

Bulletin PD-21002 01/05

International
IR Rectifier

80CNQ...APbF
80CNQ...ASMPbF

SCHOTTKY RECTIFIER
New GenIII D-61 Package

80 Amp

Major Ratings and Characteristics

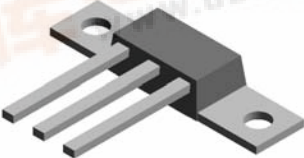
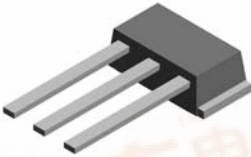
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	80	A
V_{RRM} range	35 to 45	V
I_{FSM} @tp = 5 μ s sine	5800	A
V_F @40 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.47	V
T_J range	-55 to 150	$^\circ\text{C}$

Description/ Features

The 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°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150°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
- *New fully transfer-mould low profile, small footprint, high current package*
- Through-hole versions are currently available for use in Lead-Free applications ("PbF" suffix)

Case Styles

<p>80CNQ...APbF</p>  <p>Diagram showing the pin configuration for the 80CNQ...APbF module. The central pin (2) is labeled "COMMON CATHODE". The two outer pins (1 and 3) are labeled "ANODE 1" and "ANODE 2" respectively. The package is identified as "D61-8".</p>	<p>80CNQ...ASMPbF</p>  <p>Diagram showing the pin configuration for the 80CNQ...ASMPbF module. The central pin (2) is labeled "COMMON CATHODE". The two outer pins (1 and 3) are labeled "ANODE 1" and "ANODE 2" respectively. The package is identified as "D61-8-SM".</p>
---	---



Voltage Ratings

Part number	80CNQ035A..	80CNQ040A..	80CNQ045A..
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 (Per Leg) Current * See Fig. 5 (Per Device)	40 80	A	50% duty cycle @ $T_C = 114^\circ\text{C}$, rectangular wave form
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	$T_J = 25^\circ\text{C}$, $I_{AS} = 8\text{ Amps}$, $L = 1.7\text{ mH}$
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)	10000	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 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)	

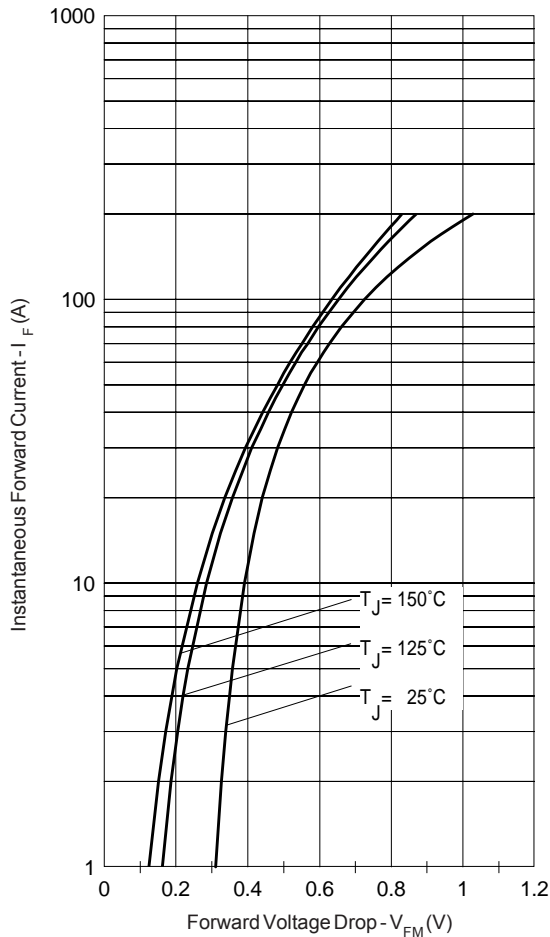


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

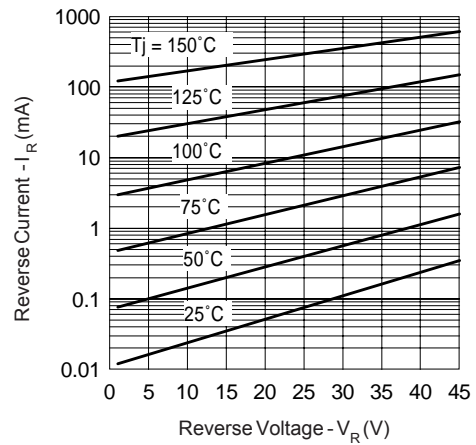


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

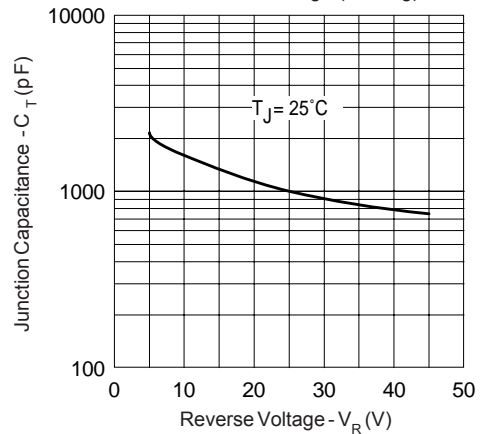


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

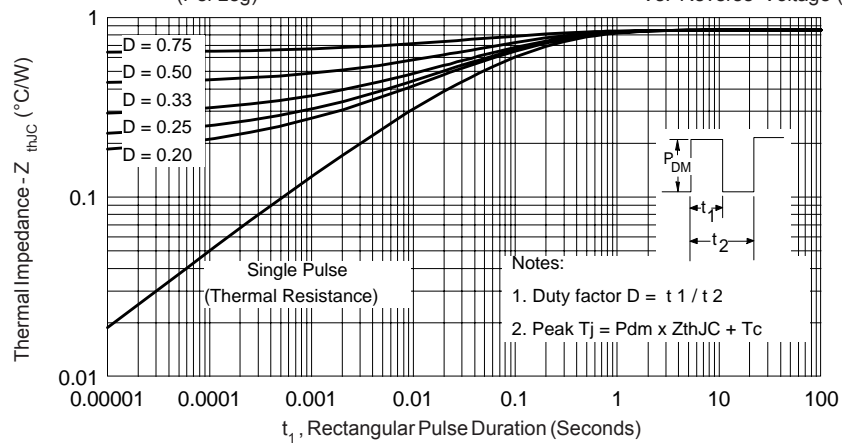


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

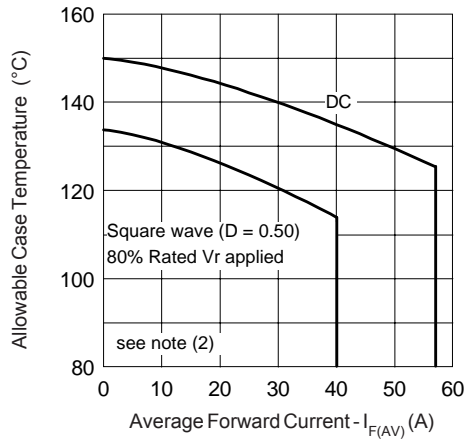


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

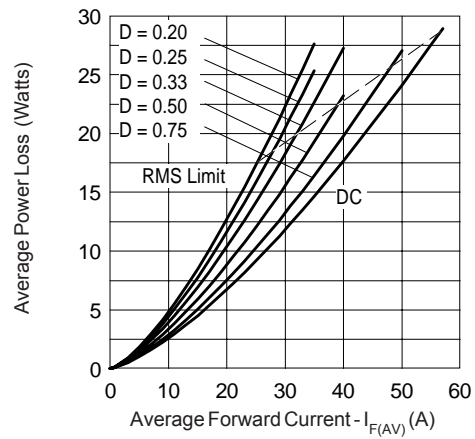


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

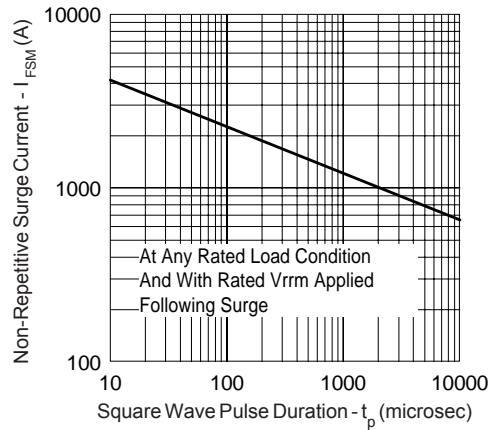


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

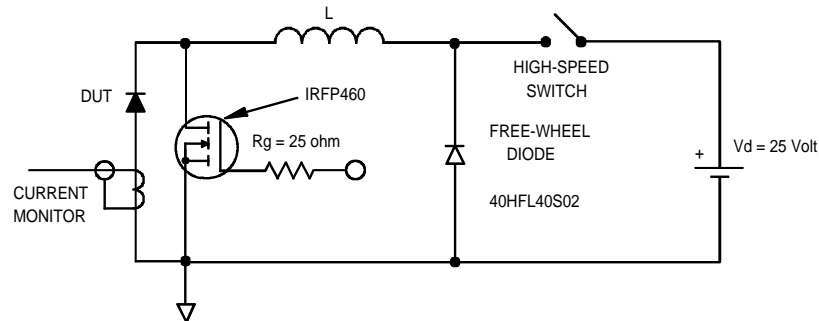


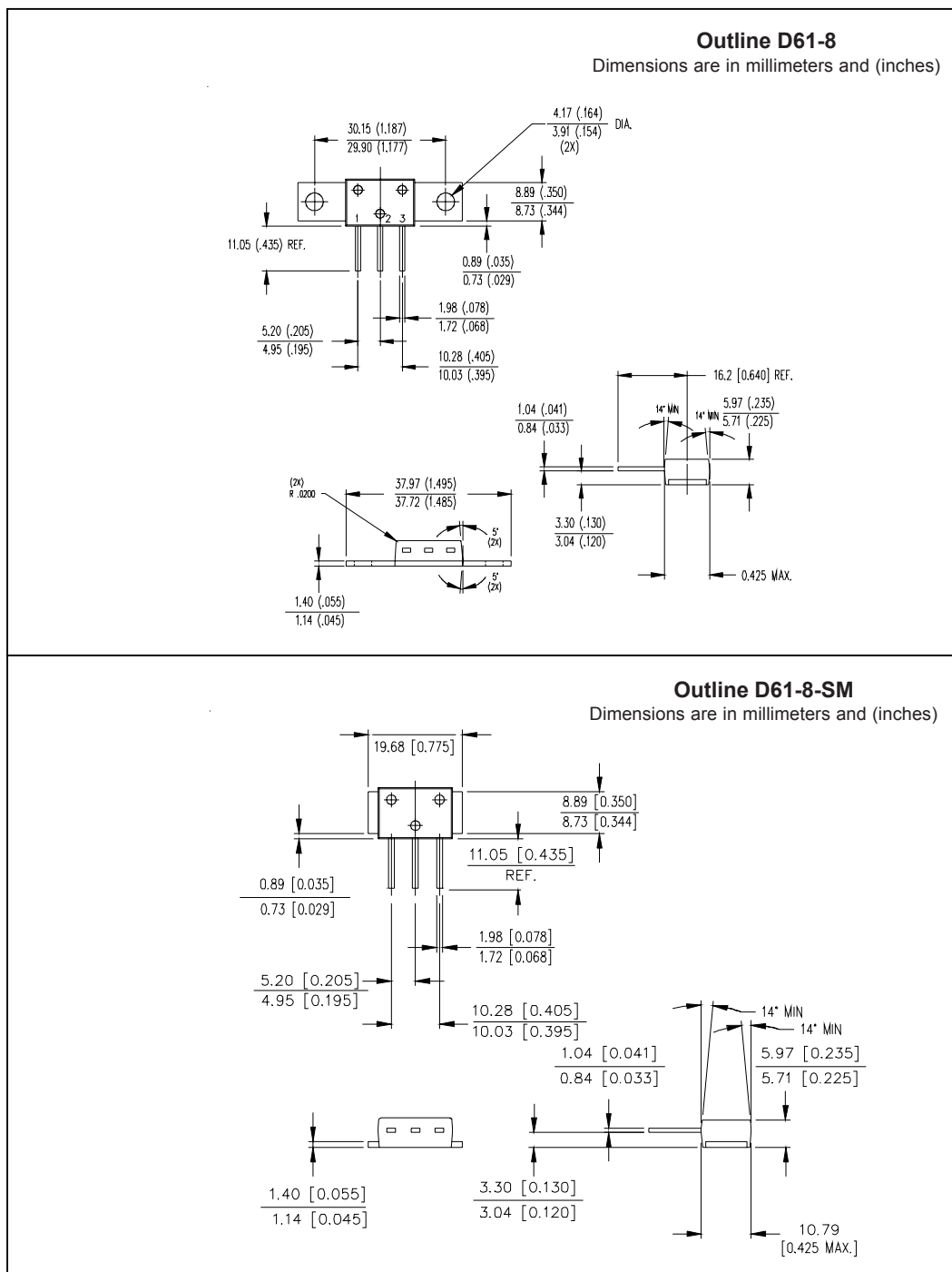
Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

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

Outline Table

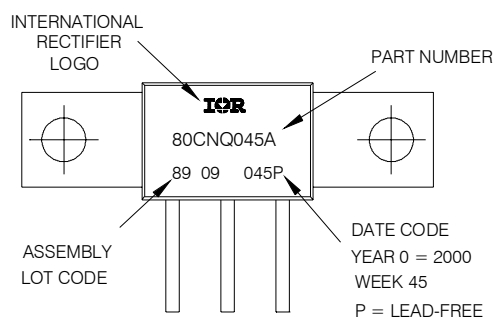


Part Marking Information

D61-8

EXAMPLE: THIS IS A 80CNQ045 WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000

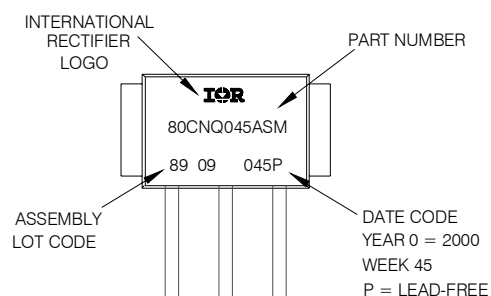
Note: "P" in assembly line
position indicates "Lead-Free"



D61-8-SM

EXAMPLE: THIS IS A 80CNQ045ASM WITH
LOT CODE 89 09
ASSEMBLED ON WW 45, 2000

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



Ordering Information Table

Device Code

80	C	N	Q	045	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
- 6** -
 - A = D-61-8 package style
 - ASM = D-61-8-SM package style
- 7** -
 - none = Standard Production
 - PbF = Lead-Free

035 = 35V
040 = 40V
045 = 45V

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.