

SCHOTTKY RECTIFIER
New GenIII D-61 Package

80 Amp

Major Ratings and Characteristics

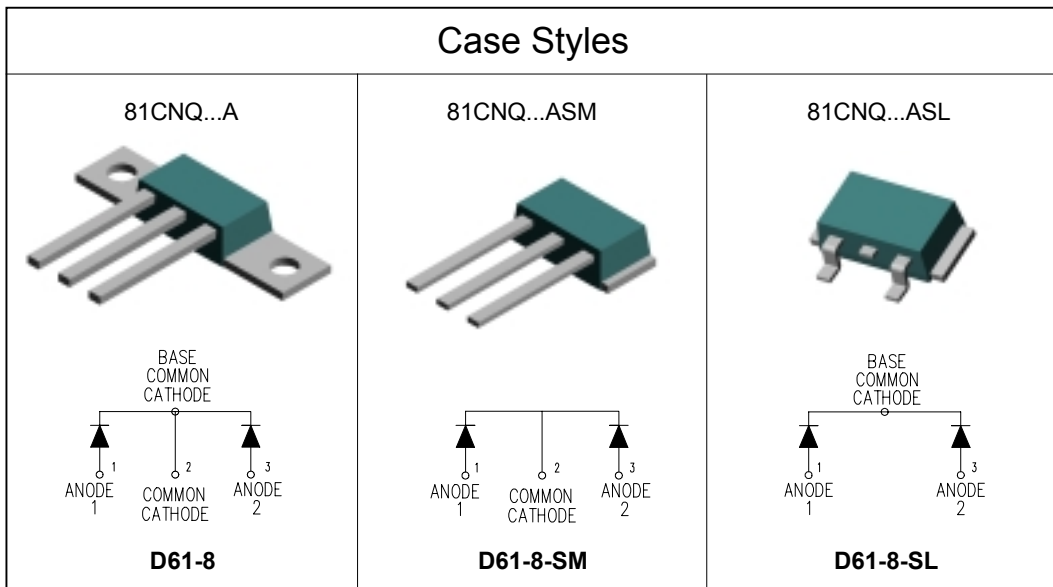
| Characteristics | 81CNQ...A | Units |
|---|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform | 80 | A |
| V_{RRM} range | 35 to 45 | V |
| I_{FSM} @tp = 5 μ s sine | 4600 | A |
| V_F @40Apk, $T_J = 125^\circ\text{C}$ (per leg) | 0.54 | V |
| T_J range | -55 to 175 | $^\circ\text{C}$ |

Description/Features

The 81CNQ...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 | 81CNQ035A | 81CNQ040A | 81CNQ045A |
|---|-----------|-----------|-----------|
| V_R Max. DC Reverse Voltage (V) | 35 | 40 | 45 |
| V_{RWM} Max. Working Peak Reverse Voltage (V) | | | |

Absolute Maximum Ratings

| Parameters | 81CNQ | Units | Conditions |
|---|-------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current * See Fig. 5 | 80 | A | 50% duty cycle @ $T_C = 141^\circ\text{C}$, rectangular waveform |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 4600 | A | Following any rated load condition and with rated V_{RRM} applied |
| | 790 | | |
| 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 | 81CNQ | Units | Conditions |
|--|-------|------------------|---|
| V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1) | 0.60 | V | @ 40A |
| | 0.74 | V | @ 80A |
| | 0.54 | V | @ 40A |
| | 0.66 | V | @ 80A |
| I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 5 | mA | $T_J = 25^\circ\text{C}$ |
| | 45 | mA | $T_J = 125^\circ\text{C}$ |
| 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) | 10000 | V/ μs | |

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

Thermal-Mechanical Specifications

| Parameters | 81CNQ | 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 | $^\circ\text{C}/\text{W}$ | DC operation * See Fig. 4 |
| R_{thJC} Max. Thermal Resistance Junction to Case (Per Package) | 0.42 | $^\circ\text{C}/\text{W}$ | DC operation |
| R_{thCS} Typical Thermal Resistance, Case to Heatsink (D61-8 Only) | 0.30 | $^\circ\text{C}/\text{W}$ | 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. | 40(35) | Kg-cm (lbf-in) |
| | Max. | 58(50) | |

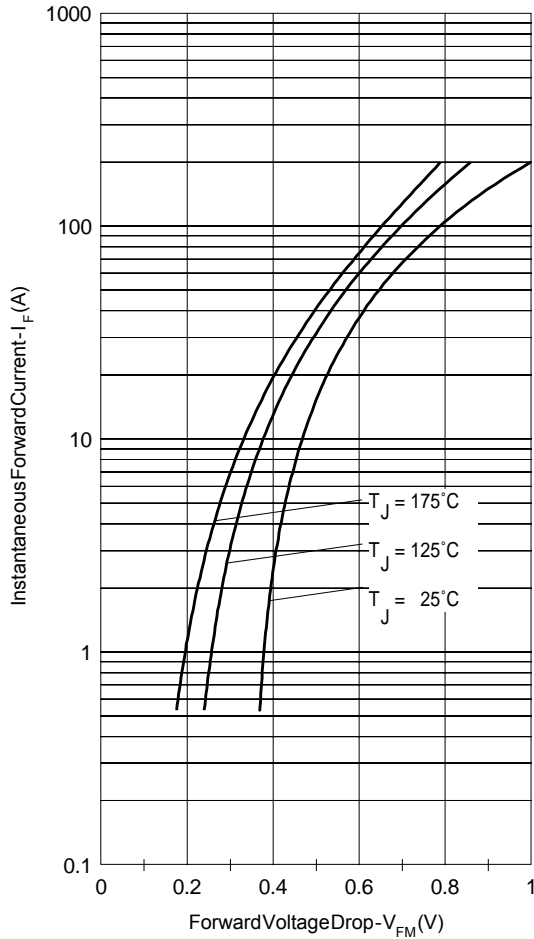


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

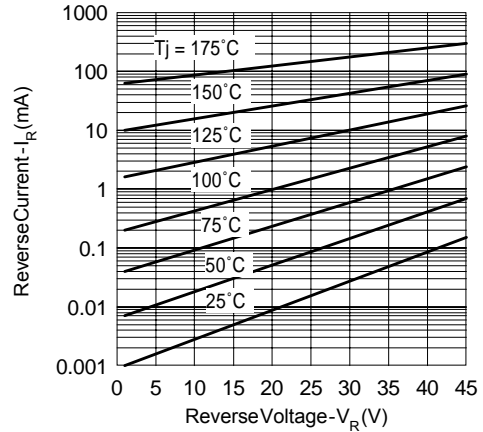


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

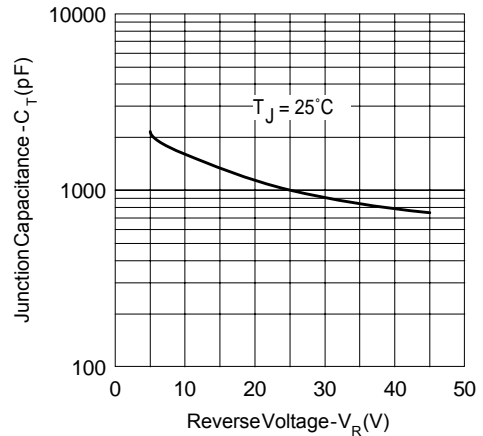


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

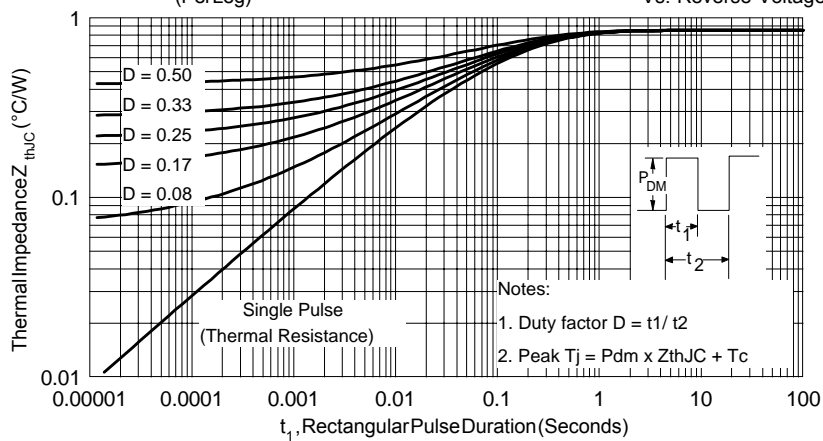


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

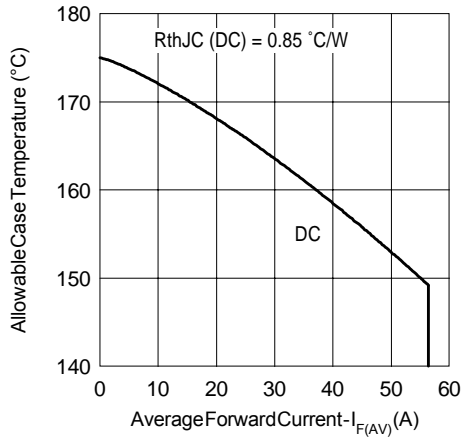


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

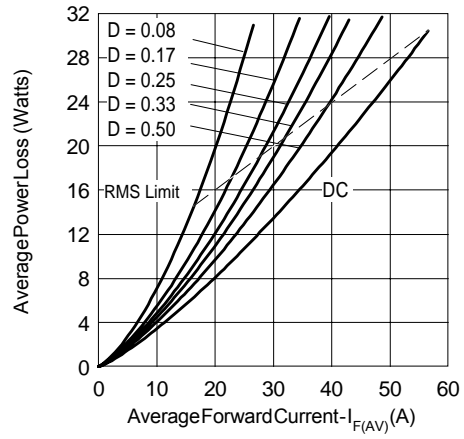


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

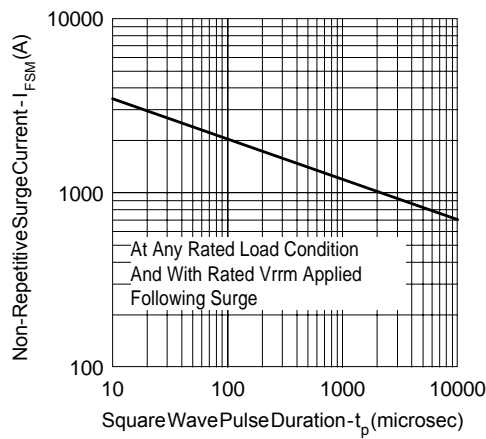


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

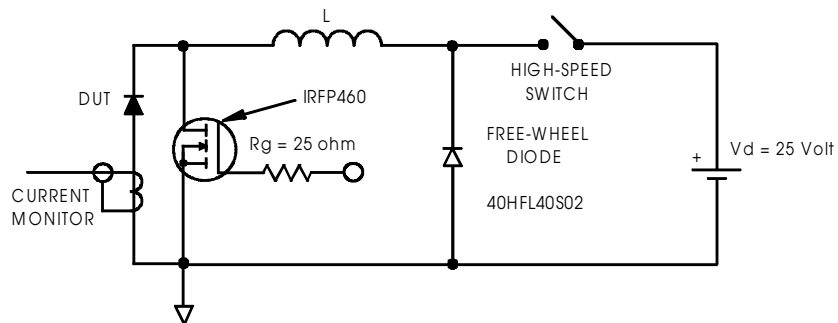
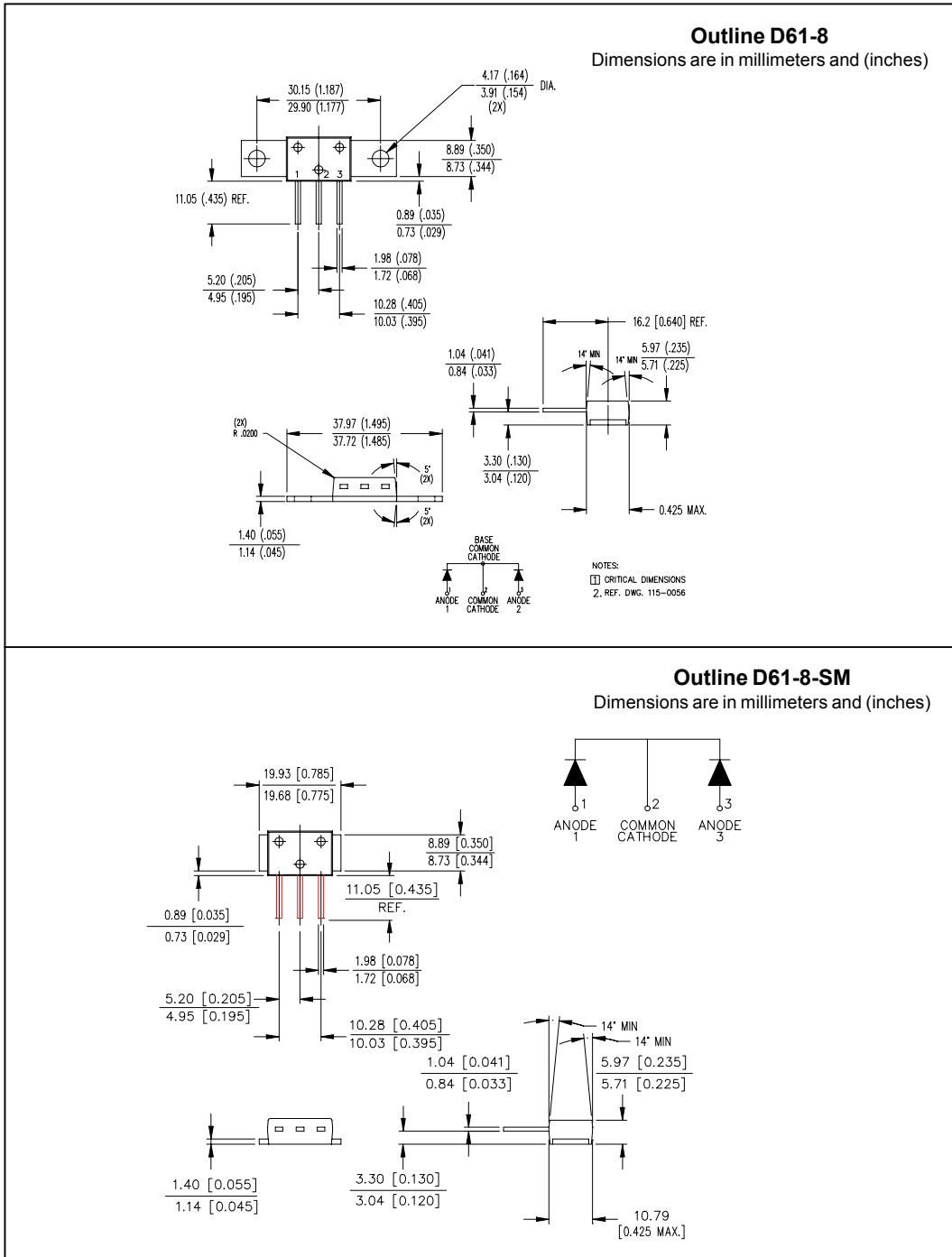


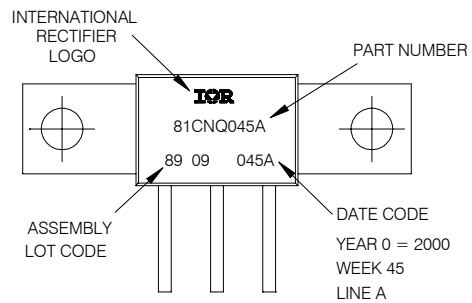
Fig. 8 - Unclamped Inductive Test Circuit

Outline Table



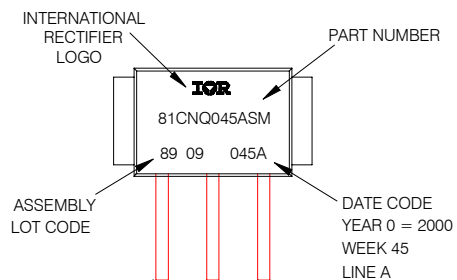
Part Marking Information

EXAMPLE: THIS IS A 81CNQ045A WITH
 LOT CODE 89 09
 ASSEMBLED ON WW 45, 2000
 IN THE ASSEMBLY LINE "A"



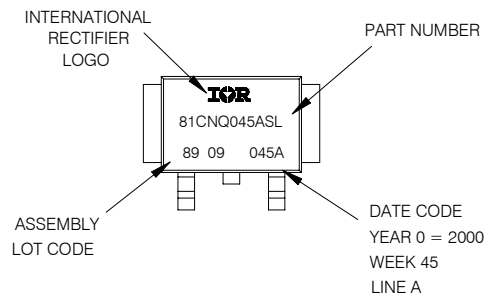
D61-8

EXAMPLE: THIS IS A 81CNQ045ASM WITH
 LOT CODE 89 09
 ASSEMBLED ON WW 45, 2000
 IN THE ASSEMBLY LINE "A"



D61-8-SM

EXAMPLE: THIS IS A 81CNQ045ASL WITH
 LOT CODE 89 09
 ASSEMBLED ON WW 45, 2000
 IN THE ASSEMBLY LINE "A"



D61-8-SL

81CNQ...A Series

Bulletin 20040 rev. A 09/01

International
IOR Rectifier

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.

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