

# MBRS360T3G, MBRS360BT3G, NRVBS360T3G, NRVBS360BT3G

## Surface Mount Schottky Power Rectifier

This device employs 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 overlay contact. Ideally suited for low voltage, high frequency rectification, or as free wheeling and polarity protection diodes, in surface mount applications where compact size and weight are critical to the system.

### Features

- Small Compact Surface Mountable Package with J-Bend Leads
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- Excellent Ability to Withstand Reverse Avalanche Energy Transients
- Guard-Ring for Stress Protection
- NRVBS Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable\*
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### Mechanical Characteristics

- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- Weight: 217 mg (Approximately), SMC  
95 mg (Approximately), SMB
- 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
- Polarity: Notch in Plastic Body Indicates Cathode Lead
- Device Meets MSL 1 Requirements
- ESD Ratings:
  - ♦ Machine Model, C
  - ♦ Human Body Model, 3B



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## SCHOTTKY BARRIER RECTIFIERS 3.0 AMPERES, 60 VOLTS



SMC 2-LEAD  
CASE 403AC



SMB  
CASE 403A-03

### MARKING DIAGRAMS



B36 = Specific Device Code  
A = Assembly Location\*\*  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package  
(Note: Microdot may be in either location)

\*\*The Assembly Location code (A) is front side optional. In cases where the Assembly Location is stamped in the package, the front side assembly code may be blank.

### ORDERING INFORMATION

| Device             | Package       | Shipping†           |
|--------------------|---------------|---------------------|
| MBRS360T3G         | SMC (Pb-Free) | 2,500 / Tape & Reel |
| MBRS360BT3G        | SMB (Pb-Free) | 2,500 / Tape & Reel |
| NRVBS360T3G*       | SMC (Pb-Free) | 2,500 / Tape & Reel |
| NRVBS360BT3G*      | SMB (Pb-Free) | 2,500 / Tape & Reel |
| NRVBS360BT3G-VF01* | SMB (Pb-Free) | 2,500 / Tape & Reel |
| SBRS360BT3G        | SMB (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 Specification Brochure, BRD8011/D.

# MBRS360T3G, MBRS360BT3G, NRVBS360T3G, NRVBS360BT3G

## MAXIMUM RATINGS

| Rating                                                                                                     | Symbol                          | Value                                                              | Unit             |
|------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                     | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 60                                                                 | V                |
| Average Rectified Forward Current                                                                          | $I_{F(AV)}$                     | 3.0 @ $T_L = 137^\circ\text{C}$<br>4.0 @ $T_L = 127^\circ\text{C}$ | A                |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 125                                                                | A                |
| Storage Temperature Range                                                                                  | $T_{stg}$                       | - 65 to +175                                                       | $^\circ\text{C}$ |
| Operating Junction Temperature (Note 1)                                                                    | $T_J$                           | - 65 to +175                                                       | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

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               |
|-----------------------------------------------------------------------------------------|-----------------|------------|--------------------|
| Thermal Resistance, Junction-to-Lead (Note 2)<br>SMC Package<br>SMB Package             | $R_{\theta JL}$ | 11<br>15   | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2)<br>SMC Package<br>SMB Package          | $R_{\theta JA}$ | 136<br>145 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 3)<br>SMC Package<br>SMB Package (Note 4) | $R_{\theta JA}$ | 71<br>73   | $^\circ\text{C/W}$ |

## ELECTRICAL CHARACTERISTICS

|                                                                                                                                                   |       |             |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------------|----|
| Maximum Instantaneous Forward Voltage (Note 5)<br>( $i_F = 3.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )                                             | $V_F$ | 0.63        | V  |
| Maximum Instantaneous Reverse Current (Note 5)<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 100^\circ\text{C}$ ) | $i_R$ | 0.03<br>3.0 | mA |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

- Mounted with minimum recommended pad size, PC Board FR4.
- 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.
- Typical Value; 1 inch square pad size (1 x 0.5 inch for each lead) on FR4 board.
- Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

TYPICAL ELECTRICAL CHARACTERISTICS

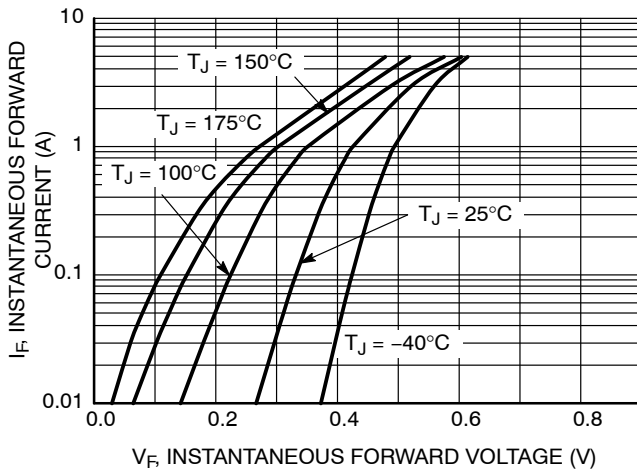


Figure 1. Typical Forward Voltage

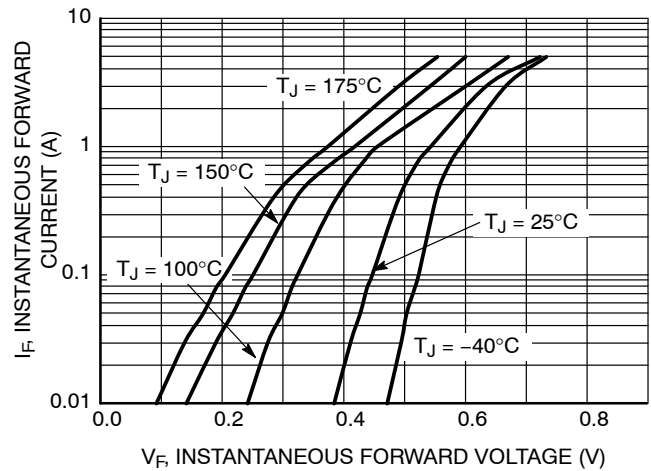


Figure 2. Maximum Forward Voltage

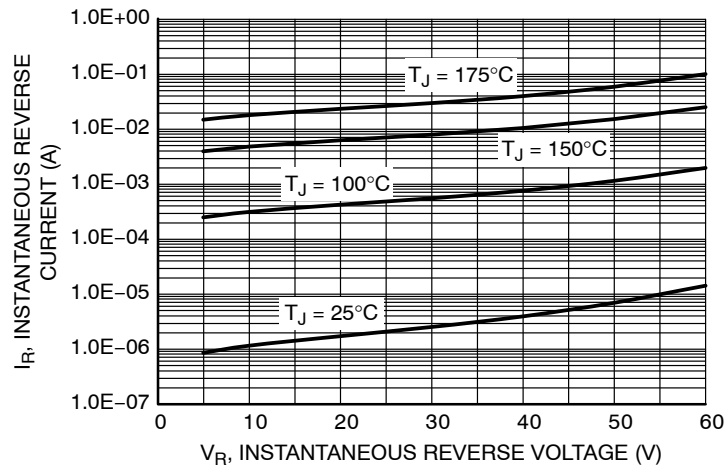


Figure 3. Typical Reverse Current

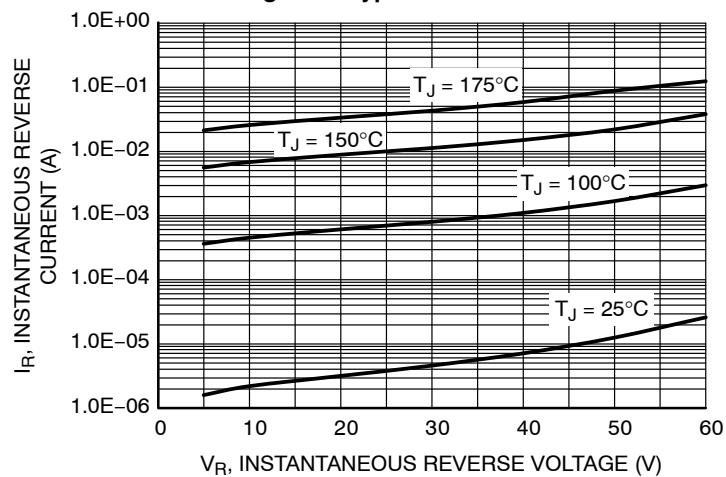


Figure 4. Maximum Reverse Current

# MBRS360T3G, MBRS360BT3G, NRVBS360T3G, NRVBS360BT3G

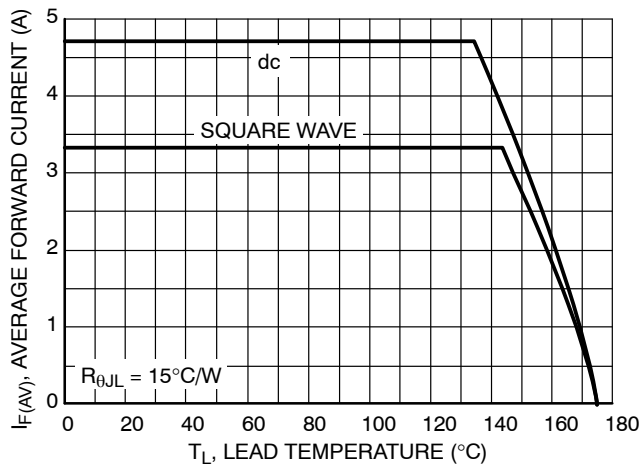


Figure 5. Current Derating

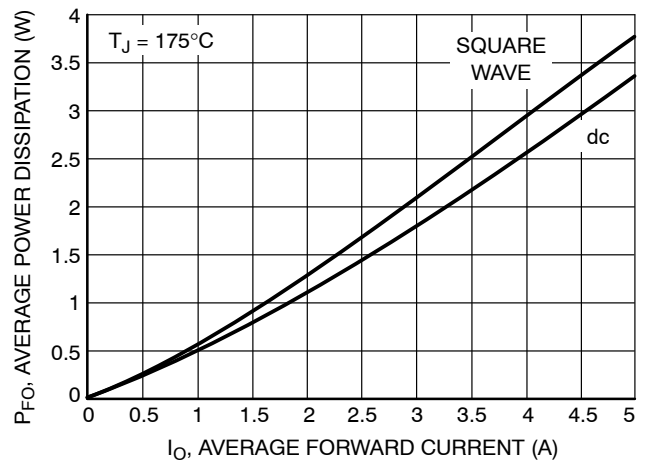


Figure 6. Forward Power Dissipation

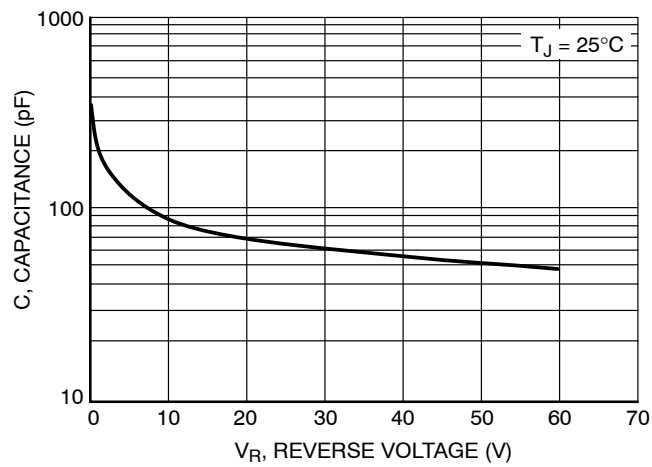


Figure 7. Typical Capacitance

# MBRS360T3G, MBRS360BT3G, NRVBS360T3G, NRVBS360BT3G

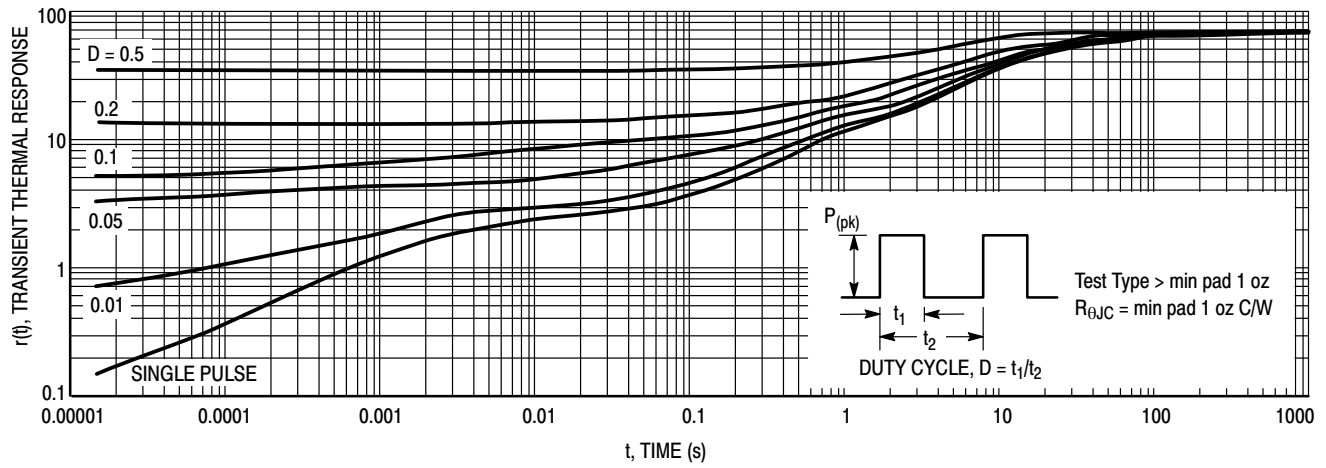


Figure 8. Thermal Response, Junction-to-Ambient, SMC Package

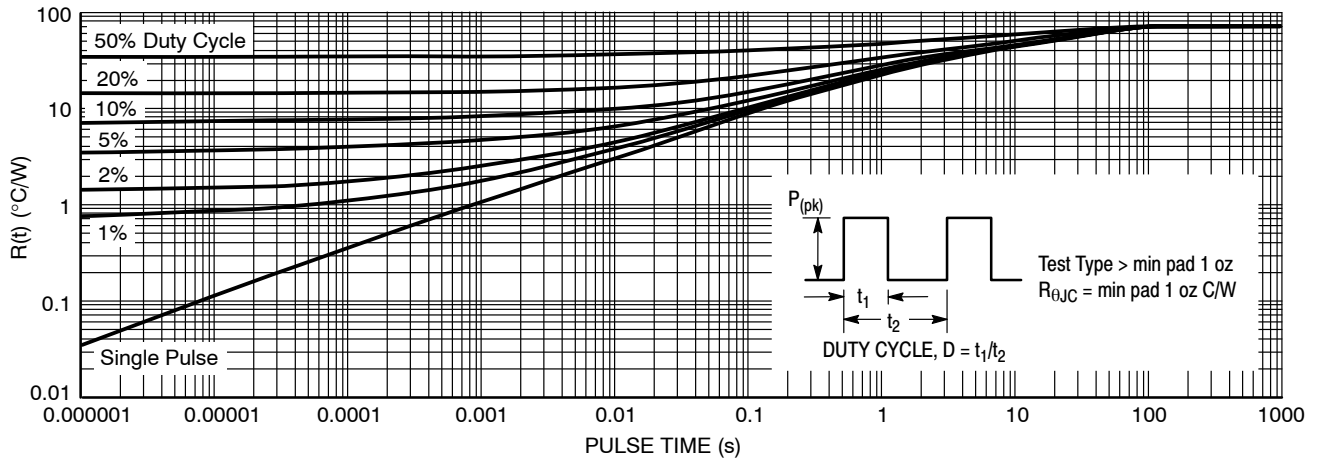
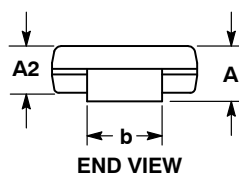
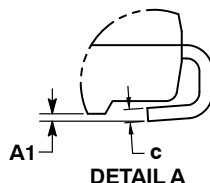
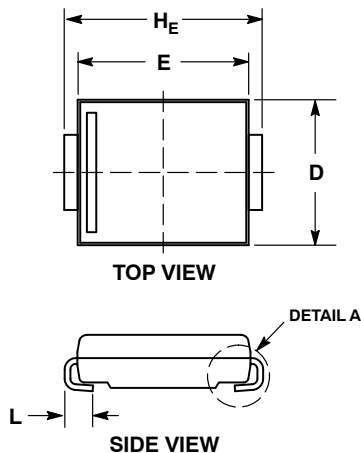


Figure 9. Typical Thermal Response, Junction-to-Ambient, SMB Package

# MBRS360T3G, MBRS360BT3G, NRVBS360T3G, NRVBS360BT3G

## PACKAGE DIMENSIONS

SMC 2-LEAD  
CASE 403AC  
ISSUE A

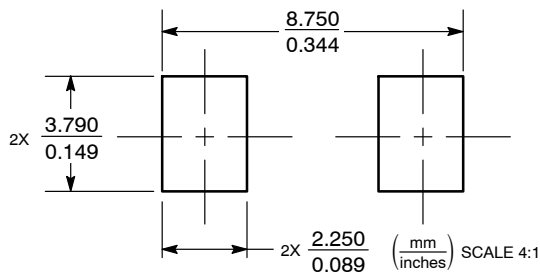


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.254mm PER SIDE.
4. DIMENSIONS D AND E TO BE DETERMINED AT DATUM H.
5. DIMENSION b SHALL BE MEASURED WITHIN THE AREA DETERMINED BY DIMENSION L.

| DIM            | MILLIMETERS |      | INCHES |       |
|----------------|-------------|------|--------|-------|
|                | MIN         | MAX  | MIN    | MAX   |
| A              | 1.95        | 2.61 | 0.077  | 0.103 |
| A1             | 0.05        | 0.20 | 0.002  | 0.008 |
| A2             | 1.90        | 2.41 | 0.075  | 0.095 |
| b              | 2.90        | 3.20 | 0.114  | 0.126 |
| c              | 0.15        | 0.41 | 0.060  | 0.016 |
| D              | 5.55        | 6.25 | 0.219  | 0.246 |
| E              | 6.60        | 7.15 | 0.260  | 0.281 |
| H <sub>E</sub> | 7.75        | 8.15 | 0.305  | 0.321 |
| L              | 0.75        | 1.60 | 0.030  | 0.063 |

### RECOMMENDED SOLDERING FOOTPRINT\*

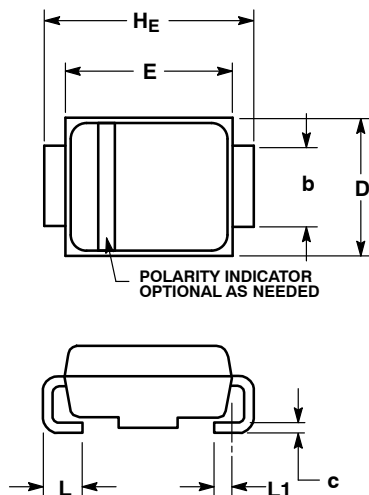


\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MBRS360T3G, MBRS360BT3G, NRVBS360T3G, NRVBS360BT3G

## PACKAGE DIMENSIONS

**SMB**  
CASE 403A-03  
ISSUE J

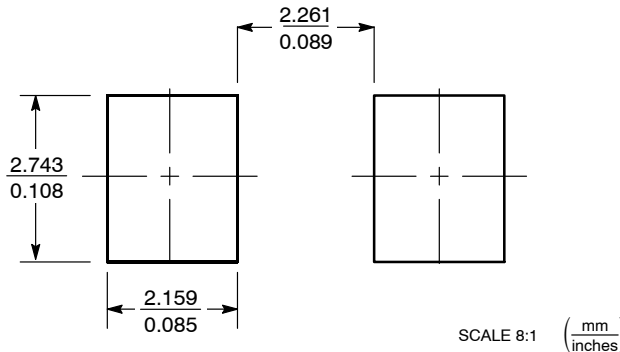


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION b SHALL BE MEASURED WITHIN DIMENSION L1.

| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | 1.95        | 2.30 | 2.47 | 0.077     | 0.091 | 0.097 |
| A1  | 0.05        | 0.10 | 0.20 | 0.002     | 0.004 | 0.008 |
| b   | 1.96        | 2.03 | 2.20 | 0.077     | 0.080 | 0.087 |
| c   | 0.15        | 0.23 | 0.31 | 0.006     | 0.009 | 0.012 |
| D   | 3.30        | 3.56 | 3.95 | 0.130     | 0.140 | 0.156 |
| E   | 4.06        | 4.32 | 4.60 | 0.160     | 0.170 | 0.181 |
| HE  | 5.21        | 5.44 | 5.60 | 0.205     | 0.214 | 0.220 |
| L   | 0.76        | 1.02 | 1.60 | 0.030     | 0.040 | 0.063 |
| L1  | 0.51 REF    |      |      | 0.020 REF |       |       |

## SOLDERING FOOTPRINT\*



\*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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