# MBRS3201T3

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

## SMC Power Surface Mount Package

### Features

- Lower Forward Voltage than any Ultrafast Rectifier: $V_F < 0.59$ V at 150°C
- Fast Switching Speed: Reverse Recovery Time ($t_{RR}$) < 35 ns
- Soft Recovery Characteristics: Softness Factor ($t_b/t_a$) ≥ 1
- Highly Stable Over Temperature
- Pb−Free Package is Available

### 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°C Maximum for 10 Seconds
- Polarity: Notch in Plastic Body Indicates Cathode Lead

### MAXIMUM RATINGS

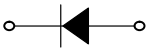
| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 200 | V |
| Average Rectified Forward Current (Rated $V_R$, $T_C$ = 70°C) | $I_{F(AV)}$ | 3 | A |
| Nonrepetitive Peak Surge Current | $I_{FSM}$ | 100 | A |
| Operating Junction Temperature | $T_J$ | −55 to +150 | °C |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

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**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† |
|---|---|---|
| MBRS3201T3 | SMC | 2500 / Tape & Reel |
| MBRS3201T3G | SMC (Pb−Free) | 2500 / 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.

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## THERMAL CHARACTERISTICS

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

## ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Maximum Instantaneous Forward Voltage<br>($I_F$ = 3 A, $T_J$ = 25°C)<br>($I_F$ = 3 A, $T_J$ = 150°C) | $V_F$ | <br>0.84<br>0.59 | V |
| Maximum Instantaneous Reverse Current (Rated $V_R$)<br>(Rated DC Voltage, $T_J$ = 25°C)<br>(Rated DC Voltage, $T_J$ = 150°C) | $I_R$ | <br>1.0<br>5.0 | <br>mA<br>mA |
| Maximum Reverse Recovery Time<br>($I_F$ = 1 A, di/dt = 100 A/us, $V_R$ = 30 V) | $t_{rr}$ | 35 | ns |

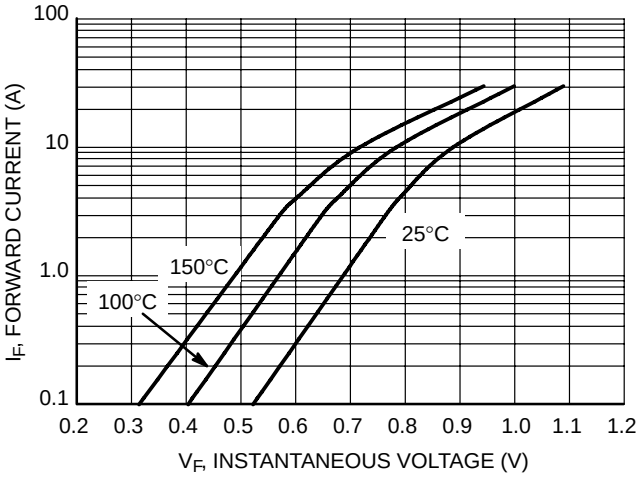



**Figure 1. Typical Forward Voltage**

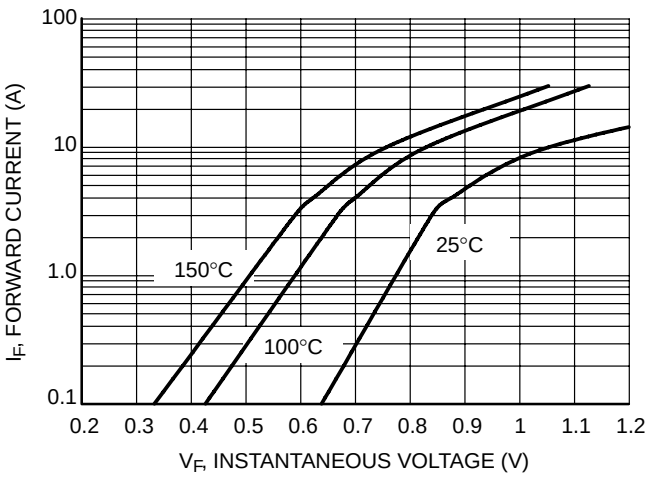



**Figure 2. Maximum Forward Voltage**

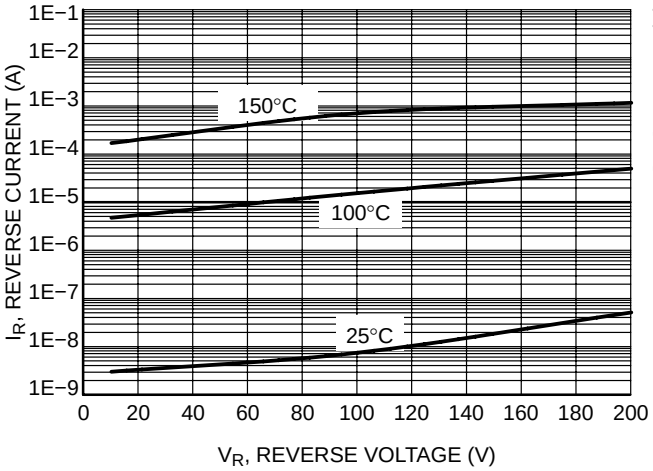



**Figure 3. Typical Reverse Current**

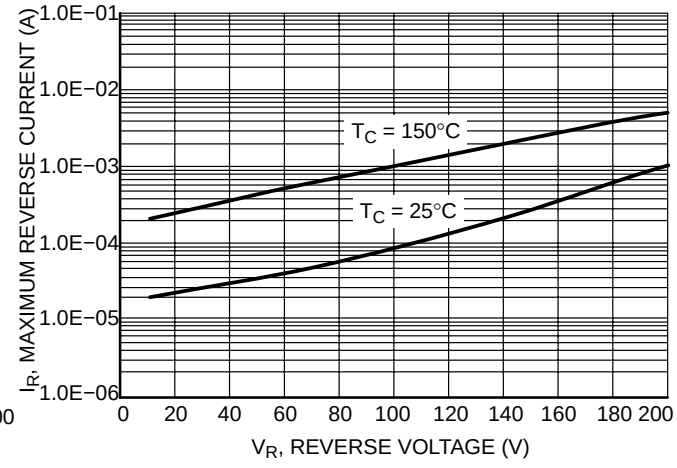



**Figure 4. Maximum Reverse Current**

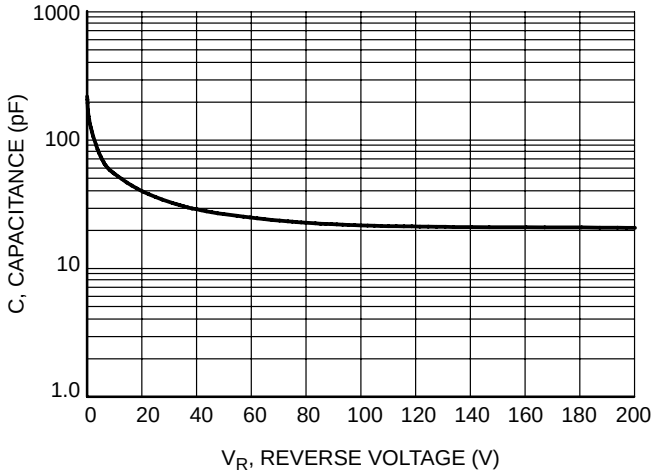



**Figure 5. Typical Capacitance**

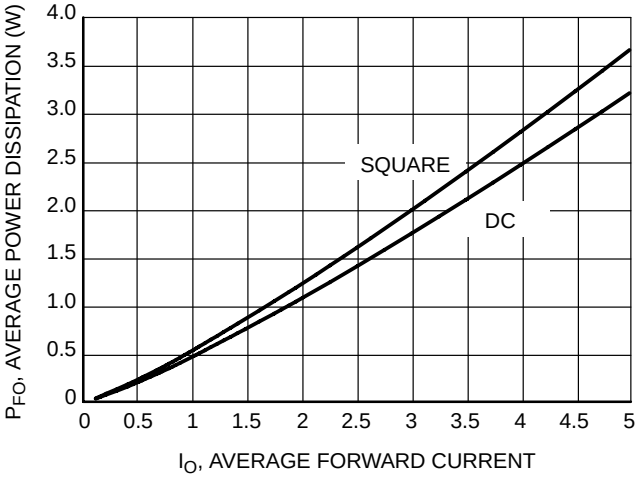



**Figure 6. Power Dissipation**

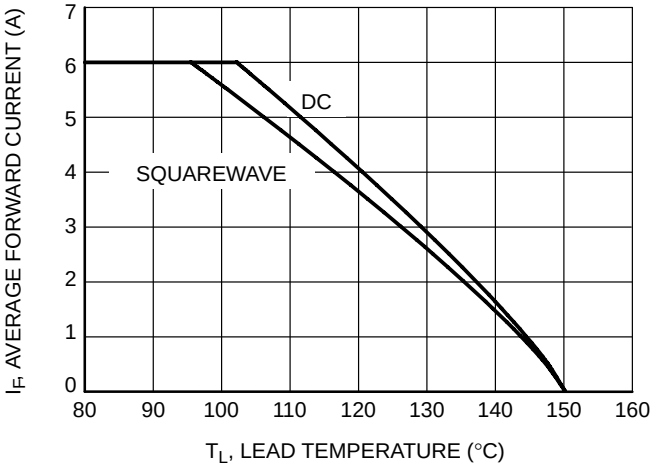
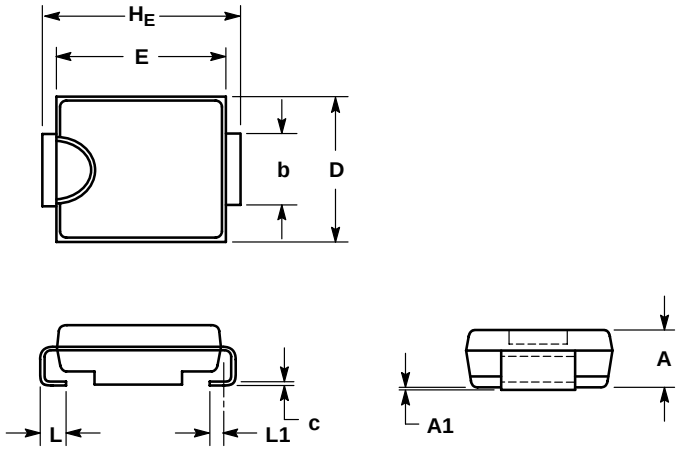



**Figure 7. Derating Curve**

## PACKAGE DIMENSIONS

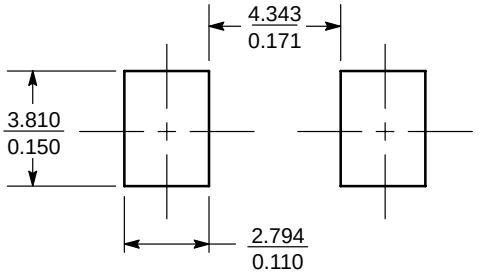
**SMC**
CASE 403−03
ISSUE E




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.

| | MILLIMETERS | | | INCHES | | |
|---|---|---|---|---|---|---|
| DIM | 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 |
| $H_E$ | 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*




SCALE 4:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*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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