

International IOR Rectifier

40CPQ050PbF 40CPQ060PbF

SCHOTTKY RECTIFIER

40 Amp

$$I_{F(AV)} = 40\text{Amp}$$

$$V_R = 50 - 60\text{V}$$

Major Ratings and Characteristics

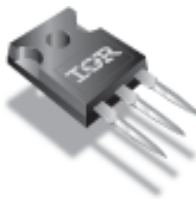
| Characteristics | Values | Units |
|--|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform | 40 | A |
| V_{RRM} | 50/60 | V |
| I_{FSM} @tp = 5 μ s sine | 3200 | A |
| V_F @20 Apk, $T_J = 125^\circ\text{C}$ (per leg) | 0.49 | V |
| T_J | -55 to 150 | $^\circ\text{C}$ |

Description/ Features

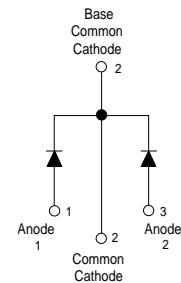
The 40CPQ...PbF center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 $^\circ\text{C}$ junction temperature. Typical applications are in switching power supplies, converters, 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
- Lead-Free ("PbF" suffix)

Case Styles



TO-247AC



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 * 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 μs Sine or 3 μs Rect. pulse |
| | 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 μsec 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) | 0.53 | V | @ 20A |
| | 0.68 | V | @ 40A |
| | 0.49 | V | @ 20A |
| | 0.64 | V | @ 40A |
| I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 1.7 | mA | $T_J = 25^\circ\text{C}$ |
| | 96 | mA | $T_J = 125^\circ\text{C}$ |
| C_T Max. Junction Capacitance (Per Leg) | 1600 | 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 | 40CPQ... | Units | Conditions |
|---|-----------------|--------------------|--------------------------------------|
| T_J Max. Junction Temperature Range | -55 to 150 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ | |
| R_{thJC} Max. Thermal Resistance Junction to Case (Per Leg) | 1.25 | $^\circ\text{C/W}$ | DC operation * See Fig. 4 |
| R_{thJC} Max. Thermal Resistance Junction to Case (Per Package) | 0.63 | $^\circ\text{C/W}$ | DC operation |
| R_{thCS} Typical Thermal Resistance, Case to Heatsink | 0.24 | $^\circ\text{C/W}$ | Mounting surface, smooth and greased |
| wt Approximate Weight | 6 (0.21) | g (oz.) | |
| T Mounting Torque | Min. | 6 (5) | Non-lubricated threads |
| | Max. | 12 (10) | |
| Case Style | TO-247AC(TO-3P) | JEDEC | |
| Marking Device | 40CPQ050 | | |
| | 40CPQ060 | | |

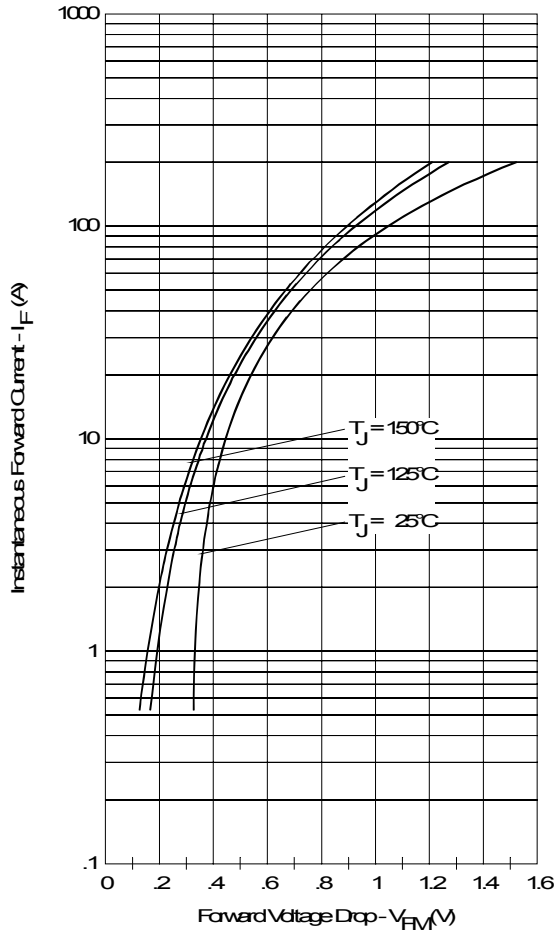


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

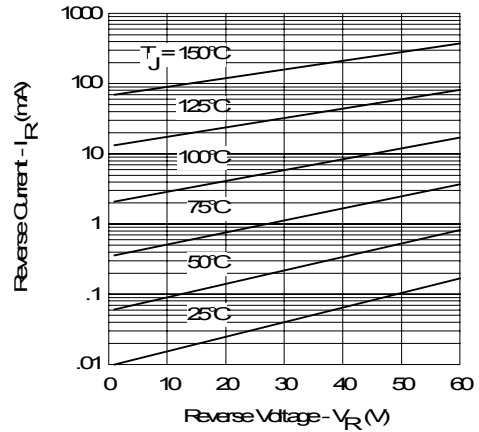


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

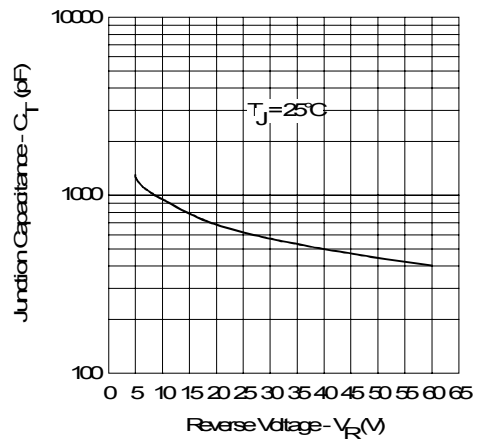


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

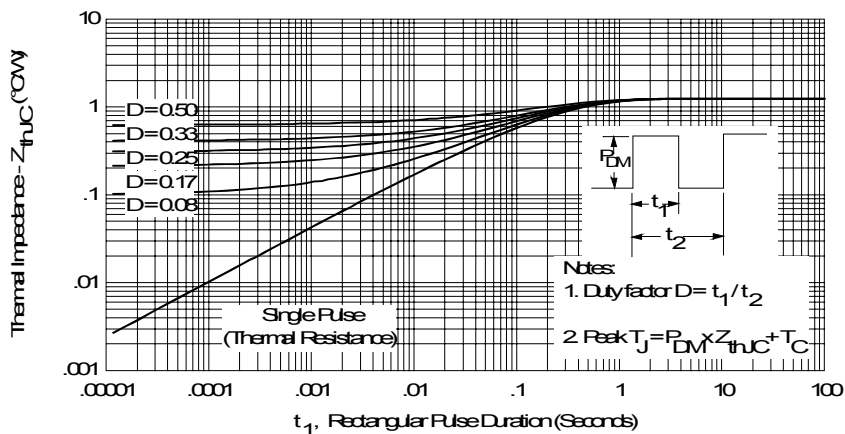


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

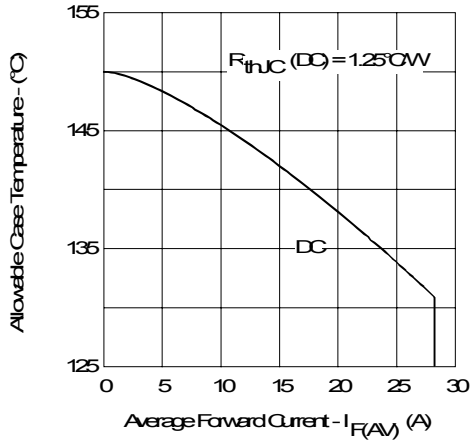


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

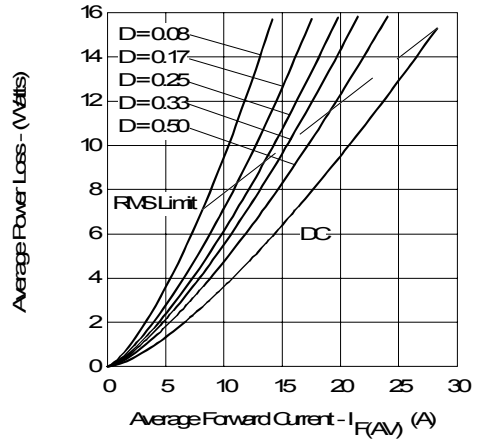


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

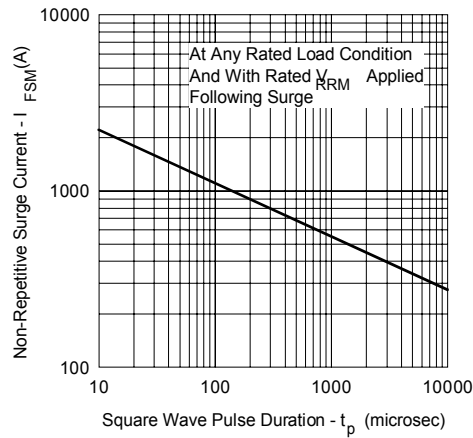


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

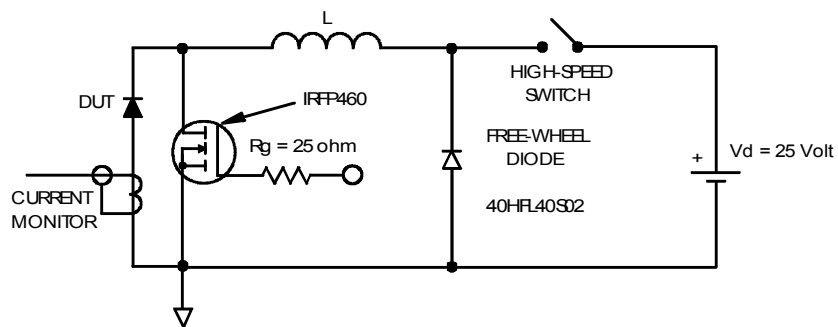
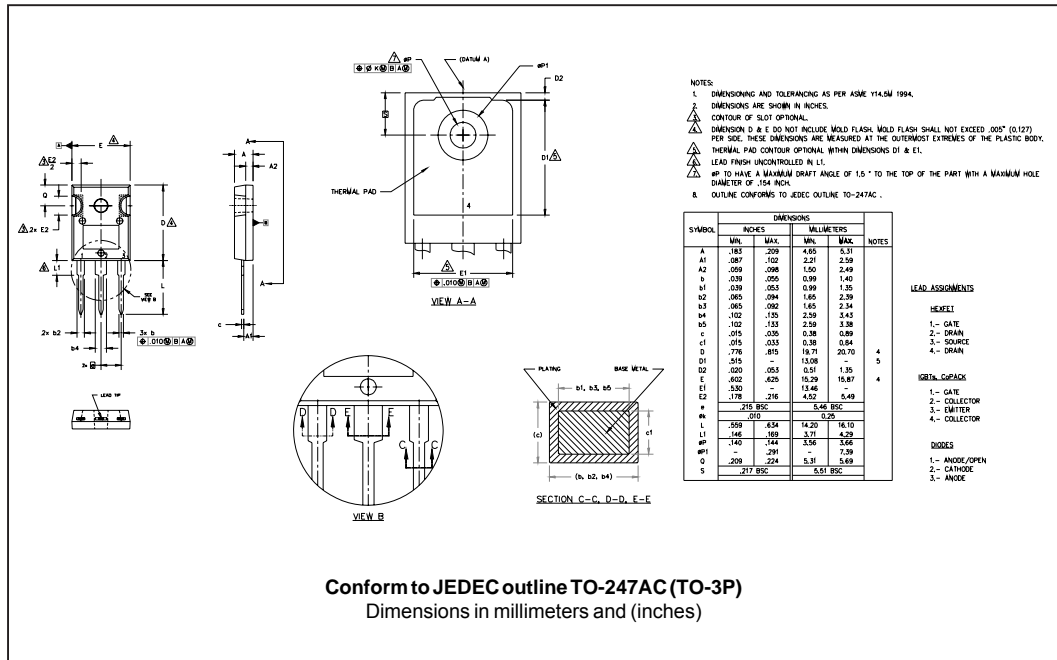
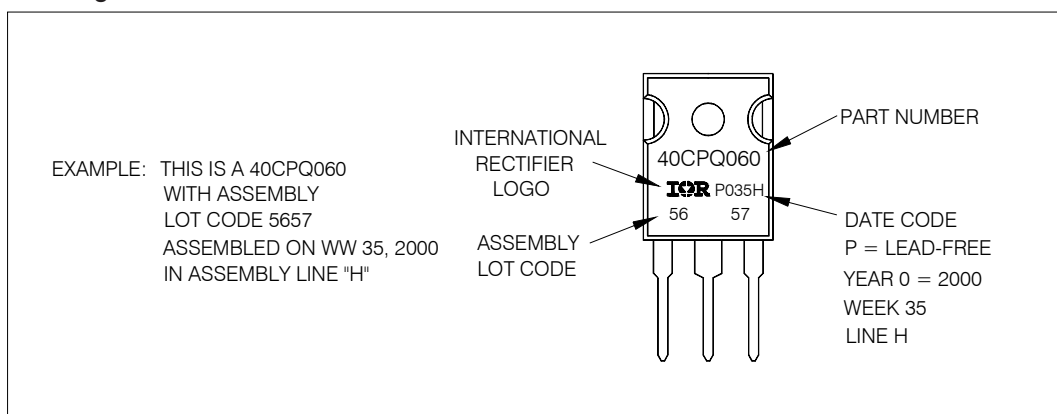


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



Marking Information



Ordering Information Table

| Device Code | | | | | |
|--|---|---|---|-----|-----|
| 40 | C | P | Q | 060 | PbF |
| ① | ② | ③ | ④ | ⑤ | ⑥ |
| 1 | - Current Rating (40 = 40A) | | | | |
| 2 | - Circuit Configuration C = Common Cathode | | | | |
| 3 | - Package P = TO-247 | | | | |
| 4 | - Schottky "Q" Series | | | | |
| 5 | - Voltage Code | | | | |
| 6 | <ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free | | | | |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;"> 050 = 50V 060 = 60V </div> | | | | | |
| Tube Standard Pack Quantity : 25 pieces | | | | | |

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