

Major Ratings and Characteristics

| Characteristics | 80CPQ150 | Units |
|--|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform | 80 | A |
| V_{RRM} | 150 | V |
| I_{FSM} @tp = 5 μ s sine | 1930 | A |
| V_F @40 Apk, $T_J=125^\circ\text{C}$ (per leg) | 0.71 | V |
| T_J | -55 to 175 | $^\circ\text{C}$ |

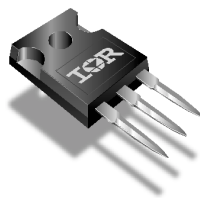
Description/ Features

The 80CPQ150 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.

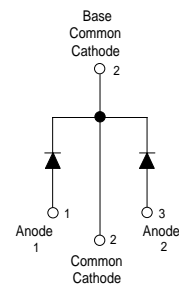
- 175° C T_J operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

Case Styles

80CPQ150



TO-247AC



Voltage Ratings

| | |
|---|----------|
| Part number | 80CPQ150 |
| V_R Max. DC Reverse Voltage (V) | 150 |
| V_{RWM} Max. Working Peak Reverse Voltage (V) | |

Absolute Maximum Ratings

| Parameters | 80CPQ | Units | Conditions |
|---|------------------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current * See Fig. 5 | Per Device 80 | A | 50% duty cycle @ $T_C = 150^\circ\text{C}$, rectangular wave form |
| | Per Leg 40 | | |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 1930 | A | 5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied |
| | 500 | | |
| E_{AS} Non-Repetitive Avalanche Energy (Per Leg) | 0.5 | mJ | $T_J = 25^\circ\text{C}$, $I_{AS} = 1.0$ Amps, $L = 1$ mH |
| I_{AR} Repetitive Avalanche Current (Per Leg) | 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 | Typ. | Max. | Units | Conditions |
|--|------|-------|------------------|--|
| V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 | 0.82 | 0.86 | V | @ 40A |
| | 0.97 | 1.09 | V | @ 80A |
| | 0.67 | 0.71 | V | @ 40A |
| | 0.80 | 0.85 | V | @ 80A |
| I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 | 10 | 200 | μA | $T_J = 25^\circ\text{C}$ |
| | 12 | 26 | mA | $T_J = 125^\circ\text{C}$ |
| C_T Typical Junction Capacitance (Per Leg) | - | 1100 | pF | $V_R = 5V_{DC}$ (test signal range 100kHz to 1Mhz) @ 25°C |
| L_S Typical Series Inductance (Per Leg) | - | 7.5 | 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 | 80CPQ | 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) | 0.6 | $^\circ\text{C}/\text{W}$ | DC operation * See Fig. 4 |
| R_{thJC} Max. Thermal Resistance Junction to Case (Per Package) | 0.3 | $^\circ\text{C}/\text{W}$ | DC operation |
| R_{thCS} Typical Thermal Resistance, Case to Heatsink | 0.24 | $^\circ\text{C}/\text{W}$ | Mounting surface, smooth and greased |
| wt Approximate Weight | 6 (0.21) | g (oz.) | |
| T Mounting Torque | Min. 6 (5) | Kg-cm (lbf-in) | |
| | Max. 12 (10) | | |
| Case Style | TO-247AC(TO-3P) | JEDEC | |

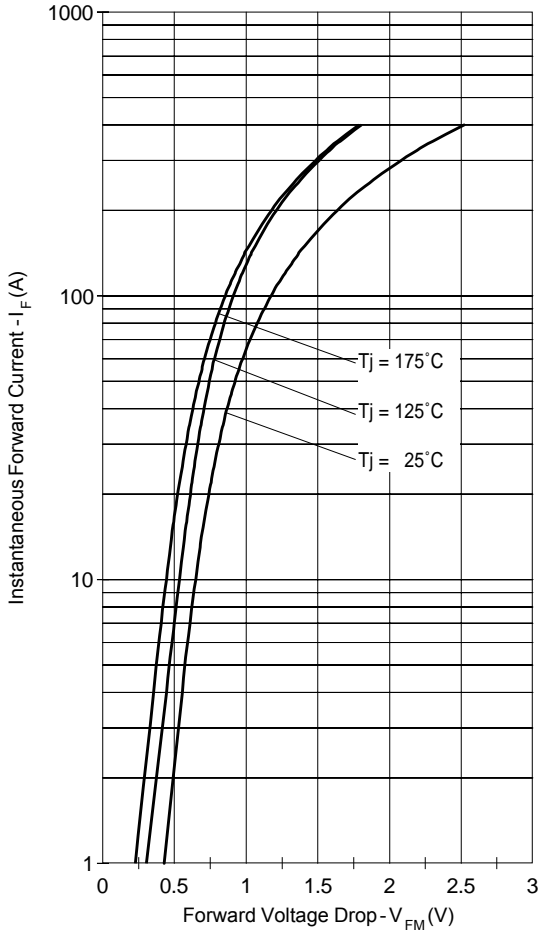


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

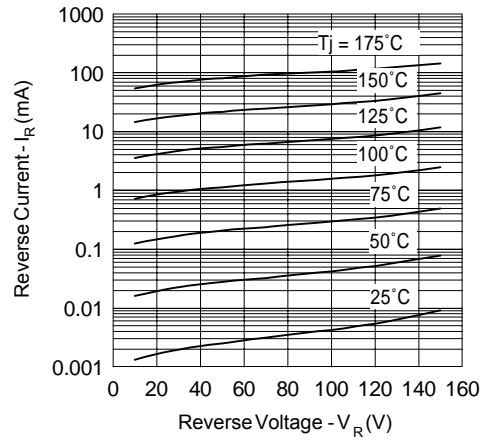


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

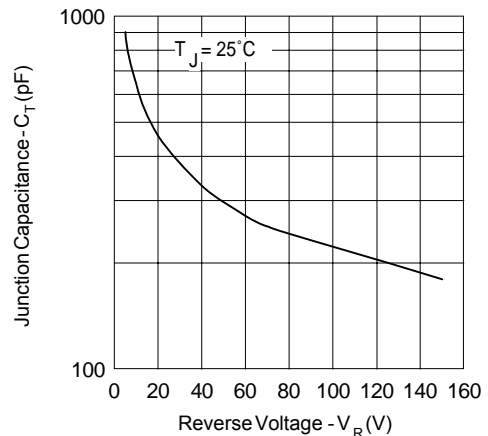


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

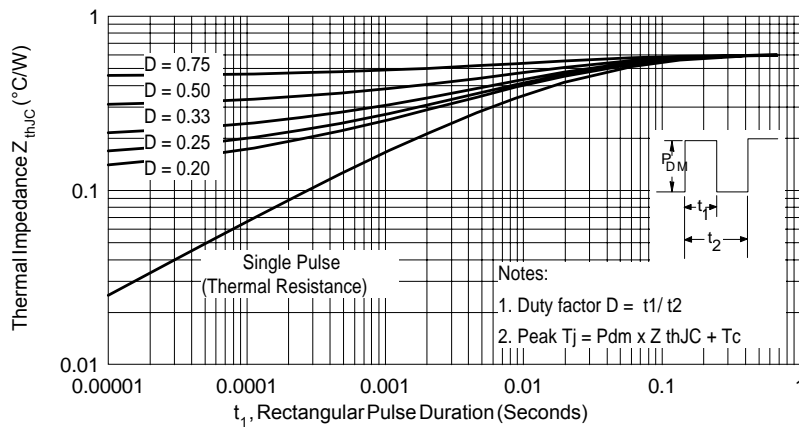


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

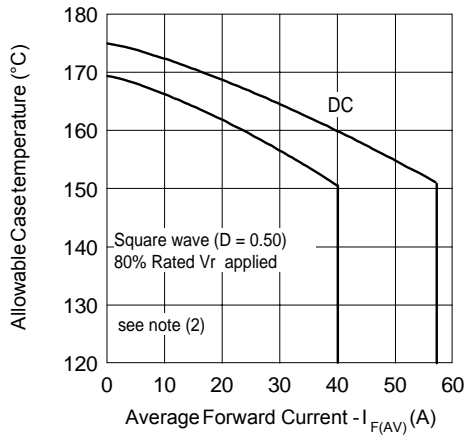


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

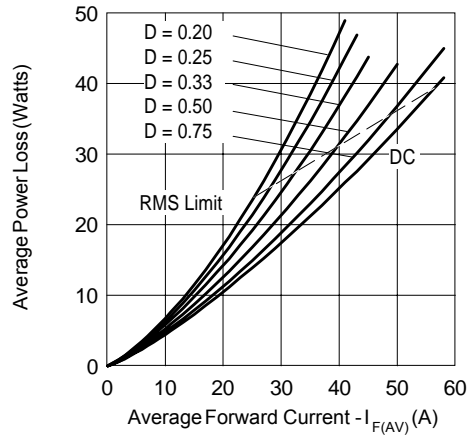


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

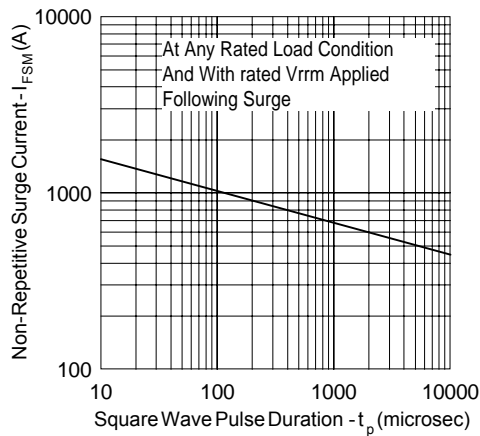


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

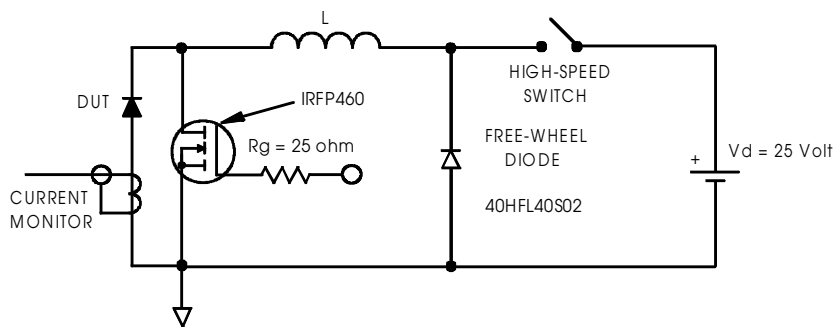


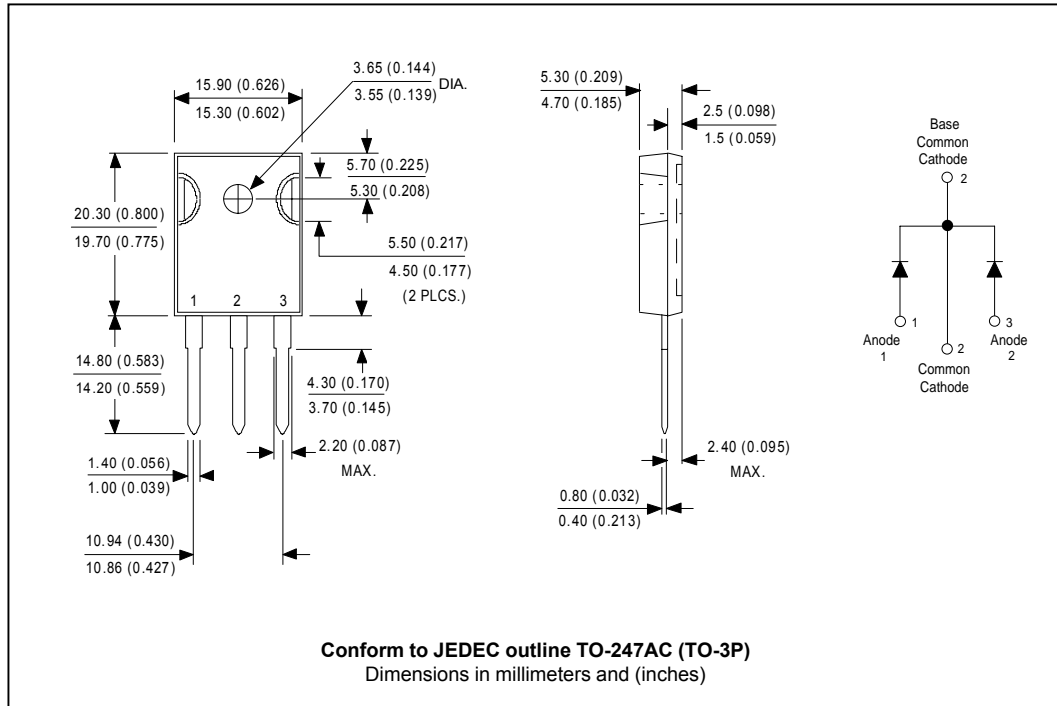
Fig. 8 - Unclamped Inductive Test Circuit

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

Outline Table



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.