Bulletin PD-21007 01/05

International
IOR Rectifier

83CNQ...APbF
83CNQ...ASMPbF

SCHOTTKY RECTIFIER
New GenIII D-61 Package

80 Amp

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	80	A
V_{RRM}	range	80, 100	V
I_{FSM}	@ tp = 5 µs sine	7000	A
V_F	@ 40 Apk, T_J = 125°C (per leg)	0.67	V
T_J	range	- 55 to 175	°C

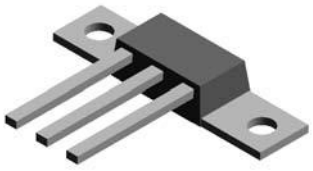
Description/ Features

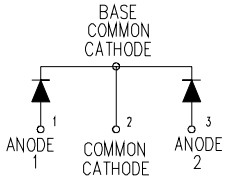
The center tap Schottky rectifier module series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175 °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*
- Through-hole versions are currently available for use in Lead-Free applications ("PbF" suffix)

Case Styles

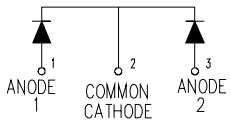
83CNQ...APbF





D61-8

83CNQ...ASMPbF



D61-8-SM

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 °C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	7000	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current (Per Leg) * See Fig. 7	720		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	15	mJ	T_J = 25 °C, I_{AS} = 1 Amps, L = 30 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	1	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x 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	T_J = 25 °C
		1.00	V	@ 80A	
		0.67	V	@ 40A	T_J = 125 °C
		0.82	V	@ 80A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.5	mA	T_J = 25 °C	V_R = rated V_R
		35	mA	T_J = 125 °C	
C_T	Max. Junction Capacitance (Per Leg)	1400	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)	10000	V/ µs		

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

Thermal-Mechanical Specifications

	Parameters		83CNQ	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 175	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 175	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		0.85	°C/W	DC operation * See Fig. 4
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		0.42	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink **(D61-8 Only)**		0.30	°C/W	Mounting surface , smooth and greased Device flatness < 5 mils
wt	Approximate Weight		7.8 (0.28)	g (oz.)	
T	Mounting Torque	Min.	12 (10)	Kg-cm (lbf-in)	(*)
	(D61-8 Only)	Max.	24 (20)		

(*) Recommended hardware 3M stainless screw

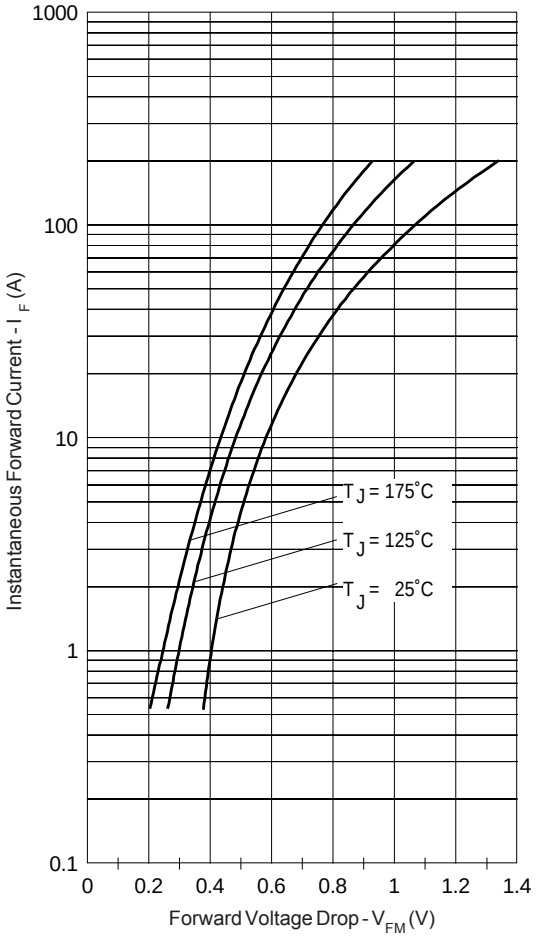


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

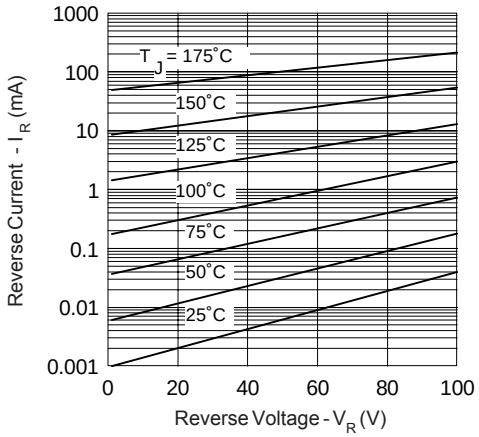


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

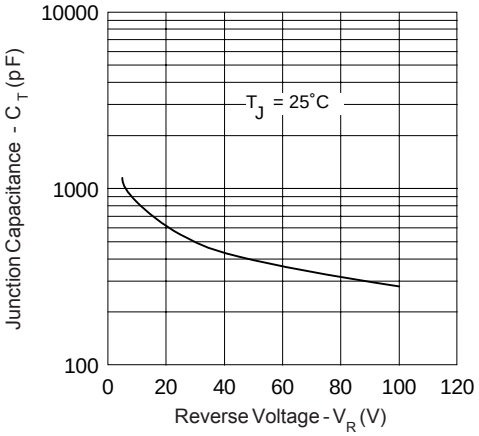


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

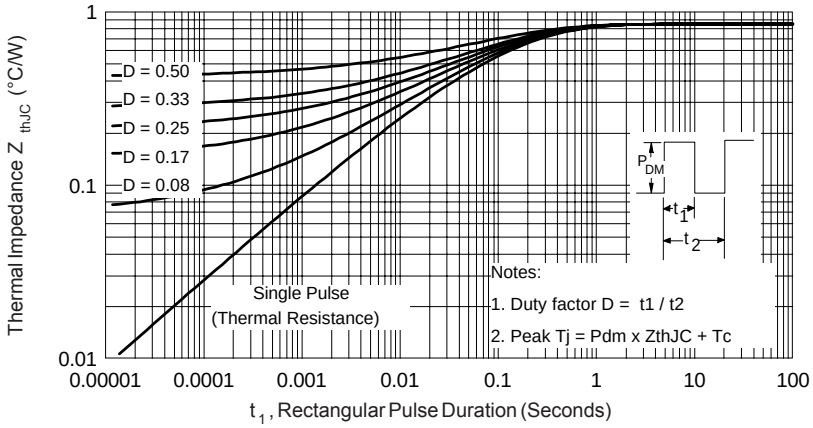


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

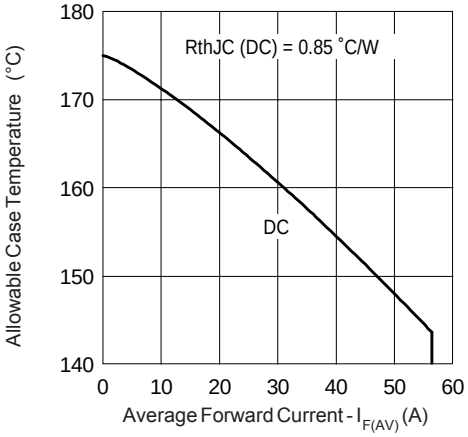


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

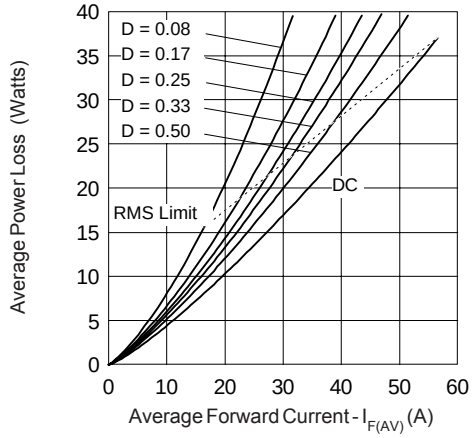


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

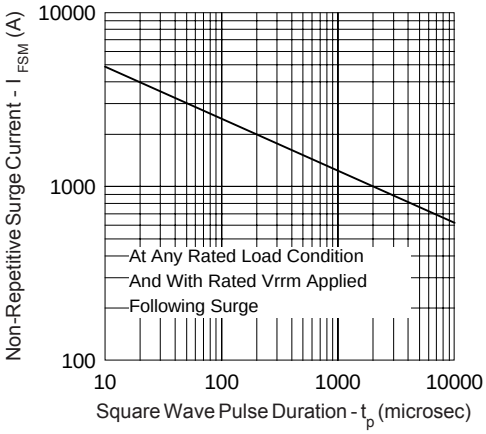


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

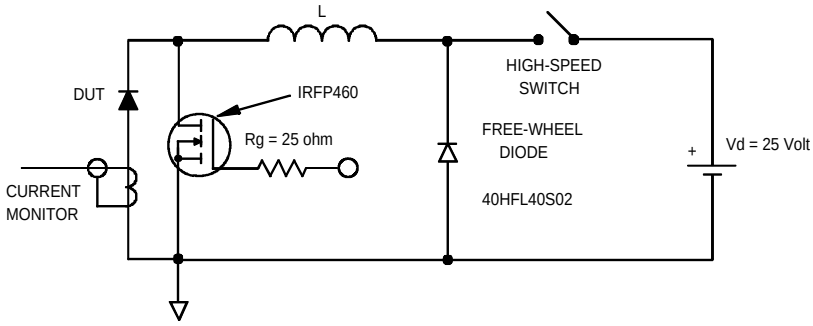
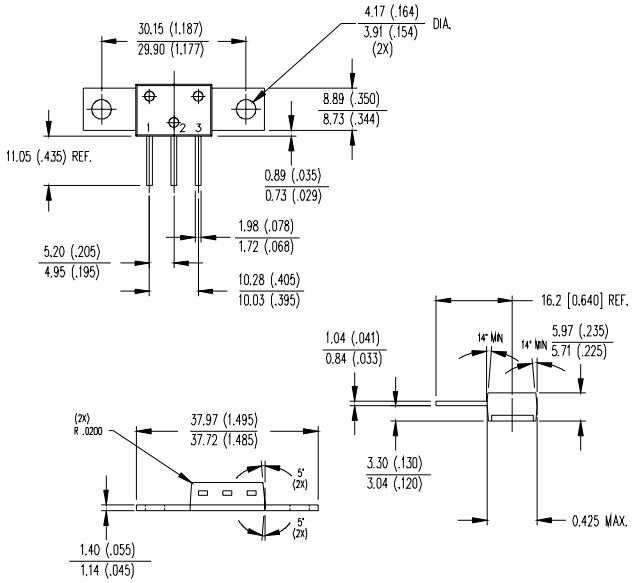


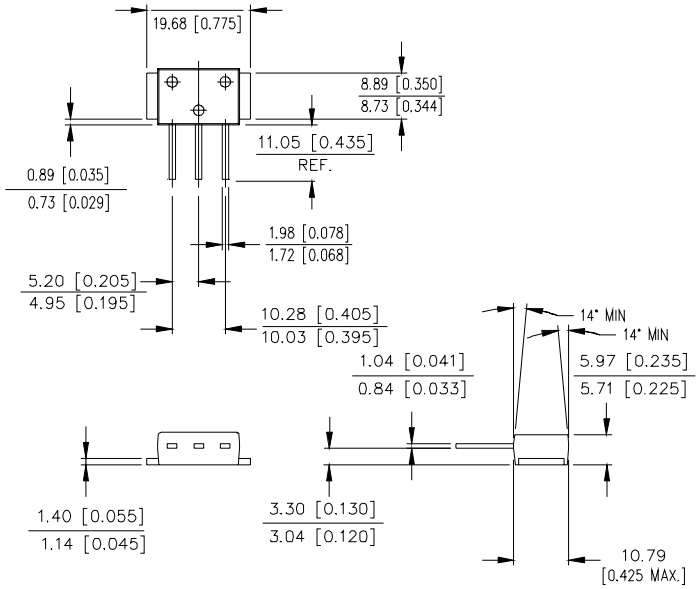
Fig. 8 - Unclamped Inductive Test Circuit

Outline Table

Outline D61-8
Dimensions are in millimeters and (inches)



Outline D61-8-SM
Dimensions are in millimeters and (inches)

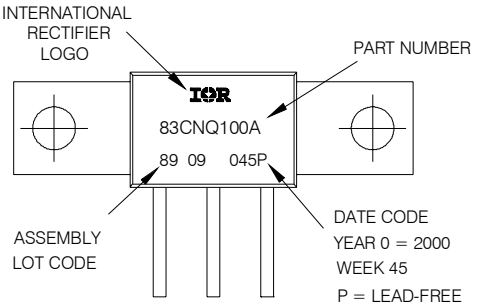


Marking Information

Outline D61-8

EXAMPLE: THIS IS A 83CNQ100 WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000

Note: "P" in assembly line
position indicates "Lead-Free"



Outline D61-8-SM

EXAMPLE: THIS IS A 83CNQ100ASM WITH
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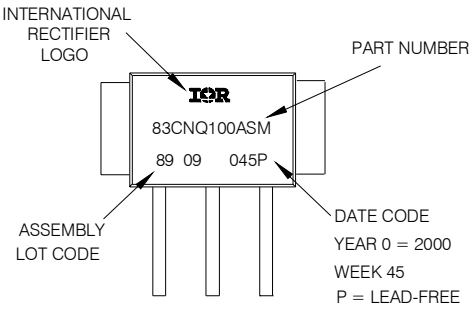
ASSEMBLED ON WW 45, 2000

Note: "P" in assembly line
position indicates "Lead-Free"



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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 paralled 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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Ordering Information Table

Device Code

83	C	N	Q	100	A	PbF
(1)	(2)	(3)	(4)	(5)	(6)	(7)

1 - Current Rating (80A)

2 - Circuit Configuration
C = Common Cathode

3 - Package
N = D-61

4 - Schottky "Q" Series

5 - Voltage Ratings
080 = 80V
100 = 100V

6 - • A = D-61-8 package style
• ASM = D-61-8-SM package style

7 - • none = Standard Production
• PbF = Lead-Free

Standard pack quantity: A = 10 pieces
ASM = 20 pieces

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.

International
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
01/05

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