

MBRS4201T3

200V, 4A Schottky Fast Soft-Recovery Power Rectifier

SMC Power Surface Mount Package

Features

- Lower Forward Voltage than any Ultrafast Rectifier:
 $V_F < 0.61\text{ V}$ at 150°C
- Fast Switching Speed: Reverse Recovery Time (t_{RR}) $< 35\text{ ns}$
- 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 Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 200 | V |
| Average Rectified Forward Current (Rated V_R , $T_L = 70^\circ\text{C}$) | $I_{F(AV)}$ | 4 | A |
| Nonrepetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 MHz) | I_{FSM} | 100 | A |
| Operating Junction Temperature | T_J | -55 to +150 | $^\circ\text{C}$ |

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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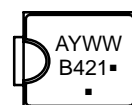
<http://onsemi.com>

SCHOTTKY RECTIFIER 4 AMPS, 200 VOLTS



SMC
CASE 403
PLASTIC

MARKING DIAGRAM



B421 = 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† |
|-------------|------------------|--------------------|
| MBRS4201T3 | SMC | 2500 / Tape & Reel |
| MBRS4201T3G | 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.

MBRS4201T3

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS

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

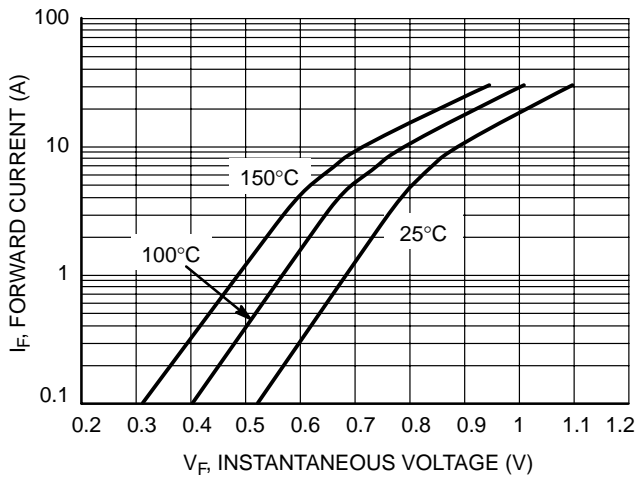


Figure 1. Typical Forward Voltage

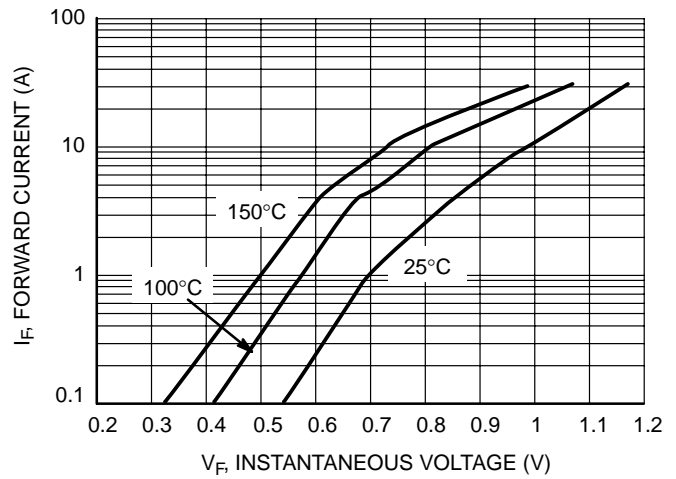


Figure 2. Maximum Forward Voltage

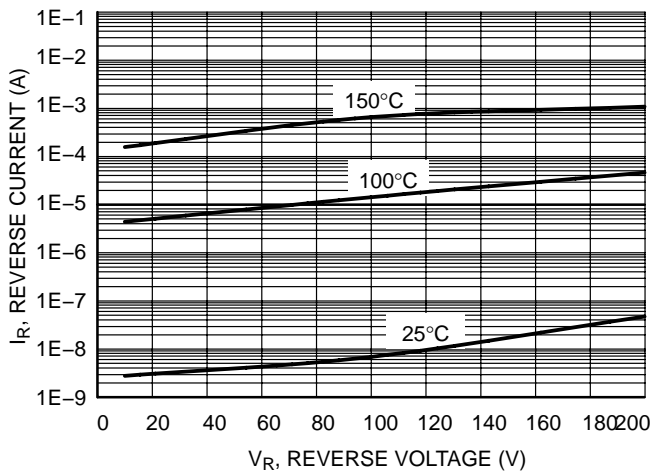


Figure 3. Typical Reverse Current

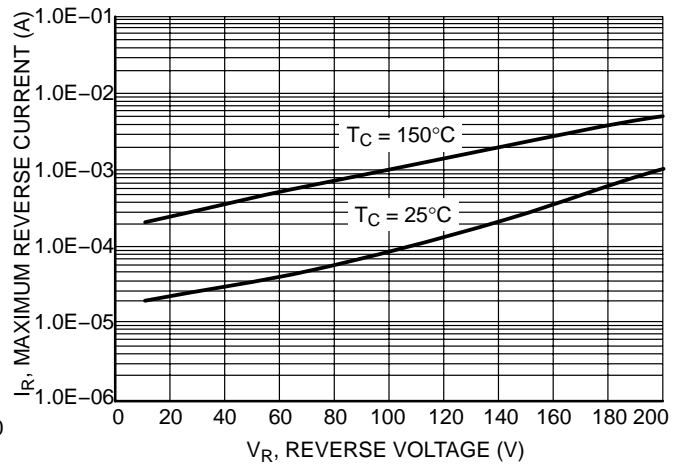


Figure 4. Maximum Reverse Current

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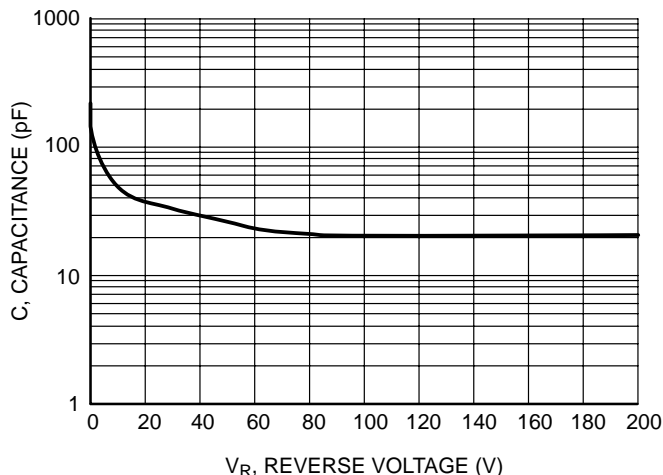


Figure 5. Typical Capacitance

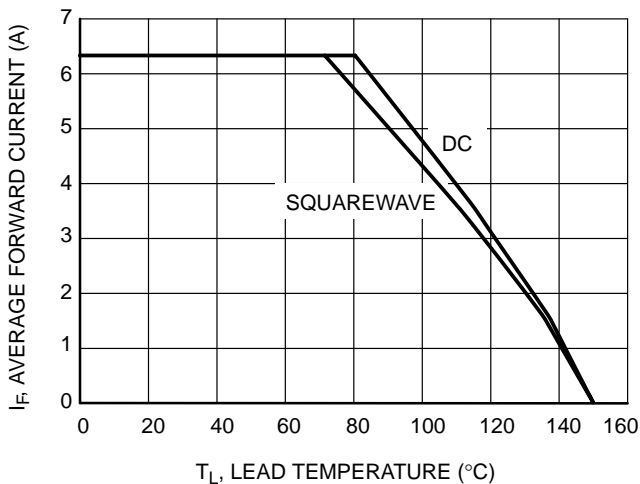


Figure 6. Derating Curve

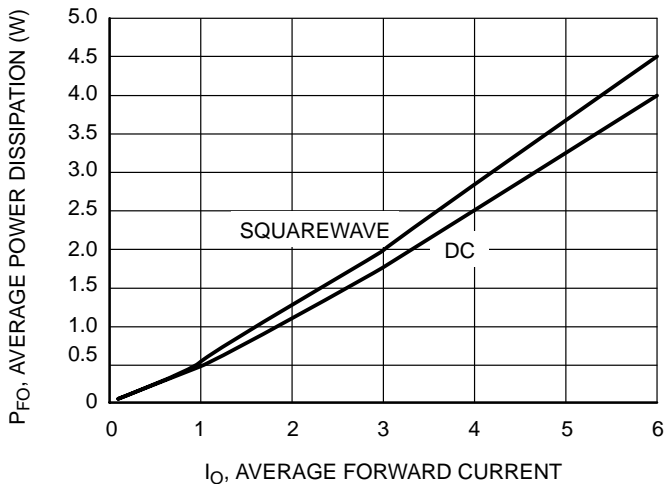
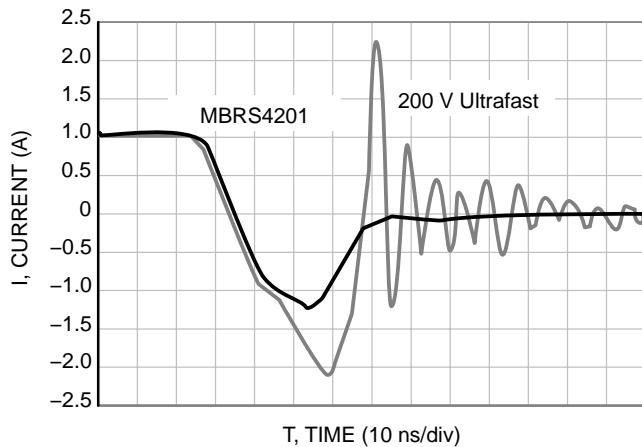


Figure 7. Power Dissipation



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

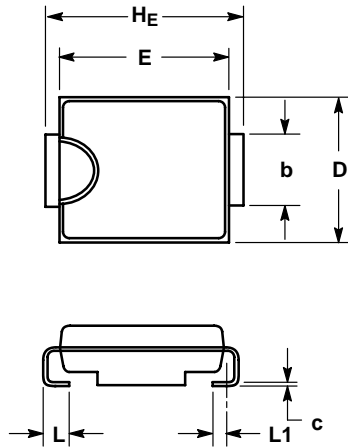
*Test Conditions:
 $I_F = 1 \text{ A}$, $dI/dT = 100 \text{ A}/\mu\text{s}$,
 $V_R = 30 \text{ V}$

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

MBRS4201T3

PACKAGE DIMENSIONS

SMC
CASE 403-03
ISSUE E

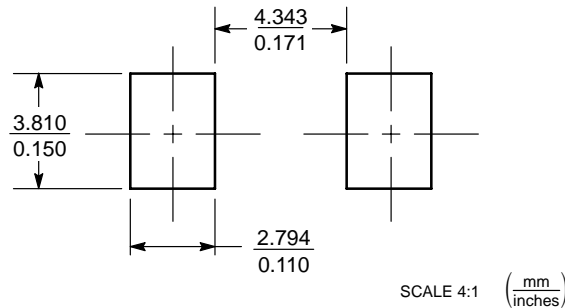


NOTES:


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.

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