

# MBRS3201T3G, NRVBS3201T3G

## 200 V, 3 A Schottky Fast Soft-Recovery Power Rectifier

### SMC Power Surface Mount Package

#### Features

- Lower Forward Voltage than any Ultrafast Rectifier:  
 $V_F < 0.59 \text{ V}$  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
- These are Pb-Free Packages\*

#### 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
- ESD Ratings:
  - ♦ Machine Model = A
  - ♦ Human Body Model = 1C
- Lead and Mounting Surface Temperature for Soldering Purposes:  $260^\circ\text{C}$  Maximum for 10 Seconds
- Polarity: Notch in Plastic Body Indicates Cathode Lead



ON Semiconductor®

<http://onsemi.com>

### SCHOTTKY RECTIFIER 3 AMPS, 200 VOLTS



SMC  
CASE 403  
PLASTIC



#### MARKING DIAGRAM



B321 = Specific Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device       | Package          | Shipping†             |
|--------------|------------------|-----------------------|
| MBRS3201T3G  | SMC<br>(Pb-Free) | 2500 /<br>Tape & Reel |
| NRVBS3201T3G | SMC<br>(Pb-Free) | 2500 /<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.

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

# MBRS3201T3G, NRVBS3201T3G

## 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 (Rated $V_R$ , $T_C = 70^\circ\text{C}$ )            | $I_{F(AV)}$                     | 3           | A                |
| Nonrepetitive Peak Surge Current                                                       | $I_{FSM}$                       | 100         | A                |
| Operating Junction Temperature                                                         | $T_J$                           | -55 to +150 | $^\circ\text{C}$ |

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.

## THERMAL CHARACTERISTICS

| Characteristic                          | Symbol          | Value | Unit               |
|-----------------------------------------|-----------------|-------|--------------------|
| Thermal Resistance, Junction-to-Lead    | $R_{\theta JL}$ | 12    | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 60    | $^\circ\text{C/W}$ |

## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                                          | Symbol   | Value        | Unit     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------|----------|
| Maximum Instantaneous Forward Voltage<br>( $I_F = 3\text{ A}$ , $T_J = 25^\circ\text{C}$ )<br>( $I_F = 3\text{ A}$ , $T_J = 150^\circ\text{C}$ )        | $V_F$    | 0.84<br>0.59 | 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>( $I_F = 1\text{ A}$ , $di/dt = 100\text{ A/us}$ , $V_R = 30\text{ V}$ )                                               | $t_{rr}$ | 35           | ns       |

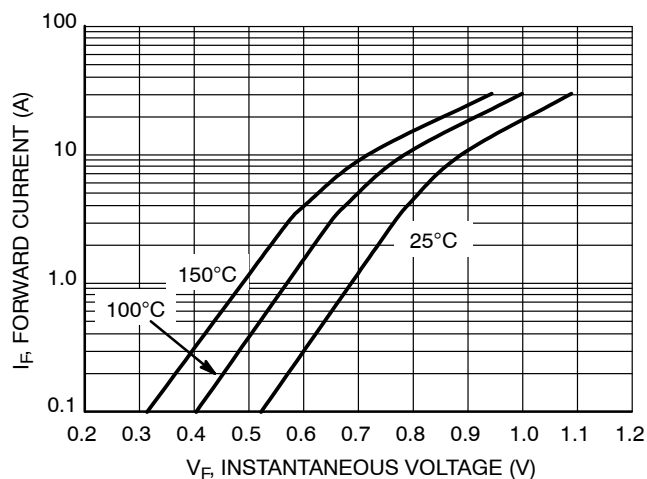


Figure 1. Typical Forward Voltage

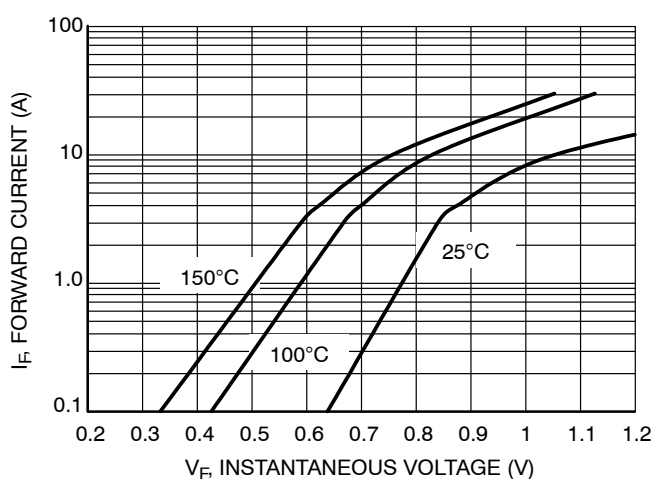


Figure 2. Maximum Forward Voltage

# MBRS3201T3G, NRVBS3201T3G

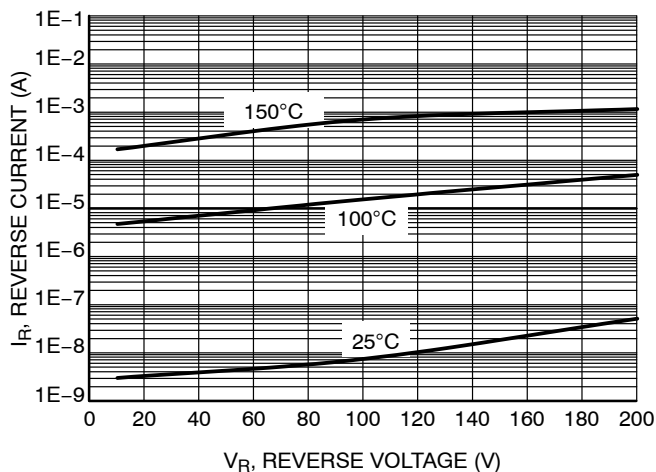


Figure 3. Typical Reverse Current

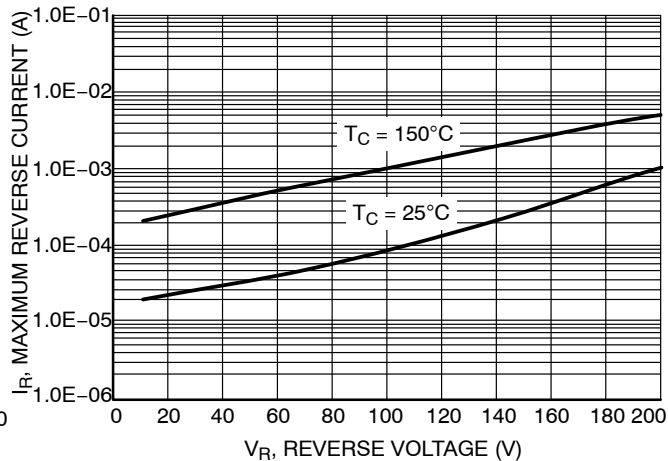


Figure 4. Maximum Reverse Current

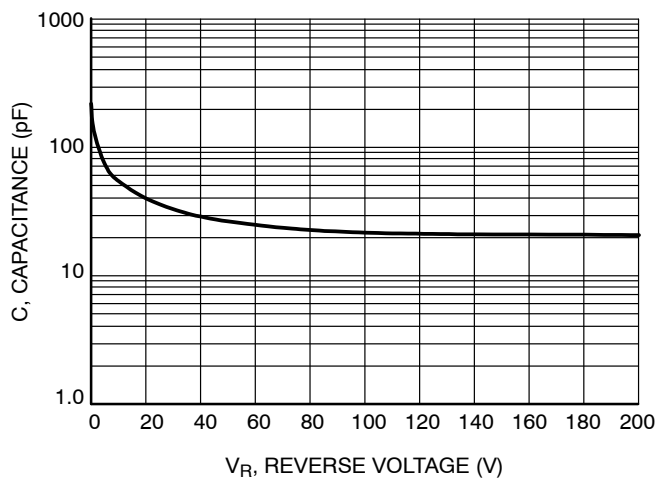


Figure 5. Typical Capacitance

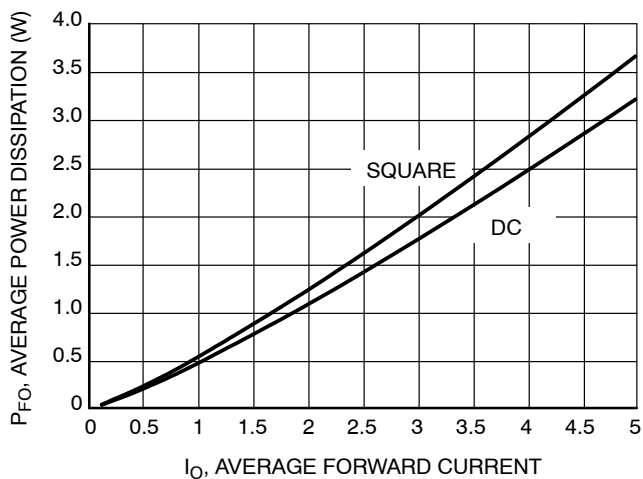


Figure 6. Power Dissipation

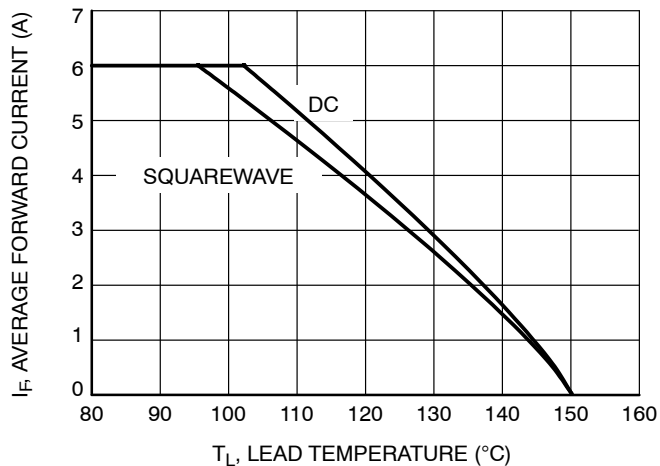
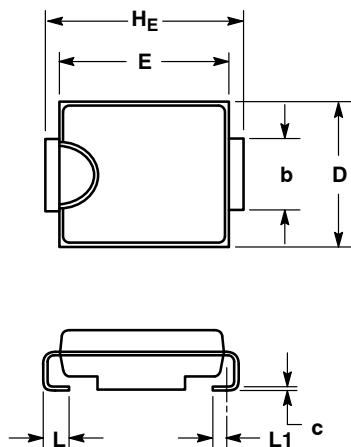


Figure 7. Derating Curve

# MBRS3201T3G, NRVBS3201T3G

## PACKAGE DIMENSIONS

SMC  
CASE 403-03  
ISSUE E

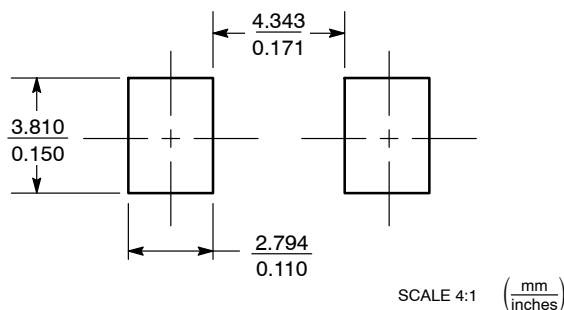


### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.
4. 403-01 THRU -02 OBSOLETE, NEW STANDARD 403-03.

| DIM | MILLIMETERS |      |      | INCHES    |       |       |
|-----|-------------|------|------|-----------|-------|-------|
|     | MIN         | NOM  | MAX  | MIN       | NOM   | MAX   |
| A   | 1.90        | 2.13 | 2.41 | 0.075     | 0.084 | 0.095 |
| A1  | 0.05        | 0.10 | 0.15 | 0.002     | 0.004 | 0.006 |
| b   | 2.92        | 3.00 | 3.07 | 0.115     | 0.118 | 0.121 |
| c   | 0.15        | 0.23 | 0.30 | 0.006     | 0.009 | 0.012 |
| D   | 5.59        | 5.84 | 6.10 | 0.220     | 0.230 | 0.240 |
| E   | 6.60        | 6.86 | 7.11 | 0.260     | 0.270 | 0.280 |
| HE  | 7.75        | 7.94 | 8.13 | 0.305     | 0.313 | 0.320 |
| L   | 0.76        | 1.02 | 1.27 | 0.030     | 0.040 | 0.050 |
| 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.

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free  
USA/Canada  
Europe, Middle East and Africa Technical Support:  
Phone: 421 33 790 2910  
Japan Customer Focus Center  
Phone: 81-3-5817-1050

ON Semiconductor Website: [www.onsemi.com](http://www.onsemi.com)

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative

MBRS3201T3/D