Bulletin PD-20796 rev. A 11/06

International
IOR Rectifier

60CPQ150PbF

SCHOTTKY RECTIFIER

60 Amp

$I_{F(AV)}$ = 60Amp
V_R = 150V

Major Ratings and Characteristics

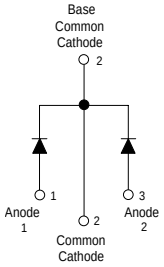
Characteristics		Value	Units
$I_{F(AV)}$	Rectangular waveform	60	A
V_{RRM}		150	V
I_{FSM}	@ tp = 5 µs sine	2300	A
V_F	@ 30 Apk, T_J = 125°C (per leg)	0.67	V
T_J	range	- 55 to 175	°C

Description/ Features

The 60CPQ150PbF 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
- Lead-Free ("PbF" suffix)

Case Styles



TO-247AC

Voltage Ratings

	Part number	60CPQ150PbF
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 (Per Leg)	30	A	50% duty cycle @ T_C = 151°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	60			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	2300	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	510		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	0.5	mJ	T_J = 25 °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 x V_R typical	

Electrical Specifications

	Parameters	Typ.	Max.	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1)	0.80	0.83	V	@ 30A	T_J = 25 °C
	(Per Leg) * See Fig. 1	0.93	0.99	V	@ 60A	
		0.64	0.67	V	@ 30A	T_J = 125 °C
		0.74	0.77	V	@ 60A	
I_{RM}	Max. Reverse Leakage Current	10	100	µA	T_J = 25 °C	V_R = rated V_R
	(Per Leg) * See Fig. 2	12	25	mA	T_J = 125 °C	
C_T	Typical Junction Capacitance (Per Leg)	-	820	pF	V_R = 5V_{DC} (test signal range 100kHz to 1Mhz) @ 25°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 < 300µs, Duty Cycle < 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 (lbf-in)	
		Max.	12 (10)		
	Case Style		TO-247AC(TO-3P)	JEDEC	
	Marking Device		60CPQ150		

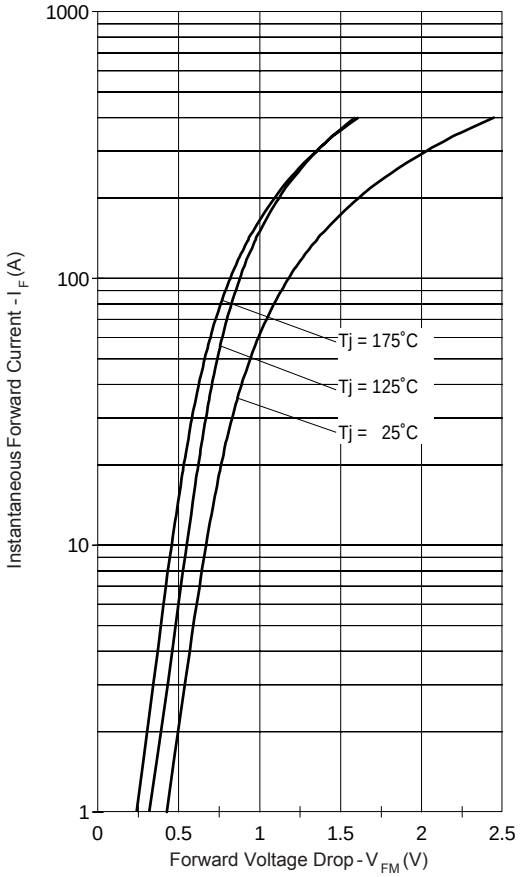


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

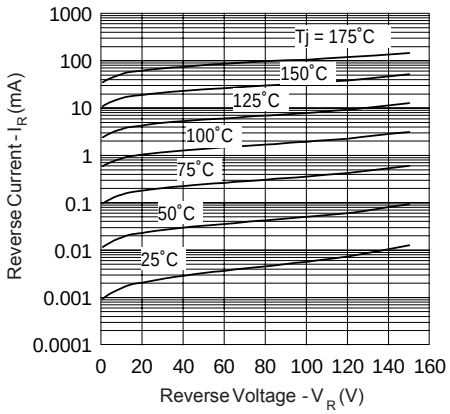


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

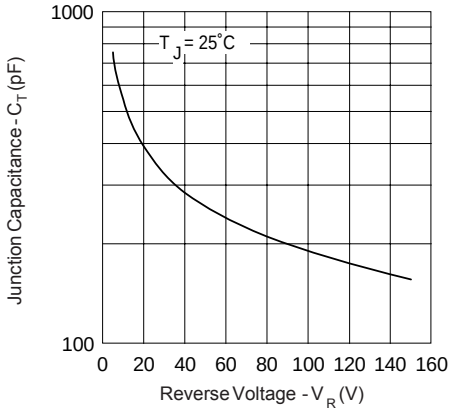


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

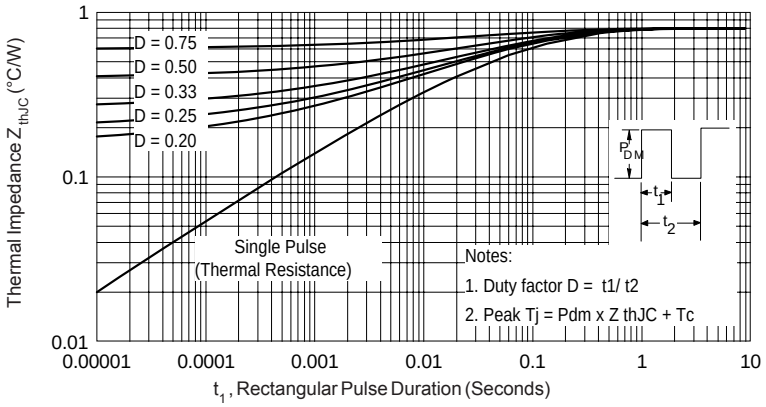


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

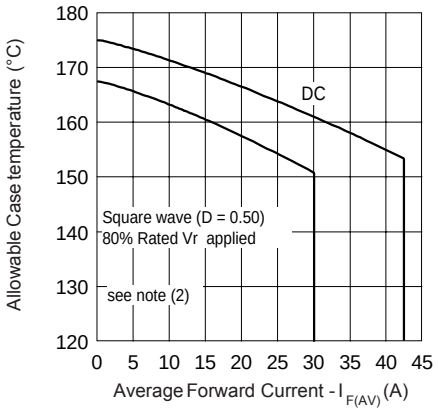


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

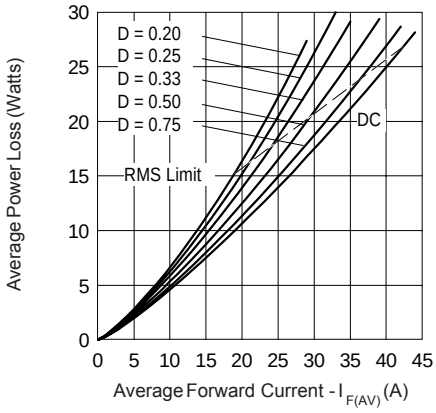


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

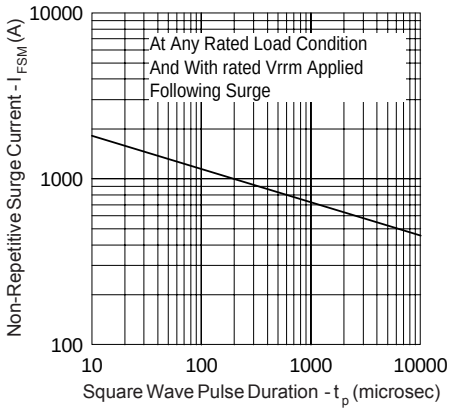


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

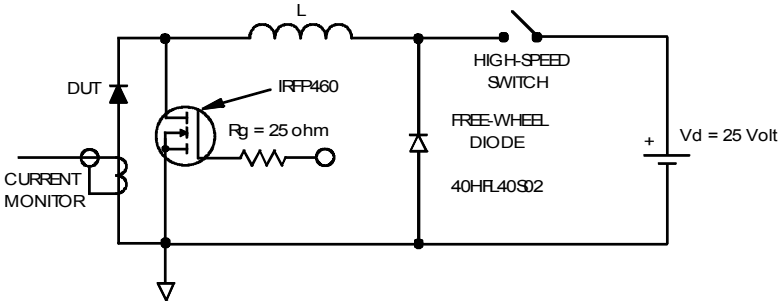
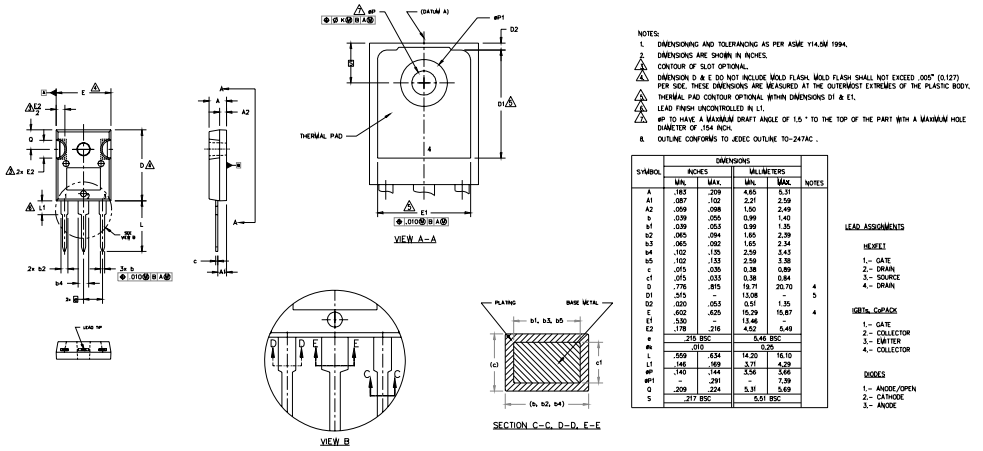


Fig. 8 - Unclamped Inductive Test Circuit

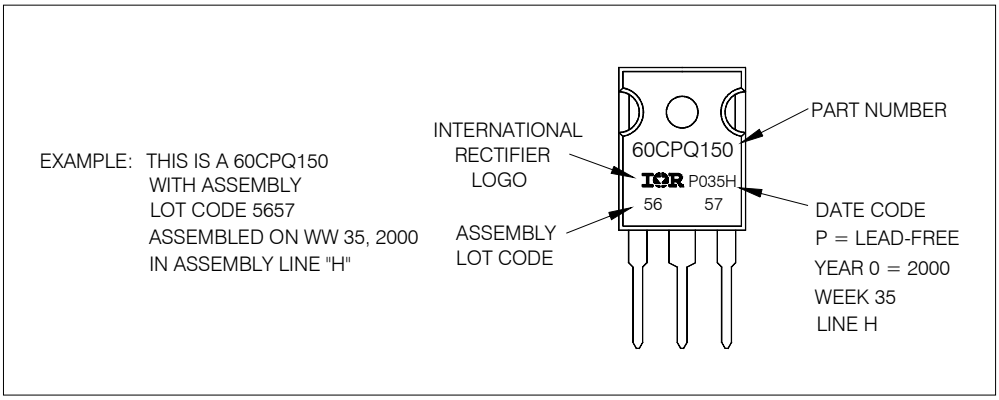
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Outline Table



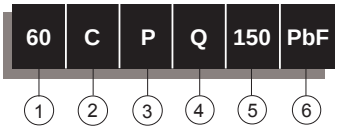
Conform to JEDEC outline TO-247AC (TO-3P)
Dimensions in millimeters and (inches)

Marking Information



Ordering Information Table

Device Code



1	-	Current Rating (60 = 60A)
2	-	Circuit Configuration C = Common Cathode
3	-	Package P = TO-247
4	-	Schottky "Q" Series
5	-	Voltage Code (150 = 150V)
6	-	• none = Standard Production • PbF = Lead-Free

Tube Standard Pack Quantity : 25 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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IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 11/06