

International
IR Rectifier

10BQ015

SCHOTTKY RECTIFIER

1 Amp

$$I_{F(AV)} = 1 \text{ Amp}$$

$$V_R = 15V$$

Major Ratings and Characteristics

| Characteristics | 10BQ015 | Units |
|--------------------------------------|-------------|------------|
| $I_{F(AV)}$ Rectangular waveform | 1.0 | A |
| V_{RRM} | 15 | V |
| I_{FSM} @ $t_p = 5 \mu s$ sine | 140 | A |
| V_F @ 1.0 Apk, $T_J = 125^\circ C$ | 0.32 | V |
| T_J range | - 55 to 125 | $^\circ C$ |

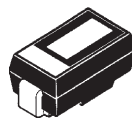
Description/ Features

The 10BQ015 surface mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. The proprietary barrier technology allows for reliable operation up to 125°C junction temperature. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- 125°C T_J operation ($V_R < 5V$)
- Optimized for OR-ing applications
- Ultra low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance

Case Styles

10BQ015



SMB



Voltage Ratings

| | |
|---|---------|
| Part number | 10BQ015 |
| V_R Max. DC Reverse Voltage (V) | 15 |
| V_{RWM} Max. Working Peak Reverse Voltage (V) | 25 |

Absolute Maximum Ratings

| Parameters | 10BQ | Units | Conditions |
|---|------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current * See Fig. 5 | 1.0 | A | 50% duty cycle @ $T_L = 84^\circ\text{C}$, rectangular wave form. |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7 | 140 | A | 5 μs Sine or 3 μs Rect. pulse |
| | 40 | | 10ms Sine or 6ms Rect. pulse |
| E_{AS} Non-Repetitive Avalanche Energy | 1.0 | mJ | $T_J = 25^\circ\text{C}$, $I_{AS} = 1\text{A}$, $L = 2\text{mH}$ |
| I_{AR} Repetitive Avalanche Current | 1.0 | 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 | 10BQ | Units | Conditions |
|---|-------|------------------|---|
| V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1 | 0.35 | V | @ 1.0A |
| | 0.44 | V | @ 2.0A |
| | 0.32 | V | @ 1.0A |
| | 0.40 | V | @ 2.0A |
| I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2 | 0.5 | mA | $T_J = 25^\circ\text{C}$ |
| | 12 | mA | $T_J = 100^\circ\text{C}$ |
| $V_{F(TO)}$ Threshold Voltage | - | V | $T_J = T_J$ max. |
| r_t Forward Slope Resistance | - | m Ω | |
| C_T Typical Junction Capacitance | 390 | 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 | 10BQ | Units | Conditions |
|--|--------------|---------------------------|---------------------------|
| T_J Max. Junction Temperature Range (*) | -55 to 125 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ | |
| R_{thJL} Max. Thermal Resistance Junction to Lead (**) | 36 | $^\circ\text{C}/\text{W}$ | DC operation (See Fig. 4) |
| R_{thJA} Max. Thermal Resistance Junction to Ambient | 80 | $^\circ\text{C}/\text{W}$ | DC operation |
| wt Approximate Weight | 0.10 (0.003) | g (oz.) | |
| Case Style | SMB | | Similar to DO-214AA |
| Device Marking | IR1C | | |

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

(**) Mounted 1 inch square PCB

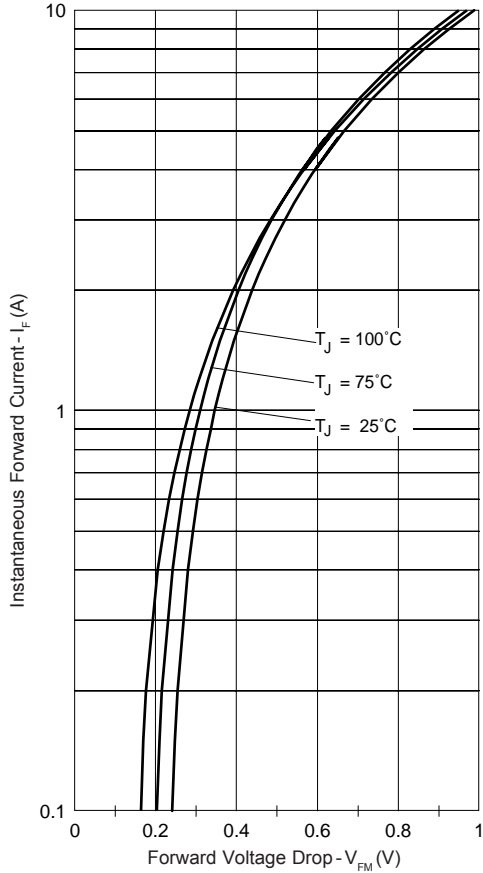


Fig. 1 - Max. Forward Voltage Drop Characteristics

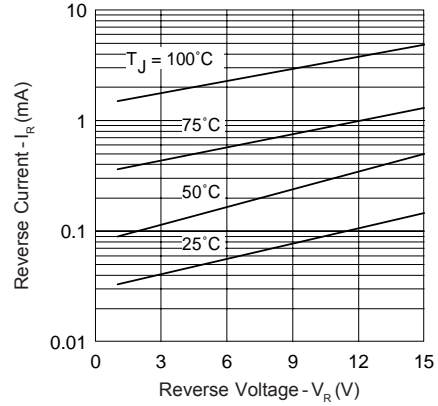


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

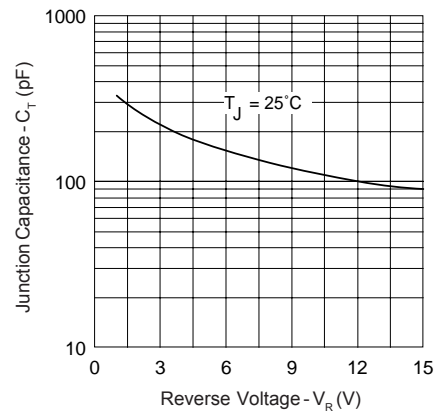


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

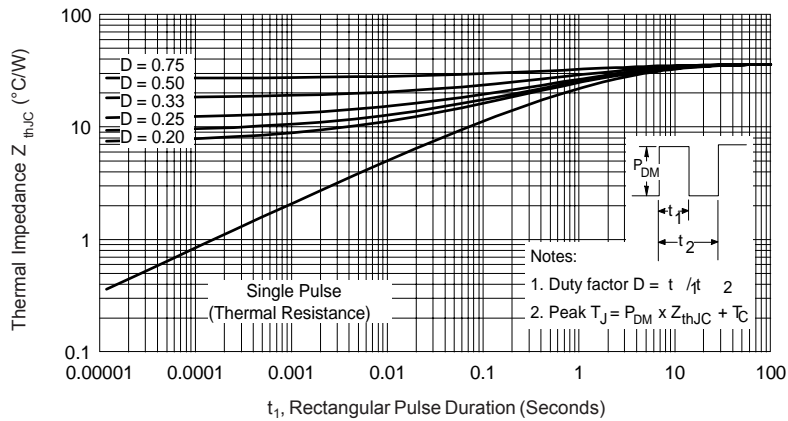


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

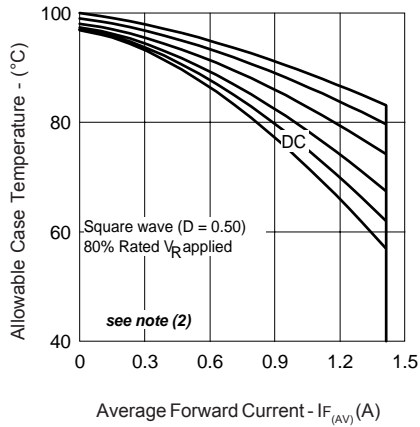


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

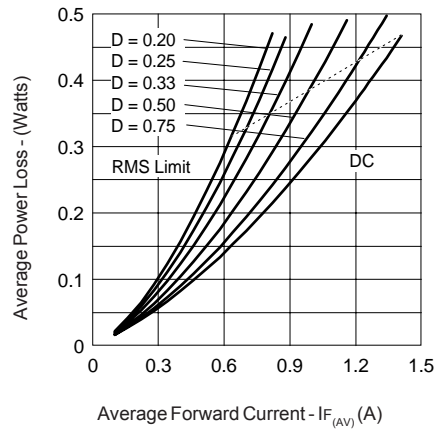


Fig. 6 - Forward Power Loss Characteristics

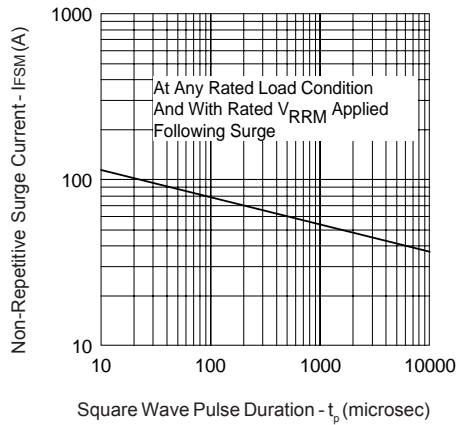
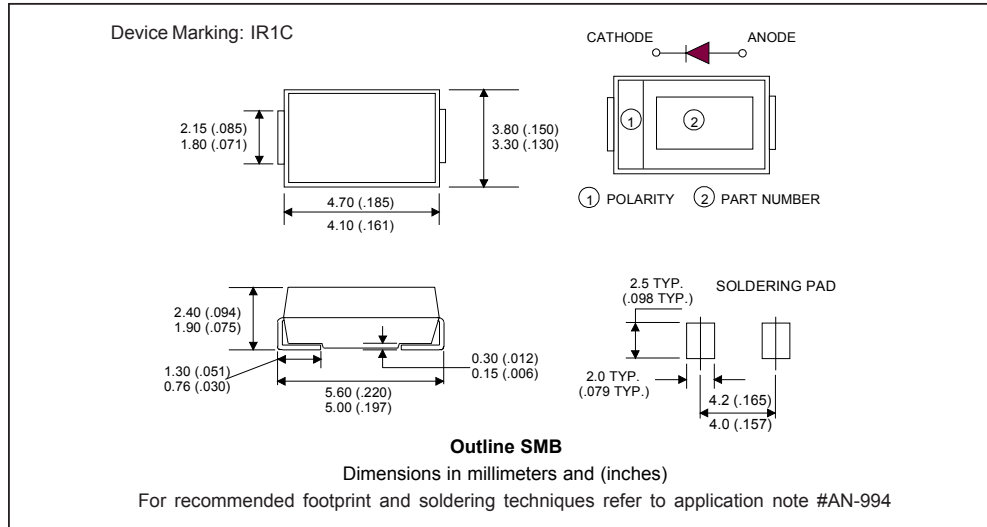


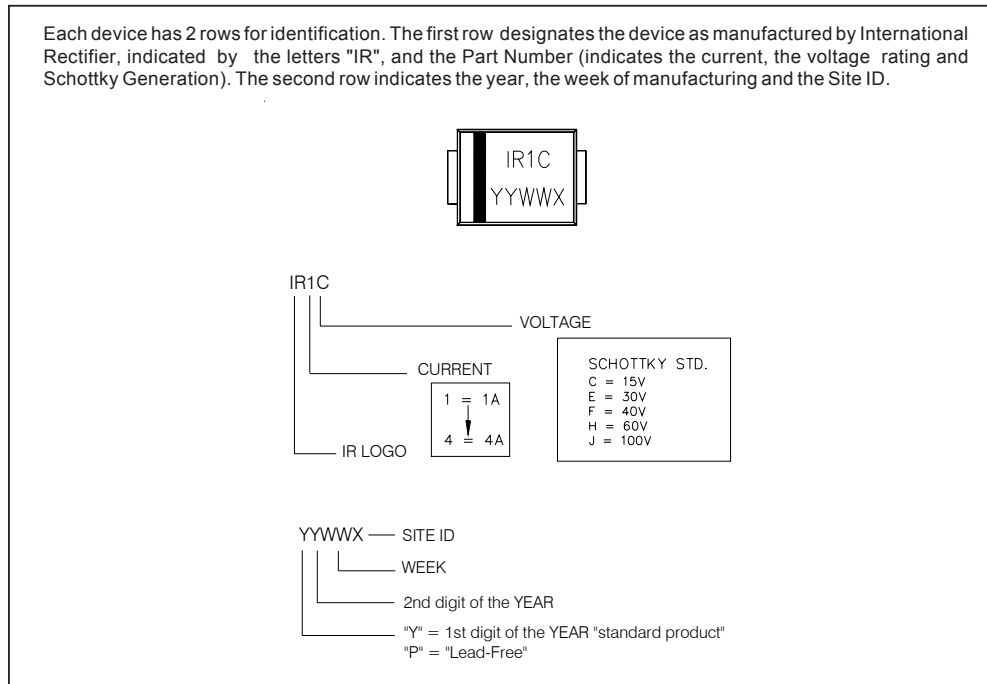
Fig. 7 - Max. Non-Repetitive Surge Current

- (2) Formula used: $T_c = T_j - (Pd + Pd_{REV}) \times R_{INJC}$;
 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

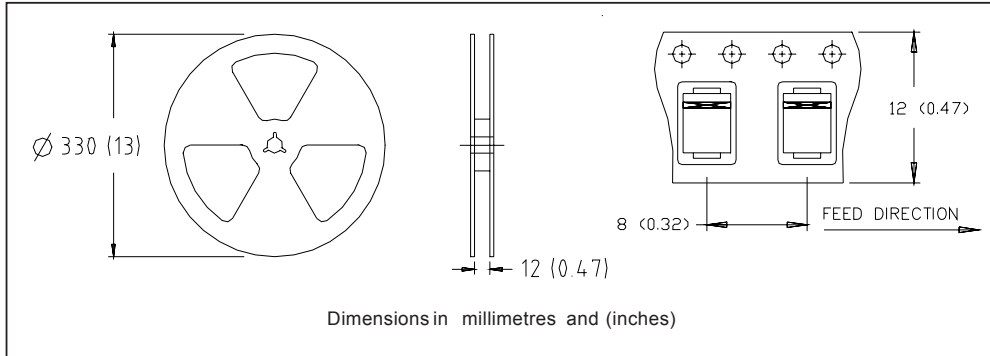


10BQ015

Bulletin PD-2.396 rev. I 07/04

International
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Tape & Reel Information



Ordering Information Table

| Device Code | | | | | |
|-------------|---|---|-----|----|---|
| 10 | B | Q | 015 | TR | - |
| ① | ② | ③ | ④ | ⑤ | ⑥ |

| | | |
|---|---|--|
| ① | - | Current Rating |
| ② | - | B = Single Lead Diode |
| ③ | - | Q = Schottky Q Series |
| ④ | - | Voltage Rating (015 = 15V) |
| ⑤ | - | • none = Box (1000 pieces) • 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.
Qualification Standards can be found on IR's Web site.

International
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