Bulletin PD-20589 rev. C 12/04

International
IOR Rectifier

MBR150
MBR160

SCHOTTKY RECTIFIER

1.0 Amp

Major Ratings and Characteristics

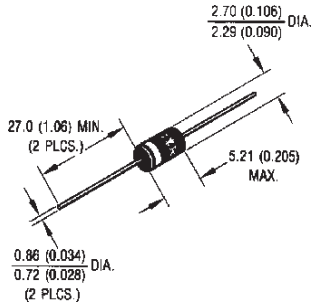
Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	1.0	A
V_{RRM}		50/60	V
I_{FSM}	@tp = 5 µs sine	150	A
V_F	@1 Apk, T_J = 125°C	0.65	V
T_J	range	-40 to 150	°C

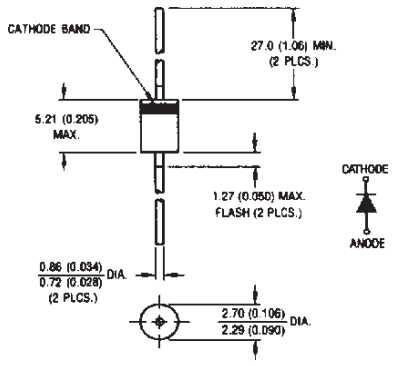
Description/ Features

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
- Lead-Free plating

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

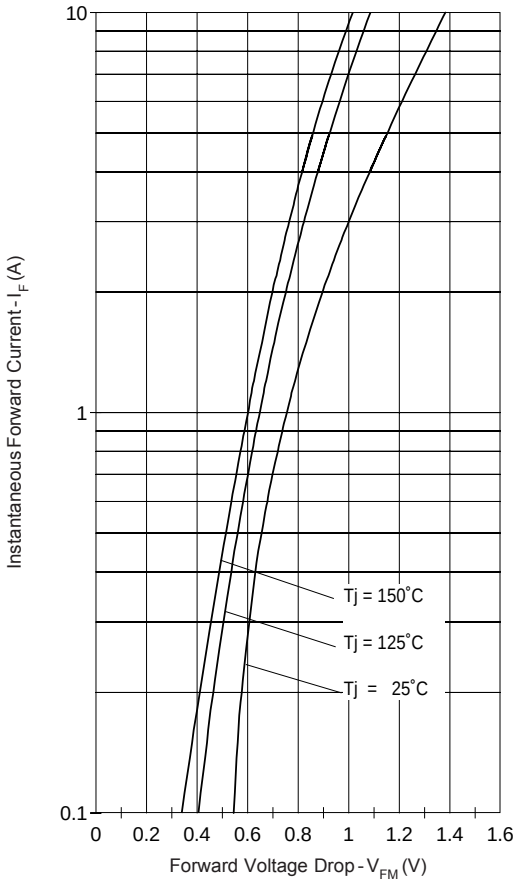


Fig. 1 - Maximum Forward Voltage Drop Characteristics

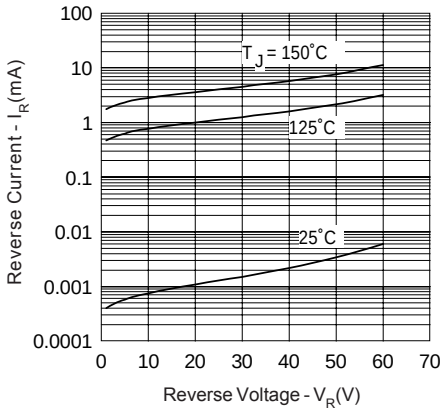


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

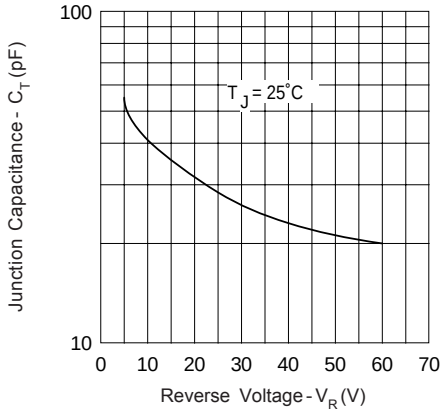


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

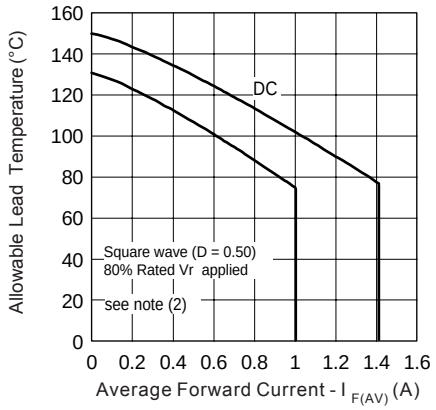


Fig. 4 - Maximum Ambient Temperature Vs. Average Forward Current, Printed Circuit Board Mounted

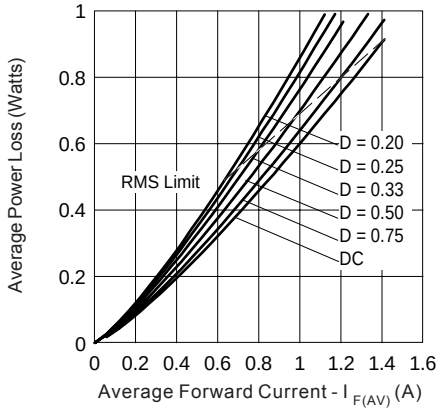


Fig. 5 - Forward Power Loss Characteristics

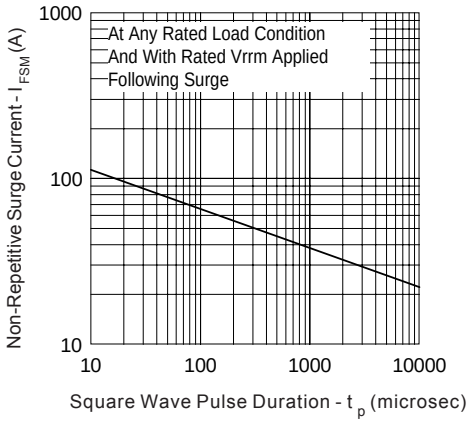
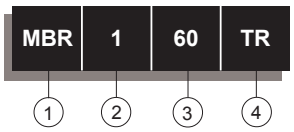


Fig. 6 - Maximum Non-Repetitive Surge Current

(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 and Lead-Free.
Qualification Standards can be found on IR's Web site.

International
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IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
12/04

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