



# MBRA120TRPbF

SCHOTTKY RECTIFIER

1.0 Amp

$$I_{F(AV)} = 1.0\text{Amp}$$

$$V_R = 40\text{V}$$

### Major Ratings and Characteristics

Characteristics	Value	Units
$I_{FAV}$ Rect. Waveform	1.0	A
$V_{RRM}$	20	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	310	A
$V_F$ @1.0Apk, $T_J=125^\circ\text{C}$	0.34	V
$T_J$ range	- 65 to 150	$^\circ\text{C}$

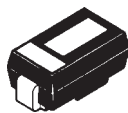

### Description/ Features

The MBRA120TRPbF 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**

MBRA120TRPbF

SMA

MBRA120TRPbF

Bulletin PD-20776 07/04



Voltage Ratings

Part number	MBRA120TR
V <sub>R</sub> Max. DC Reverse Voltage (V)	20
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	Value	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current	1.0	A	50% duty cycle @ T <sub>L</sub> = 136°C, rectangular wave form
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current	310	A	5µs Sine or 3µs Rect. pulse
	40		10ms Sine or 6ms Rect. pulse
E <sub>AS</sub> Non Repetitive Avalanche Energy	2.0	mJ	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 1A, L = 4mH
I <sub>AR</sub> Repetitive Avalanche Current	1.0	A	

Electrical Specifications

Parameters	Typ.	Max.	Units	Conditions
V <sub>FM</sub> 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 <sub>RM</sub> Max. Reverse Leakage Current (1)	0.015	0.2	mA	T <sub>J</sub> = 25 °C
	2.0	6.0	mA	T <sub>J</sub> = 100 °C
	7.0	20	mA	T <sub>J</sub> = 125 °C
C <sub>T</sub> Typical Junction Capacitance	110	-	pF	V <sub>R</sub> = 5V <sub>DC</sub> (test signal range 100kHz to 1MHz), @ 25°C
L <sub>S</sub> 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 <sub>R</sub> )

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

Thermal-Mechanical Specifications

Parameters	Value	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range(*)	-65 to 150	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-65 to 150	°C	
R <sub>thJL</sub> Max. Thermal Resistance Junction to Lead (**)	35	°C/W	DC operation
R <sub>thJA</sub> Max. Thermal Resistance Junction to Ambient	80	°C/W	
Wt Approximate Weight	0.07(0.002)	gr (oz)	
Case Style	SMA		Similar D-64
Device Marking	IR12A		

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

(\*\*) Mounted 1 inch square PCB

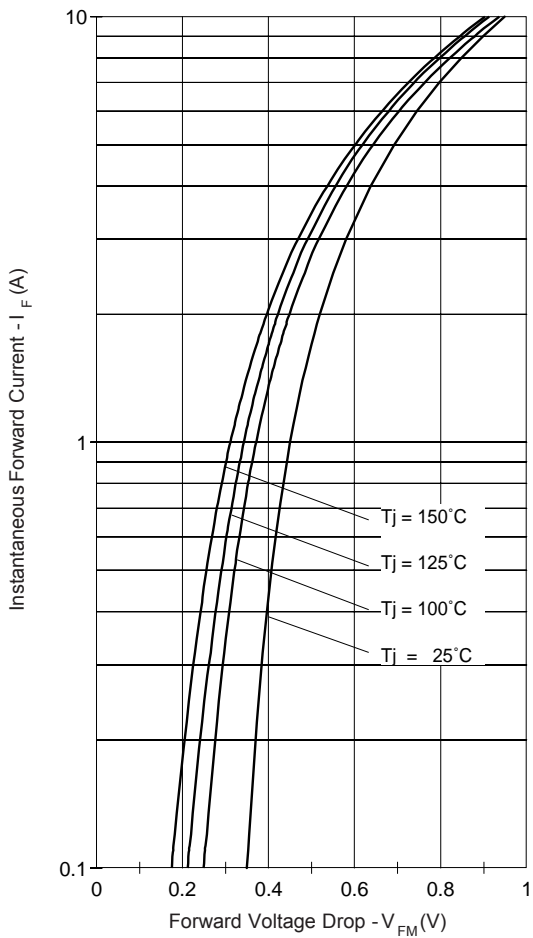


Fig. 1 - Maximum Forward Voltage Drop Characteristics

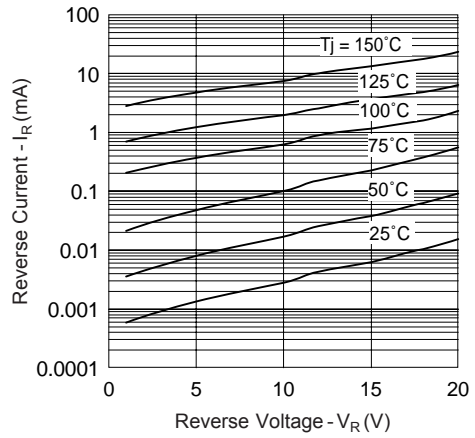


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

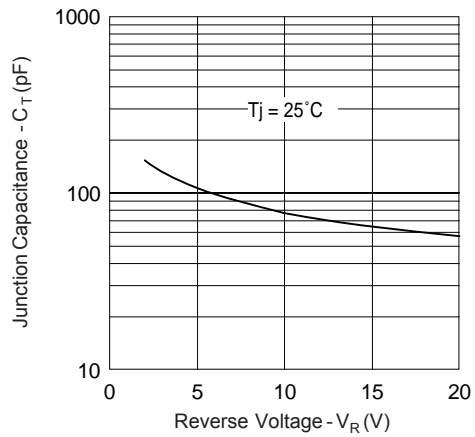


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

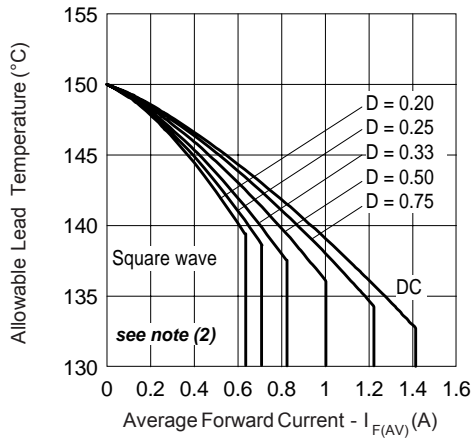


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

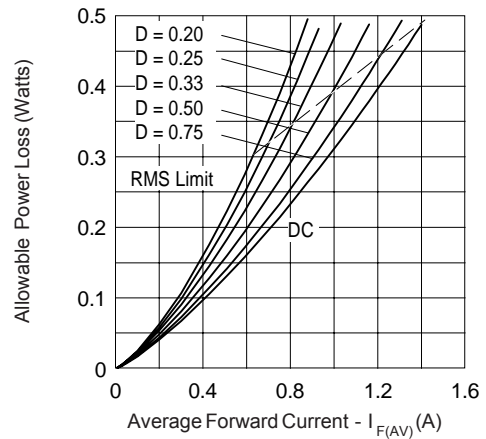


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

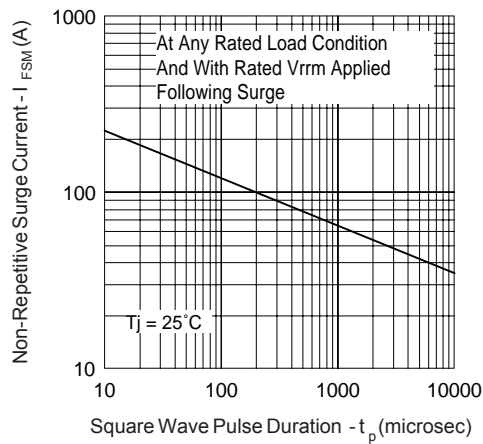
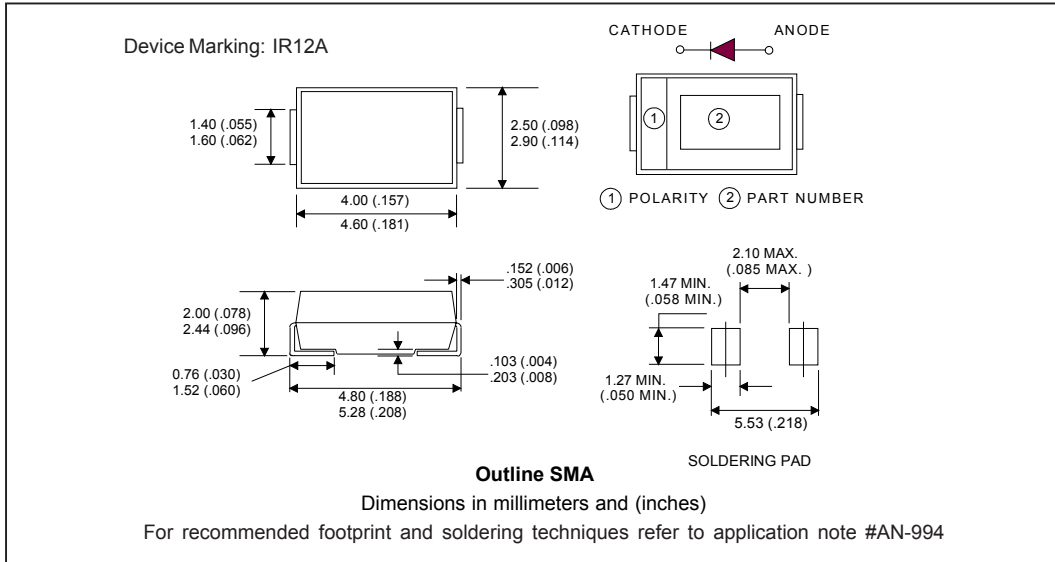


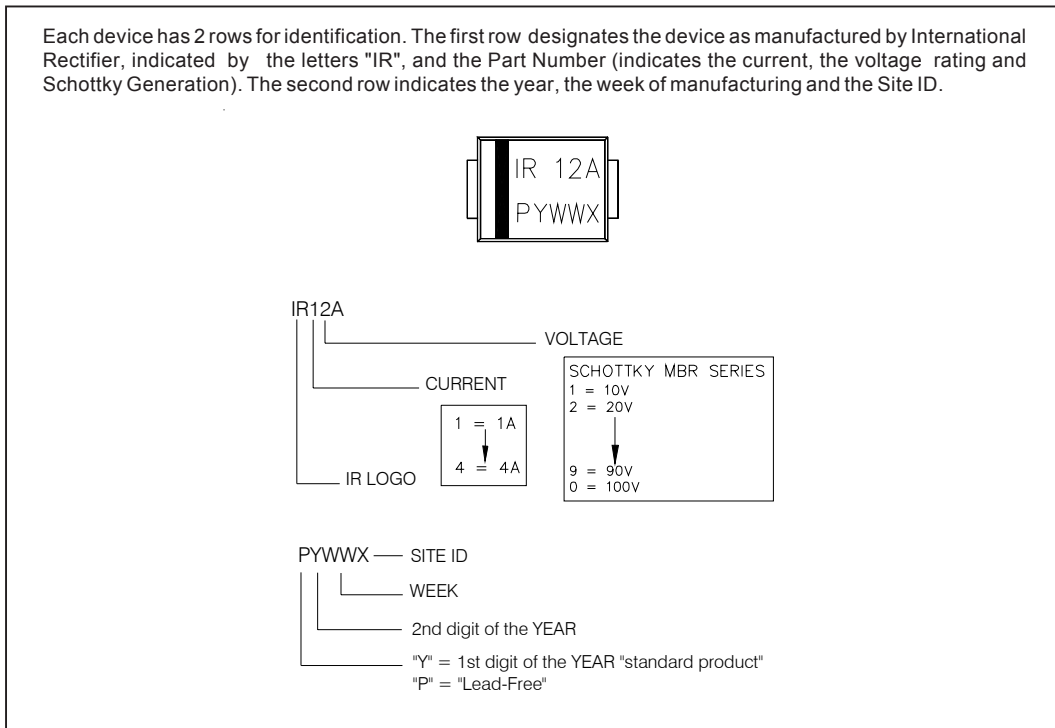
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

Outline Table



Marking & Identification

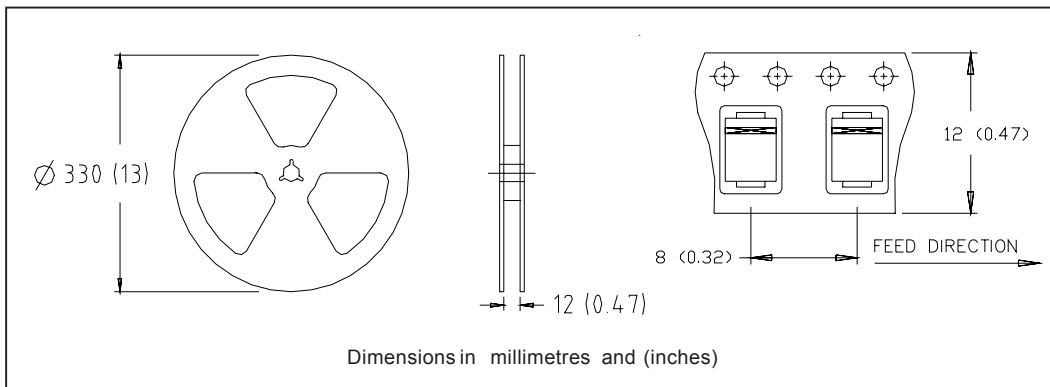


MBRA120TRPbF

Bulletin PD-20776 07/04



Tape & Reel Information



Ordering Information Table

Device Code	
<b>MBR</b>	<b>A</b>
1	20
TR	PbF
①	②
③	④
⑤	⑥

<p><b>1</b> - Schottky MBR Series</p> <p><b>2</b> - A = SMA</p> <p><b>3</b> - Current Rating (1 = 1 A)</p> <p><b>4</b> - Voltage Rating (20 = 20V)</p> <p><b>5</b> - TR = Tape &amp; Reel (7500 pieces)</p> <p><b>6</b></p>	<ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>
---	---

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.



IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105  
 TAC Fax: (310) 252-7309  
 Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 07/04