## MBR1080G, MBR1090G, MBR10100G, NRVB10100G

## **SWITCHMODE Power Rectifiers**

### **Features**

- Guard-Ring for Stress Protection
- Low Forward Voltage
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Low Power Loss/High Efficiency
- High Surge Capacity
- Low Stored Charge Majority Carrier Conduction
- AEC-Q101 Qualified and PPAP Capable
- NRVB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

### **Mechanical Characteristics**

- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Rating:
  - ♦ Human Body Model = 3B
  - ♦ Machine Model = C



## ON Semiconductor®

http://onsemi.com

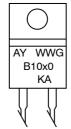
# SCHOTTKY BARRIER RECTIFIERS 10 AMPERES, 80 to 100 VOLTS



TO-220AC CASE 221B



## **MARKING DIAGRAM**



A = Assembly Location
Y = Year
WW = Work Week
G = Pb-Free Package
B10x0 = Device Code
x = 8, 9 or 10
KA = Diode Polarity

## **ORDERING INFORMATION**

Device	Package	Shipping
MBR1080G	TO-220 (Pb-Free)	50 Units/Rail
MBR1090G	TO-220 (Pb-Free)	50 Units/Rail
MBR10100G	TO-220 (Pb-Free)	50 Units/Rail
NRVB10100G	TO-220 (Pb-Free)	50 Units/Rail

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

## MBR1080G, MBR1090G, MBR10100G, NRVB10100G

### **MAXIMUM RATINGS**

Datie:	Symbol	MBR/NRVB			11-14
Rating		1080	1090	10100	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	80	90	100	V
Average Rectified Forward Current (Rated V <sub>R</sub> ) T <sub>C</sub> = 133°C	I <sub>F(AV)</sub>	10		Α	
Peak Repetitive Forward Current (Rated V <sub>R</sub> , Square Wave, 20 kHz) T <sub>C</sub> = 133°C	I <sub>FRM</sub>	20		Α	
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I <sub>FSM</sub>	150		Α	
Peak Repetitive Reverse Surge Current (2.0 μs, 1.0 kHz)	I <sub>RRM</sub>	0.5		Α	
Operating Junction Temperature (Note 1)	TJ	- 65 to +175		°C	
Storage Temperature	T <sub>stg</sub>	- 65 to +175		°C	
Voltage Rate of Change (Rated V <sub>R</sub> )	dv/dt	10,000		V/μs	

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		Value	Unit
Maximum Thermal Resistance, Junction-to-Case	$R_{ heta JC}$	2.0	°C/W
Maximum Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	60	°C/W

## **ELECTRICAL CHARACTERISTICS**

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 2) $ \begin{aligned} &(i_F=10 \text{ Amps, } T_C=125^{\circ}\text{C}) \\ &(i_F=10 \text{ Amps, } T_C=25^{\circ}\text{C}) \\ &(i_F=20 \text{ Amps, } T_C=125^{\circ}\text{C}) \\ &(i_F=20 \text{ Amps, } T_C=25^{\circ}\text{C}) \end{aligned} $	VF	0.7 0.8 0.85 0.95	V
Maximum Instantaneous Reverse Current (Note 2) (Rated dc Voltage, $T_C$ = 125°C) (Rated dc Voltage, $T_C$ = 25°C)	i <sub>R</sub>	6.0 0.10	mA

<sup>2.</sup> Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

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

## MBR1080G, MBR1090G, MBR10100G, NRVB10100G

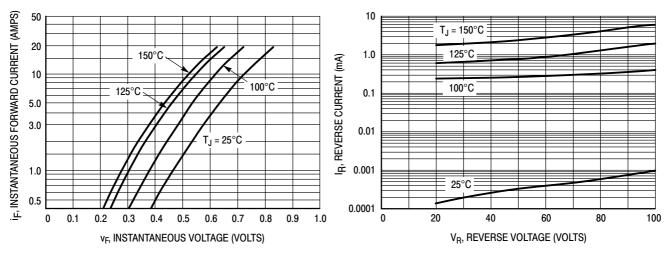


Figure 1. Typical Forward Voltage

**Figure 2. Typical Reverse Current** 

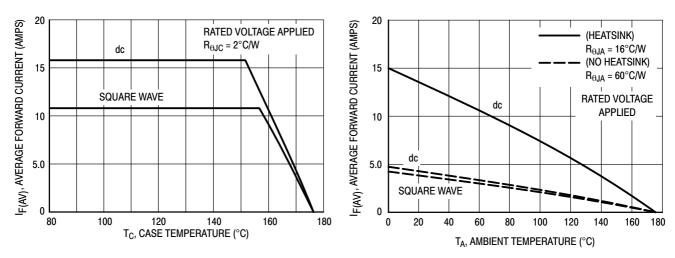


Figure 3. Typical Current Derating, Case

Figure 4. Typical Current Derating, Ambient

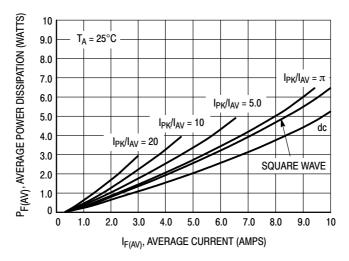


Figure 5. Forward Power Dissipation

## **MECHANICAL CASE OUTLINE**

**PACKAGE DIMENSIONS** 



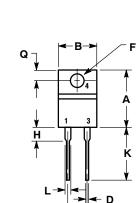


TO-220, 2-LEAD CASE 221B-04 ISSUE F

**DATE 12 APR 2013** 

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.595	0.620	15.11	15.75
В	0.380	0.405	9.65	10.29
С	0.160	0.190	4.06	4.82
D	0.025	0.039	0.64	1.00
F	0.142	0.161	3.61	4.09
G	0.190	0.210	4.83	5.33
Н	0.110	0.130	2.79	3.30
J	0.014	0.025	0.36	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.14	1.39
T	0.235	0.255	5.97	6.48
U	0.000	0.050	0.000	1.27



STYLE 1: PIN 1. CATHODE 2. N/A 3. ANODE

PIN 1. ANODE 2. N/A 3. CATHODE 4. ANODE

DOCUMENT NUMBER:	98ASB42149B	Electronic versions are uncontrolled except when accessed directly from the Document Reposito Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.		
DESCRIPTION:	TO-220, 2-LEAD		PAGE 1 OF 1	

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights nor the rights of others.

onsemi, Onsemi, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at <a href="www.onsemi.com/site/pdf/Patent-Marking.pdf">www.onsemi.com/site/pdf/Patent-Marking.pdf</a>. Onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by onsemi. "Typical" parameters which may be provided in onsemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. onsemi does not convey any license under any of its intellectual property rights nor the rights of others. onsemi products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA class 3 medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase

#### ADDITIONAL INFORMATION

**TECHNICAL PUBLICATIONS:** 

 $\textbf{Technical Library:} \ \underline{www.onsemi.com/design/resources/technical-documentation}$ 

onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at

www.onsemi.com/support/sales