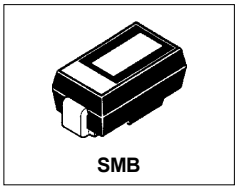
Bulletin PD-20644 rev. A 02/02

International
IOR Rectifier

MBRS120TR

SCHOTTKY RECTIFIER 1 Amp



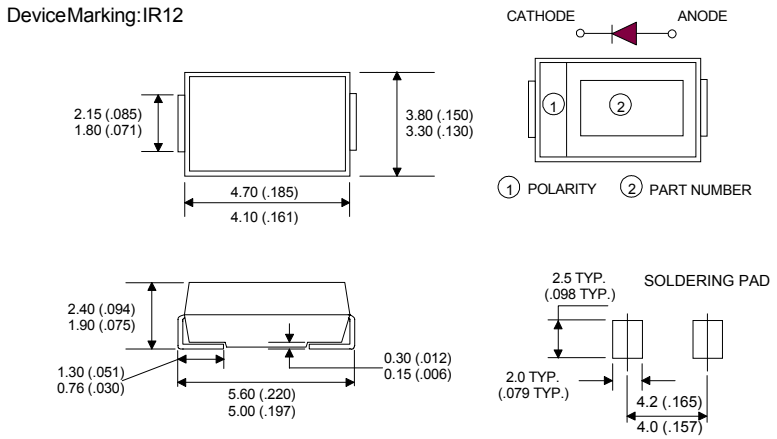
Major Ratings and Characteristics

Characteristics		MBRS120TR	Units
$I_{F(AV)}$	Rectangular waveform	1.0	A
V_{RRM}		20	V
I_{FSM}	@t_p = 5 µs sine	310	A
V_F	@1.0Apk, T_J=125°C	0.35	V
T_J	range	- 65 to 150	°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



Outline SMB
Dimensions in millimeters and (inches)
For recommended footprint and soldering techniques refer to application note #AN-994

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°C, rectangular waveform	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	310		5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current	40		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non Repetitive Avalanche Energy	3	mJ	T_J = 25 °C, I_{AS} = 1A, L = 10mH	
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	T_J = 25 °C
		0.46	0.52	V	@ 2A	
		0.33	0.37	V	@ 1A	T_J = 100 °C
		0.39	0.45	V	@ 2A	
		0.30	0.35	V	@ 1A	T_J = 125 °C
		0.36	0.43	V	@ 2A	
I_{RM}	Max. Reverse Leakage Current (1)	0.015	0.2	mA	T_J = 25 °C	V_R = rated V_R
		2.0	6.0	mA	T_J = 100 °C	
		7.0	20	mA	T_J = 125 °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 < 300µs, 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		

(*) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink (**) Mounted 1 inch square PCB

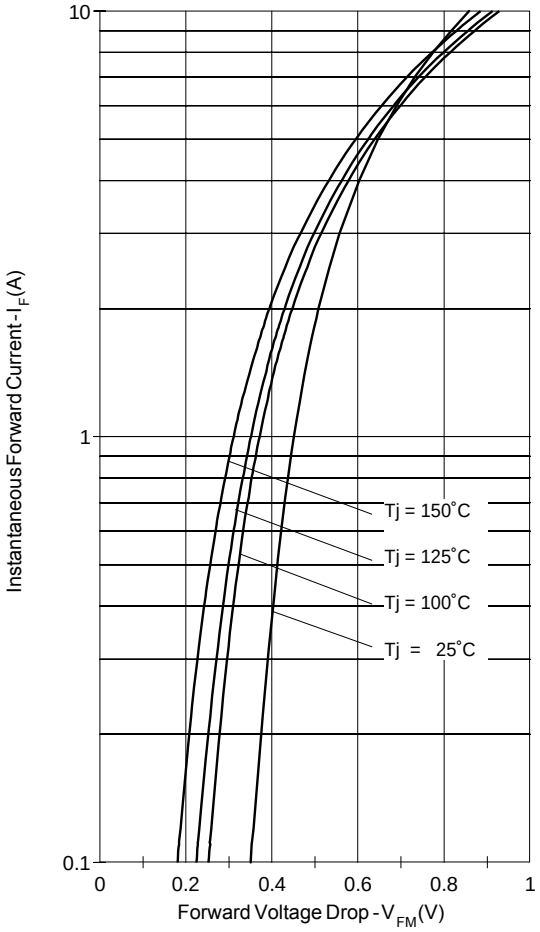


Fig. 1 - Maximum Forward Voltage Drop Characteristics

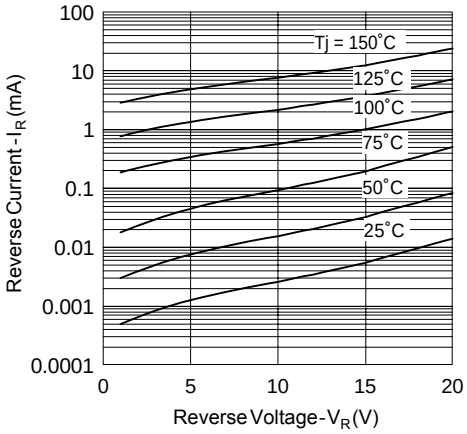


Fig. 2 - Typical Peak Reverse Current
Vs. Reverse Voltage

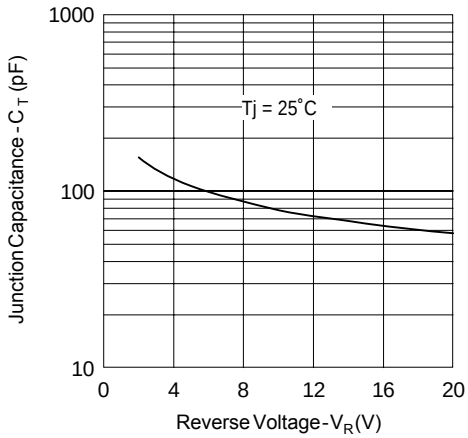


Fig. 3 - Typical Junction Capacitance
Vs. Reverse Voltage

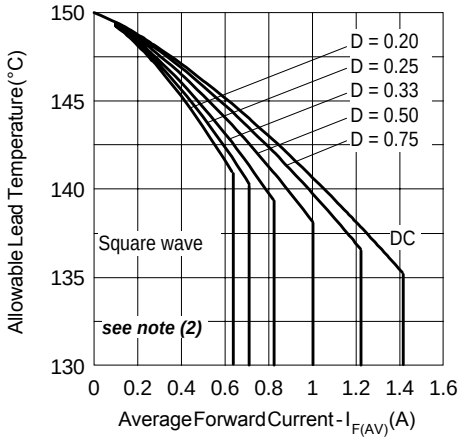


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

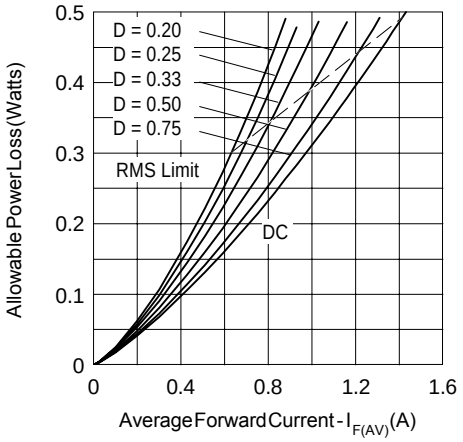


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

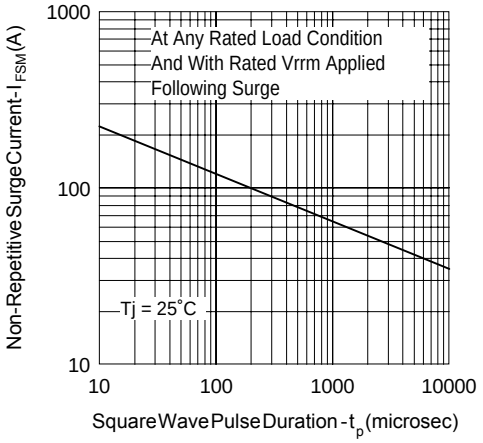
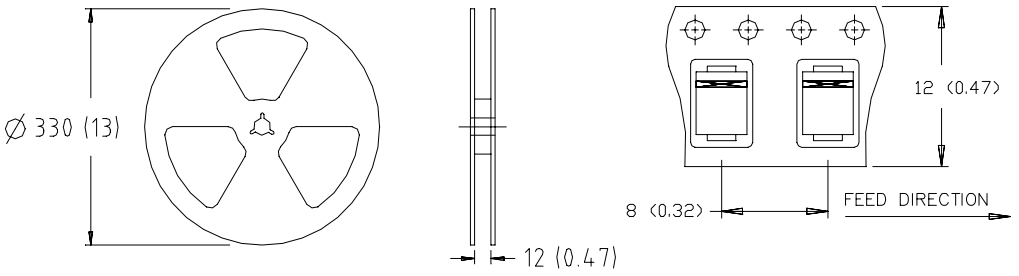


Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

Tape & Reel Information



Dimensions in millimeters and (inches)

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.

International
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