

International IR Rectifier

PD-2.216 rev. C 01/99

80CNQ... SERIES

SCHOTTKY RECTIFIER

80 Amp

Major Ratings and Characteristics

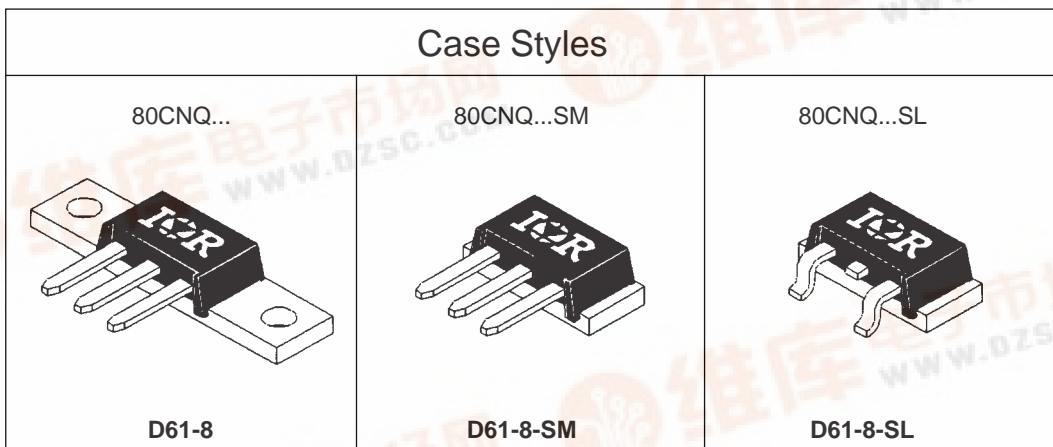
Characteristics	80CNQ...	Units
$I_{F(AV)}$ Rectangular waveform	80	A
V_{RRM} range	35 to 45	V
I_{FSM} @ tp=5 μ s sine	5800	A
V_F @ 40 Apk, $T_J=125^\circ\text{C}$ (per leg)	0.47	V
T_J range	-55 to 150	$^\circ\text{C}$

Description/Features

The 80CNQ center tap 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 $^\circ\text{C}$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150 $^\circ\text{C}$ T_J operation
- Center tap module
- Very low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Low profile, small footprint, high current package

Case Styles



Voltage Ratings

Part number	80CNQ035	80CNQ040	80CNQ045
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters	80CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	40 80	A	50% duty cycle @ $T_C = 114^\circ\text{C}$, rectangular waveform
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	5800 750	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	54	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 8$ Amps, $L = 1.7$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	8	A	Current decaying linearly to zero in 1 μsec Frequency limited by T_J max. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

Parameters	80CNQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.52	V	@ 40A $T_J = 25^\circ\text{C}$
	0.66	V	@ 80A
	0.47	V	@ 40A $T_J = 125^\circ\text{C}$
	0.61	V	@ 80A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	5	mA	$T_J = 25^\circ\text{C}$
	250	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.26	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	3.93	m Ω	
C_T Max. Junction Capacitance (Per Leg)	2600	pF	$V_R = 5V_{DC}$, (test signal range 100KHz to 1MHz) 25°C
L_S Typical Series Inductance (Per Leg)	5.5	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change (Rated V_R)	10,000	V/ μs	

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

Thermal-Mechanical Specifications

Parameters	80CNQ	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)	0.85	$^\circ\text{C/W}$	DC operation * See Fig. 4
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.42	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink (D61-8 Only)	0.30	$^\circ\text{C/W}$	Mounting surface, smooth and greased
wt Approximate Weight	7.8(0.28)	g(oz.)	
T Mounting Torque (D61-8 Only)	Min.	40(35)	Kg-cm (lbf-in)
	Max.	58(50)	

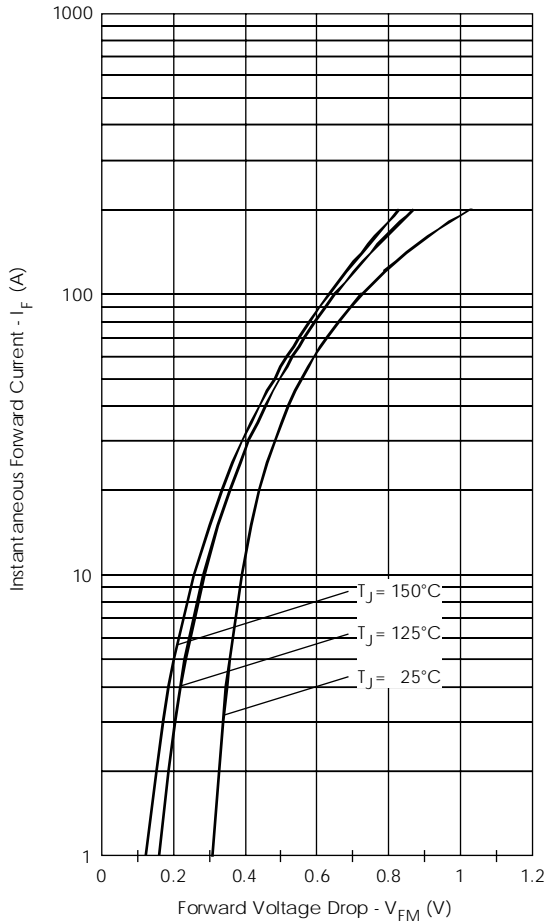


Fig. 1 - Max. Forward Voltage Drop Characteristics (PerLeg)

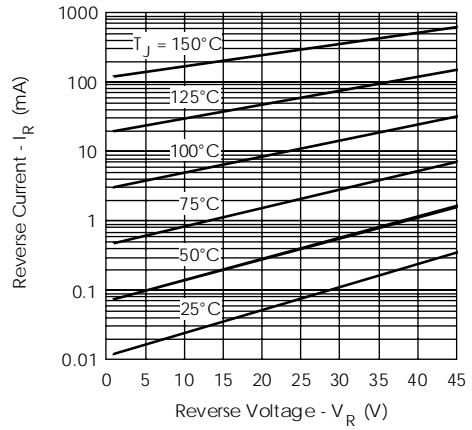


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (PerLeg)

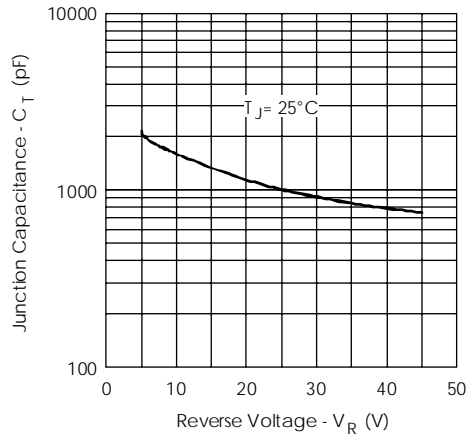


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (PerLeg)

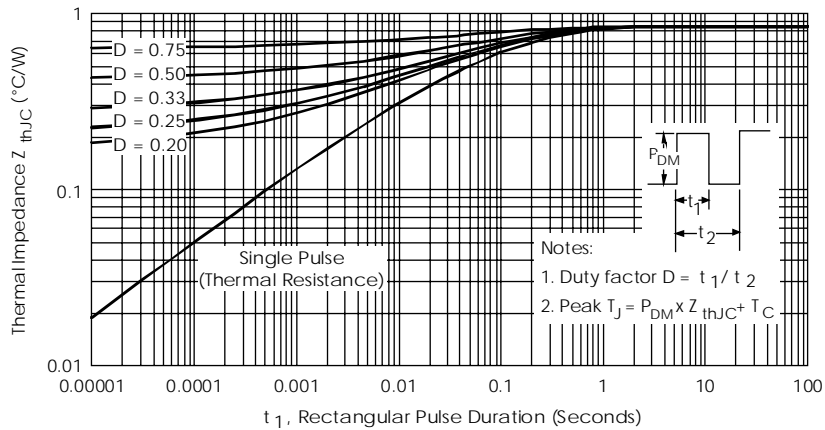


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (PerLeg)

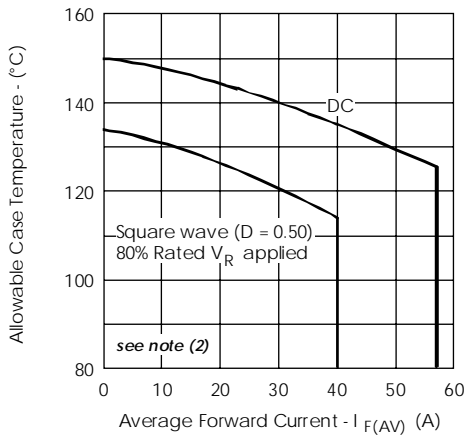


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

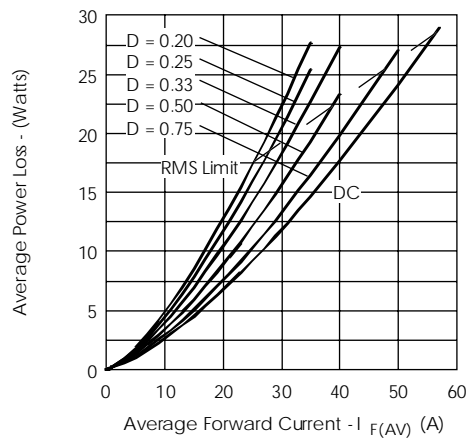


Fig. 6- Forward Power Loss Characteristics (Per Leg)

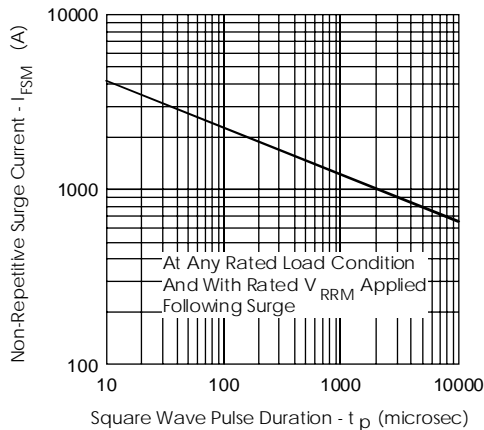


Fig. 7- Max. Non-Repetitive Surge Current (Per Leg)

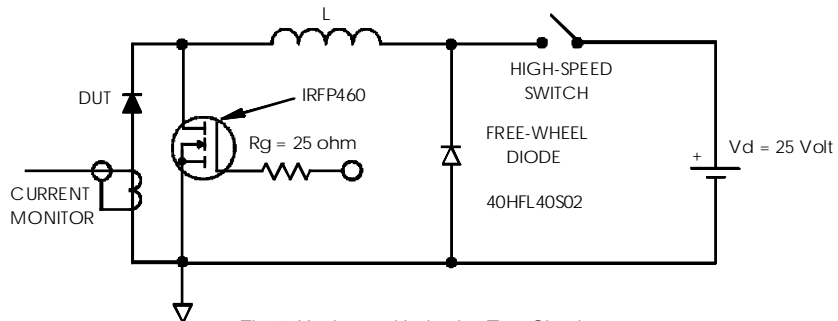
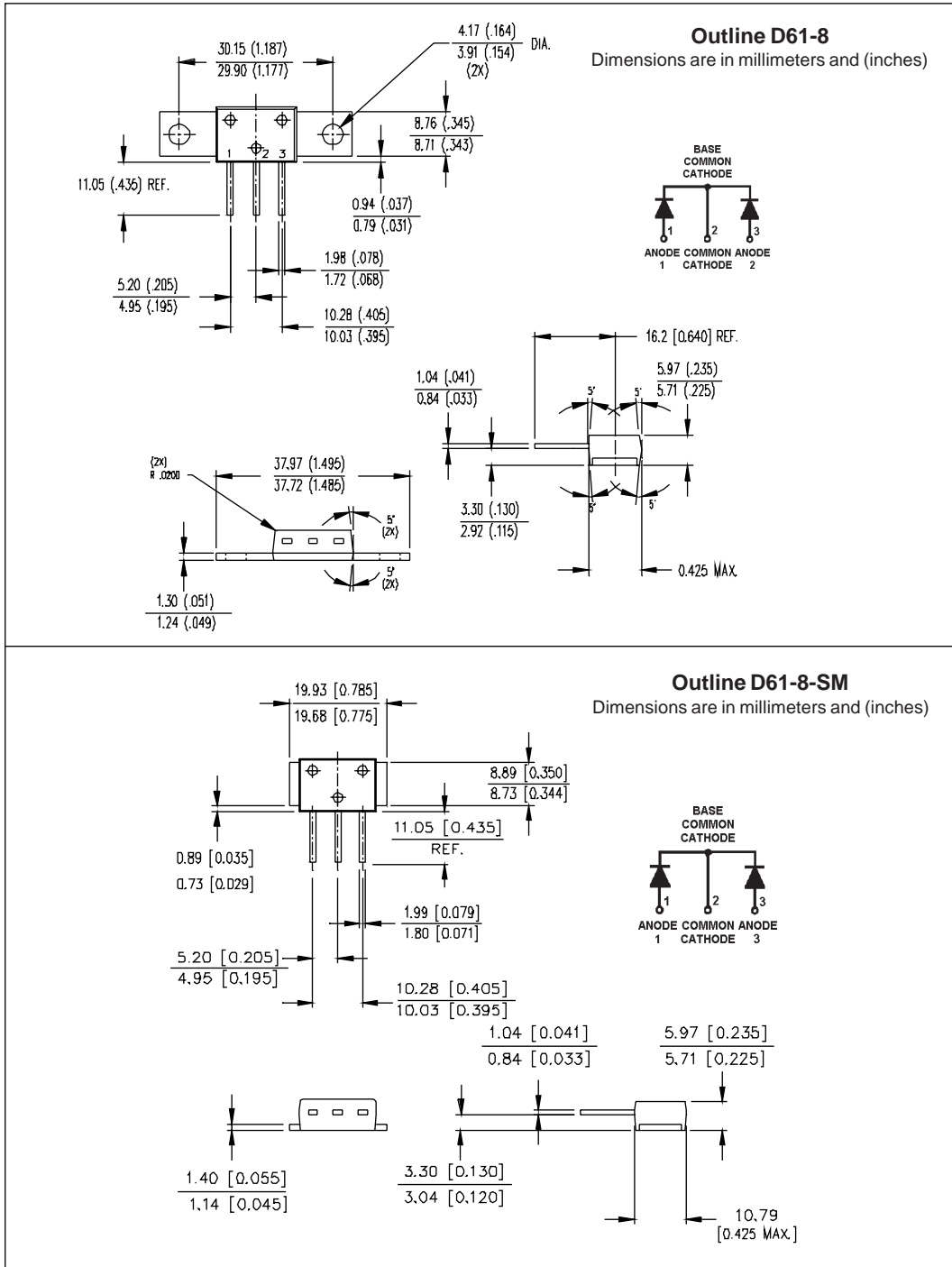


Fig. 8- Unclamped Inductive Test Circuit

- (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);
 $P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R

Outline Table



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