

# International IOR Rectifier

## 72CPQ030PbF

SCHOTTKY RECTIFIER

70 Amp

$$I_{F(AV)} = 70\text{Amp}$$

$$V_R = 30\text{V}$$

### Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	70	A
$V_{RRM}$	30	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	2180	A
$V_F$ @35Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.43	V
$T_J$ range	-55 to 150	$^\circ\text{C}$

### Description/ Features

The 72CPQ030PbF 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 150 $^\circ\text{C}$  junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150 $^\circ\text{C}$   $T_J$  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



## 72CPQ030PbF

Bulletin PD-20799 rev. A 11/06

International  
IR Rectifier

## Voltage Ratings

Part number	72CPQ030PbF
$V_R$ Max. DC Reverse Voltage (V)	30
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	72CPQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	35	A	50% duty cycle @ $T_C = 125^\circ\text{C}$ , rectangular wave form
	70		
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	2180	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse
	600		
$E_{AS}$ Non-Repetitive Avalanche Energy (Per Leg)	27	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 6$ Amps, $L = 1.5$ mH
$I_{AR}$ Repetitive Avalanche Current (Per Leg)	6	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	72CPQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.51	V	@ 35A $T_J = 25^\circ\text{C}$
	0.61	V	@ 70A
	0.43	V	@ 35A $T_J = 125^\circ\text{C}$
	0.58	V	@ 70A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1.9	mA	$T_J = 25^\circ\text{C}$
	450	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.25	V	$T_J = T_J \text{ max.}$
$r_t$ Forward Slope Resistance	4.70	m $\Omega$	
$C_T$ Max. Junction Capacitance (Per Leg)	4600	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	72CPQ	Units	Conditions
$T_J$ Max. Junction Temperature Range	-55 to 150	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Leg) * See Fig. 4	0.8	$^\circ\text{C}/\text{W}$	DC operation
$R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package)	0.4	$^\circ\text{C}/\text{W}$	DC operation
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.25	$^\circ\text{C}/\text{W}$	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 Information	72CPQ030		

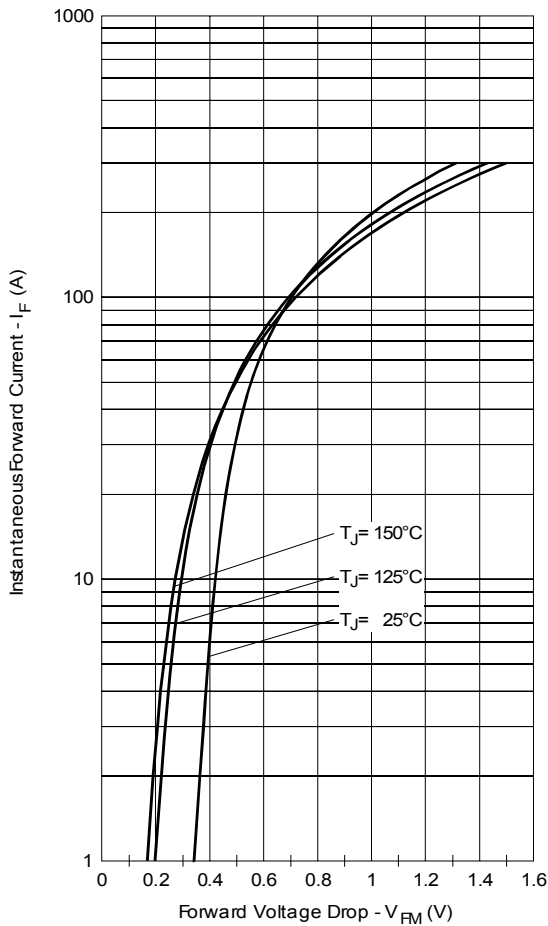


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

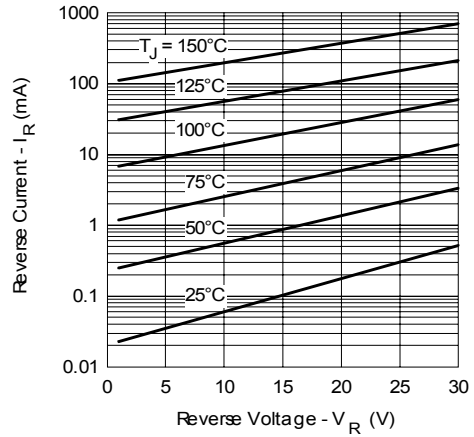


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

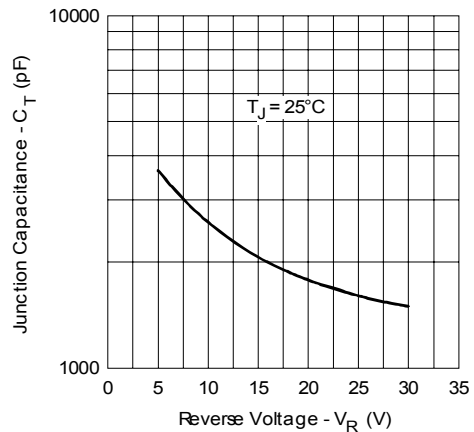


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

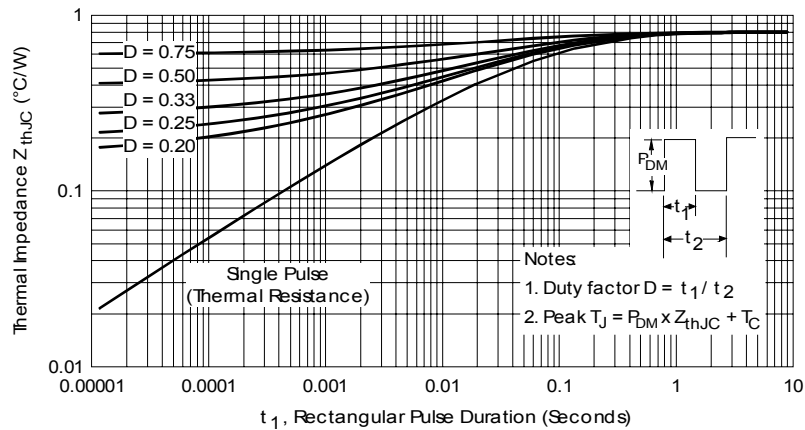


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

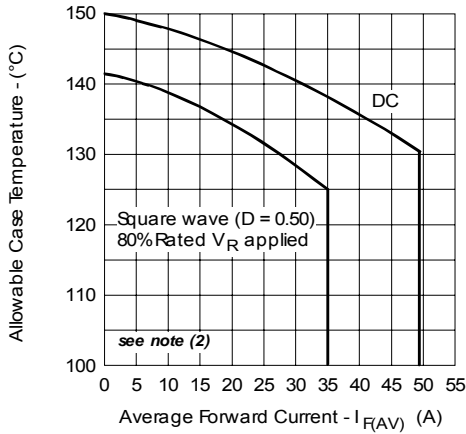


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

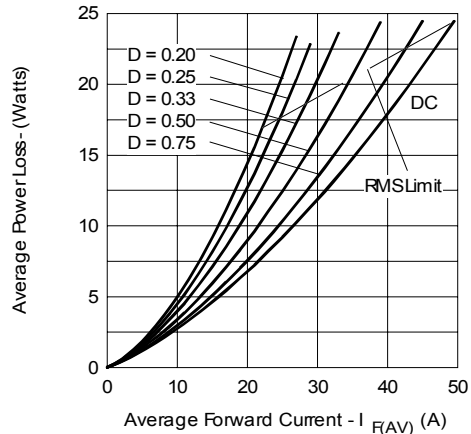


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

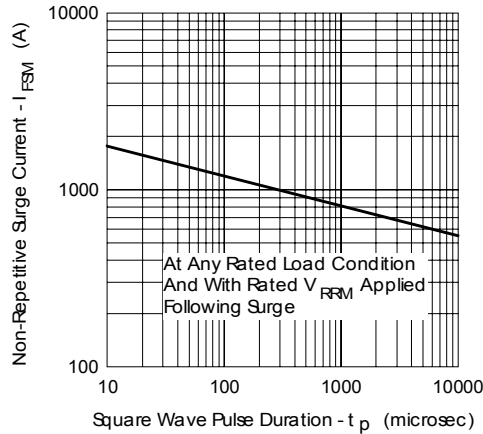


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

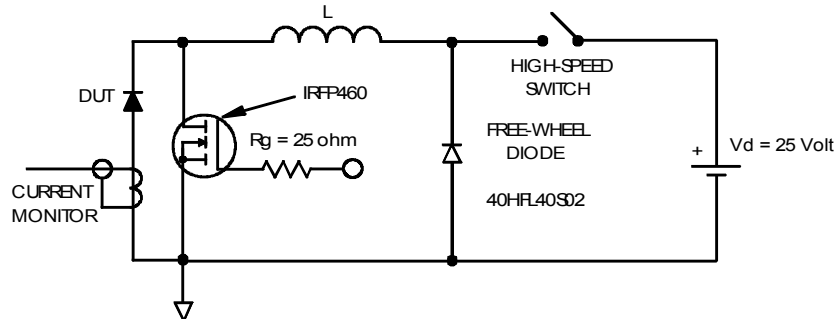
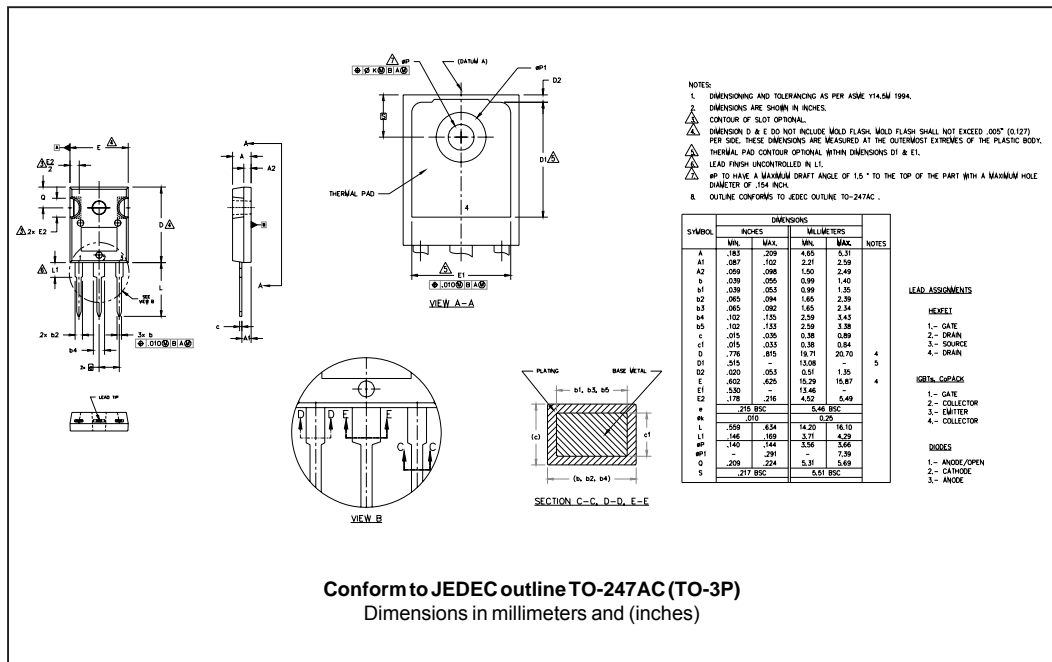


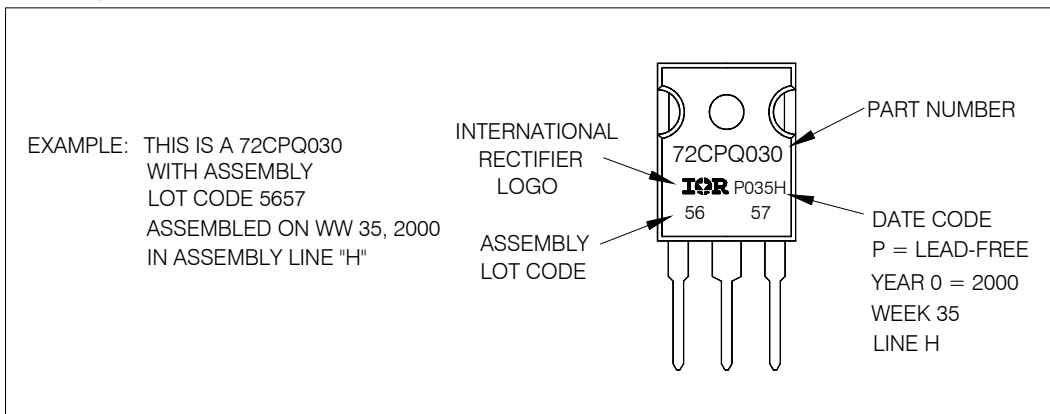
Fig. 8 - Unclamped Inductive Test Circuit

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

Outline Table



Marking Information



## Ordering Information Table

Device Code													
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">72</td> <td style="padding: 5px;">C</td> <td style="padding: 5px;">P</td> <td style="padding: 5px;">Q</td> <td style="padding: 5px;">030</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>	72	C	P	Q	030	PbF	①	②	③	④	⑤	⑥
72	C	P	Q	030	PbF								
①	②	③	④	⑤	⑥								
<b>1</b>	- Current Rating (70A)												
<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 (030 = 30V)												
<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.