

# Schottky Power Rectifier, Surface Mount, Fast Soft-Recovery

4.0 A, 200 V, SMC Package

**MBRS4201T3G,  
NRVBS4201T3G**

## Features

- Lower Forward Voltage than any Ultrafast Rectifier:  
 $V_F < 0.61 \text{ V}$  at  $150^\circ\text{C}$
- Fast Switching Speed: Reverse Recovery Time ( $t_{RR}$ )  $< 35 \text{ ns}$
- Soft Recovery Characteristics: Softness Factor ( $t_b/t_a$ )  $\geq 1$
- Highly Stable Over Temperature
- AEC-Q101 Qualified and PPAP Capable
- 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

## Benefits

- Significantly Reduced EMI
- Eliminates the Need of Snubber Circuits
- Low Switching and Heat Losses
- Improved Thermal Management

## Applications

- Engine and Convenience Control Systems
- Motor Controls
- Battery Chargers and Switching Power Supplies

## Mechanical Characteristics

- Small Compact Surface Mount Package with J-Bend Leads
- Rectangular Package for Automated Handling
- Weight: 217 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes:  $260^\circ\text{C}$  Maximum for 10 Seconds
- ESD Ratings:
  - ♦ Machine Model = A
  - ♦ Human Body Model = 1C
- Polarity: Polarity Band on Plastic Body Indicates Cathode Lead

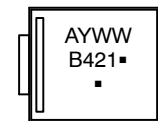
## SCHOTTKY RECTIFIER 4 AMPS, 200 VOLTS



SMC 2-LEAD  
CASE 403AC



## MARKING DIAGRAM



B421 = 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†              |
|---------------|------------------|------------------------|
| MBRS4201T3G   | SMC<br>(Pb-Free) | 2,500 /<br>Tape & Reel |
| NRVBS4201T3G* | SMC<br>(Pb-Free) | 2,500 /<br>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.

# MBRS4201T3G, NRVBS4201T3G

## MAXIMUM RATINGS

| Characteristic                                                                                             | Symbol                          | Value       | Unit             |
|------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                     | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 200         | V                |
| Average Rectified Forward Current<br>(Rated $V_R$ , $T_L = 70^\circ\text{C}$ )                             | $I_{F(AV)}$                     | 4           | A                |
| Nonrepetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 100         | A                |
| Operating Junction Temperature                                                                             | $T_J$                           | -55 to +150 | $^\circ\text{C}$ |

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.

## THERMAL CHARACTERISTICS

| Characteristic                       | Symbol          | Value | Unit               |
|--------------------------------------|-----------------|-------|--------------------|
| Thermal Resistance, Junction-to-Lead | $R_{\theta JL}$ | 11    | $^\circ\text{C/W}$ |

## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                                          | Symbol   | Value        | Unit     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------|----------|
| Maximum Instantaneous Forward Voltage<br>( $I_F = 4\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 4\text{ A}$ , $T_J = 150^\circ\text{C}$ )        | $V_F$    | 0.86<br>0.61 | V        |
| Maximum Instantaneous Reverse Current (Rated $V_R$ )<br>(Rated DC Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated DC Voltage, $T_J = 150^\circ\text{C}$ ) | $I_R$    | 1.0<br>5.0   | mA<br>mA |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ )                                    | $t_{rr}$ | 35           | ns       |

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.

TYPICAL ELECTRICAL CHARACTERISTICS

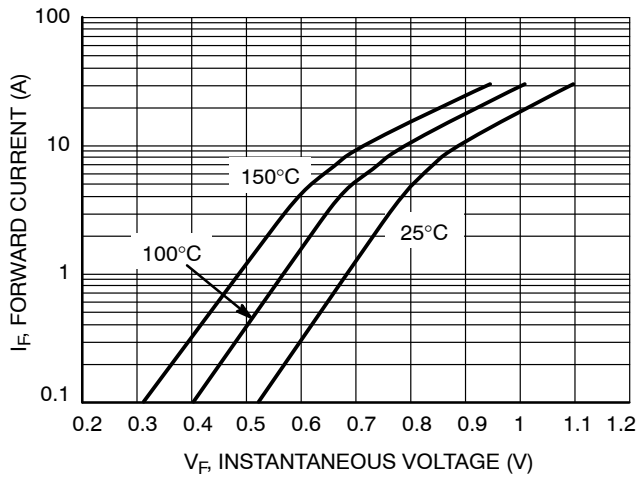


Figure 1. Typical Forward Voltage

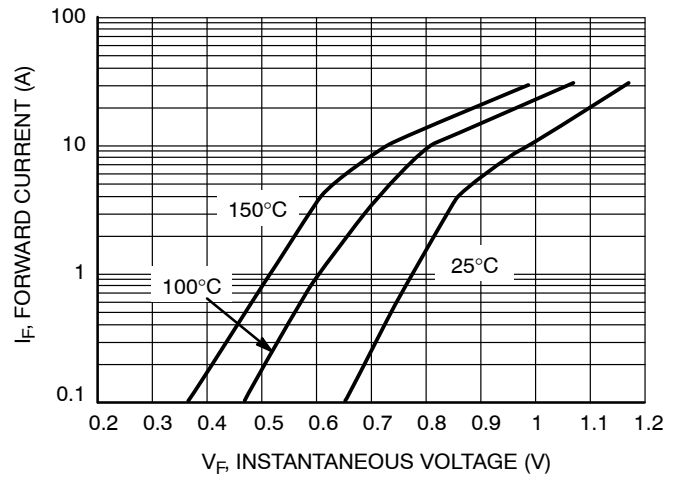


Figure 2. Maximum Forward Voltage

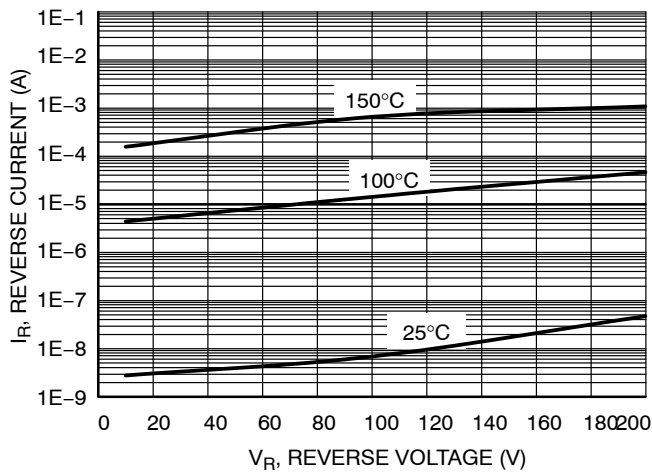


Figure 3. Typical Reverse Current

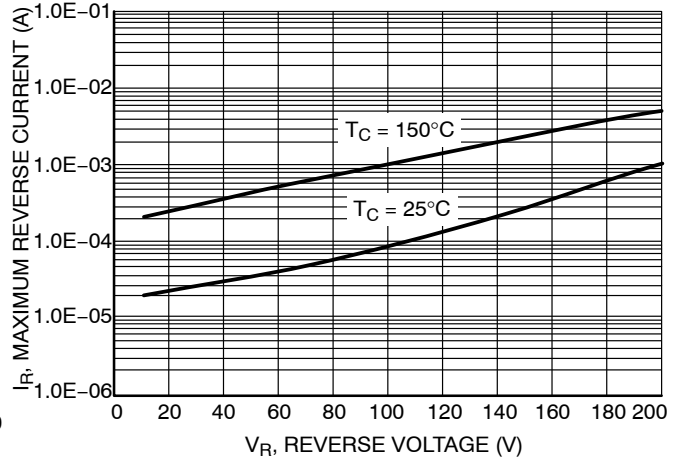


Figure 4. Maximum Reverse Current

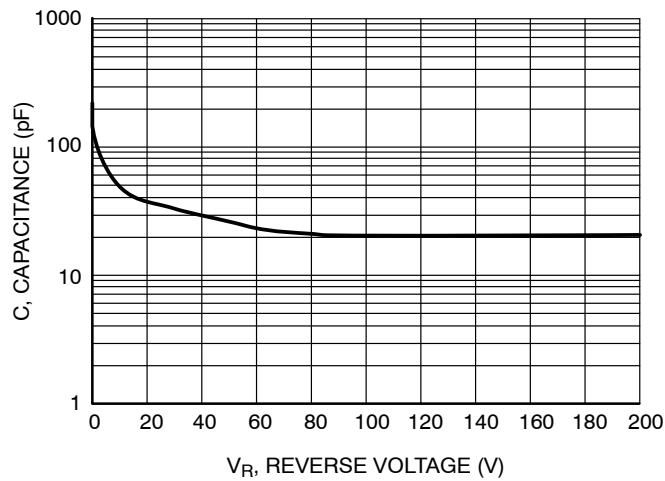


Figure 5. Typical Capacitance

# MBRS4201T3G, NRVBS4201T3G

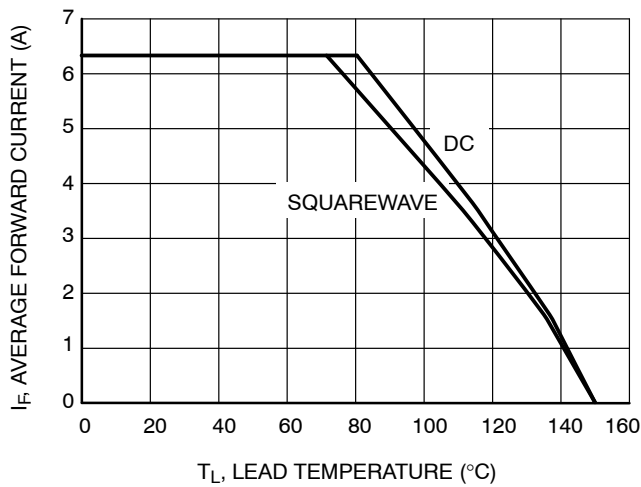


Figure 6. Derating Curve

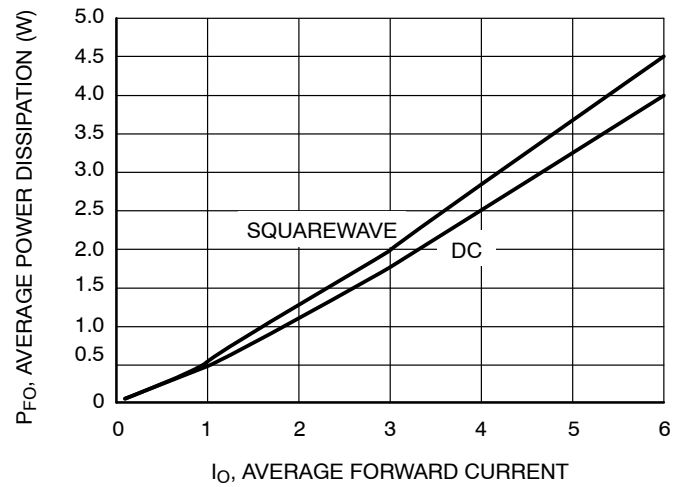
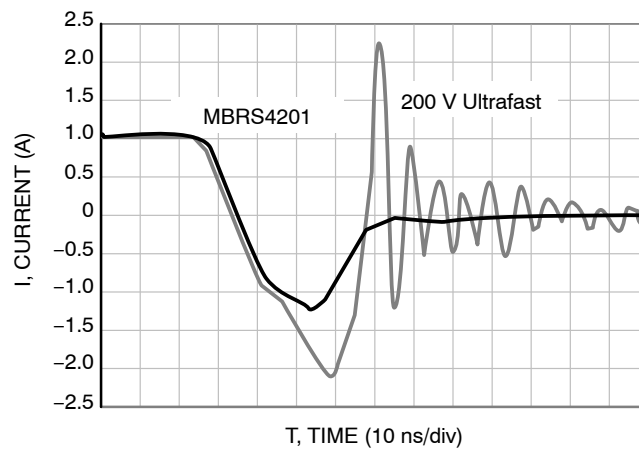


Figure 7. Power Dissipation



**onsemi** MBRS4201 eliminates reverse recovery oscillations present in Ultrafast devices in the market, particularly at hot temperatures.

\*Test Conditions:  
 $I_F = 1 \text{ A}$ ,  $dI/dT = 100 \text{ A}/\mu\text{s}$ ,  
 $V_R = 30 \text{ V}$

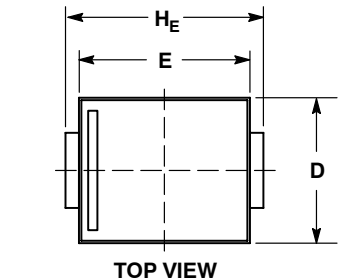
Figure 8. Reverse Recovery Time\* ( $t_{RR}$ ) at 125°C



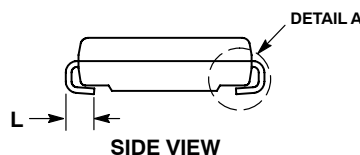
SCALE 1:1

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

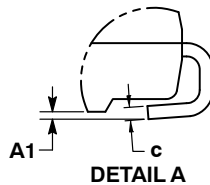
DATE 27 JUL 2017



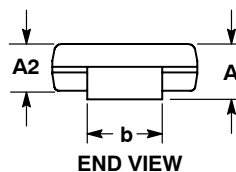
TOP VIEW



SIDE VIEW



DETAIL A



END VIEW

**GENERIC**  
**MARKING DIAGRAM\***


XXXX = Specific Device Code  
A = Assembly Location  
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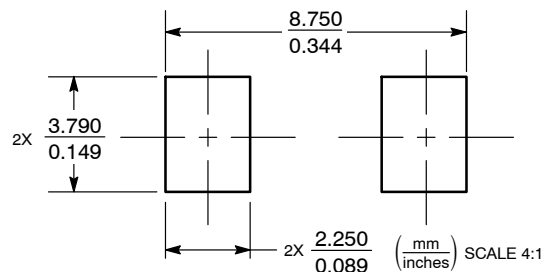
(Note: Microdot may be in either location)

\*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 |
| HE  | 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.

**DOCUMENT NUMBER:** 98AON97675F

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**DESCRIPTION:** SMC 2-LEAD

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