

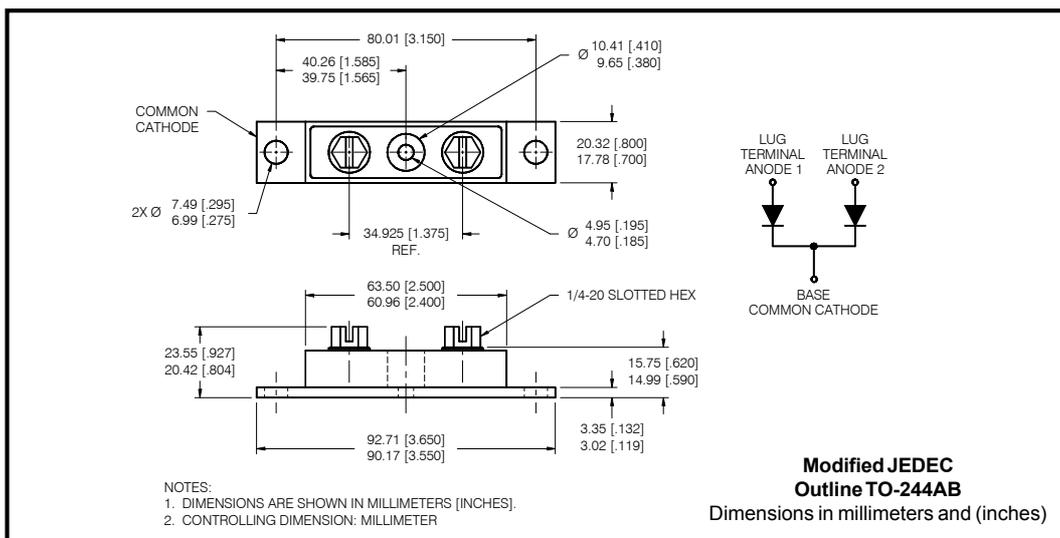
Major Ratings and Characteristics

| Characteristics | 408CNQ... | Units |
|---|------------|------------|
| $I_{F(AV)}$ Rectangular waveform | 400 | A |
| V_{RRM} range | 60 | V |
| I_{FSM} @ $t_p = 5 \mu s$ sine | 25,500 | A |
| V_F @ 200Apk, $T_J = 125^\circ C$ (per leg) | 0.59 | V |
| T_J range | -55 to 150 | $^\circ C$ |

Description/Features

The 408CNQ center tap Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in high current switching power supplies, plating power supplies, UPS systems, converters, free-wheeling diodes, welding, and reverse battery protection.

- 150 °C T_J operation
- Center tap module
- 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



408CNQ060

Bulletin PD-20581 rev. A 07/01



Voltage Ratings

| Part number | | 408CNQ060 |
|-------------|---------------------------------------|-----------|
| V_R | Max. DC Reverse Voltage (V) | 60 |
| V_{RWM} | Max. Working Peak Reverse Voltage (V) | |

Absolute Maximum Ratings

| Parameters | 408CNQ | Units | Conditions |
|---|--------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device) | 200 | A | 50% duty cycle @ $T_C = 115^\circ\text{C}$, rectangular waveform |
| | 400 | | |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 25,500 | A | 5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RWM} applied |
| | 3,300 | | |
| E_{AS} Non-Repetitive Avalanche Energy (Per Leg) | 15 | mJ | $T_J = 25^\circ\text{C}$, $I_{AS} = 1$ Amps, $L = 30$ mH |
| I_{AR} Repetitive Avalanche Current (Per Leg) | 1 | 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 | 408CNQ | Units | Conditions |
|--|--------|------------------|---|
| V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1) | 0.68 | V | @ 200A $T_J = 25^\circ\text{C}$ |
| | 0.83 | V | @ 400A |
| | 0.59 | V | @ 200A $T_J = 125^\circ\text{C}$ |
| | 0.76 | V | @ 400A |
| I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 2.2 | mA | $T_J = 25^\circ\text{C}$ |
| | 600 | mA | $T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$ |
| C_T Max. Junction Capacitance (Per Leg) | 11000 | pF | $V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C |
| L_S Typical Series Inductance (Per Leg) | 5.0 | nH | From top of terminal hole to mounting plane |
| dv/dt Max. Voltage Rate of Change (Rated V_R) | 10000 | V/ μs | |

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

| Parameters | 408CNQ | 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) | 0.20 | $^\circ\text{C/W}$ | DC operation * See Fig. 4 | |
| R_{thJC} Max. Thermal Resistance Junction to Case (Per Package) | 0.10 | $^\circ\text{C/W}$ | DC operation | |
| R_{thCS} Typical Thermal Resistance, Case to Heatsink | 0.10 | $^\circ\text{C/W}$ | Mounting surface, smooth and greased | |
| wt Approximate Weight | 79(2.80) | g(oz.) | | |
| T Mounting Torque | Min. | 24(20) | Kg-cm (lbf-in) | |
| | Max. | 35(30) | | |
| | Mounting Torque Center Hole | Typ. | | 13.5(12) |
| | Terminal Torque | Min. | | 35(30) |
| | | Max. | | 46(40) |
| Case Style | TO-244AB | | Modified JEDEC | |

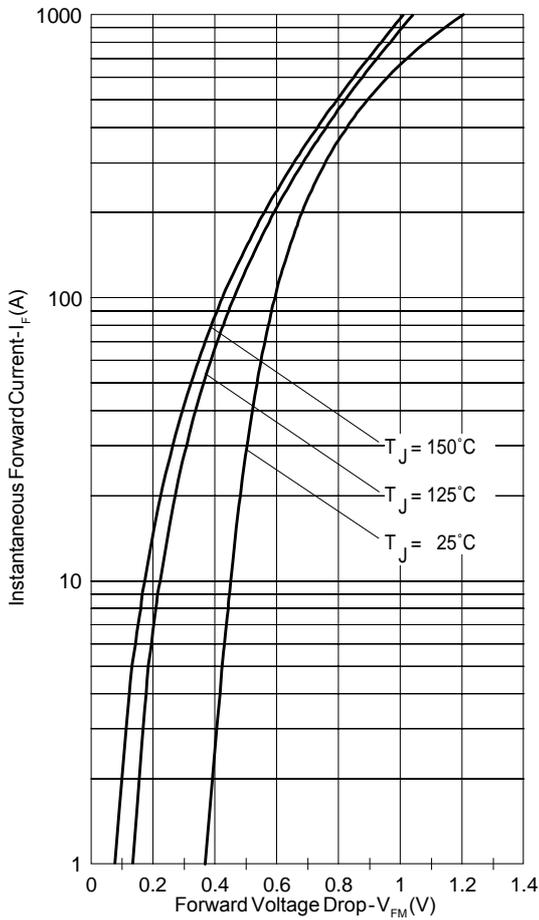


Fig. 1 - Max. Forward Voltage Drop Characteristics

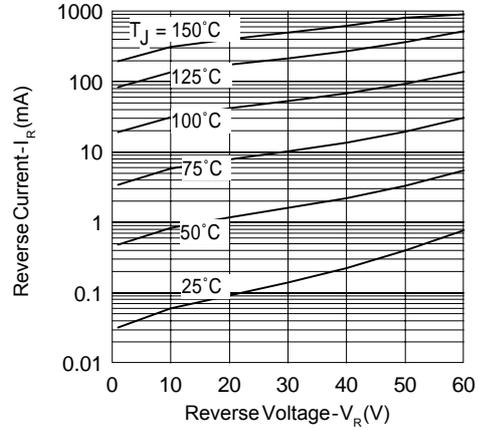


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

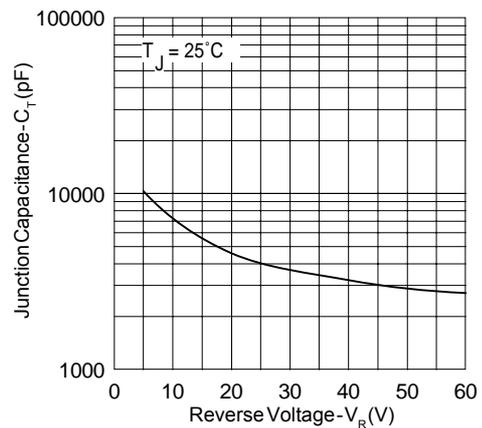


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

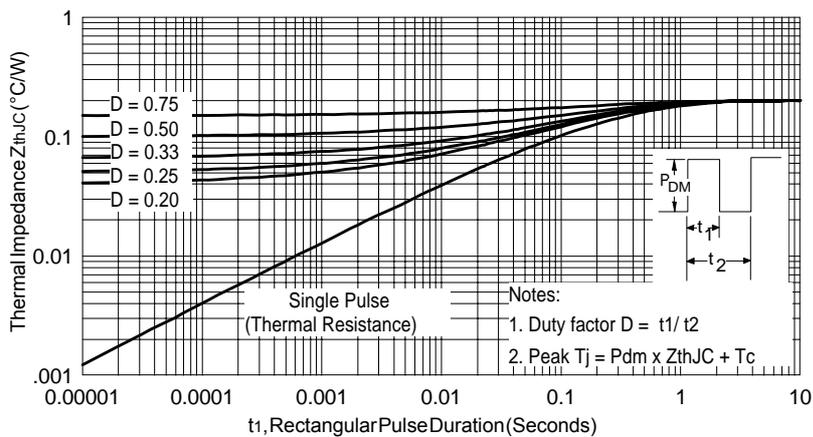


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

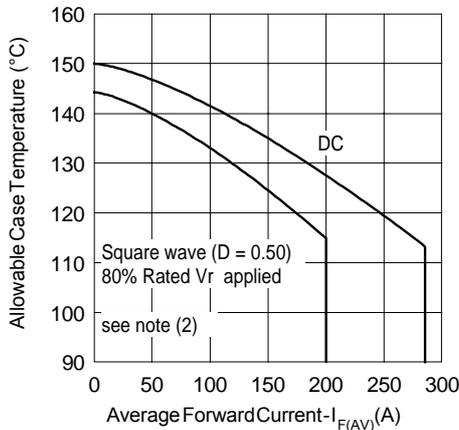


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

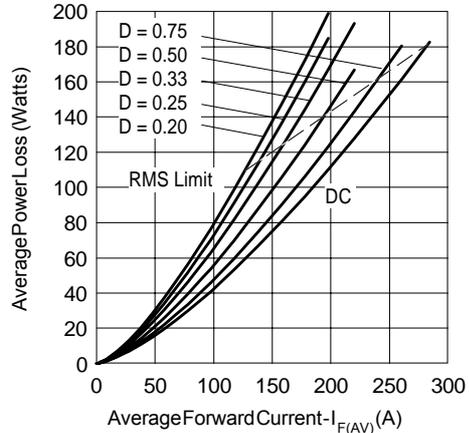


Fig. 6 - Forward Power Loss Characteristics

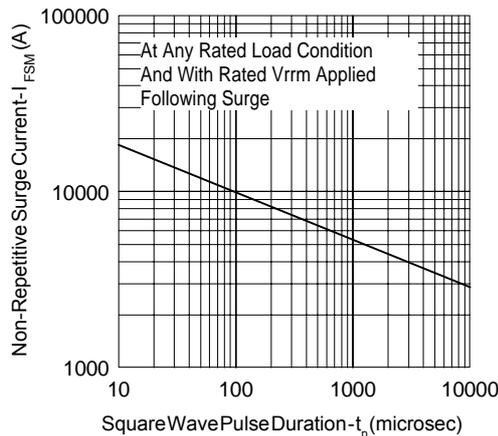


Fig. 7 - Max. Non-Repetitive Surge Current

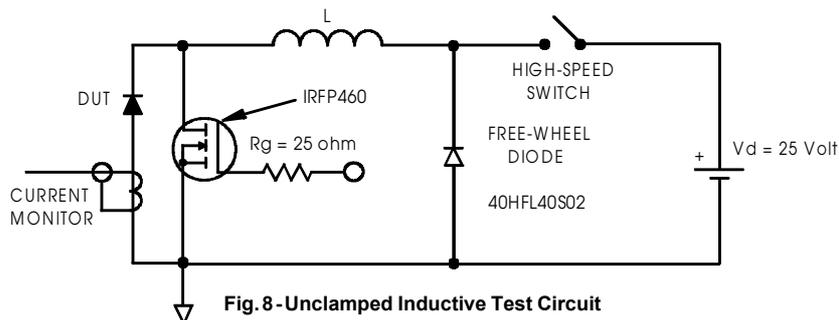


Fig. 8 - Unclamped Inductive Test Circuit

(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

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.

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