

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 μ s sine	870	A
V_F @1.0 Apk, $T_J = 125^\circ\text{C}$	0.63	V
T_J range	-55 to 175	$^\circ\text{C}$

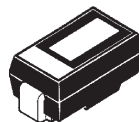
Description/ Features

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.

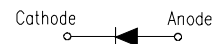
- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

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 μs Sine or 3 μs 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 μsec 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°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/ μs	

(1) Pulse Width < 300 μs , 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

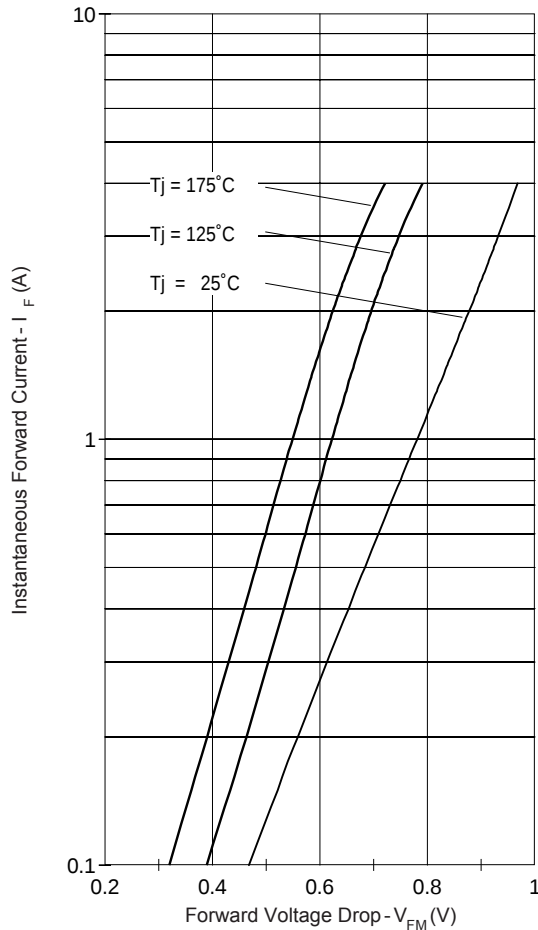


Fig. 1 - Maximum Forward Voltage Drop Characteristics

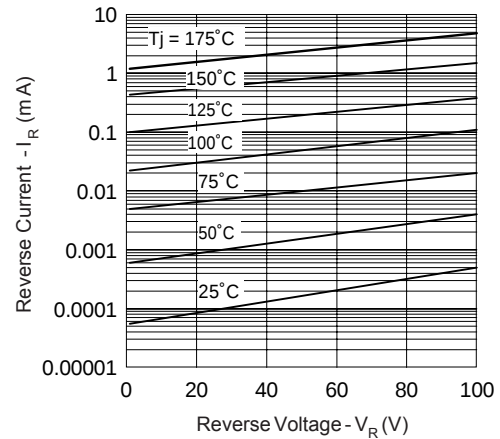


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

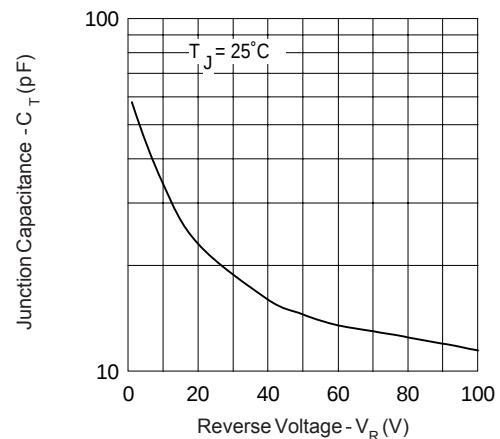


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

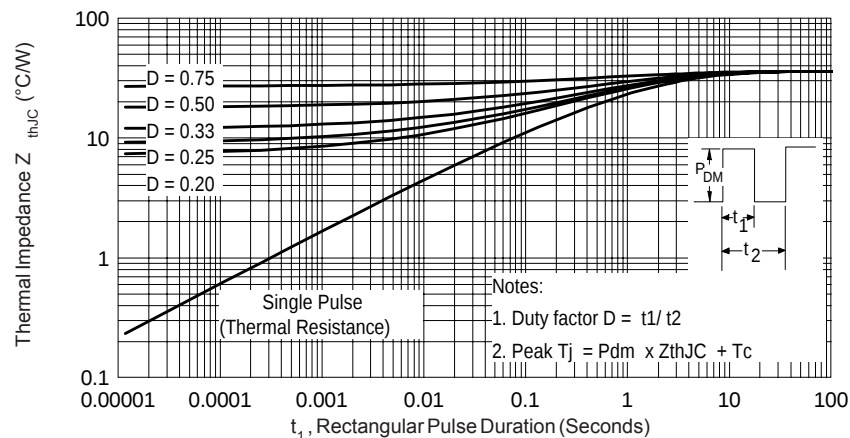


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

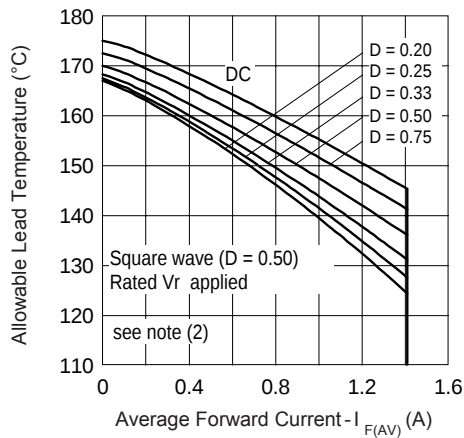


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

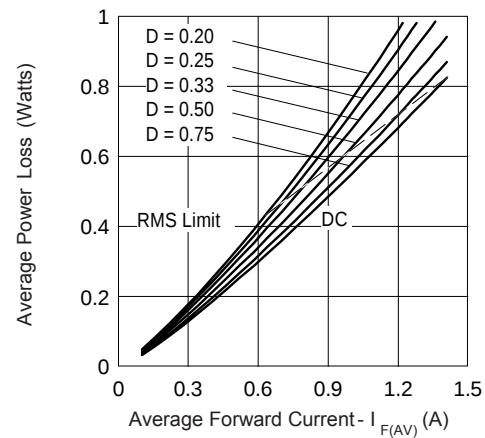


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

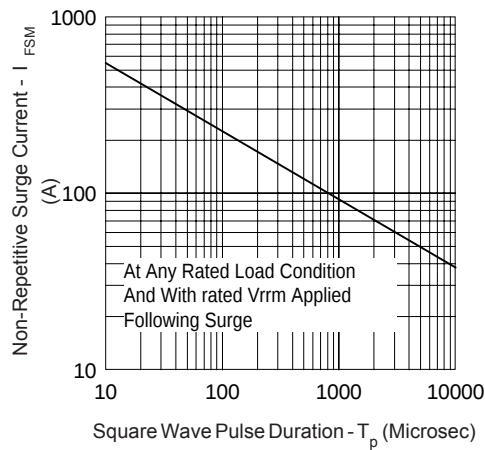


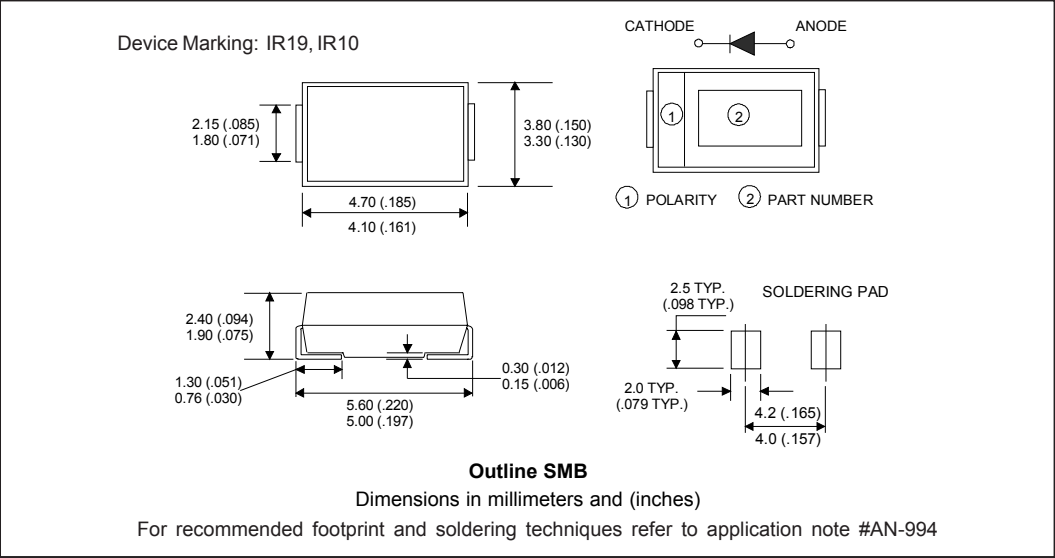
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

(2) Formula used: $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$;

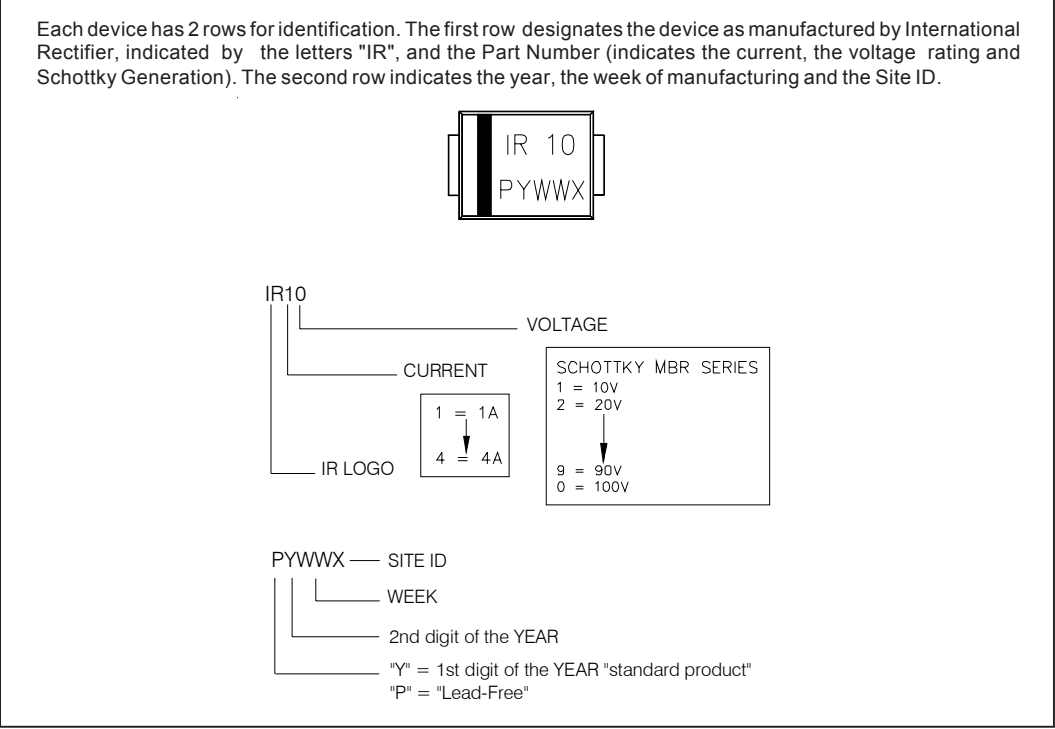
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

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

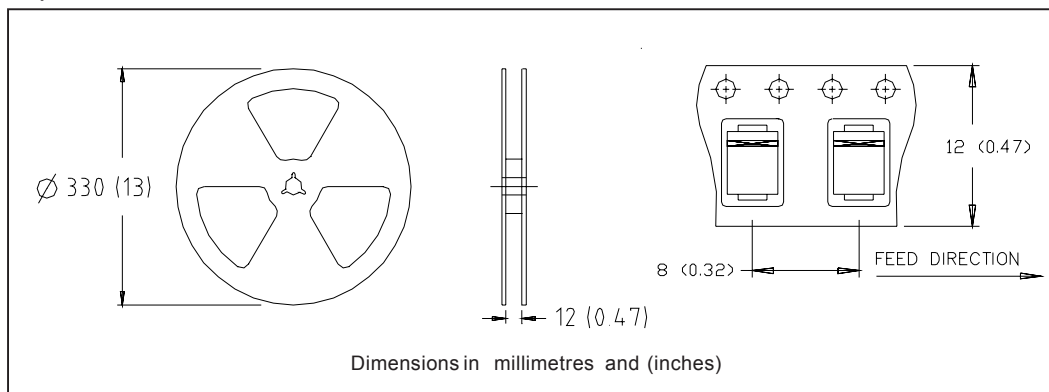
Outline Table



Marking & Identification



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.