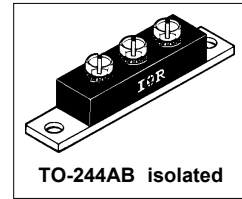


# International IR Rectifier

## 440CMQ030

### SCHOTTKY RECTIFIER

440 Amp



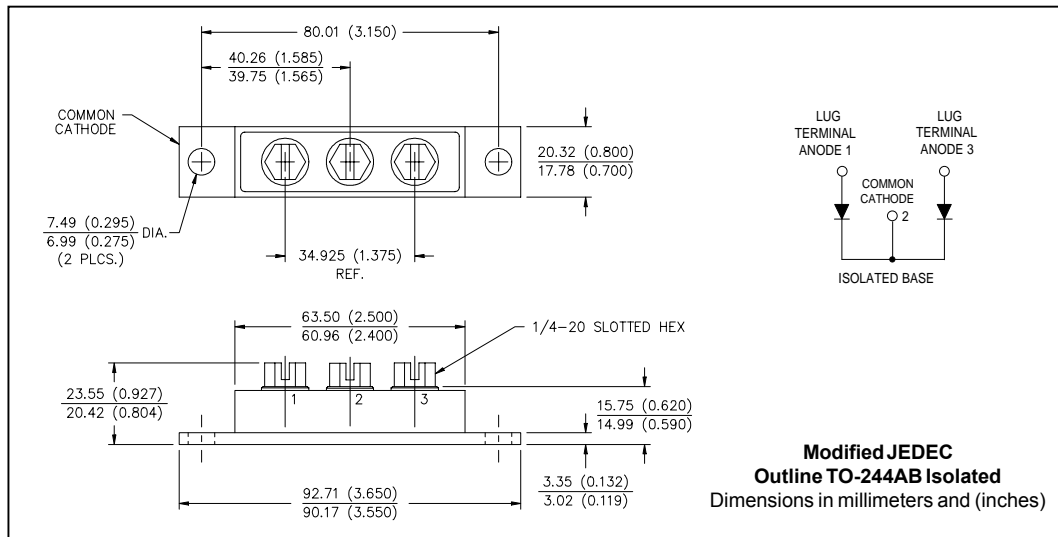
#### Major Ratings and Characteristics

Characteristics	440CMQ030	Units
$I_{F(AV)}$ Rectangular waveform	440	A
$V_{RRM}$ range	30	V
$I_{FSM}$ @ $t_p = 5 \mu s$ sine	27,000	A
$V_F$ @ 100Apk, $T_J = 125^\circ C$ (per leg)	0.41	V
$T_J$ range	- 55 to 150	$^\circ C$

#### Description/Features

The 440CMQ high current Schottky rectifier module series has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150  $^\circ C$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150  $^\circ C$   $T_J$  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



# 440CMQ030

Bulletin PD-2.369 rev. B 08/01

International  
**IR** Rectifier

## Voltage Ratings

Part number	440CMQ030
V <sub>R</sub> Max. DC Reverse Voltage (V)	30
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	440CMQ	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	220	A	50% duty cycle @ T <sub>C</sub> = 95 °C, rectangular wave form
	440		
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	27,000	A	5µs Sine or 3µs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V <sub>RRM</sub> applied
	3000		
E <sub>AS</sub> Non-Repetitive Avalanche Energy (Per Leg)	198	mJ	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 44 Amps, L = 0.20 mH
I <sub>AR</sub> Repetitive Avalanche Current (Per Leg)	44	A	Current decaying linearly to zero in 1µsec Frequency limited by T <sub>J</sub> max. V <sub>A</sub> = 1.5 x V <sub>R</sub> typical

## Electrical Specifications

Parameters	440CMQ	Units	Conditions
V <sub>FM</sub> Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.50	V	@ 220A T <sub>J</sub> = 25 °C
	0.60	V	@ 440A
	0.41	V	@ 220A T <sub>J</sub> = 125 °C
	0.52	V	@ 440A
I <sub>RM</sub> Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	20	mA	T <sub>J</sub> = 25 °C
	1120	mA	T <sub>J</sub> = 125 °C V <sub>R</sub> = rated V <sub>R</sub>
C <sub>T</sub> Max. Junction Capacitance (Per Leg)	14,800	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)	5.0	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	440CMQ	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)	0.40	°C/W	DC operation * See Fig. 4	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Package)	0.20	°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	

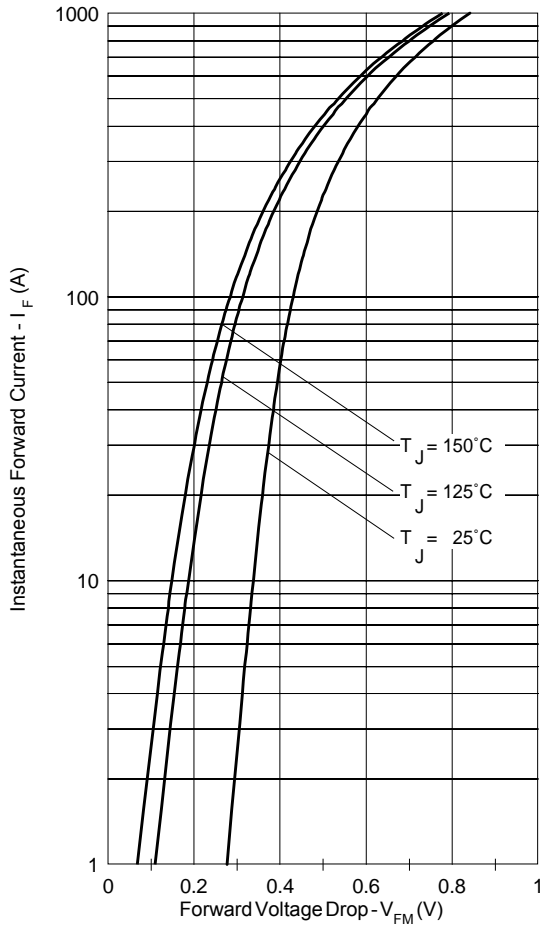


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

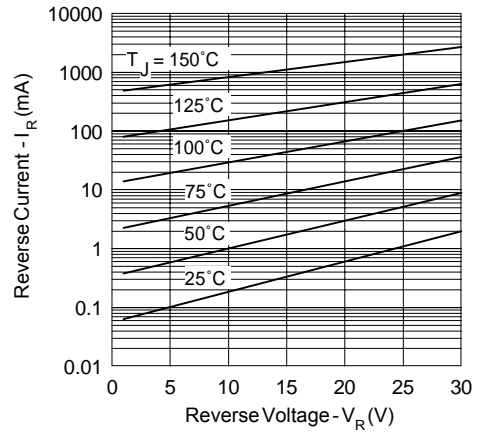


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

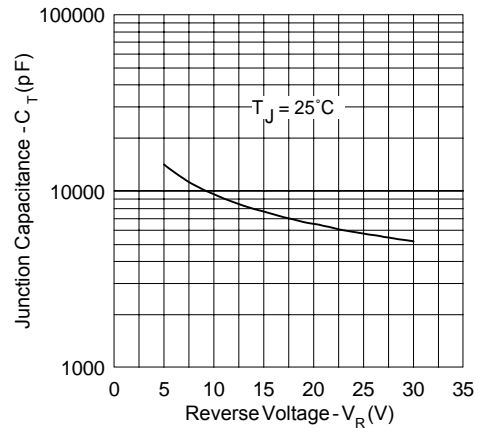


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

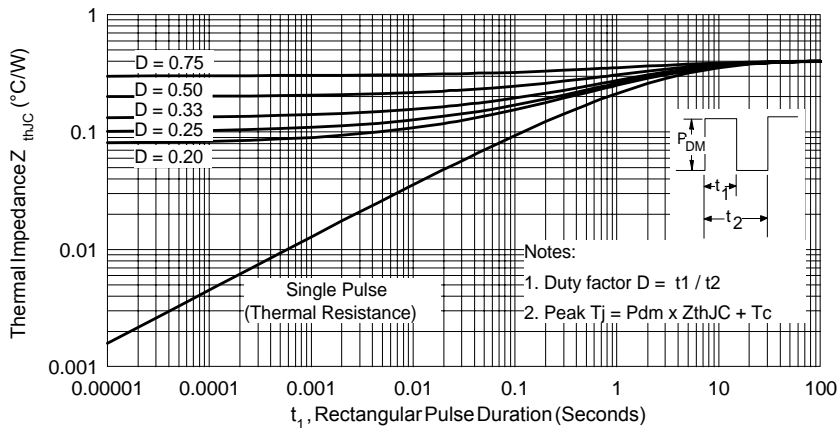


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

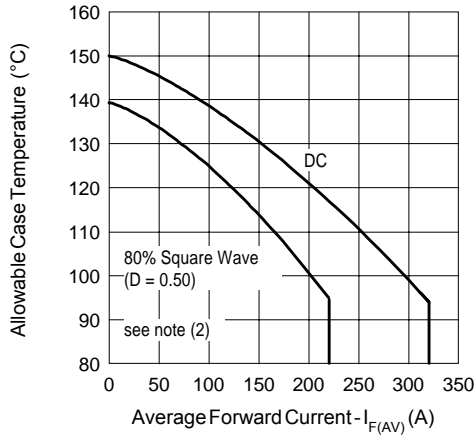


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

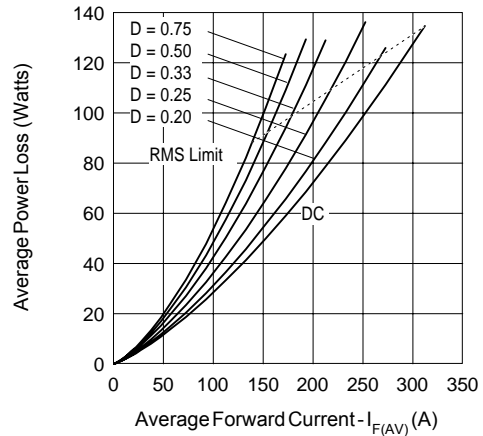


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

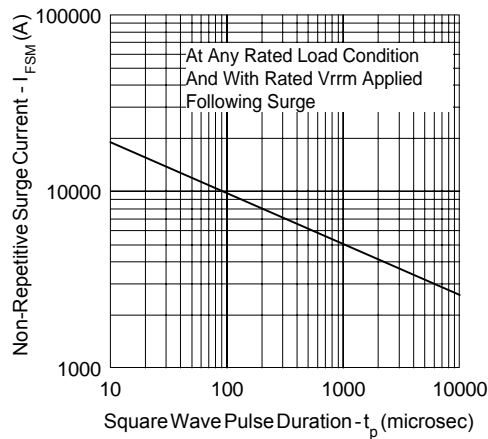


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

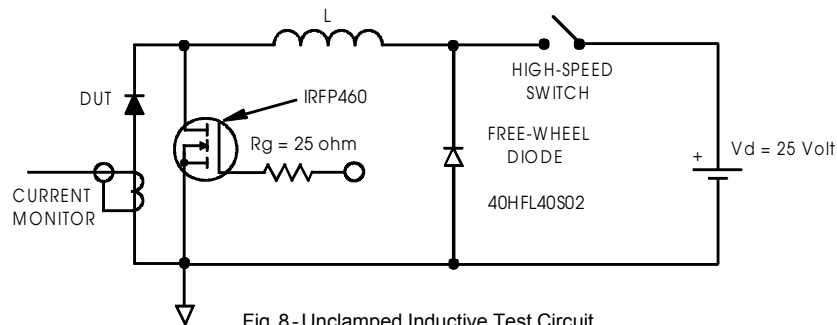


Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used:  $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$ ;

$Pd$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

$Pd_{REV}$  = Inverse Power Loss =  $V_{R1} \times I_{R1} (1 - D)$ ;  $I_{R1} @ V_{R1} = 80\%$  rated  $V_R$

### Ordering Information Table

Device Code				
440	C	M	Q	030
①	②	③	④	⑤
<b>1</b>	-	Current Rating: 400A		
<b>2</b>	-	Common Cathode		
<b>3</b>	-	Module		
<b>4</b>	-	Schottky Q Series		
<b>5</b>	-	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.