



83CNQ...GA
83CNQ...GASM
83CNQ...GASL

SCHOTTKY RECTIFIER
New GenIII D-61 Package

80 Amp

$I_{F(AV)} = 80\text{Amp}$
 $V_R = 80\text{-}100\text{V}$

Major Ratings and Characteristics

| Characteristics | Values | Units |
|---|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform | 80 | A |
| V_{RRM} range | 80 - 100 | V |
| I_{FSM} @ tp = 5 μ s sine | 5800 | 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...AG 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

| 83CNQ...GA | 83CNQ...GASM | 83CNQ...GASL |
|--|---|--|
| | | |
| <p>BASE COMMON CATHODE</p> <p>1 ANODE 2 COMMON CATHODE 3 ANODE</p> | <p>1 ANODE 2 COMMON CATHODE 3 ANODE</p> | <p>BASE COMMON CATHODE</p> <p>1 ANODE 2 ANODE 3 COMMON CATHODE</p> |
| D61-8 | D61-8-SM | D61-8-SL |

Voltage Ratings

| Part number | 83CNQ080GA | 83CNQ100GA |
|---|------------|------------|
| 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 wave form |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 5800 | A | 5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse |
| | 600 | | |
| 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 μsec 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 $T_J = 25^\circ\text{C}$ |
| | 1.00 | V | @ 80A |
| | 0.67 | V | @ 40A $T_J = 125^\circ\text{C}$ |
| | 0.82 | V | @ 80A |
| I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 0.4 | mA | $T_J = 25^\circ\text{C}$ |
| | 35 | mA | $T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$ |
| 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 | 10000 | V/ μs | (Rated V_R) |

(1) Pulse Width < 300 μs , 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) | Recommended hardware 3M stainless screw |
| | Max. | 24 (20) | |
| Device Marking | 83CNQ...GA | | Case style D61-8 |
| | 83CNQ...GASM | | Case style D61-8-SM |
| | 83CNQ...GASL | | Case style D61-8-SL |

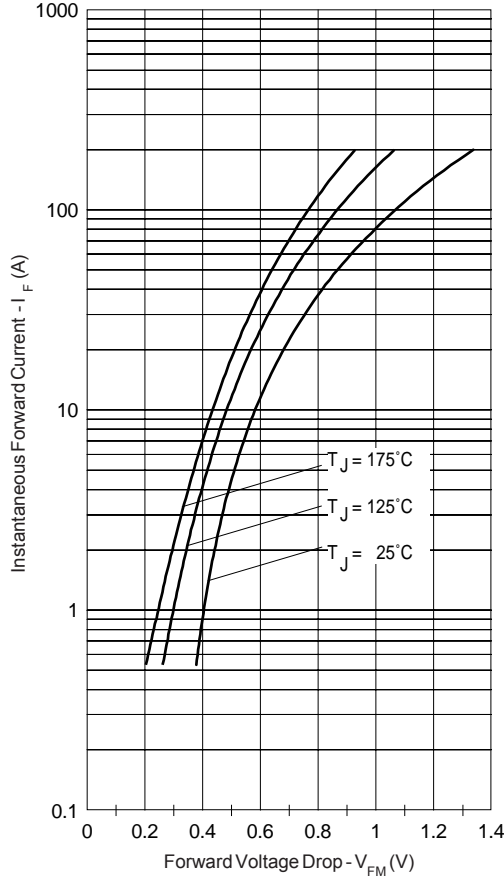


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

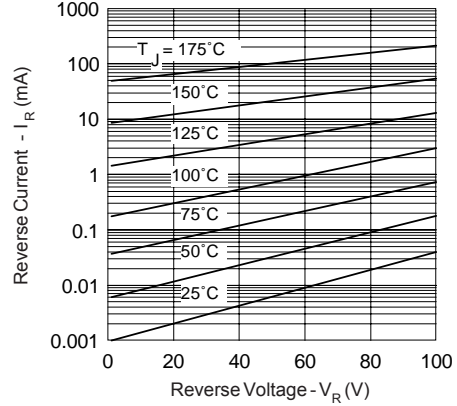


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

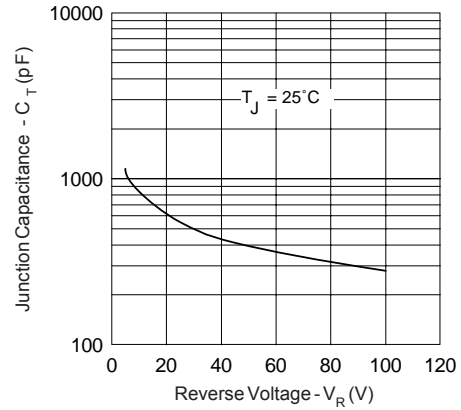


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

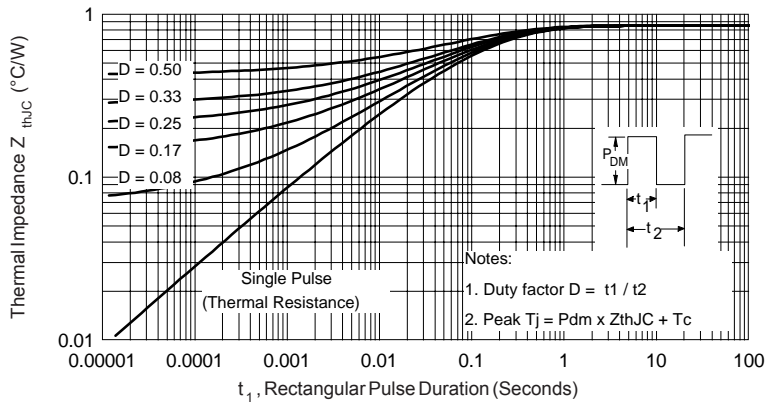


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

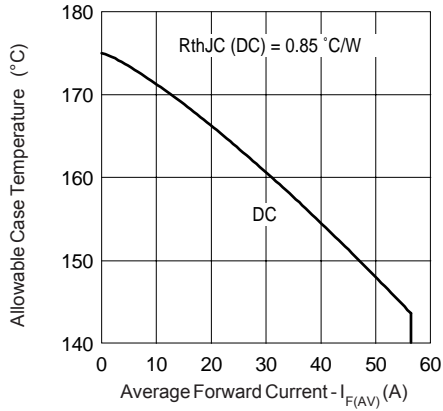


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

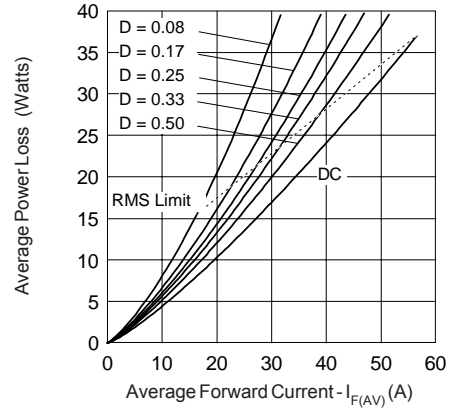


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

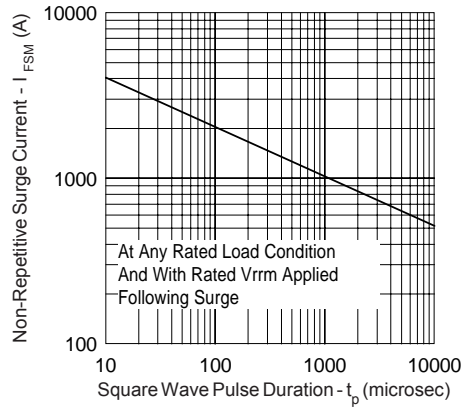


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

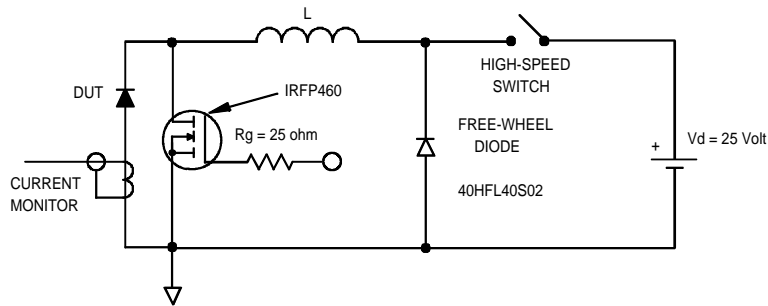
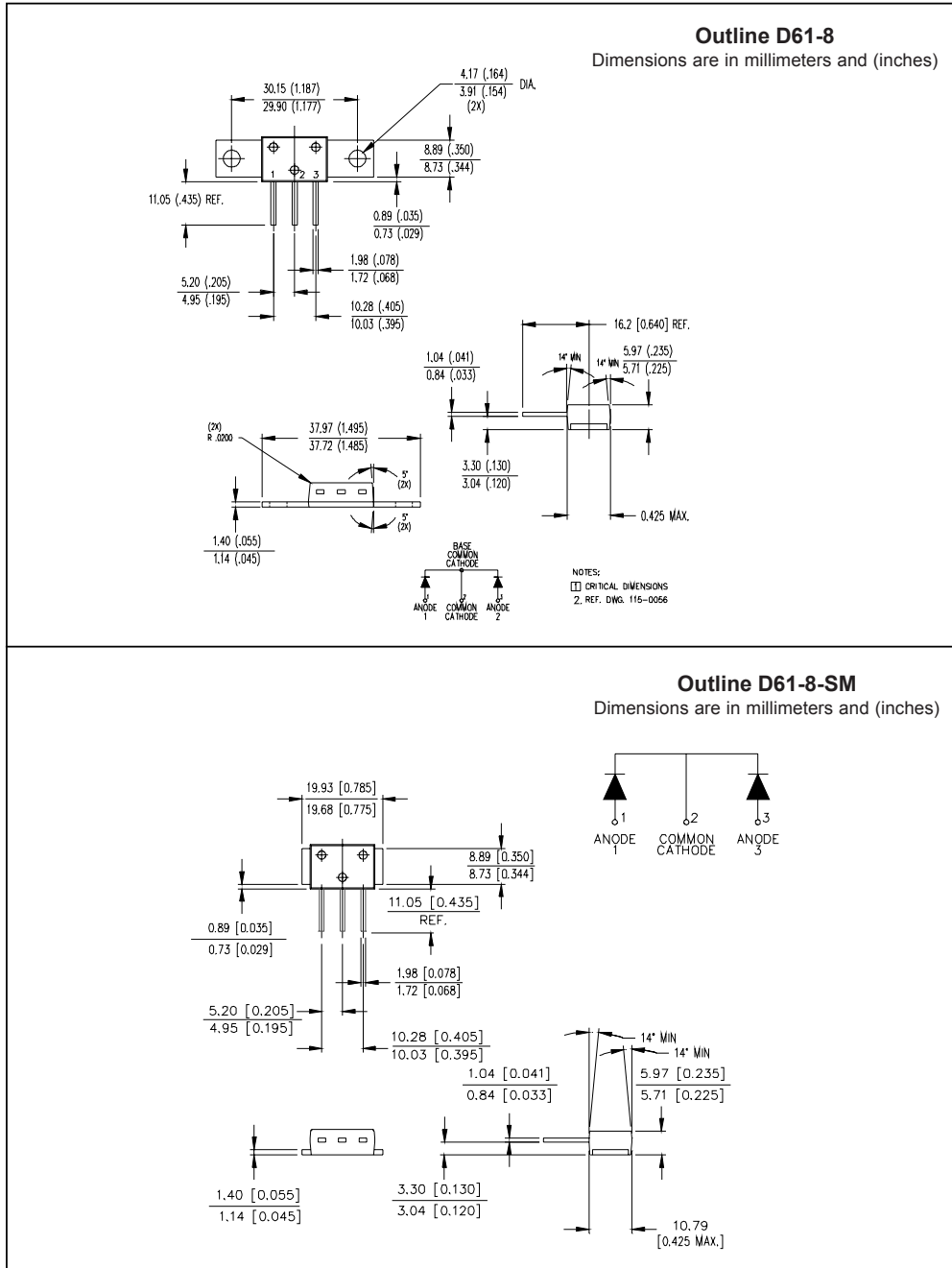


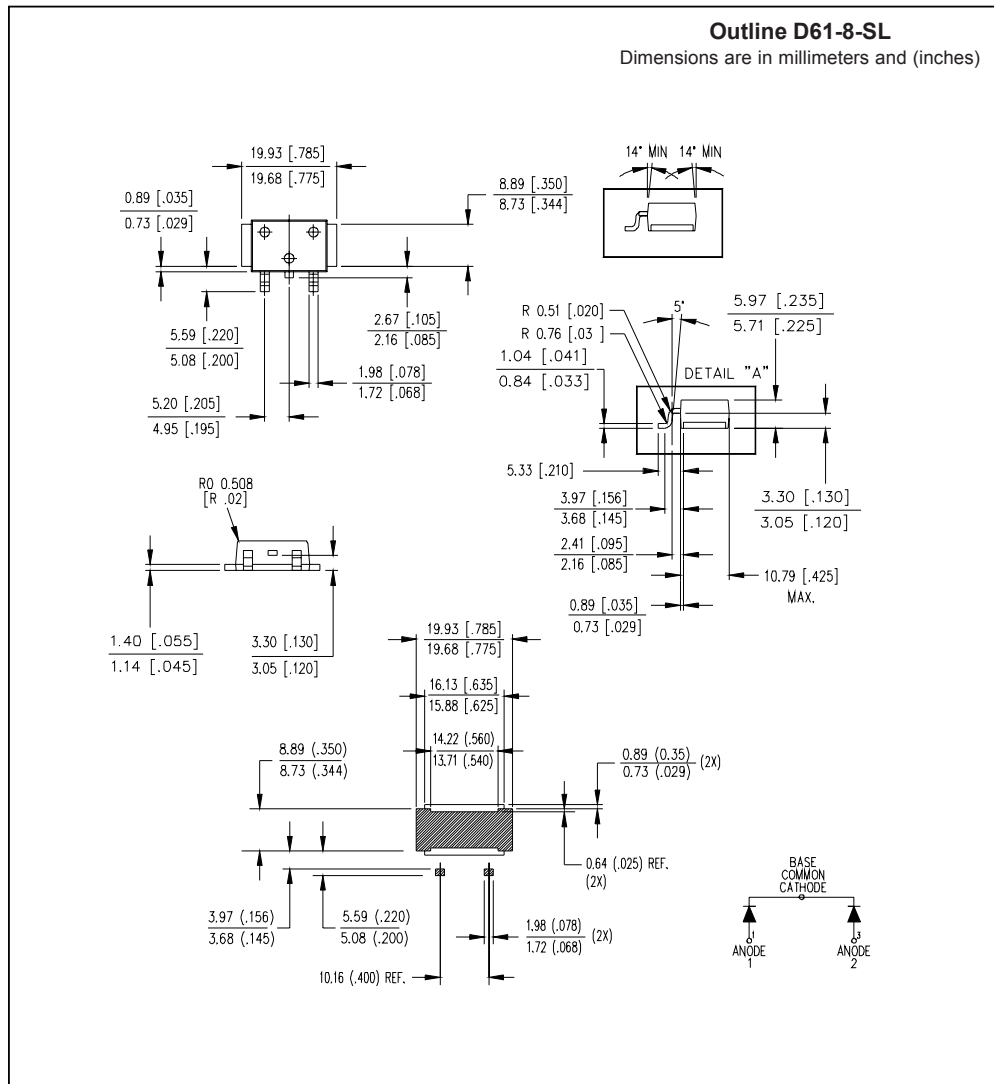
Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



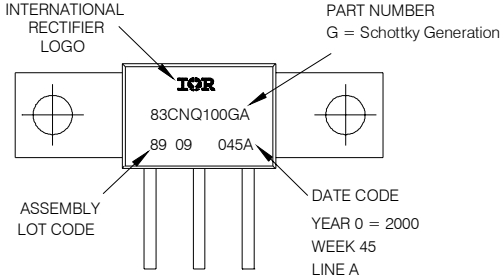
Outline D61-8-SM
 Dimensions are in millimeters and (inches)

Outline Table



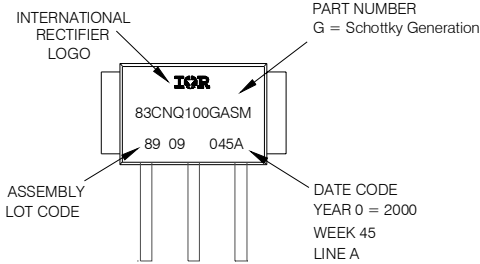
Part Marking Information

EXAMPLE: THIS IS A 83CNQ100GA WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000
IN THE ASSEMBLY LINE "A"



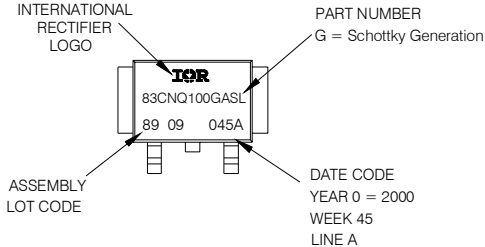
D61-8

EXAMPLE: THIS IS A 83CNQ100GASM WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000
IN THE ASSEMBLY LINE "A"



D61-8-SM

EXAMPLE: THIS IS A 83CNQ100GASL WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000
IN THE ASSEMBLY LINE "A"



D61-8-SL

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 paraladed 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

R THERM1 5 4 1.00E-07

R THERM2 4 3 4.51E-01

R THERM1 3 2 3.08E-01

R THERM1 2 1 7.27E-02

.ENDS 83CNQ100A

Ordering Information Table

| Device Code | 83 | C | N | Q | 100 | G | A | - |
|-------------|----|--|---|---|-----|---|---|---|
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
| 1 | - | Current Rating (80A) | | | | | | |
| 2 | - | C = Common Cathode | | | | | | |
| 3 | - | N = Module (Not Isolated) | | | | | | |
| 4 | - | Q = Schottky Q Series | | | | | | |
| 5 | - | Voltage Ratings | | | | | | |
| 6 | - | G = Schottky Generation | | | | | | |
| 7 | - | <ul style="list-style-type: none"> • A = D-61-8 (10 pieces) • ASL = D61-8-SL (20 pieces) • ASM = D61-8-SM (20 pieces) | | | | | | |
| 8 | - | <ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free | | | | | | |

080 = 80V
 100 = 100V

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.