

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

**Major Ratings and Characteristics**


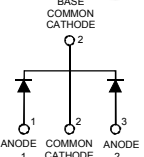

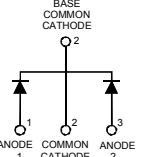
| Characteristics                                     | Values     | Units            |
|---|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform                    | 2 x 15     | A                |
| $V_{RRM}$   | 30         | V                |
| $V_F$ @ 15 Apk, $T_J = 125^\circ\text{C}$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

| STPS30L30CT   | STPS30L30CG   |
|---|---|
| <br><br><p>TO-220</p> | <br><br><p>D<sup>2</sup>PAK</p> |

## Voltage Ratings

| Parameters                                      | Values |
|---|--------|
| $V_R$ 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    | $T_J = 25^\circ\text{C}$ , $I_{AS} = 2$ Amps, $L = 7.5$ 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<br>$T_J = 25^\circ\text{C}$                                     |
|  | 0.57   | V                | @ 30A   |
|  | 0.37   | V                | @ 15A<br>$T_J = 125^\circ\text{C}$                                    |
|  | 0.50   | V                | @ 30A   |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg)  | 1.50   | mA               | $T_J = 25^\circ\text{C}$  |
|  | 350    | mA               | $T_J = 125^\circ\text{C}$<br>$V_R = \text{rated } V_R$                |
| $C_T$ 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 (Rated $V_R$ ) | 10000  | V/ $\mu\text{s}$ |   |

(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          | $^\circ\text{C}/\text{W}$     | DC operation |
| $R_{thJC}$ Max. Thermal Resistance Junction to Case (Per Package) | 0.8          | $^\circ\text{C}/\text{W}$     | DC operation |
| wt Approximate Weight   | 2 (0.07)     | g (oz.)                       |              |
| T Mounting Torque   | Min. 6 (5)   | Kg-cm<br>(lbf-in)             |              |
|   | Max. 12 (10) |                               |              |
| Marking Device  | STPS 30L30CT | Case Style TO-220             |              |
|   | STPS30L30CG  | Case Style D <sup>2</sup> Pak |              |

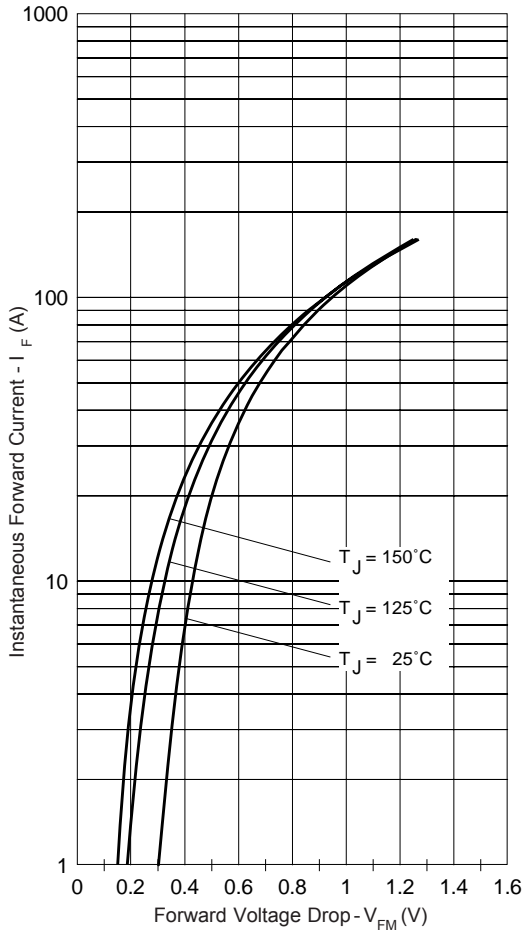


Fig. 1 - Maximum Forward Voltage Drop Characteristics

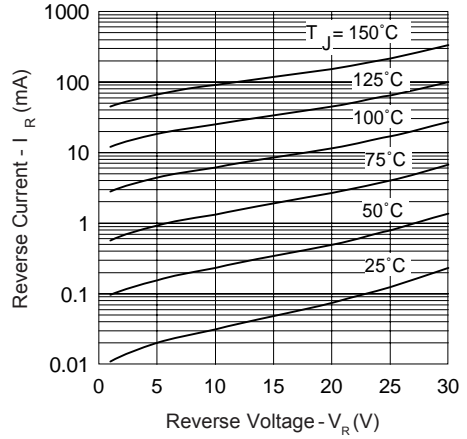


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

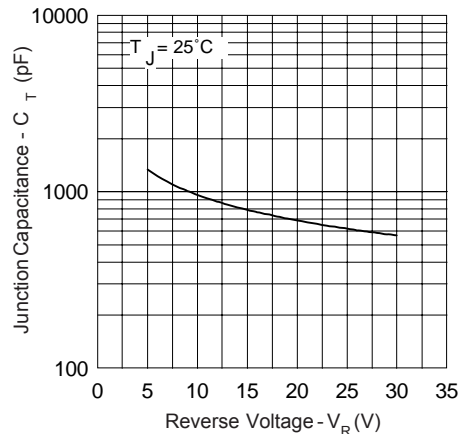


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

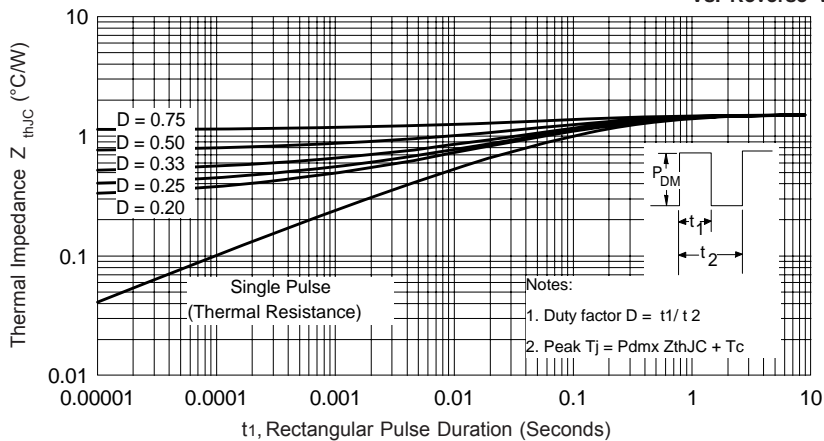


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics

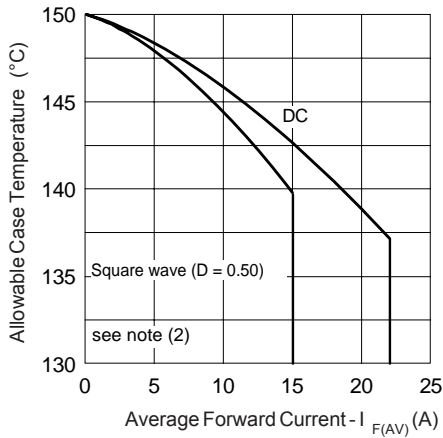


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

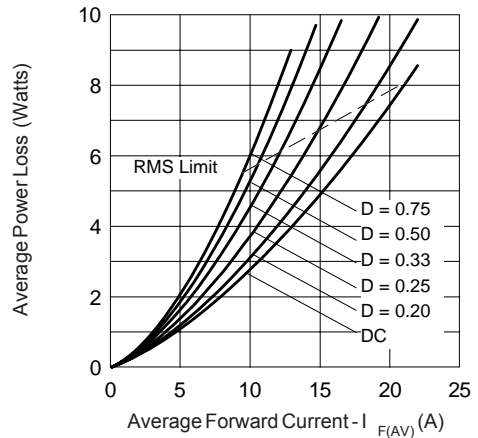


Fig. 6 - Forward Power Loss Characteristics

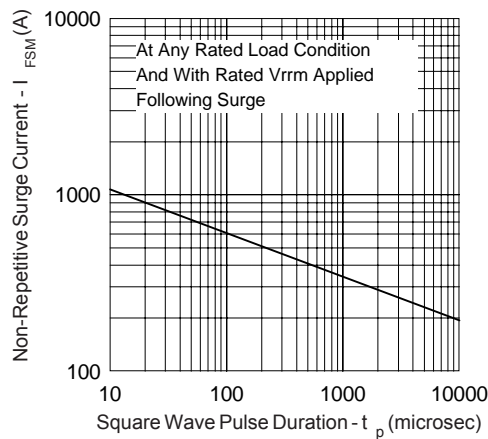
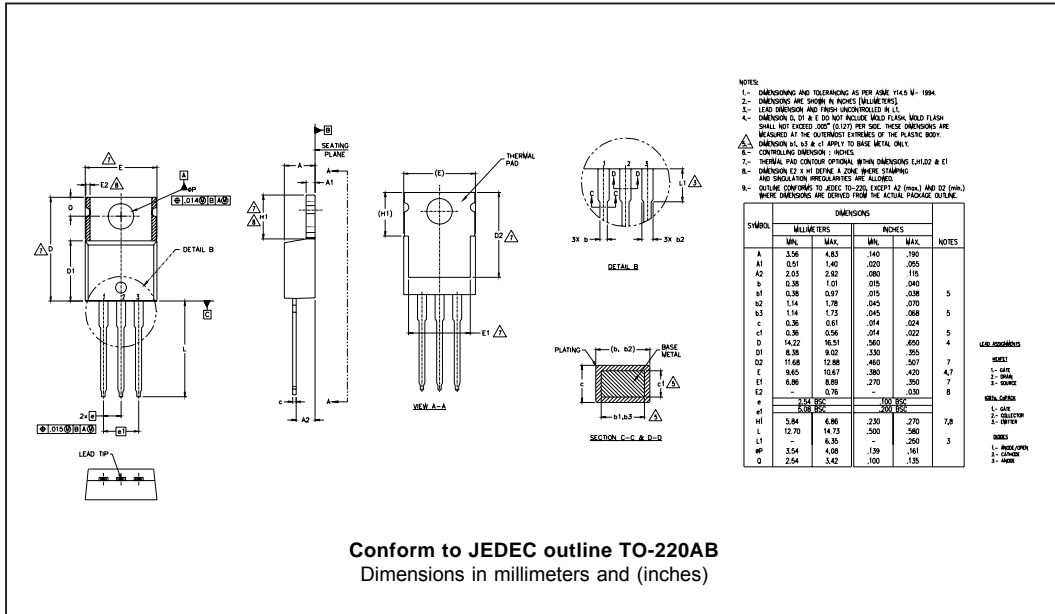


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

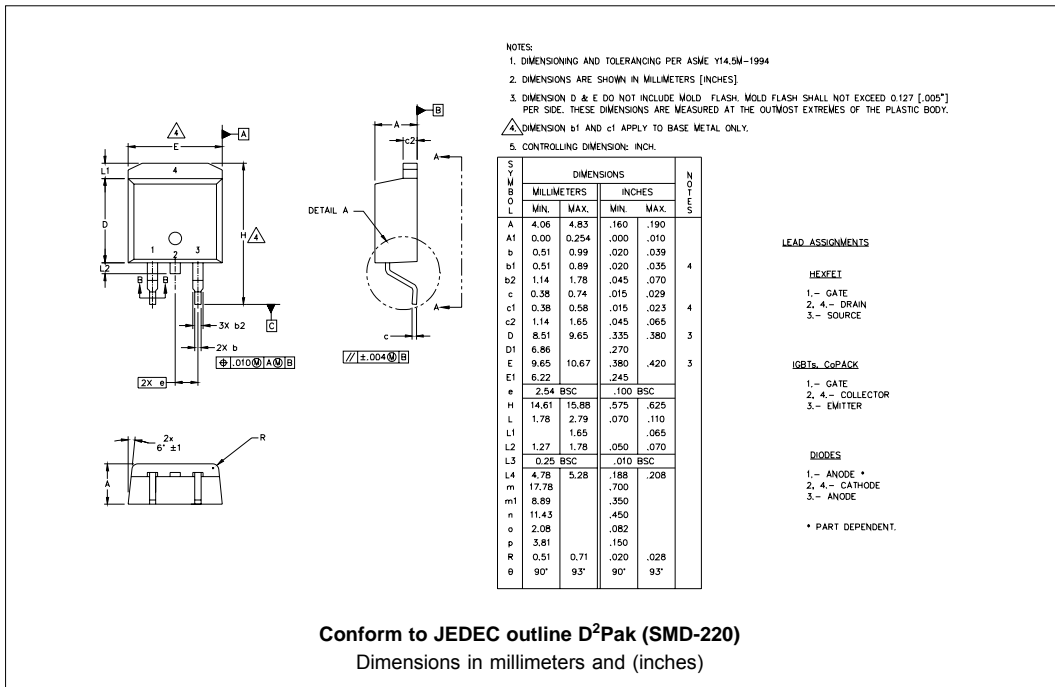
(2) Formula used:  $T_C = T_J - Pd \times R_{thJC}$ ;

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

Outline Table



Conform to JEDEC outline TO-220AB  
Dimensions in millimeters and (inches)



Conform to JEDEC outline D<sup>2</sup>Pak (SMD-220)  
Dimensions in millimeters and (inches)

Part Marking Information

**TO-220AB**

EXAMPLE: THIS IS A STPS30L30CT  
LOT CODE 1789  
ASSEMBLED ON WW 19, 2003  
IN THE ASSEMBLY LINE "C"

INTERNATIONAL  
RECTIFIER  
LOGO

ASSEMBLY  
LOT CODE

PART NUMBER

DATE CODE  
YEAR 3 = 2003  
WEEK 19  
LINE C

**D<sup>2</sup>Pak**

EXAMPLE: THIS IS A STPS30L30CG  
LOT CODE 8024  
ASSEMBLED ON WW 02, 2000

INTERNATIONAL  
RECTIFIER  
LOGO

ASSEMBLY  
LOT CODE

PART NUMBER

DATE CODE  
YEAR 0 = 2000  
WEEK 02  
LINE C

Tape & Reel Information

SECTION Y-Y

NOTES:

- 1.0 10 SPROCKET HOLE PITH CUMULATIVE TOLERANCE ±.02
- 2.0 CAMBER NOT TO EXCEED 1mm In 100mm
- 3.0 MATERIAL: CONDUCTIVE BLACK STYRENIC ALLOY
- 4.0 K<sub>0</sub> MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
- 5.0 MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF POCKET
- 6.0 VENDOR: (OPTIONAL)
- 7.0 MUST ALSO MEET REQUIREMENTS OF EIA STANDAR #EIA-481A TAPING OF SURFACE MOUNT COMPONENTS FOR AUTOMATIC PLACEMENT
- 8.0 SURFACE RESISTIVITY OF MOLDED MATL. MUST MEASURE LESS OR EQUAL TO 10<sup>6</sup> OHMS PER SQUARE. MEASURED IN ACCORDANCE TO PROCEDURE GIVEN IN ASTM D-257 & ASTM D-991
- 9.0 TOTAL LENGTH PER REEL MUST BE 45 METERS
- 10.0 © CRITICAL

|                |               |
|----------------|---------------|
| A <sub>0</sub> | 10.50 +/- 0.1 |
| B <sub>0</sub> | 15.80 +/- 0.1 |
| B <sub>2</sub> | 10.25 +/- 0.1 |
| K <sub>0</sub> | 4.90 +/- 0.1  |
| F              | 11.50 +/- 0.1 |
| P <sub>1</sub> | 16.00 +/- 0.1 |
| W              | 24.00 +/- 0.3 |

Dimensions in millimeters and (inches)

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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 paralalled VCG2T
*****
.SUBCKT 30I30ct 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 30I30ct

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

```

## Ordering Information Table

| Device Code |  |      |    |   |    |     |   |     |   |   |   |   |   |   |   |   |   |
|-------------|--|------|----|---|----|-----|---|-----|---|---|---|---|---|---|---|---|---|
|             | <table border="1"> <tr> <td>STPS</td> <td>30</td> <td>L</td> <td>30</td> <td>C</td> <td>G</td> <td>TRL</td> <td>-</td> </tr> <tr> <td>①</td> <td>②</td> <td>③</td> <td>④</td> <td>⑤</td> <td>⑥</td> <td>⑦</td> <td>⑧</td> </tr> </table> | STPS | 30 | L | 30 | C   | G | TRL | - | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
| STPS        | 30   | L    | 30 | C | G  | TRL | - |     |   |   |   |   |   |   |   |   |   |
| ①           | ②  | ③    | ④  | ⑤ | ⑥  | ⑦   | ⑧ |     |   |   |   |   |   |   |   |   |   |
| <b>1</b>    | - Essential Part Number  |      |    |   |    |     |   |     |   |   |   |   |   |   |   |   |   |
| <b>2</b>    | - Current Rating (30A)   |      |    |   |    |     |   |     |   |   |   |   |   |   |   |   |   |
| <b>3</b>    | - L = Low Voltage  |      |    |   |    |     |   |     |   |   |   |   |   |   |   |   |   |
| <b>4</b>    | - Voltage Rating (30 = 30V)  |      |    |   |    |     |   |     |   |   |   |   |   |   |   |   |   |
| <b>5</b>    | - C = Common cathode   |      |    |   |    |     |   |     |   |   |   |   |   |   |   |   |   |
| <b>6</b>    | - <ul style="list-style-type: none"> <li>• G = D<sup>2</sup>Pak package</li> <li>• T = TO-220</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 (for D<sup>2</sup>Pak tube)</li> <li>• P = Lead-Free (for D<sup>2</sup>Pak TRR and TRL)</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.

International  
**IOR** Rectifier

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