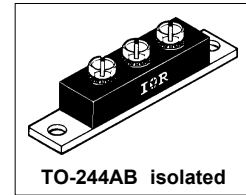


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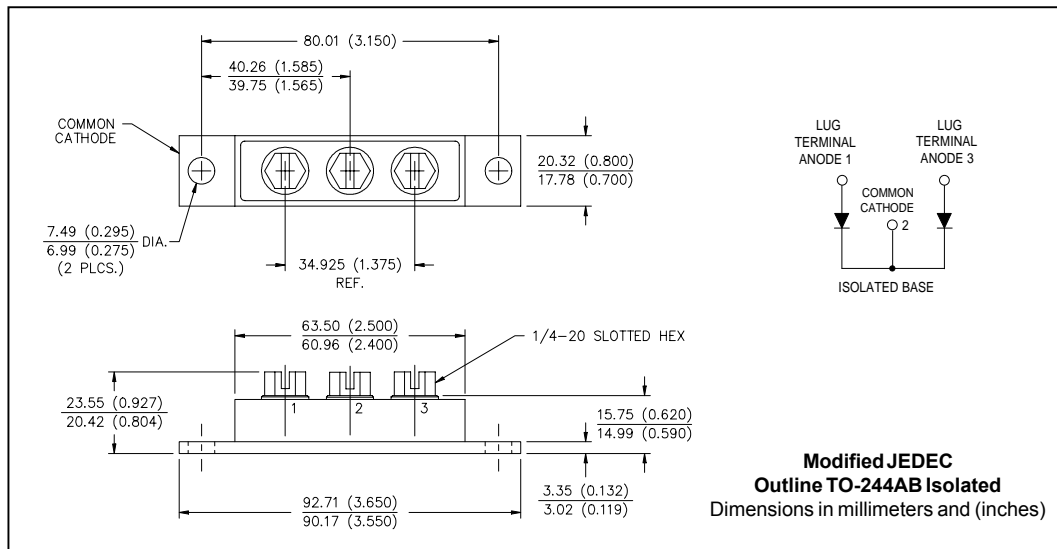
**Major Ratings and Characteristics**

Characteristics	220CMQ030	Units
$I_{F(AV)}$ Rectangular waveform	220	A
$V_{RRM}$	30	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	22,500	A
$V_F$ @110Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.40	V
$T_J$ range	-55 to 150	$^\circ\text{C}$

**Description/Features**

The 220CMQ030 high current Schottky rectifier module 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, welding and reverse battery protection.

- 150  $^\circ\text{C}$   $T_J$  operation
- Center tap module - Isolated Base
- 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



# 220CMQ030

Bulletin PD-2.555 rev. B 08/01

International  
**IR** Rectifier

## Voltage Ratings

Part number	220CMQ030
V <sub>R</sub> Max. DC Reverse Voltage (V)	30
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	220CMQ	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	110 220	A	50% duty cycle @ T <sub>C</sub> = 100 °C, rectangular waveform
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	22,500 2,400	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse
E <sub>AS</sub> Non-Repetitive Avalanche Energy (Per Leg)	99	mJ	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 22 Amps, L = 0.41 mH
I <sub>AR</sub> Repetitive Avalanche Current (Per Leg)	22	A	Current decaying linearly to zero in 1 μsec Frequency limited by T <sub>J</sub> max. V <sub>A</sub> = 1.5 x V <sub>R</sub> typical

## Electrical Specifications

Parameters	220CMQ	Units	Conditions
V <sub>FM</sub> Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.48	V	@ 110A T <sub>J</sub> = 25 °C
	0.57	V	@ 220A
	0.40	V	@ 110A T <sub>J</sub> = 125 °C
	0.52	V	@ 220A
I <sub>RM</sub> Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	10	mA	T <sub>J</sub> = 25 °C
	560	mA	T <sub>J</sub> = 125 °C
V <sub>F(TO)</sub> Threshold Voltage	0.23	V	T <sub>J</sub> = T <sub>J</sub> max.
r <sub>t</sub> Forward Slope Resistance	1.16	mΩ	
C <sub>T</sub> Max. Junction Capacitance (Per Leg)	7,400	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)	7.0	nH	From top of terminal hole to mounting plane
dv/dt Max. Voltage Rate of Change	10000	V/ μs	(Rated V <sub>R</sub> )
V <sub>RMS</sub> Insulation Voltage	1000	V	

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

## Thermal-Mechanical Specifications

Parameters	220CMQ	Units	Conditions	
T <sub>J</sub> Max. Junction Temperature Range	-55 to 150	°C		
T <sub>stg</sub> Max. Storage Temperature Range	-55 to 150	°C		
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Leg)	0.70	°C/W	DC operation * See Fig. 4	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Package)	0.35	°C/W	DC operation	
R <sub>thCS</sub> Typical Thermal Resistance, Case to Heatsink	0.10	°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 Isolated		Modified JEDEC	

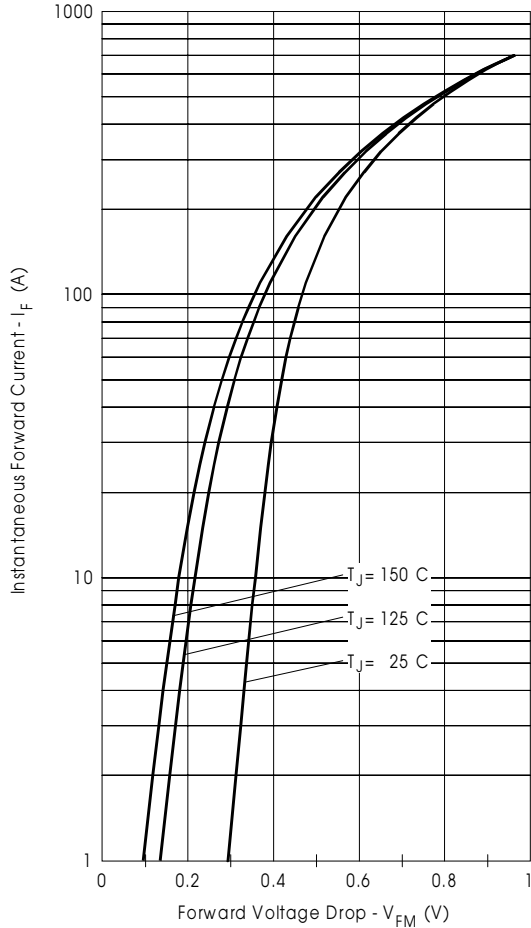


Fig. 1 - Max. Forward Voltage Drop Characteristics (PerLeg)

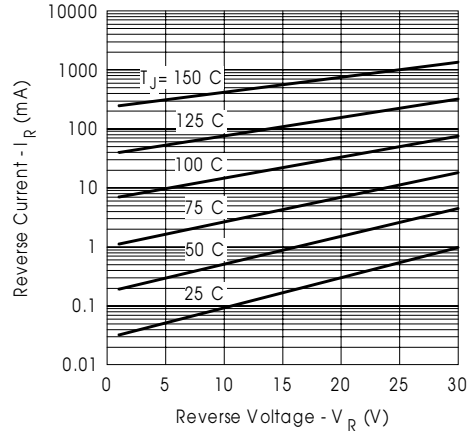


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (PerLeg)

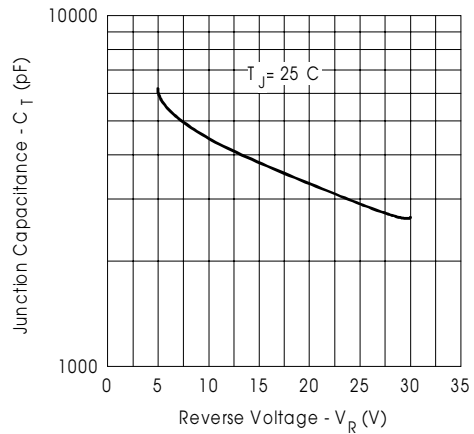


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (PerLeg)

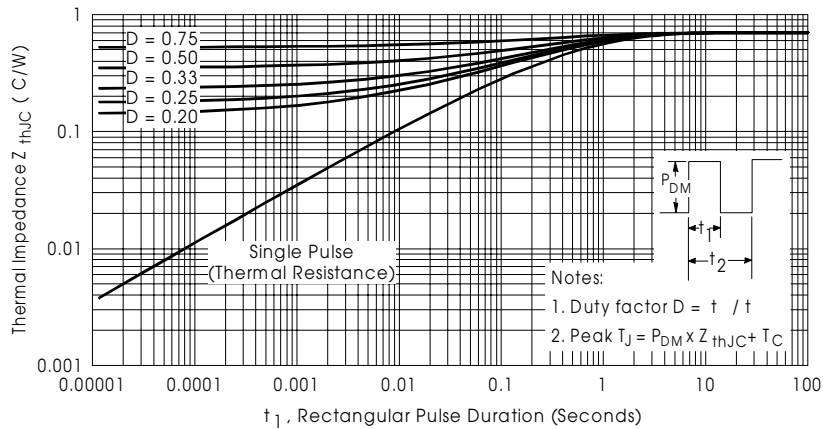


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (PerLeg)

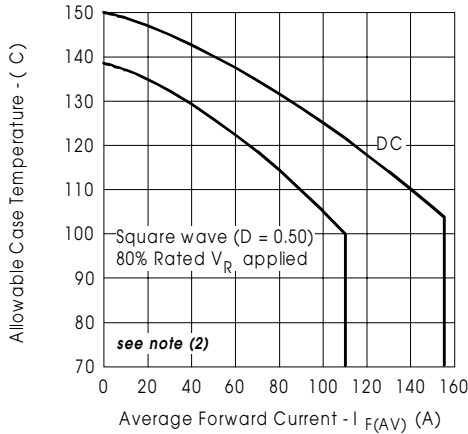


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

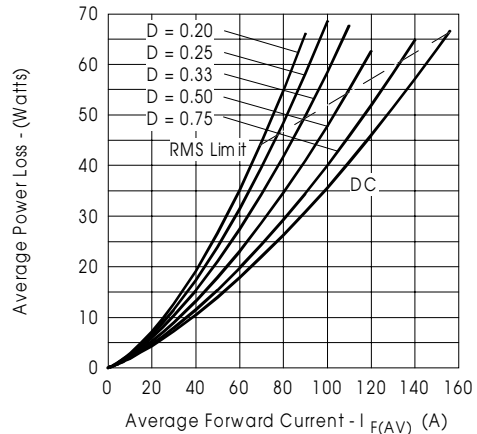


Fig. 6- Forward Power Loss Characteristics (Per Leg)

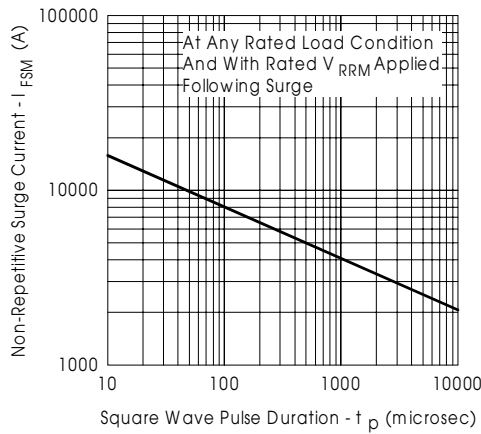


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

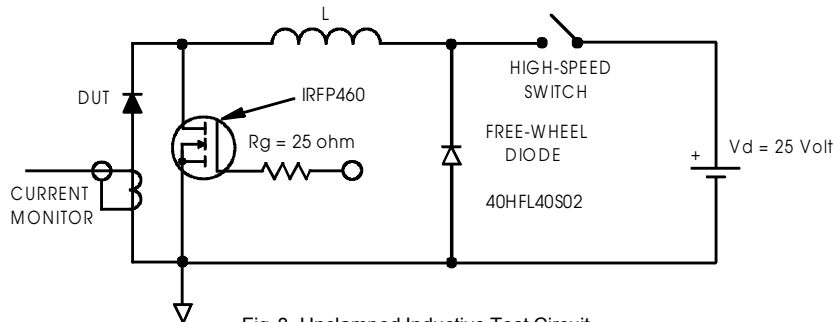


Fig. 8- Unclamped Inductive Test Circuit

- (2) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);  
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D); I_R @ V_{R1} = 80\% \text{ rated } V_R$

Ordering Information Table

Device Code				
220	C	M	Q	030
①	②	③	④	⑤
1	-	Current Rating: 220A		
2	-	Common Cathode		
3	-	Module		
4	-	Schottky Q Series		
5	-	Voltage Rating: 30V		

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.