



30L30CT  
30L30CTS  
30L30CT-1

SCHOTTKY RECTIFIER

30 Amp

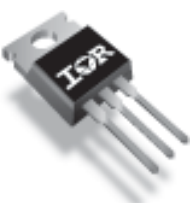
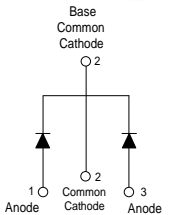

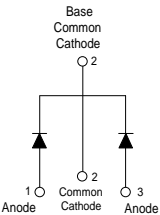

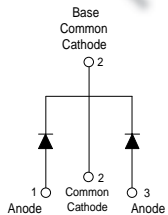
Major Ratings and Characteristics

| Characteristics                                     | Values     | Units            |
|---|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform                    | 2 x 15     | A                |
| $V_{RRM}$   | 30         | V                |
| $V_F$ @ 15 Apk, $T_J = 125^\circ\text{C}$ (Per Leg) | 0.37       | V                |
| $T_J$ range   | -55 to 150 | $^\circ\text{C}$ |

Description/ Features

This center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150° C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 150° C  $T_J$  operation
- Center tap configuration
- Very low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

| Case Styles   |  |  |
|---|--|--|
| <p>30L30CT</p>  <p>Base<br/>Common<br/>Cathode</p>  <p>TO-220</p> | <p>30L30CTS</p>  <p>Base<br/>Common<br/>Cathode</p>  <p>D<sup>2</sup>PAK</p> | <p>30L30CT -1</p>  <p>Base<br/>Common<br/>Cathode</p>  <p>TO-262</p> |

## Voltage Ratings

| Parameters                                      | 30L30CT<br>30L30CTS<br>30L30CT-1 |
|---|----------------------------------|
| $V_R$ Max. DC Reverse Voltage (V)               | 30                               |
| $V_{RWM}$ Max. Working Peak Reverse Voltage (V) |                                  |

## Absolute Maximum Ratings

| Parameters  | Values      | Units | Conditions   |
|---|-------------|-------|--|
| $I_{F(AV)}$ Max. Average Forward Current<br>Per Device<br>Per Leg | 30<br>15    | A     | 50% duty cycle @ $T_C = 140^\circ\text{C}$ , rectangular wave form   |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current        | 1450<br>220 | 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)                | 15          | mJ    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 2\text{Amps}$ , $L = 7.5\text{mH}$  |
| $I_{AR}$ Repetitive Avalanche Current (Per Leg)                   | 2           | 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                                       | Values | Units            | Conditions  |
|--|--------|------------------|---|
| $V_{FM}$ Max. Forward Voltage Drop (Per Leg) (1) | 0.46   | V                | @ 15A   |
|  | 0.57   | V                | @ 30A   |
|  | 0.37   | V                | @ 15A   |
|  | 0.50   | V                | @ 30A   |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg)  | 1.50   | mA               | $T_J = 25^\circ\text{C}$  |
|  | 350    | mA               | $T_J = 125^\circ\text{C}$   |
| $C_T$ Max. Junction Capacitance (Per Leg)        | 1500   | pF               | $V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance (Per Leg)        | 8.0    | 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  | Values     | 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)     | 1.5        | $^\circ\text{C/W}$ | DC operation      |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package) | 0.8        | $^\circ\text{C/W}$ | DC operation      |
| wt Approximate Weight   | 2 (0.07)   | g (oz.)            |                   |
| T Mounting Torque   | Min.       | 6 (5)              | Kg-cm<br>(lbf-in) |
|   | Max.       | 12 (10)            |                   |

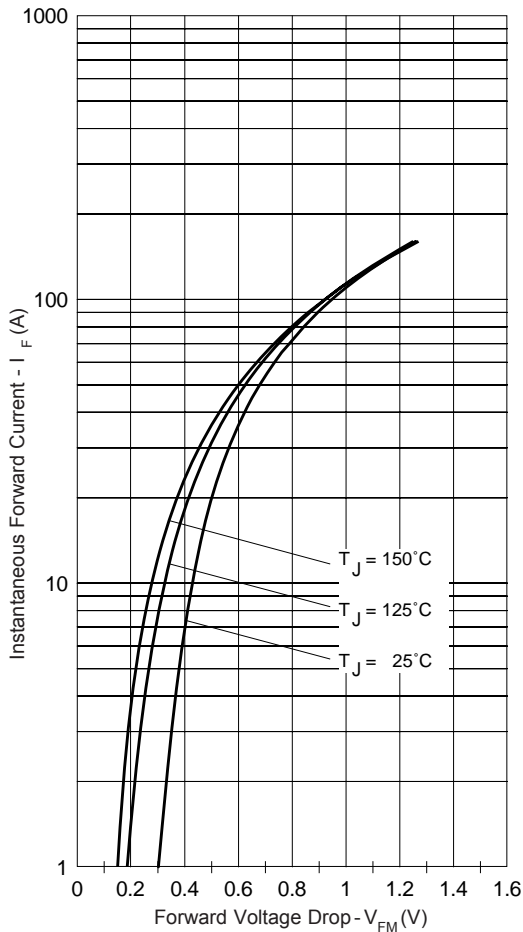


Fig. 1 - Maximum Forward Voltage Drop Characteristics

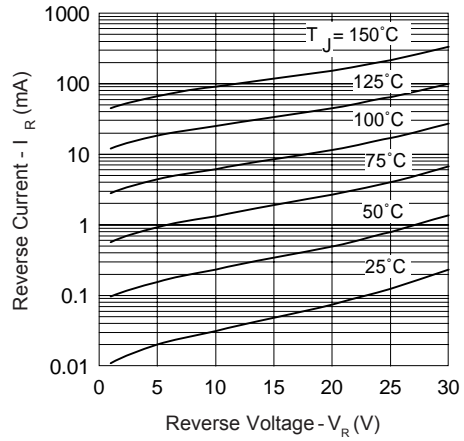


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

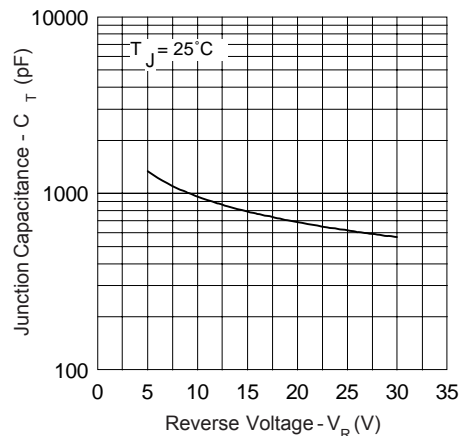


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

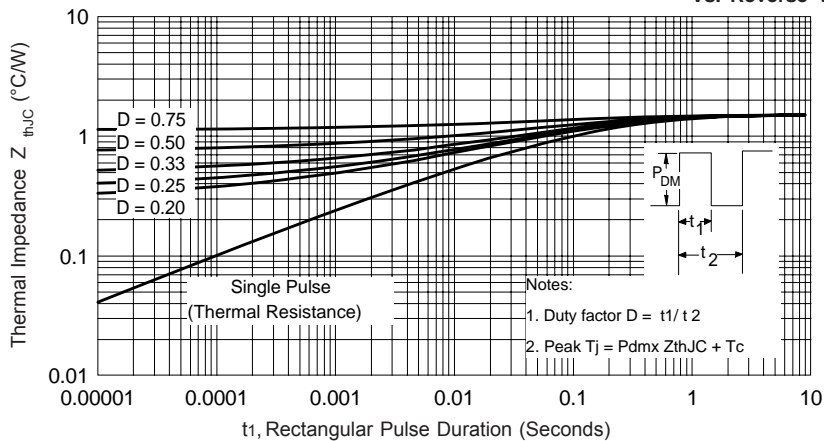
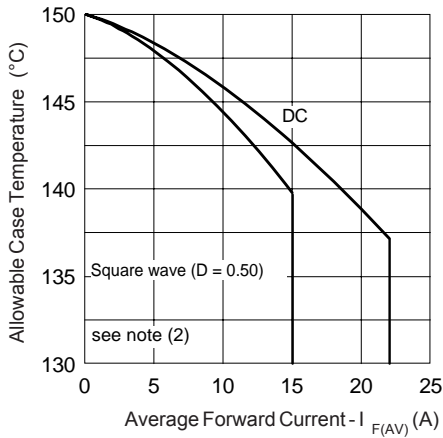
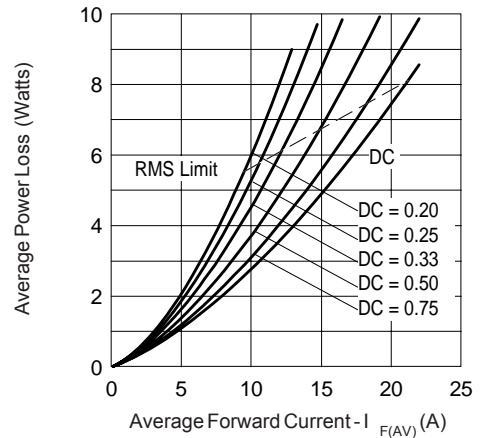


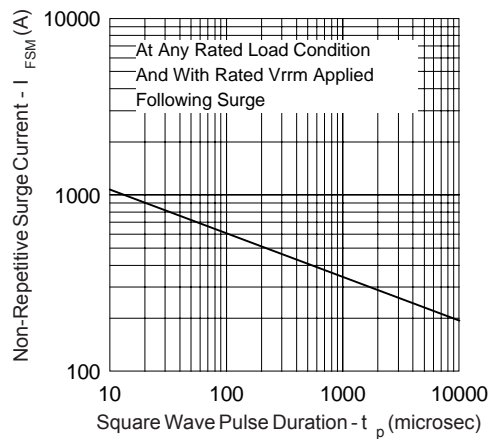
Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics



**Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current**



**Fig. 6 - Forward Power Loss Characteristics**



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

(2) Formula used:  $T_c = T_j - Pd \times R_{thJC}$ ;

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

Outline Table

**NOTES:**

- 1- DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M-1994.
- 2- DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS].
- 3- LEAD DIMENSIONS AND TOLERANCES ARE IN MILLIMETERS.
- 4- DIMENSION D, D1 & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .002" [0.051mm] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
- 5- DIMENSION b1 & c1 APPLY TO BASE METAL ONLY.
- 6- CONTROLLING DIMENSION: INCHES.
- 7- THERMAL PAD CENTER SPACING: MINIMUM DIMENSIONS L1-D1 & L1-E1.
- 8- DIMENSION L2 ± H1 DEFINE A ZONE WHERE SWAMPING AND SOLDERING OPERATIONS ARE ALLOWED.
- 9- OUTLINE CONFORMS TO JEDEC TO-220 EXCEPT A2 (max.) AND D2 (min.) THESE DIMENSIONS ARE DERIVED FROM THE ACTUAL PACKAGE OUTLINE.

| SYMBOL | DIMENSIONS  |        | MIN.     | MAX. | MIN. | MAX. | NOTES                                   |
|--------|-------------|--------|----------|------|------|------|---|
|        | MILLIMETERS | INCHES |          |      |      |      |   |
| A      | 3.56        | 4.83   | .140     | .190 |      |      |   |
| A1     | 0.51        | 1.40   | .020     | .055 |      |      |   |
| A2     | 2.65        | 2.82   | .060     | .115 |      |      |   |
| b      | 0.38        | 1.01   | .015     | .040 |      |      |   |
| b1     | 0.38        | 0.87   | .015     | .038 |      |      | 5                                       |
| b2     | 1.14        | 1.78   | .045     | .070 |      |      |   |
| b3     | 1.14        | 1.73   | .045     | .068 |      |      | 5                                       |
| c      | 0.38        | 0.81   | .014     | .024 |      |      |   |
| c1     | 0.38        | 0.58   | .014     | .022 |      |      | 5                                       |
| D      | 14.22       | 16.51  | .560     | .650 |      |      | MAX. DIMENSIONS                         |
| D1     | 6.35        | 9.52   | .250     | .375 |      |      |   |
| D2     | 11.68       | 12.86  | .460     | .507 |      |      | 7                                       |
| E      | 6.65        | 10.67  | .260     | .420 |      |      | 4, 7                                    |
| E1     | 6.86        | 8.89   | .270     | .350 |      |      | 7                                       |
| E2     | -           | 0.76   | -        | .030 |      |      | 8                                       |
| e      | 2.54 BSC    |        | .100 BSC |      |      |      |   |
| e1     | 3.08 BSC    |        | .120 BSC |      |      |      | 7, 8                                    |
| h      | 15.84       | 6.86   | .230     | .270 |      |      | 1- GATE<br>2- COLLECTOR<br>3- EMITTER   |
| L      | 12.70       | 14.73  | .500     | .580 |      |      | MAX.                                    |
| L1     | -           | 6.35   | -        | .250 |      |      | 5                                       |
| L2     | 1.54        | 4.28   | .061     | .169 |      |      | MIN.                                    |
| L3     | 0.25 BSC    |        | .010 BSC |      |      |      | MIN.                                    |
| L4     | 4.78        | 5.28   | .188     | .208 |      |      | 1- ANODE *<br>2, 4- CATHODE<br>3- ANODE |
| m      | 17.78       |        | .700     |      |      |      |   |
| m1     | 8.89        |        | .350     |      |      |      |   |
| n      | 11.43       |        | .450     |      |      |      |   |
| o      | 2.08        |        | .082     |      |      |      |   |
| p      | 3.81        |        | .150     |      |      |      |   |
| R      | 0.51        | 0.71   | .020     | .028 |      |      |   |
| θ      | 90°         | 93°    | 90°      | 93°  |      |      |   |

**CONFORM TO JEDEC OUTLINE TO-220AB**

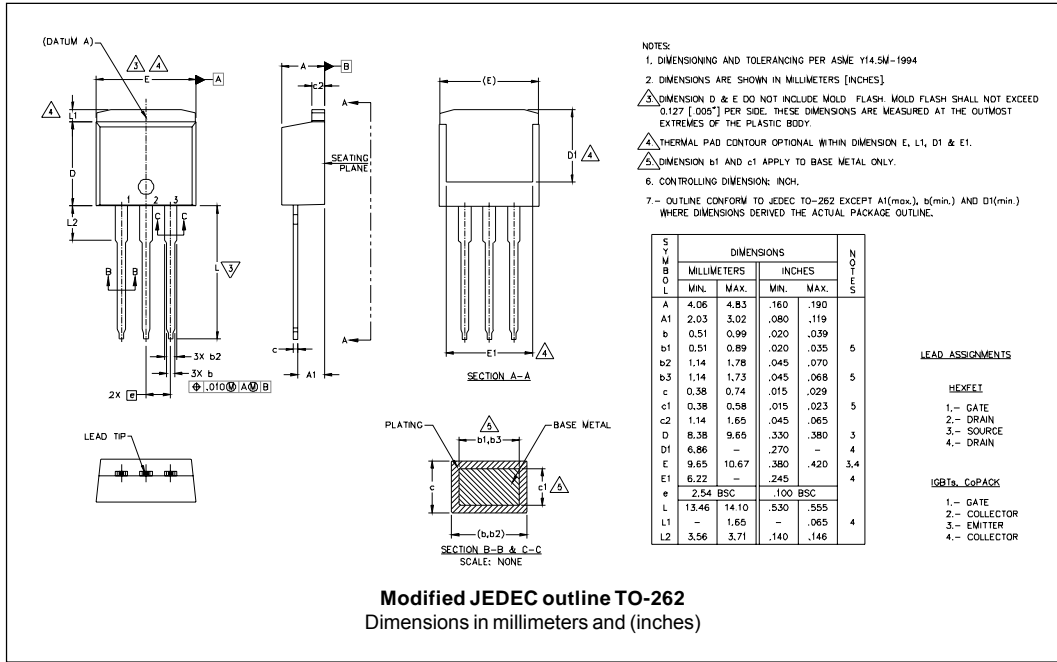
**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [0.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
5. CONTROLLING DIMENSION: INCH.

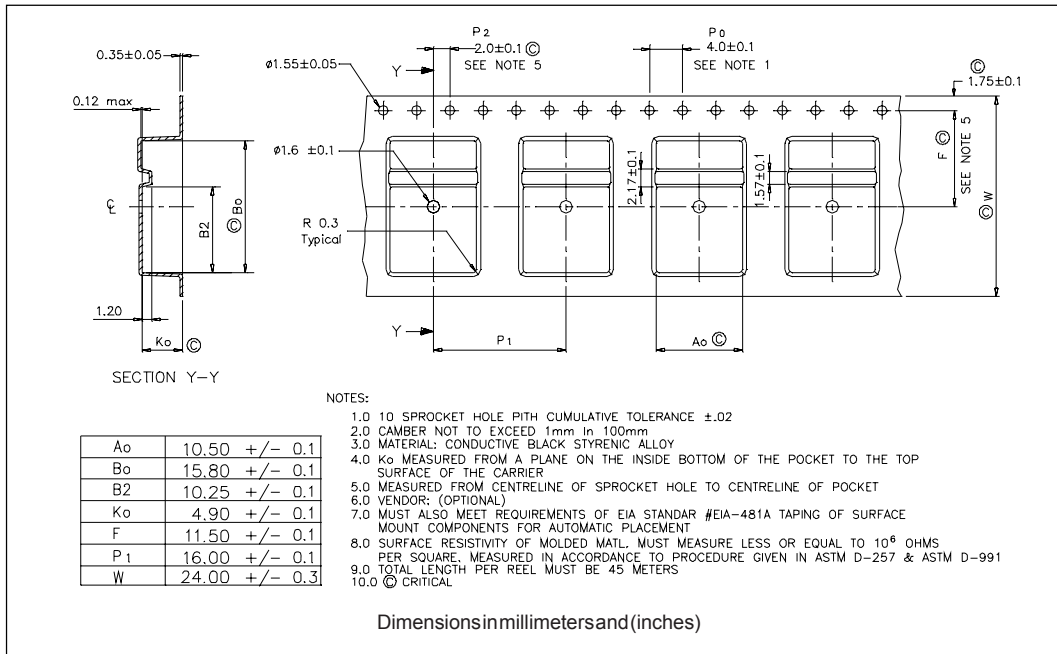
| SYMBOL | DIMENSIONS  |        | MIN.     | MAX. | MIN. | MAX. | NOTES |
|--------|-------------|--------|----------|------|------|------|-------|
|        | MILLIMETERS | INCHES |          |      |      |      |       |
| A      | 4.06        | 4.83   | .160     | .190 |      |      |       |
| A1     | 0.00        | 0.254  | .000     | .010 |      |      |       |
| b      | 0.51        | 0.99   | .020     | .039 |      |      |       |
| b1     | 0.51        | 0.89   | .020     | .035 |      |      | 4     |
| b2     | 1.14        | 1.78   | .045     | .070 |      |      |       |
| c      | 0.38        | 0.74   | .015     | .029 |      |      |       |
| c1     | 0.38        | 0.58   | .015     | .023 |      |      | 4     |
| c2     | 1.14        | 1.65   | .045     | .065 |      |      |       |
| D      | 8.51        | 9.65   | .335     | .380 |      |      | 3     |
| D1     | 6.86        |        | .270     |      |      |      |       |
| E      | 9.65        | 10.67  | .380     | .420 |      |      | 3     |
| E1     | 6.22        |        | .245     |      |      |      |       |
| e      | 2.54 BSC    |        | .100 BSC |      |      |      |       |
| h      | 14.61       | 15.88  | .575     | .625 |      |      |       |
| L      | 1.78        | 2.79   | .070     | .110 |      |      |       |
| L1     |             | 1.65   |          | .065 |      |      |       |
| L2     | 1.27        | 1.78   | .050     | .070 |      |      |       |
| L3     | 0.25 BSC    |        | .010 BSC |      |      |      |       |
| L4     | 4.78        | 5.28   | .188     | .208 |      |      |       |
| m      | 17.78       |        | .700     |      |      |      |       |
| m1     | 8.89        |        | .350     |      |      |      |       |
| n      | 11.43       |        | .450     |      |      |      |       |
| o      | 2.08        |        | .082     |      |      |      |       |
| p      | 3.81        |        | .150     |      |      |      |       |
| R      | 0.51        | 0.71   | .020     | .028 |      |      |       |
| θ      | 90°         | 93°    | 90°      | 93°  |      |      |       |

**CONFORM TO JEDEC OUTLINE D<sup>2</sup>PAK (SMD-220)**  
Dimensions in millimeters and (inches)

Outline Table



Tape & Reel Information



Part Marking Information

|                         |  |  |
|-------------------------|--|--|
| <p>TO-220</p>           | <p>EXAMPLE: THIS IS A 30L30CT<br/>           LOT CODE 1789<br/>           ASSEMBLED ON WW 19, 2000<br/>           IN THE ASSEMBLY LINE "C"</p> | <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE</p> <p>YEAR 0 = 2000<br/>           WEEK 19<br/>           LINE C</p> |
| <p>D<sup>2</sup>PAK</p> | <p>EXAMPLE: THIS IS A 30L30CTS<br/>           LOT CODE 8024<br/>           ASSEMBLED ON WW 02, 2003<br/>           IN ASSEMBLY LINE "C"</p>    | <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE</p> <p>YEAR 3 = 2003<br/>           WEEK 02<br/>           LINE C</p> |
| <p>TO-262</p>           | <p>EXAMPLE: THIS IS A 30L30CT-1<br/>           LOT CODE 1789<br/>           ASSEMBLED ON WW 19, 2002<br/>           IN ASSEMBLY LINE "C"</p>   | <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE</p> <p>YEAR 2 = 2002<br/>           WEEK 19<br/>           LINE C</p> |

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30L30CT
*****
    This model has been developed by
    Wizard SPICE MODEL GENERATOR (1999)
    (International Rectifier Corporation)
    contains Proprietary Information
*****
    SPICE Model Diode is composed by a
    simple diode plus paralld VCG2T
*****
.SUBCKT 30l30ct ANO CAT
D1 ANO 1 DMOD (0.08936)
*Define diode model
.MODEL DMOD D(IS=3.01789428908089E-04A,N=1.12506549677918,BV=35V,
+ IBV=0.40837541124234A,RS= 0.000285952,CJO=3.65460570356249E-08,
+ VJ=0.934944724736772,XTI=2, EG=0.674450307828855)
*****
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES(R=1,TC1=11.2856367229303)
GP1 ANO CAT VALUE={-ABS(I(VX))*(EXP((( -2.138249E-03/11.28564)*((V(2,CAT)*1E6)/(I(VX)+1E-6)-
1))+1)*9.434315E-02*ABS(V(ANO,CAT)))-1}}
*****
.ENDS 30l30ct

Thermal Model Subcircuit
.SUBCKT 30L30CT 5 1

CTHERM1  5  4  3.53E-1
CTHERM2  4  3  6.35E0
CTHERM3  3  2  5.15E+1
CTHERM4  2  1  4.08E+3

R THERM1  5  4  3.15E-1
R THERM2  4  3  6.15E-1
R THERM1  3  2  3.7E-1
R THERM1  2  1  1.98E-1

.ENDS 30L30CT

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Ordering Information Table

| Device Code |  |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |
|-------------|--|----|---|----|----|-----|----|-----|---|---|---|---|---|---|---|---|---|
|             | <table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">30</td> <td style="padding: 5px;">L</td> <td style="padding: 5px;">30</td> <td style="padding: 5px;">C</td> <td style="padding: 5px;">T</td> <td style="padding: 5px;">-1</td> <td style="padding: 5px;">TRL</td> <td style="padding: 5px;">-</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> <td style="text-align: center;">⑦</td> <td style="text-align: center;">⑧</td> </tr> </table> | 30 | L | 30 | C  | T   | -1 | TRL | - | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
| 30          | L  | 30 | C | T  | -1 | TRL | -  |     |   |   |   |   |   |   |   |   |   |
| ①           | ②  | ③  | ④ | ⑤  | ⑥  | ⑦   | ⑧  |     |   |   |   |   |   |   |   |   |   |
| <b>1</b>    | - Current Rating (30A)   |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |
| <b>2</b>    | - Schottky "L" Series  |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |
| <b>3</b>    | - Voltage Rating (30 = 30V)  |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |
| <b>4</b>    | - C = Common Cathode   |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |
| <b>5</b>    | - T = TO-220   |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |
| <b>6</b>    | - <ul style="list-style-type: none"> <li>• S = D<sup>2</sup>Pak</li> <li>• -1 = TO-262</li> </ul>  |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |
| <b>7</b>    | - <ul style="list-style-type: none"> <li>• none = Tube (50 pieces)</li> <li>• TRL = Tape &amp; Reel (Left Oriented - for D<sup>2</sup>Pak only)</li> <li>• TRR = Tape &amp; Reel (Right Oriented - for D<sup>2</sup>Pak only)</li> </ul>   |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |
| <b>8</b>    | - <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>  |    |   |    |    |     |    |     |   |   |   |   |   |   |   |   |   |

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.