

**SCHOTTKY RECTIFIER**

**40 Amp**

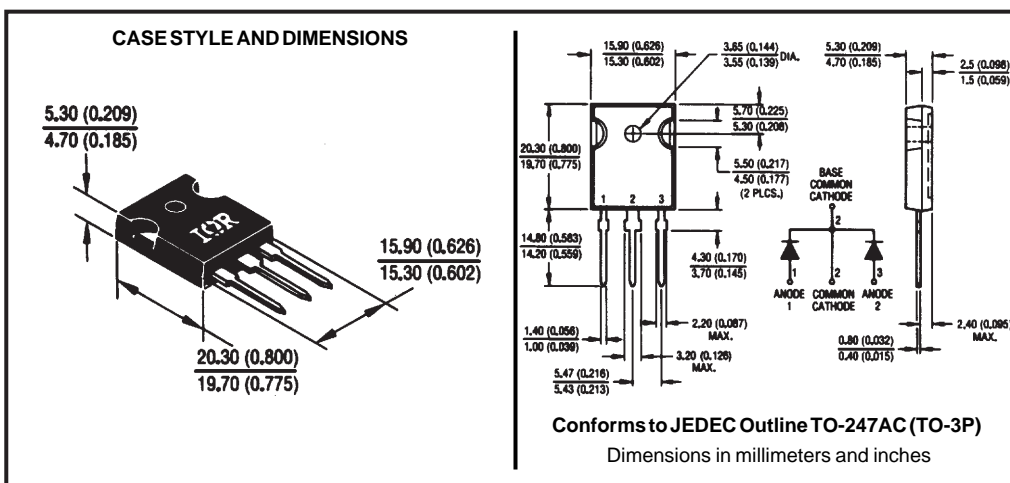
**Major Ratings and Characteristics**

| Characteristics                            | 40CPQ...   | Units      |
|--|------------|------------|
| $I_{F(AV)}$ Rectangular waveform           | 40         | A          |
| $V_{RRM}$                                  | 80/100     | V          |
| $I_{FSM}$ @ $t_p=5\mu s$ sine              | 2950       | A          |
| $V_F$ @ 20Apk, $T_J=125^\circ C$ (per leg) | 0.61       | V          |
| $T_J$                                      | -55 to 175 | $^\circ C$ |

**Description/Features**

The 40CPQ... center tap Schottky rectifier 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



## Voltage Ratings

| Part number                                     | 40CPQ080 | 40CPQ100 |
|---|----------|----------|
| $V_R$ Max. DC Reverse Voltage (V)               | 80       | 100      |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |          |          |

## Absolute Maximum Ratings

| Parameters  | 40CPQ... | Units | Conditions   |
|---|----------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current<br>* See Fig. 5                          | 40       | A     | 50% duty cycle @ $T_C = 145^\circ\text{C}$ , rectangular wave form   |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 2950     | A     | Following any rated load condition and with rated $V_{RWM}$ applied  |
|   | 300      |       |  |
| $E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)                                | 11.25    | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 0.75$ Amps, $L = 40$ mH   |
| $I_{AR}$ Repetitive Avalanche Current (Per Leg)                                   | 0.75     | 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   | 40CPQ... | Units            | Conditions  |
|--|----------|------------------|---|
| $V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)    | 0.77     | V                | @ 20A   |
|  | 0.91     | V                | @ 40A   |
|  | 0.61     | V                | @ 20A   |
|  | 0.75     | V                | @ 40A   |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 1.25     | mA               | $T_J = 25^\circ\text{C}$  |
|  | 15       | mA               | $T_J = 125^\circ\text{C}$   |
| $C_T$ Max. Junction Capacitance (Per Leg)                        | 600      | pF               | $V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance (Per Leg)                        | 7.5      | nH               | Measured lead to lead 5mm from package body                             |
| dv/dt Max. Voltage Rate of Change (Rated $V_R$ )                 | 10,000   | V/ $\mu\text{s}$ |   |

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

## Thermal-Mechanical Specifications

| Parameters  | 40CPQ...        | 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)     | 1.25            | $^\circ\text{C}/\text{W}$ | DC operation * See Fig. 4            |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package) | 0.63            | $^\circ\text{C}/\text{W}$ | 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<br>(lbf-in)         | Non-lubricated threads               |
|   | Max. 12(10)     |                           |                                      |
| Case Style  | TO-247AC(TO-3P) |                           | JEDEC                                |

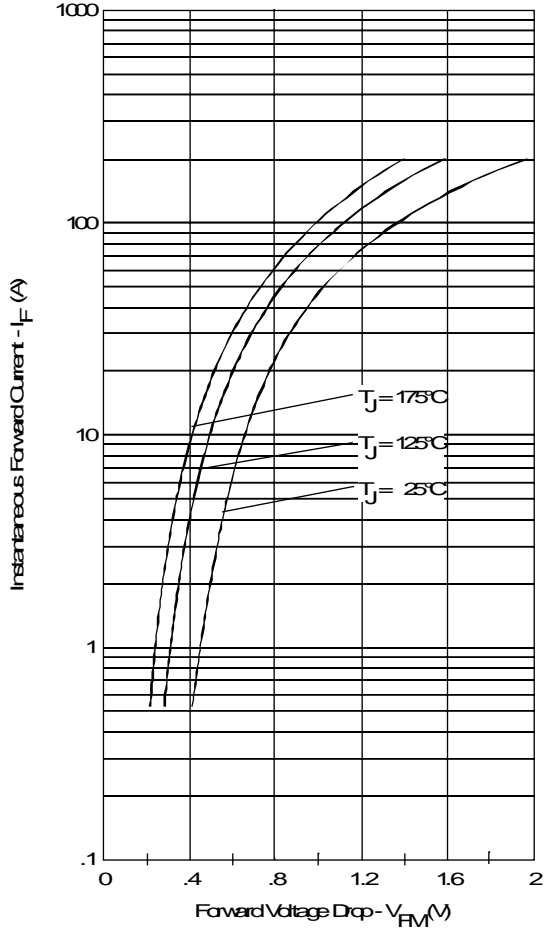


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

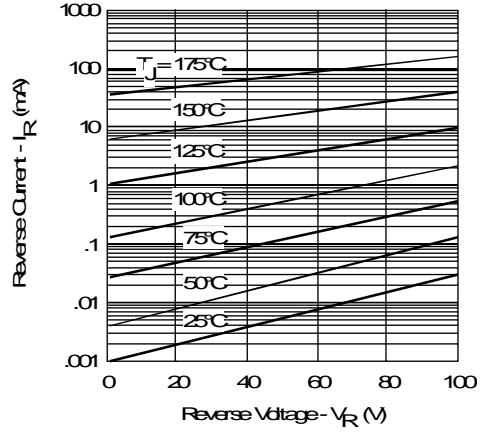


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

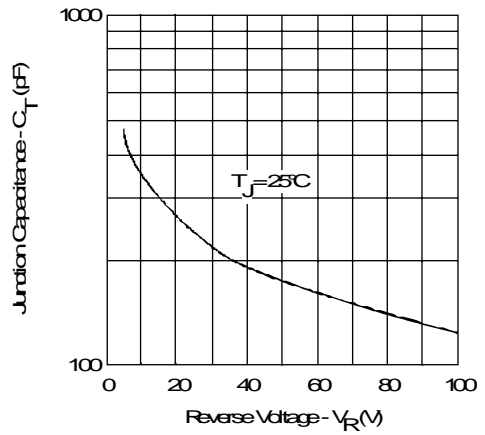


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

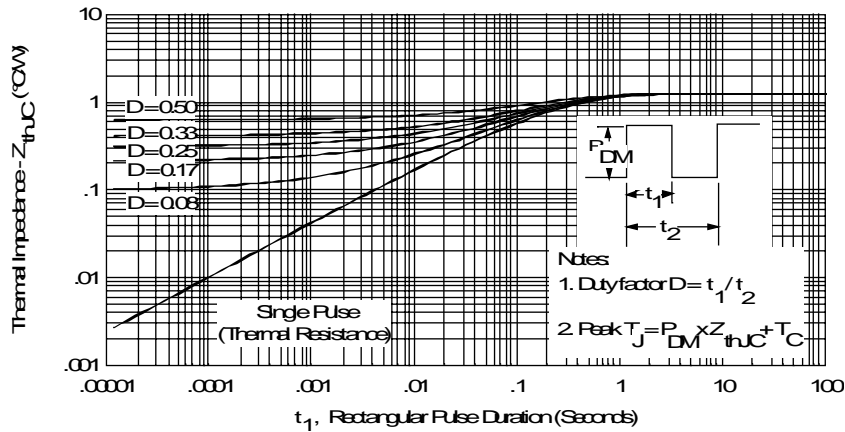


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

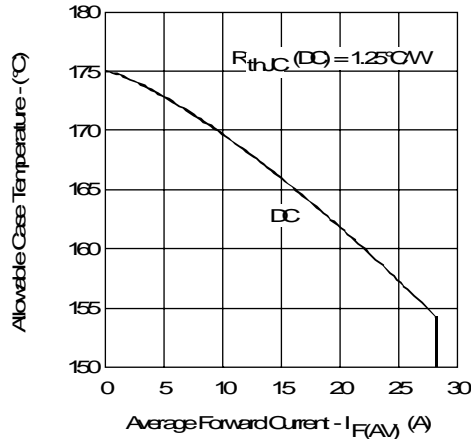


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

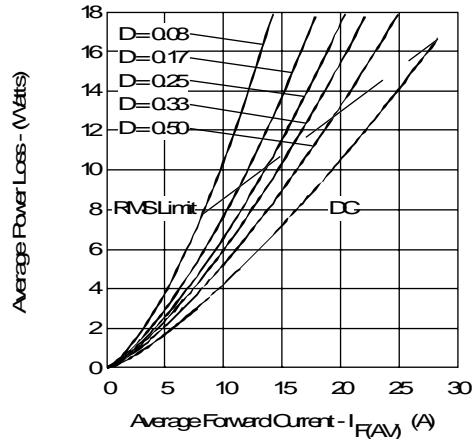


Fig. 6- Forward Power Loss Characteristics (Per Leg)

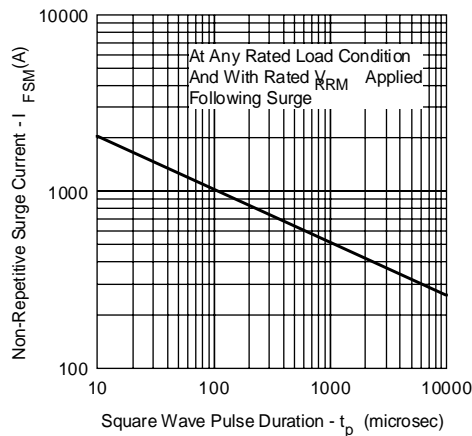


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

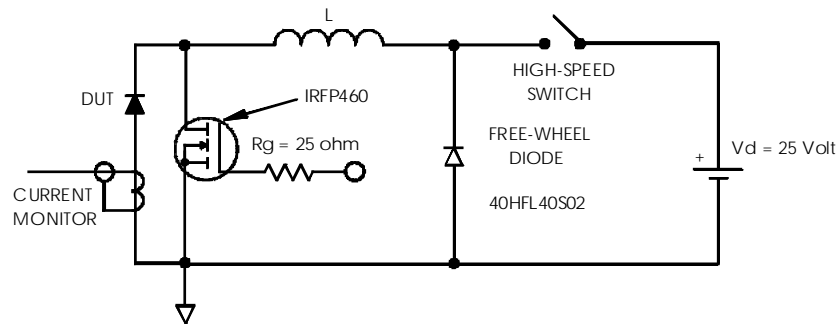


Fig. 8- Unclamped Inductive Test Circuit