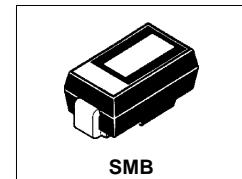


International  
**IR** Rectifier

MBRS120

SCHOTTKY RECTIFIER

1 Amp



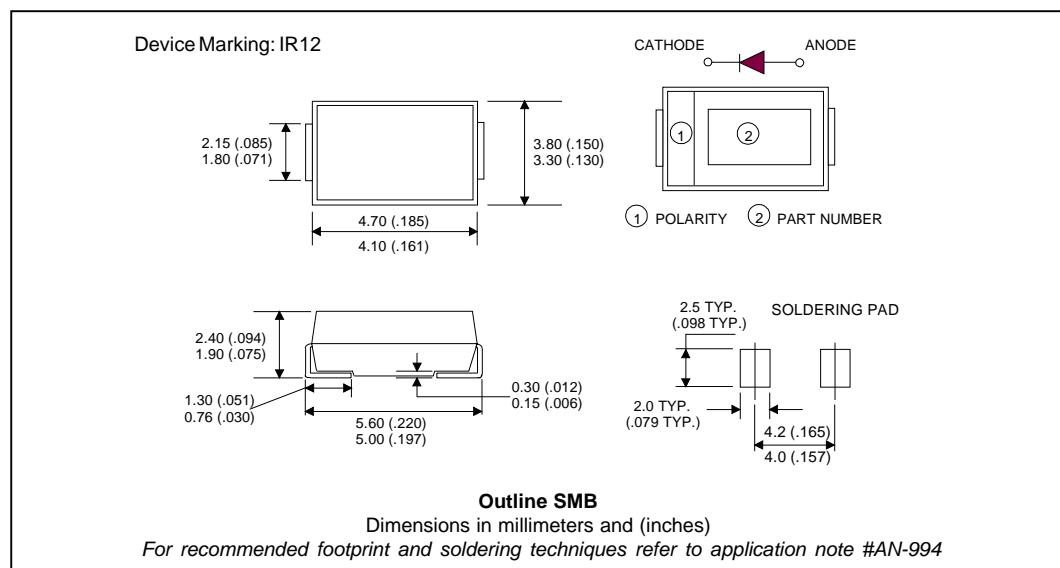
## Major Ratings and Characteristics

Characteristics	MBRS120	Units
$I_{F(AV)}$ Rectangular waveform	1.0	A
$V_{RRM}$	20	V
$I_{FSM}$ @ $t_p=5\mu s$ sine	310	A
$V_F$ @ $1.0A_{pk}, T_J=125^\circ C$	0.35	V
$T_J$ range	- 65 to 150	°C

## Description/Features

The MBRS120 surface-mount Schottky rectifier has been designed for applications requiring low forward drop and 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
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



## Voltage Ratings

Part number	MBRS120
$V_R$ Max. DC Reverse Voltage (V)	20
$V_{RWM}$ 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 @ $T_L = 138^\circ\text{C}$ , rectangular wave form	Following any rated load condition and with rated $V_{RRM}$ applied	
$I_{FSM}$	Max. Peak One Cycle Non-Repetitive	310		5μs Sine or 3μs Rect. pulse		
	Surge Current	40		10ms Sine or 6ms Rect. pulse		
$E_{AS}$	Non Repetitive Avalanche Energy	2.0	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1\text{A}$ , $L = 4\text{mH}$		
$I_{AR}$	Repetitive Avalanche Current	0.8	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		Typ.	Max.	Units	Conditions		
$V_{FM}$	Max. Forward Voltage Drop (1)	0.42	0.45	V	@ 1A	$T_J = 25 \text{ }^{\circ}\text{C}$	
		0.46	0.52	V	@ 2A		
		0.33	0.37	V	@ 1A	$T_J = 100 \text{ }^{\circ}\text{C}$	
		0.39	0.45	V	@ 2A		
		0.30	0.35	V	@ 1A	$T_J = 125 \text{ }^{\circ}\text{C}$	
		0.36	0.43	V	@ 2A		
$I_{RM}$	Max. Reverse Leakage Current (1)	0.015	0.2	mA	$T_J = 25 \text{ }^{\circ}\text{C}$	$V_R = \text{rated } V_R$	
		2.0	6.0	mA	$T_J = 100 \text{ }^{\circ}\text{C}$		
		7.0	20	mA	$T_J = 125 \text{ }^{\circ}\text{C}$		
$C_T$	Typical Junction Capacitance	110	-	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. Voltage Rate of Change	-	10000	V/ $\mu$ s	(Rated $V_R$ )		

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

## Thermal-Mechanical Specifications

Parameters		Value	Units	Conditions
$T_J$	Max. Junction Temperature Range (*)	-65 to 150	°C	
$T_{stg}$	Max. Storage Temperature Range	-65 to 150	°C	
$R_{thJL}$	Max. Thermal Resistance Junction to Lead (**)	30	°C/W	DC operation
$R_{thJA}$	Max. Thermal Resistance Junction to Ambient		80	°C/W
Wt	Approximate Weight	0.10(0.003)	gr (oz)	
Case Style		SMB		Similar DO-214AA
Device Marking		IR12		

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

(\*\*) Mounted 1 inch square PCB

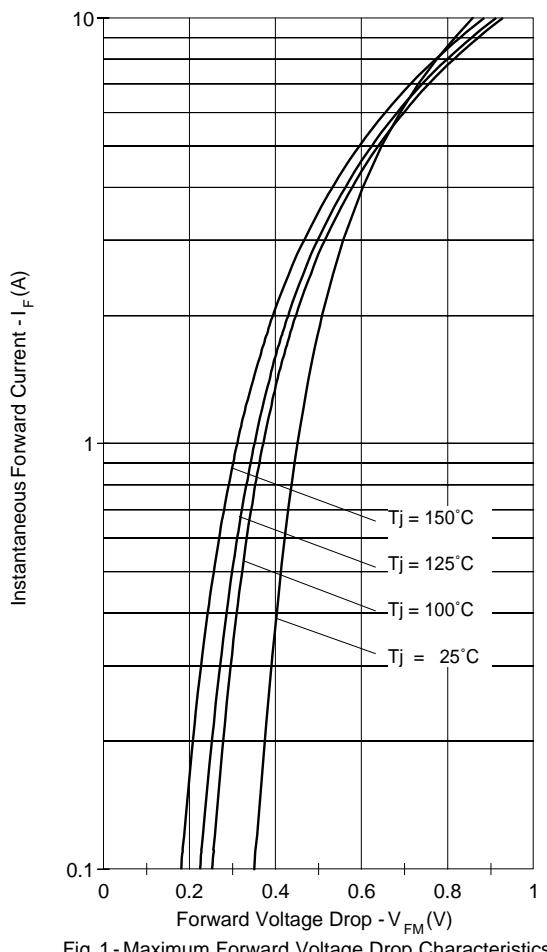


Fig. 1 - Maximum Forward Voltage Drop Characteristics

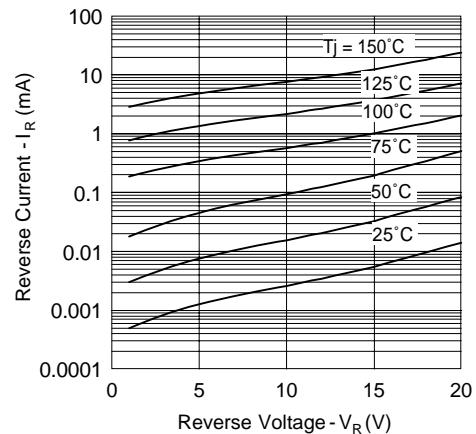


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

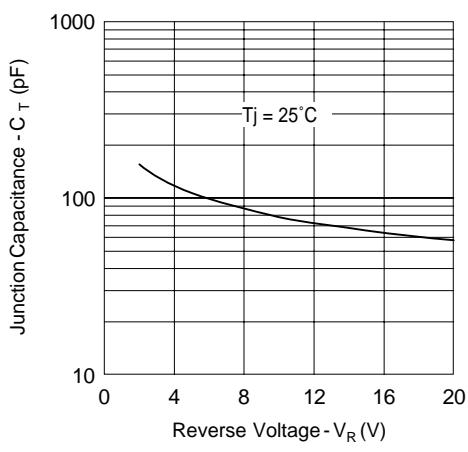


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

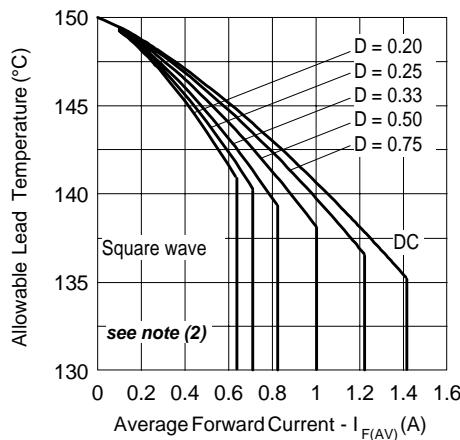


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

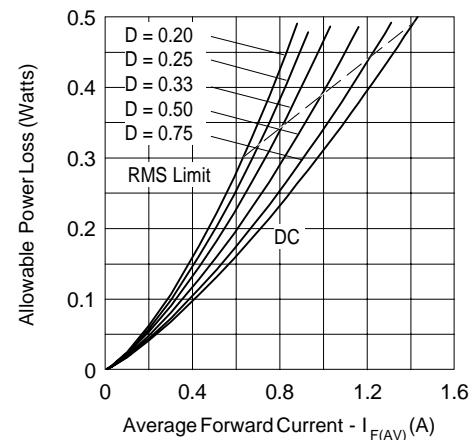


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

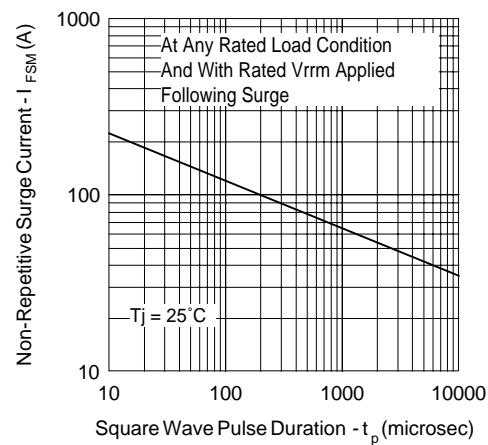
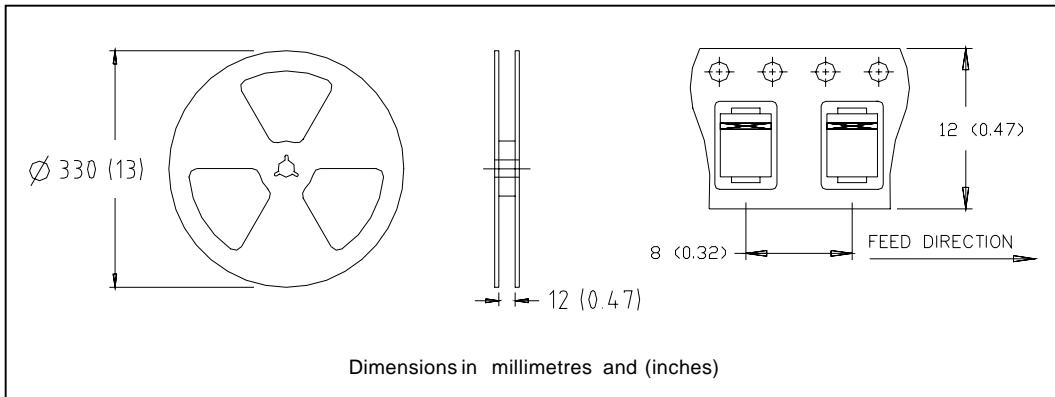


Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

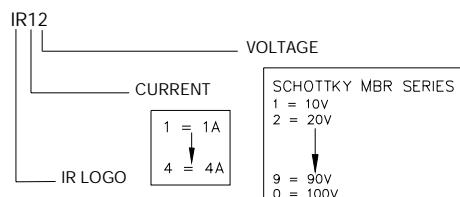
(2) Formula used:  $T_c = T_j - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);  
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$

Tape & Reel Information



Marking & Identification

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



YYWWX — SITE ID  
 WEEK  
 YEAR

Ordering Information

**MBRS120TR - TAPE AND REEL**

WHEN ORDERING, INDICATE THE PART NUMBER AND THE QUANTITY (IN MULTIPLES OF 3000 PIECES).

EXAMPLE: MBRS120TR - 6000 PIECES

MBRS120

Bulletin PD-20644 rev. D 03/03

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International  
**IR** Rectifier

Data and specifications subject to change without notice.  
This product has been designed for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IR** Rectifier

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