

International
IR Rectifier

MBRS190TR
MBRS1100TR

SCHOTTKY RECTIFIER

1 Amp

$$I_{F(AV)} = 1 \text{ Amp}$$

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

Major Ratings and Characteristics

Characteristics	MBR190TR MBR1100TR	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	$^\circ\text{C}$

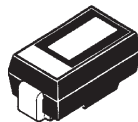
Description/ Features

The MBRS190TR, MBRS1100TR 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

Case Styles

MBRS190TR
 MBR1100TR



SMB



Voltage Ratings

Part number	MBRS190TR	MBRS1100TR
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 °C, rectangular wave form		
I _{FSM}	Max. Peak One Cycle Non-Repetitive	870	A	5μs Sine or 3μs Rect. pulse	Following any rated load condition and with rated V _{RRM} applied	
	Surge Current	50		10ms Sine or 6ms Rect. pulse		
E _{AS}	Non- Repetitive Avalanche Energy	1.0	mJ	T _J = 25 °C, I _{AS} = 0.5A, L = 8mH		
I _{AR}	Repetitive Avalanche Current	0.5	A	Current decaying linearly to zero in 1 μsec Frequency limited by T _J max. Va = 1.5 x Vr typical		

Electrical Specifications

Parameters		Value	Units	Conditions	
V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1		0.78	V	@ 1A	$T_J = 25\text{ }^{\circ}\text{C}$
		0.62	V	@ 1A	$T_J = 125\text{ }^{\circ}\text{C}$
I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2		0.5	mA	$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{rated } V_R$
		1.0	mA	$T_J = 125\text{ }^{\circ}\text{C}$	
C_T Typical Junction Capacitance		42	pF	$V_R = 5V_{DC}$, (test signal range 100kHz to 1MHz) $25\text{ }^{\circ}\text{C}$	
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/ 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

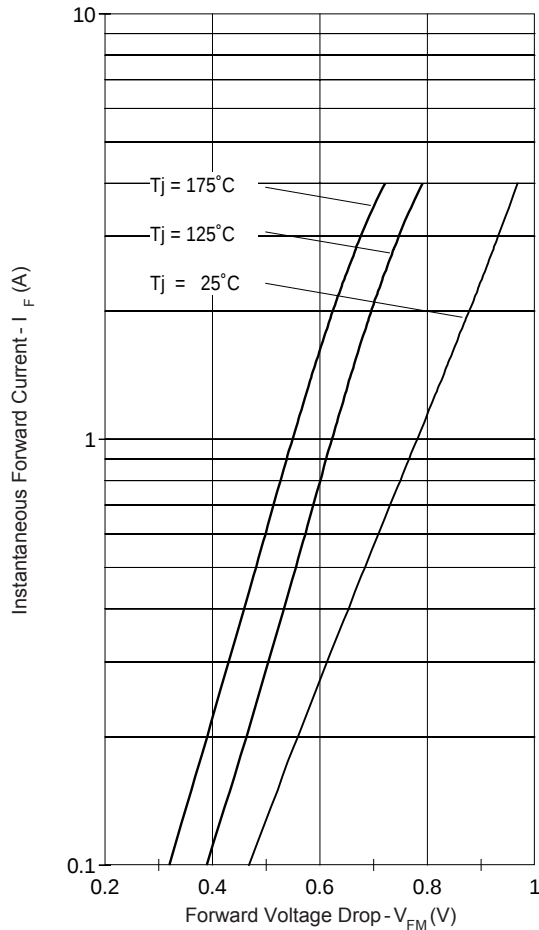


Fig. 1 - Maximum Forward Voltage Drop Characteristics

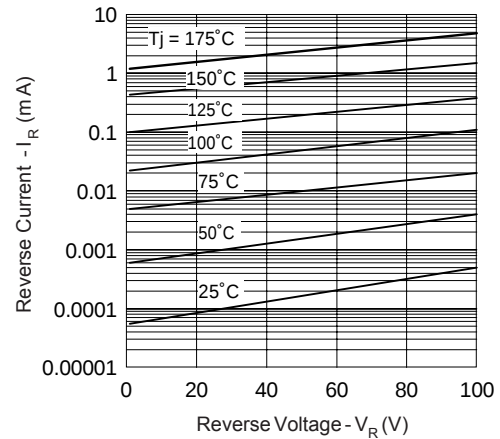


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

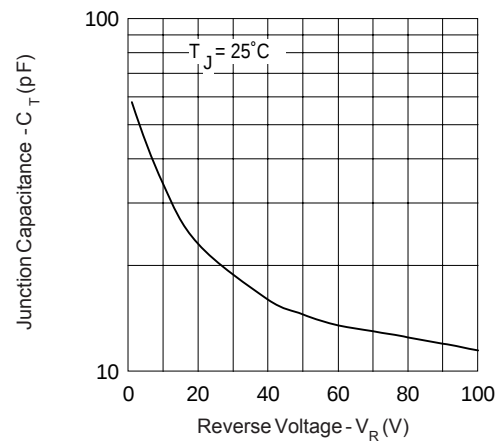


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

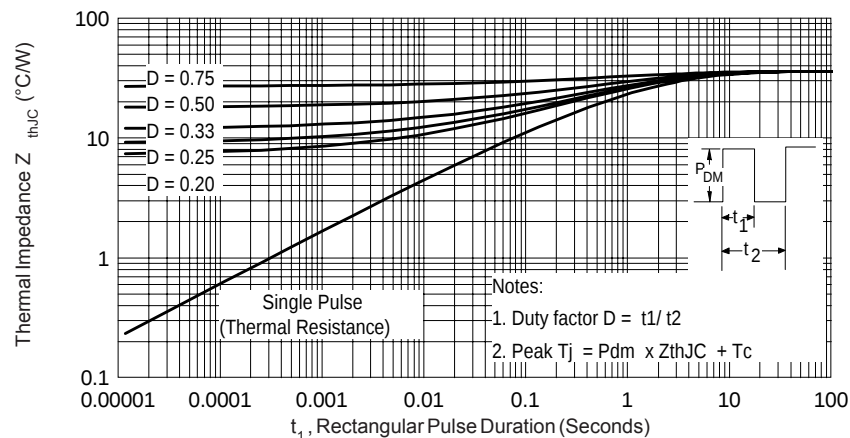


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

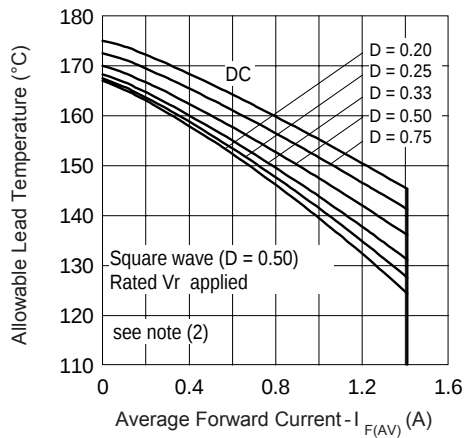


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

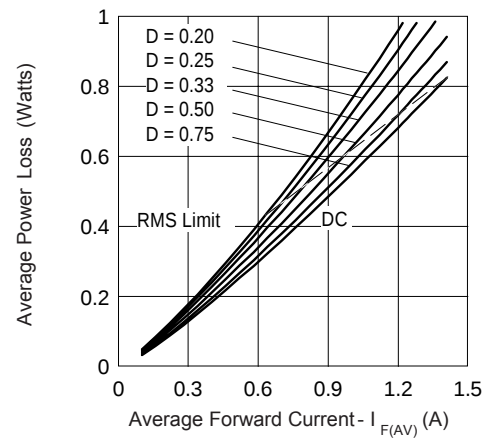


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

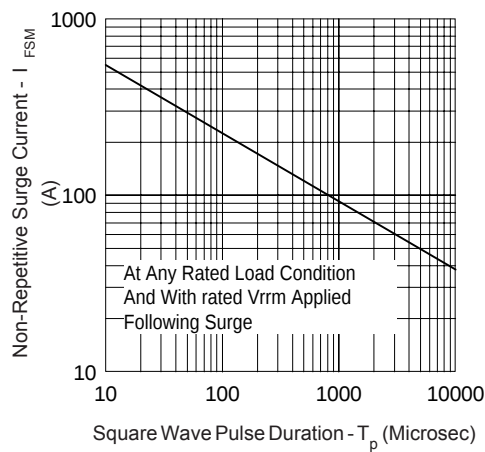


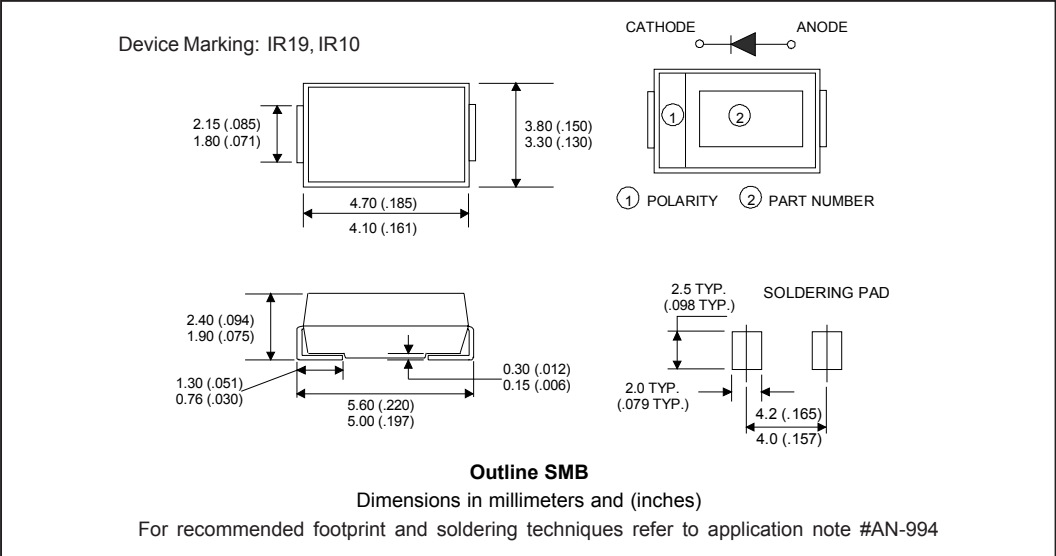
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

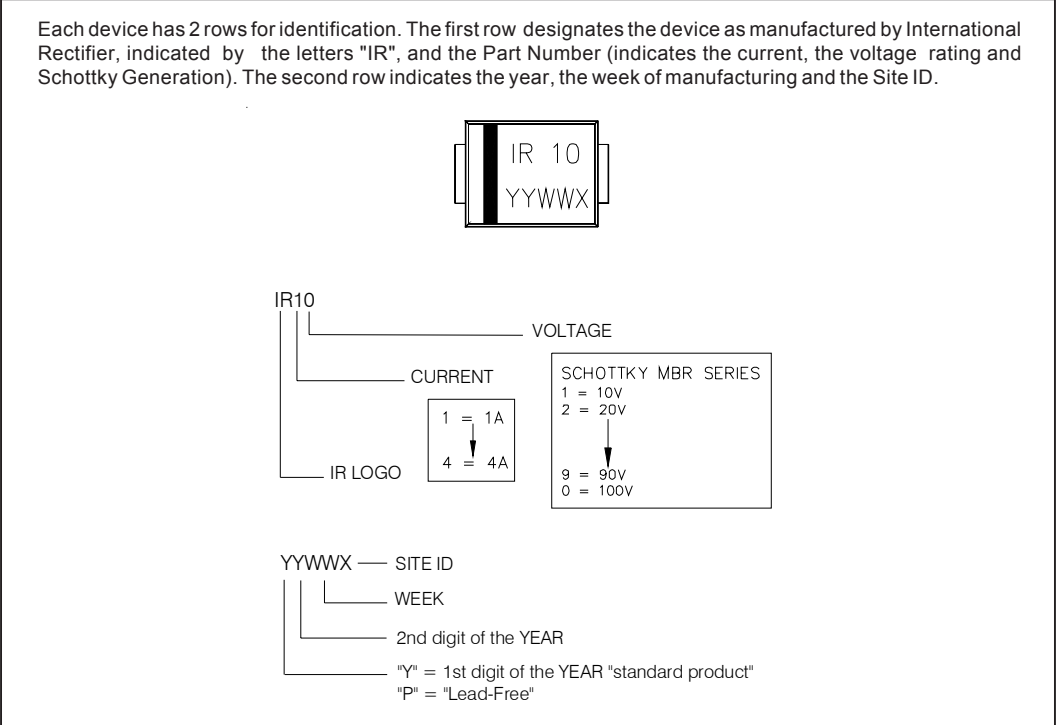
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

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

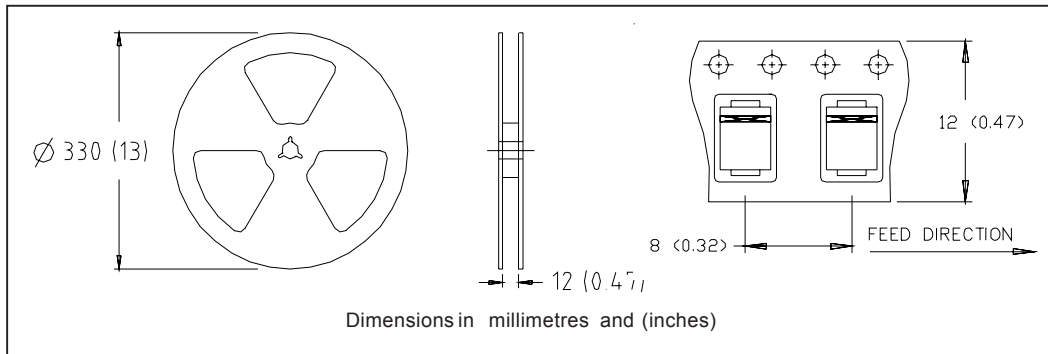
Outline Table



Marking & Identification



Tape & Reel Information



Ordering Information Table

Device Code

MBR	S	1	100	TR	-
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1

2

3

4

5

6

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

90 = 90V
 100 = 100V

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
IR Rectifier

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