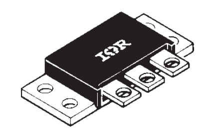
Bulletin PD-2.175 05/00

International
IOR Rectifier

161CNQ... SERIES

SCHOTTKY RECTIFIER

160 Amp



TO-249AA

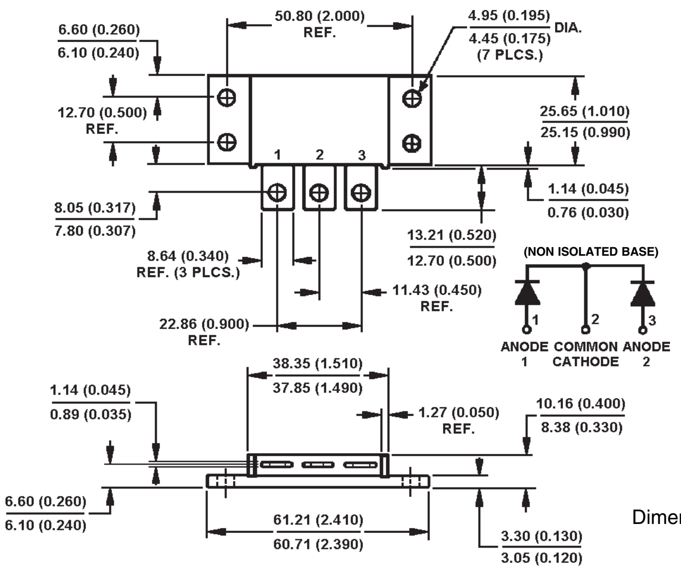
Major Ratings and Characteristics

Characteristics		161CNQ...	Units
$I_{F(AV)}$	Rectangular waveform	160	A
V_{RRM}	range	35 to 45	V
I_{FSM}	@ tp = 5 μs sine	11500	A
V_F	@ 80 Apk, T_J = 125°C (per leg)	0.63	V
T_J	range	-55 to 175	°C

Description/Features

The 161CNQ non isolated, 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 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- Isolated heatsink
- Center tap module
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Low profile, high current package



Outline TO-249AA
Dimensions in millimeters and (inches)

Voltage Ratings

	Part number	161CNQ035	161CNQ040	161CNQ045
V_R	Max. DC Reverse Voltage (V)	35	40	45
V_{RWM}	Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

	Parameters	161CNQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward (Per Leg)	80	A	50% duty cycle @ T_C = 129 °C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	160			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	11,500	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	900		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	108	mJ	T_J = 25 °C, I_{AS} = 16 Amps, L = 0.84 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	16	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	161CNQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	0.71	V	@ 80A	T_J = 25 °C
	(Per Leg) * See Fig. 1 (1)	0.88	V	@ 160A	
		0.63	V	@ 80A	T_J = 125 °C
		0.79	V	@ 160A	
I_{RM}	Max. Reverse Leakage Current	5	mA	T_J = 25 °C	V_R = rated V_R
	(Per Leg) * See Fig. 2 (1)	45	mA	T_J = 125 °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)	8.0	nH	Measured from terminal hole to terminal hole	
dv/dt	Max. Voltage Rate of Change (Rated V_R)	10,000	V/ µs		

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

Thermal-Mechanical Specifications

	Parameters	161CNQ	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)	0.70	°C/W	DC operation * See Fig. 4
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)	0.35	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink	0.10	°C/W	Mounting surface, smooth and greased
wt	Approximate Weight	58 (2.0)	g (oz.)	
T	Mounting Torque Min.	40 (35)	Kg-cm (lbf-in)	
	Max.	58 (50)		
	Case Style	TO - 249AA		JEDEC

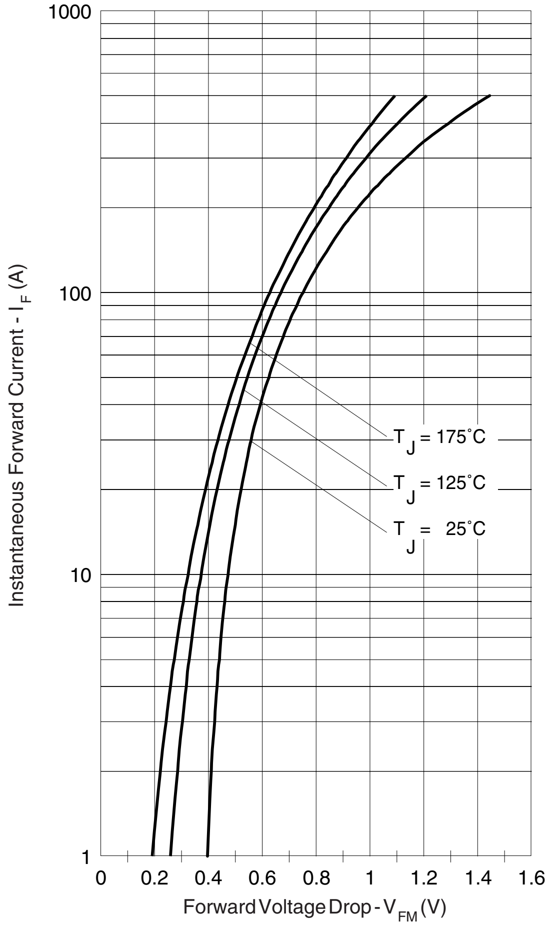


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

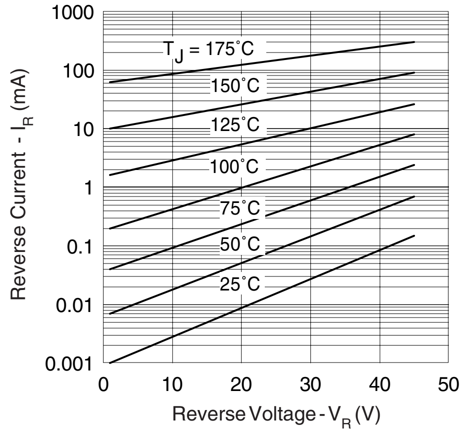


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

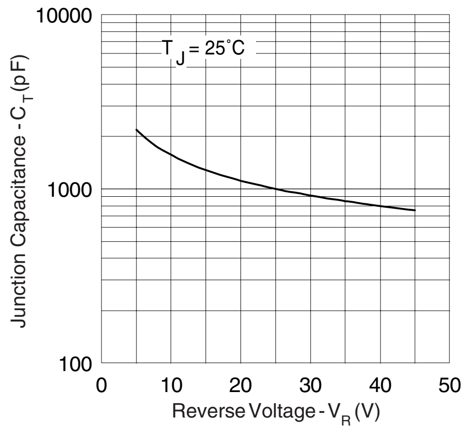


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

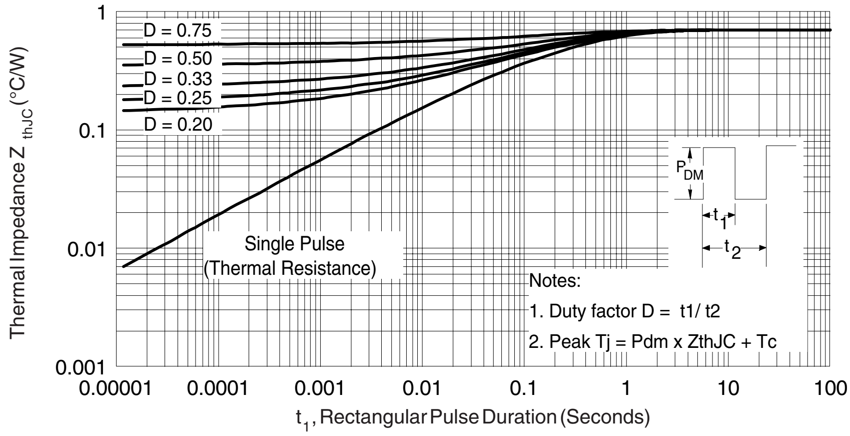


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

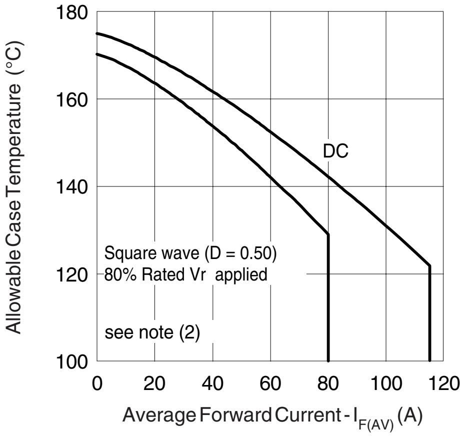


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

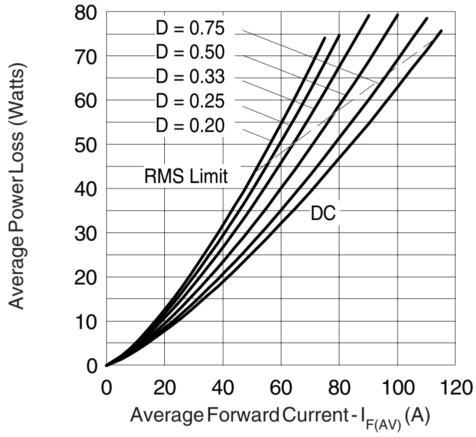


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

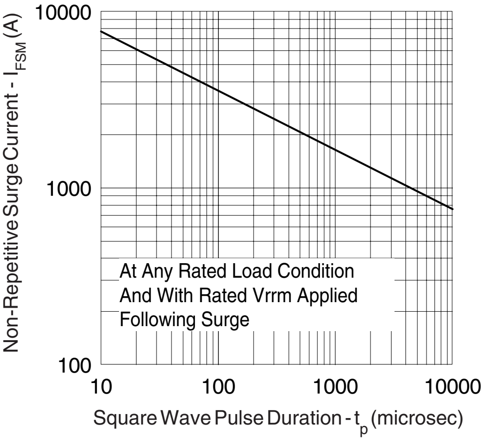


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

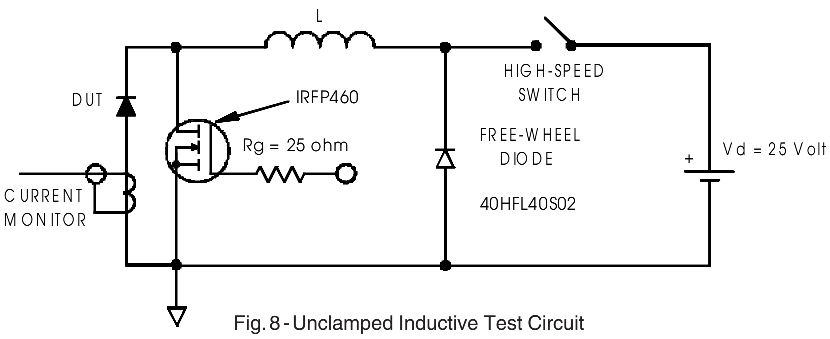


Fig. 8 - Unclamped Inductive Test Circuit

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

International Rectifier

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