

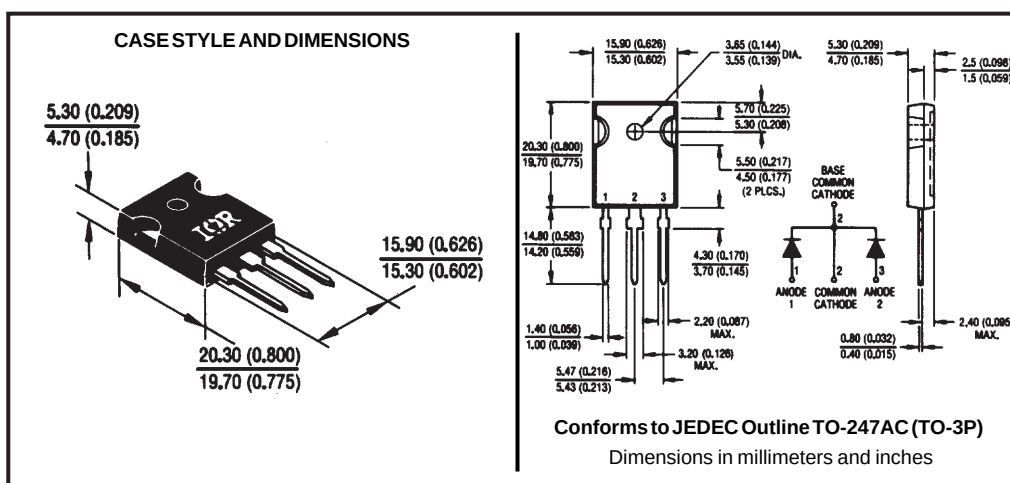
#### Major Ratings and Characteristics

| Characteristics                                   | 40CPQ...   | Units            |
|---------------------------------------------------|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform                  | 40         | A                |
| $V_{RRM}$                                         | 50/60      | V                |
| $I_{FSM}$ @ tp = 5 $\mu$ s sine                   | 3200       | A                |
| $V_F$ @ 20 Apk, $T_J=125^\circ\text{C}$ (per leg) | 0.49       | V                |
| $T_J$                                             | -55 to 150 | $^\circ\text{C}$ |

#### Description/Features

The 40CPQ... center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to  $150^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $150^\circ\text{C}$   $T_J$  operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



## Voltage Ratings

| Part number                                     | 40CPQ050 | 40CPQ060 |
|-------------------------------------------------|----------|----------|
| $V_R$ Max. DC Reverse Voltage (V)               | 50       | 60       |
| $V_{RWM}$ 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 @ $T_C = 120^{\circ}\text{C}$ , rectangular wave form                                                     |                                                                     |  |
| $I_{FSM}$   | Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 3200     | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse                                                                      | Following any rated load condition and with rated $V_{RRM}$ applied |  |
|             |                                                                         | 320      |       | 10ms Sine or 6ms Rect. pulse                                                                                             |                                                                     |  |
| $E_{AS}$    | Non-Repetitive Avalanche Energy (Per Leg)                               | 18       | mJ    | $T_J = 25^{\circ}\text{C}$ , $I_{AS} = 2$ Amps, $L = 9.0$ mH                                                             |                                                                     |  |
| $I_{AR}$    | Repetitive Avalanche Current (Per Leg)                                  | 2        | 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 <sub>FM</sub> | Max. Forward Voltage Drop<br>(Per Leg) * See Fig. 1 (1)    | 0.53     | V     | @ 20A                                                                       | T <sub>J</sub> = 25 °C                |
|                 |                                                            | 0.68     | V     | @ 40A                                                                       |                                       |
|                 |                                                            | 0.49     | V     | @ 20A                                                                       | T <sub>J</sub> = 125 °C               |
|                 |                                                            | 0.64     | V     | @ 40A                                                                       |                                       |
| I <sub>RM</sub> | Max. Reverse Leakage Current<br>(Per Leg) * See Fig. 2 (1) | 1.7      | mA    | T <sub>J</sub> = 25 °C                                                      | V <sub>R</sub> = rated V <sub>R</sub> |
|                 |                                                            | 96       | mA    | T <sub>J</sub> = 125 °C                                                     |                                       |
| C <sub>T</sub>  | Max. Junction Capacitance (Per Leg)                        | 1600     | pF    | V <sub>R</sub> = 5V <sub>DC</sub> , (test signal range 100Khz to 1Mhz) 25°C |                                       |
| L <sub>S</sub>  | Typical Series Inductance (Per Leg)                        | 7.5      | nH    | Measured lead to lead 5mm from package body                                 |                                       |
| dv/dt           | Max. Voltage Rate of Change<br>(Rated V <sub>R</sub> )     | 10,000   | V/ μs |                                                                             |                                       |

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

## Thermal-Mechanical Specifications

| Parameters        |                                                        |      | 40CPQ...        | Units          | Conditions                            |
|-------------------|--------------------------------------------------------|------|-----------------|----------------|---------------------------------------|
| T <sub>J</sub>    | Max. Junction Temperature Range                        |      | -55to150        | °C             |                                       |
| T <sub>stg</sub>  | Max. Storage Temperature Range                         |      | -55to150        | °C             |                                       |
| R <sub>thJC</sub> | Max. Thermal Resistance Junction to Case (Per Leg)     |      | 1.25            | °C/W           | DCoperation      * See Fig. 4         |
| R <sub>thJC</sub> | Max. Thermal Resistance Junction to Case (Per Package) |      | 0.63            | °C/W           | DCoperation                           |
| R <sub>thCS</sub> | Typical Thermal Resistance, Case to Heatsink           |      | 0.24            | °C/W           | Mounting surface , smooth and greased |
| wt                | Approximate Weight                                     |      | 6(0.21)         | g(oz.)         |                                       |
| T                 | Mounting Torque                                        | Min. | 6(5)            | Kg-cm (lbf-in) | Non-lubricated threads                |
|                   |                                                        | Max. | 12(10)          |                |                                       |
| Case Style        |                                                        |      | TO-247AC(TO-3P) | JEDEC          |                                       |

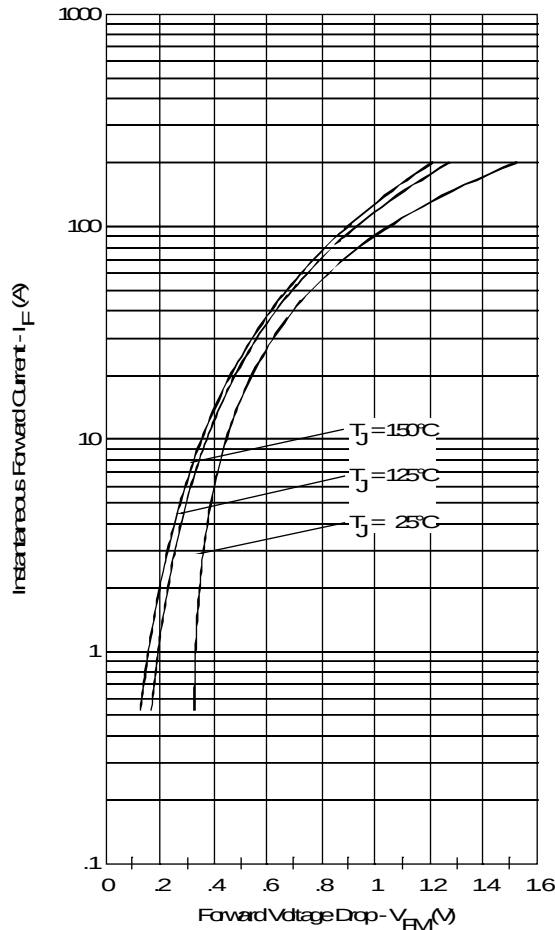


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

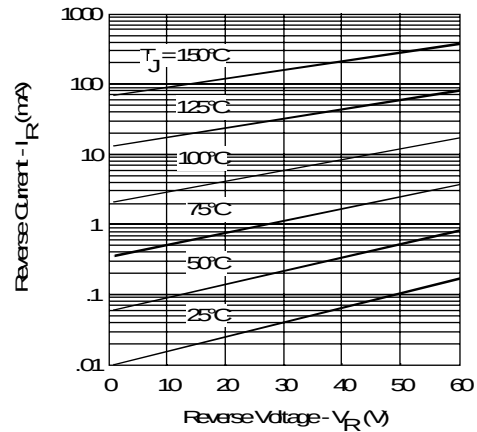


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

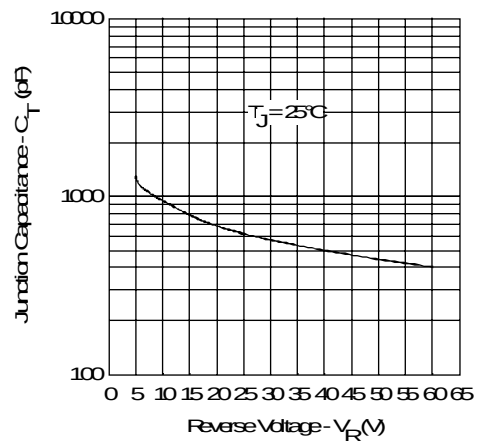


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

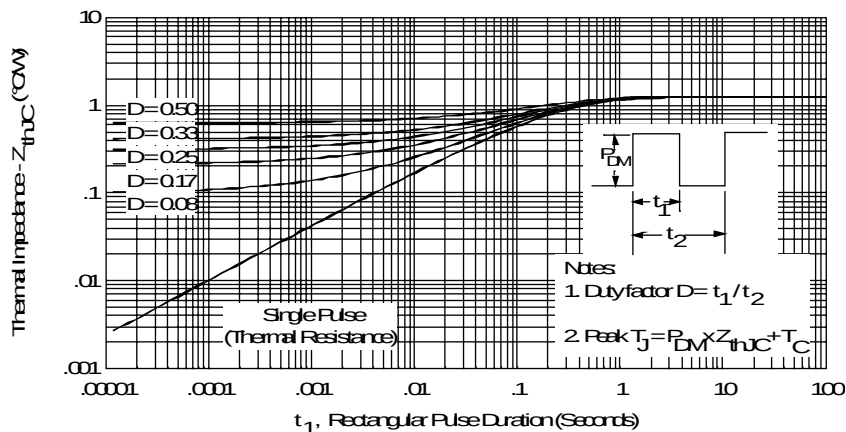


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

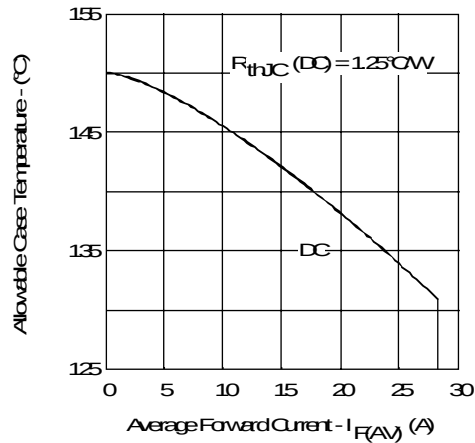


Fig. 5- Max. Allowable Case Temperature  
Vs. Average Forward Current (Per Leg)

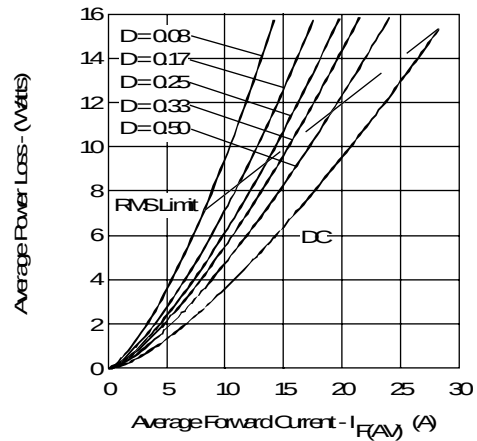


Fig. 6- Forward Power Loss Characteristics  
(Per Leg)

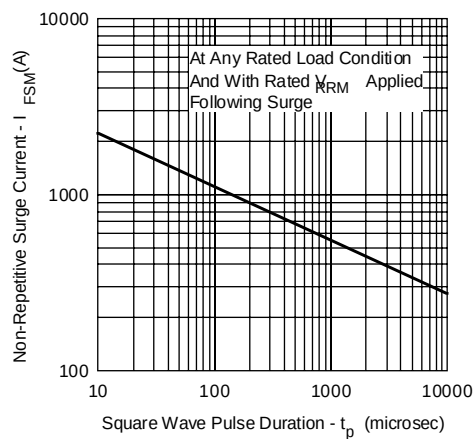


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

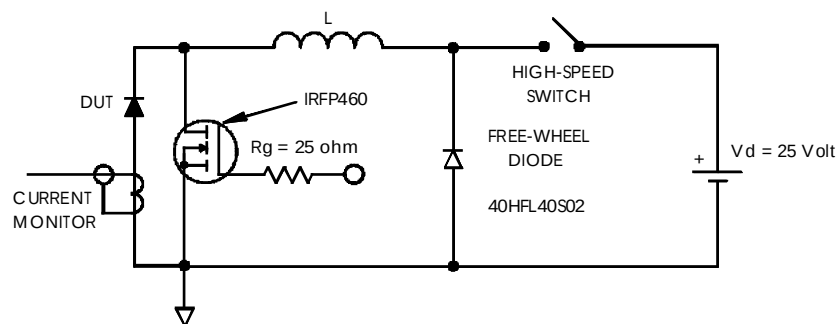


Fig. 8- Unclamped Inductive Test Circuit