

International
IR Rectifier

322CNQ030

SCHOTTKY RECTIFIER

300 Amp

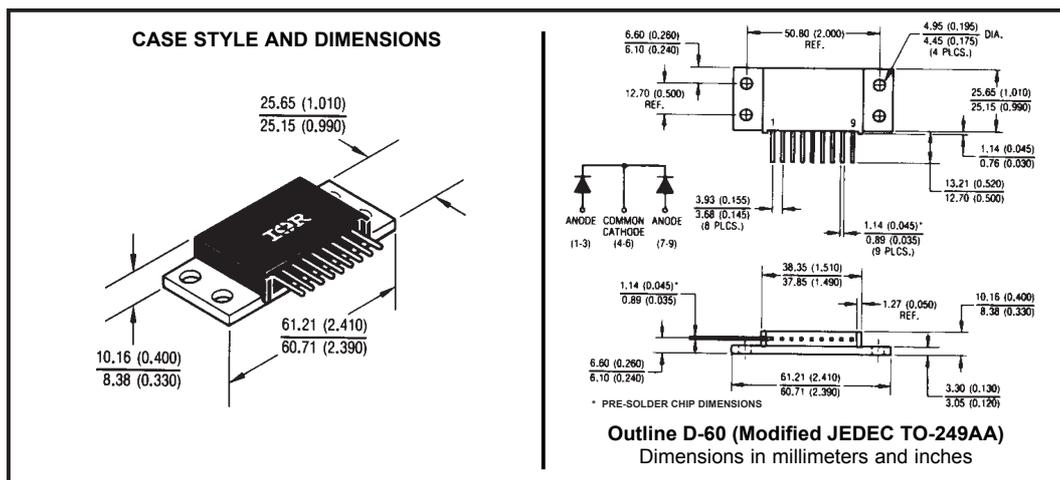
Major Ratings and Characteristics

Characteristics	322CNQ030	Units
$I_{F(AV)}$ Rectangular waveform	300	A
V_{RRM}	30	V
I_{FSM} @ $t_p = 5 \mu s$ sine	10000	A
V_F @150Apk, $T_J = 125^\circ C$ (per leg)	0.49	V
T_J range	-55 to 150	$^\circ C$

Description/ Features

The 322CNQ030 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 $150^\circ C$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- $150^\circ C$ T_J operation
- High Surge Capability
- 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
- Low profile, high current package



Voltage Ratings

Part number	322CNQ030
V_R Max. DC Reverse Voltage (V)	30
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	322CNQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg)	300	A	50% duty cycle @ $T_C = 87^\circ\text{C}$, rectangular wave form
	150	A	
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg)	10000	A	5 μs Sine or 3 μs Rect. pulse
	1500		10ms Sine or 6ms Rect. pulse
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	322CNQ	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg)	0.56	V	@ 150A
	0.70	V	@ 300A
	0.49	V	@ 150A
	0.68	V	@ 300A
I_{RM} Max. Reverse Leakage Current (Per Leg)	10	mA	$T_J = 25^\circ\text{C}$
	650	mA	$T_J = 125^\circ\text{C}$
C_T Max. Junction Capacitance (Per Leg)	5500	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)	10000	V/ μs	

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

Thermal-Mechanical Specifications

Parameters	322CNQ	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)	0.50	$^\circ\text{C}/\text{W}$	DC operation
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	0.25	$^\circ\text{C}/\text{W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.10	$^\circ\text{C}/\text{W}$	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	

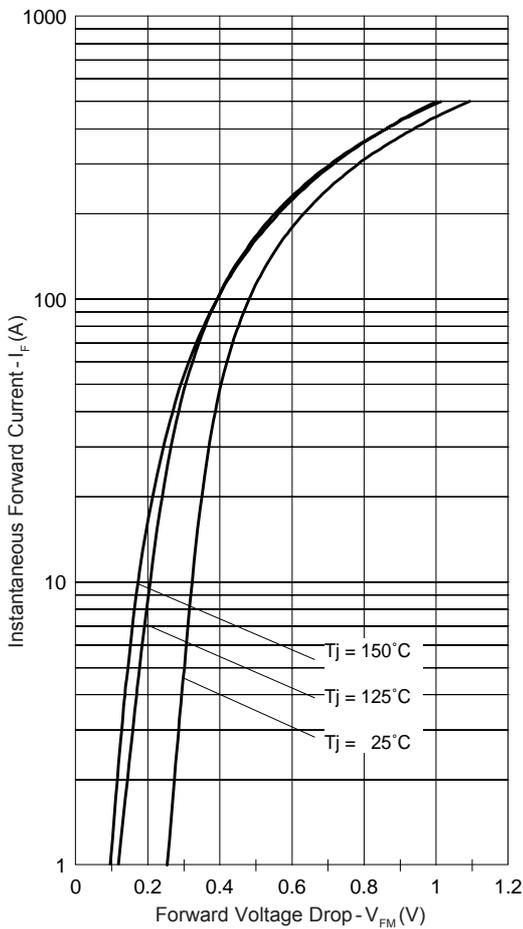


Fig. 1 - Max. Forward Voltage Drop Characteristics

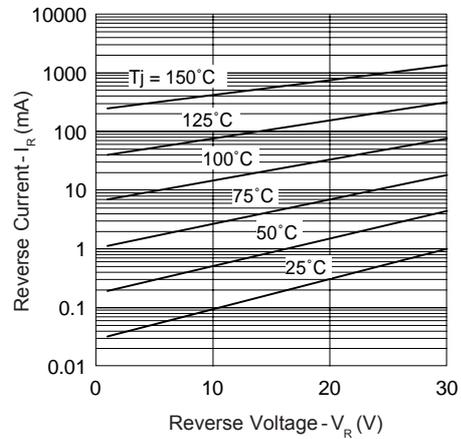


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

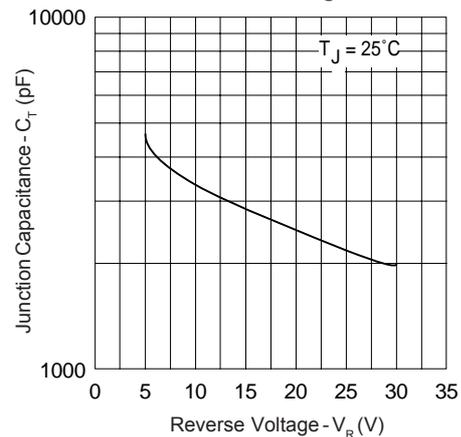


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

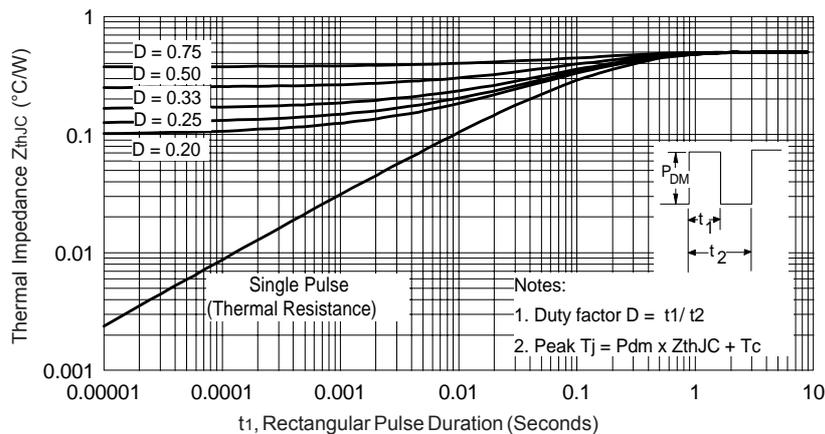


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

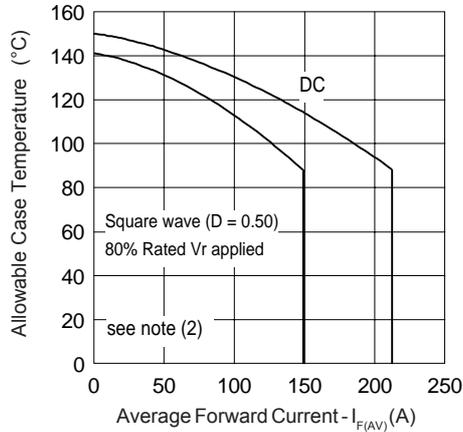


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

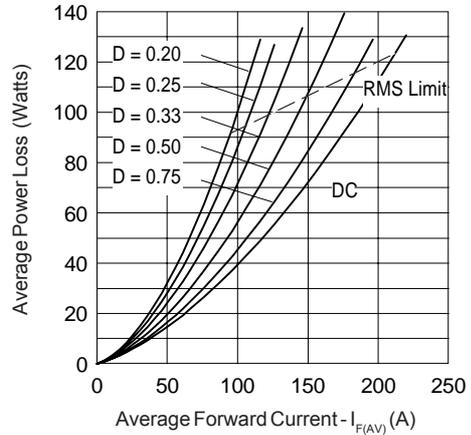


Fig. 6 - Forward Power Loss Characteristics

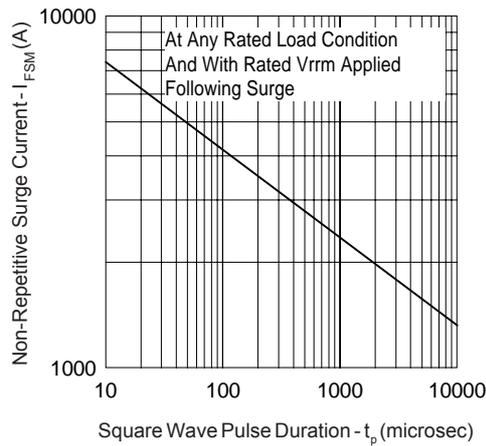


Fig. 7 - Max. Non-Repetitive Surge Current

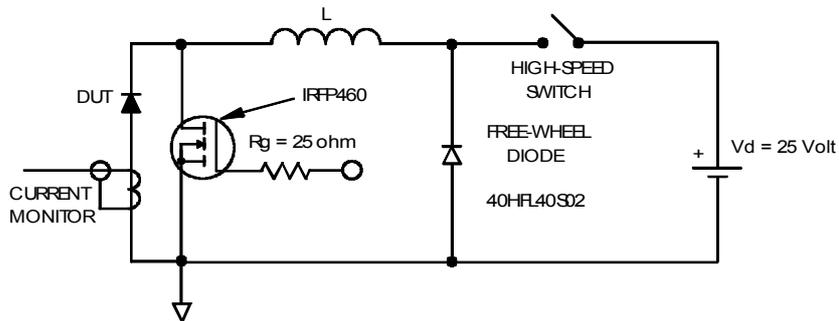


Fig. 8 - Unclamped Inductive Test Circuit

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

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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