

Surface Mount Schottky Power Rectifier

SMA Power Surface Mount Package



ON Semiconductor®

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MBRA210L, NRVBA210L, NRVBA210LN

This device employs the Schottky Barrier principle in a metal-to-silicon power rectifier. Features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies; free wheeling diodes and polarity protection diodes. Typical applications are AC-DC and DC-DC converters, reverse battery protection, and “Oring” of multiple supply voltages and any other application where performance and size are critical.

Features

- Ultra Low V_F
- 1st in the Market Place with a 10 V_R Schottky Rectifier
- Compact Package with J-Bend Leads Ideal for Automated Handling
- Highly Stable Oxide Passivated Junction
- Guardring for Over-Voltage Protection
- Optimized for Low Forward Voltage
- NRVBA 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:

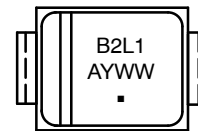
- Case: Molded Epoxy
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 70 mg (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Polarity: Polarity Band Indicates Cathode Lead
- ESD Ratings:
 - ◆ Machine Model = C
 - ◆ Human Body Model = 3A

SCHOTTKY BARRIER RECTIFIER 2 AMPERES 10 VOLTS



SMA
CASE 403D

MARKING DIAGRAM



B2L1 = 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 bottom (molding ejecter pin), the front side assembly code may be blank.

ORDERING INFORMATION

| Device | Package | Shipping† |
|----------------|------------------|------------------------|
| MBRA210LT3G | SMA (Pb-Free) | 5,000 / Tape & Reel |
| NRVBA210LT3G* | SMA (Pb-Free) | 5,000 / Tape & Reel |
| NRVBA210LNT3G* | SMA (Pb-Free) | 5,000 / 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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MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 10 | V |
| Average Rectified Forward Current (At Rated V_R , $T_L = 110^\circ\text{C}$) | I_O | 2.0 | A |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | I_{FSM} | 160 | A |
| Storage/Operating Case Temperature Operating Junction Temperature | T_{stg}, T_C T_J | -55 to +125 | $^\circ\text{C}$ |
| Voltage Rate of Change (Rated V_R , $T_J = 25^\circ\text{C}$) | dv/dt | 10,000 | V/ μs |

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 | Min Pad | 1 Inch Pad | Unit |
|---|------------------------------------|-----------|------------|---------------------------|
| Thermal Resistance, Junction-to-Lead Thermal Resistance, Junction-to-Ambient | $R_{\theta JL}$ $R_{\theta JA}$ | 22 150 | 15 81 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS

| | | | | |
|---|-------|--------------------------|---------------------------|----|
| Maximum Instantaneous Forward Voltage (Note 1) ($I_F = 0.1 \text{ A}$) ($I_F = 1.0 \text{ A}$) ($I_F = 2.0 \text{ A}$) | V_F | $T_J = 25^\circ\text{C}$ | $T_J = 100^\circ\text{C}$ | V |
| | | 0.260 | 0.15 | |
| | | 0.325 | 0.23 | |
| Maximum Instantaneous Reverse Current ($V_R = 5.0 \text{ V}$) ($V_R = 10 \text{ V}$) | I_R | $T_J = 25^\circ\text{C}$ | $T_J = 100^\circ\text{C}$ | mA |
| | | 0.25 | 40 | |
| | | 0.70 | 60 | |

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.

1. Pulse Test: Pulse Width $\leq 250 \mu\text{s}$, Duty Cycle $\leq 2\%$.

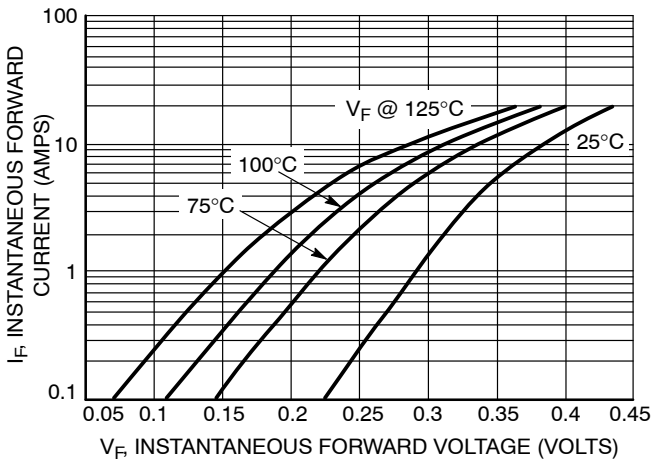


Figure 1. Typical Forward Voltage

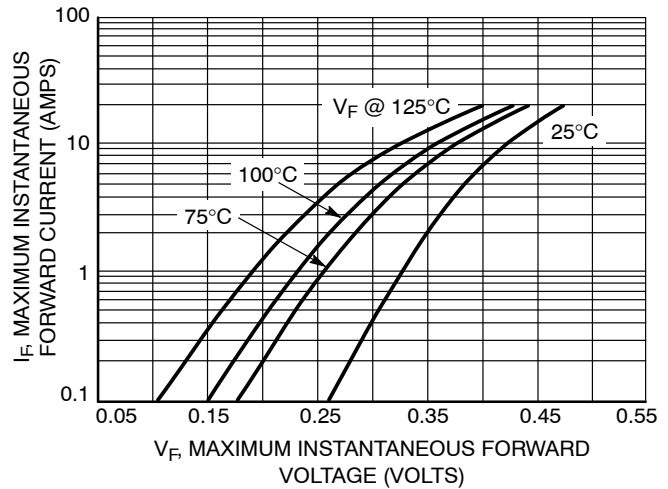


Figure 2. Maximum Forward Voltage

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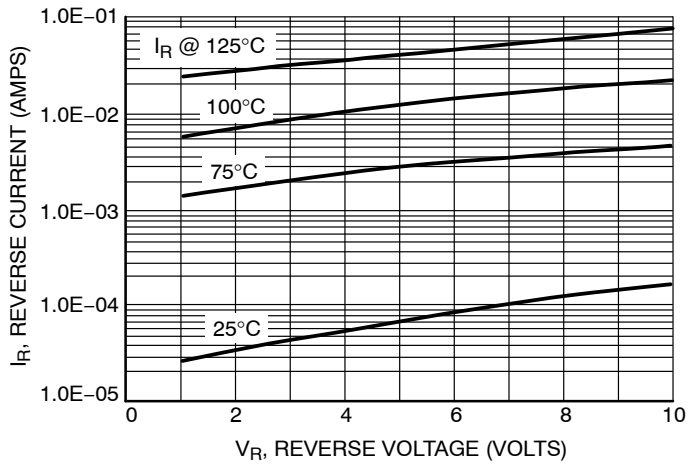


Figure 3. Typical Reverse Current

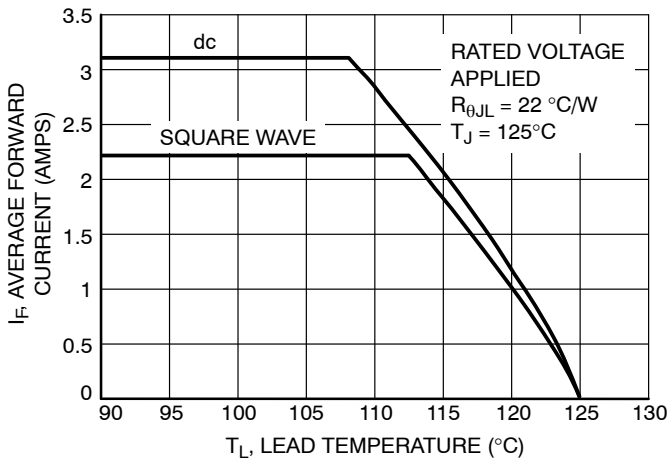


Figure 4. Current Derating - Junction to Lead

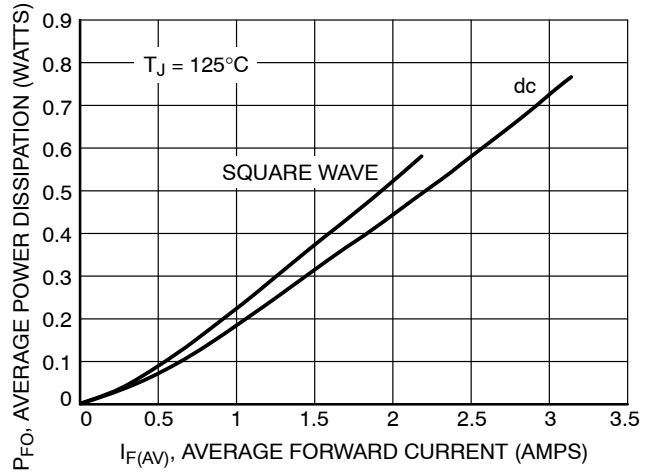


Figure 5. Forward Power Dissipation

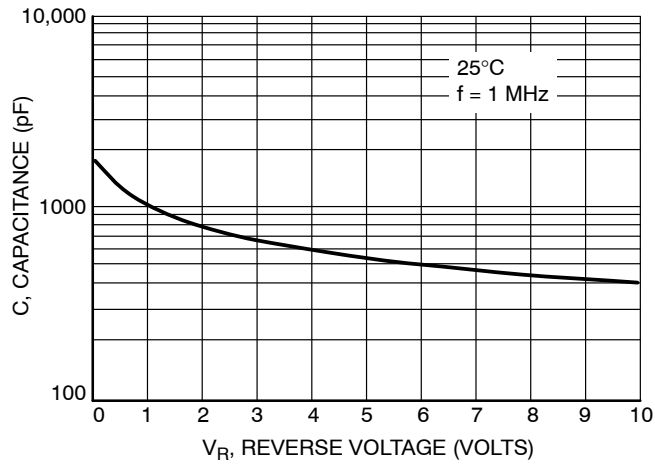


Figure 6. Typical Capacitance

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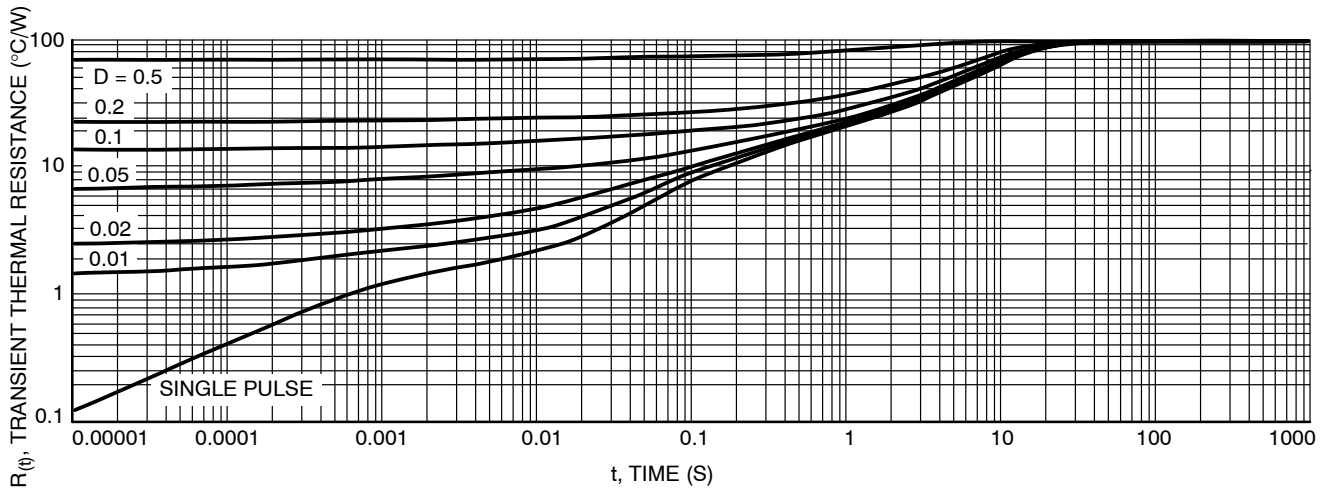


Figure 7. Thermal Response, Junction to Ambient (min pad)

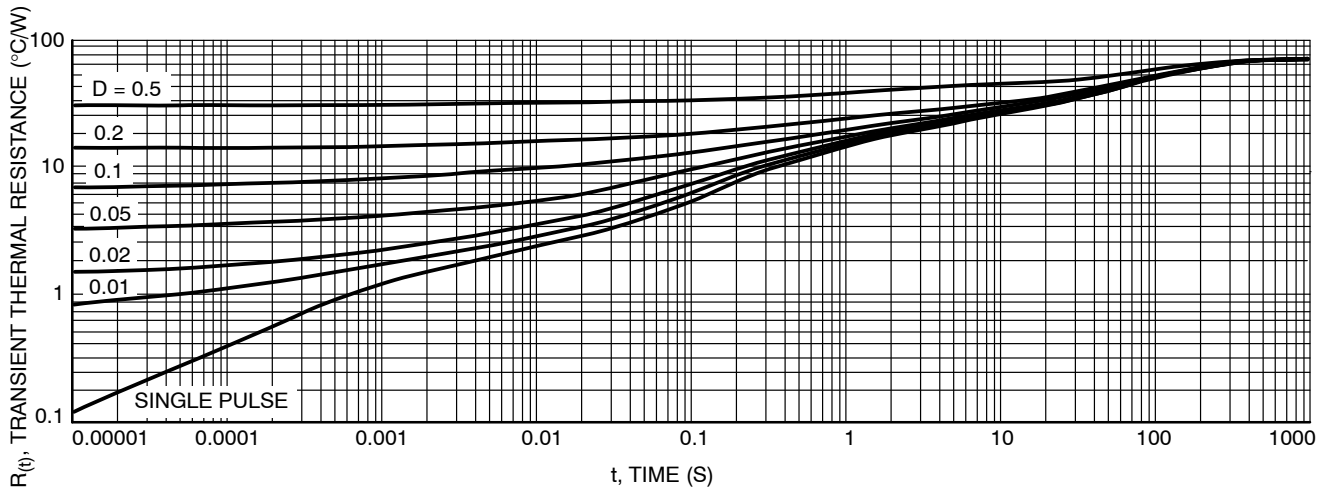


Figure 8. Thermal Response, Junction to Ambient (1 inch pad)

MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

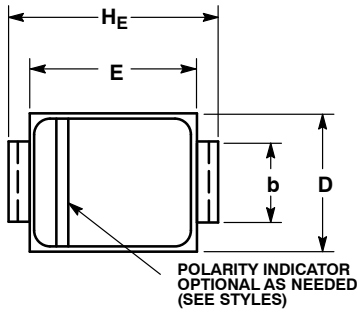
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STYLE 1 STYLE 2
SCALE 1:1

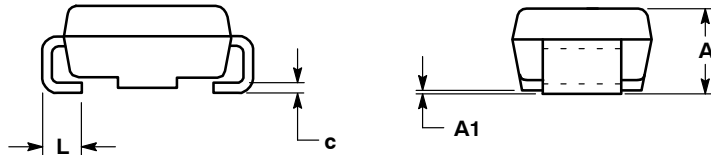
SMA CASE 403D ISSUE H

DATE 23 SEP 2015

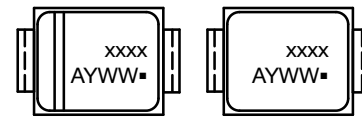


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION b SHALL BE MEASURED WITHIN DIMENSION L.

| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 1.97 | 2.10 | 2.20 | 0.078 | 0.083 | 0.087 |
| A1 | 0.05 | 0.10 | 0.20 | 0.002 | 0.004 | 0.008 |
| b | 1.27 | 1.45 | 1.63 | 0.050 | 0.057 | 0.064 |
| c | 0.15 | 0.28 | 0.41 | 0.006 | 0.011 | 0.016 |
| D | 2.29 | 2.60 | 2.92 | 0.090 | 0.103 | 0.115 |
| E | 4.06 | 4.32 | 4.57 | 0.160 | 0.170 | 0.180 |
| HE | 4.83 | 5.21 | 5.59 | 0.190 | 0.205 | 0.220 |
| L | 0.76 | 1.14 | 1.52 | 0.030 | 0.045 | 0.060 |



GENERIC MARKING DIAGRAM*

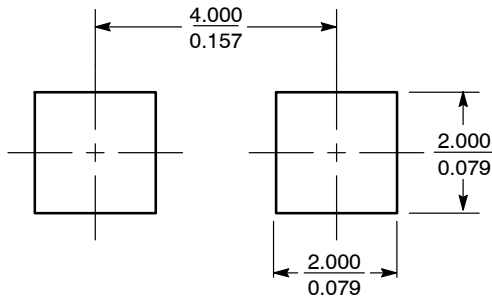


STYLE 1 STYLE 2

- xxxx = Specific Device Code
- A = Assembly Location
- Y = Year
- WW = Work Week
- = Pb-Free Package

*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.

SOLDERING FOOTPRINT*



SCALE 8:1 (mm/inches)

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

- STYLE 1: STYLE 2:
1. CATHODE (POLARITY BAND)
 2. ANODE
- NO POLARITY

| | | |
|-------------------------|--------------------|--|
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