Bulletin PD-21012 02/05

International
IOR Rectifier

88CNQ060APbF
88CNQ060ASMPbF

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}		60	V
I_{FSM}	@tp = 5 µs sine	5000	A
V_F	@40 Apk, T_J = 125 °C (per leg)	0.56	V
T_J	range	- 55 to 150	°C

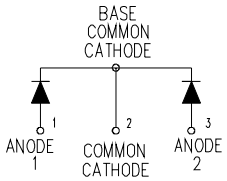
Description/ Features

The center tap Schottky rectifier module 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
- 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)

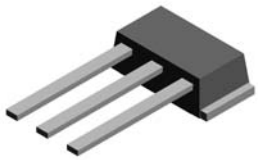
Case Styles

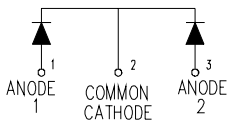
88CNQ060APbF



D61-8

88CNQ060ASMPbF





D61-8-SM

Voltage Ratings

	Part number	88CNQ060A..
V_R	Max. DC Reverse Voltage (V)	60
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters	88CNQ	Units	Conditions	
$I_{F(AV)}$	Max. Av. Forward Current (Per Leg)	40	A	50% duty cycle @ T_C = 120°C, rectangular wave form	
	See Fig. 5 (Per Device)	80		(Rated V_R)	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	5000	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated Vr applied
	Surge Current (Per Leg) See Fig. 7	600		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	75	mJ	T_J = 25 °C, I_{AS} = 1 Amps, L = 0.57 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	1.0	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	88CNQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) (1)	0.58	V	@ 40A	T_J = 25 °C
		0.77	V	@ 80A	
		0.56	V	@ 40A	T_J = 125 °C
		0.67	V	@ 80A	
I_{RM}	Typical Reverse Leakage Current (Per Leg) See Fig. 2 (1)	0.64	mA	T_J = 25 °C	V_R = rated V_R
		240	mA	T_J = 125 °C	
C_T	Max. Junction Capacitance (Per Leg)	5200	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		88CNQ	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		0.85	°C/W	DC operation
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.	40 (35)	Kg-cm (lbf-in)	
	(D61-8 Only)	Max.	58 (50)		

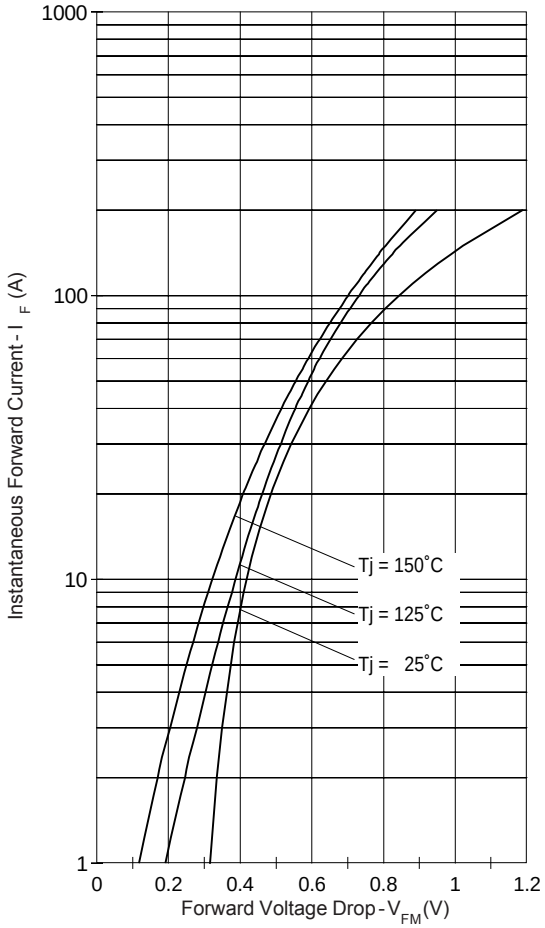


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

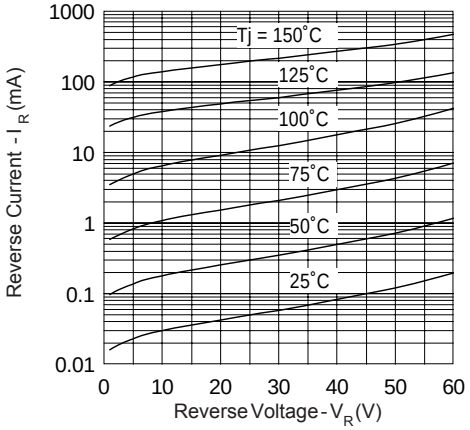


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

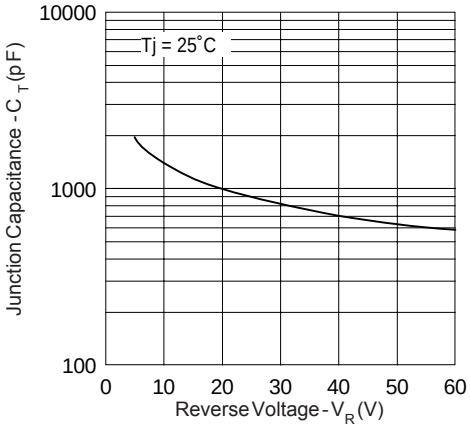


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

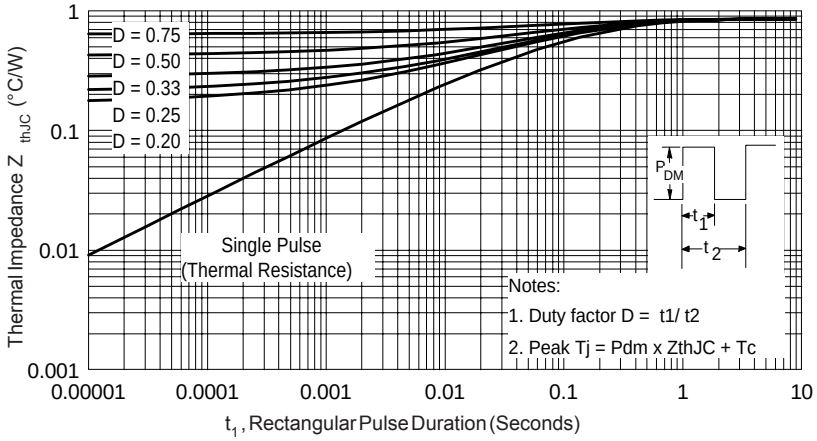


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

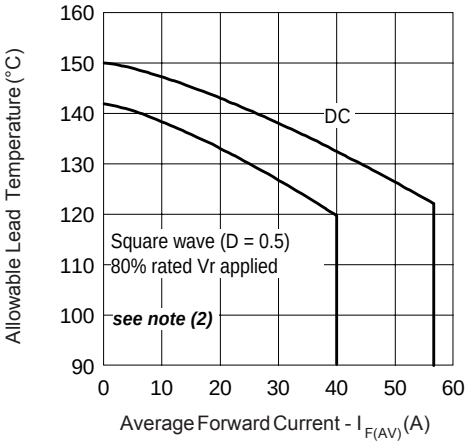


Fig. 5 - Maximum Average Forward Current Vs. Allowable Lead Temperature

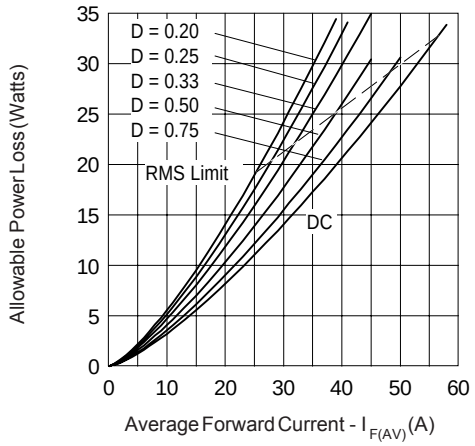


Fig. 6 - Maximum Average Forward Dissipation Vs. Average Forward Current

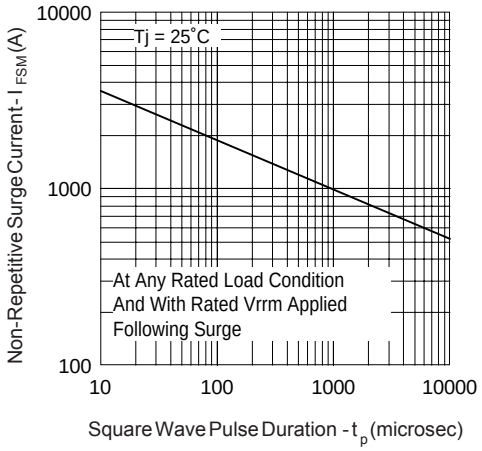


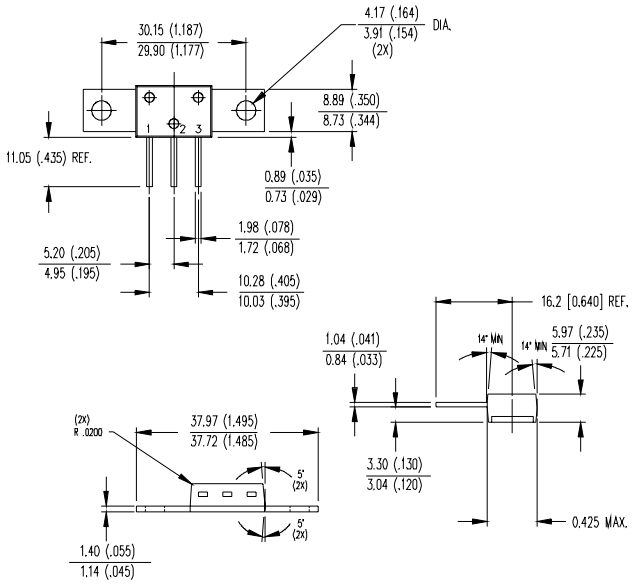
Fig. 7 - Maximum Peak Surge Forward Current Vs. Pulse Duration

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Outline Table

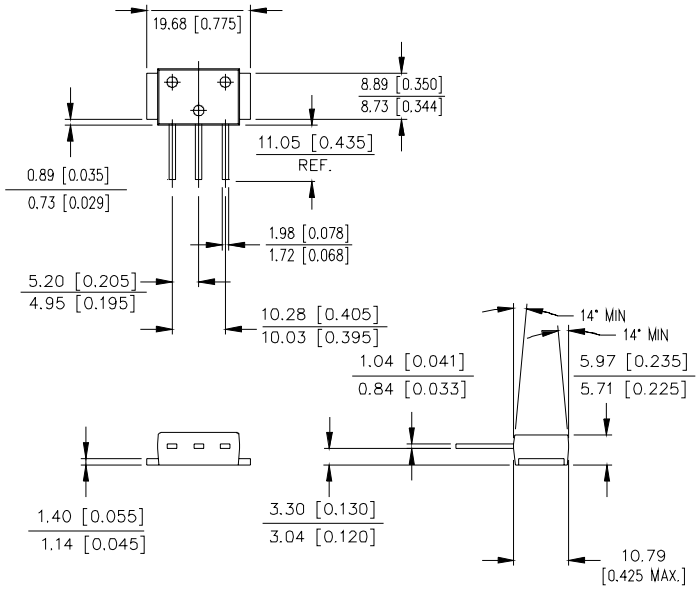
Outline D61-8

Dimensions are in millimeters and (inches)



Outline D61-8-SM

Dimensions are in millimeters and (inches)

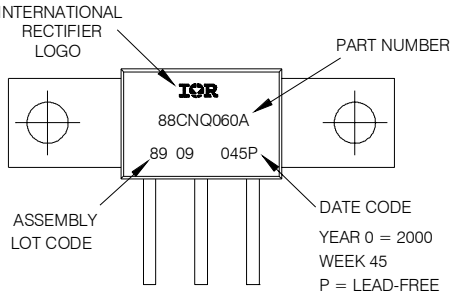


Part Marking Information

D61-8

EXAMPLE: THIS IS A 88CNQ060A 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 88CNQ060ASM WITH
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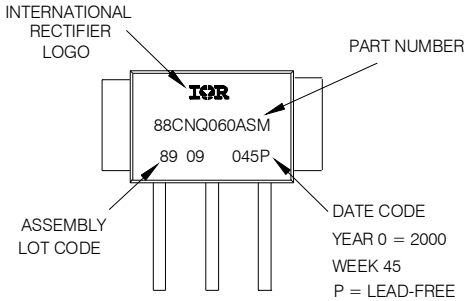
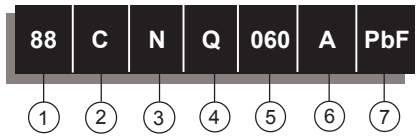
ASSEMBLED ON WW 45, 2000

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



Ordering Information Table

Device Code



1 - Current Rating (80A)

2 - Circuit Configuration
C = Common Cathode

3 - Package
N = D-61

4 - Schottky "Q" Series

5 - Voltage Rating (060 = 60V)

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.

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