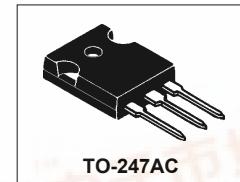


# International **IR** Rectifier

SCHOTTKY RECTIFIER

60CPQ150

60 Amp



## Major Ratings and Characteristics

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

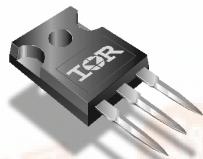
## Description/Features

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  $175^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

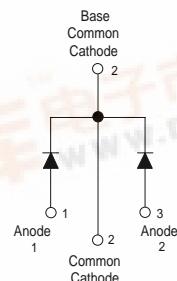
- $175^\circ\text{C}$   $T_J$  operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

## Case Styles

60CPQ150



TO-247AC



60CPQ150

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**Voltage Ratings**

Part number	60CPQ150		
$V_R$ Max. DC Reverse Voltage (V)	150		
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)			

**Absolute Maximum Ratings**

Parameters	60CPQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	30	A	50% duty cycle @ $T_J = 151^\circ\text{C}$ , rectangular wave form
	60		
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	2300	A	5μs Sine or 3μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated $V_{RRM}$ applied
	510		
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	0.5	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1$ Amps, $L = 1$ 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	Typ.	Max.	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1) (Per Leg) * See Fig. 1	0.80	0.83	V	$T_J = 25^\circ\text{C}$
	0.93	0.99	V	
	0.64	0.67	V	$T_J = 125^\circ\text{C}$
	0.74	0.77	V	
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2	10	100	μA	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
	12	25	mA	
$C_T$ Typical Junction Capacitance (Per Leg)	-	820	pF	$V_R = 5V_{DC}$ (test signal range 100kHz to 1Mhz) $@ 25^\circ\text{C}$
$L_S$ 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 $V_R$ )

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

**Thermal-Mechanical Specifications**

Parameters	60CPQ	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) * See Fig. 4	0.8	°C/W	DC operation
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package)	0.4	°C/W	DC operation
$R_{thCS}$ 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
	Max.	12(10)	(lbf-in)
Case Style	TO-247AC(TO-3P)		JEDEC

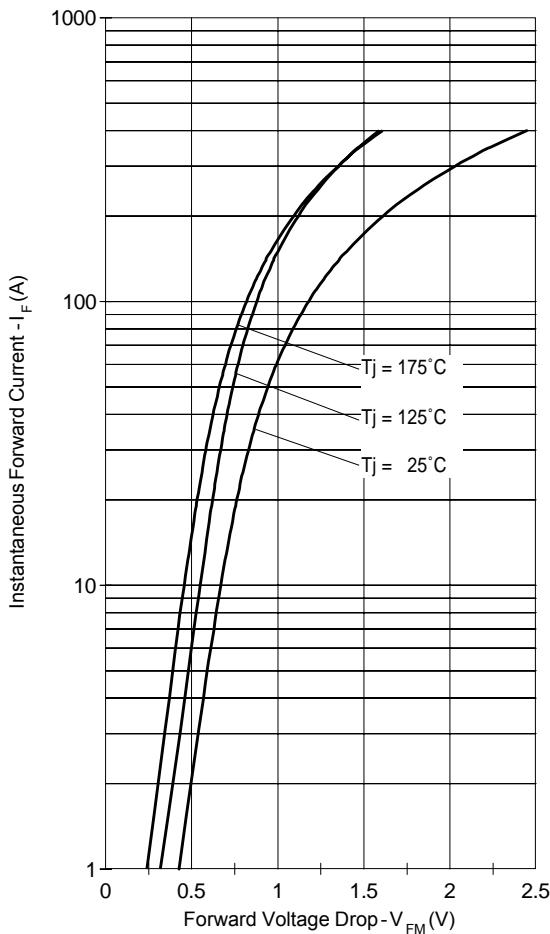


Fig. 1 - Max. Forward Voltage Drop Characteristics  
 (Per Leg)

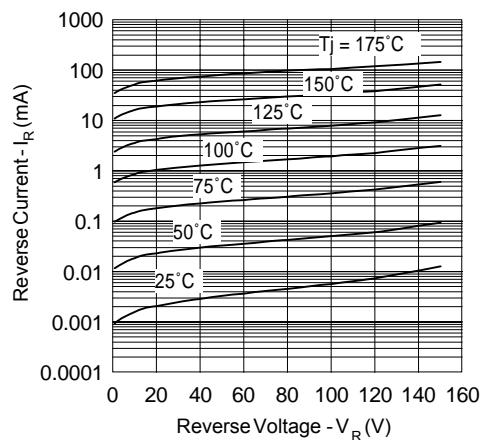


Fig. 2 - Typical Values Of Reverse Current  
 Vs. Reverse Voltage (Per Leg)

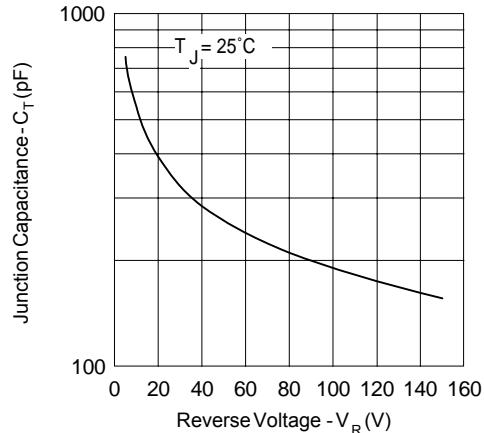


Fig. 3 - Typical Junction Capacitance  
 Vs. Reverse Voltage (Per Leg)

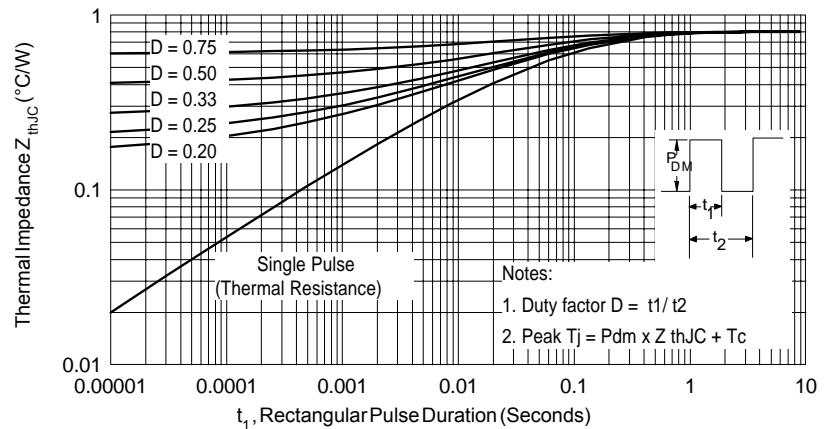


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

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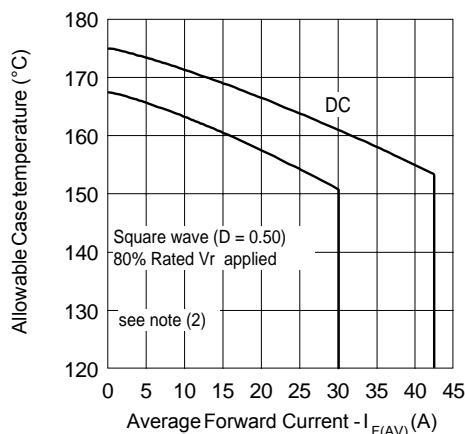


Fig. 5-Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

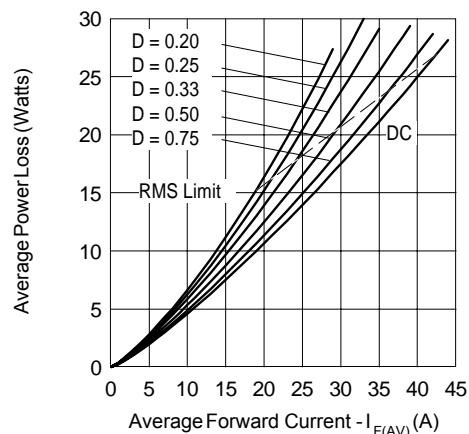


Fig. 6-Forward Power Loss Characteristics (Per Leg)

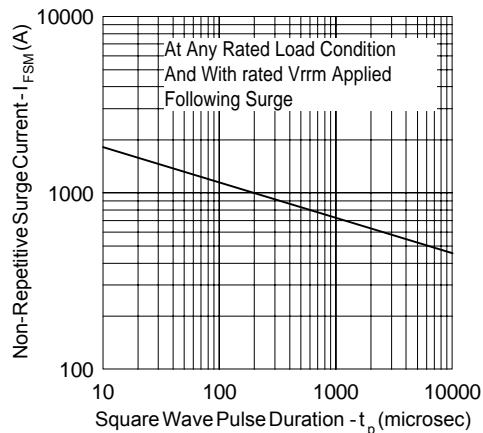


Fig. 7-Max. Non-Repetitive Surge Current (Per Leg)

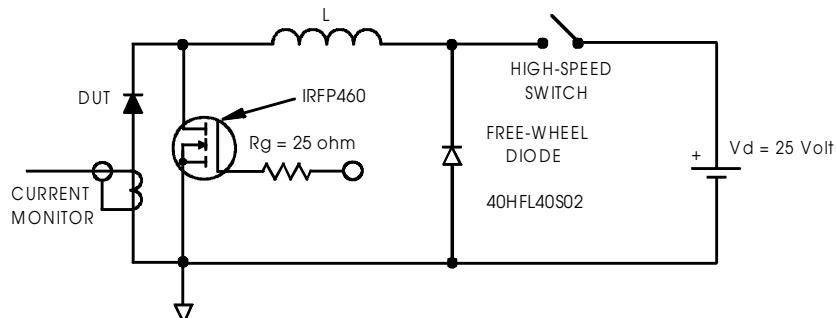
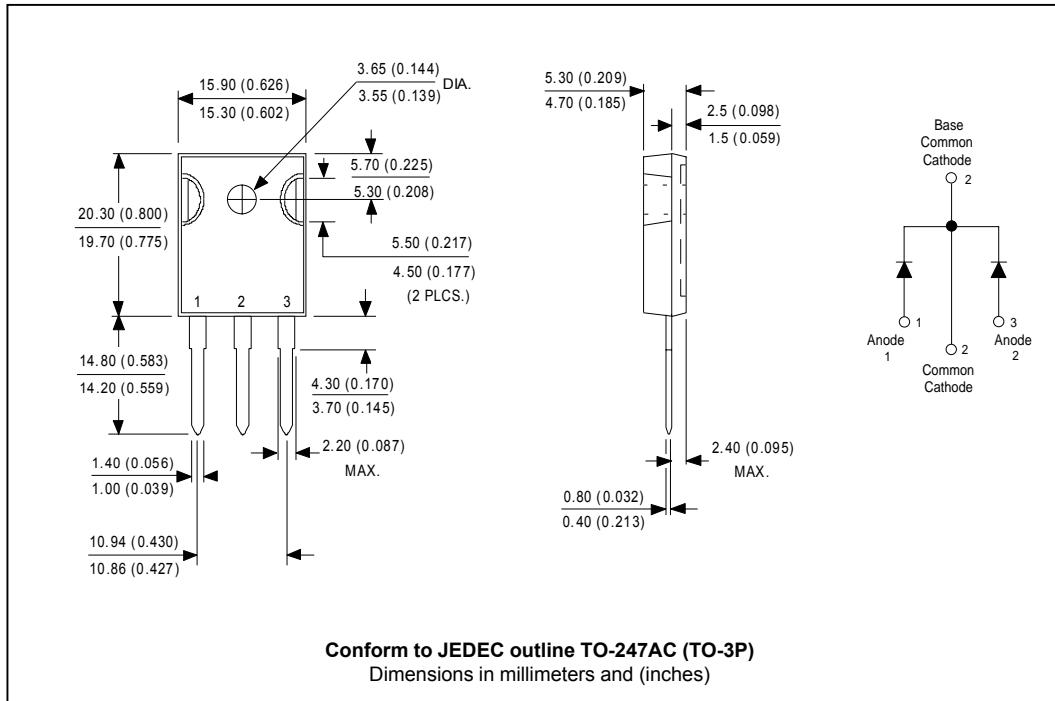


Fig. 8-Unclamped Inductive Test Circuit

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

**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.

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