

$$I_{F(AV)} = 3.0\text{Amp}$$

$$V_R = 20\text{V}$$

Major Ratings and Characteristics

Characteristics	Value	Units
$I_{F(AV)}$ Rectangular waveform	3.0	A
V_{RRM}	20	V
I_{FSM} @ $t_p=5\mu\text{s}$ sine	820	A
V_F @3.0Apk, $T_J=125^\circ\text{C}$	0.36	V
T_J range	- 65 to 150	$^\circ\text{C}$

Description/ Features

The MBRS320TRPbF 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

MBRS320TRPbF



SMC



Voltage Ratings

Part number	MBRS320PbF
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	3.0	A	50% duty cycle @ T _L = 136°C, rectangular wave form
I _{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	820		5μs Sine or 3μs Rect. pulse
	80		10ms Sine or 6ms Rect. pulse
E _{AS} Non Repetitive Avalanche Energy	4	mJ	T _J = 25 °C, I _{AS} = 1.0A, L = 8mH
I _{AR} Repetitive Avalanche Current	1.0	A	Current decaying linearly to zero in 1 μsec Frequency limited by T _J max. Va = 1.5 x Vr typical

Electrical Specifications

Parameters	Typ.	Max.	Units	Conditions
V _{FM} Max. Forward Voltage Drop (1)	0.41	0.45	V	@ 3A
	0.45	0.53	V	@ 6A
	0.29	0.36	V	@ 3A
	0.35	0.46	V	@ 6A
I _{RM} Max. Reverse Leakage Current (1)	0.04	0.5	mA	T _J = 25 °C
	8.0	20	mA	T _J = 100 °C
	23	35	mA	T _J = 125 °C
C _T Typical Junction Capacitance	360	-	pF	V _R = 5V _{DC} (test signal range 100kHz to 1Mhz), @ 25°C
L _S Typical Series Inductance	3.0	-	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 (**)	12	°C/W	DC operation
R _{thJA} Max. Thermal Resistance Junction to Ambient	46	°C/W	
Wt Approximate Weight	0.24(0.008)	gr (oz)	
Case Style	SMC		Similar DO-214AB
Device Marking	IR32		

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

(**) Mounted 1 inch square PCB

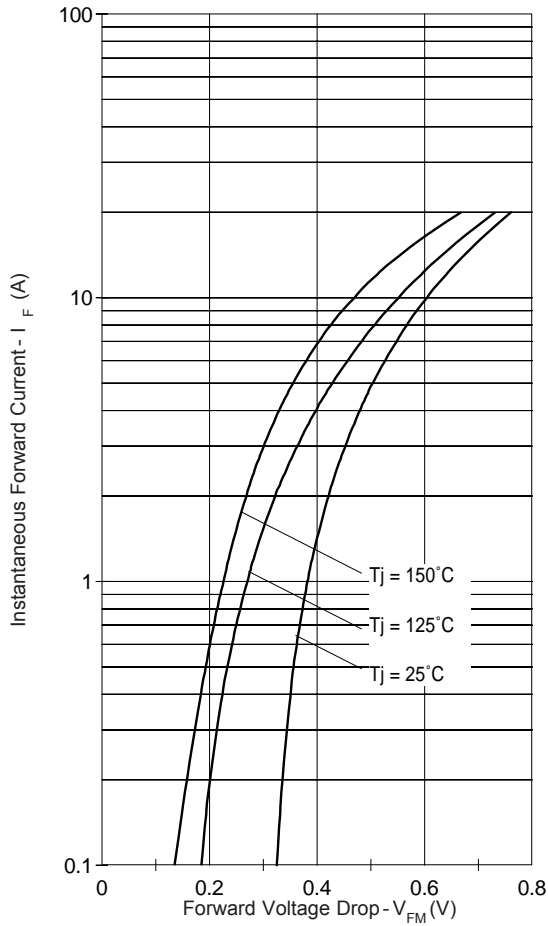


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

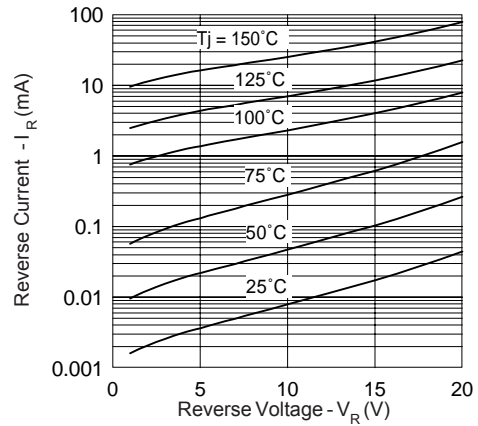


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

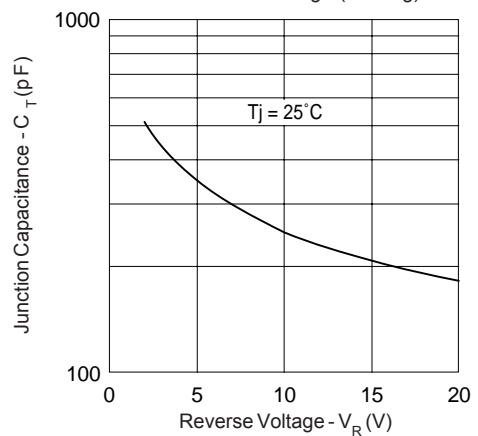


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

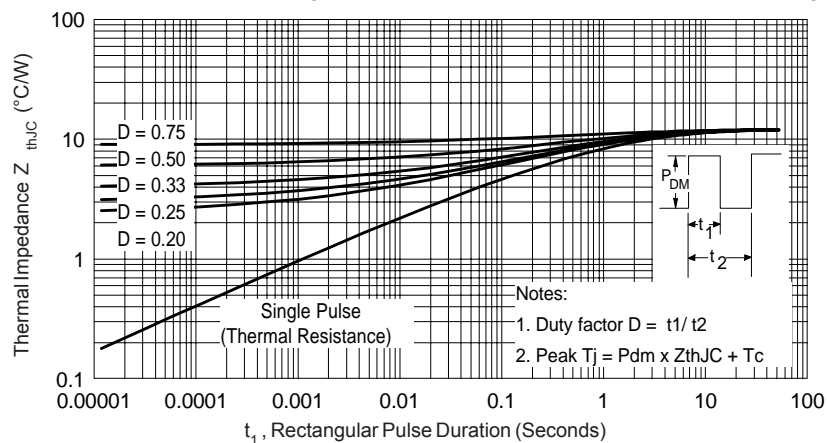


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

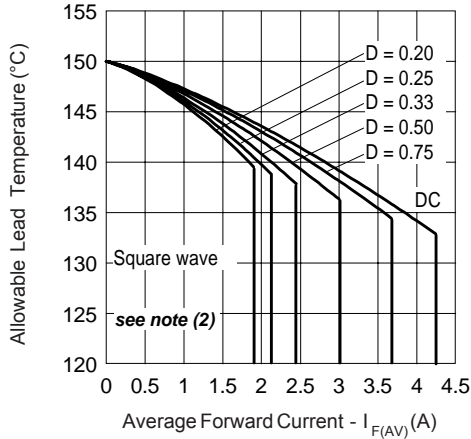


Fig. 5 - Maximum Average Forward Current Vs. Allowable Lead Temperature

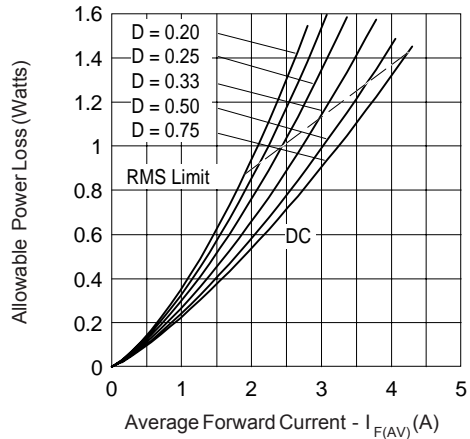


Fig. 6 - Maximum Average Forward Dissipation Vs. Average Forward Current

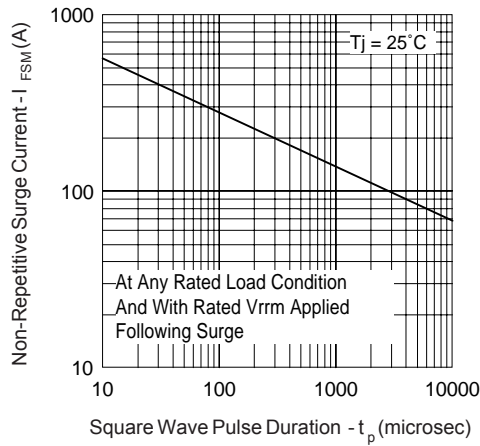
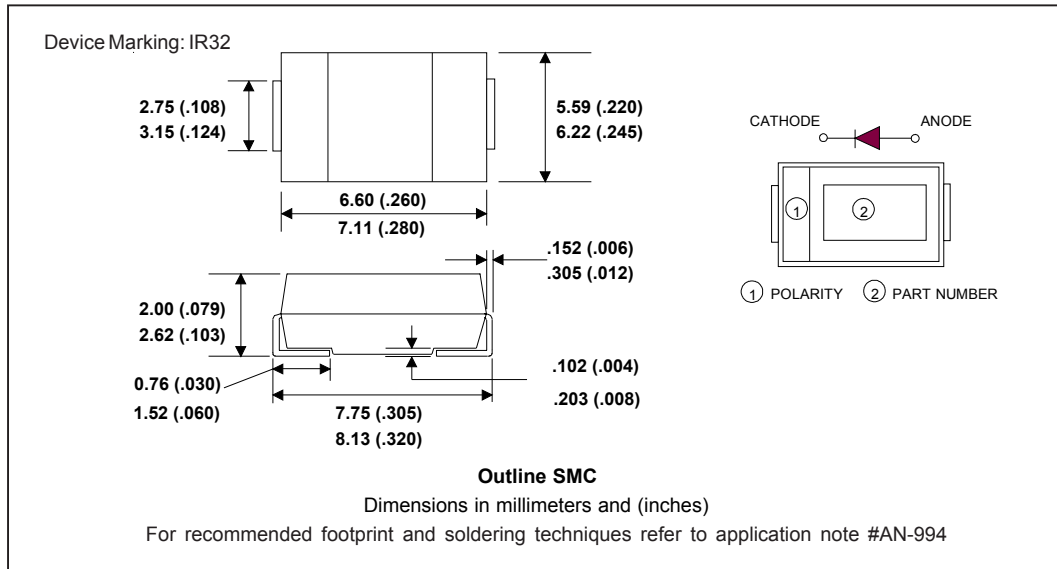


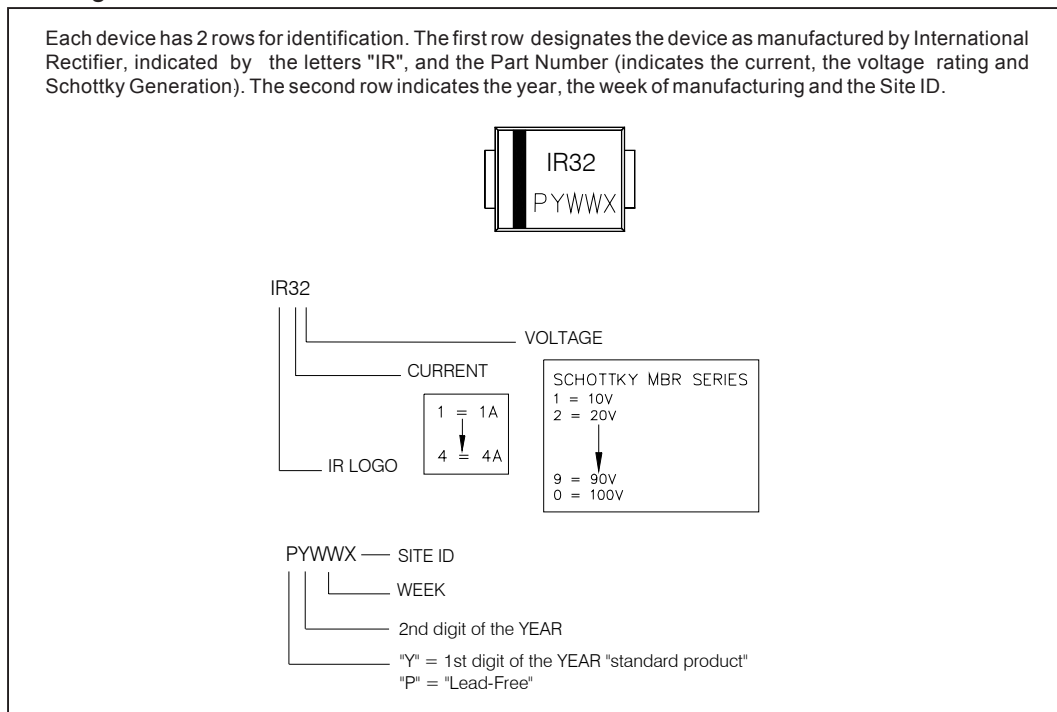
Fig. 7 - Maximum Peak Surge Forward Current Vs. Pulse Duration

- (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);
 $Pd_{REV} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$

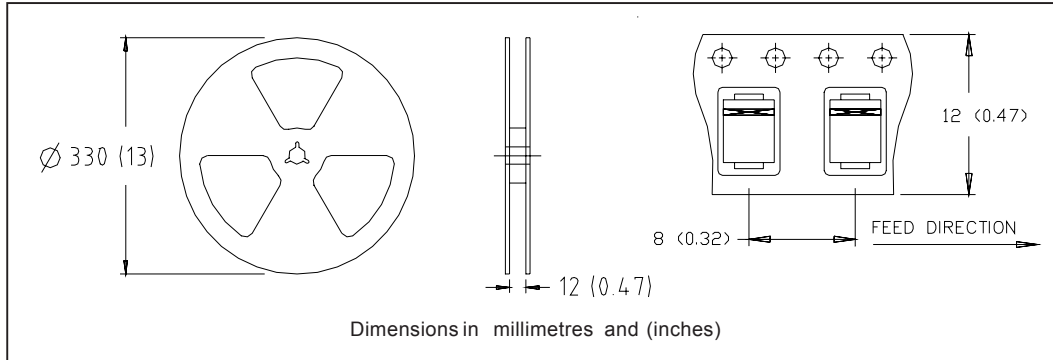
Outline Table



Marking & Identification



Tape & Reel Information



Ordering Information Table

Device Code					
MBR	S	3	20	TR	PbF
①	②	③	④	⑤	⑥
1	- Schottky MBR Series				
2	- S = SMC				
3	- Current Rating (3 = 3 A)				
4	- Voltage Rating (20 = 20V)				
5	- TR = Tape & Reel (3000 pieces)				
6	<ul style="list-style-type: none"> • 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.