

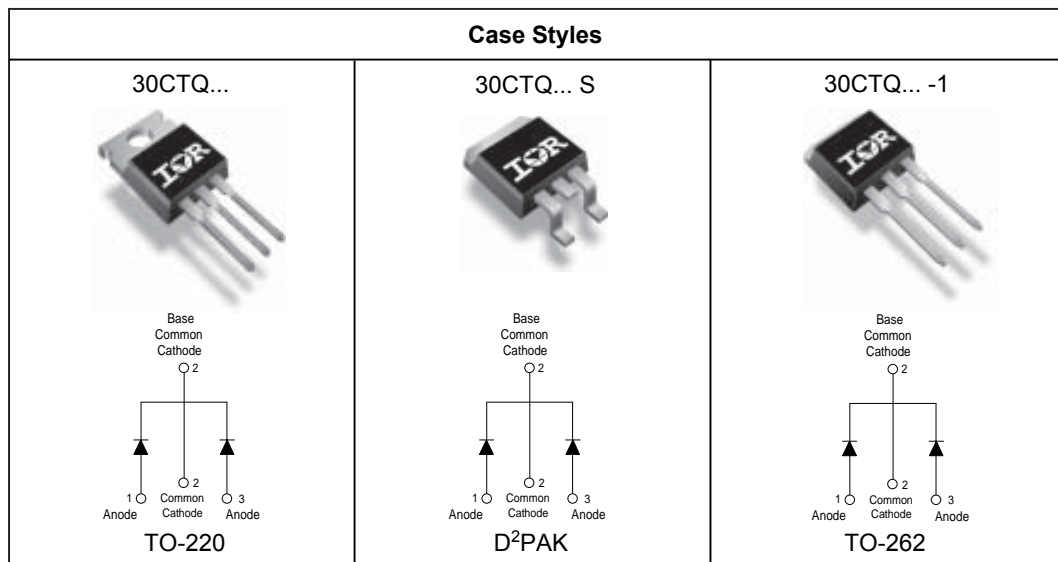
**Major Ratings and Characteristics**

| Characteristics                                     | Values     | Units            |
|---|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform                    | 30         | A                |
| $V_{RRM}$   | 80 - 100   | V                |
| $I_{FSM}$ @ tp = 5 $\mu$ s sine                     | 850        | A                |
| $V_F$ @ 15 Apk, $T_J = 125^\circ\text{C}$ (per leg) | 0.67       | V                |
| $T_J$ range   | -55 to 175 | $^\circ\text{C}$ |

**Description/ Features**

This center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C  $T_J$  operation
- Center tap configuration
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



## Voltage Ratings

| Parameters                                      | 30CTQ80<br>30CTQ80S<br>30CTQ80-1 | 30CTQ100<br>30CTQ100S<br>30CTQ100-1 |
|---|----------------------------------|-------------------------------------|
| $V_R$ Max. DC Reverse Voltage (V)               | 80                               | 100                                 |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |                                  |                                     |

## Absolute Maximum Ratings

| Parameters   | Values     | Units | Conditions   |
|--|------------|-------|--|
| $I_{F(AV)}$ Max. Average Forward (Per Leg)<br>Current * See Fig. 5 (Per Device)      | 15<br>30   | A     | 50% duty cycle @ $T_C = 129^\circ\text{C}$ , rectangular wave form   |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive<br>Surge Current (Per Leg) * See Fig. 7 | 850<br>275 | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse<br>10ms Sine or 6ms Rect. pulse<br>Following any rated load condition and with rated $V_{RRM}$ applied |
| $E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)                                   | 7.50       | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 0.50$ Amps, $L = 60$ mH   |
| $I_{AR}$ Repetitive Avalanche Current (Per Leg)                                      | 0.50       | 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   | Values                       | Units            | Conditions  |
|--|------------------------------|------------------|---|
| $V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)    | 0.86<br>1.05<br>0.67<br>0.82 | V                | @ 15A<br>@ 30A<br>@ 15A<br>@ 30A<br>$T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$ |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 0.55<br>7.0                  | mA               | $T_J = 25^\circ\text{C}$<br>$T_J = 125^\circ\text{C}$<br>$V_R = \text{rated } V_R$        |
| $C_T$ Max. Junction Capacitance (Per Leg)                        | 500                          | pF               | $V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$                     |
| $L_S$ Typical Series Inductance (Per Leg)                        | 8.0                          | 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  | Values                     | Units                     | Conditions   |
|---|----------------------------|---------------------------|--|
| $T_J$ Max. Junction Temperature Range                             | -55 to 175                 | $^\circ\text{C}$          |  |
| $T_{stg}$ Max. Storage Temperature Range                          | -55 to 175                 | $^\circ\text{C}$          |  |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Leg)     | 3.25                       | $^\circ\text{C}/\text{W}$ | DC operation   |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package) | 1.63                       | $^\circ\text{C}/\text{W}$ | DC operation   |
| $R_{thCS}$ Typical Thermal Resistance, Case to Heatsink           | 0.50                       | $^\circ\text{C}/\text{W}$ | Mounting surface, smooth and greased (only for TO-220) |
| wt Approximate Weight   | 2 (0.07)                   | g (oz.)                   |  |
| T Mounting Torque   | Min. 6 (5)<br>Max. 12 (10) | Kg-cm<br>(lbf-in)         |  |

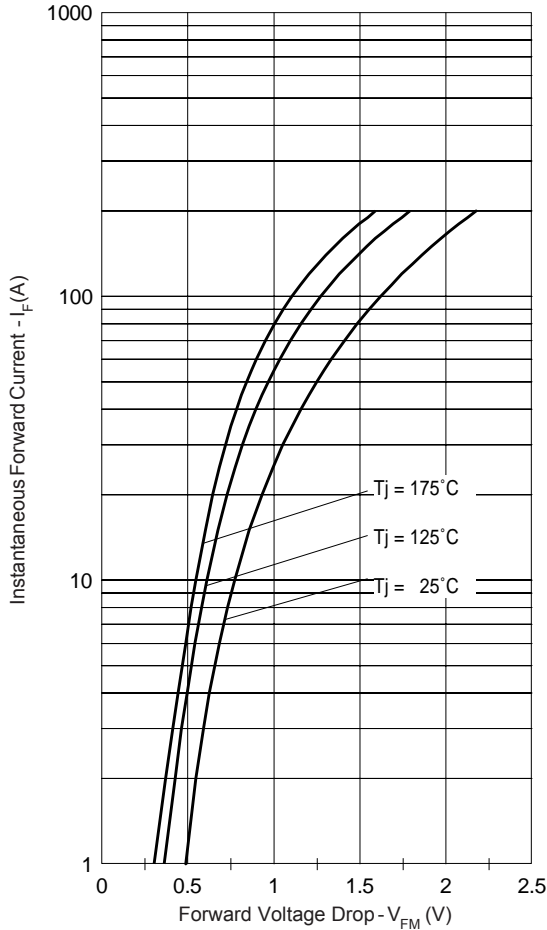


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

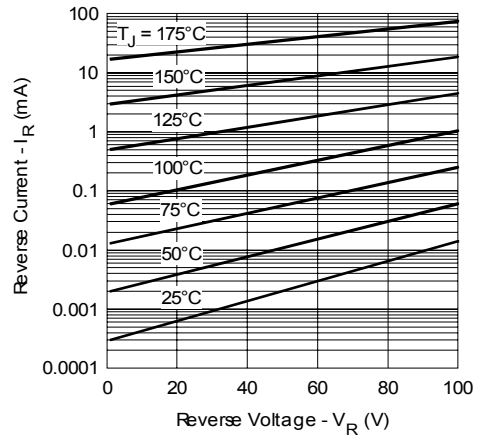


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

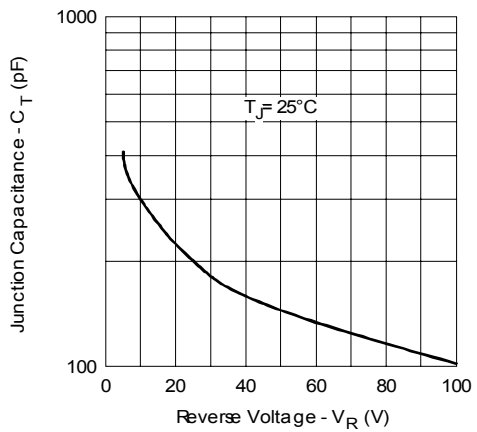


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

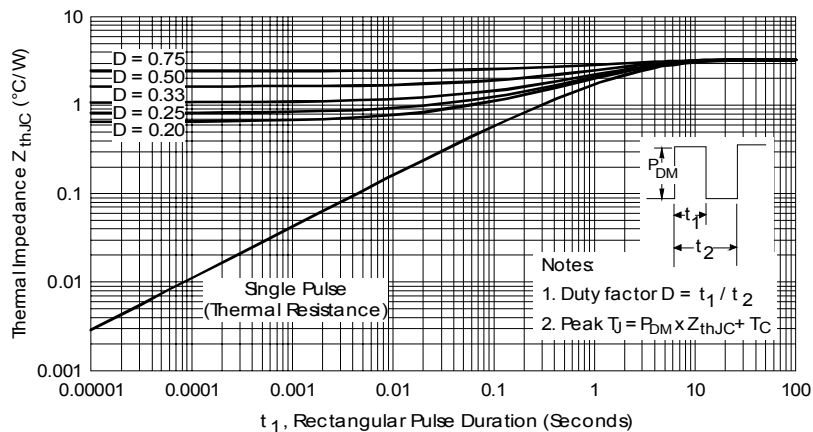


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

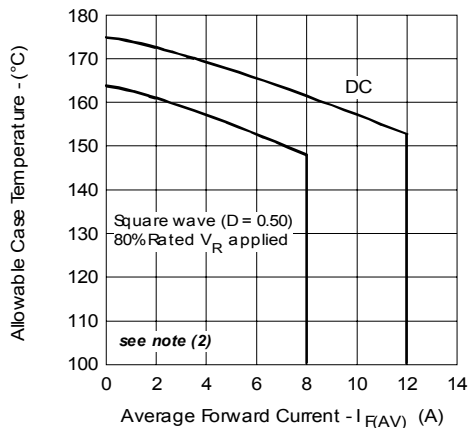


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

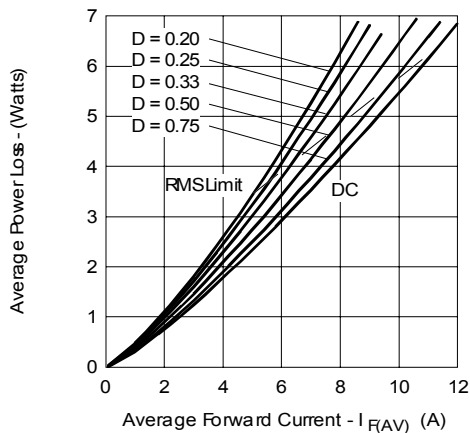


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

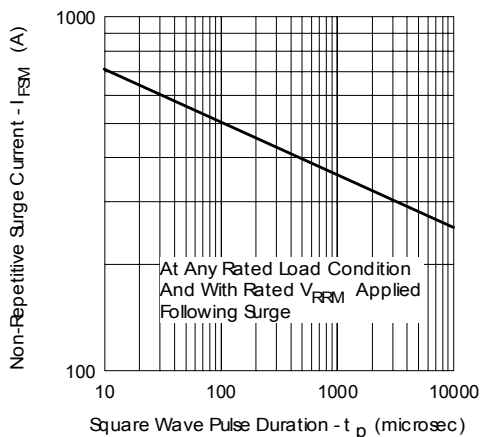


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

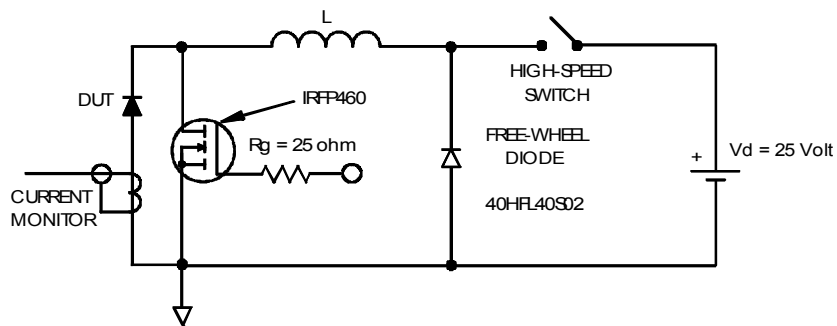
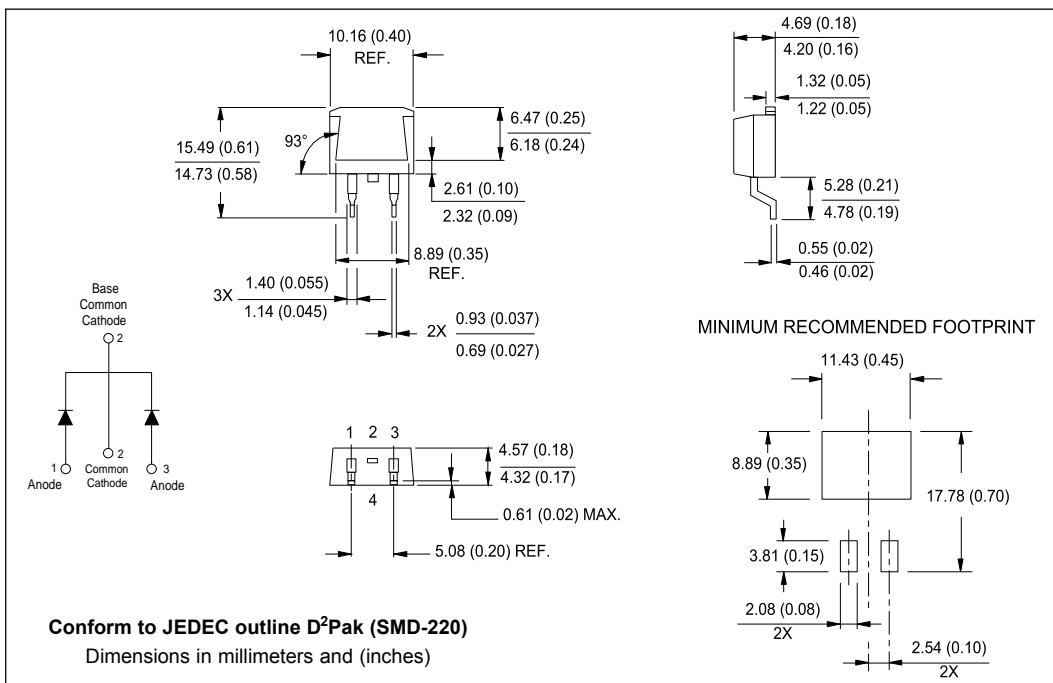
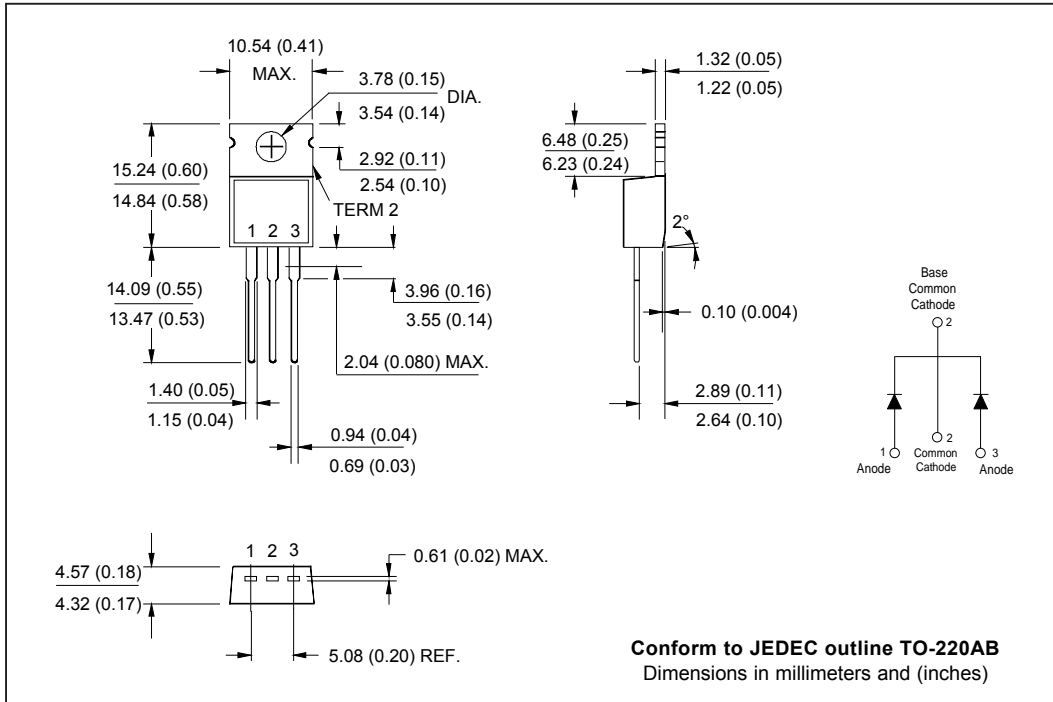


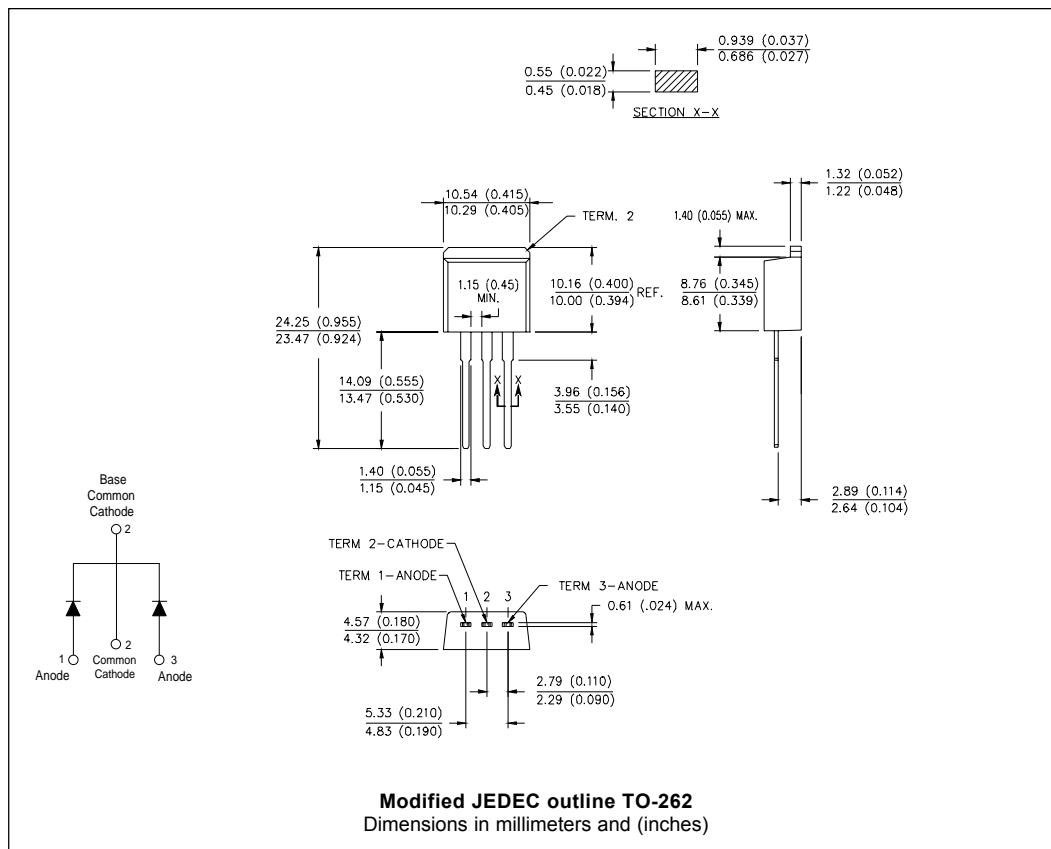
Fig. 8 - Unclamped Inductive Test Circuit

- (2) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);  
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 10 \text{ V}$

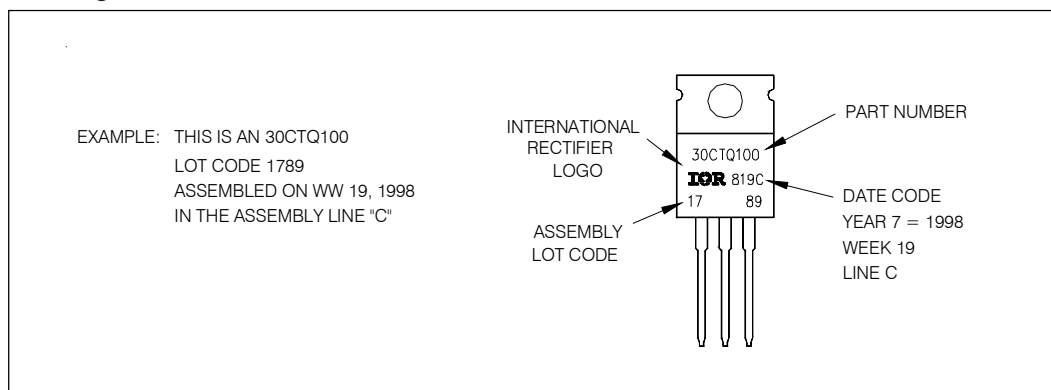
Outline Table



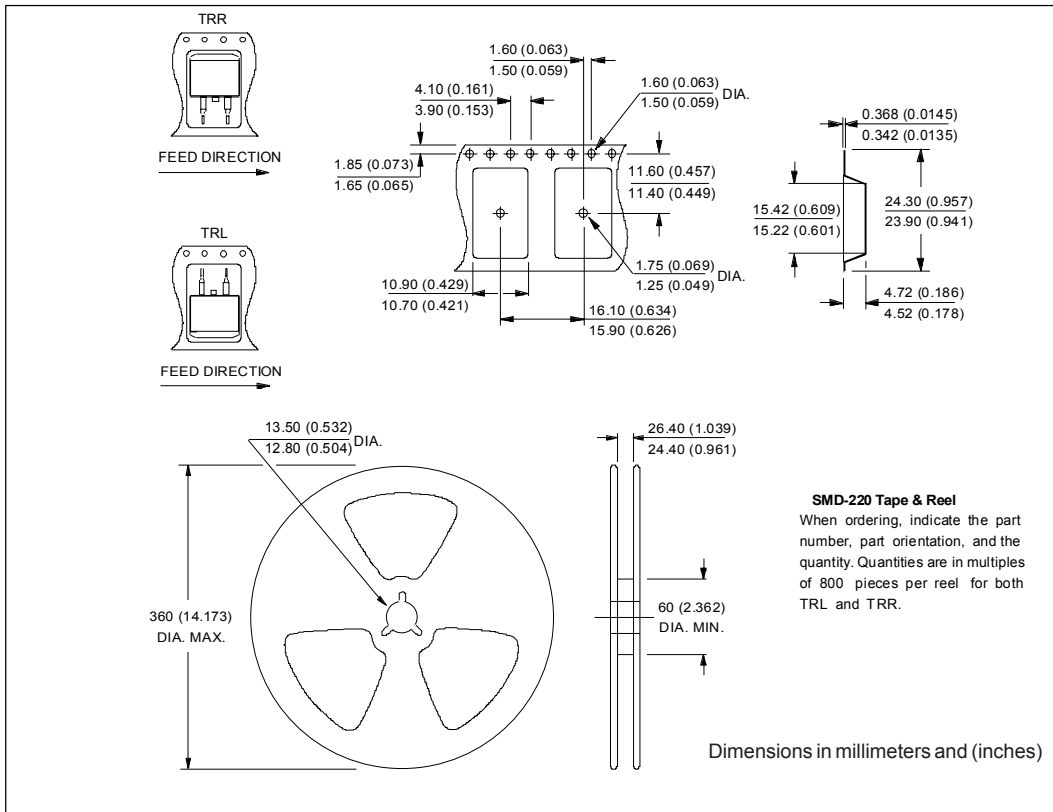
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

| Device Code | 30 | C                      | T | Q | 100 | -1 |
|-------------|----|------------------------|---|---|-----|----|
|             | 1  | 2                      | 3 | 4 | 5   | 6  |
| <b>1</b>    | -  | Essential Part Number  |   |   |     |    |
| <b>2</b>    | -  | C = Common Cathode     |   |   |     |    |
| <b>3</b>    | -  | T = TO-220             |   |   |     |    |
| <b>4</b>    | -  | Q = Schottky Q Series  |   |   |     |    |
| <b>5</b>    | -  | Voltage Rating         |   |   |     |    |
| <b>6</b>    | -  | 1 = TO-262             |   |   |     |    |
|             |    | S = D <sup>2</sup> Pak |   |   |     |    |

080 = 80V  
 100 = 100V

30CTQ..., 30CTQ...S, 30CTQ...-1

Bulletin PD-20606 rev. B 01/04

International  
**IOR** Rectifier

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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  
**IOR** Rectifier

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