PD-2.255 rev. A 12/97

International
IOR Rectifier

# 163CMQ... SERIES

## SCHOTTKY RECTIFIER 160 Amp

### Major Ratings and Characteristics

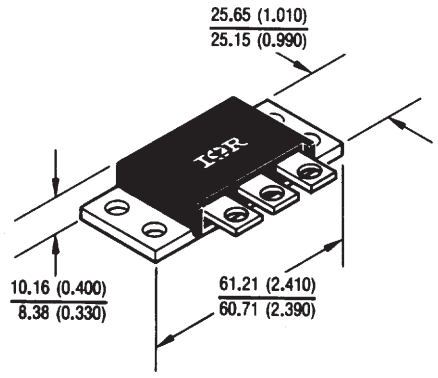
| Characteristics | | 163CMQ... | Units |
|---|---|---|---|
| $I_{F(AV)}$ | Rectangular waveform | 160 | A |
| $V_{RRM}$ | range | 80 to 100 | V |
| $I_{FSM}$ | @ tp = 5 µs sine | 9000 | A |
| $V_F$ | @ 80 Apk, $T_J$ = 125°C (per leg) | 0.80 | V |
| $T_J$ | range | -55 to 175 | °C |

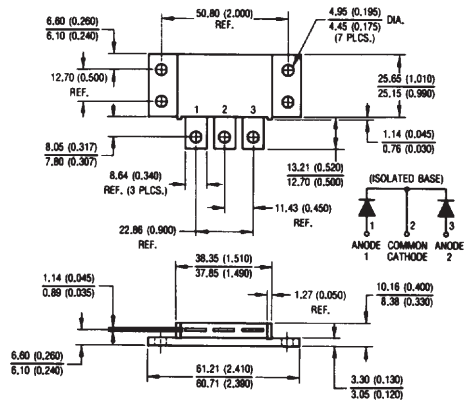
### Description/Features

The 163CMQ isolated 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 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175 °C $T_J$ operation
- Isolated heatsink
- 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
- Low profile, high current package

**CASE STYLE AND DIMENSIONS**




**Conforms to JEDEC Outline TO - 249AA**

Dimensions in millimeters and inches

## Voltage Ratings

| | Part number | 163CMQ080 | 163CMQ100 |
|---|---|---|---|
| $V_R$ | Max. DC Reverse Voltage (V) | 80 | 100 |
| $V_{RWM}$ | Max. Working Peak Reverse Voltage (V) | | |

## Absolute Maximum Ratings

| | Parameters | 163CMQ | Units | Conditions | |
|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. Average Forward Current *See Fig. 5 | 160 | A | 50% duty cycle @ $T_C$ = 87 °C, rectangular wave form | |
| $I_{FSM}$ | Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) *See Fig. 7 | 9000 | A | 5µs Sine or 3µs Rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied |
| | | 800 | | 10ms Sine or 6ms Rect. pulse | |
| $E_{AS}$ | Non-Repetitive Avalanche Energy (Per Leg) | 15 | mJ | $T_J$ = 25 °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 x $V_R$ typical | |

## Electrical Specifications

| | Parameters | 163CMQ | Units | Conditions | |
|---|---|---|---|---|---|
| $V_{FM}$ | Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1) | 0.98 | V | @ 80A | $T_J$ = 25 °C |
| | | 1.17 | V | @ 160A | |
| | | 0.80 | V | @ 80A | $T_J$ = 125 °C |
| | | 0.96 | V | @ 160A | |
| $I_{RM}$ | Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 1.5 | mA | $T_J$ = 25 °C | $V_R$ = rated $V_R$ |
| | | 20 | mA | $T_J$ = 125 °C | |
| $C_T$ | Max. Junction Capacitance (Per Leg) | 1400 | pF | $V_R$ = 5$V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C | |
| $L_S$ | Typical Series Inductance (Per Leg) | 8.0 | nH | Measured from terminal hole to terminal hole | |
| dv/dt | Max. Voltage Rate of Change (Rated $V_R$) | 10,000 | V/ µs | | |

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

## Thermal-Mechanical Specifications

| | Parameters | | 163CMQ | Units | Conditions |
|---|---|---|---|---|---|
| $T_J$ | Max. Junction Temperature Range | | -55 to 175 | °C | |
| $T_{stg}$ | Max. Storage Temperature Range | | -55 to 175 | °C | |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case (Per Leg) | | 1.0 | °C/W | DC operation *See Fig. 4 |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case (Per Package) | | 0.50 | °C/W | DC operation |
| $R_{thCS}$ | Typical Thermal Resistance, Case to Heatsink | | 0.10 | °C/W | Mounting surface , smooth and greased |
| wt | Approximate Weight | | 58 (2.0) | g (oz.) | |
| T | Mounting Torque | Min. | 40 (35) | Kg-cm (lbf-in) | |
| | | Max. | 58 (50) | | |
| | Case Style | | TO - 249AA | | JEDEC |

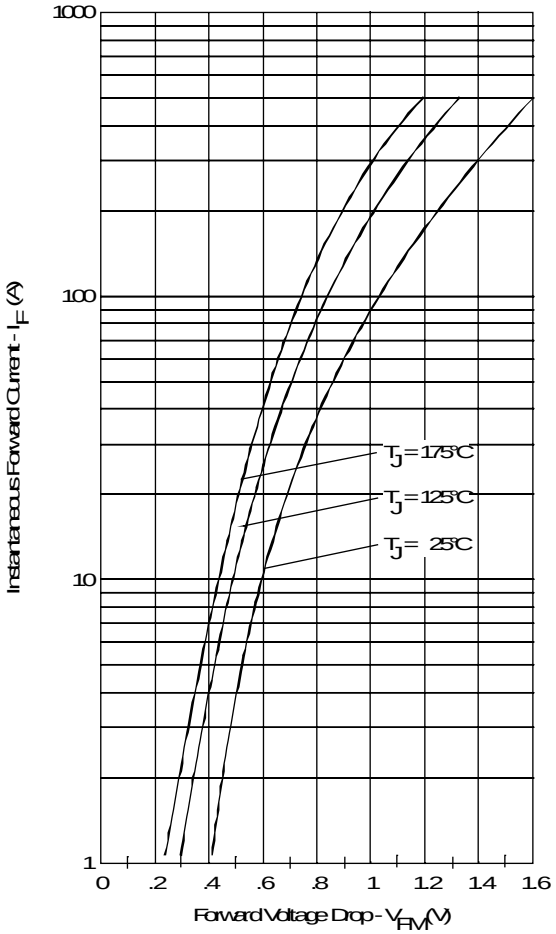



Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

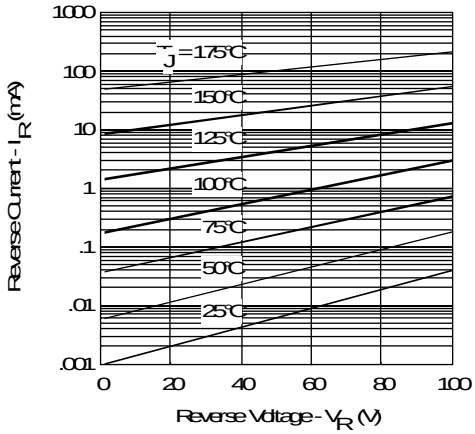



Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

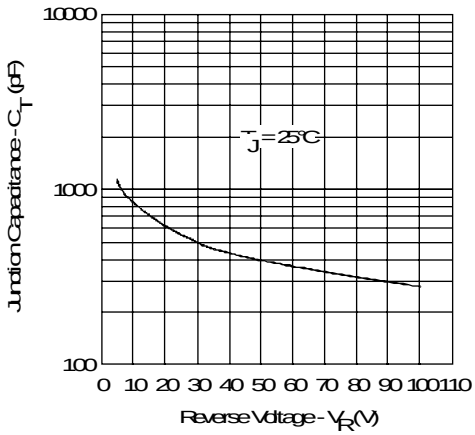



Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

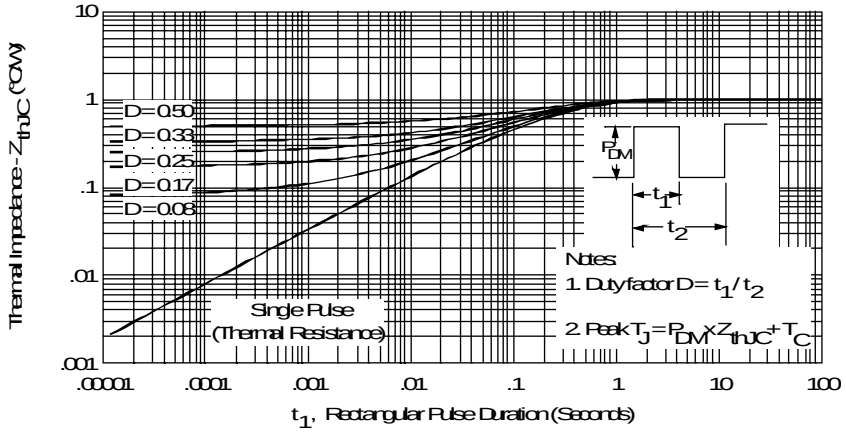



Fig. 4 - Max. Thermal Impedance $Z_{thJC}$ Characteristics (Per Leg)

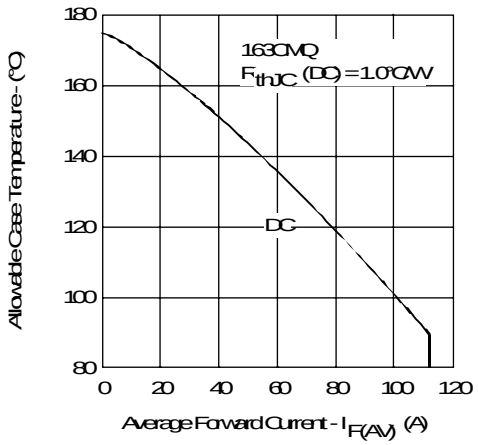



Fig. 5 - Max. Allowable Case Temperature
Vs. Average Forward Current (Per Leg)

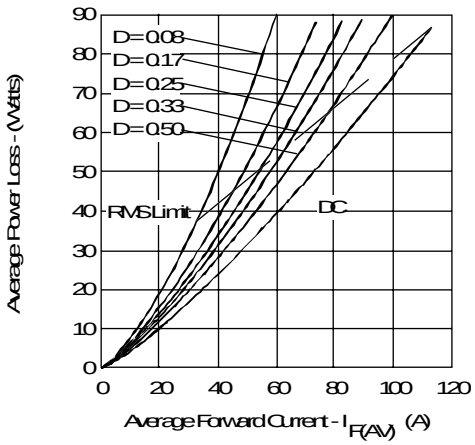



Fig. 6 - Forward Power Loss Characteristics
(Per Leg)

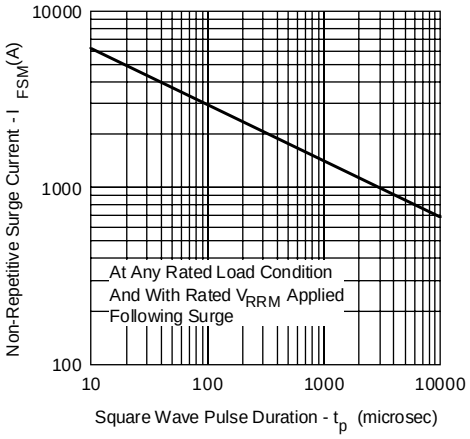



Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

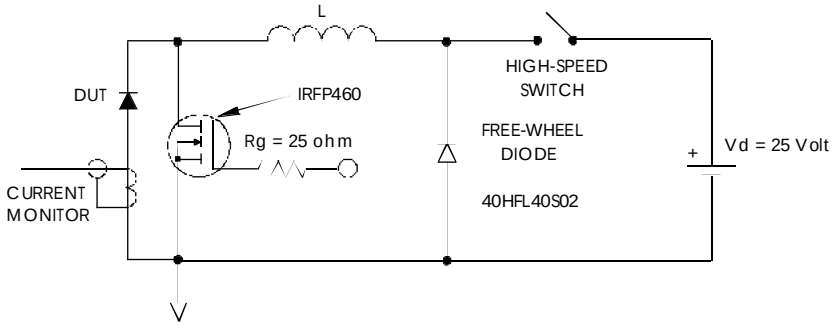



Fig. 8 - Unclamped Inductive Test Circuit