

# MBRS3201P

## 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
- 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
- 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
- Cathode Polarity Band



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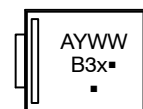
### SCHOTTKY RECTIFIER 3 AMPS, 200 VOLTS



SMC 2-LEAD  
CASE 403AC



#### MARKING DIAGRAM



B321 = 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†             |
|--------------|-------------------------|-----------------------|
| MBRS3201PT3G | SMC 2-Lead<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.

## 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 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    | $R_{\theta JL}$ | 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>( $I_F = 1\text{ A}$ , $di/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ )                                      | $t_{rr}$ | 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 CHARACTERISTICS

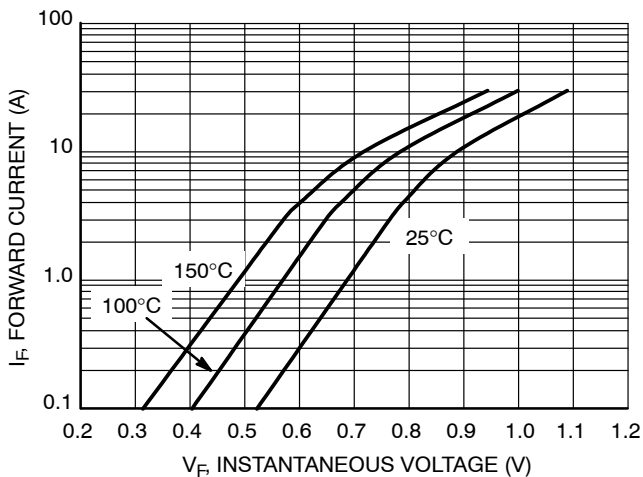


Figure 1. Typical Forward Voltage

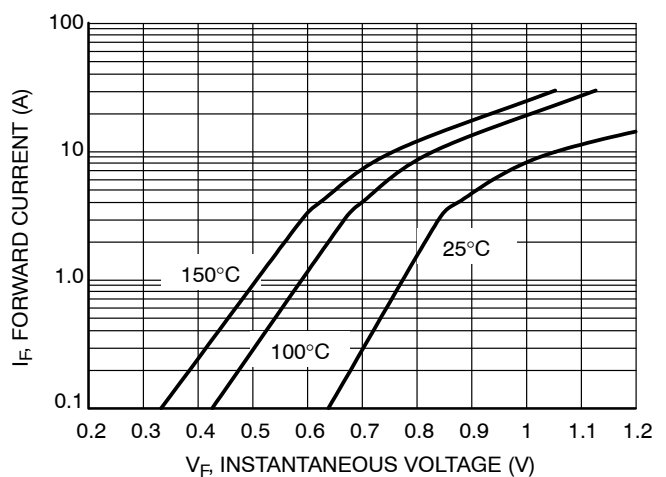


Figure 2. Maximum Forward Voltage

TYPICAL CHARACTERISTICS

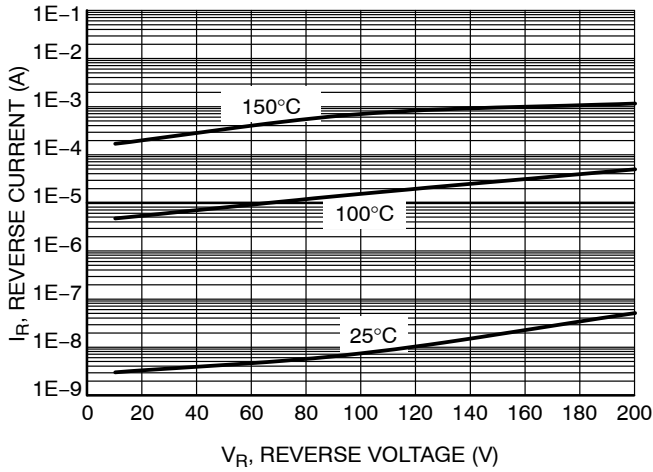


Figure 3. Typical Reverse Current

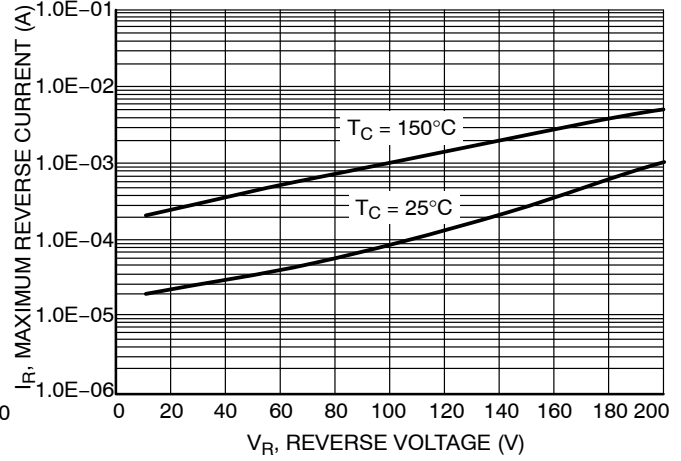


Figure 4. Maximum Reverse Current

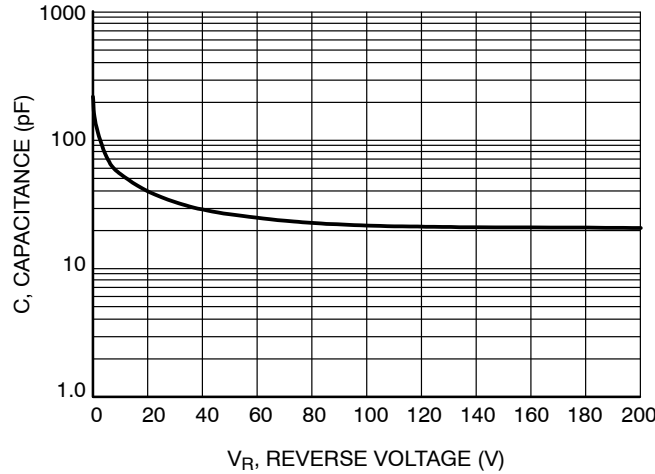


Figure 5. Typical Capacitance

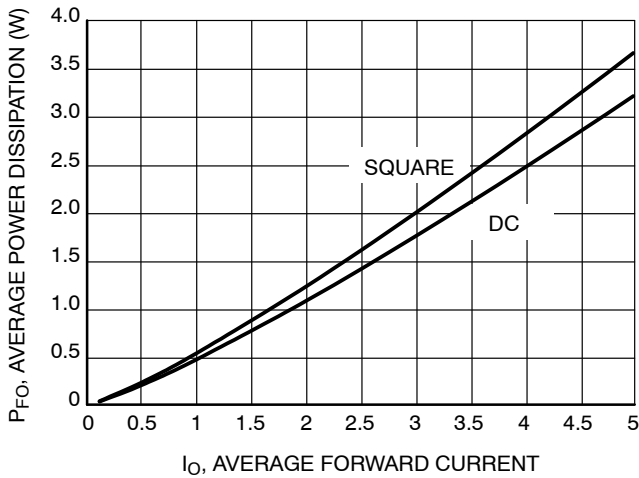


Figure 6. Power Dissipation

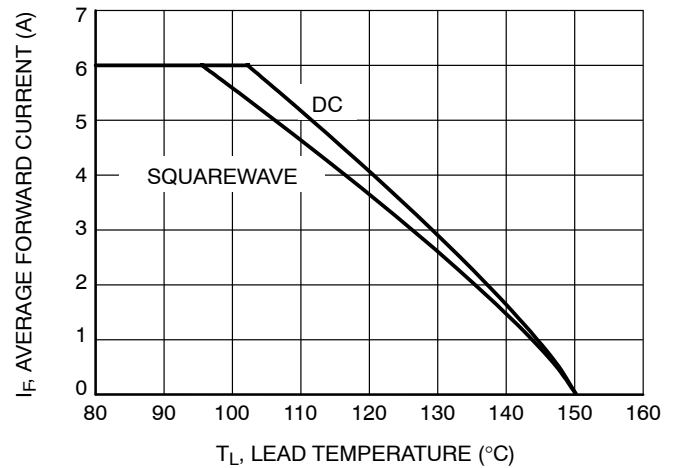


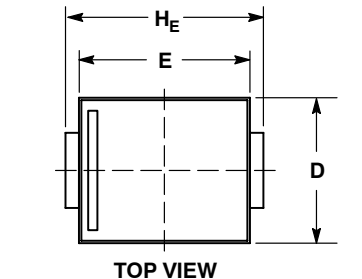
Figure 7. Derating Curve



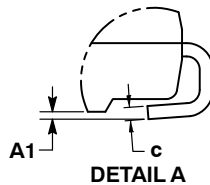
SCALE 1:1

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

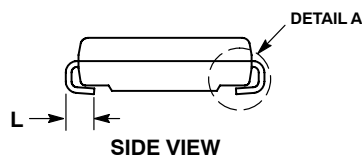
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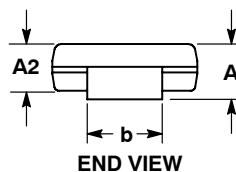
TOP VIEW



DETAIL A



SIDE VIEW



END VIEW

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


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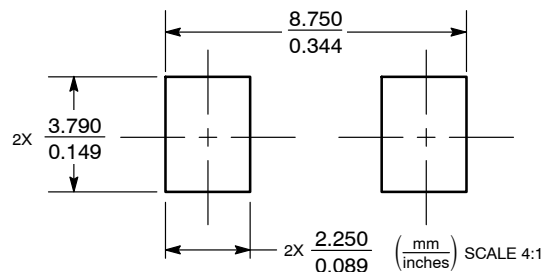
(Note: Microdot may be in either location)

\*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 |
| 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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