

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

**Major Ratings and Characteristics**


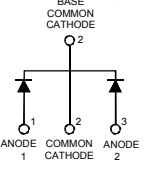

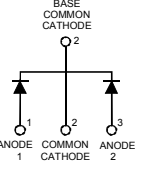
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	2 x 15	A
$V_{RRM}$	30	V
$V_F$ @ 15Apk, $T_J = 125^\circ\text{C}$ (Per Leg)	0.37	V
$T_J$ range	-55 to 150	$^\circ\text{C}$

**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
  <p>TO-220</p>	  <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 Per Device Per Leg	30 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 220	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse 10ms Sine or 6ms Rect. pulse 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 $\mu\text{sec}$ 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 $T_J = 25^\circ\text{C}$
	0.57	V	@ 30A
	0.37	V	@ 15A $T_J = 125^\circ\text{C}$
	0.50	V	@ 30A
$I_{RM}$ Max. Reverse Leakage Current (Per Leg)	1.50	mA	$T_J = 25^\circ\text{C}$
	350	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$C_T$ 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 (lbf-in)	
	Max. 12 (10)		
Marking Device	STPS 30L30CT	Case Style TO-220	
	STPS30L30CG	Case Style D <sup>2</sup> Pak	

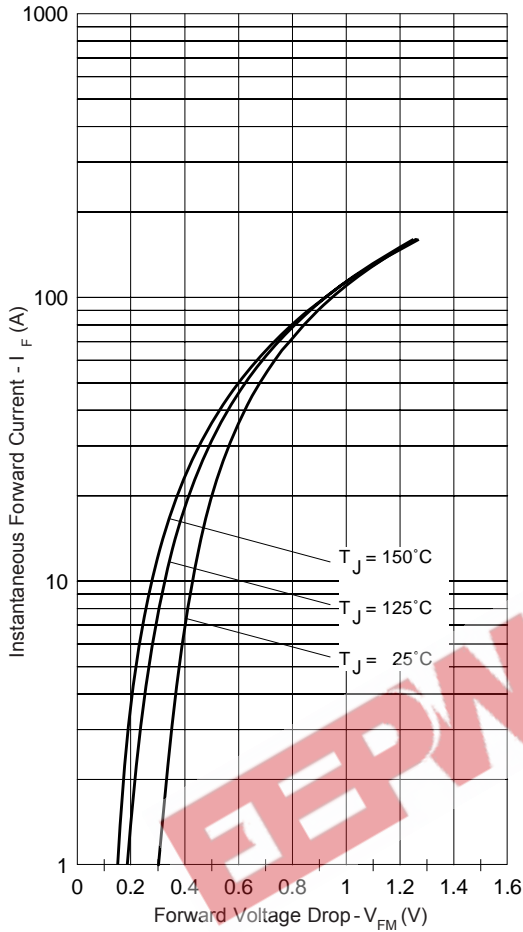


Fig. 1 - Maximum Forward Voltage Drop Characteristics

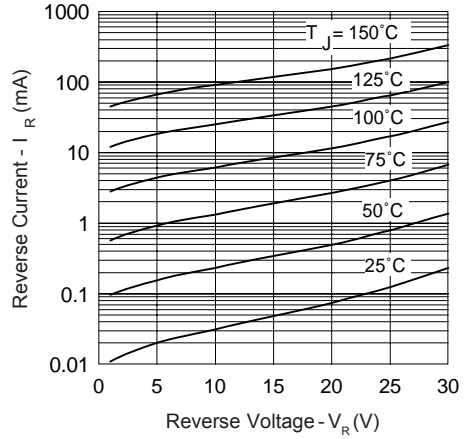


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

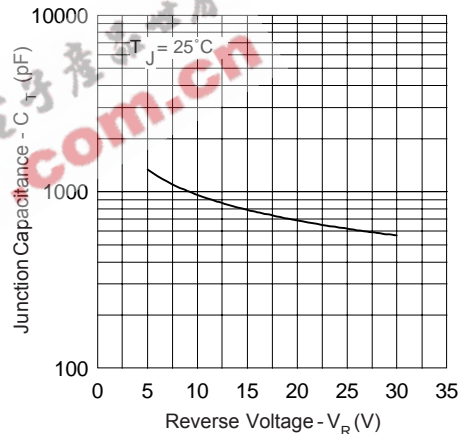


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

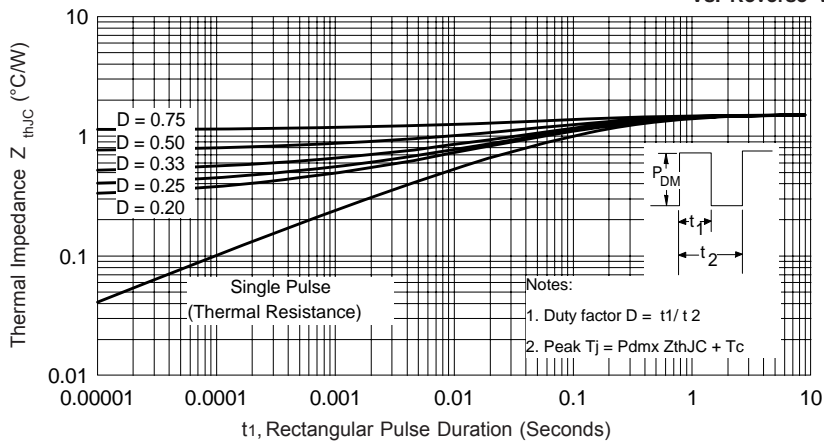


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics

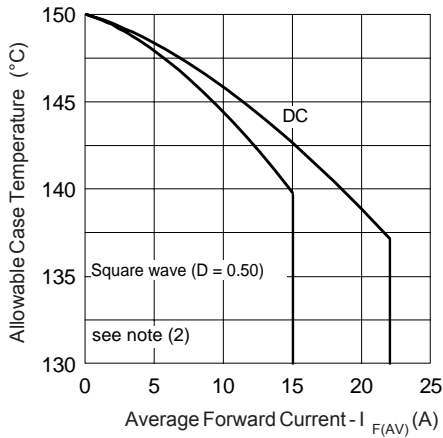


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

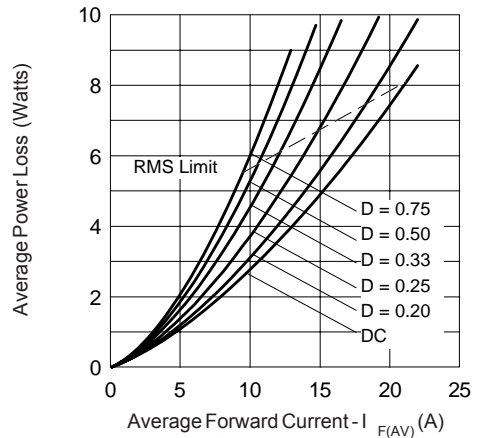


Fig. 6 - Forward Power Loss Characteristics

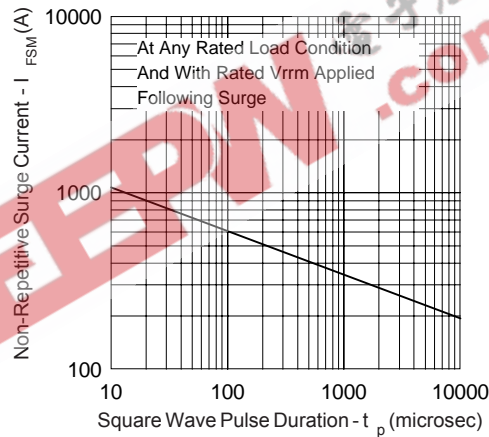
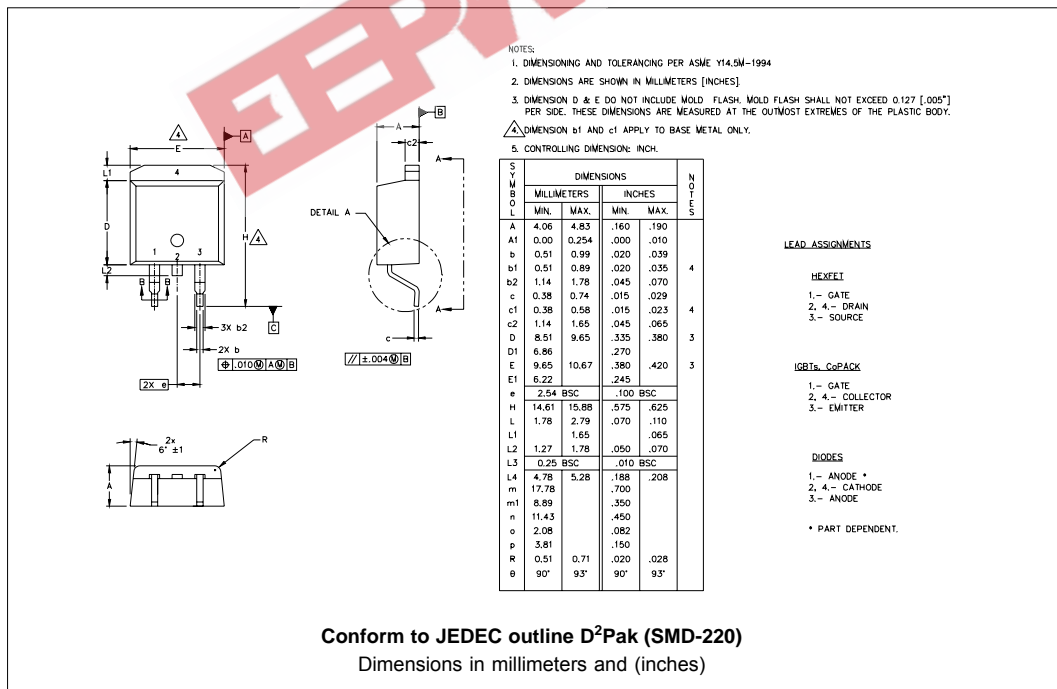
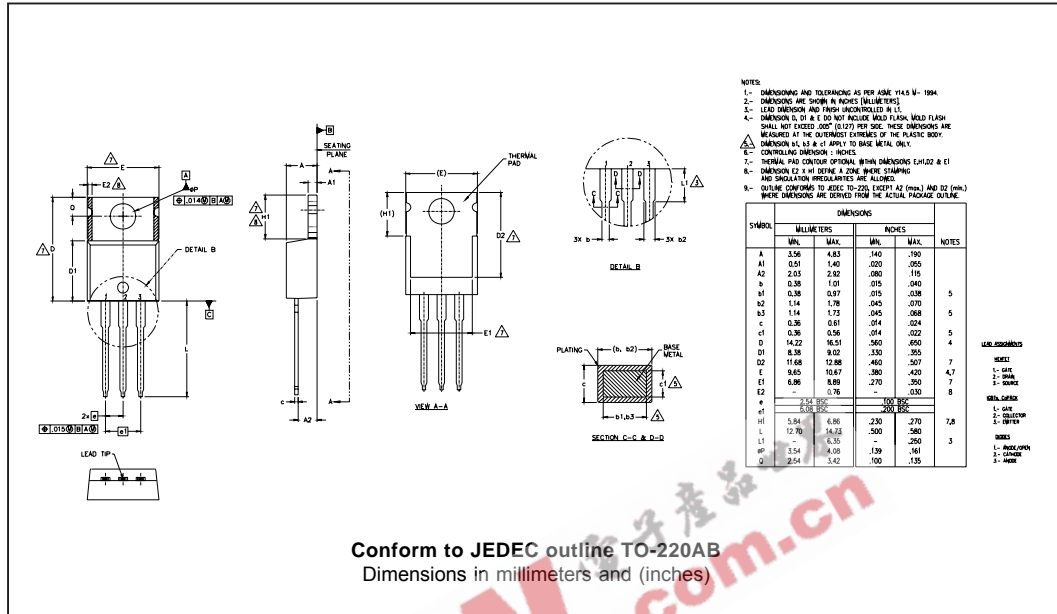


Fig. 7 - Max. Non-Repitative Surge Current (Per Leg)

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

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

Outline Table



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

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## 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  
IR Rectifier

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Visit us at [www.irf.com](http://www.irf.com) for sales contact information. 01/07