

$$I_{F(AV)} = 30\text{Amp}$$

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

**Major Ratings and Characteristics**

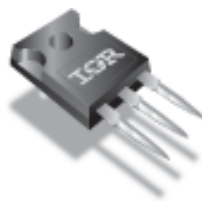
Characteristics	Value	Units
$I_{F(AV)}$ Rectangular waveform	30	A
$V_{RRM}$	150	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	1000	A
$V_F$ @15 Apk, $T_J=125^\circ\text{C}$ (per leg)	0.78	V
$T_J$	-55 to 175	$^\circ\text{C}$

**Description/ Features**

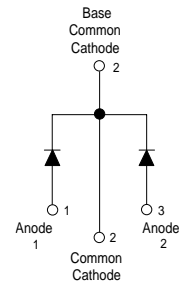
The 30CPQ150PbF center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, 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	30CPQ150PbF
$V_R$ Max. DC Reverse Voltage (V)	150
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	30CPQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	30 15	A	50% duty cycle @ $T_C = 135^\circ\text{C}$ , rectangular wave form Per Device Per Leg
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	1000 340	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated $V_{RWM}$ applied
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	11.25	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 0.50$ Amps, $L = 90$ mH
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	0.50	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	30CPQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	1.00	V	@ 15A $T_J = 25^\circ\text{C}$
	1.19	V	@ 30A
	0.78	V	@ 15A $T_J = 125^\circ\text{C}$
	0.93	V	@ 30A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.1	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	15	mA	$T_J = 125^\circ\text{C}$
$C_T$ Max. Junction Capacitance (Per Leg)	340	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 (Rated $V_R$ )	10000	V/ $\mu\text{s}$	

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

## Thermal-Mechanical Specifications

Parameters	30CPQ	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)	2.20	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package)	1.10	$^\circ\text{C}/\text{W}$	DC operation
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.24	$^\circ\text{C}/\text{W}$	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	30CPQ150		

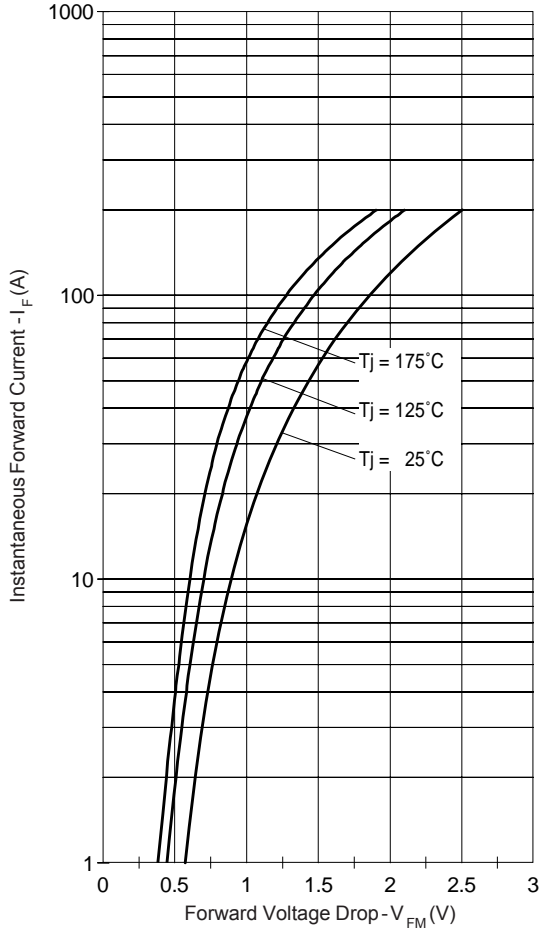


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

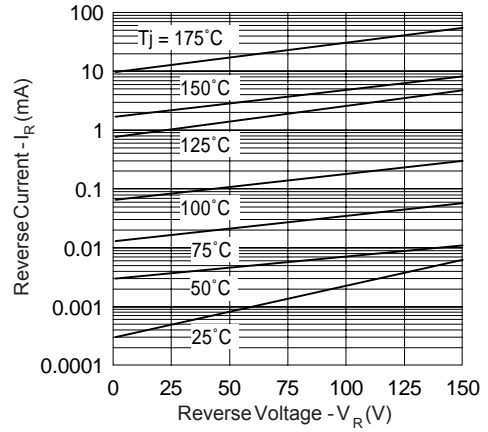


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

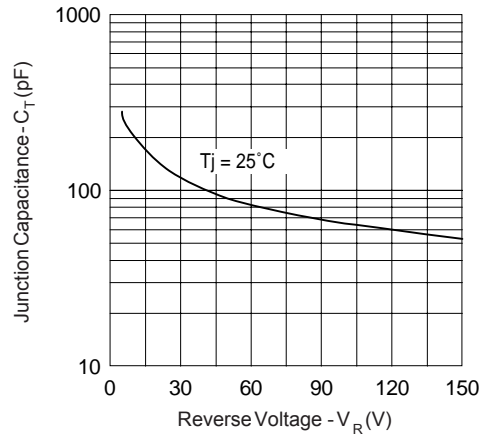


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

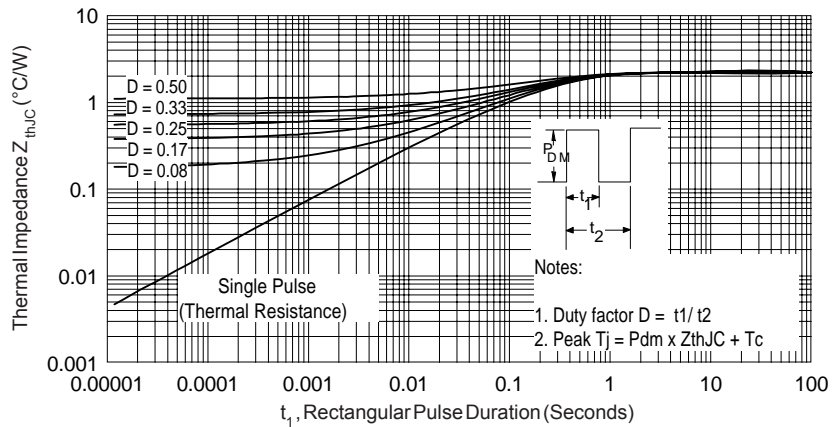


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

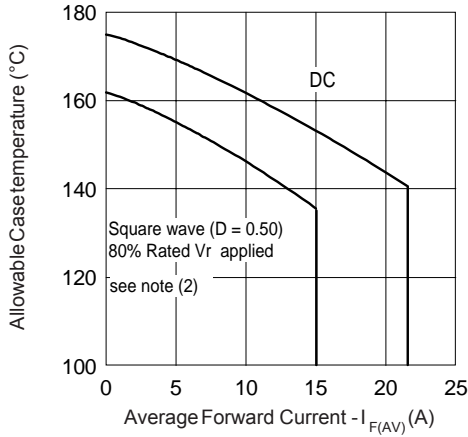


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

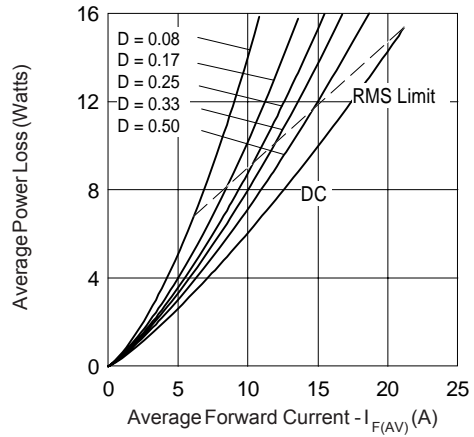


Fig. 6- Forward Power Loss Characteristics (Per Leg)

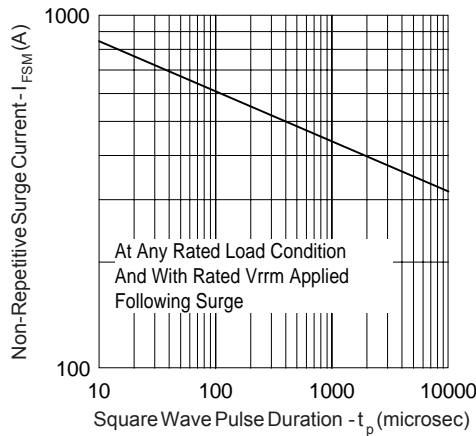


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

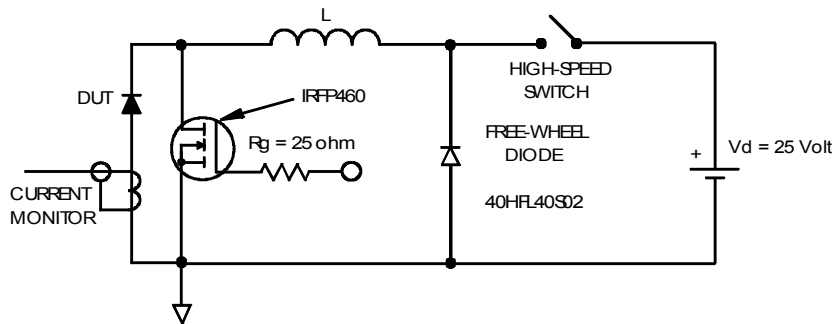


Fig. 8- Unclamped Inductive Test Circuit

(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

**NOTES:**  
 1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M 1994.  
 2. DIMENSIONS ARE SHOWN IN INCHES.  
 3. CONTOUR OF SLOT OPTIONAL.  
 4. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.  
 5. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 & E1.  
 6. LEAD FINISH UNCONTROLLED IN LT.  
 7. HP TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .154 INCH.  
 8. OUTLINE CONFORMS TO JEDEC OUTLINE TO-247AC.

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.183	.209	4.65	5.31	
A1	.087	.102	2.21	2.59	
A2	.059	.088	1.50	2.24	
b	.039	.050	0.99	1.27	
b1	.039	.050	0.99	1.25	
b2	.065	.094	1.65	2.39	
b3	.065	.092	1.65	2.34	
b4	.102	.135	2.59	3.43	
b5	.102	.135	2.59	3.38	
c	.015	.030	0.38	0.89	
c1	.015	.035	0.38	0.84	
d	.276	.875	19.71	20.70	4
D1	.515	-	13.08	-	4
D2	.020	.055	0.51	1.35	
E	.022	.029	0.56	0.74	4
E1	.530	-	13.46	15.87	
E2	.178	.216	4.52	5.49	
e	215 BSC		5.46 BSC		
h	0.015		0.38		
L	.558	.634	14.20	16.10	
L1	.146	.169	3.71	4.29	
HP	.145	.144	3.68	3.66	
HP1	-	.291	-	7.39	
Q	.208	.224	5.31	5.69	
S	217 BSC		5.51 BSC		

**LEAD ASSIGNMENTS**  
 HEXVOLT  
 1- GATE  
 2- BRN  
 3- SOURCE  
 4- DRN

**IGBTs, CAPAC**  
 1- GATE  
 2- COLLECTOR  
 3- EMITTER  
 4- COLLECTOR

**DIODES**  
 1- ANODE/OPEN  
 2- CATHODE  
 3- ANODE

**SECTION C-C, D-D, E-E**

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

Marking Information

EXAMPLE: THIS IS A 30CPQ150 WITH ASSEMBLY LOT CODE 5657 ASSEMBLED ON WW 35, 2000 IN ASSEMBLY LINE "H"

INTERNATIONAL RECTIFIER LOGO  
 30CPQ150  
**IR** P035H  
 56 57  
 PART NUMBER

DATE CODE  
 P = LEAD-FREE  
 YEAR 0 = 2000  
 WEEK 35  
 LINE H

## Ordering Information Table

Device Code													
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 5px;">30</td> <td style="padding: 5px;">C</td> <td style="padding: 5px;">P</td> <td style="padding: 5px;">Q</td> <td style="padding: 5px;">150</td> <td style="padding: 5px;">PbF</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> </tr> </table>	30	C	P	Q	150	PbF	①	②	③	④	⑤	⑥
30	C	P	Q	150	PbF								
①	②	③	④	⑤	⑥								
<b>1</b>	- Current Rating (30 = 30A)												
<b>2</b>	- Circuit Configuration C = Common Cathode												
<b>3</b>	- Package P = TO-247												
<b>4</b>	- Schottky "Q" Series												
<b>5</b>	- Voltage Code (150 = 150V)												
<b>6</b>	- <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>												
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.