



30CTQ...G

SCHOTTKY RECTIFIER

30 Amp

$I_{F(AV)} = 30 \text{ Amp}$   
 $V_R = 80 - 100V$

Major Ratings and Characteristics

| Characteristics                               | Values     | Units      |
|-----------------------------------------------|------------|------------|
| $I_{F(AV)}$ Rectangular waveform              | 30         | A          |
| $V_{RRM}$                                     | 80 - 100   | V          |
| $I_{FSM}$ @ $t_p = 5 \mu s$ sine              | 650        | A          |
| $V_F$ @ 15 Apk, $T_J = 125^\circ C$ (per leg) | 0.69       | V          |
| $T_J$ range                                   | -55 to 175 | $^\circ C$ |

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.

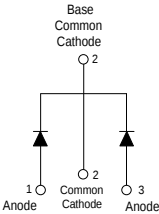
- 175° C  $T_J$  operation
- Center tap configuration
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

30CTQ...G



TO-220



## Voltage Ratings

| Parameters                                      | 30CTQ80G | 30CTQ100G |
|-------------------------------------------------|----------|-----------|
| $V_R$ 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 | 650<br>210 | 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   | V                | @ 15A<br>$T_J = 25^\circ\text{C}$                                     |
|                                                                  | 1.05   | V                | @ 30A<br>$T_J = 25^\circ\text{C}$                                     |
|                                                                  | 0.69   | V                | @ 15A<br>$T_J = 125^\circ\text{C}$                                    |
|                                                                  | 0.82   | V                | @ 30A<br>$T_J = 125^\circ\text{C}$                                    |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 0.28   | mA               | $T_J = 25^\circ\text{C}$<br>$V_R = \text{rated } V_R$                 |
|                                                                  | 7.0    | mA               | $T_J = 125^\circ\text{C}$                                             |
| $C_T$ 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 <sub>J</sub>    | Max. Junction Temperature Range                        | -55 to 175 | °C      |                                                        |
| T <sub>stg</sub>  | Max. Storage Temperature Range                         | -55 to 175 | °C      |                                                        |
| R <sub>thJC</sub> | Max. Thermal Resistance Junction to Case (Per Leg)     | 3.25       | °C/W    | DC operation                                           |
| R <sub>thJC</sub> | Max. Thermal Resistance Junction to Case (Per Package) | 1.63       | °C/W    | DC operation                                           |
| R <sub>thCS</sub> | Typical Thermal Resistance, Case to Heatsink           | 0.50       | °C/W    | Mounting surface ,smooth and greased (only for TO-220) |
| wt                | Approximate Weight                                     | 2 (0.07)   | g (oz.) |                                                        |
| T                 | Mounting Torque                                        | Min.       | 6 (5)   | Kg-cm (lbf-in)                                         |
|                   |                                                        | Max.       | 12 (10) |                                                        |
| Device Marking    |                                                        | 30CTQ...G  |         |                                                        |

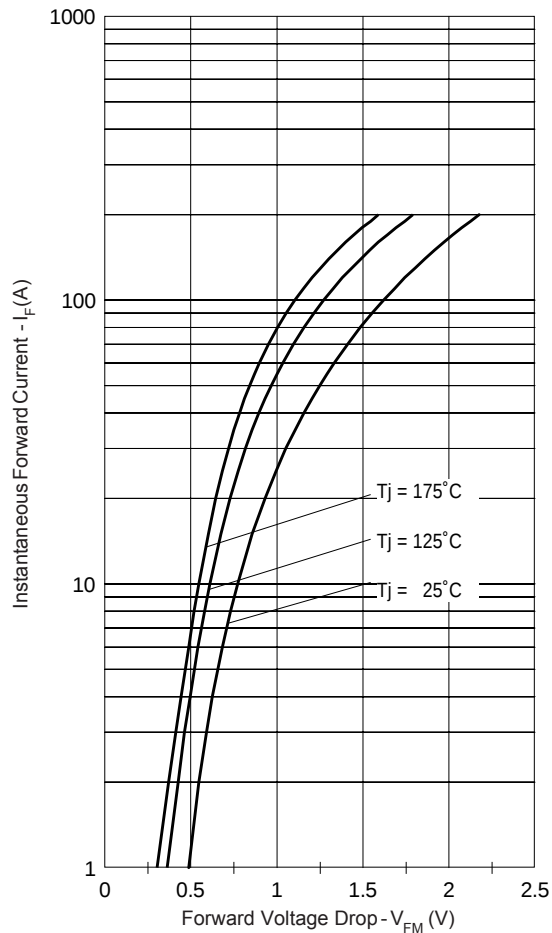


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

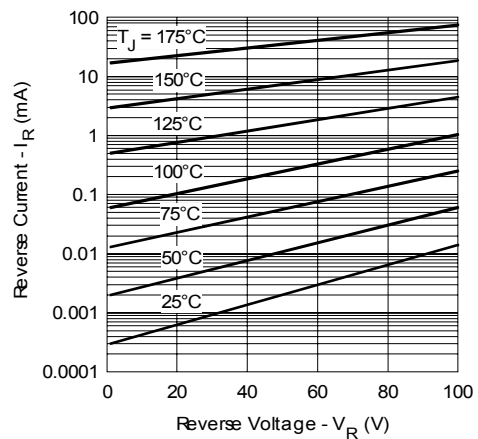


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

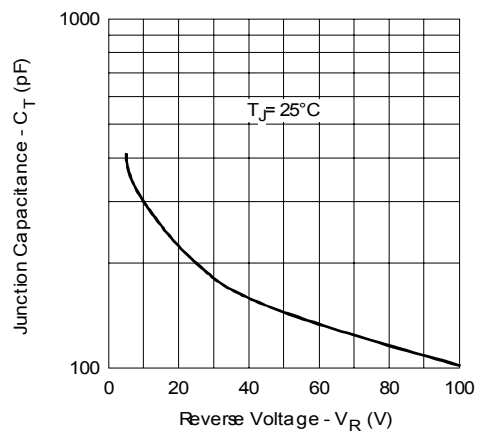


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

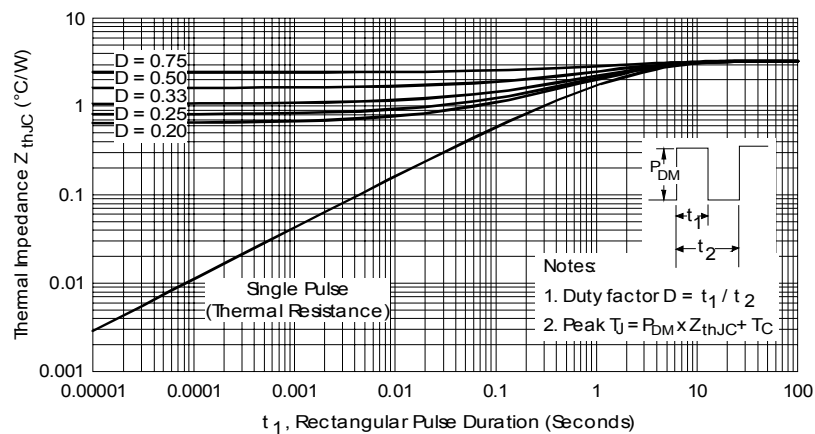


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

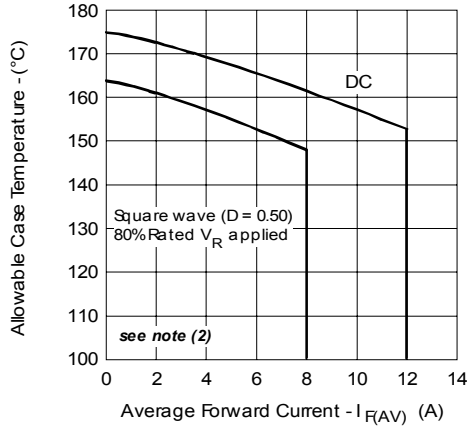


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

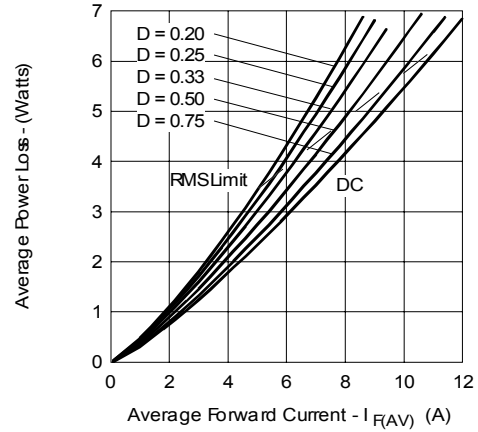


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

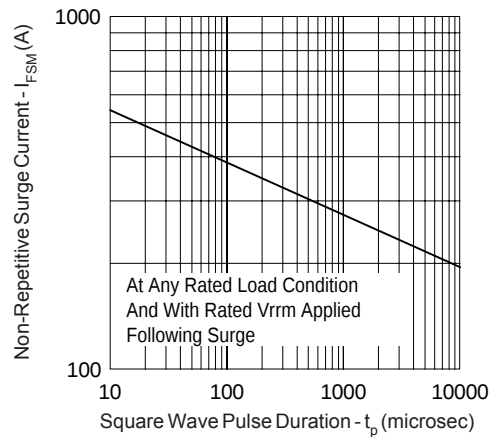


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

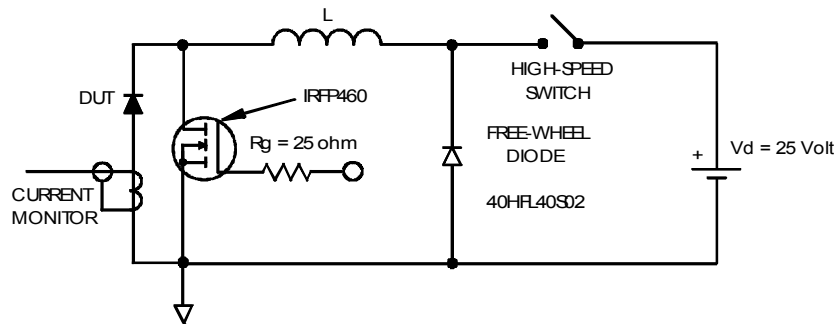


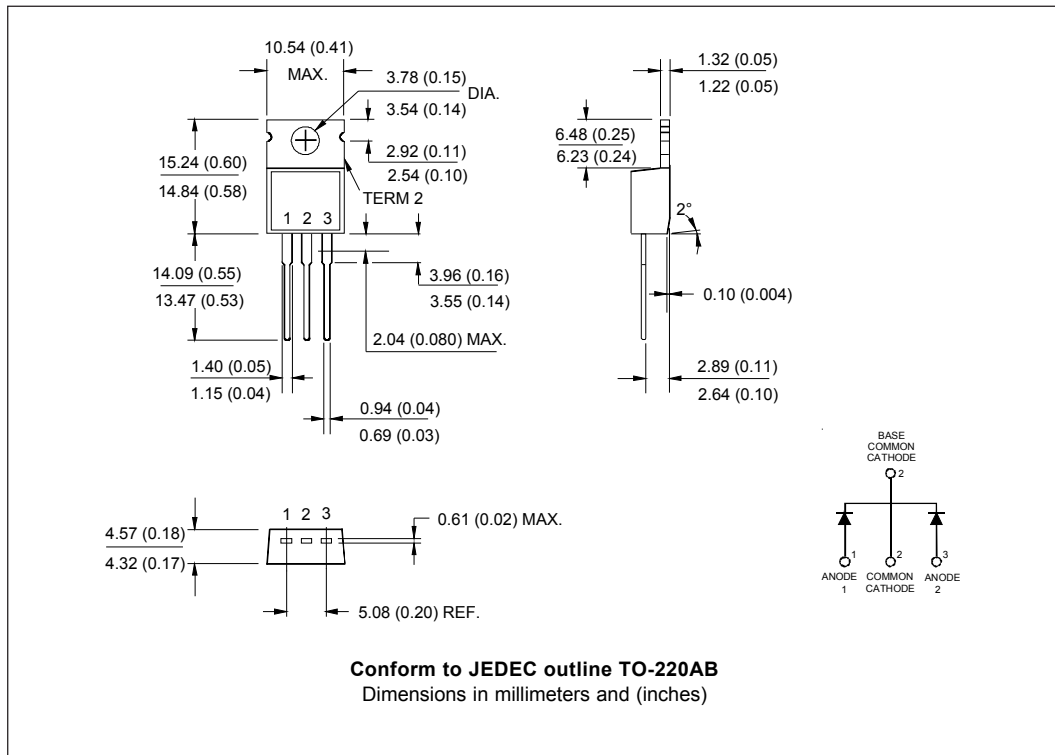
Fig. 8 - Unclamped Inductive Test Circuit

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

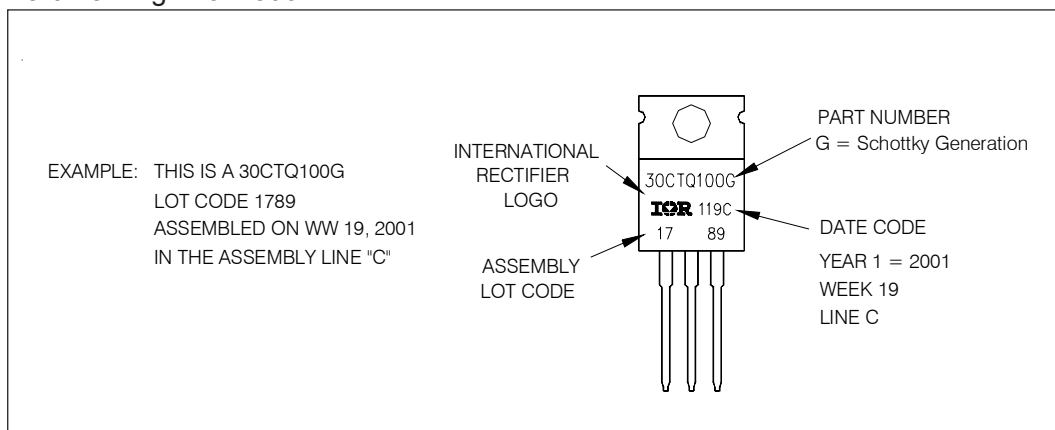
$P_d$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

$P_{d_{REV}}$  = Inverse Power Loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 10$  V

## Outline Table



## Part Marking Information



## Ordering Information Table

| Device Code |    |                                                                                                        |   |   |     |     |
|-------------|----|--------------------------------------------------------------------------------------------------------|---|---|-----|-----|
|             | 30 | C                                                                                                      | T | Q | 100 | G - |
|             | 1  | 2                                                                                                      | 3 | 4 | 5   | 6 7 |
| 1           | -  | Current Rating (30 = 30A)                                                                              |   |   |     |     |
| 2           | -  | C = Common Cathode                                                                                     |   |   |     |     |
| 3           | -  | T = TO-220                                                                                             |   |   |     |     |
| 4           | -  | Q = Schottky Q Series                                                                                  |   |   |     |     |
| 5           | -  | Voltage Ratings                                                                                        |   |   |     |     |
| 6           | -  | G = Schottky Generation                                                                                |   |   |     |     |
| 7           | -  | <ul style="list-style-type: none"><li>• none = Standard Production</li><li>• PbF = Lead-Free</li></ul> |   |   |     |     |

080 = 80V  
100 = 100V

Tube Standard Pack Quantity : 50 pieces

Data and specifications subject to change without notice.  
 This product has been designed for Industrial Level.  
 Qualification Standards can be found on IR's Web site.

International  
**IOR** Rectifier

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