Bulletin PD-20786 rev. A 09/06

International
IOR Rectifier

# 30CPQ080PbF
# 30CPQ100PbF

## SCHOTTKY RECTIFIER

## 30 Amp

$I_{F(AV)}$ = 30Amp
$V_R$ = 80 -100V

### Major Ratings and Characteristics

| Characteristics | | Values | Units |
|---|---|---|---|
| $I_{F(AV)}$ | Rectangular waveform | 30 | A |
| $V_{RRM}$ | | 80-100 | V |
| $I_{FSM}$ | @tp = 5 µs sine | 920 | A |
| $V_F$ | @15 Apk, $T_J$=125°C (per leg) | 0.67 | V |
| $T_J$ | | - 55 to 175 | °C |

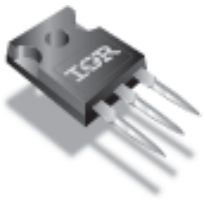
### Description/ Features

The 30CPQ...PbF center tap Schottky rectifier 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.

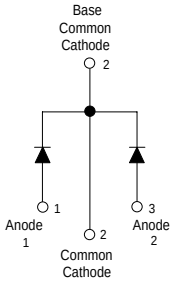
- 175° C $T_J$ operation
- Center tap TO-247 package
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

## Case Styles

30CPQ...PbF



TO-247AC



## Voltage Ratings

| | Part number | 30CPQ080PbF | 30CPQ100PbF |
|---|---|---|---|
| $V_R$ | Max. DC Reverse Voltage (V) | 80 | 100 |
| $V_{RWM}$ | Max. Working Peak Reverse Voltage (V) | | |

## Absolute Maximum Ratings

| | Parameters | 30CPQ... | Units | Conditions | |
|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. Average Forward Current * See Fig. 5 | 30 | A | 50% duty cycle @ $T_C$ = 140°C, rectangular wave form | |
| $I_{FSM}$ | Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 920 | A | 5µs Sine or 3µs Rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied |
| | | 240 | | 10ms Sine or 6ms Rect. pulse | |
| $E_{AS}$ | Non-Repetitive Avalanche Energy (Per Leg) | 7.50 | mJ | $T_J$ = 25 °C, $I_{AS}$ = 0.50 Amps, L = 60 mH | |
| $I_{AR}$ | Repetitive Avalanche Current (Per Leg) | 0.50 | 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 | 30CPQ... | Units | Conditions | |
|---|---|---|---|---|---|
| $V_{FM}$ | Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1) | 0.86 | V | @ 15A | $T_J$ = 25 °C |
| | | 1.05 | V | @ 30A | |
| | | 0.67 | V | @ 15A | $T_J$ = 125 °C |
| | | 0.81 | V | @ 30A | |
| $I_{RM}$ | Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 0.55 | mA | $T_J$ = 25 °C | $V_R$ = rated $V_R$ |
| | | 7 | mA | $T_J$ = 125 °C | |
| $C_T$ | Max. Junction Capacitance (Per Leg) | 500 | pF | $V_R$ = 5$V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C | |
| $L_S$ | Typical Series Inductance (Per Leg) | 7.5 | nH | Measured lead to lead 5mm from package 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 | | 30CPQ... | 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) | | 2.20 | °C/W | DC operation * See Fig. 4 |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case (Per Package) | | 1.10 | °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) | Non-lubricated threads |
| | | Max. | 12 (10) | | |
| | Case Style | | TO-247AC(TO-3P) | | JEDEC |
| | Device Marking | | 30CPQ080 | | |
| | | | 30CPQ100 | | |

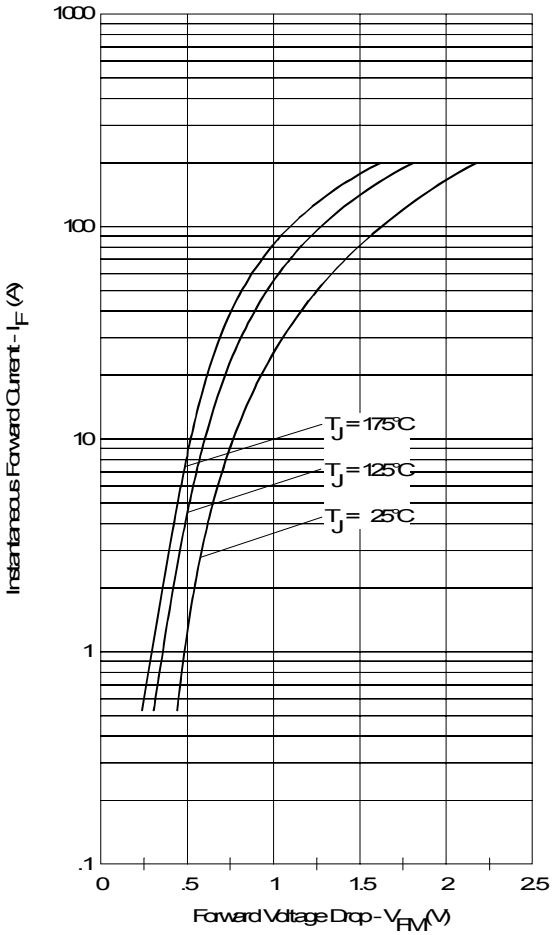



Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

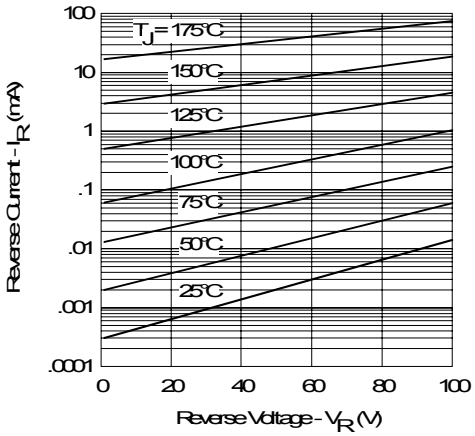



Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

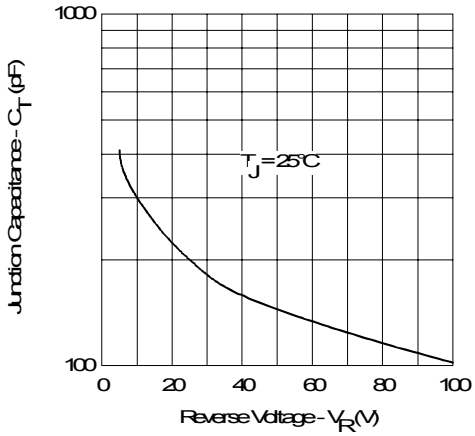



Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

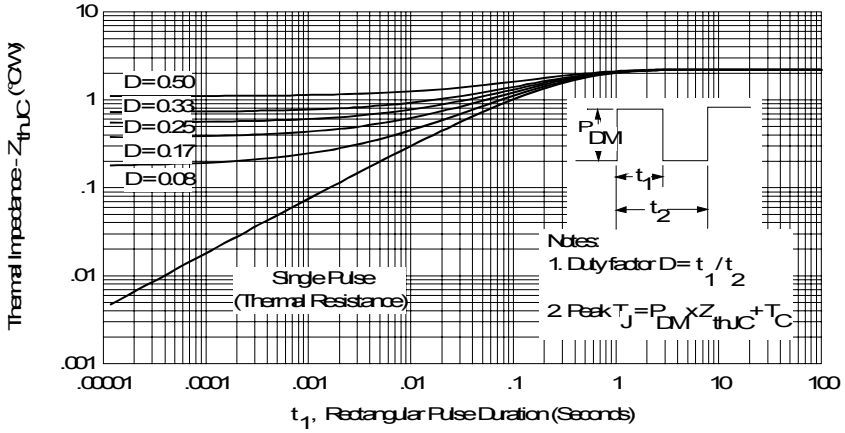



Fig. 4 - Max. Thermal Impedance $Z_{thJC}$ Characteristics (Per Leg)

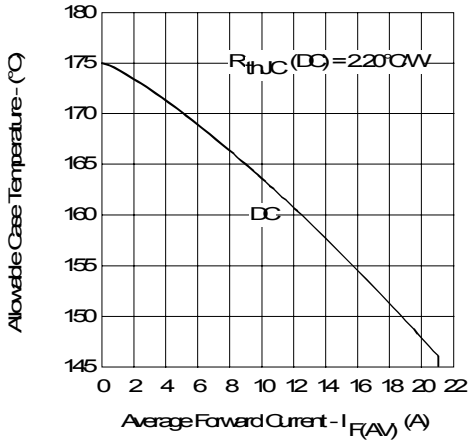



Fig. 5 - Max. Allowable Case Temperature
Vs. Average Forward Current (Per Leg)

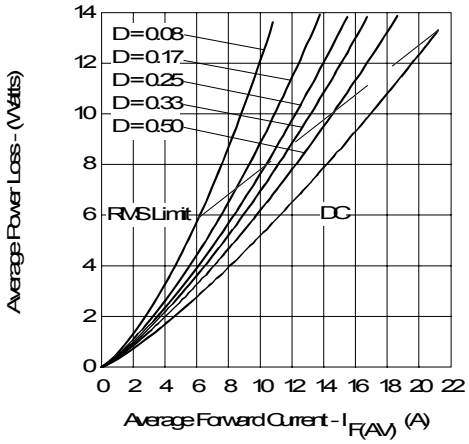



Fig. 6 - Forward Power Loss Characteristics
(Per Leg)

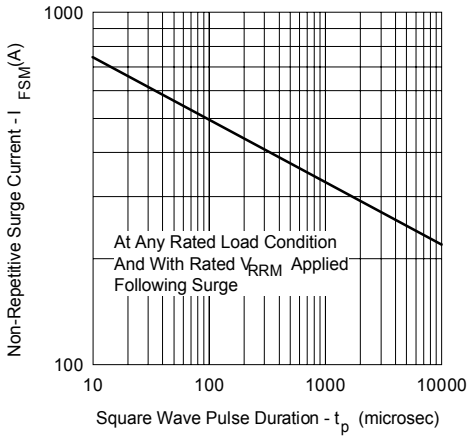



Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

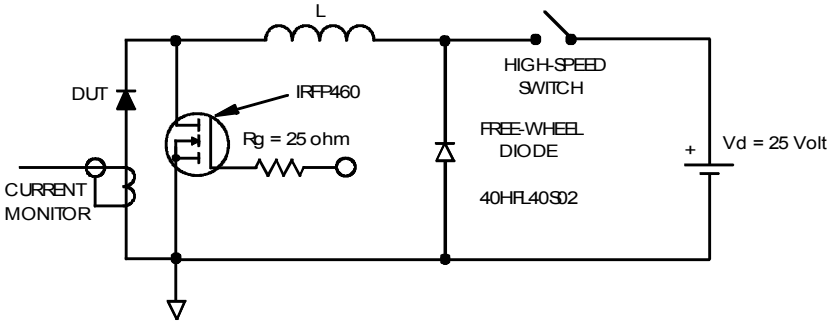
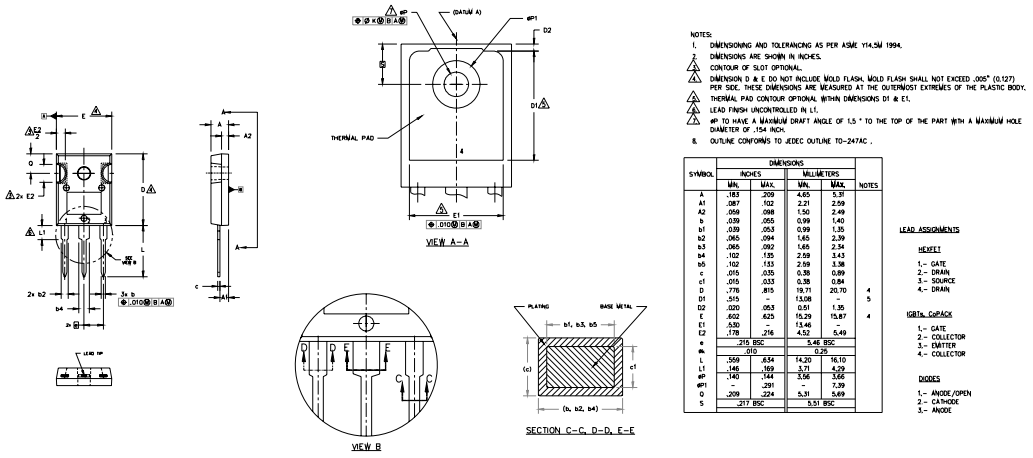



Fig. 8 - Unclamped Inductive Test Circuit

## Outline Table

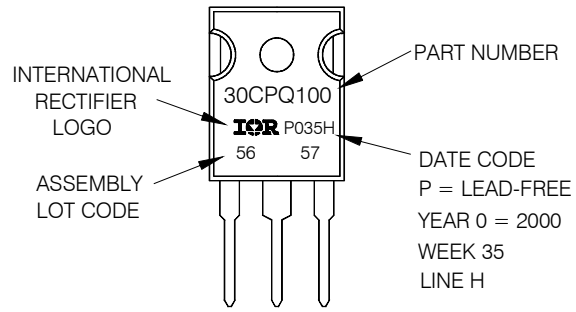



| SYMBOL | DIMENSIONS | | | | NOTES |
|---|---|---|---|---|---|
| | INCHES | | MILLIMETERS | | |
| | MIN. | MAX. | MIN. | MAX. | |
| A | .183 | .209 | 4.65 | 5.31 | |
| A1 | .087 | .102 | 2.21 | 2.59 | |
| A2 | .059 | .098 | 1.50 | 2.49 | |
| b | .039 | .055 | 0.99 | 1.40 | |
| b1 | .039 | .053 | 0.99 | 1.35 | |
| b2 | .065 | .094 | 1.65 | 2.39 | |
| b3 | .065 | .092 | 1.65 | 2.34 | |
| b4 | .102 | .135 | 2.59 | 3.43 | |
| b5 | .102 | .133 | 2.59 | 3.38 | |
| c | .015 | .035 | 0.38 | 0.89 | |
| c1 | .015 | .033 | 0.38 | 0.84 | |
| D | .776 | .815 | 19.71 | 20.70 | 4 |
| D1 | .515 | - | 13.08 | - | 5 |
| D2 | .020 | .053 | 0.51 | 1.35 | |
| E | .602 | .625 | 15.29 | 15.87 | 4 |
| E1 | .530 | - | 13.46 | - | |
| E2 | .178 | .216 | 4.52 | 5.49 | |
| e | .215 BSC | | 5.46 BSC | | |
| ø& | .010 | | 0.25 | | |
| L | .559 | .634 | 14.20 | 16.10 | |
| L1 | .146 | .169 | 3.71 | 4.29 | |
| øP | .140 | .144 | 3.56 | 3.66 | |
| øP1 | - | .291 | - | 7.39 | |
| Q | .209 | .224 | 5.31 | 5.69 | |
| S | .217 BSC | | 5.51 BSC | | |

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

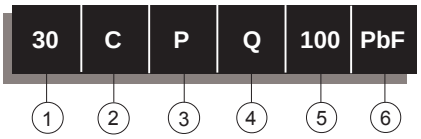
## Marking Information

EXAMPLE: THIS IS A 30CPQ100
WITH ASSEMBLY
LOT CODE 5657
ASSEMBLED ON WW 35, 2000
IN ASSEMBLY LINE "H"



## Ordering Information Table

**Device Code**




1 - Current Rating
2 - Circuit Configuration
C = Common Cathode
3 - Package
P = TO-247
4 - Schottky "Q" Series
5 - Voltage Code
080 = 80V
100 = 100V
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

**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
09/06

# Notice

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