

**Major Ratings and Characteristics**

Characteristics	80CPQ150	Units
$I_{F(AV)}$ Rectangular waveform	80	A
$V_{RRM}$	150	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	1930	A
$V_F$ @40 Apk, $T_J=125^\circ\text{C}$ (per leg)	0.71	V
$T_J$	-55 to 175	$^\circ\text{C}$

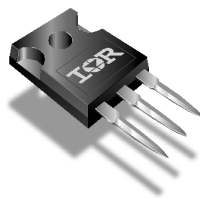
**Description/ Features**

The 80CPQ150 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.

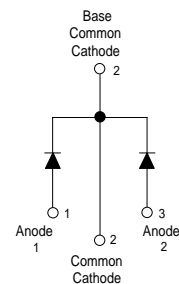
- 175° C  $T_J$  operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

**Case Styles**

80CPQ150



**TO-247AC**



## Voltage Ratings

Part number	80CPQ150
$V_R$ 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	50% duty cycle @ $T_C = 150^\circ\text{C}$ , rectangular wave form
	Per Leg	40	
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1930	A	Following any rated load condition and with rated $V_{RWM}$ applied
	500		
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	0.5	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1.0$ Amps, $L = 1$ mH
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	1.0	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ 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 (Per Leg) * See Fig. 1	0.82	0.86	V	@ 40A
	0.97	1.09	V	@ 80A
	0.67	0.71	V	@ 40A
	0.80	0.85	V	@ 80A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2	10	200	$\mu\text{A}$	$T_J = 25^\circ\text{C}$
	12	26	mA	$T_J = 125^\circ\text{C}$
$C_T$ Typical Junction Capacitance (Per Leg)	-	1100	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/ $\mu\text{s}$	(Rated $V_R$ )

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## Thermal-Mechanical Specifications

Parameters	80CPQ	Units	Conditions
$T_J$ Max. Junction Temperature Range	-55 to 175	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Leg)	0.6	$^\circ\text{C/W}$	DC operation * See Fig. 4
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package)	0.3	$^\circ\text{C/W}$	DC operation
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.24	$^\circ\text{C/W}$	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	

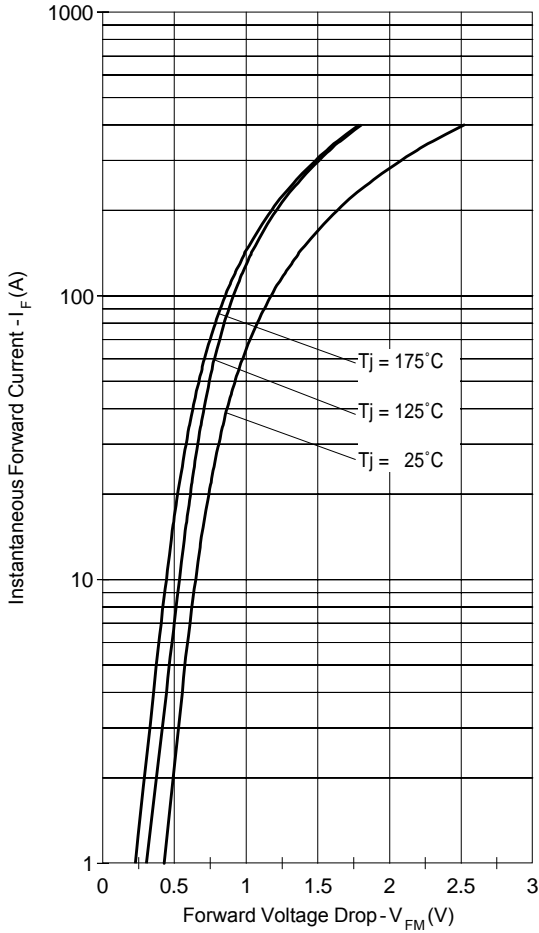


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

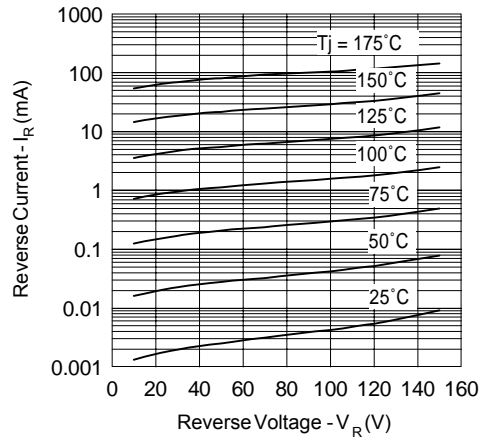


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

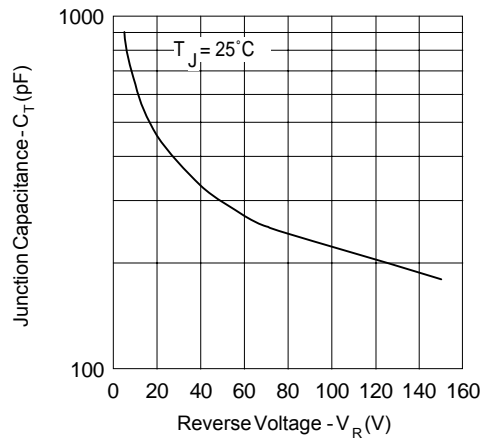


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

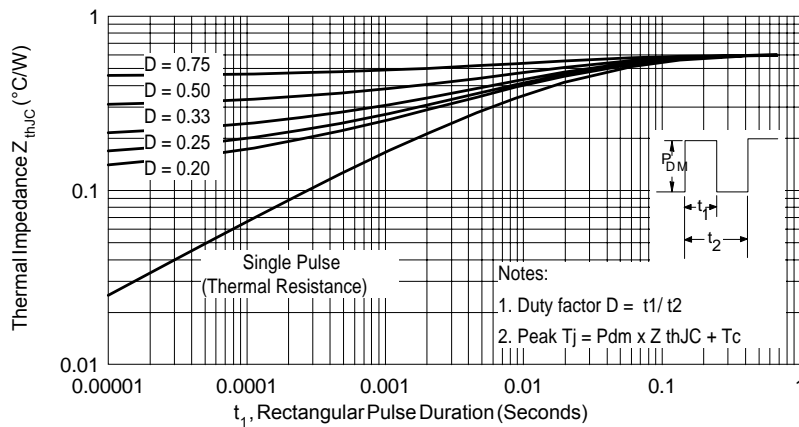


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

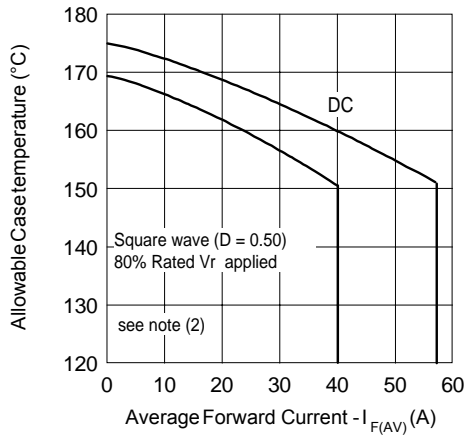


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

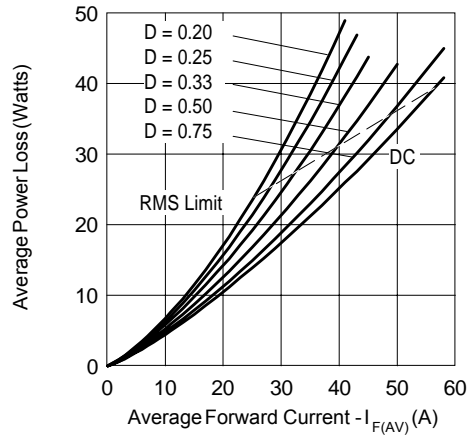


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

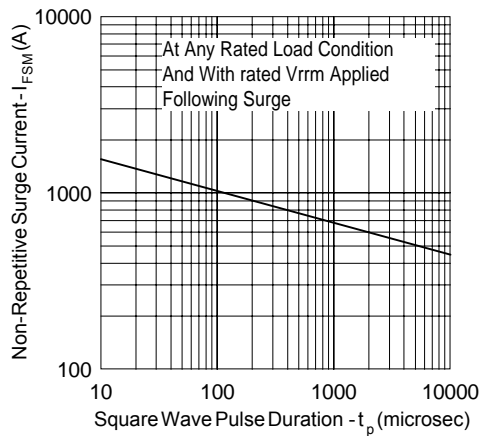


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

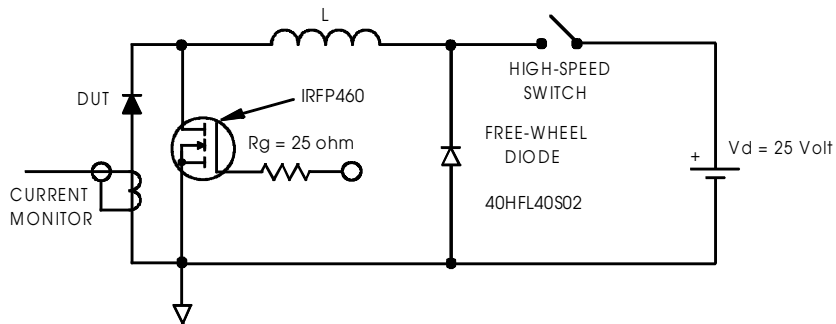


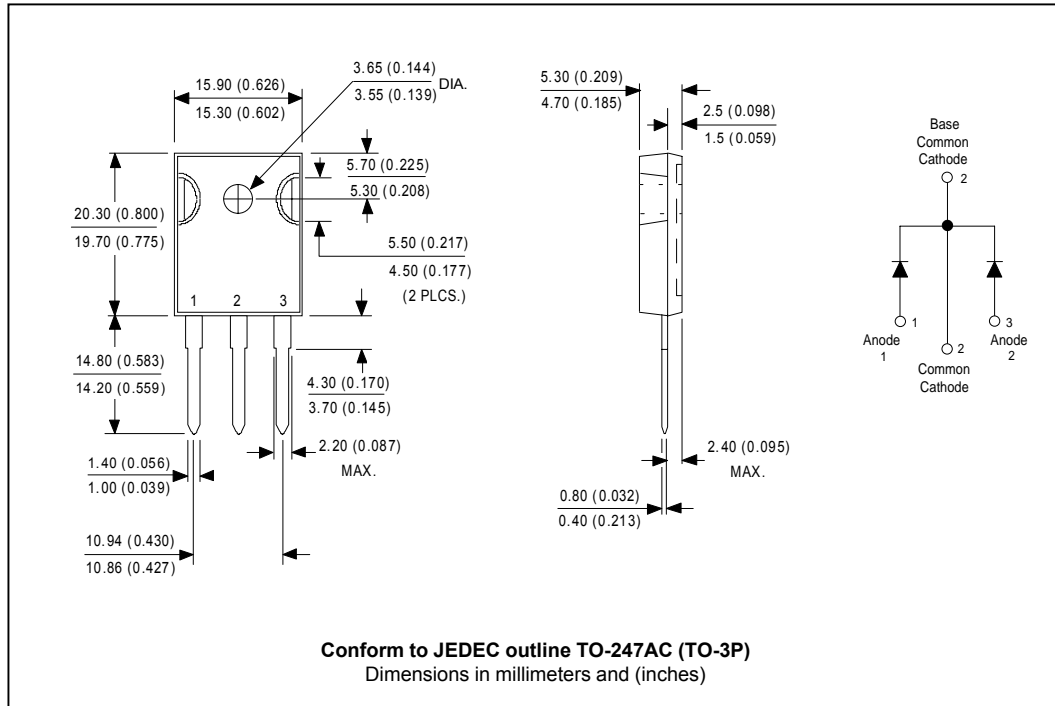
Fig. 8 - Unclamped Inductive Test Circuit

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

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