

International  
**IRF** Rectifier

**83CNQ...A SERIES**

**SCHOTTKY RECTIFIER**  
*New GenIII D-61 Package*

**80 Amp**

**Major Ratings and Characteristics**

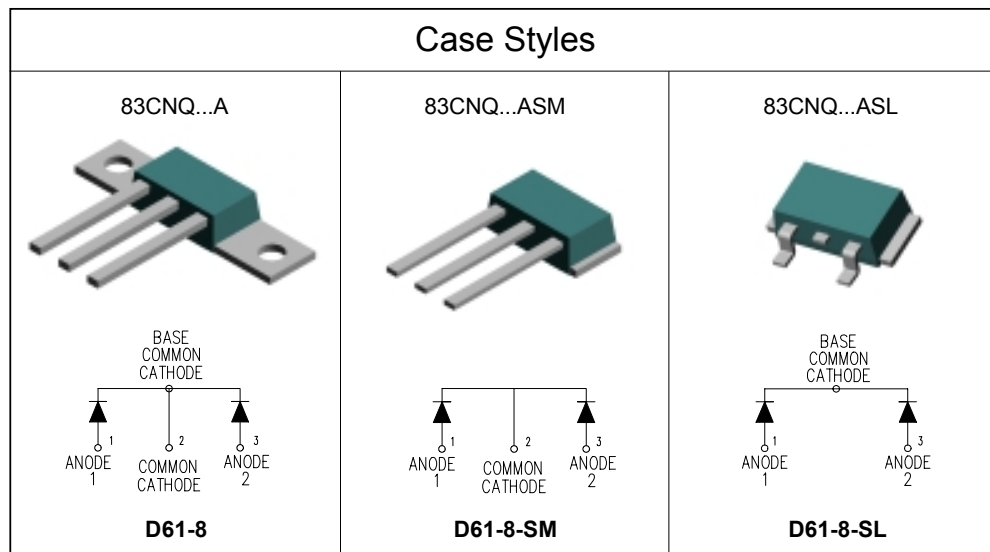
Characteristics	83CNQ...A	Units
$I_{F(AV)}$ Rectangular waveform	80	A
$V_{RRM}$ range	80 to 100	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	7000	A
$V_F$ @40 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.67	V
$T_J$ range	-55 to 175	$^\circ\text{C}$

**Description/Features**

The 83CNQ...A 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  $^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175  $^\circ\text{C}$   $T_J$  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
- *New fully transfer-mold low profile, small footprint, high current package*

**Case Styles**



## Voltage Ratings

Part number	83CNQ080A	83CNQ100A
$V_R$ Max. DC Reverse Voltage (V)	80	100
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)		

## Absolute Maximum Ratings

Parameters	83CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	80	A	50% duty cycle @ $T_C = 132^\circ\text{C}$ , rectangular waveform
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	7000	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse
	720		
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1$ Amps, $L = 30$ mH
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	1	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	83CNQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.81	V	@ 40A
	1.00	V	@ 80A
	0.67	V	@ 40A
	0.82	V	@ 80A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.5	mA	$T_J = 25^\circ\text{C}$
	35	mA	$T_J = 125^\circ\text{C}$
$C_T$ Max. Junction Capacitance (Per Leg)	1400	pF	$V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance (Per Leg)	5.5	nH	Measured lead to lead 5mm from package body
$dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ )	10000	V/ $\mu\text{s}$	

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

## Thermal-Mechanical Specifications

Parameters	83CNQ	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)	0.85	$^\circ\text{C/W}$	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 Device flatness < 5 mils
wt Approximate Weight	7.8(0.28)	g(oz.)	
T Mounting Torque (D61-8 Only)	Min. 12(10)	Kg-cm (lbf-in)	(*)
	Max. 24(20)		

(\*) Recommended hardware 3M stainless screw

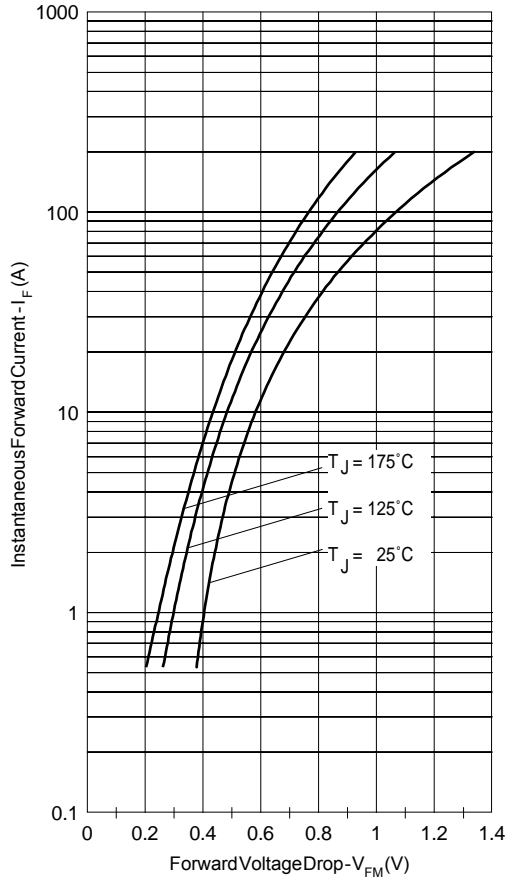


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

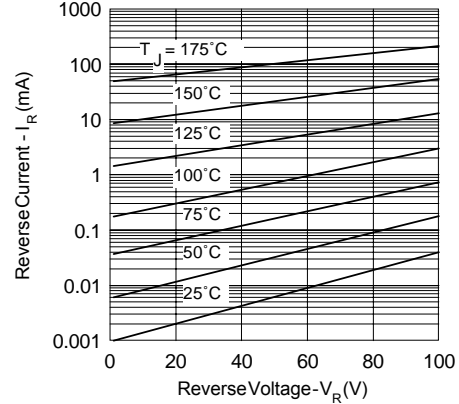


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

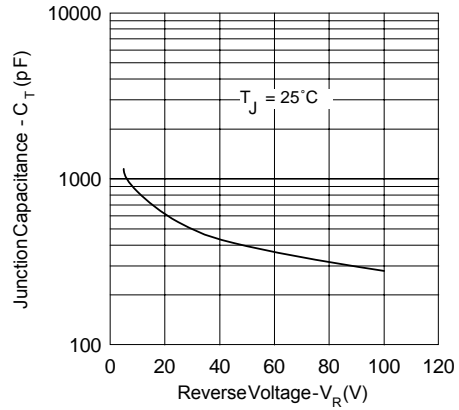


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

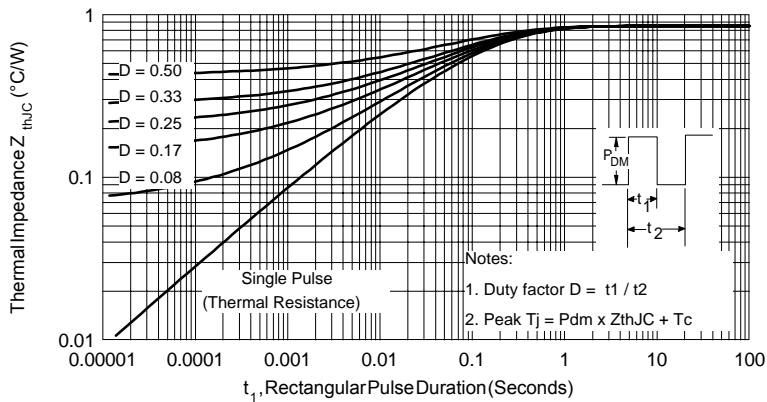


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

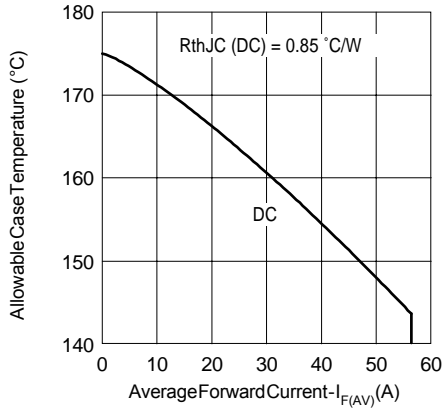


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

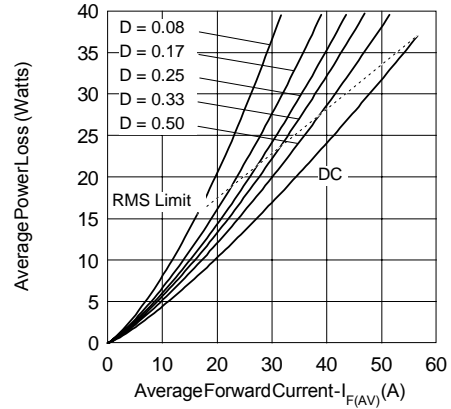


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

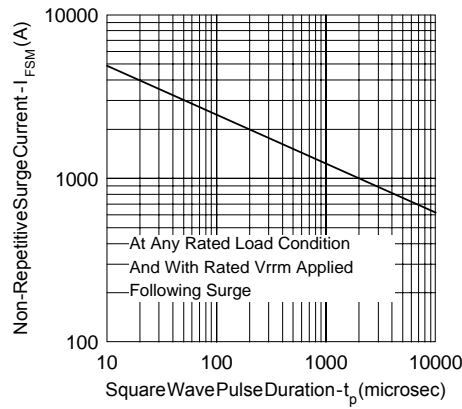


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

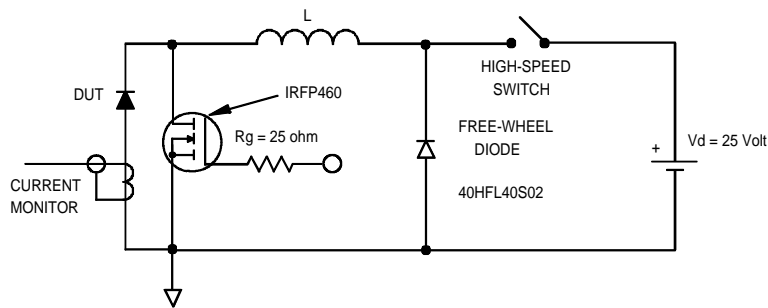
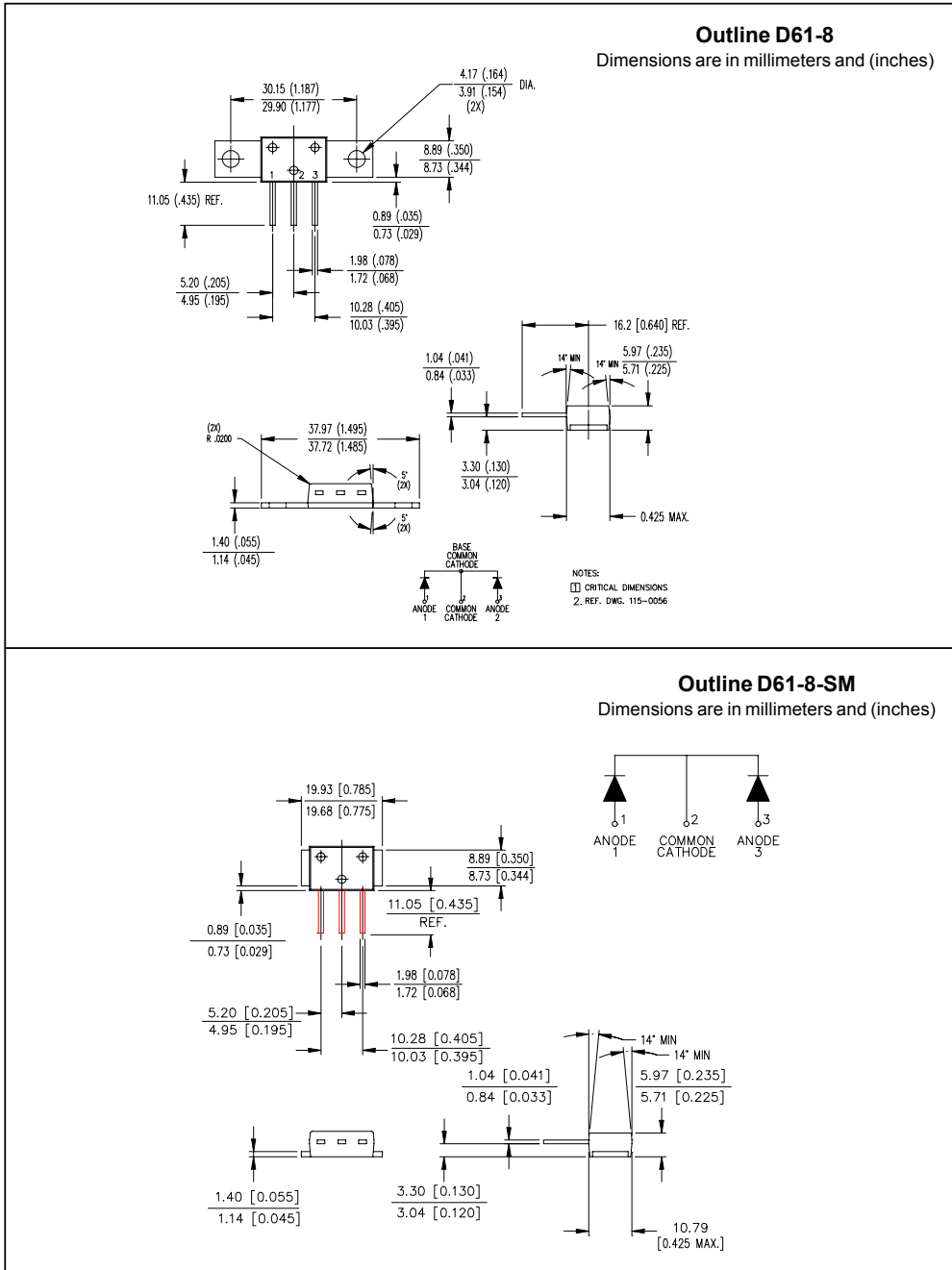
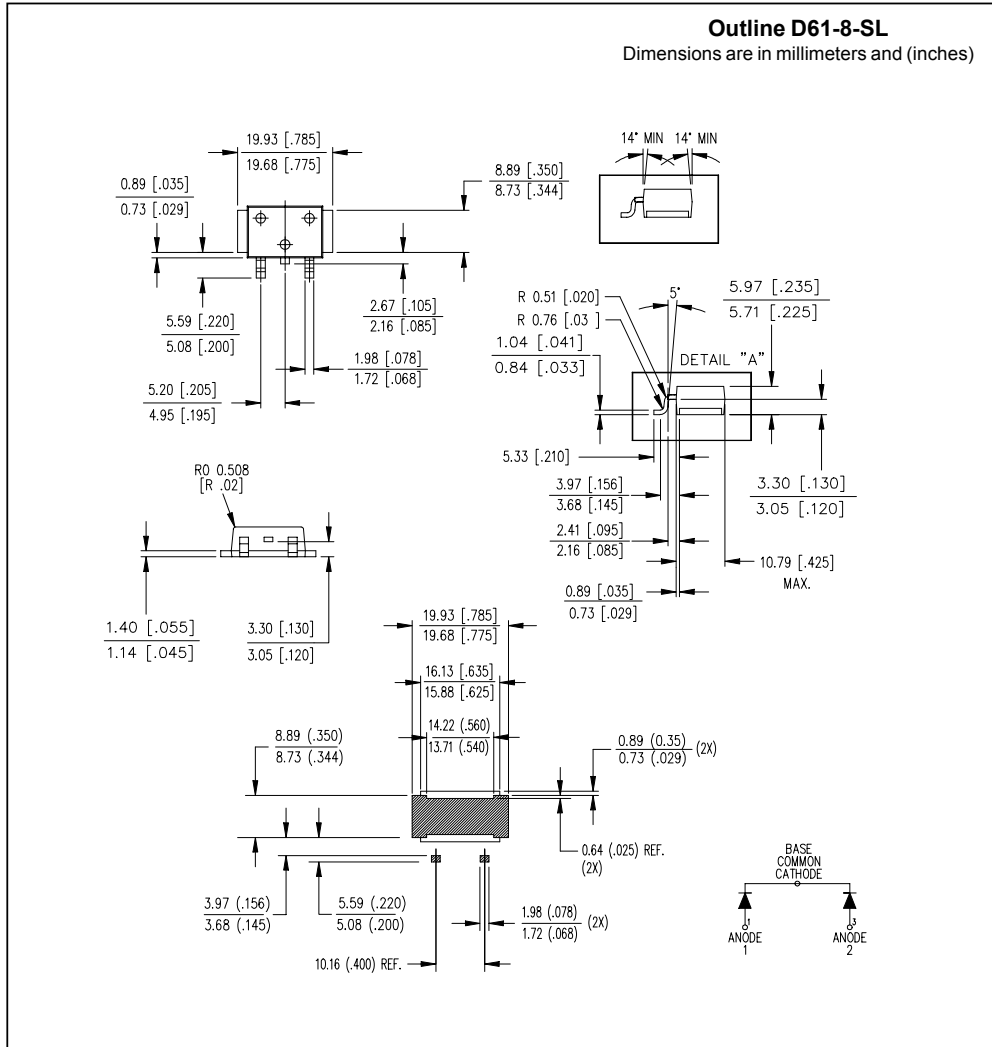


Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



Outline Table



Part Marking Information

<p>EXAMPLE: THIS IS A 83CNQ100A WITH              LOT CODE 89 09              ASSEMBLED ON WW 45, 2000              IN THE ASSEMBLY LINE "A"</p>	
<p><b>D61-8</b></p>	
<p>EXAMPLE: THIS IS A 83CNQ100ASM WITH              LOT CODE 89 09              ASSEMBLED ON WW 45, 2000              IN THE ASSEMBLY LINE "A"</p>	
<p><b>D61-8-SM</b></p>	
<p>EXAMPLE: THIS IS A 83CNQ100ASL WITH              LOT CODE 89 09              ASSEMBLED ON WW 45, 2000              IN THE ASSEMBLY LINE "A"</p>	
<p><b>D61-8-SL</b></p>	

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83CNQ100A
*****
* This model has been developed by *
* Wizard SPICE MODEL GENERATOR (1999) *
* (International Rectifier Corporation) *
* contains Proprietary Information *
*****
* SPICE Model Diode is composed by a *
* simple diode plus paralalled VCG2T *
*****
.SUBCKT 83CNQ100A ANO CAT
D1 ANO 1 DMOD (0.20831)
*Define diode model
.MODEL DMOD D(IS=3.91765102575707E-04A,N=1.6412007115037,BV=110V,
+IBV=1.66611874283115A,RS=0.001083212,CJO=1.31909764291715E-08,
+VJ=1.04145964983498,XTI=2,EG=0.757359996913038)
*****
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES(R=1,TC1=-5.06642501757023)
GP1 ANO CAT VALUE={-ABS(I(VX))*(EXP(((2.558893E-02/-5.066425)*(V(2,CAT)*1E6)/(I(VX)+1E-6)-1))+1)*3.120336E-
03*ABS(V(ANO,CAT)))-1}}
*****
.ENDS 83CNQ100A

Thermal Model Subcircuit
.SUBCKT 83CNQ100A 5 1

CTHERM1 5 4 8.75E-04
CTHERM2 4 3 1.99E+00
CTHERM3 3 2 2.04E+01
CTHERM4 2 1 2.41E+02

RTHERM1 5 4 1.00E-07
RTHERM2 4 3 4.51E-01
RTHERM1 3 2 3.08E-01
RTHERM1 2 1 7.27E-02

.ENDS 83CNQ100A

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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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