

International
IR Rectifier

60CPQ150PbF

SCHOTTKY RECTIFIER

60 Amp

$$I_{F(AV)} = 60\text{Amp}$$

$$V_R = 150\text{V}$$

Major Ratings and Characteristics

Characteristics	Value	Units
$I_{F(AV)}$ Rectangular waveform	60	A
V_{RRM}	150	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ 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

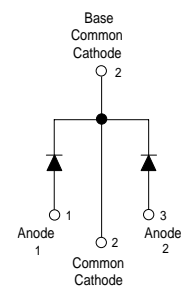
The 60CPQ150PbF center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, 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



60CPQ150PbF

Bulletin PD-20796 rev. A 11/06

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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 Current (Per Leg) * See Fig. 5 (Per Device)	30 60	A	50% duty cycle @ $T_C = 151^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	2300 510	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RRM} applied
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	0.5	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1\text{ Amps}$, $L = 1\text{ mH}$
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	@ 30A $T_J = 25^\circ\text{C}$
	0.93	0.99	V	@ 60A
	0.64	0.67	V	@ 30A $T_J = 125^\circ\text{C}$
	0.74	0.77	V	@ 60A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2	10	100	μA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	12	25	mA	$T_J = 125^\circ\text{C}$
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 < 300 μs , 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			

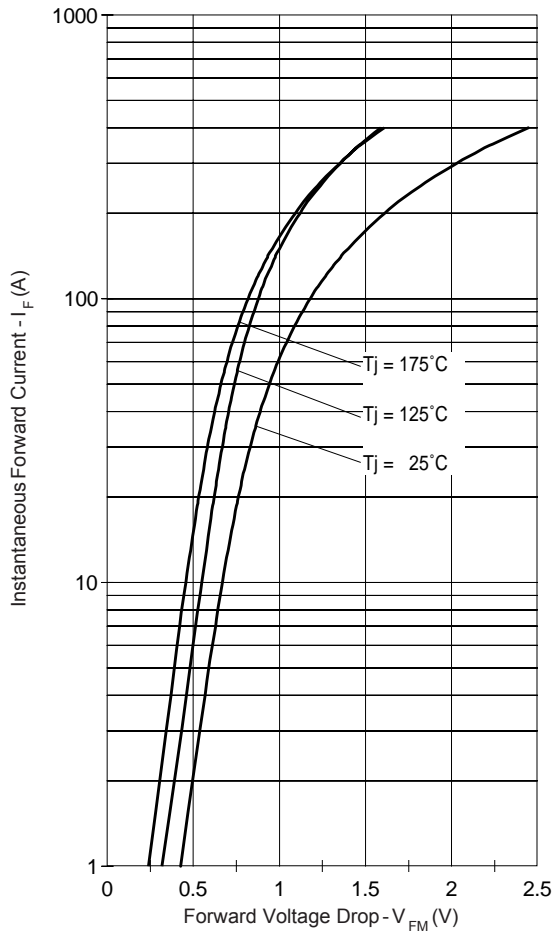


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

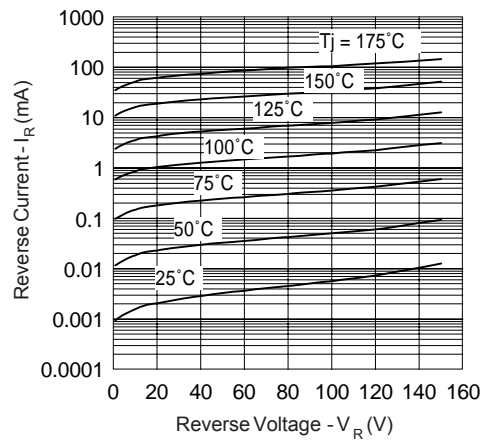


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

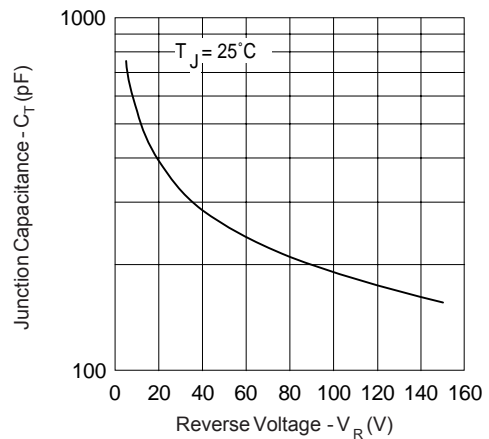


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

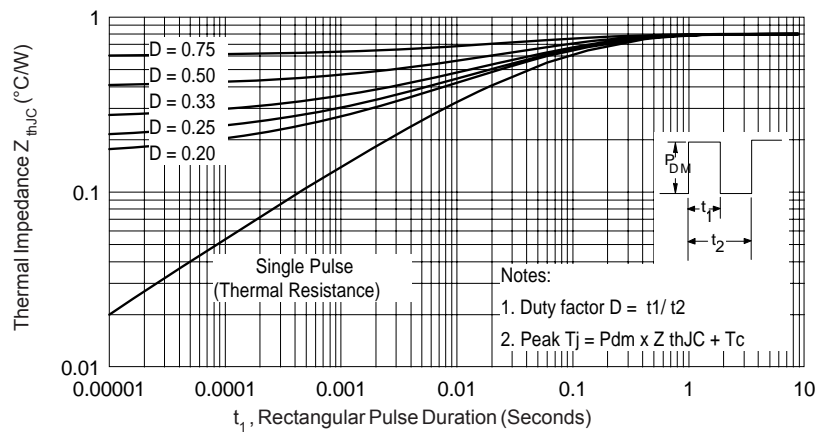


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

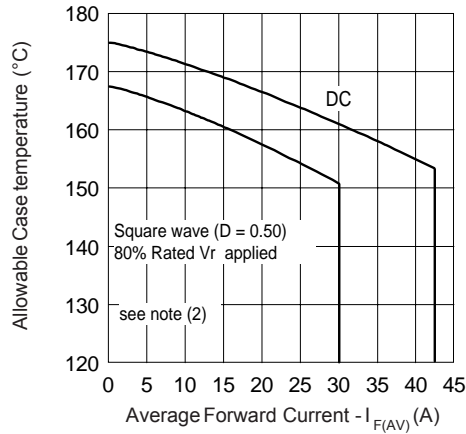


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

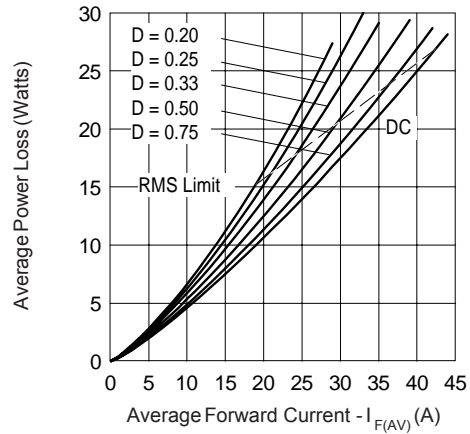


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

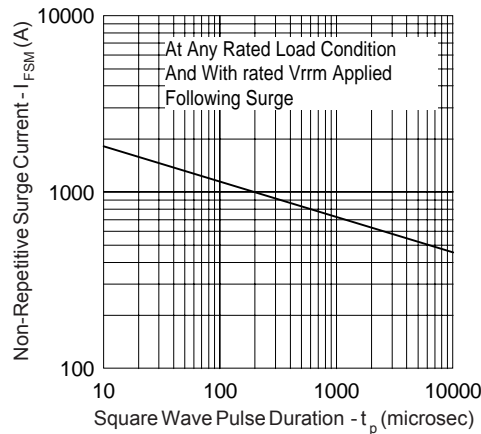


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

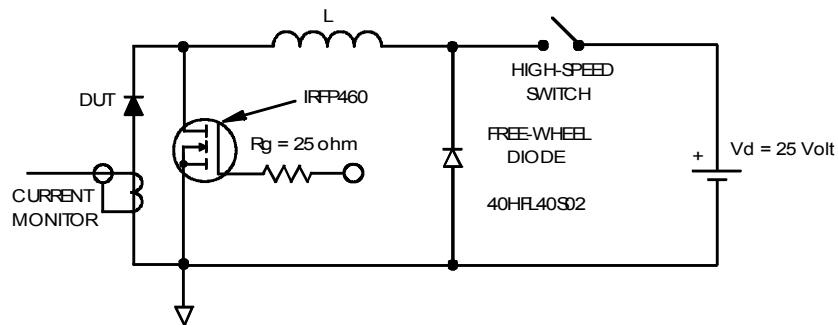


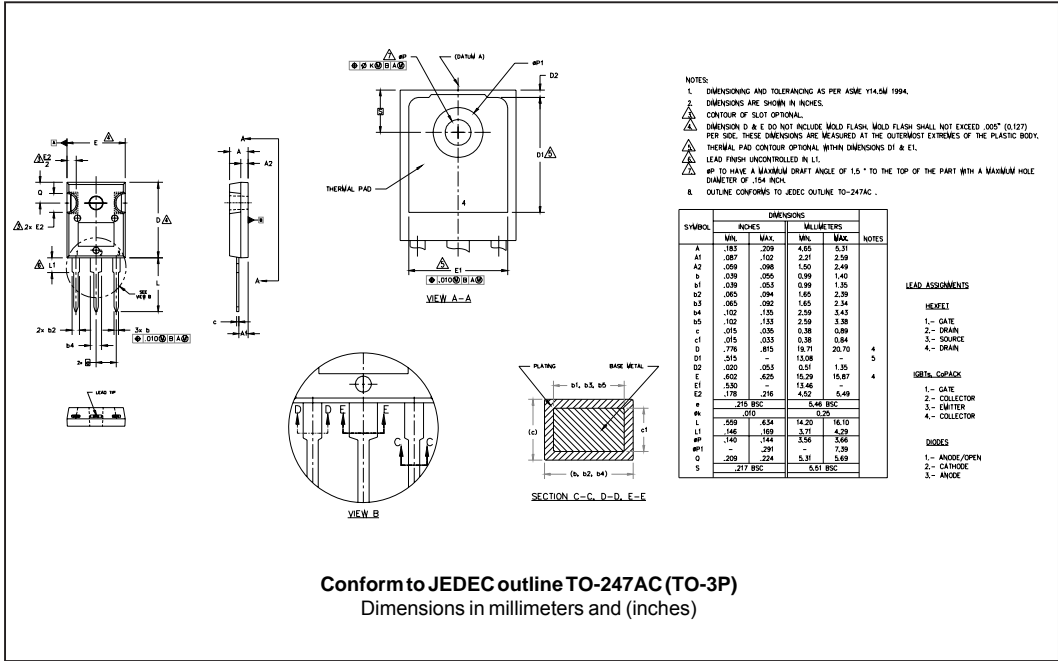
Fig. 8 - Unclamped Inductive Test Circuit

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

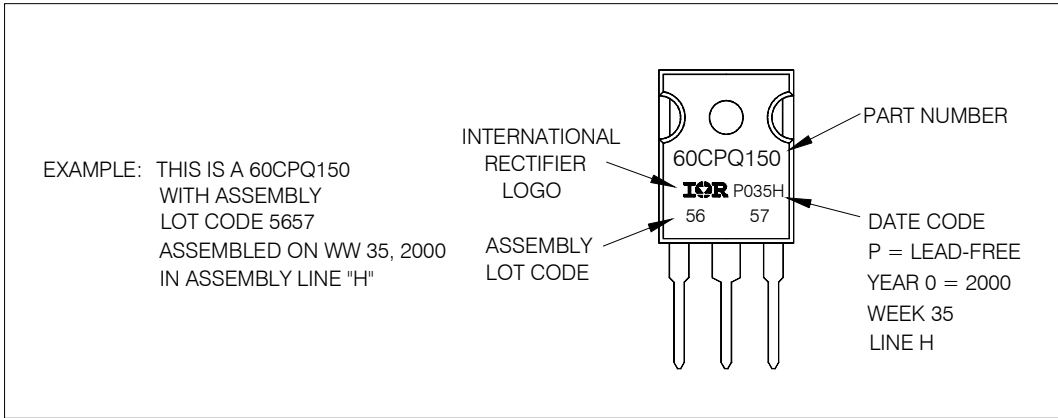
P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_{R1} (1 - D)$; $I_{R1} @ V_{R1} = 80\% \text{ rated } V_R$

Outline Table



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.