

$I_{F(AV)} = 1.0\text{Amp}$ $V_R = 20\text{V}$

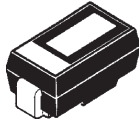

Major Ratings and Characteristics

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

Description/ Features

The MBRS120TRPbF 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
- Lead-Free ("PbF" suffix)

Case Styles	
MBRS120TRPbF	
	
SMB	

Voltage Ratings

Part number	MBRS120TRPbF
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 40	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse
			Following any rated load condition and with rated V_{RWM} applied
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
	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	$^\circ\text{C}/\text{W}$	DC operation
R_{thJA} Max. Thermal Resistance Junction to Ambient		80	$^\circ\text{C}/\text{W}$
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

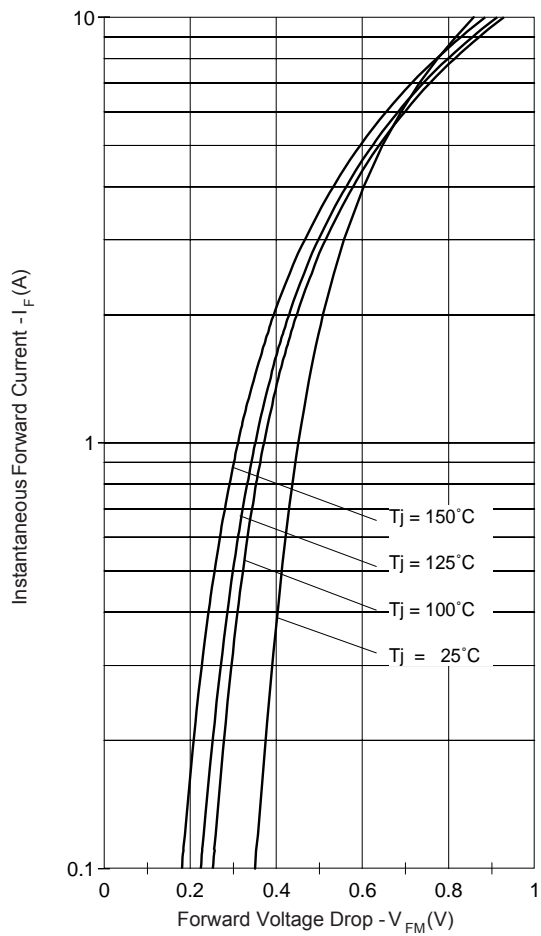


Fig. 1 - Maximum Forward Voltage Drop Characteristics

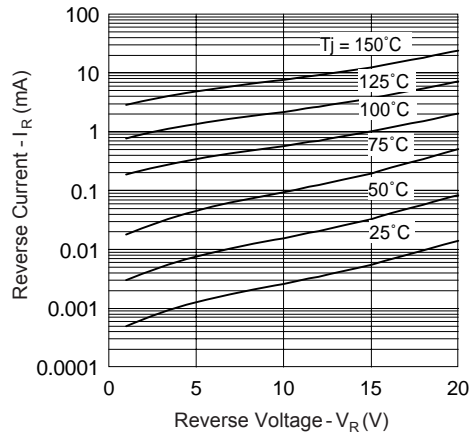


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

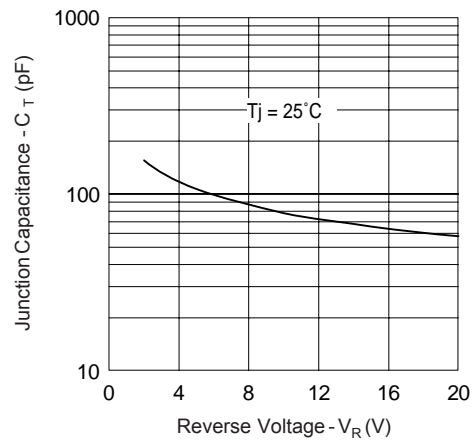


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

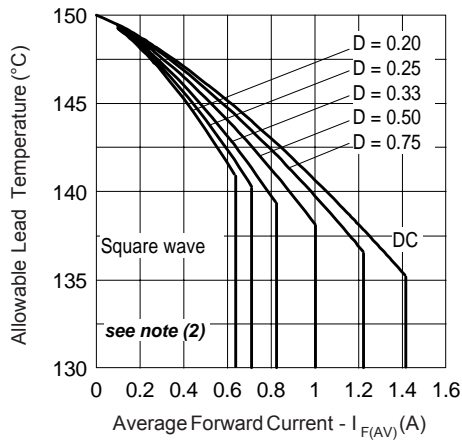


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

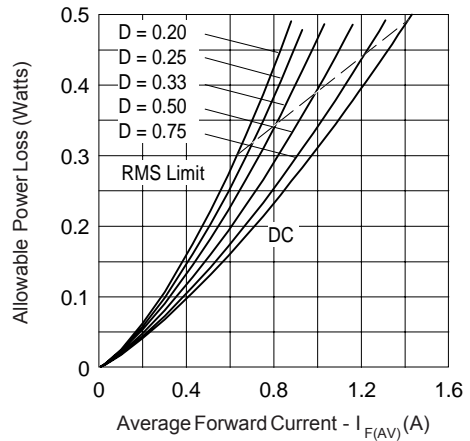


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

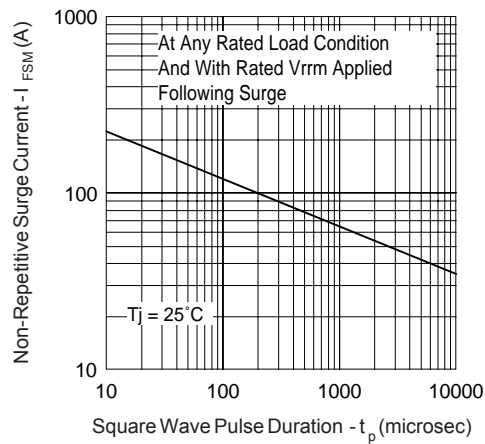
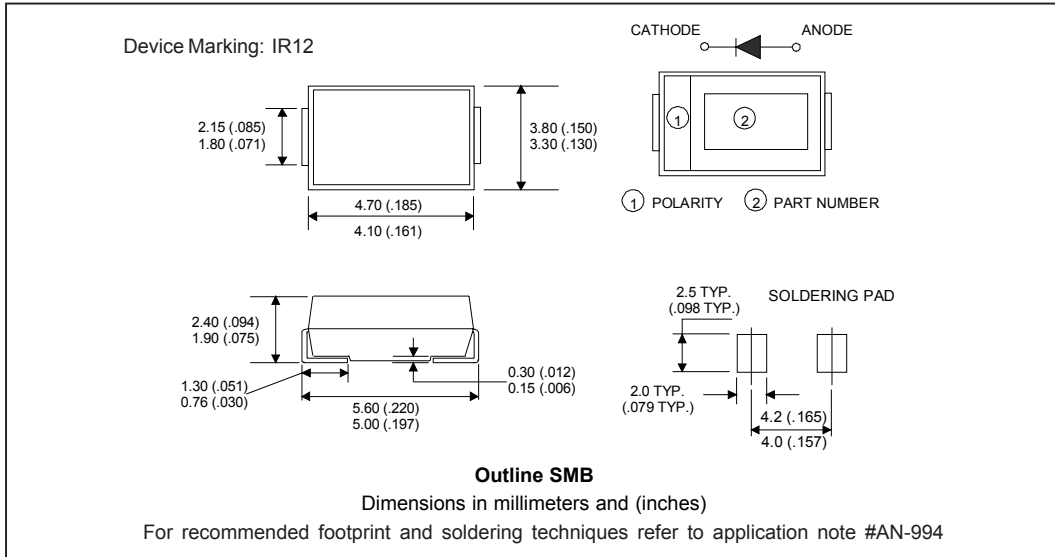


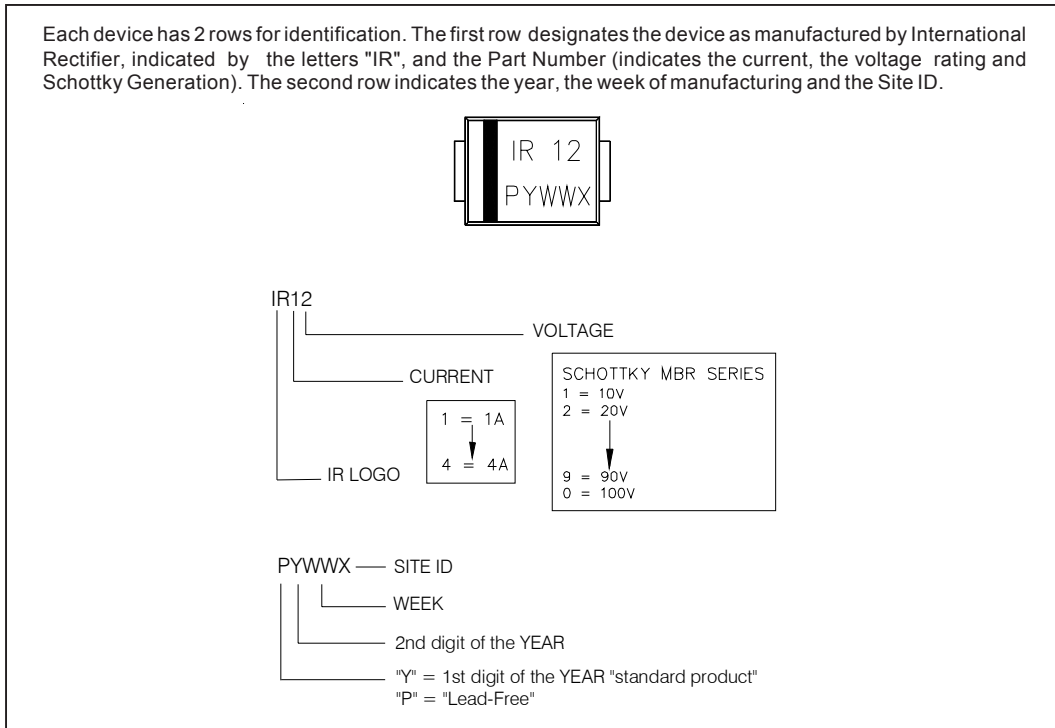
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

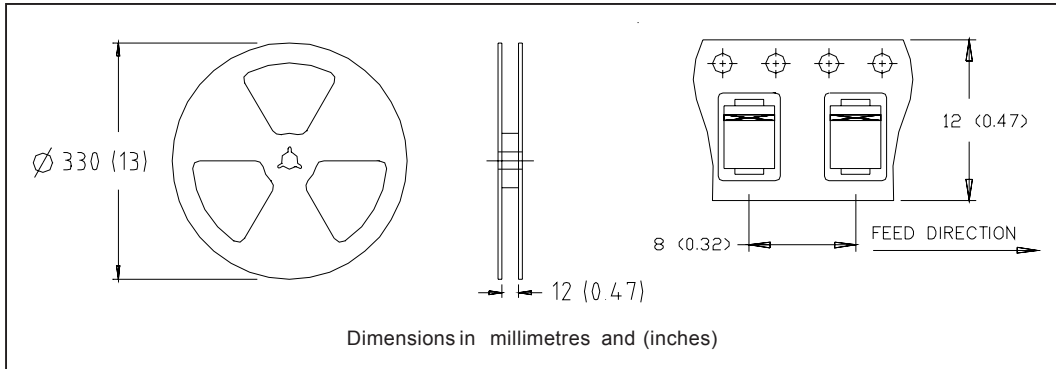
Outline Table



Marking & Identification



Tape & Reel Information



Ordering Information Table

Device Code	
MBR	S
1	20
TR	PbF
①	②
③	④
⑤	⑥

- 1** - Schottky MBR Series
- 2** - S = SMB
- 3** - Current Rating (1 = 1 A)
- 4** - Voltage Rating (20 = 20V)
- 5** - TR = Tape & Reel (3000 pieces)
- 6** -
 - none = Standard Production
 - PbF = Lead-Free

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.