# 200 V, 4 A 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  $(t_{RR}) < 35$  ns
- Soft Recovery Characteristics: Softness Factor  $(t_b/t_a) \ge 1$
- 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°C Maximum for 10 Seconds
- ESD Ratings:
  - ♦ Machine Model = A
  - ◆ Human Body Model = 1C
- Polarity: Polarity Band on Plastic Body Indicates Cathode Lead



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# 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 <sup>†</sup>
MBRS4201T3G	SMC (Pb-Free)	2,500 / Tape & Reel
NRVBS4201T3G*	SMC (Pb-Free)	2,500 / Tape & Reel

<sup>†</sup>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 Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	200	V
Average Rectified Forward Current (Rated V <sub>R</sub> , T <sub>L</sub> = 70°C)	I <sub>F(AV)</sub>	4	А
Nonrepetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I <sub>FSM</sub>	100	А
Operating Junction Temperature	TJ	-55 to +150	°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

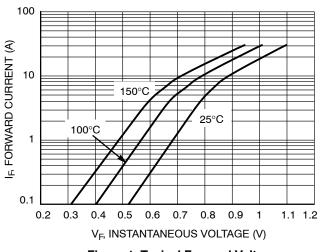
Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction-to-Lead	$R_{ heta JL}$	11	°C/W

#### **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 <sub>F</sub>	0.86 0.61	V
Maximum Instantaneous Reverse Current (Rated $V_R$ ) (Rated DC Voltage, $T_J$ = 25°C) (Rated DC Voltage, $T_J$ = 150°C)	I <sub>R</sub>	1.0 5.0	mA mA
Maximum Reverse Recovery Time (I <sub>F</sub> = 1.0 A, di/dt = 100 A/ $\mu$ s, V <sub>R</sub> = 30 V)	t <sub>rr</sub>	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.

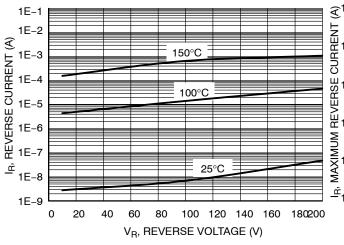
#### TYPICAL ELECTRICAL CHARACTERISTICS

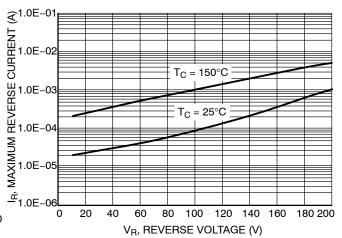


100 (V) 100°C 150°C 100°C 25°C 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1 1.1 1. V<sub>F</sub>, INSTANTANEOUS VOLTAGE (V)

Figure 1. Typical Forward Voltage

Figure 2. Maximum Forward Voltage





**Figure 3. Typical Reverse Current** 

Figure 4. Maximum Reverse Current

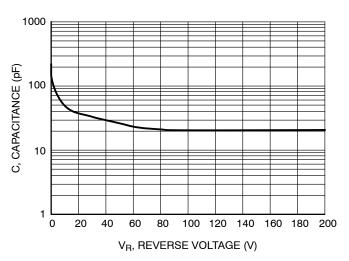


Figure 5. Typical Capacitance

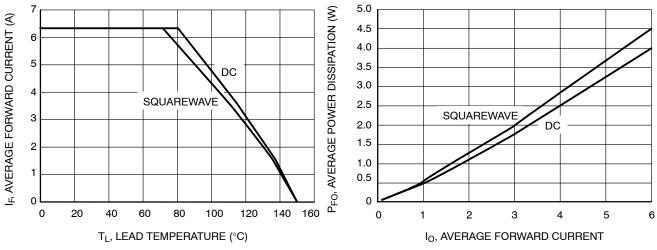


Figure 6. Derating Curve

Figure 7. Power Dissipation

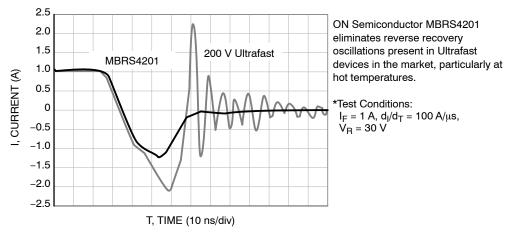
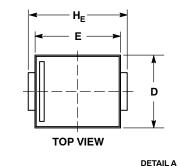


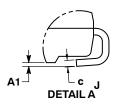
Figure 8. Reverse Recovery Time\* (t<sub>RR</sub>) at 125°C

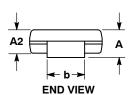
### PACKAGE DIMENSIONS

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



**SIDE VIEW** 



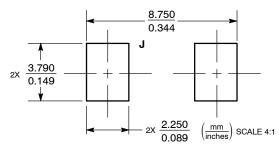


#### NOTES:

- DIMENSIONING AND TOLERANCING PER ANME Y14.5M, 1994. CONTROLLING DIMENSION: INCHES.
- DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.254mm PER SIDE. DIMENSIONS D AND E TO BE DETERMINED AT DATUM H. DIMENSION b SHALL BE MEASURED WITHIN THE AREA
- DETERMINED BY DIMENSION L.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
Α	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 ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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