

Surface Mount Schottky Power Rectifier

MBRS3100T3G, NRVBS3100T3G

This device employs the Schottky Barrier principle in a large area metal-to-silicon power diode. State-of-the-art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency rectification, or as free wheeling and polarity protection diodes, in surface mount applications where compact size and weight are critical to the system.

Features

- Small Compact Surface Mountable Package with J-Bend Leads
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- Excellent Ability to Withstand Reverse Avalanche Energy Transients
- Guard-Ring for Stress Protection
- 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

Mechanical Characteristics

- Case: Epoxy, Molded
- 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 Max. for 10 Seconds
- Polarity: Polarity Band on Plastic Body Indicates Cathode Lead

1

- ESD Ratings:
 - ♦ Machine Model = C
 - ◆ Human Body Model = 3B

SCHOTTKY BARRIER RECTIFIERS 3.0 AMPERES, 100 VOLTS



SMC 2-LEAD CASE 403AC

MARKING DIAGRAM



B310 = Specific Device Code A = Assembly Location**

/ = 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 [†]
MBRS3100T3G	SMC 2-Lead (Pb-Free)	2,500 / Tape & Reel
NRVBS3100T3G*	SMC 2-Lead (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 Specifications Brochure, BRD8011/D.

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V _{RRM} V _{RWM} V _R	100	V
Average Rectified Forward Current (At Rated V _R , T _L = 100°C)	I _{F(AV)}	3.0	Α
Non-repetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I _{FSM}	130	Α
Operating Junction Temperature Range (Note 1)	TJ	-65 to +175	°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
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{ heta JA}$	85	°C/W
Thermal Characteristic, Junction-to-Lead (Note 2)	$\Psi_{\sf JL}$	16	°C/W
Thermal Characteristic, Junction-to-Case Top (Note 2)	Ψ_{JCT}	3.0	°C/W

^{2.} PCB Cu area = 600 mm², single layer with 1 oz thickness.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 3)	V _F	0.79 0.90 0.62 0.70	V
Maximum Instantaneous Reverse Current (Note 3) (Rated dc Voltage, T _J = 25°C) (Rated dc Voltage, T _J = 125°C)	İR	0.05 5.0	mA

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. 3. Pulse Test: Pulse Width = 300 μ s, Duty Cycle \leq 2.0%.

^{1.} The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

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TYPICAL CHARACTERISTICS

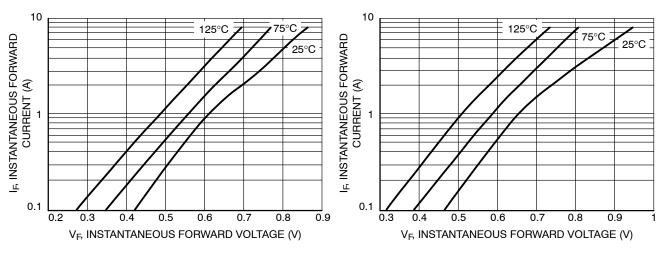


Figure 1. Typical Forward Voltage

Figure 2. Maximum Forward Voltage

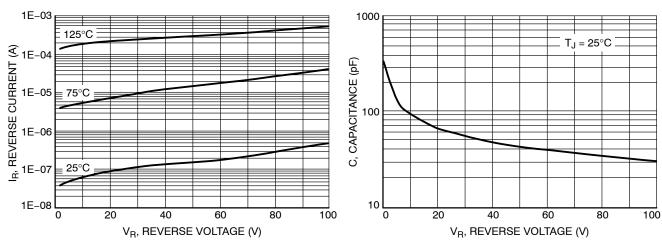


Figure 3. Typical Reverse Current

dc

SQUARE WAVE

 $R_{\theta JL} = 11 \, ^{\circ}C/W$ $T_{J} = 150 ^{\circ}C$

RATED VOLTAGE APPLIED

160

7

6

I_F, AVERAGE FORWARD

CURRENT (A)

3

2

1

0

100

4.5 4 3.5 3 SQUARE WAVE

2.5 2.5 2.5 0.5 0.5 0.5 1_O, AVERAGE FORWARD CURRENT (A)

Figure 4. Typical Capacitance

Figure 5. Current Derating - Lead

T_L, LEAD TEMPERATURE (°C)

140

150

130

Figure 6. Forward Power Dissipation

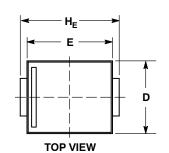


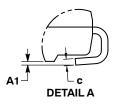


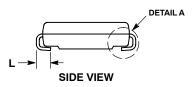


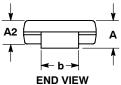
SMC 2-LEAD CASE 403AC **ISSUE B**

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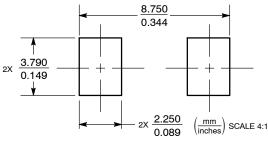




- DIMENSIONING AND TOLERANCING PER ANME Y14.5M, 1994.
- 1. DIMENSIONING AND TOLEHANGING PEH ANME Y14-5M, 1994.
 2. CONTROLLING DIMENSION: INCHES.
 3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.254mm PER SIDE.
 4. DIMENSIONS D AND E TO BE DETERMINED AT DATUM H.
 5. DIMENSION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

	MILLIMETERS		INC	HES
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
С	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 onsemi Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



XXXX = Specific Device Code = Assembly Location

Α = Year WW = Work Week = Pb-Free Package

(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.

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