

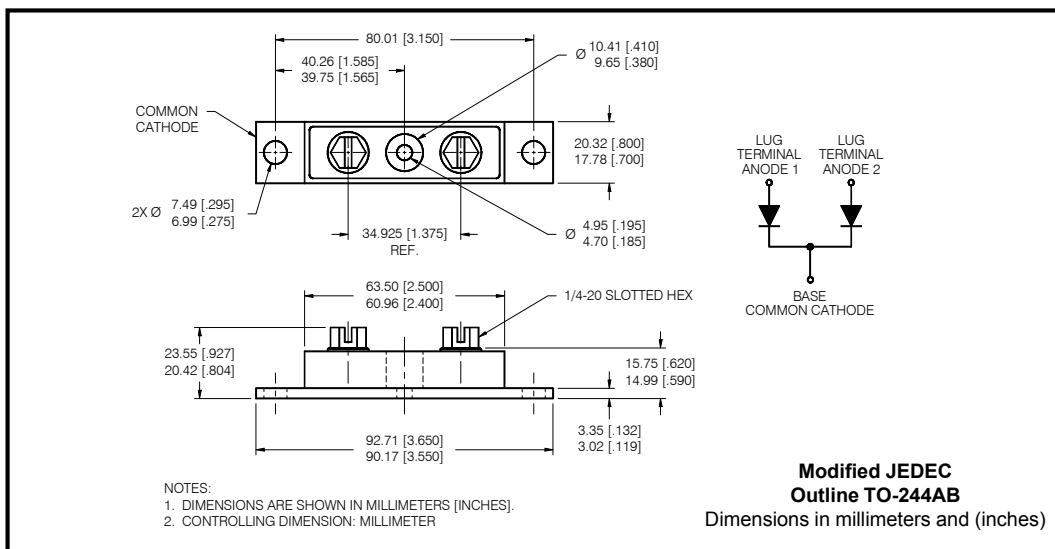
**Major Ratings and Characteristics**

Characteristics	440CNQ...	Units
$I_{F(AV)}$ Rectangular waveform	440	A
$V_{RRM}$	30	V
$I_{FSM}$ @ $t_p=5\mu s$ sine	27,000	A
$V_F$ @220Apk, $T_J=125^\circ C$ (per leg)	0.41	V
$T_J$ range	-55 to 150	$^\circ C$

**Description/Features**

The 440CNQ030 center tap, 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 °C junction temperature. Typical applications are in switching power supplies, 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
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



## Voltage Ratings

Part number	440CNQ030
$V_R$ Max. DC Reverse Voltage (V)	30
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	440CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	440	A	50% duty cycle @ $T_C = 115^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	27,000	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse Following any rated load condition and with rated $V_{RRM}$ applied
	3000		
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	198	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 44$ Amps, $L = 0.20$ mH
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	44	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ , max. $V_A = 1.5 \times V_R$ typical

## Electrical Specifications

Parameters	440CNQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.50	V	@ 220A $T_J = 25^\circ\text{C}$
	0.60	V	@ 440A
	0.41	V	@ 220A $T_J = 125^\circ\text{C}$
	0.52	V	@ 440A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	20	mA	$T_J = 25^\circ\text{C}$
	1120	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$C_T$ Max. Junction Capacitance (Per Leg)	14,800	pF	$V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ 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/ $\mu\text{s}$	

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

## Thermal-Mechanical Specifications

Parameters	440CNQ	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	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4	
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package)	0.10	$^\circ\text{C}/\text{W}$	DC operation	
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.10	$^\circ\text{C}/\text{W}$	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	

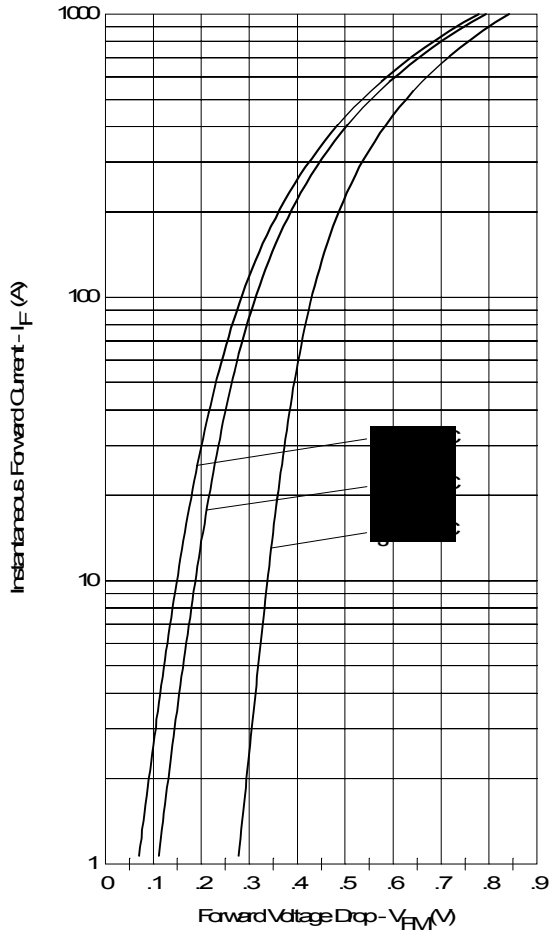


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

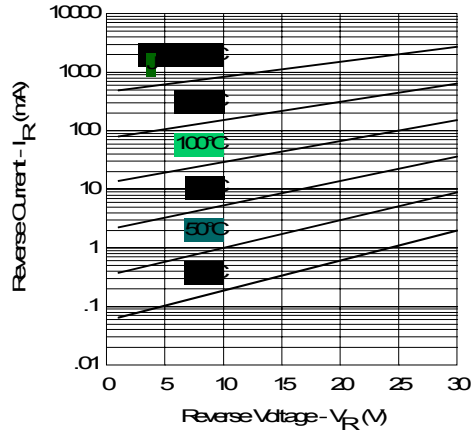


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

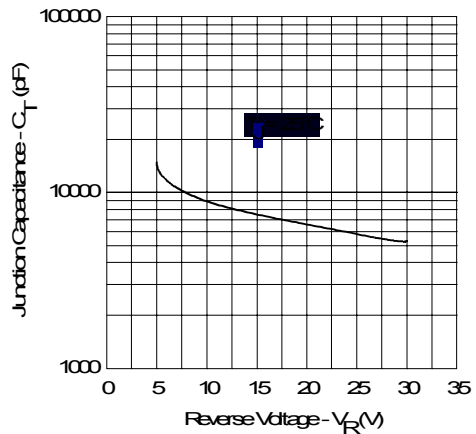


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

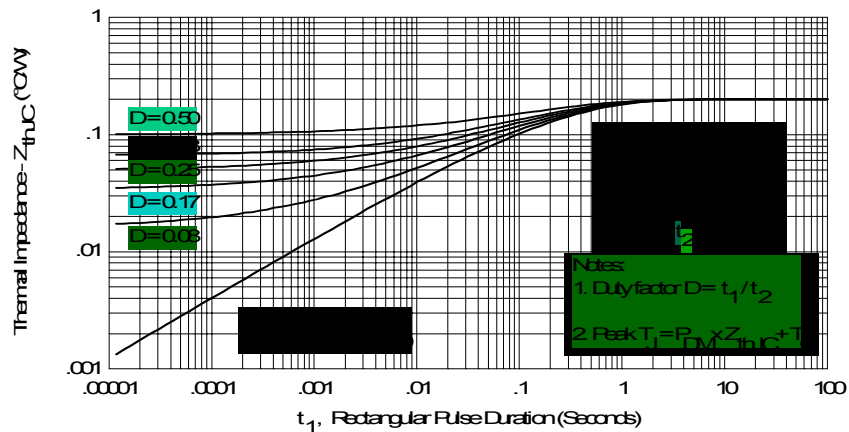


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

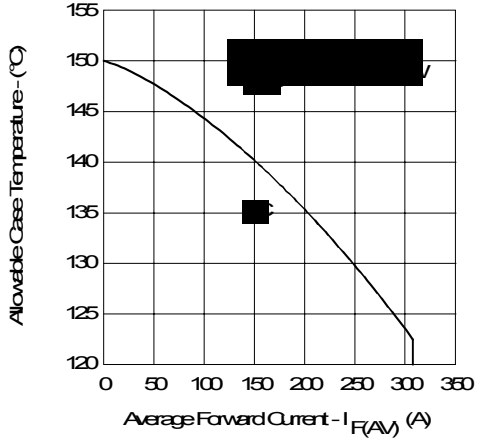


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

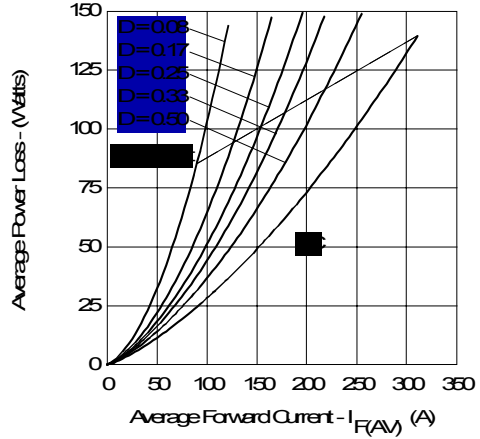


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

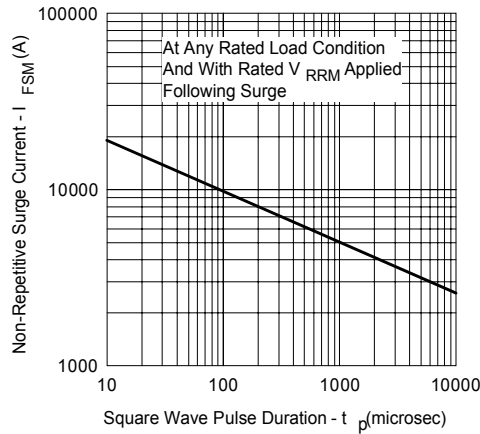


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

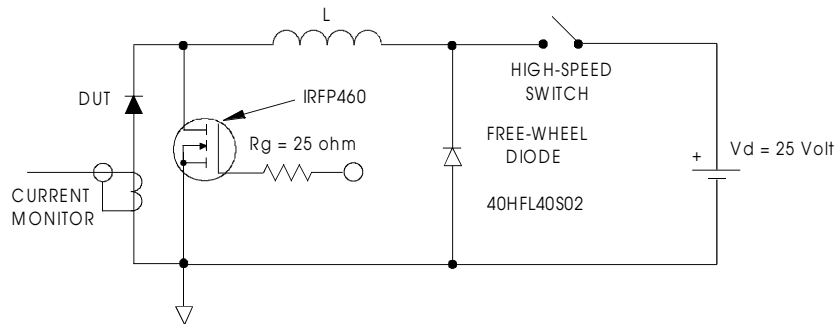


Fig. 8 - Unclamped Inductive Test Circuit

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  
**IR** Rectifier

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