

**Major Ratings and Characteristics**

Characteristics	60CPQ150	Units
$I_{F(AV)}$ Rectangular waveform	60	A
$V_{RRM}$	150	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	2300	A
$V_F$ @30 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.67	V
$T_J$ range	-55 to 175	$^\circ\text{C}$

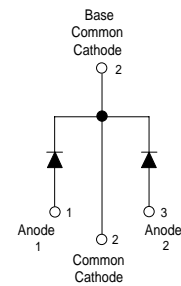
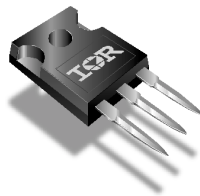
**Description/Features**

The 60CPQ150 center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. 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
- Center tap TO-247 package
- 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

**Case Styles**

60CPQ150



## Voltage Ratings

Part number	60CPQ150
V <sub>R</sub> Max. DC Reverse Voltage (V)	150
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	60CPQ	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	30	A	50% duty cycle @ T <sub>C</sub> = 151°C, rectangular wave form
	60		
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	2300	A	5µs Sine or 3µs Rect. pulse
	510		10ms Sine or 6ms Rect. pulse
E <sub>AS</sub> Non-Repetitive Avalanche Energy (Per Leg)	0.5	mJ	T <sub>J</sub> = 25°C, I <sub>AS</sub> = 1 Amps, L = 1 mH
I <sub>AR</sub> Repetitive Avalanche Current (Per Leg)	1	A	Current decaying linearly to zero in 1 µsec Frequency limited by T <sub>J</sub> max. V <sub>A</sub> = 1.5 x V <sub>R</sub> typical

## Electrical Specifications

Parameters	Typ.	Max.	Units	Conditions
V <sub>FM</sub> Max. Forward Voltage Drop (1) (Per Leg) * See Fig. 1	0.80	0.83	V	@ 30A
	0.93	0.99	V	@ 60A
	0.64	0.67	V	@ 30A
	0.74	0.77	V	@ 60A
I <sub>RM</sub> Max. Reverse Leakage Current (Per Leg) * See Fig. 2	10	100	µA	T <sub>J</sub> = 25°C
	12	25	mA	T <sub>J</sub> = 125°C
C <sub>T</sub> Typical Junction Capacitance (Per Leg)	-	820	pF	V <sub>R</sub> = 5V <sub>DC</sub> (test signal range 100kHz to 1Mhz) @ 25°C
L <sub>S</sub> Typical Series Inductance (Per Leg)	-	7.5	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	-	10000	V/µs	(Rated V <sub>R</sub> )

(1) Pulse Width &lt; 300µs, Duty Cycle &lt; 2%

## Thermal-Mechanical Specifications

Parameters	60CPQ	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range	-55 to 175	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-55 to 175	°C	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Leg) * See Fig. 4	0.8	°C/W	DC operation
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case (Per Package)	0.4	°C/W	DC operation
R <sub>thCS</sub> Typical Thermal Resistance, Case to Heatsink	0.25	°C/W	Mounting surface, smooth and greased
wt Approximate Weight	6 (0.21)	g (oz.)	
T Mounting Torque	Min. 6 (5)	Kg-cm (lbf-in)	
	Max. 12 (10)		
Case Style	TO-247AC (TO-3P)	JEDEC	

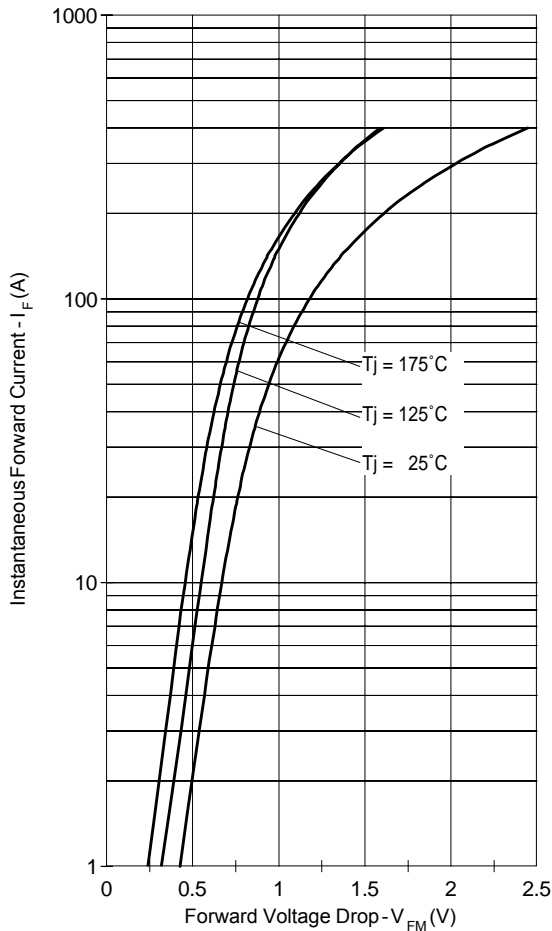


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

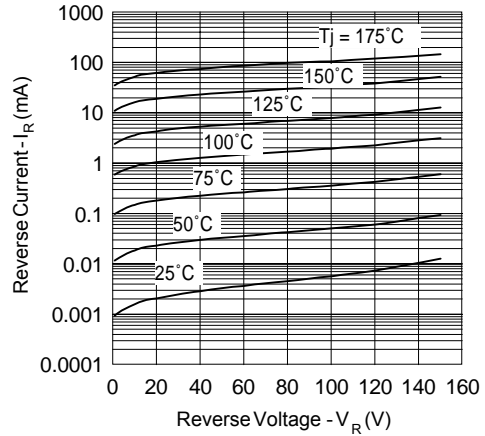


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

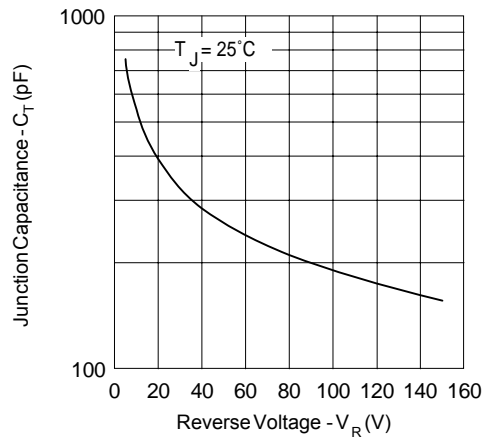


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

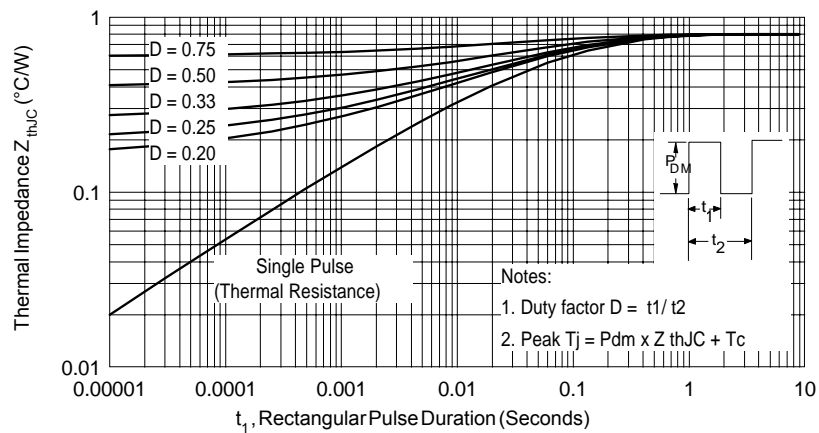


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

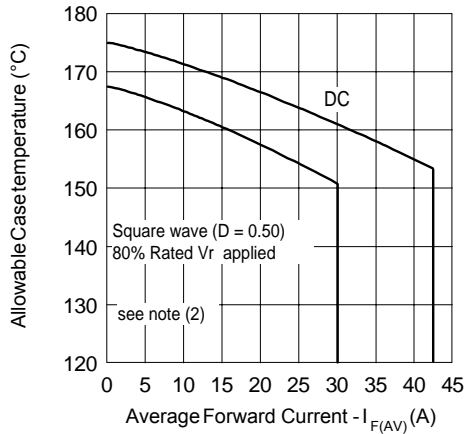


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

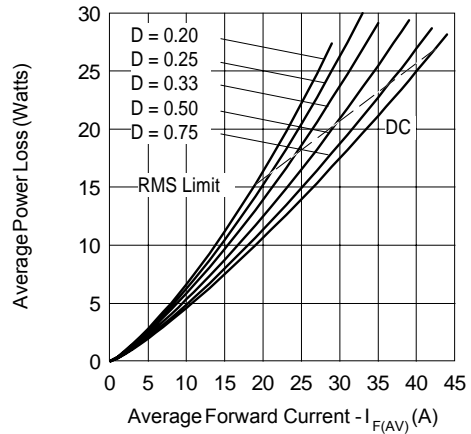


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

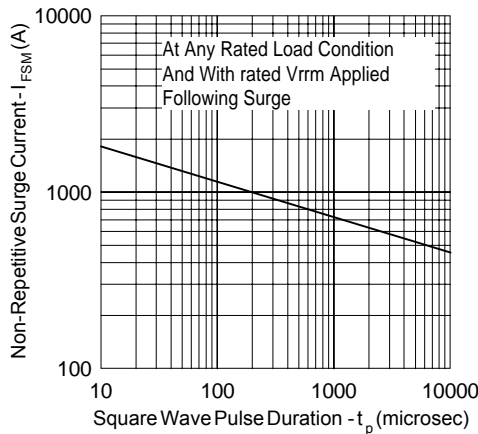


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

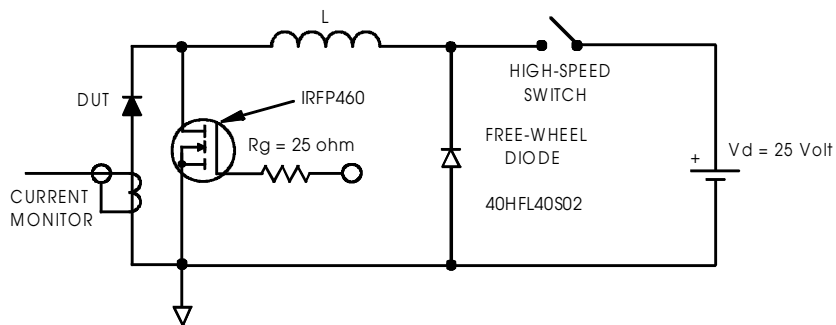
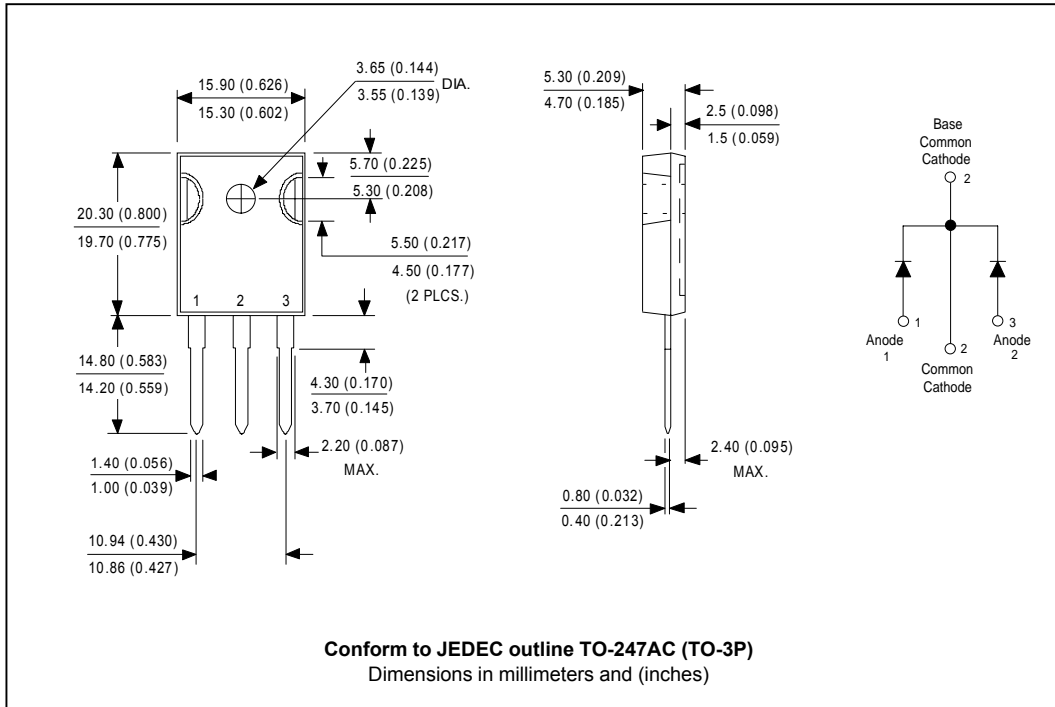


Fig. 8 - Unclamped Inductive Test Circuit

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

Outline Table



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.