

International  
**IR** Rectifier

**MBRS190TRPbF**  
**MBRS1100TRPbF**

**SCHOTTKY RECTIFIER**

**1 Amp**

$$I_{F(AV)} = 1.0\text{Amp}$$

$$V_R = 90\text{-}100\text{V}$$

#### Major Ratings and Characteristics

Characteristics	Value	Units
$I_{F(AV)}$ Rectangular waveform	1.0	A
$V_{RRM}$	90 - 100	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	870	A
$V_F$ @1.0 Apk, $T_J = 125^\circ\text{C}$	0.63	V
$T_J$ range	-55 to 175	$^\circ\text{C}$

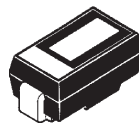
#### Description/ Features

The MBRS190TRPbF, MBRS1100TRPbF surface-mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

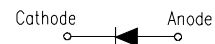
- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

#### Case Styles

MBRS190TRPbF  
 MBRS1100TRPbF



SMB



## Voltage Ratings

Part number	MBRS190TRPbF	MBRS1100TRPbF
$V_R$ Max. DC Reverse Voltage (V)	90	100
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)		

## Absolute Maximum Ratings

Parameters	Value	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	1.0	A	50% duty cycle @ $T_L = 147^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	870	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse
	50		10ms Sine or 6ms Rect. pulse
$E_{AS}$ Non- Repetitive Avalanche Energy	1.0	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 0.5\text{A}$ , $L = 8\text{mH}$
$I_{AR}$ Repetitive Avalanche Current	0.5	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_a = 1.5 \times V_r$ typical

## Electrical Specifications

Parameters	Value	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) * See Fig. 1	0.78	V	@ 1A, $T_J = 25^\circ\text{C}$
	0.62	V	@ 1A, $T_J = 125^\circ\text{C}$
$I_{RM}$ Max. Reverse Leakage Current (1) * See Fig. 2	0.5	mA	$T_J = 25^\circ\text{C}$
	1.0	mA	$T_J = 125^\circ\text{C}$
$C_T$ Typical Junction Capacitance	42	pF	$V_R = 5V_{DC}$ , (test signal range 100kHz to 1MHz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance	2.0	nH	Measured lead to lead 5mm from package body
$dv/dt$ Max. Volatge Rate of Charge (Rated $V_R$ )	10000	V/ $\mu\text{s}$	

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## Thermal-Mechanical Specifications

Parameters	Value	Units	Conditions
$T_J$ Max. Junction Temperature Range (*)	-55 to 175	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
$R_{thJL}$ Max. Thermal Resistance Junction to Lead (**)	36	$^\circ\text{C/W}$	DC operation (See Fig. 4)
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient	80	$^\circ\text{C/W}$	DC operation
wt Approximate Weight	0.10(0.003)	g(oz.)	
Case Style	SMB		Similar to DO-214AA
Device Marking	IR19-IR10		

(\*)  $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{th(J-a)}}$  thermal runaway condition for a diode on its own heatsink

(\*\*) Mounted 1 inch square PCB

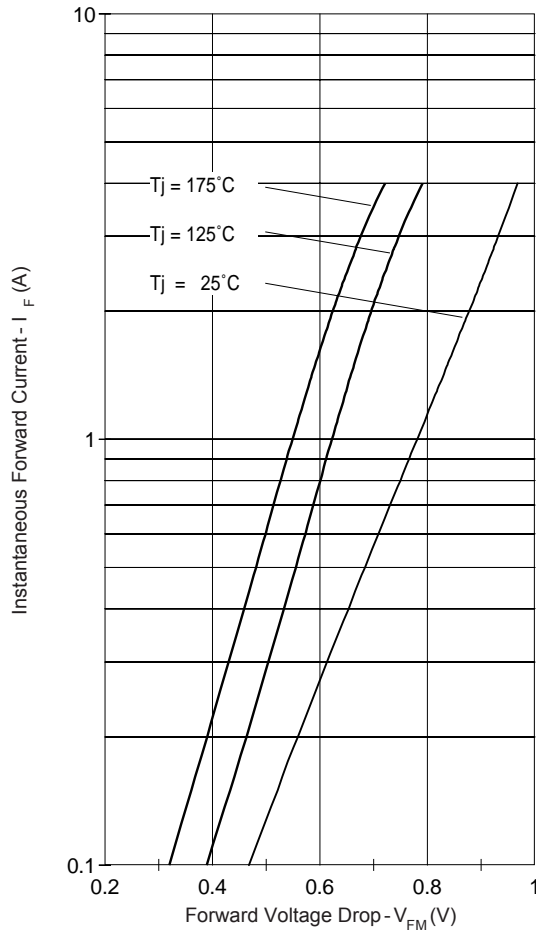


Fig. 1 - Maximum Forward Voltage Drop Characteristics

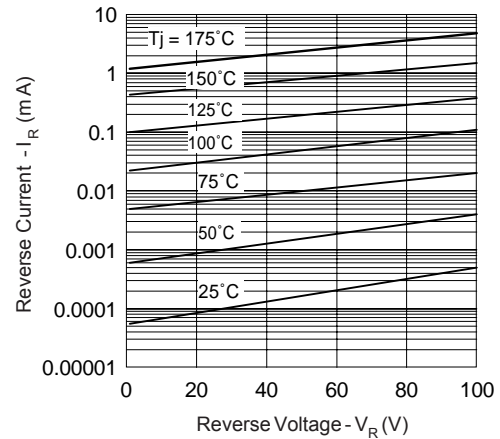


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

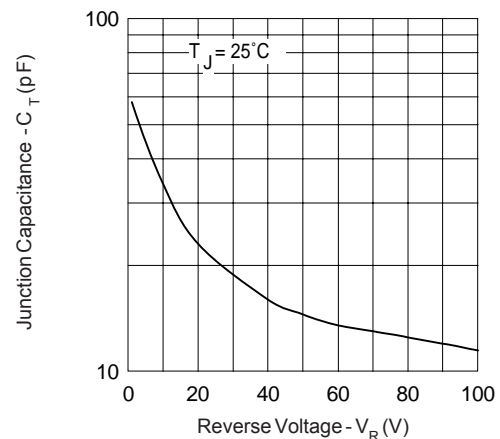


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

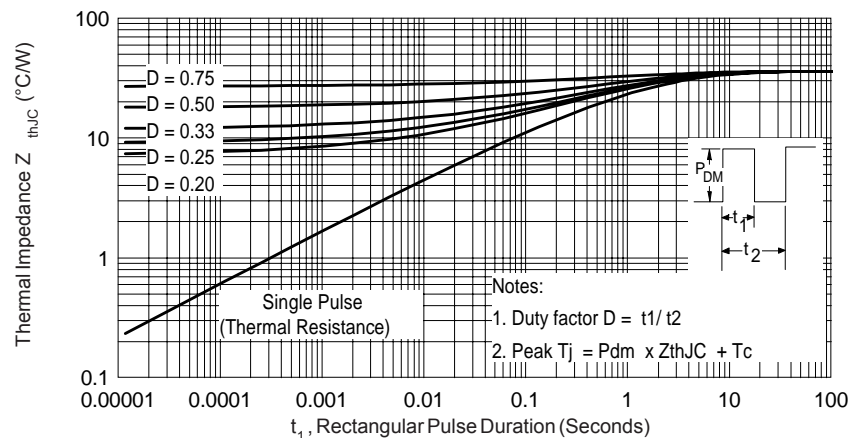


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

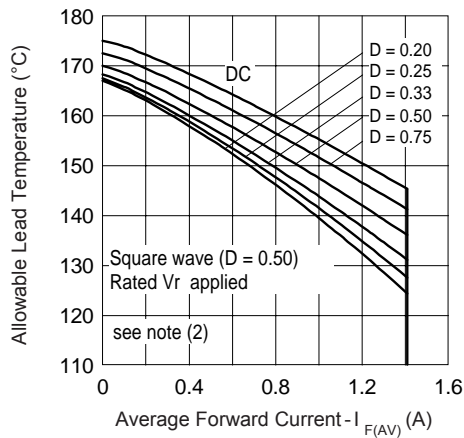


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

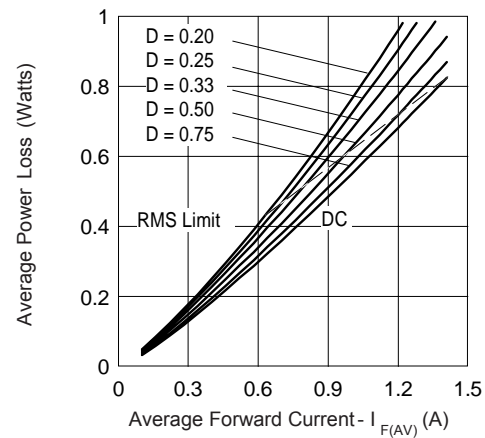


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

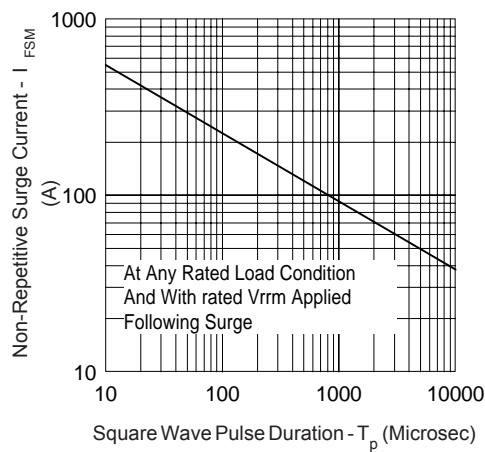


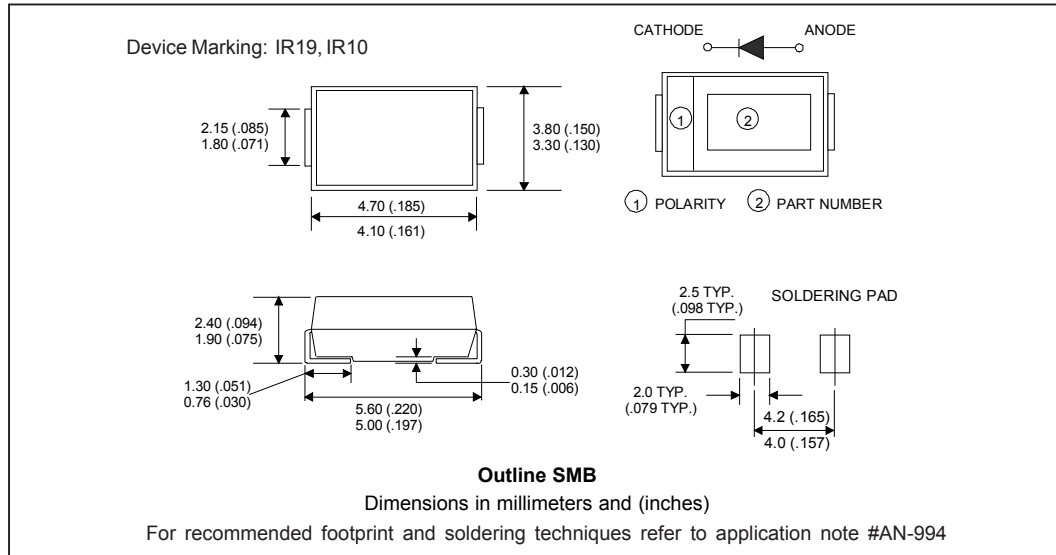
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

(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);

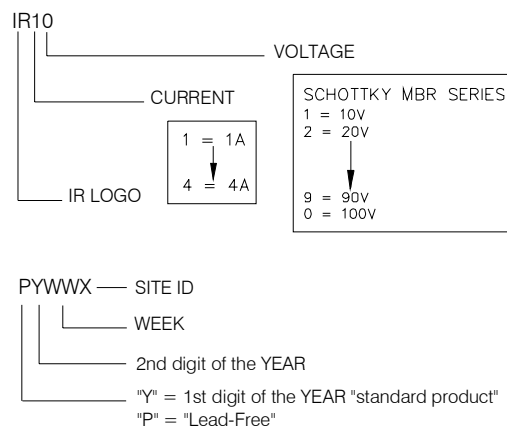
$Pd_{REV}$  = Inverse Power Loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 80\%$  rated  $V_R$

## Outline Table

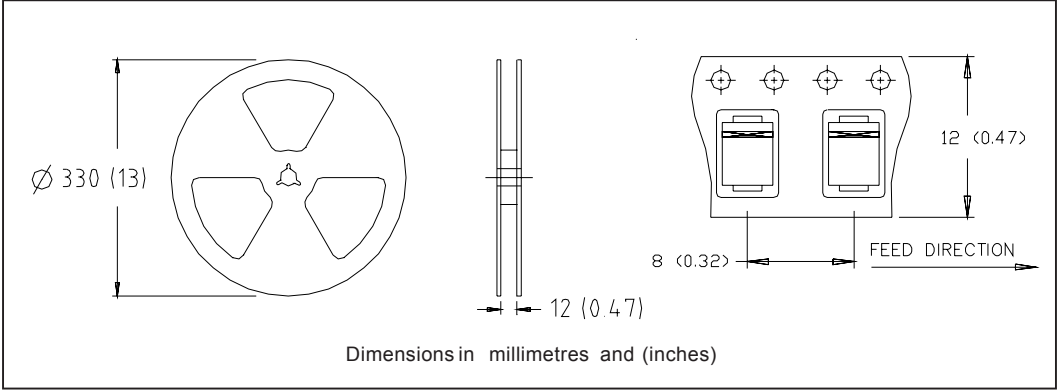


## Marking & Identification

Each device has 2 rows for identification. The first row designates the device as manufactured by International Rectifier, indicated by the letters "IR", and the Part Number (indicates the current, the voltage rating and Schottky Generation). The second row indicates the year, the week of manufacturing and the Site ID.



Tape & Reel Information



Ordering Information Table

Device Code					
1	2	3	4	5	6
MBR	S	1	100	TR	PbF
1	-	Schottky MBR Series			
2	-	S = SMB			
3	-	Current Rating (1 = 1 A)			
4	-	Voltage Rating			90 = 90V 100 = 100V
5	-	TR = Tape & Reel (3000 pieces)			
6	-	• none = Standard Production • PbF = Lead-Free			

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.