

# MBRS4201T3G, NRVBS4201T3G

## 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  $150^\circ\text{C}$
- 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
- Lead and Mounting Surface Temperature for Soldering Purposes:  $260^\circ\text{C}$  Maximum for 10 Seconds
- ESD Ratings:
  - ◆ Machine Model = A
  - ◆ Human Body Model = 1C
- Polarity: Notch in Plastic Body Indicates Cathode Lead



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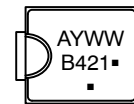
### SCHOTTKY RECTIFIER 4 AMPS, 200 VOLTS



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†
MBRS4201T3G	SMC (Pb-Free)	2,500 / Tape & Reel
NRVBS4201T3G	SMC (Pb-Free)	2,500 / 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.

# MBRS4201T3G, NRVBS4201T3G

## 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 Hz)	$I_{FSM}$	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	$R_{\theta JL}$	11	$^\circ\text{C/W}$

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage ( $I_F = 4\text{ A}$ , $T_J = 25^\circ\text{C}$ ) ( $I_F = 4\text{ A}$ , $T_J = 150^\circ\text{C}$ )	$V_F$	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

# MBRS4201T3G, NRVBS4201T3G

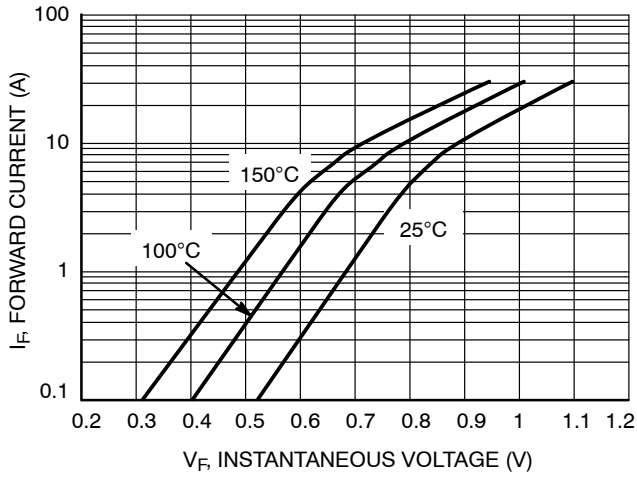


Figure 1. Typical Forward Voltage

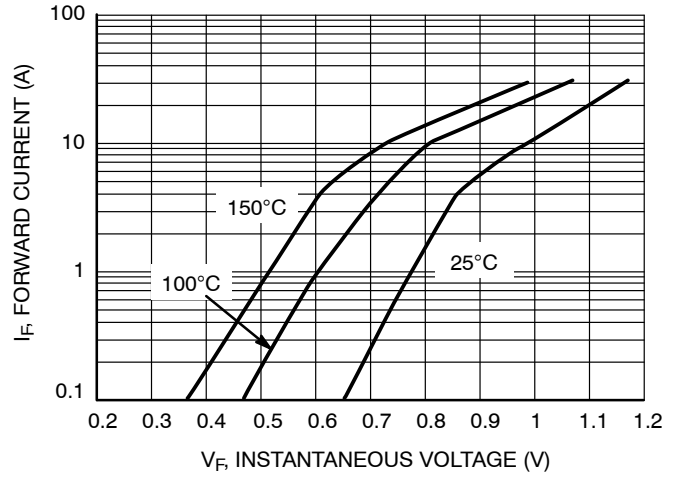


Figure 2. Maximum Forward Voltage

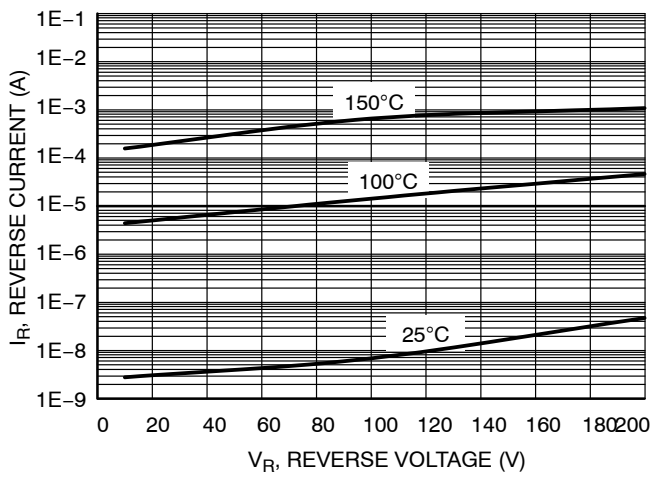


Figure 3. Typical Reverse Current

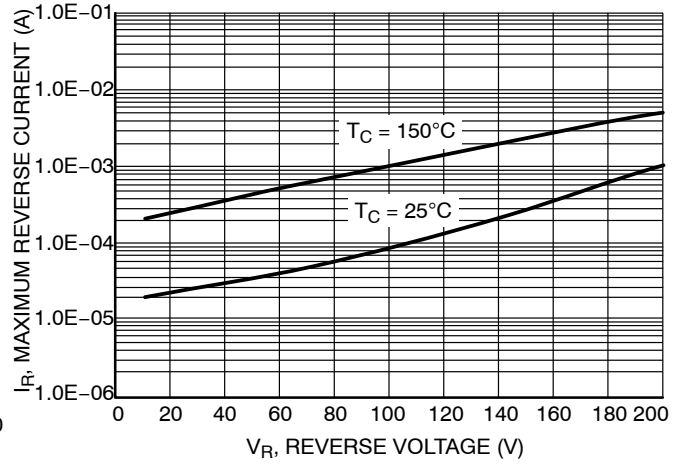


Figure 4. Maximum Reverse Current

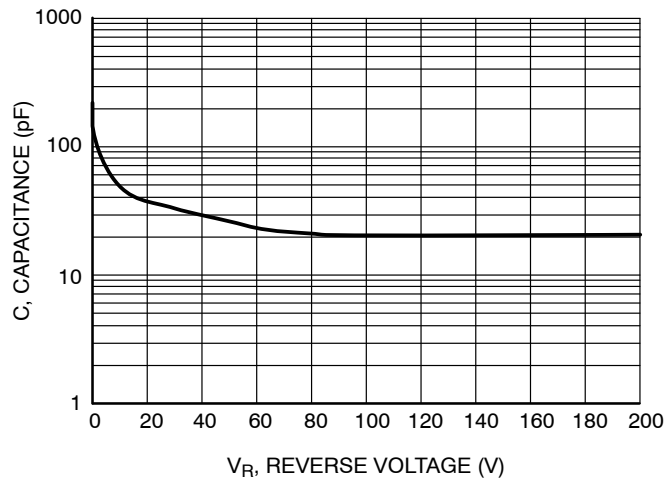


Figure 5. Typical Capacitance

# MBRS4201T3G, NRVBS4201T3G

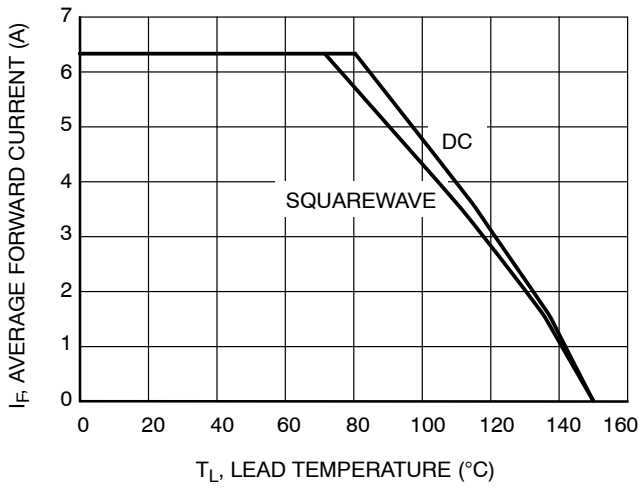


Figure 6. Derating Curve

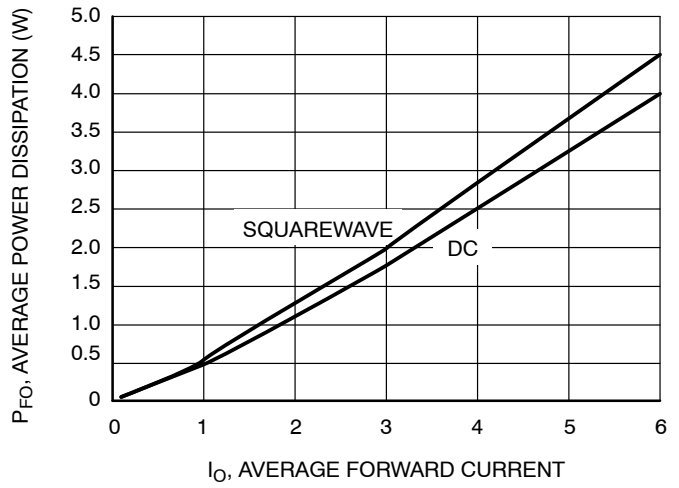
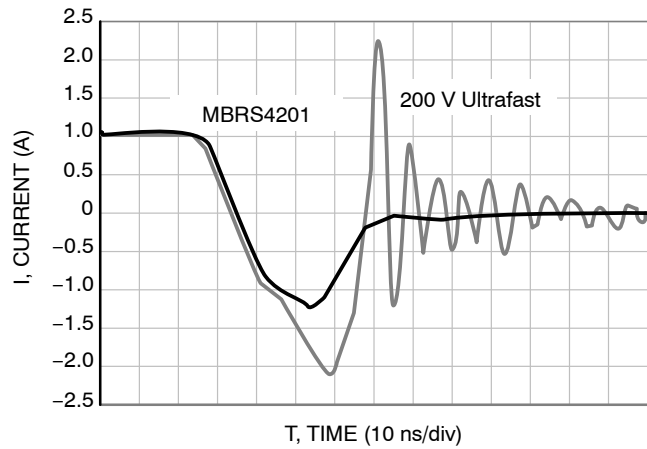


Figure 7. Power Dissipation



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

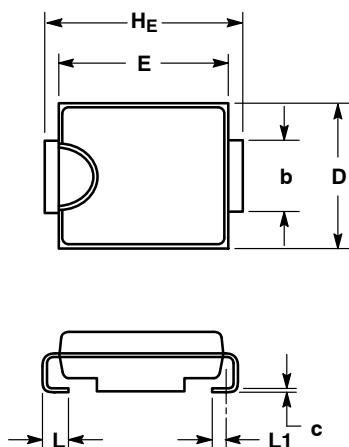
\*Test Conditions:  
 $I_F = 1 \text{ A}$ ,  $dI/dT = 100 \text{ A}/\mu\text{s}$ ,  
 $V_R = 30 \text{ V}$

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

# MBRS4201T3G, NRVBS4201T3G

## PACKAGE DIMENSIONS

SMC  
CASE 403-03  
ISSUE E

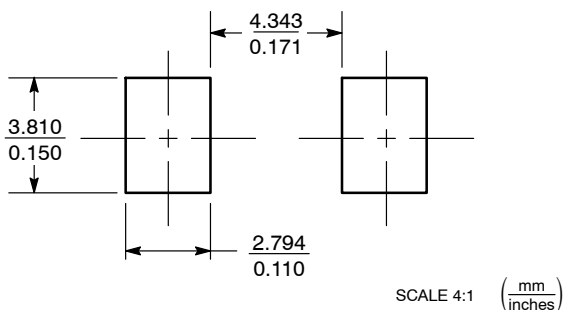


NOTES:

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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