Bulletin PD-20589 rev. B 03/03

International
IOR Rectifier

MBR150
MBR160

SCHOTTKY RECTIFIER

1.0 Amp

Major Ratings and Characteristics

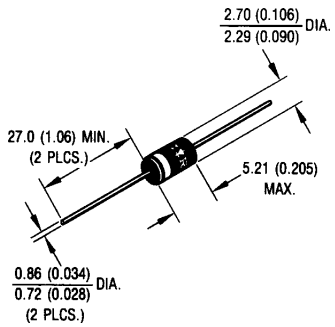
Characteristics		MBR150 MBR160	Units
$I_{F(AV)}$	Rectangular waveform	1.0	A
V_{RRM}		50/60	V
I_{FSM}	@ tp = 5 µs sine	150	A
V_F	@ 1 Apk, T_J = 125°C	0.65	V
T_J	range	- 40 to 150	°C

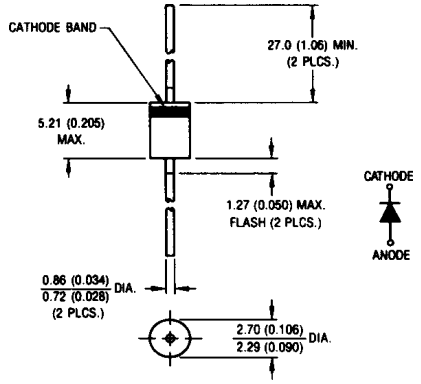
Description/ Features

The MBR150, MBR160 axial leaded Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- Low profile, axial leaded outline
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

CASE STYLE AND DIMENSIONS





Conform to JEDEC Outline DO-204AL (DO-41)

Dimensions in millimeters and inches

Voltage Ratings

Part number		MBR150	MBR160
V_R	Max. DC Reverse Voltage (V)	50	60
V_{RWM}	Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

Parameters		Value	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 4	1.0	A	50% duty cycle @ T_C = 75°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 6	150	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		25		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	2.0	mJ	T_J = 25 °C, I_{AS} = 1 Amps, L = 4 mH	
I_{AR}	Repetitive Avalanche Current	1.0	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

Parameters		Value	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop * See Fig. 1 (1)	0.75	V	@ 1A	T_J = 25 °C
		0.9	V	@ 2A	
		1.0	V	@ 3A	
		0.65	V	@ 1A	T_J = 125 °C
		0.75	V	@ 2A	
		0.82	V	@ 3A	
I_{RM}	Max. Reverse Leakage Current * See Fig. 2 (1)	0.5	mA	T_J = 25 °C	V_R = rated V_R
		5	mA	T_J = 100°C	
		10	mA	T_J = 125 °C	
C_T	Typical Junction Capacitance	55	pF	V_R = 5V_{DC} (test signal range 100Khz to 1Mhz) 25°C	
L_S	Typical Series Inductance	8.0	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Voltage Rate of Change	10000	V/µs	(Rated V_R)	

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters		Value	Units	Conditions
T_J	Max. Junction Temperature Range(*)	-40 to 150	°C	
T_{stg}	Max. Storage Temperature Range	-40 to 150	°C	
R_{thJL}	Max. Thermal Resistance Junction to Lead (**)	80	°C/W	DC operation (*See Fig. 4)
wt	Approximate Weight	0.33(0.012)	g (oz.)	
	Case Style	DO-204AL(DO-41)		

(*) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink

(**) Mounted 1 inch square PCB, Thermal Probe connected to lead 2mm from package

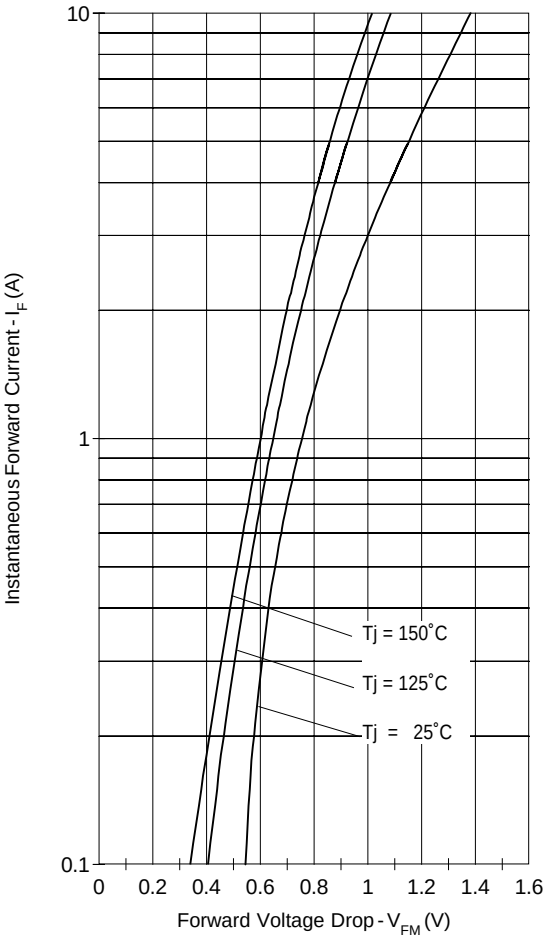


Fig. 1 - Maximum Forward Voltage Drop Characteristics

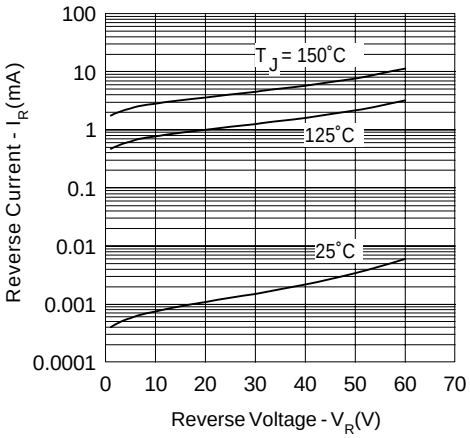


Fig. 2 - Typical Values of Reverse Current
Vs. Reverse Voltage

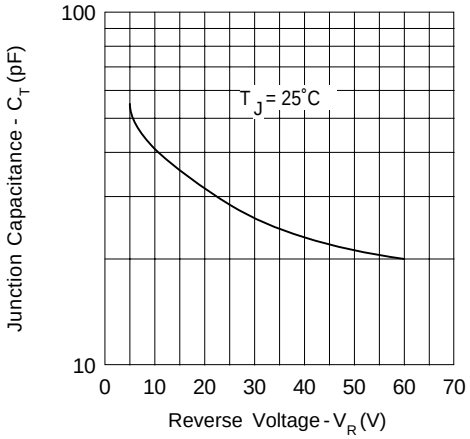


Fig. 3 - Typical Junction Capacitance
Vs. Reverse Voltage

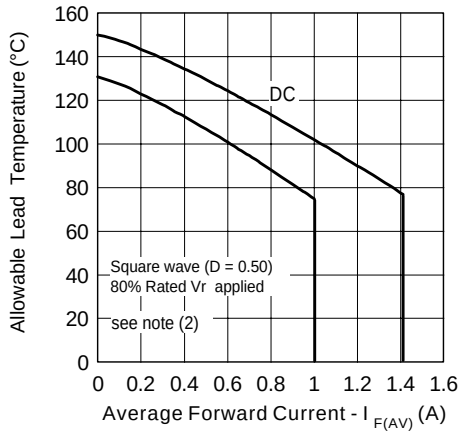


Fig. 4 - Maximum Ambient Temperature Vs. Average Forward Current, Printed Circuit Board Mounted

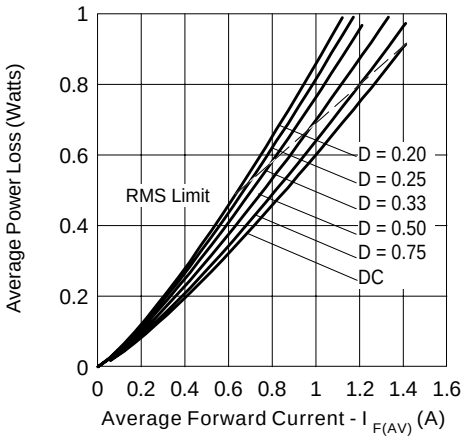


Fig. 5 - Forward Power Loss Characteristics

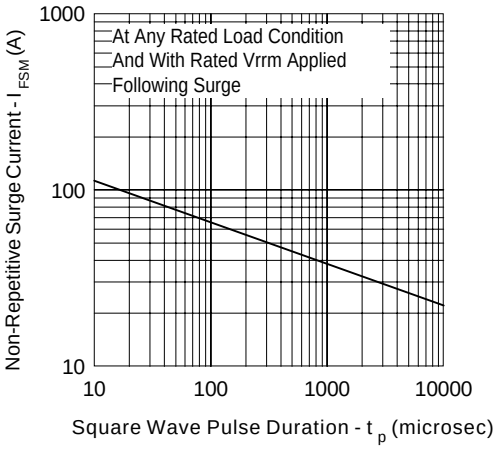
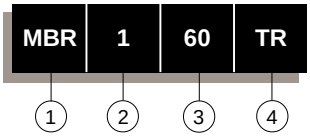


Fig. 6 - Maximum Non-Repetitive Surge Current

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Ordering Information Table

Device Code



1	-	Schottky MBR Series
2	-	Current Rating: 1 = 1A
3	-	Voltage Rating (60 = 60V, 50 = 50V)
4	-	TR = Tape & Reel package (5000 pcs)
	-	= Box package (1000 pcs)

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 03/03