

International
IR Rectifier

STPS30L30CTPbF

SCHOTTKY RECTIFIER

30 Amp

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

$$V_R = 30\text{V}$$

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	$^\circ\text{C}$

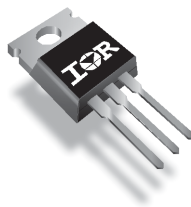
Description/ Features

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°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

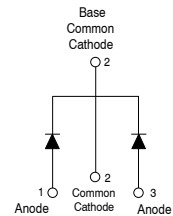
- 150°C T_J operation
- Center tap configuration
- Very low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

Case Styles

STPS30L30CTPbF



TO-220



Voltage Ratings

Parameters	STPS30L30CT
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 μs Sine or 3 μs 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	$T_J = 25^\circ\text{C}$, $I_{AS} = 2\text{Amps}$, $L = 7.5\text{mH}$
I_{AR} Repetitive Avalanche Current (Per Leg)	2	A	Current decaying linearly to zero in 1 μsec 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°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/ μs	

(1) Pulse Width < 300 μs , 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	STPS30L30CT		

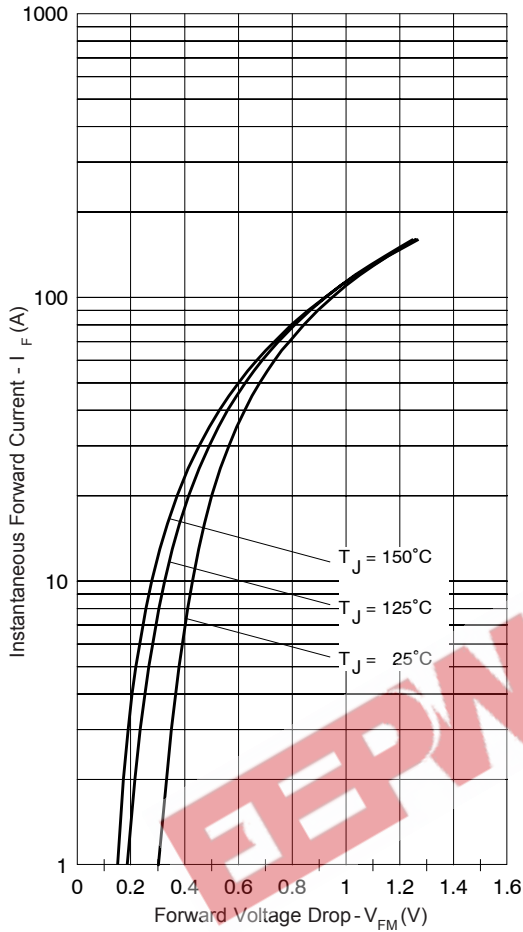


Fig. 1 - Maximum Forward Voltage Drop Characteristics

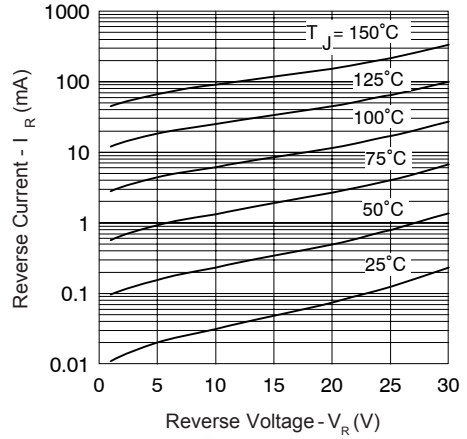


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

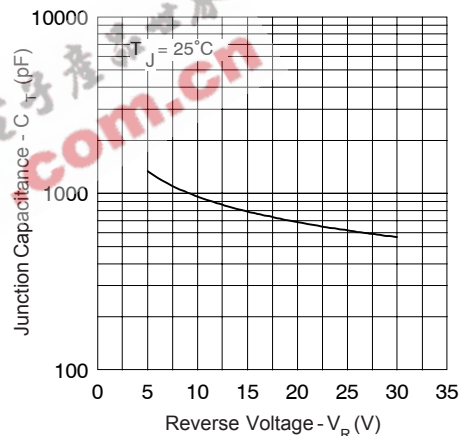


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

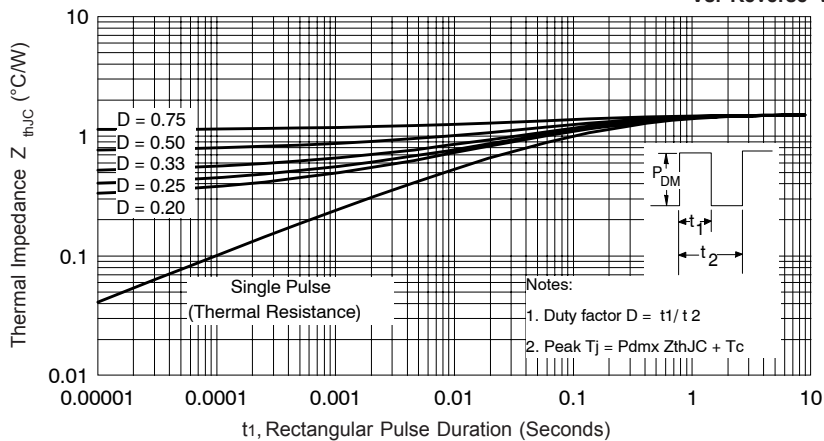


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

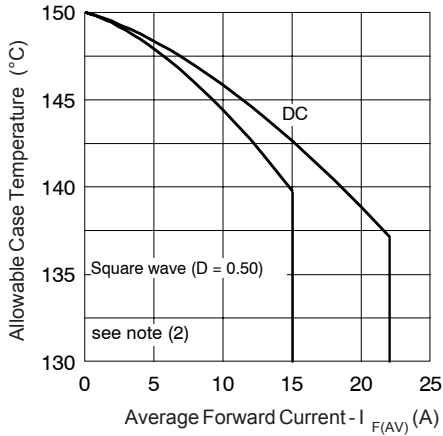


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

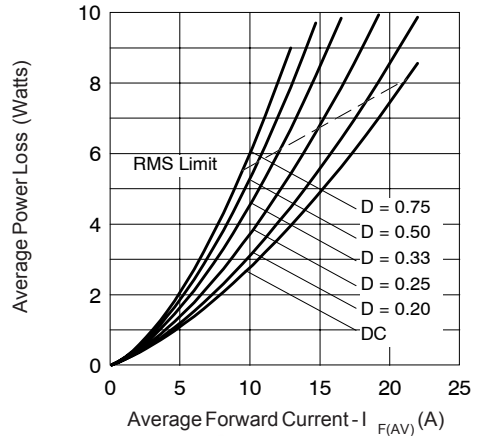


Fig. 6 - Forward Power Loss Characteristics

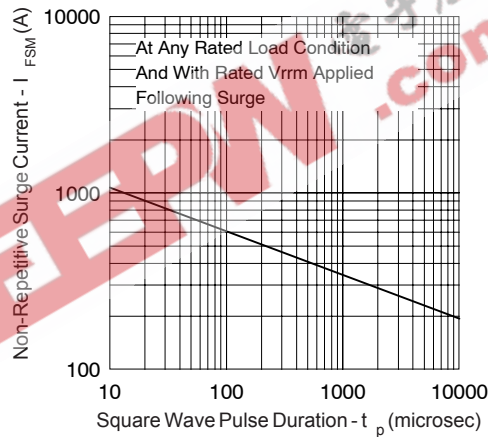
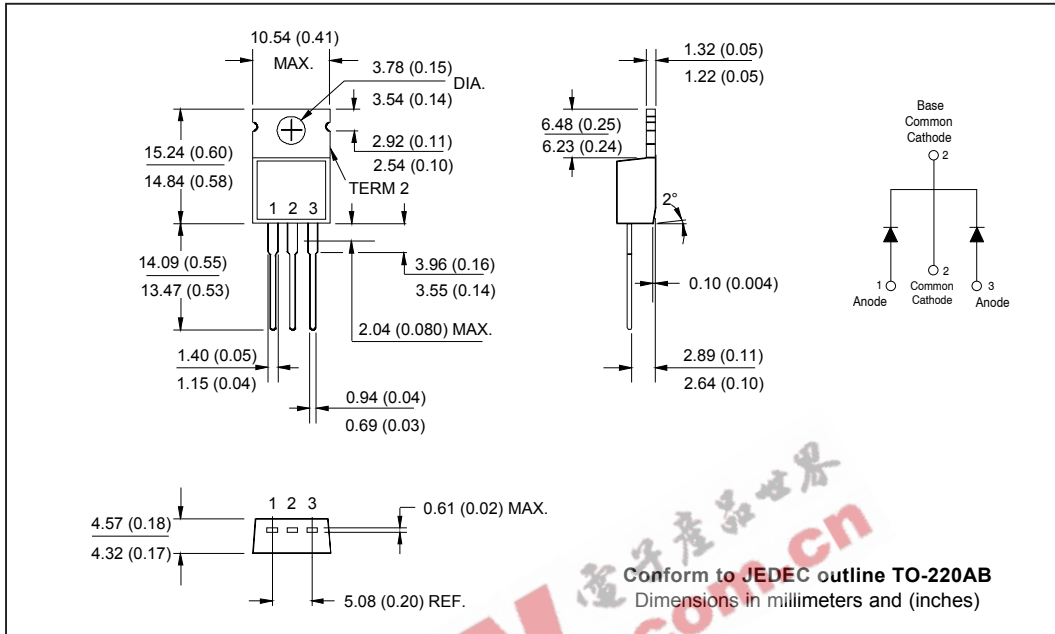


Fig. 7 - Max. Non-Repertitive Surge Current (Per Leg)

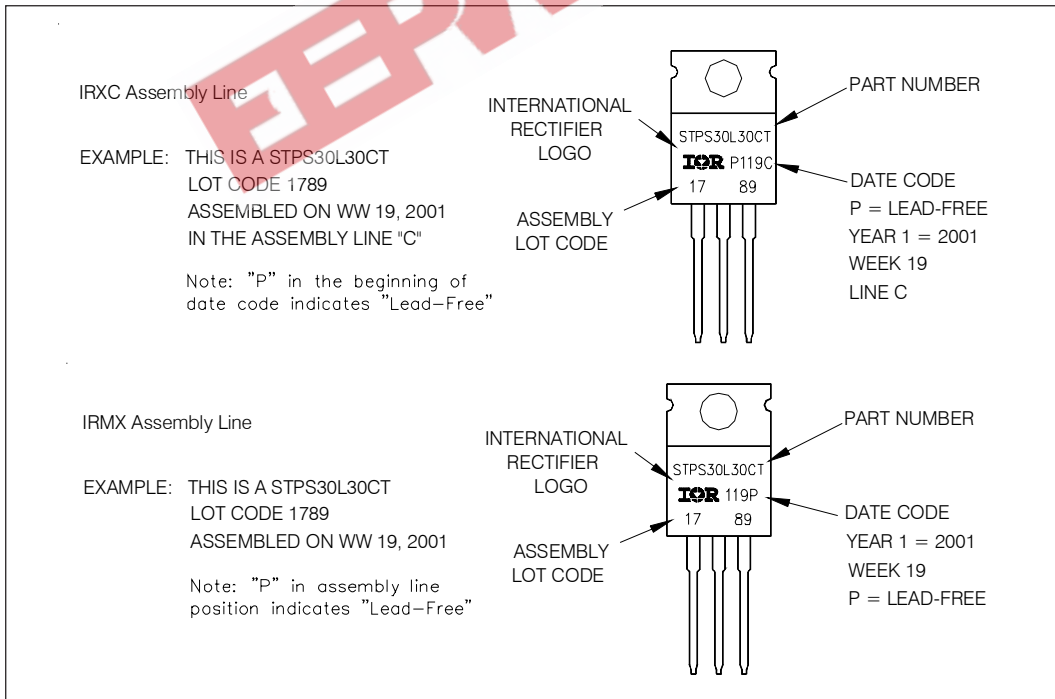
(2) Formula used: $T_C = T_J - P_d \times R_{thJC}$;

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

Outline Table



Part Marking Information



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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 paralled 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	
	STPS 30 L 30 CT PbF
	① ② ③ ④ ⑤ ⑥
1	- Schottky STPS Series
2	- Current Rating (30 = 30A)
3	- L = Low Voltage Drop
4	- Voltage Rating (30 = 30V)
5	- CT = Essential Part Number
 	- • none = Standard Production
 	- • PbF = Lead-Free

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.