

$$I_{F(AV)} = 30\text{Amp}$$
$$V_R = 150\text{V}$$

Major Ratings and Characteristics

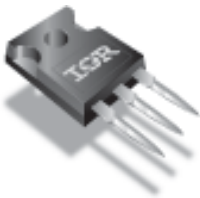
| Characteristics                                    | Value      | Units            |
|----------------------------------------------------|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform                   | 30         | A                |
| $V_{RRM}$                                          | 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

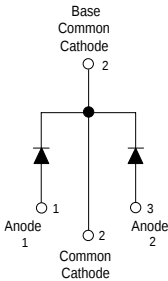
The 30CPQ150PbF center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, 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



## 30CPQ150PbF

Bulletin PD-20787 rev. A 11/06

International  
**IR** Rectifier

### 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 Per Device Current * See Fig. 5 Per Leg          | 30<br>15    | A     | 50% duty cycle @ $T_C = 135^\circ\text{C}$ , rectangular wave form                                                                                         |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 1000<br>340 | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse<br>10ms Sine or 6ms Rect. pulse<br>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 $\mu\text{sec}$<br>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<br>$T_J = 25^\circ\text{C}$                                     |
|                                                                  | 1.19  | V                | @ 30A                                                                 |
|                                                                  | 0.78  | V                | @ 15A<br>$T_J = 125^\circ\text{C}$                                    |
|                                                                  | 0.93  | V                | @ 30A                                                                 |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 0.1   | mA               | $T_J = 25^\circ\text{C}$<br>$V_R = \text{rated } V_R$                 |
|                                                                  | 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             | $^\circ\text{C/W}$ | DC operation * See Fig. 4            |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package) | 1.10             | $^\circ\text{C/W}$ | 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<br>(lbf-in)  |                                      |
|                                                                   | Max. 12 (10)     |                    |                                      |
| Case Style                                                        | TO-247AC (TO-3P) | JEDEC              |                                      |
| Marking Device                                                    | 30CPQ150         |                    |                                      |

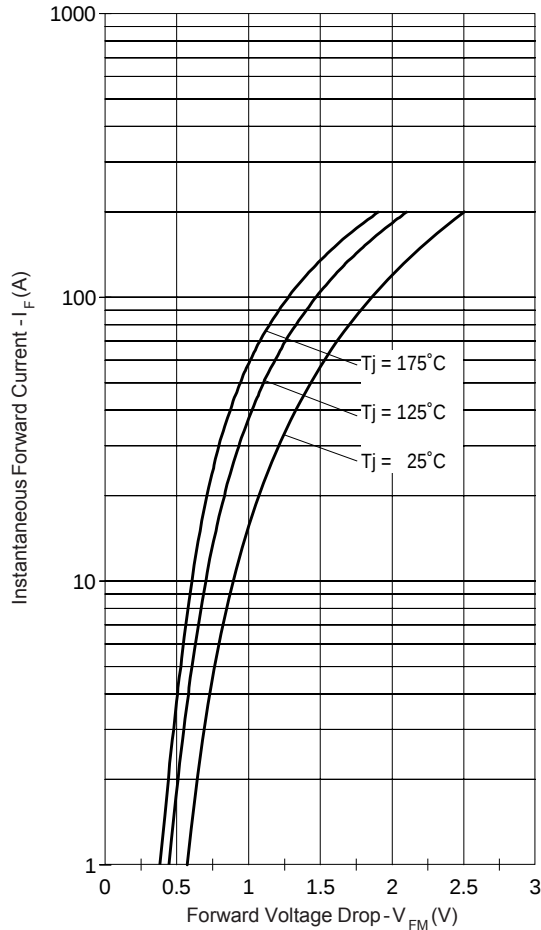


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

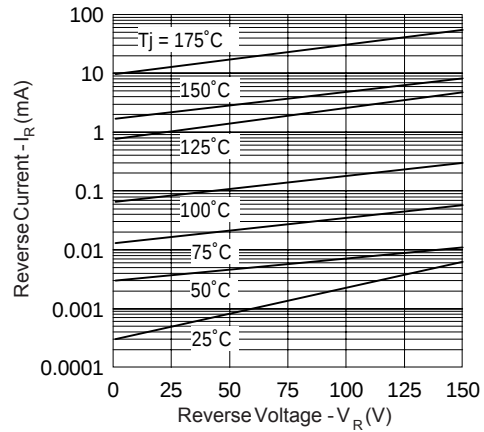


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

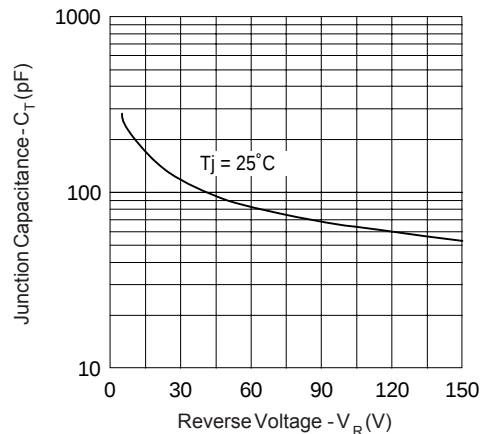


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

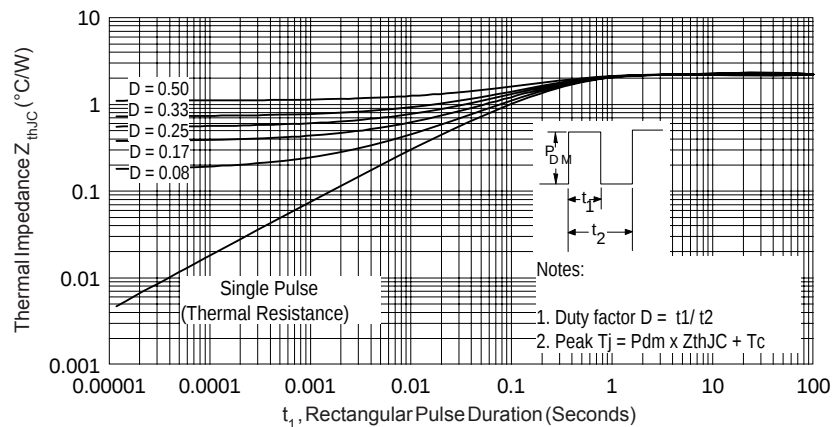


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

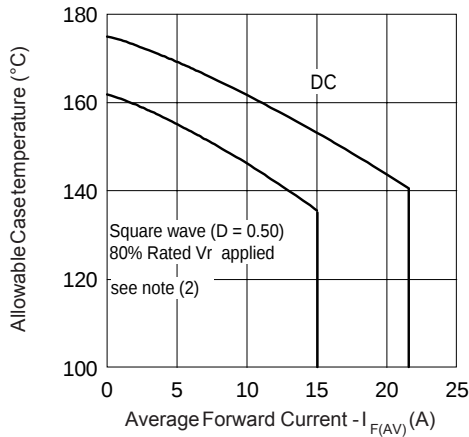


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

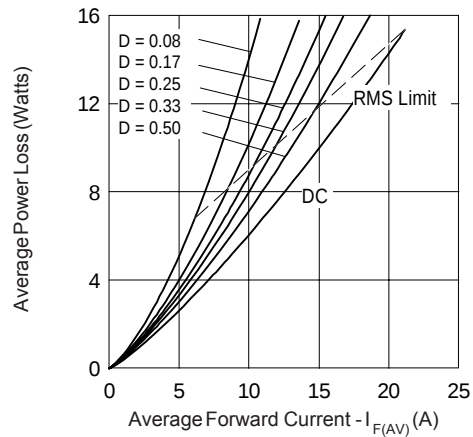


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

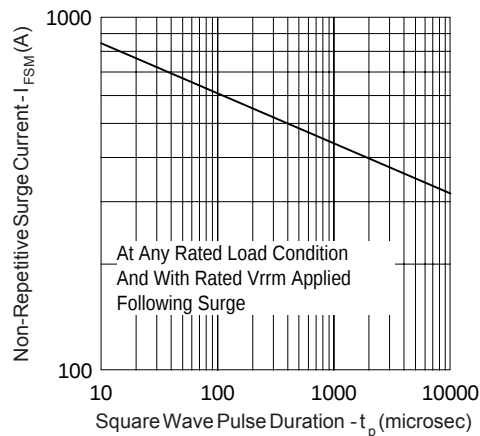


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

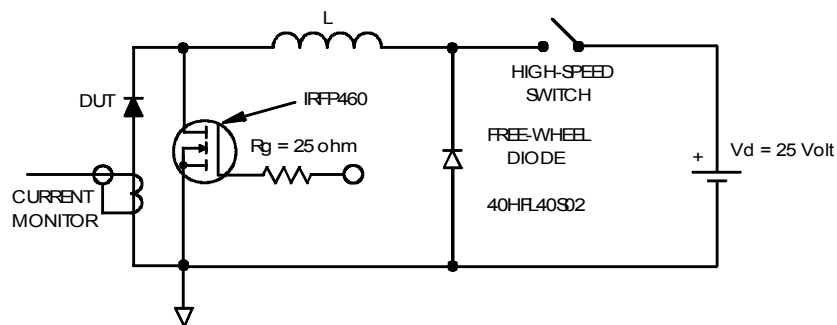


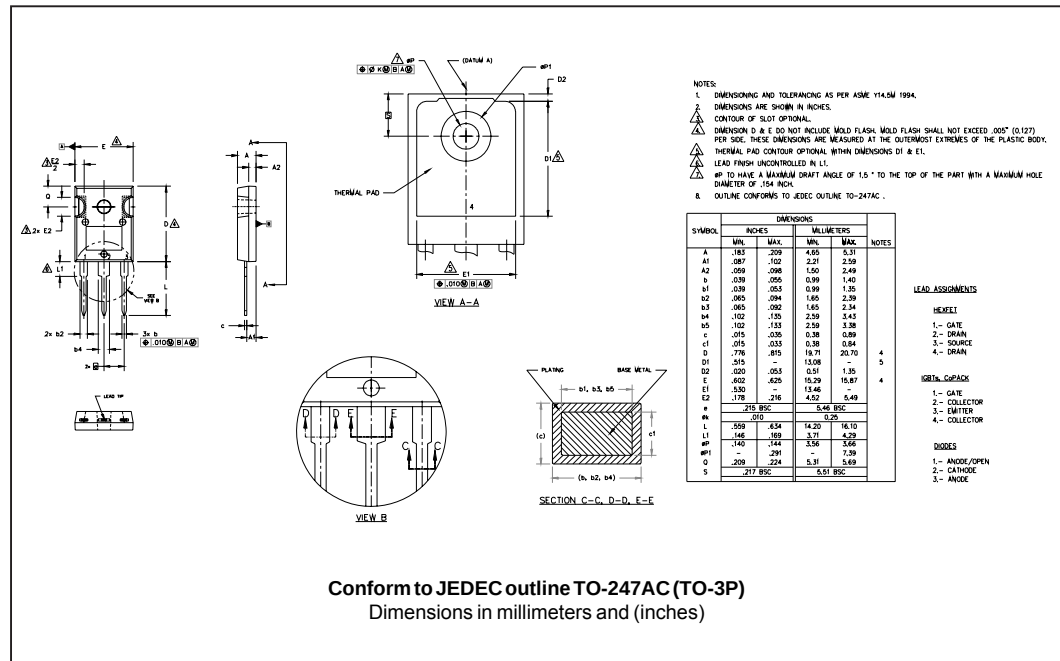
Fig. 8 - Unclamped Inductive Test Circuit

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

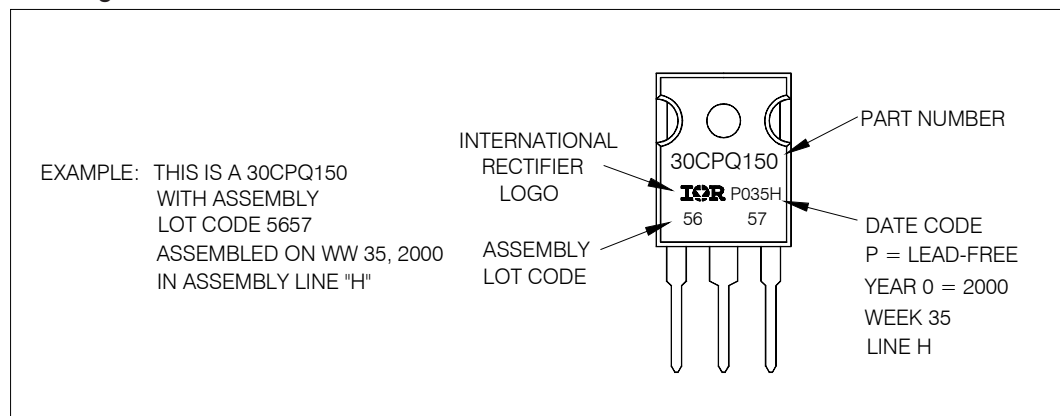
$P_d$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

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

## Outline Table



## Marking Information



Ordering Information Table

## Device Code

|    |   |   |   |     |     |
|----|---|---|---|-----|-----|
| 30 | C | P | Q | 150 | PbF |
| 1  | 2 | 3 | 4 | 5   | 6   |

- 1** - Current Rating (30 = 30A)
- 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.