

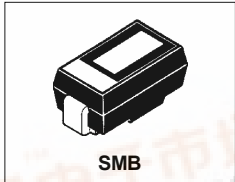
Bulletin PD-20644 rev. A 02/02

International
IOR Rectifier

MBRS120TR

SCHOTTKY RECTIFIER

1 Amp



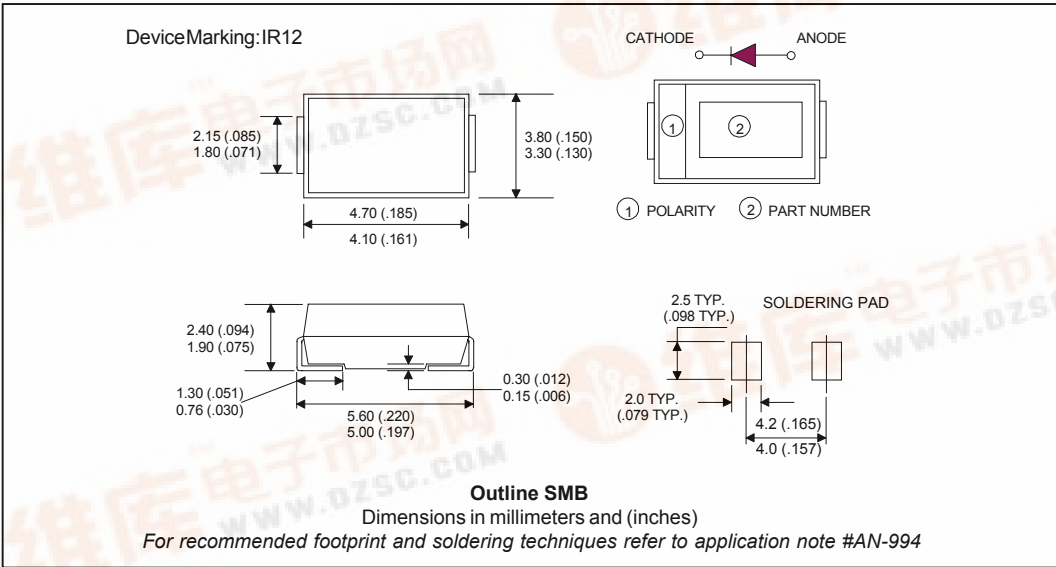
Major Ratings and Characteristics

Characteristics	MBRS120TR	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	$^\circ C$

Description/Features

The MBRS120TR 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



MBRS120TR

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Voltage Ratings

Part number	MBRS120TR
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
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	310		5 μs Sine or 3 μs Rect. pulse
	40		10ms Sine or 6ms Rect. pulse
E_{AS} Non Repetitive Avalanche Energy	3	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1\text{A}$, $L = 10\text{mH}$
I_{AR} Repetitive Avalanche Current	0.8	A	

Electrical Specifications

Parameters	Typ.	Max.	Units	Conditions
V_{FM} Max. Forward Voltage Drop (1)	0.42	0.45	V	@ 1A
	0.46	0.52	V	@ 2A
	0.33	0.37	V	@ 1A
	0.39	0.45	V	@ 2A
	0.30	0.35	V	@ 1A
	0.36	0.43	V	@ 2A
I_{RM} Max. Reverse Leakage Current (1)	0.015	0.2	mA	$T_J = 25^\circ\text{C}$
	2.0	6.0	mA	$T_J = 100^\circ\text{C}$
	7.0	20	mA	$T_J = 125^\circ\text{C}$
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/ μs	(Rated V_R)

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

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

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

(**) Mounted 1 inch square PCB

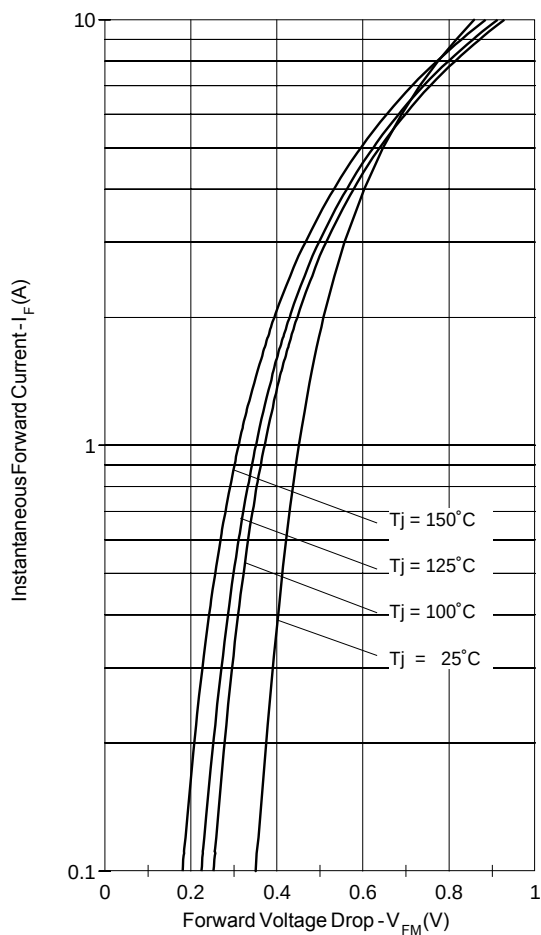


Fig. 1 - Maximum Forward Voltage Drop Characteristics

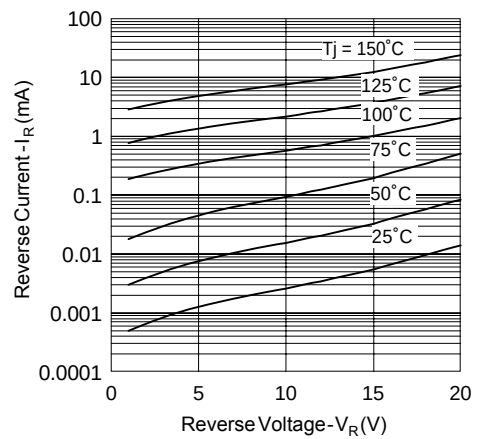


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

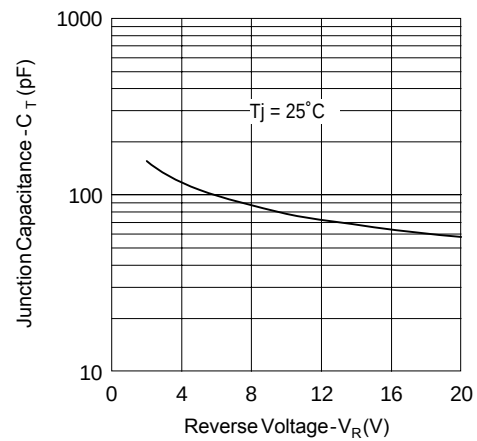


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

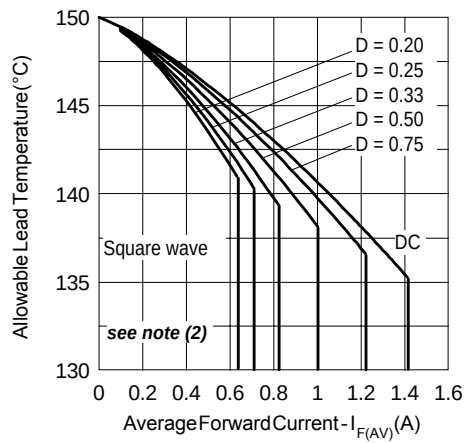


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

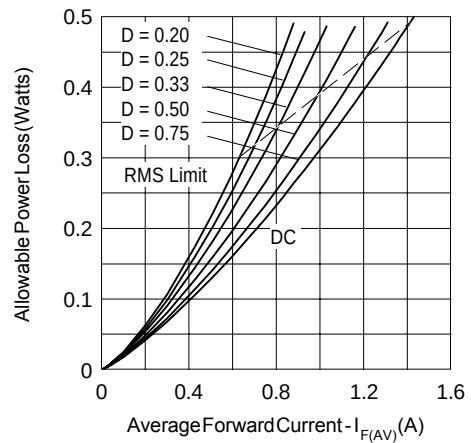


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

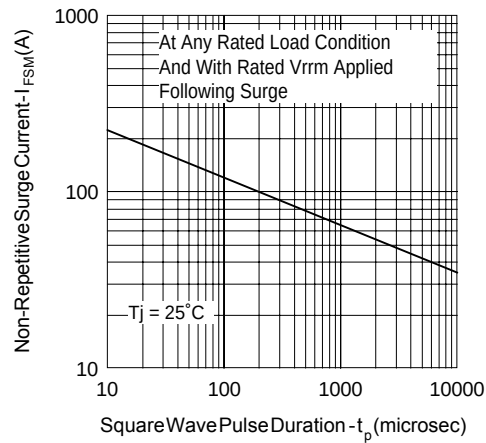


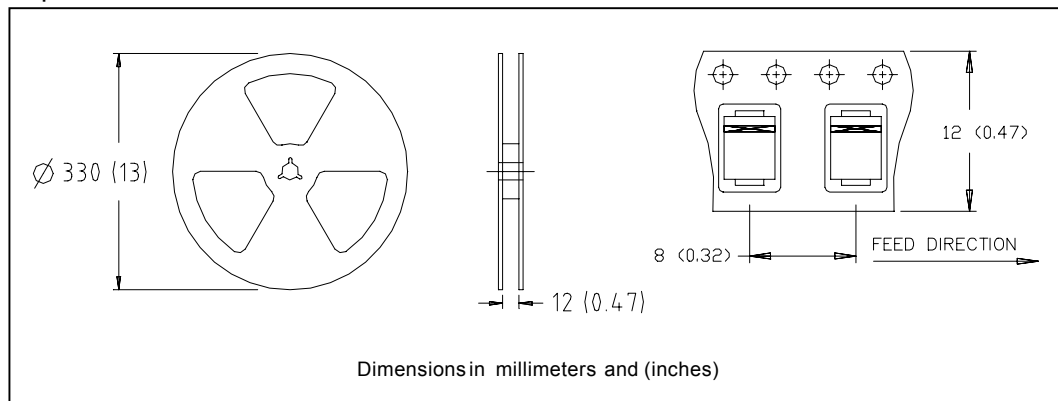
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

(2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

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

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$

Tape & Reel Information



Marking & Identification

Each device has marking and identification on two rows.
- The first row designates the device as manufactured by International Rectifier as indicated by the letters "IR", then Current and Voltage.
- The second row shows the data code: Year and Week.

See below marking diagram.

FIRST ROW

IR 12

SECOND ROW

Date Code

YY WW

Ordering Information

MBRS120TR - TAPE AND REEL

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

EXAMPLE: MBRS120TR - 6000 PIECES

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.