

International  
**IR** Rectifier

# 10BQ030PbF

## SCHOTTKY RECTIFIER

## 1 Amp

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

$$V_R = 30\text{V}$$

### Major Ratings and Characteristics

| Characteristics                                     | Value       | Units            |
|---|-------------|------------------|
| $I_{F(AV)}$ Rectangular waveform                    | 1.0         | A                |
| $V_{RRM}$   | 30          | V                |
| $I_{FSM}$ @ $t_p = 5\text{ms}$ sine                 | 430         | A                |
| $V_F$ @ $1.0\text{Apk}$ , $T_J = 125^\circ\text{C}$ | 0.30        | V                |
| $T_J$ range   | - 55 to 150 | $^\circ\text{C}$ |

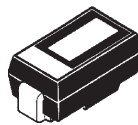
### Description/ Features

The 10BQ030PbF 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

10BQ030PbF



SMB



## Voltage Ratings

| Part number                                     | 10BQ030PbF |
|---|------------|
| $V_R$ Max. DC Reverse Voltage (V)               | 30         |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |            |

## Absolute Maximum Ratings

| Parameters  | 10BQ | Units | Conditions   |
|---|------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current                                | 1.0  | A     | 50% duty cycle @ $T_L = 106^\circ\text{C}$ , rectangular wave form.  |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 6 | 430  |       | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse  |
|   | 90   |       | 10ms Sine or 6ms Rect. pulse   |
| $E_{AS}$ Non-Repetitive Avalanche Energy                                | 3.0  | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 1\text{A}$ , $L = 6\text{mH}$   |
| $I_{AR}$ Repetitive Avalanche Current                                   | 1.0  | A     | Current decaying linearly to zero in 1 $\mu\text{sec}$<br>Frequency limited by $T_J$ max. $V_a = 1.5 \times V_r$ typical |

## Electrical Specifications

| Parameters   | 10BQ  | Units            | Conditions  |
|--|-------|------------------|---|
| $V_{FM}$ Max. Forward Voltage Drop (1)             | 0.420 | V                | @ 1A  |
|  | 0.470 | V                | @ 2A  |
| $V_{FM}$ Max. Forward Voltage Drop (1)             | 0.300 | V                | @ 1A  |
|  | 0.370 | V                | @ 2A  |
| $I_{RM}$ Max. Reverse Leakage Current (1)          | 0.5   | mA               | $T_J = 25^\circ\text{C}$  |
|  | 5.0   | mA               | $T_J = 100^\circ\text{C}$   |
|  | 15    | mA               | $T_J = 125^\circ\text{C}$   |
| $C_T$ Max. Junction Capacitance                    | 200   | pF               | $V_R = 5V_{DC}$ (test signal range 100KHz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance                    | 2.0   | nH               | Measured lead to lead 5mm from package body                           |
| $dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ ) | 10000 | V/ $\mu\text{s}$ |   |

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## Thermal-Mechanical Specifications

| Parameters   | 10BQ        | Units                     | Conditions       |
|--|-------------|---------------------------|------------------|
| $T_J$ Max. Junction Temperature Range (*)                | -55 to 150  | $^\circ\text{C}$          |                  |
| $T_{stg}$ Max. Storage Temperature Range                 | -55 to 150  | $^\circ\text{C}$          |                  |
| $R_{thJL}$ Max. Thermal Resistance Junction to Lead (**) | 25          | $^\circ\text{C}/\text{W}$ | DC operation     |
| $R_{thJA}$ Max. Thermal Resistance Junction to Ambient   | 80          | $^\circ\text{C}/\text{W}$ |                  |
| wt Approximate Weight                                    | 0.10(0.003) | g(oz.)                    |                  |
| Case Style   | SMB         |                           | Similar DO-214AA |
| Device Marking   | IR1E        |                           |                  |

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

(\*\*) Mounted 1 inch square PCB

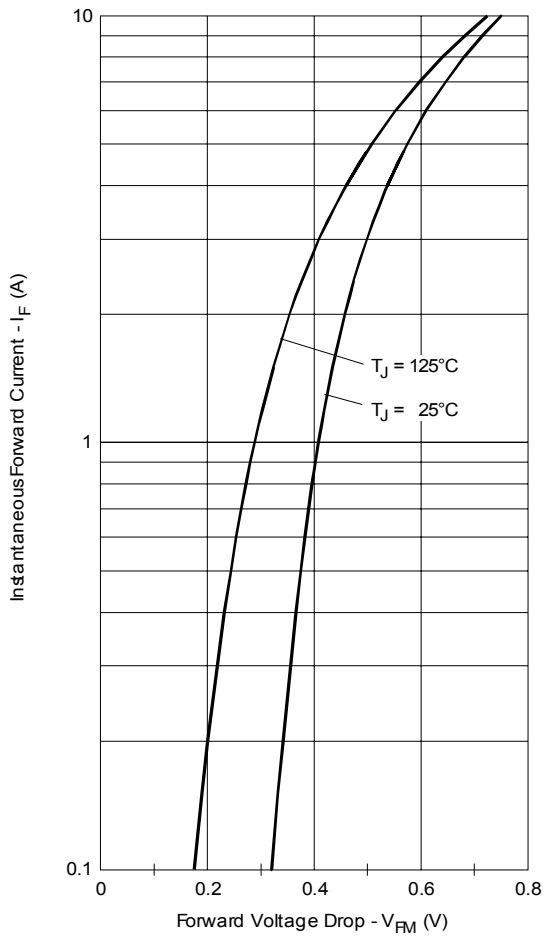


Fig. 1 - Maximum Forward Voltage Drop Characteristics

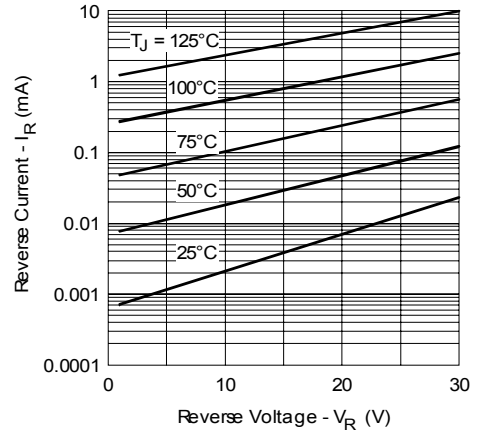


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

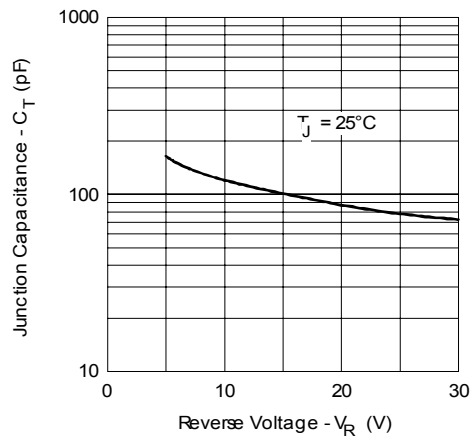


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

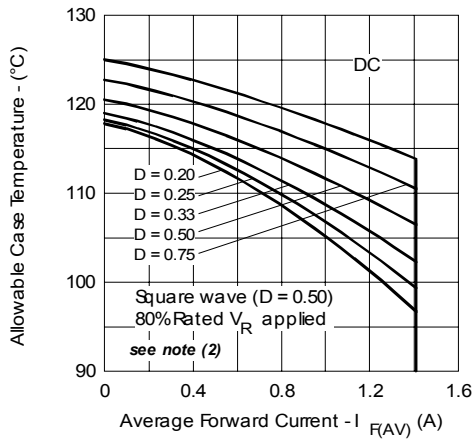


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

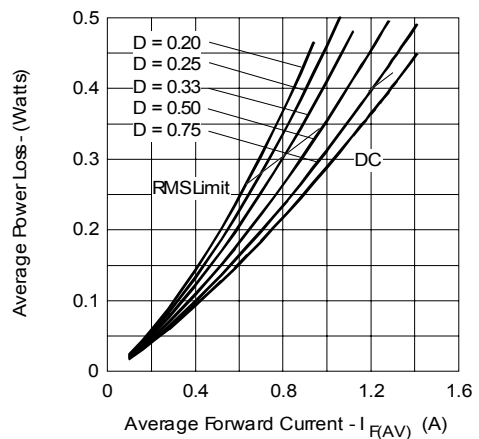


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

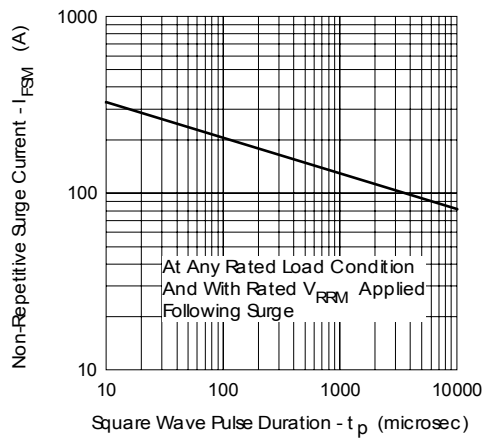


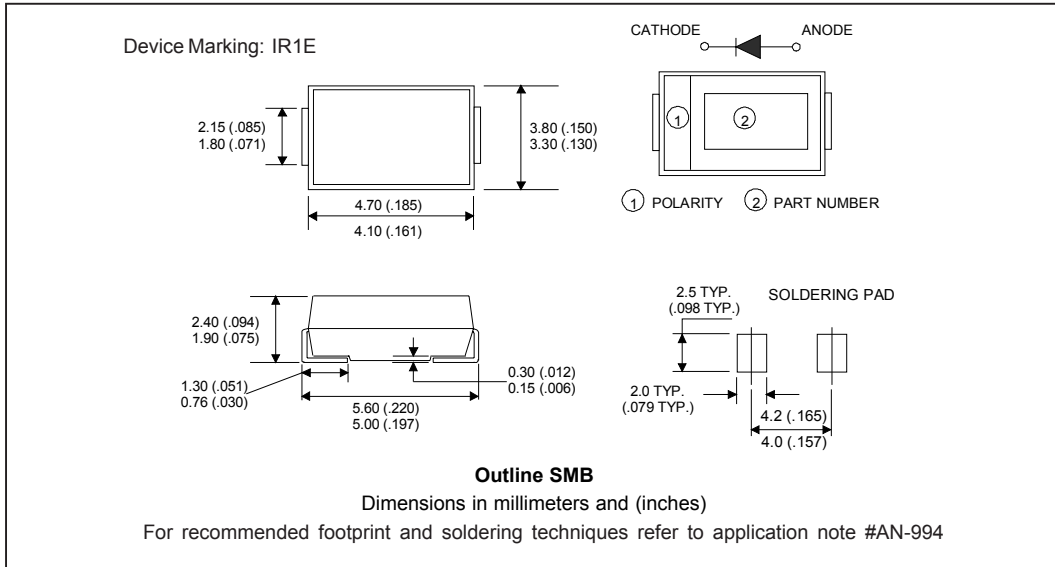
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

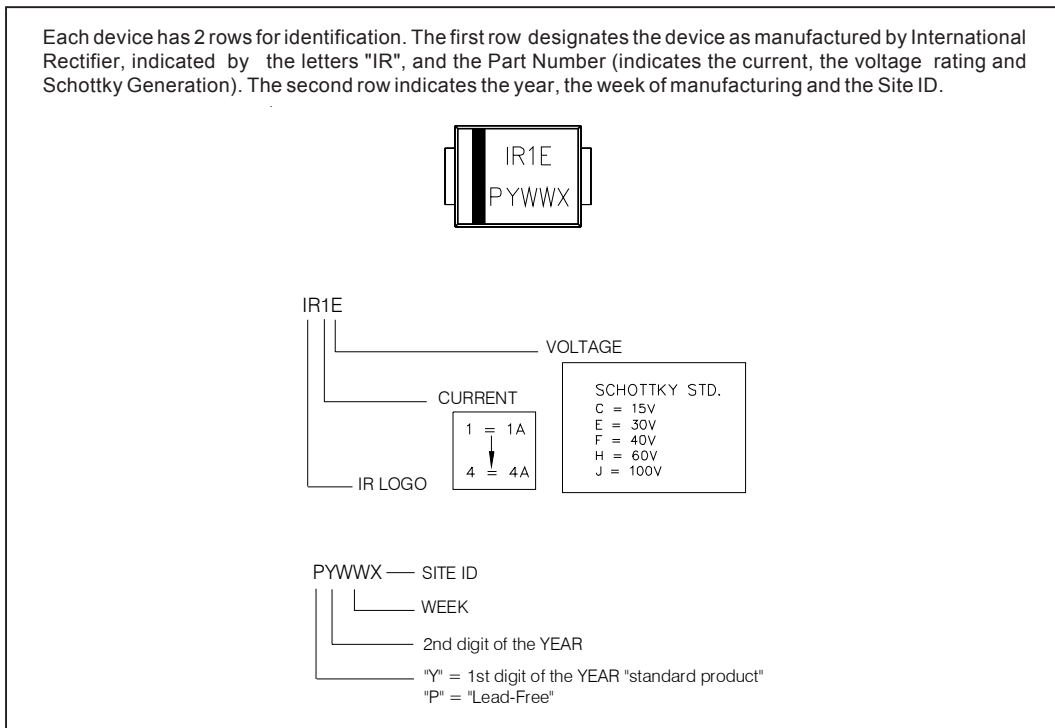
$Pd$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

$Pd_{REV}$  = Inverse Power Loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 80\%$  rated  $V_R$

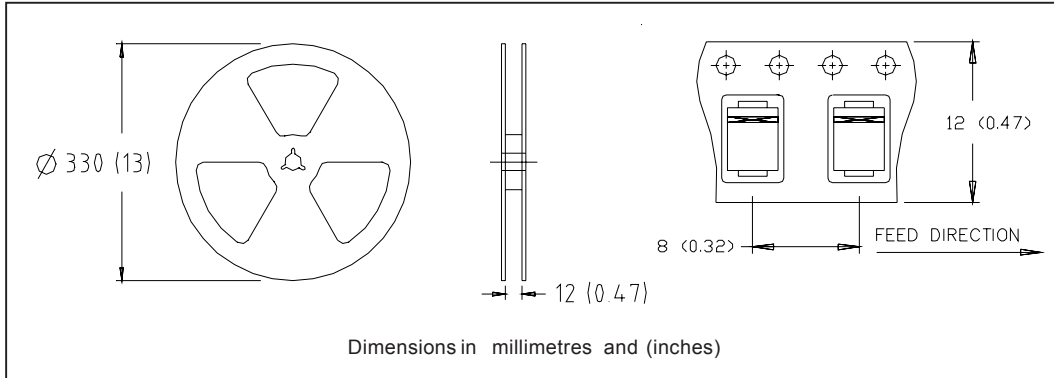
Outline Table



Marking & Identification



Tape & Reel Information



Ordering Information Table

| Device Code |  |          |            |           |            |
|-------------|--|----------|------------|-----------|------------|
| <b>10</b>   | <b>B</b>   | <b>Q</b> | <b>030</b> | <b>TR</b> | <b>PbF</b> |
| ①           | ②  | ③        | ④          | ⑤         | ⑥          |
| <b>1</b>    | - Current Rating   |          |            |           |            |
| <b>2</b>    | - B = Single Lead Diode  |          |            |           |            |
| <b>3</b>    | - Q = Schottky Q Series  |          |            |           |            |
| <b>4</b>    | - Voltage Rating (030 = 30V)                                     |          |            |           |            |
| <b>5</b>    | - • none = Box (1000 pieces)<br>• TR = Tape & Reel (3000 pieces) |          |            |           |            |
| <b>6</b>    | - • none = Standard Production<br>• 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.