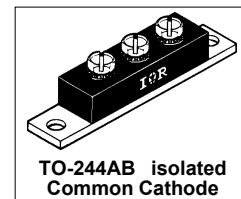


### SCHOTTKY RECTIFIER

### 200 Amp



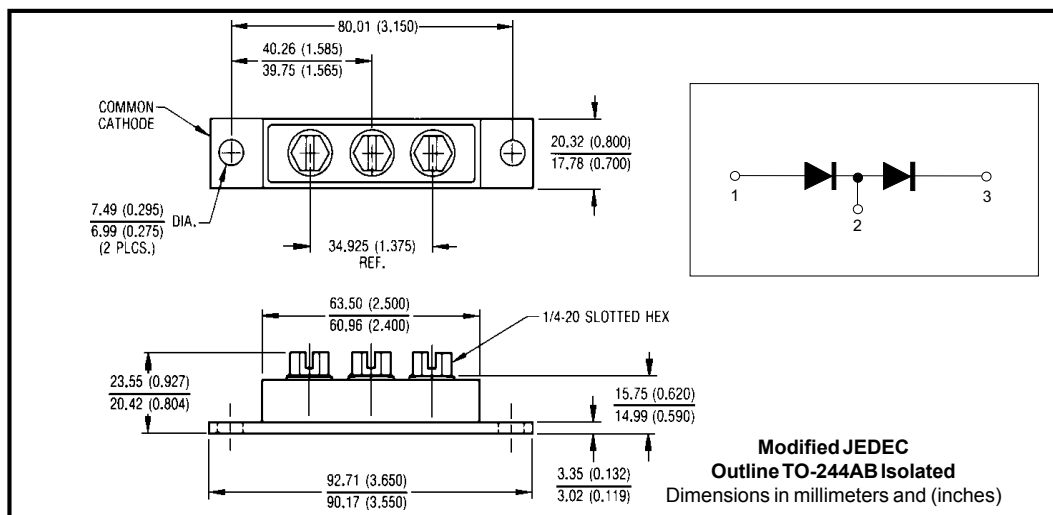
#### Major Ratings and Characteristics

| Characteristics                                | 203DMQ...  | Units      |
|------------------------------------------------|------------|------------|
| $I_{F(AV)}$ Rectangular waveform               | 200        | A          |
| $V_{RRM}$ range                                | 80 to 100  | V          |
| $I_{FSM}$ @ $t_p = 5 \mu s$ sine               | 16,000     | A          |
| $V_F$ @ 100A pk, $T_J = 125^\circ C$ (per leg) | 0.70       | V          |
| $T_J$ range                                    | -55 to 175 | $^\circ C$ |

#### Description/Features

The 203DMQ 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  $175^\circ C$  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.

- $175^\circ C$   $T_J$  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



## 203DMQ... Series

Bulletin PD-20579 rev. A 07/01

International  
**IR** Rectifier

### Voltage Ratings

| Part number                                     | 203DMQ080 | 203DMQ100 |
|-------------------------------------------------|-----------|-----------|
| $V_R$ Max. DC Reverse Voltage (V)               | 80        | 100       |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |           |           |

### Absolute Maximum Ratings

| Parameters                                                                        | 203DMQ | Units | Conditions                                                                                                               |
|-----------------------------------------------------------------------------------|--------|-------|--------------------------------------------------------------------------------------------------------------------------|
| $I_{F(AV)}$ Max. Average Forward Current * See Fig. 5 (Per Device)                | 200    | A     | 50% duty cycle @ $T_C = 107^\circ\text{C}$ , rectangular waveform                                                        |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 16,000 | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse                                                                      |
|                                                                                   | 2,100  |       | 10ms Sine or 6ms Rect. pulse                                                                                             |
| $E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)                                | 15     | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 1\text{ Amps}$ , $L = 30\text{ mH}$                                                 |
| $I_{AR}$ Repetitive Avalanche Current (Per Leg)                                   | 1      | 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                                                       | 203DMQ | Units            | Conditions                                                              |
|------------------------------------------------------------------|--------|------------------|-------------------------------------------------------------------------|
| $V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)    | 0.86   | V                | @ 100A                                                                  |
|                                                                  | 1.03   | V                | @ 200A                                                                  |
|                                                                  | 0.70   | V                | @ 100A                                                                  |
|                                                                  | 0.84   | V                | @ 200A                                                                  |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 3      | mA               | $T_J = 25^\circ\text{C}$                                                |
|                                                                  | 40     | mA               | $T_J = 125^\circ\text{C}$                                               |
| $V_{F(TO)}$ Threshold Voltage                                    | 0.50   | V                | $T_J = T_J \text{ max.}$                                                |
| $r_t$ Forward Slope Resistance                                   | 1.08   | m $\Omega$       |                                                                         |
| $C_T$ Max. Junction Capacitance (Per Leg)                        | 2,650  | pF               | $V_R = 5V_{DC}$ , (test signal range 100KHz to 1MHz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance (Per Leg)                        | 7.0    | nH               | From top of terminal hole to mounting plane                             |
| $dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ )               | 10000  | V/ $\mu\text{s}$ |                                                                         |

### Thermal-Mechanical Specifications

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

| Parameters                                                        | 203DMQ            | 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)     | 0.70              | $^\circ\text{C/W}$ | DC operation * See Fig. 4            |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package) | 0.35              | $^\circ\text{C/W}$ | 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<br>(lbf-in)                    |
|                                                                   | Max.              | 35 (30)            |                                      |
|                                                                   | Typ.              | 13.5 (12)          |                                      |
|                                                                   | Min.              | 35 (30)            |                                      |
|                                                                   | Max.              | 46 (40)            |                                      |
| Case Style                                                        | TO-244AB Isolated |                    | Modified JEDEC                       |

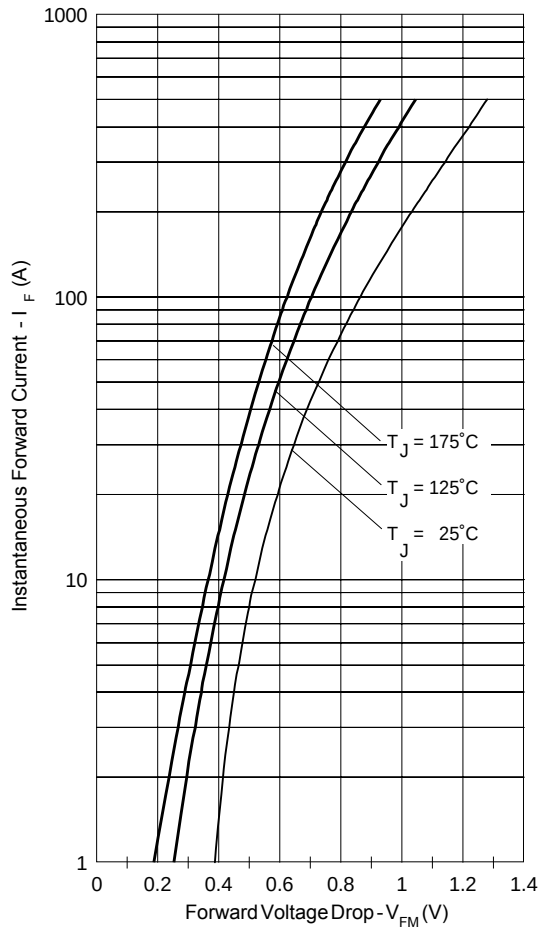


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

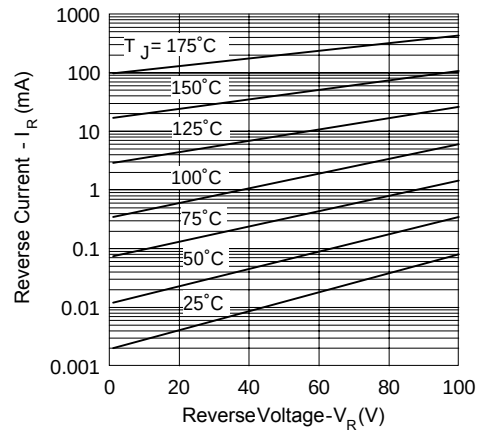


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

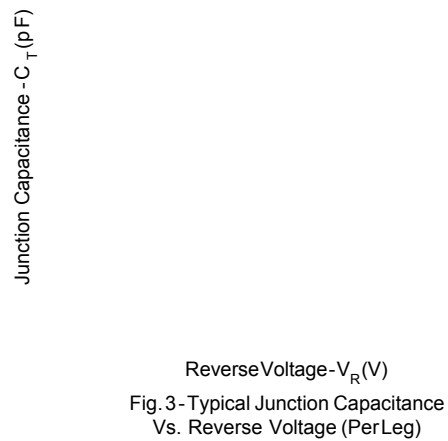


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

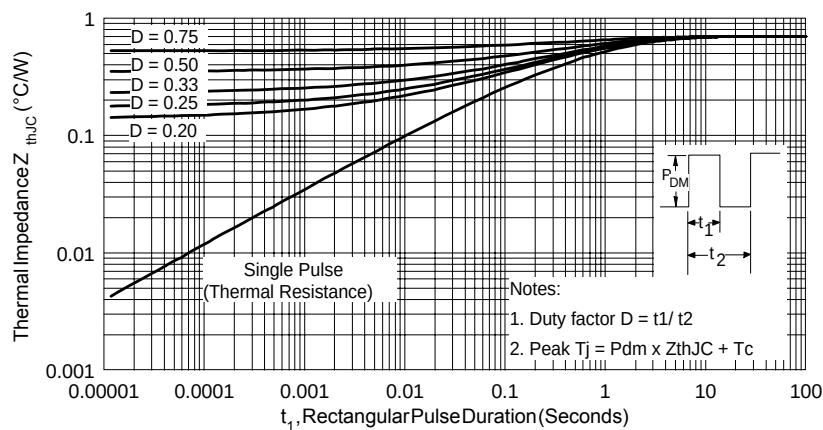


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

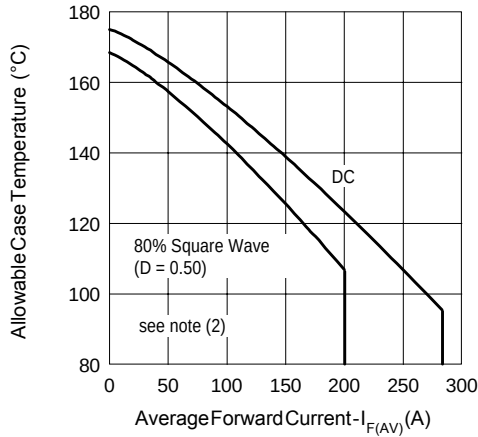


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

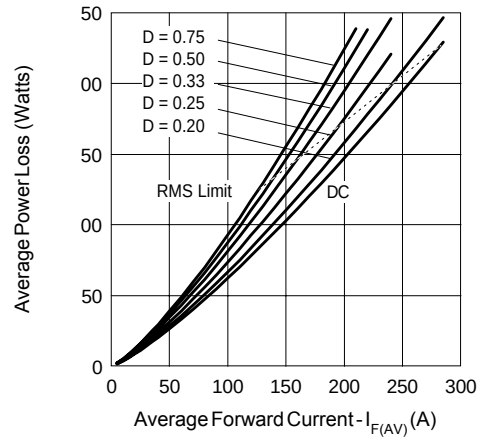


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

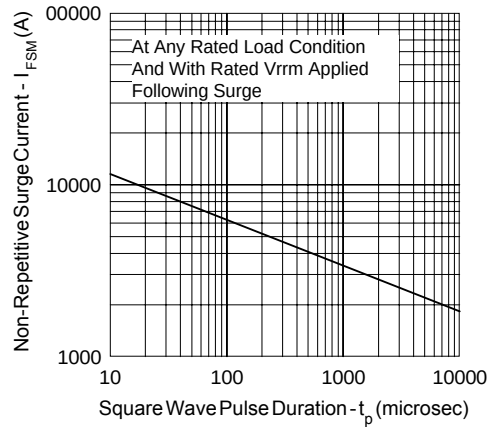


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

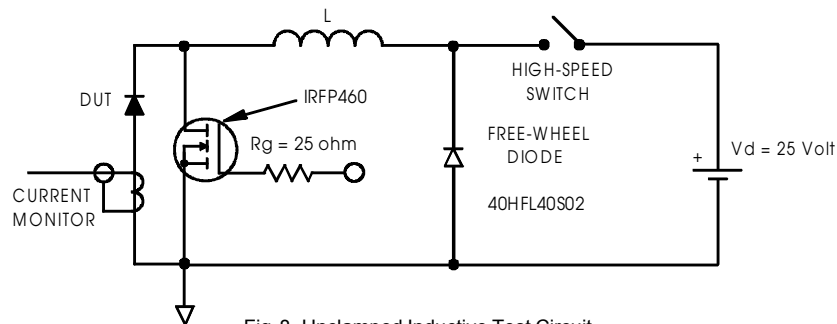


Fig. 8 - Unclamped Inductive Test Circuit

(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.

International  
**IOR** Rectifier

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