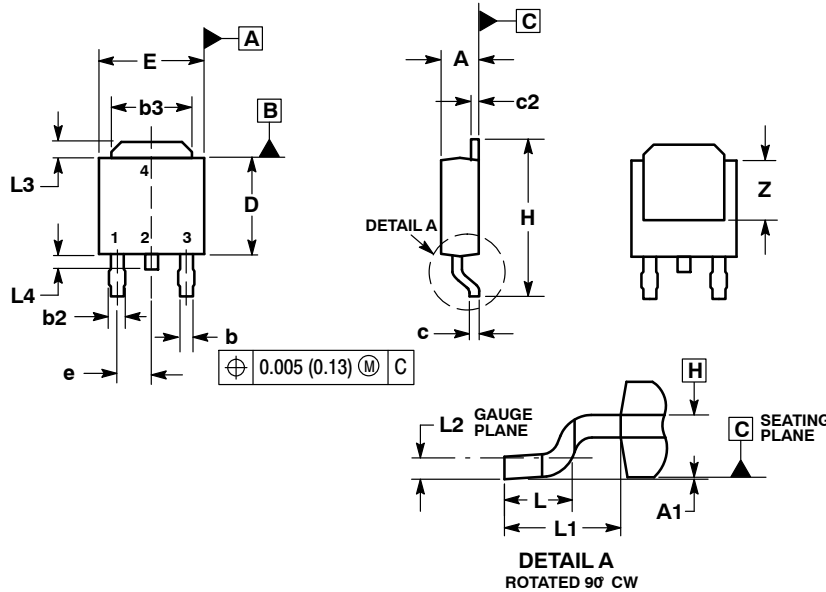


**Figure 6. Typical Capacitance**

# MBRD320G, SBRD8320G, MBRD330G, SBRD8330G, MBRD340G, SBRD8340G, MBRD350G, SBRD8350G, MBRD360G, SBRD8360G

## PACKAGE DIMENSIONS

### DPAK (SINGLE GAUGE) CASE 369C-01 ISSUE D

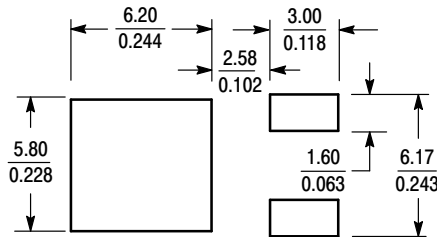


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3 and Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.086     | 0.094 | 2.18        | 2.38  |
| A1  | 0.000     | 0.005 | 0.00        | 0.13  |
| b   | 0.025     | 0.035 | 0.63        | 0.89  |
| b2  | 0.030     | 0.045 | 0.76        | 1.14  |
| b3  | 0.180     | 0.215 | 4.57        | 5.46  |
| c   | 0.018     | 0.024 | 0.46        | 0.61  |
| c2  | 0.018     | 0.024 | 0.46        | 0.61  |
| D   | 0.235     | 0.245 | 5.97        | 6.22  |
| E   | 0.250     | 0.265 | 6.35        | 6.73  |
| e   | 0.090 BSC |       | 2.29 BSC    |       |
| H   | 0.370     | 0.410 | 9.40        | 10.41 |
| L   | 0.055     | 0.070 | 1.40        | 1.78  |
| L1  | 0.108 REF |       | 2.74 REF    |       |
| L2  | 0.020 BSC |       | 0.51 BSC    |       |
| L3  | 0.035     | 0.050 | 0.89        | 1.27  |
| L4  | ---       | 0.040 | ---         | 1.01  |
| Z   | 0.155     | ---   | 3.93        | ---   |

### SOLDERING FOOTPRINT\*



SCALE 3:1 (mm/inches)

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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