Bulletin PD-20587 rev. A 03/02

International
IOR Rectifier

# MBR1100

## SCHOTTKY RECTIFIER 1.0 Amp

### Major Ratings and Characteristics

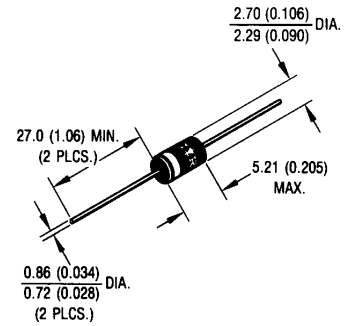
| Characteristics | | MBR1100 | Units |
|---|---|---|---|
| $I_{F(AV)}$ | Rectangular waveform | 1.0 | A |
| $V_{RRM}$ | | 100 | V |
| $I_{FSM}$ | @ tp = 5 µs sine | 200 | A |
| $V_F$ | @1 Apk, $T_J$ = 125°C | 0.68 | V |
| $T_J$ | range | -40 to 150 | °C |

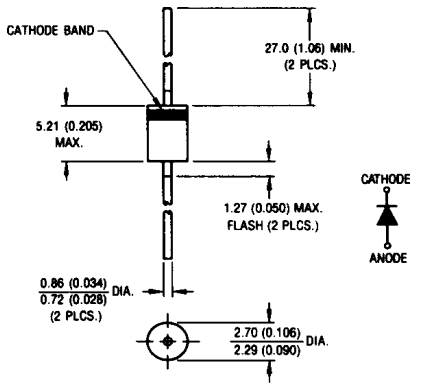
### Description/Features

The MBR1100 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 | | MBR1100 |
|---|---|---|
| $V_R$ | Max. DC Reverse Voltage (V) | 100 |
| $V_{RWM}$ | Max. Working Peak Reverse Voltage (V) | |

## Absolute Maximum Ratings

| | Parameters | Value | Units | Conditions | |
|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. Average Forward Current * See Fig. 4 | 10 | A | 50% duty cycle @ $T_C$ = 85°C, rectangular waveform | |
| $I_{FSM}$ | Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 6 | 200 | A | 5µs Sine or 3µs Rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied |
| | | 50 | | 10ms Sine or 6ms Rect. pulse | |
| $E_{AS}$ | Non-Repetitive Avalanche Energy | 3.0 | mJ | $T_J$ = 25 °C, $I_{AS}$ = 0.5 Amps, L = 10 mH | |
| $I_{AR}$ | Repetitive Avalanche Current | 0.2 | A | Current decaying linearly to zero in 1 µsec<br>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) | 0.85 | V | @ 1A | $T_J$ = 25 °C |
| | | | 0.96 | V | @ 2A | |
| | | | 0.68 | V | @ 1A | $T_J$ = 125 °C |
| | | | 0.78 | V | @ 2A | |
| $I_{RM}$ | Max. Reverse Leakage Current * See Fig. 2 | (1) | 0.5 | mA | $T_J$ = 25 °C | $V_R$ = rated $V_R$ |
| | | | 1.0 | mA | $T_J$ = 125 °C | |
| $C_T$ | Typical Junction Capacitance | | 35 | pF | $V_R$ = 5$V_{DC}$, (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

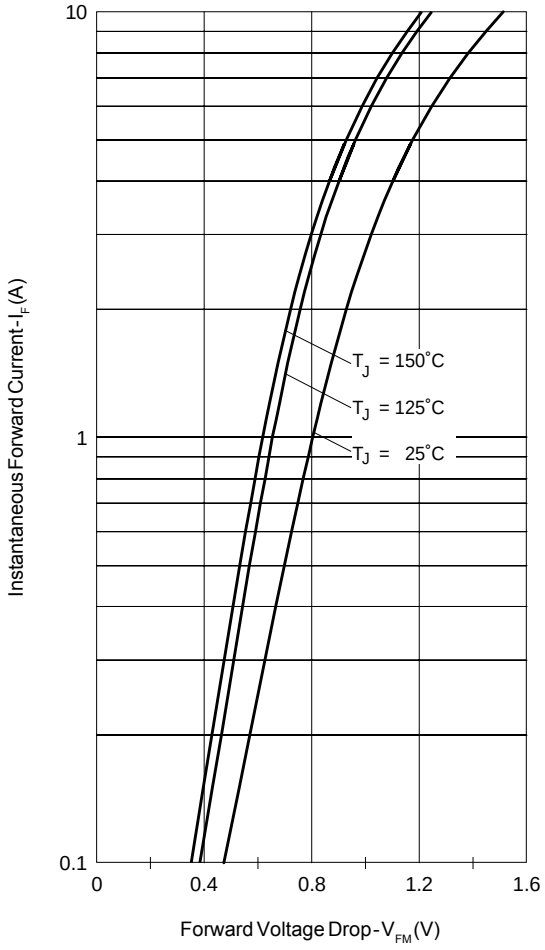



**Fig. 1 - Max. Forward Voltage Drop Characteristics**

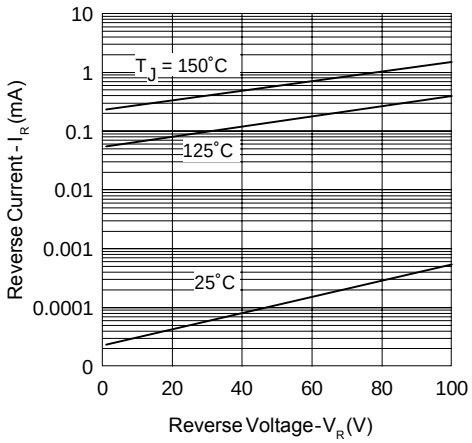



**Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage**

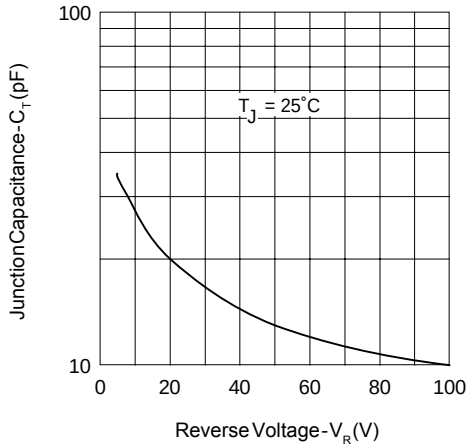



**Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage**

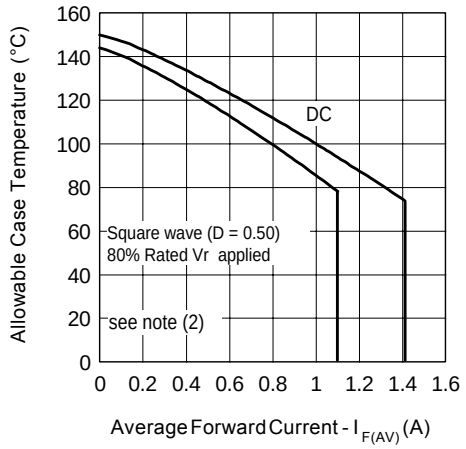



**Fig. 4 - Max. Allowable Case Temperature Vs. Average Forward Current**

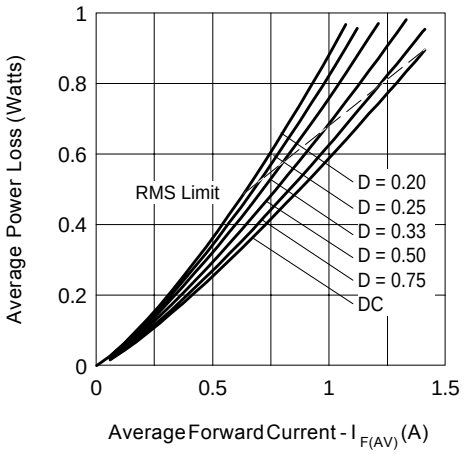



**Fig. 5 - Forward Power Loss Characteristics**

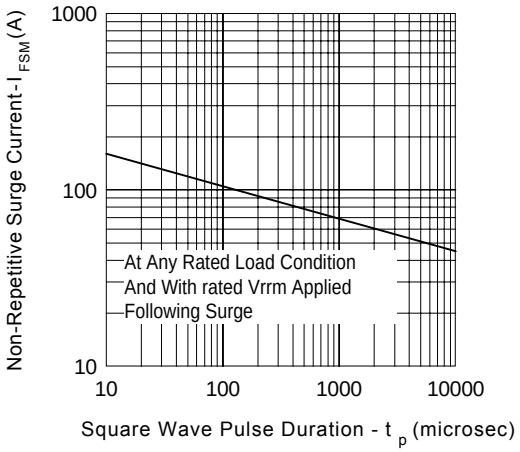
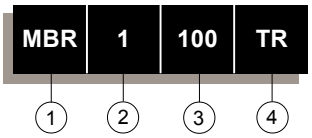



**Fig. 6 - Max. Non-Repetitive Surge Current**

**(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: 100 = 100V |
| **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.

International
IOR Rectifier

**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. 03/02