Bulletin PD-20811 rev. A 11/06

International
IOR Rectifier

80CPQ150PbF

SCHOTTKY RECTIFIER 80 Amp

$I_{F(AV)}$ = 80Amp
V_R = 150V

Major Ratings and Characteristics

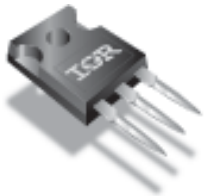
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	80	A
V_{RRM}	150	V
I_{FSM} @tp = 5 µs sine	1930	A
V_F @40 Apk, T_J=125°C (per leg)	0.71	V
T_J	- 55 to 175	°C

Description/ Features

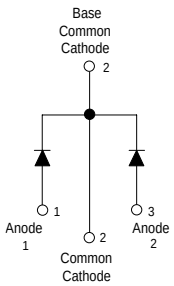
The 80CPQ150PbF center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, 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	80CPQ150PbF
V_R	Max. DC Reverse Voltage (V)	150
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters		80CPQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current * See Fig. 5	Per Device	80	A	50% duty cycle @ T_C = 150°C, rectangular wave form	
		Per Leg	40			
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7		1930	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
			500		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)		0.5	mJ	T_J = 25 °C, I_{AS} = 1.0 Amps, L = 1 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)		1.0	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) (Per Leg) * See Fig. 1	0.82	0.86	V	@ 40A	T_J = 25 °C
		0.97	1.09	V	@ 80A	
		0.67	0.71	V	@ 40A	T_J = 125 °C
		0.80	0.85	V	@ 80A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2	10	200	µA	T_J = 25 °C	V_R = rated V_R
		12	26	mA	T_J = 125 °C	
C_T	Typical Junction Capacitance (Per Leg)	-	1100	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 pack. 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		80CPQ	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)		0.6	°C/W	DC operation * See Fig. 4
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		0.3	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.24	°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		80CPQ150		

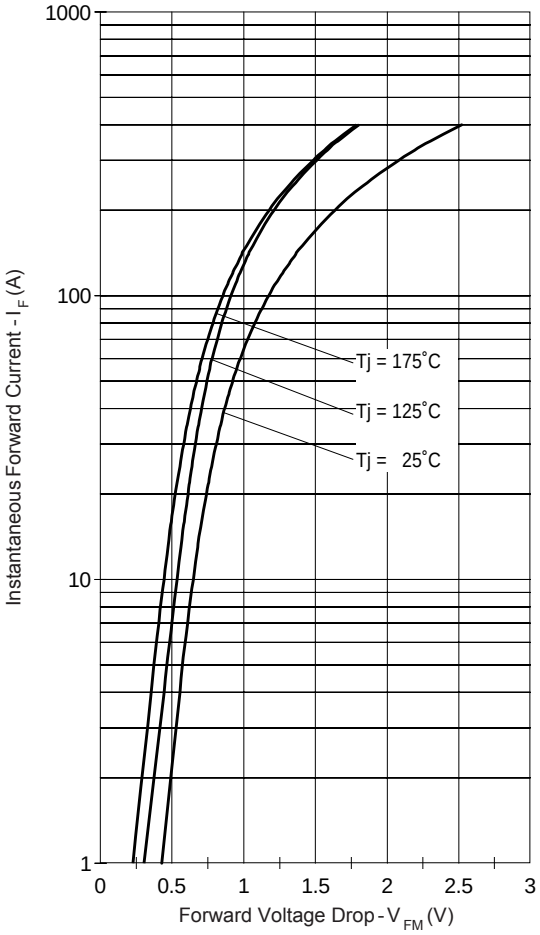


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

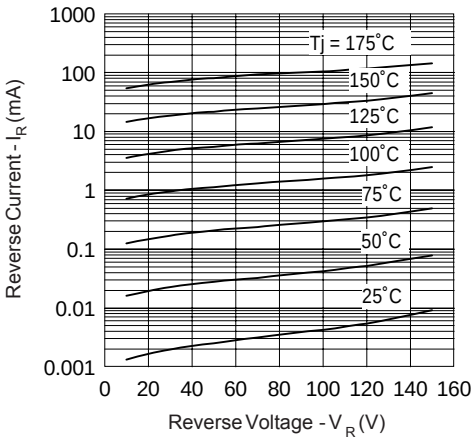


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

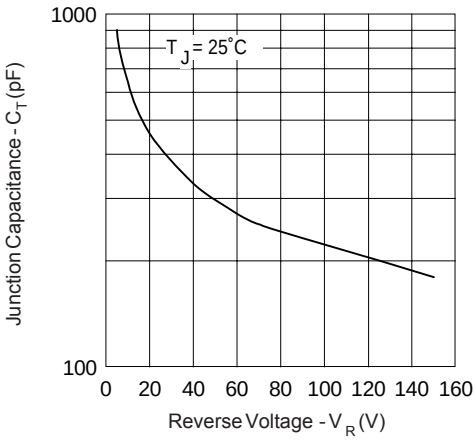


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

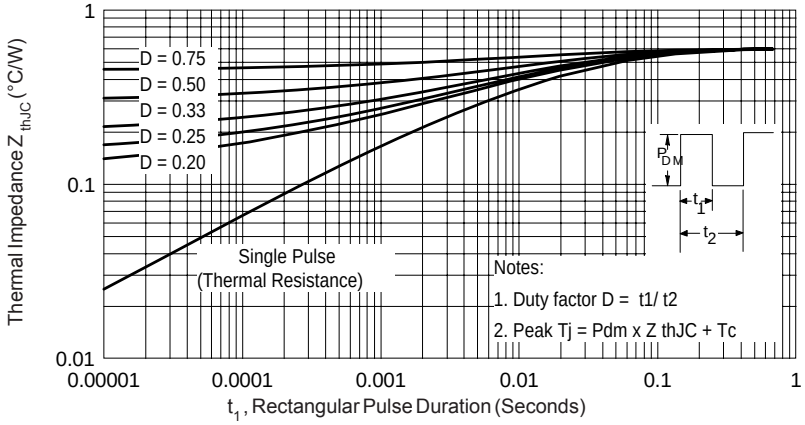


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

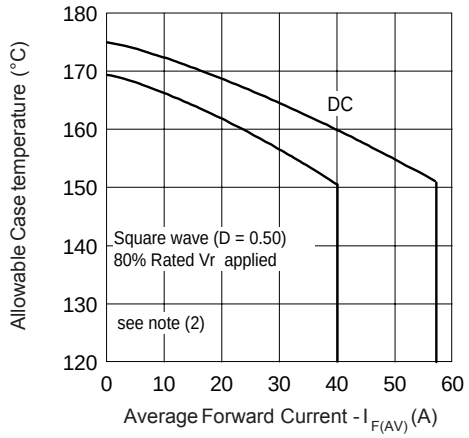


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

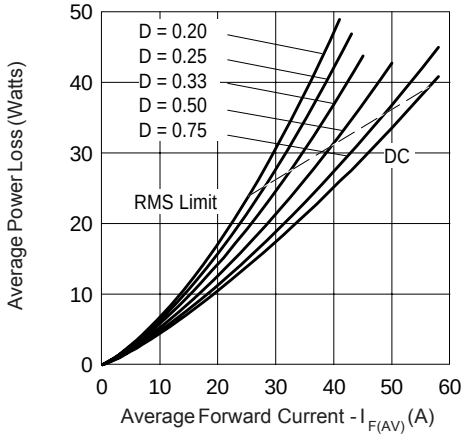


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

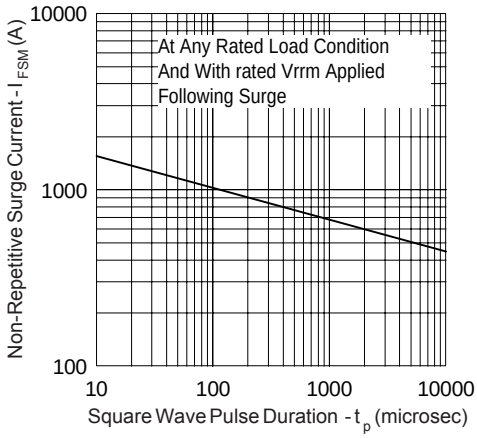


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

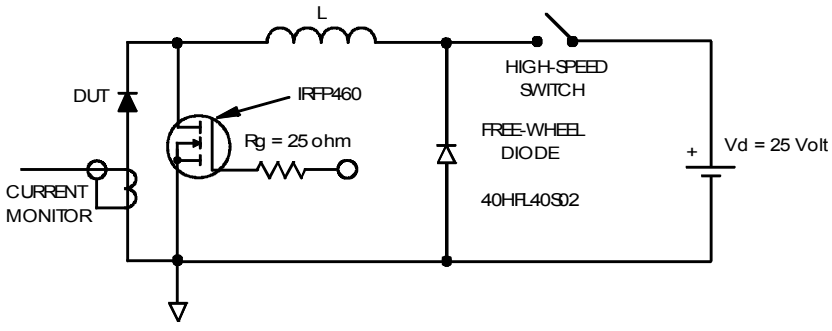
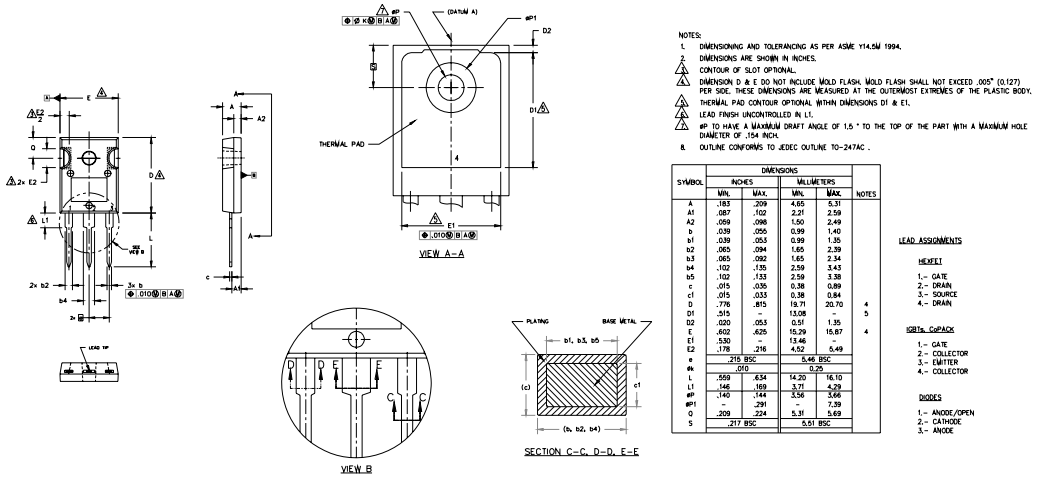


Fig. 8 - Unclamped Inductive Test Circuit

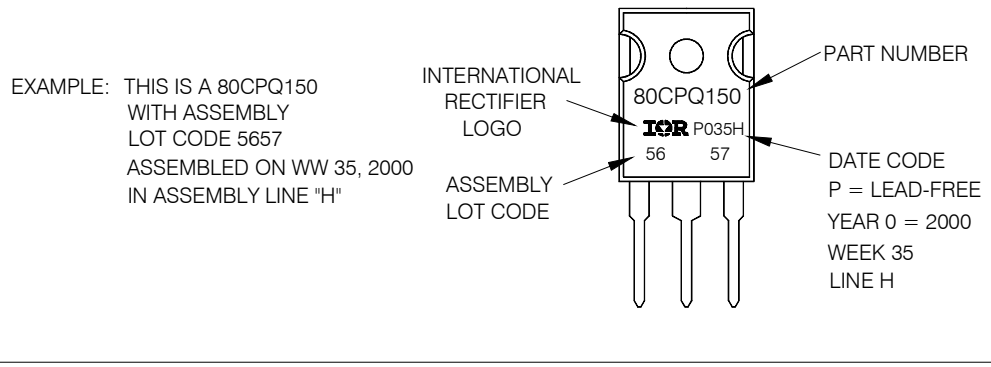
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Outline Table



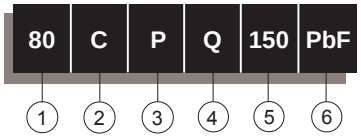
Conform to JEDEC outline TO-247AC (TO-3P)
Dimensions in millimeters and (inches)

Marking Information



Ordering Information Table

Device Code



1	-	Current Rating (80 = 80A)
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.

International
IOR Rectifier

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11/06

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