

# MBR1060, MBR1080, MBR1090, MBR10100

MBR1060 and MBR10100 are Preferred Devices

## SWITCHMODE™ Power Rectifiers

This series of SWITCHMODE power rectifiers uses the Schottky Barrier principle with a platinum barrier metal. These state-of-the-art devices have the following features:

### 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
- Pb-Free Packages are Available\*

### Mechanical Characteristics

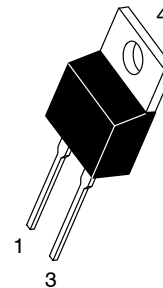
- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds



**ON Semiconductor®**

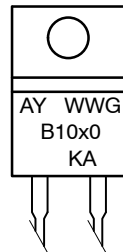
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIERS 10 AMPERES, 60 to 100 VOLTS



**TO-220AC  
CASE 221B  
PLASTIC**

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package  
B10x0 = Device Code  
x = 6, 8, 9 or 10  
KA = Diode Polarity

### ORDERING INFORMATION

Device	Package	Shipping
MBR1060	TO-220	50 Units/Rail
MBR1060G	TO-220 (Pb-Free)	50 Units/Rail
MBR1080	TO-220	50 Units/Rail
MBR1080G	TO-220 (Pb-Free)	50 Units/Rail
MBR1090	TO-220	50 Units/Rail
MBR1090G	TO-220 (Pb-Free)	50 Units/Rail
MBR10100	TO-220	50 Units/Rail
MBR10100G	TO-220 (Pb-Free)	50 Units/Rail

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

**Preferred** devices are recommended choices for future use and best overall value.

# MBR1060, MBR1080, MBR1090, MBR10100

## MAXIMUM RATINGS

Rating	Symbol	MBR				Unit
		1060	1080	1090	10100	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	60	80	90	100	V
Average Rectified Forward Current (Rated $V_R$ ) $T_C = 133^\circ\text{C}$	$I_{F(AV)}$	10				A
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20 kHz) $T_C = 133^\circ\text{C}$	$I_{FRM}$	20				A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	150				A
Peak Repetitive Reverse Surge Current (2.0 $\mu\text{s}$ , 1.0 kHz)	$I_{RRM}$	0.5				A
Operating Junction Temperature (Note 1)	$T_J$	- 65 to +175				$^\circ\text{C}$
Storage Temperature	$T_{stg}$	- 65 to +175				$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ )	$dv/dt$	10,000				V/ $\mu\text{s}$

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.

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

## THERMAL CHARACTERISTICS

Maximum Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.0	$^\circ\text{C/W}$
Maximum Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	60	$^\circ\text{C/W}$

## ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 2) ( $i_F = 10$ Amps, $T_C = 125^\circ\text{C}$ ) ( $i_F = 10$ Amps, $T_C = 25^\circ\text{C}$ ) ( $i_F = 20$ Amps, $T_C = 125^\circ\text{C}$ ) ( $i_F = 20$ Amps, $T_C = 25^\circ\text{C}$ )	$v_F$	0.7 0.8 0.85 0.95	V
Maximum Instantaneous Reverse Current (Note 2) (Rated dc Voltage, $T_C = 125^\circ\text{C}$ ) (Rated dc Voltage, $T_C = 125^\circ\text{C}$ – MBR1060 only) (Rated dc Voltage, $T_C = 25^\circ\text{C}$ )	$i_R$	6.0 15 0.10	mA

2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

# MBR1060, MBR1080, MBR1090, MBR10100

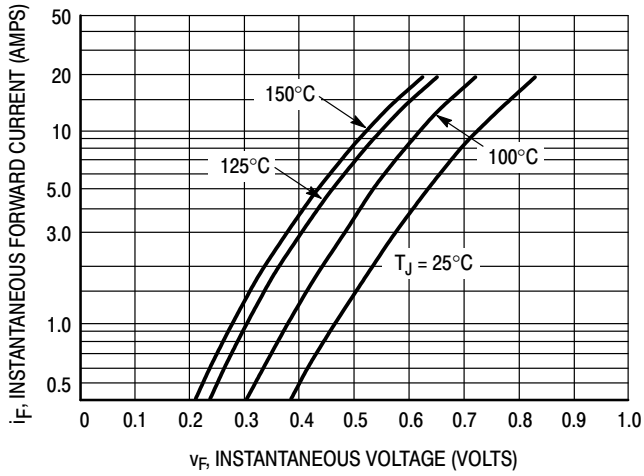


Figure 1. Typical Forward Voltage

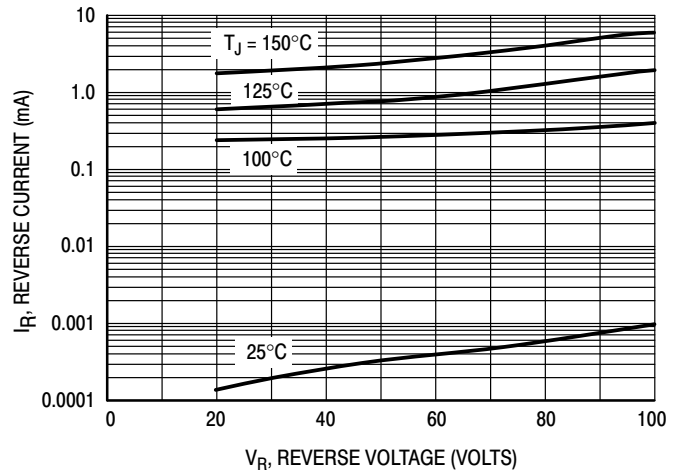


Figure 2. Typical Reverse Current

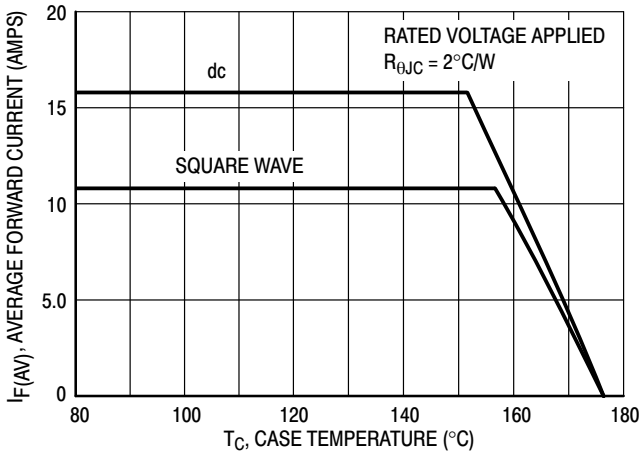


Figure 3. Typical Current Derating, Case

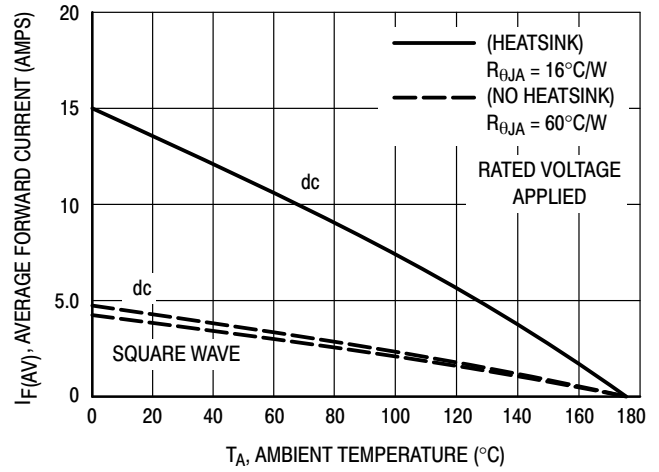


Figure 4. Typical Current Derating, Ambient

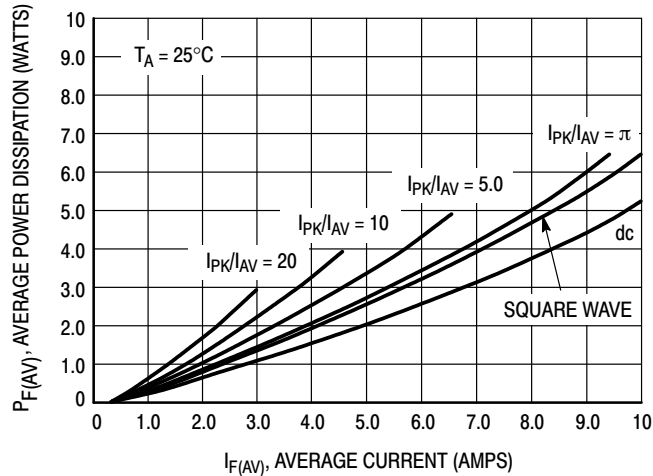
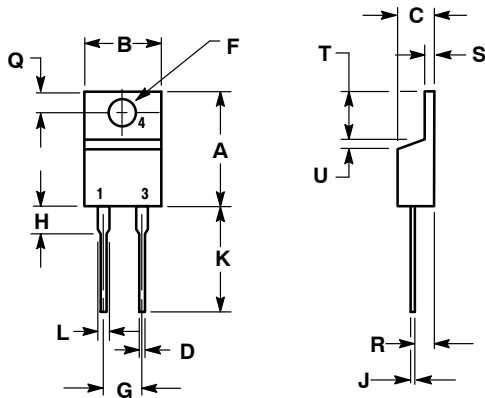


Figure 5. Forward Power Dissipation

# MBR1060, MBR1080, MBR1090, MBR10100

## PACKAGE DIMENSIONS

TO-220  
CASE 221B-04  
ISSUE E




NOTES:

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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.595	0.620	15.11	15.75
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.82
D	0.025	0.035	0.64	0.89
F	0.142	0.161	3.61	4.09
G	0.190	0.210	4.83	5.33
H	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

SWITCHMODE is a trademark of Semiconductor Components Industries, LLC.

ON Semiconductor and  are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC 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. "Typical" parameters which may be provided in SCILLC 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. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

### PUBLICATION ORDERING INFORMATION

**LITERATURE FULFILLMENT:**  
Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** orderlit@onsemi.com

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5773-3850

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative