

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

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

Major Ratings and Characteristics

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

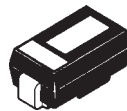
Description/ Features

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



Voltage Ratings

| Part number | MBRA120TR |
|---|-----------|
| 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 @ $T_L = 136^\circ\text{C}$, rectangular wave form |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current | 310 | A | 5 μs Sine or 3 μs Rect. pulse |
| | 40 | | 10ms Sine or 6ms Rect. pulse |
| 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 | 1.0 | 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 (**) | 35 | $^\circ\text{C}/\text{W}$ | DC operation |
| R_{thJA} Max. Thermal Resistance Junction to Ambient | 80 | $^\circ\text{C}/\text{W}$ | |
| Wt Approximate Weight | 0.07(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

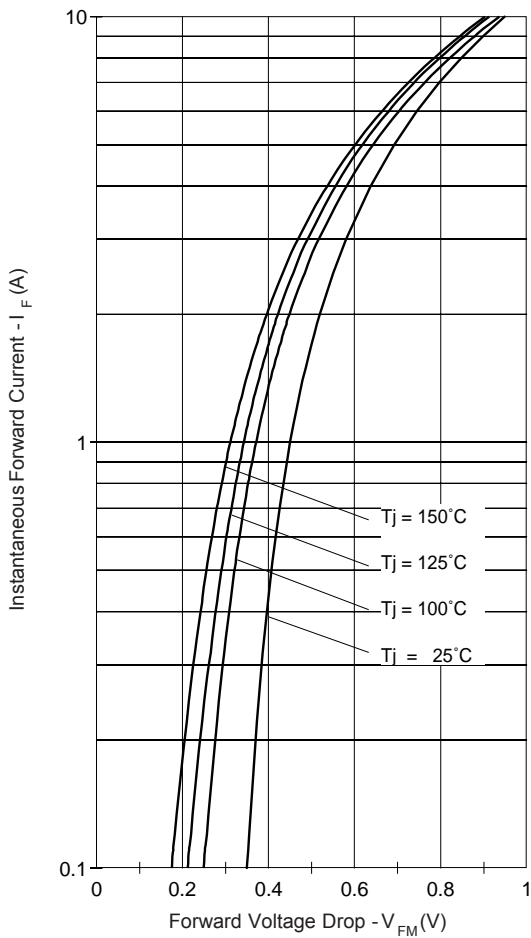


Fig. 1 - Maximum Forward Voltage Drop Characteristics

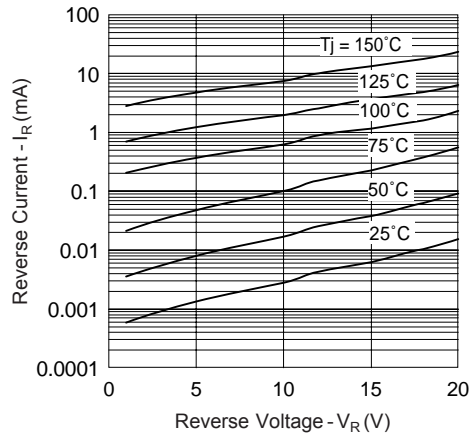


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

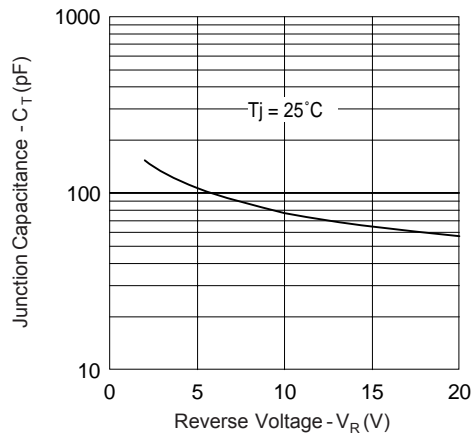


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

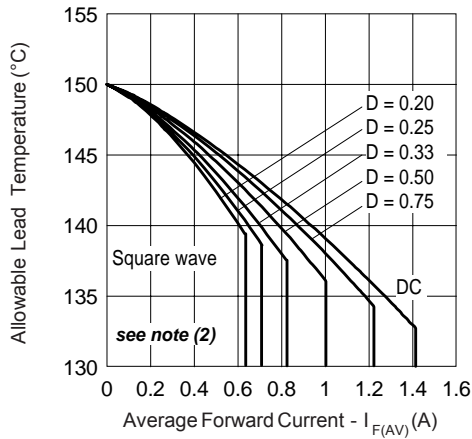


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

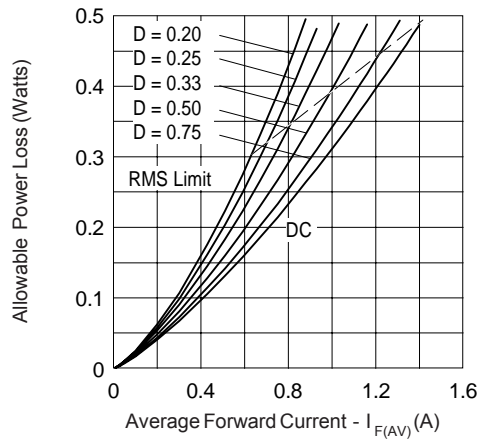


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

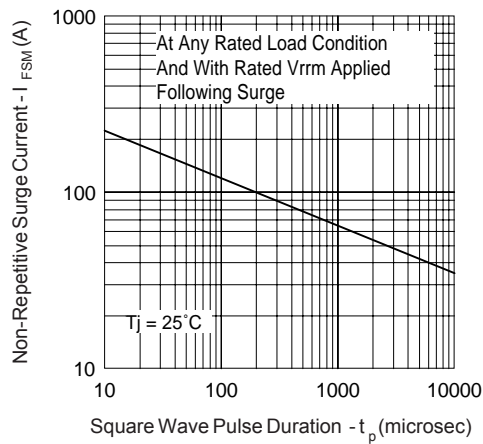
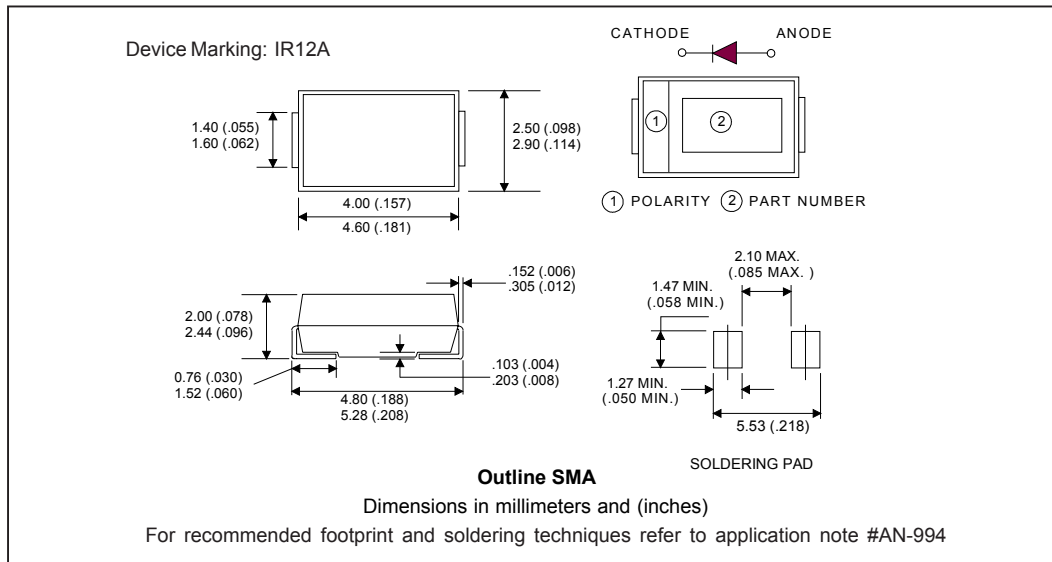


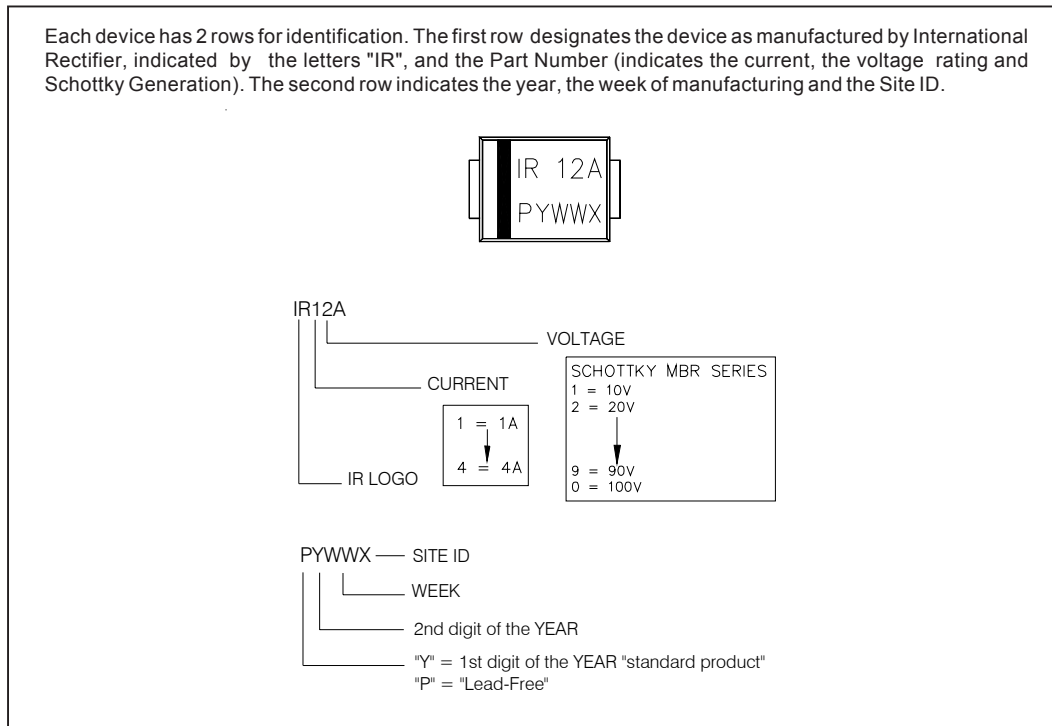
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

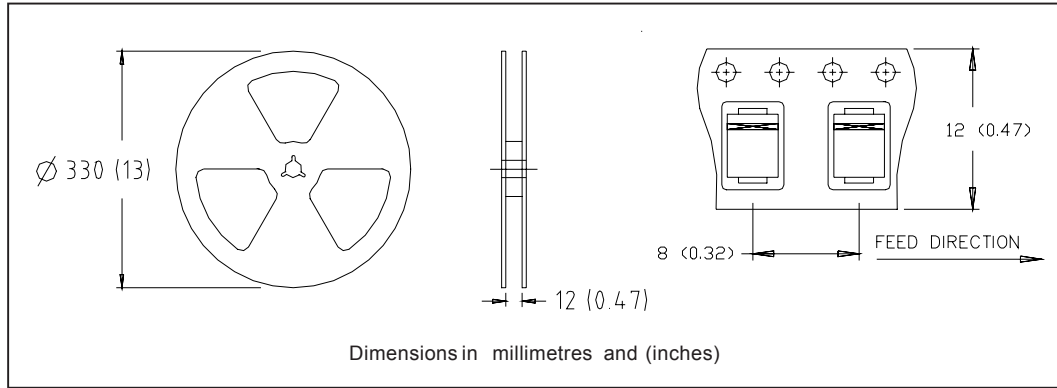
Outline Table



Marking & Identification



Tape & Reel Information



Ordering Information Table

| Device Code | |
|-------------|----------|
| MBR | A |
| 1 | 20 |
| TR | PbF |
| ① | ② |
| ③ | ④ |
| ⑤ | ⑥ |

| | |
|---|---|
| <p>1 - Schottky MBR Series</p> <p>2 - A = SMA</p> <p>3 - Current Rating (1 = 1 A)</p> <p>4 - Voltage Rating (20 = 20V)</p> <p>5 - TR = Tape & Reel (7500 pieces)</p> <p>6</p> | <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.