

# Surface Mount Schottky Power Rectifier

## MBRS3100T3G, NRVBS3100T3G

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
- NRVB 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

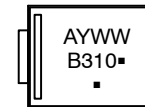
- Case: Epoxy, Molded
- Weight: 217 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Polarity: Polarity Band on Plastic Body Indicates Cathode Lead
- ESD Ratings:
  - ♦ Machine Model = C
  - ♦ Human Body Model = 3B

## SCHOTTKY BARRIER RECTIFIERS 3.0 AMPERES, 100 VOLTS



SMC 2-LEAD  
CASE 403AC

### MARKING DIAGRAM



B310 = 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†           |
|---------------|----------------------|---------------------|
| MBRS3100T3G   | SMC 2-Lead (Pb-Free) | 2,500 / Tape & Reel |
| NRVBS3100T3G* | SMC 2-Lead (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.

# MBRS3100T3G, NRVBS3100T3G

## 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>$V_R$ | 100         | V                |
| Average Rectified Forward Current<br>(At Rated $V_R$ , $T_L = 100^\circ\text{C}$ )                          | $I_{F(AV)}$                     | 3.0         | A                |
| Non-repetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 130         | A                |
| Operating Junction Temperature Range (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                  | $R_{\theta JL}$ | 11    | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient (Note 2)      | $R_{\theta JA}$ | 85    | $^\circ\text{C/W}$ |
| Thermal Characteristic, Junction-to-Lead (Note 2)     | $\Psi_{JL}$     | 16    | $^\circ\text{C/W}$ |
| Thermal Characteristic, Junction-to-Case Top (Note 2) | $\Psi_{JCT}$    | 3.0   | $^\circ\text{C/W}$ |

2. PCB Cu area = 600 mm<sup>2</sup>, single layer with 1 oz thickness.

## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                                                                                                                                                               | Symbol | Value                        | Unit |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------|------|
| Maximum Instantaneous Forward Voltage (Note 3)<br>( $i_F = 3.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $i_F = 6.0\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $i_F = 3.0\text{ A}$ , $T_J = 125^\circ\text{C}$ )<br>( $i_F = 6.0\text{ A}$ , $T_J = 125^\circ\text{C}$ ) | $V_F$  | 0.79<br>0.90<br>0.62<br>0.70 | V    |
| Maximum Instantaneous Reverse Current (Note 3)<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 125^\circ\text{C}$ )                                                                                                                            | $i_R$  | 0.05<br>5.0                  | 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.

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

# MBRS3100T3G, NRVBS3100T3G

## TYPICAL CHARACTERISTICS

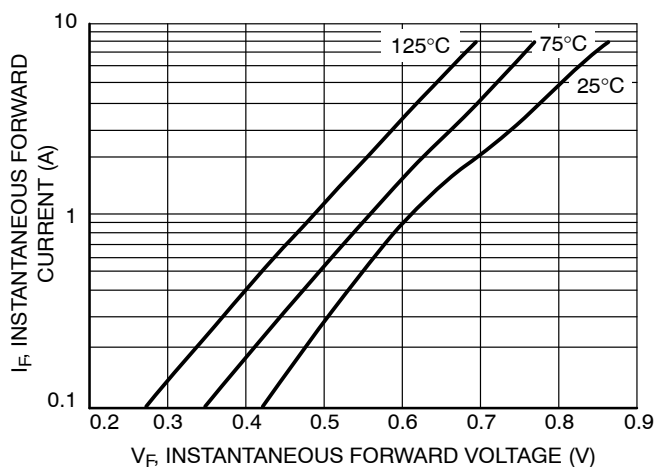


Figure 1. Typical Forward Voltage

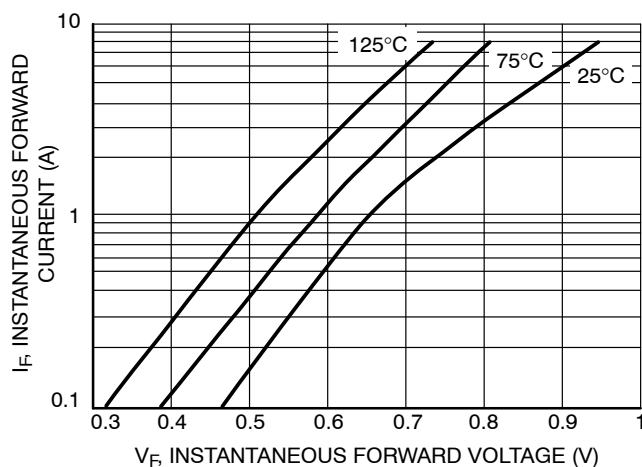


Figure 2. Maximum Forward Voltage

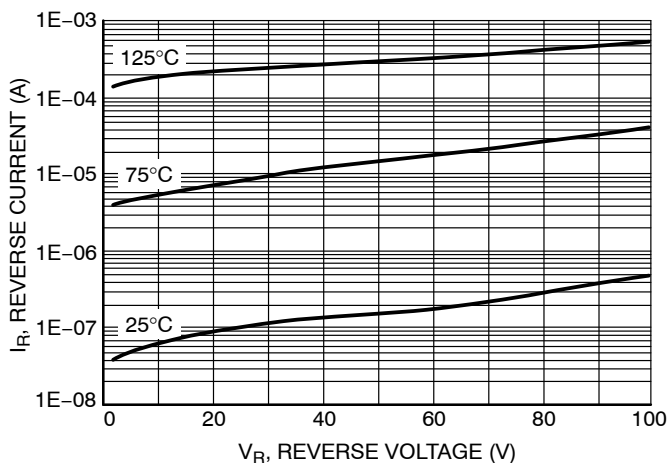


Figure 3. Typical Reverse Current

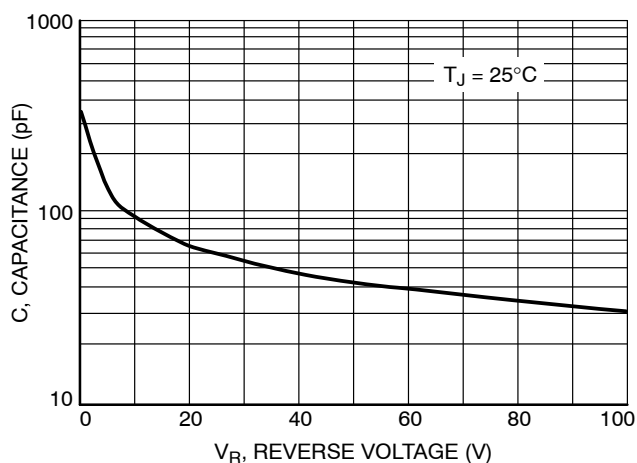


Figure 4. Typical Capacitance

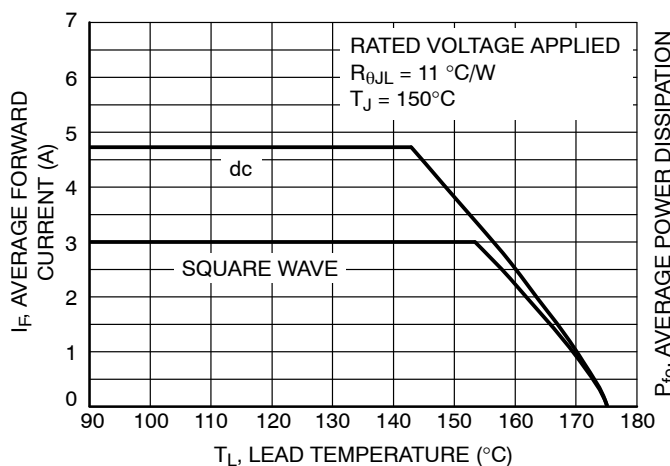


Figure 5. Current Derating - Lead

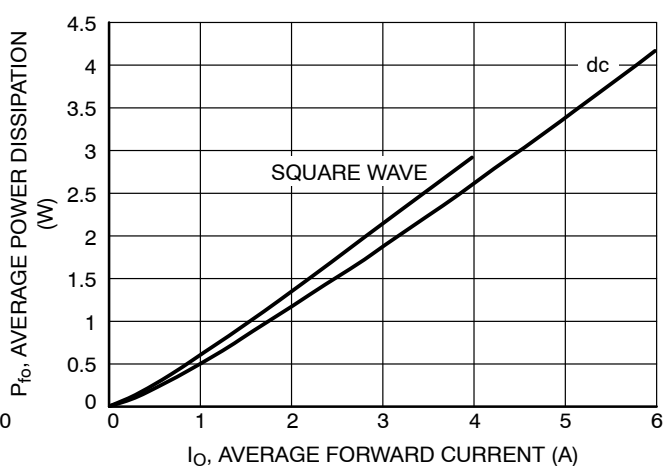


Figure 6. Forward Power Dissipation

# MECHANICAL CASE OUTLINE

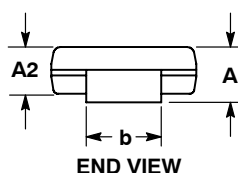
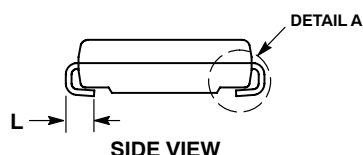
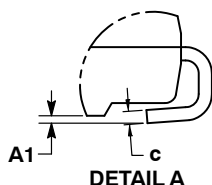
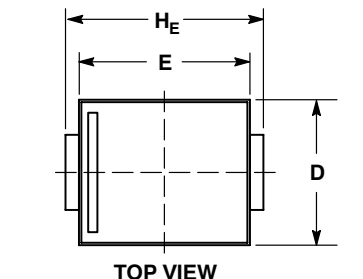
## PACKAGE DIMENSIONS



SCALE 1:1

### SMC 2-LEAD CASE 403AC ISSUE B

DATE 27 JUL 2017



#### GENERIC MARKING DIAGRAM\*



XXXX = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
▪ = Pb-Free Package

(Note: Microdot may be in either location)

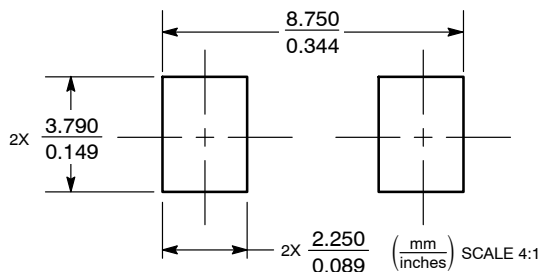
\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

#### 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 | 0.006  | 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 **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

|                  |             |                                                                                                                                                                                     |
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| DESCRIPTION:     | SMC 2-LEAD  | PAGE 1 OF 1                                                                                                                                                                         |

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