Bulletin PD-21050 rev. B 01/07

International
IOR Rectifier

STPS30L30CGPbF

SCHOTTKY RECTIFIER

30 Amp

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

Major Ratings and Characteristics

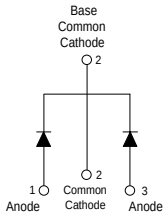
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	2 x 15	A
V_{RRM}	30	V
V_F @15 Apk, T_J = 125°C (Per Leg)	0.37	V
T_J range	- 55 to 150	°C

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



D^2PAK

Voltage Ratings

Parameters		STPS30L30CGPbF
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°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current		1450 220	A	5µs Sine or 3µs Rect. pulse 10ms Sine or 6ms Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)		15	mJ	T_J = 25 °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 µsec Frequency limited by T_J max. V_A = 1.5 x 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 °C
			0.57	V	@ 30A	
			0.37	V	@ 15A	T_J = 125 °C
			0.50	V	@ 30A	
I_{RM}	Max. Reverse Leakage Current (Per Leg)		1.50	mA	T_J = 25 °C	V_R = rated V_R
			350	mA	T_J = 125 °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		10000	V/µs	(Rated V_R)	

(1) Pulse Width < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

	Parameters		Values	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 150	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		1.5	°C/W	DC operation
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		0.8	°C/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		STPS30L30CG		Case style D^2Pak

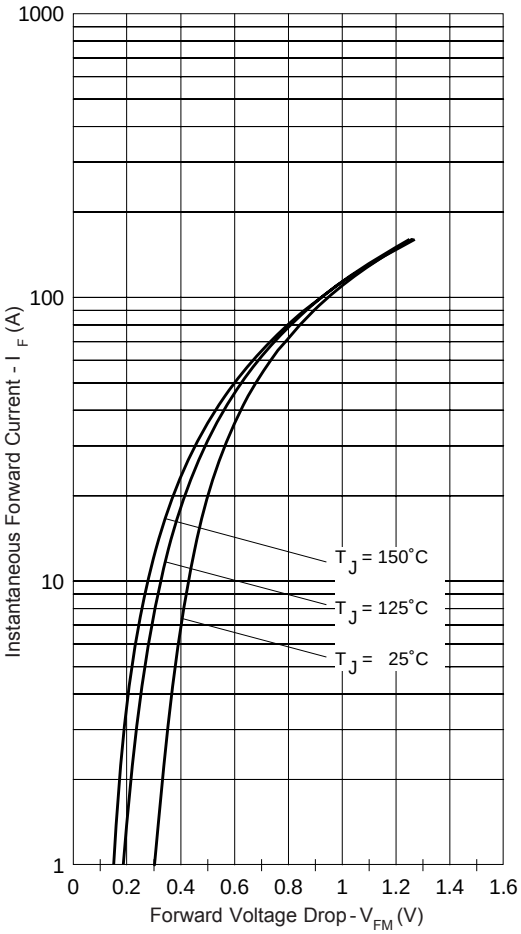


Fig. 1 - Maximum Forward Voltage Drop Characteristics

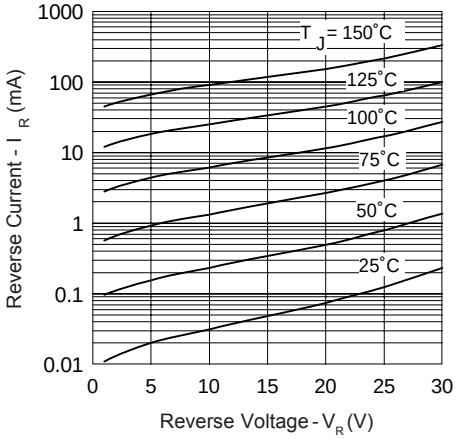


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

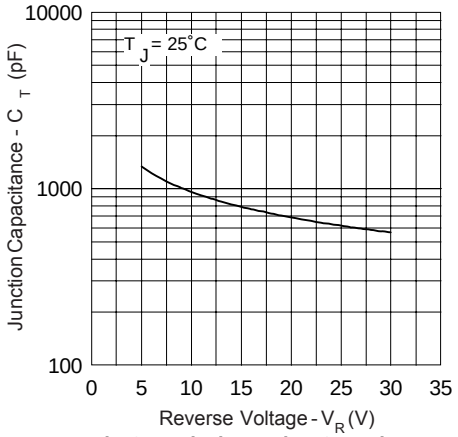


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

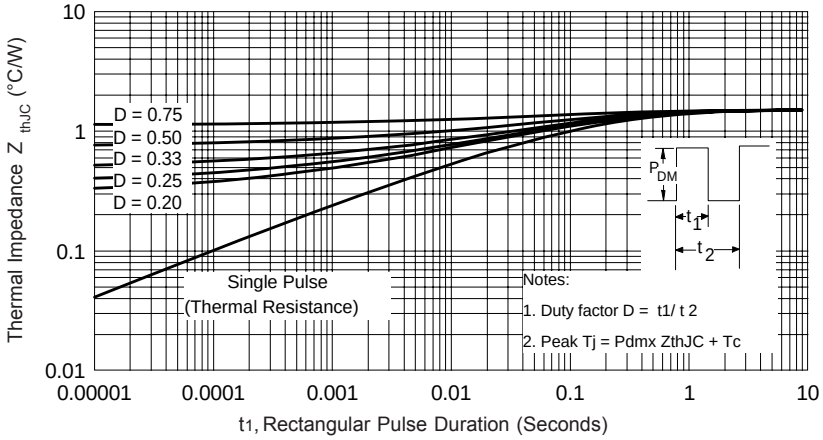


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

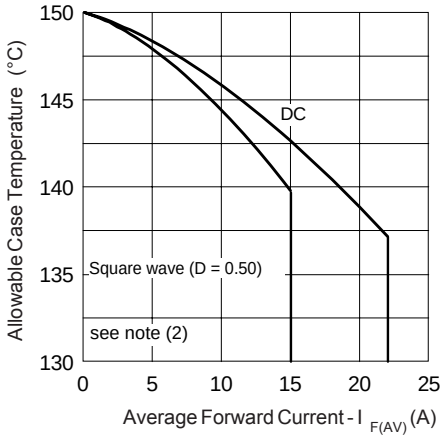


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current

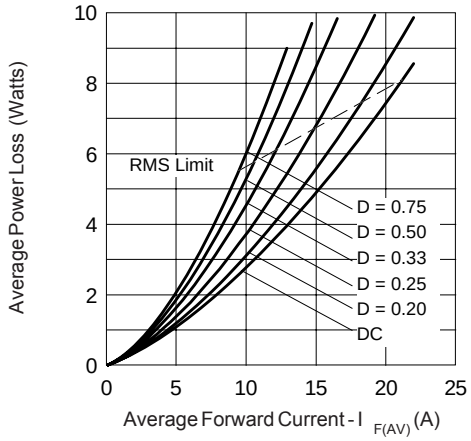


Fig. 6 - Forward Power Loss Characteristics

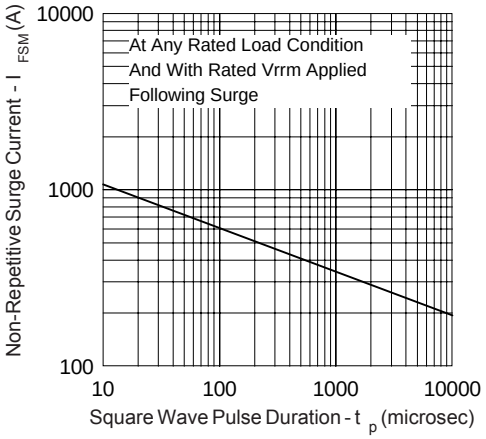
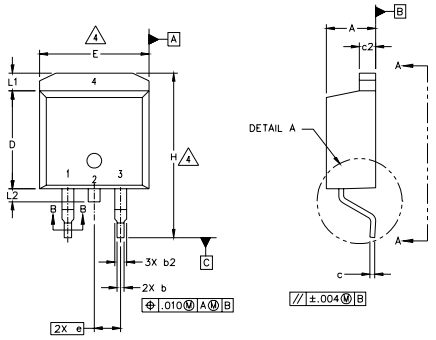


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

(2) Formula used: $T_C = T_J - Pd \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6)

Outline Table



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 [.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				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
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°	

LEAD ASSIGNMENTS

HEXFET

1.– GATE
2, 4.– DRAIN
3.– SOURCE

IGBTs, CoPACK

1.– GATE
2, 4.– COLLECTOR
3.– EMITTER

DIODES

1.– ANODE *
2, 4.– CATHODE
3.– ANODE

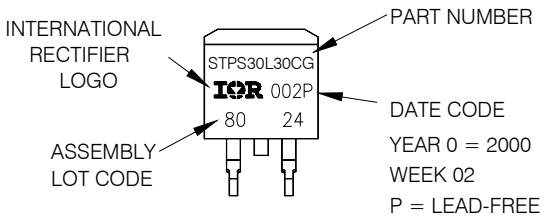
* PART DEPENDENT.

Conform to JEDEC outline D²Pak (SMD-220)
Dimensions in millimeters and (inches)

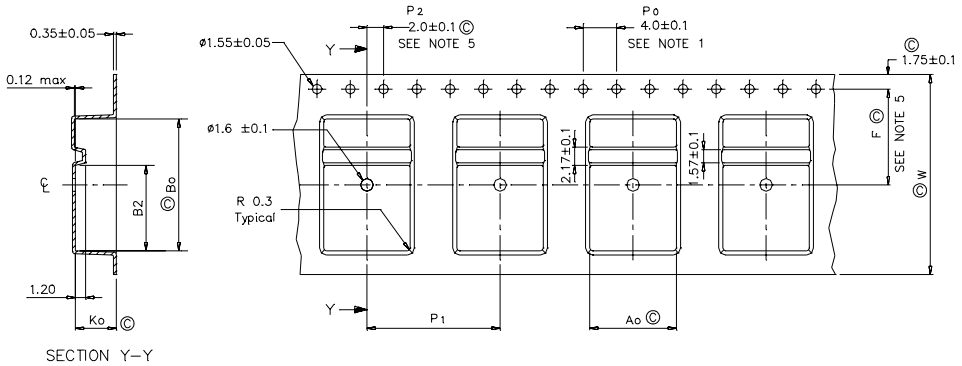
Part Marking Information

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

Note: "P" in assembly line position indicates "Lead–Free"



Tape & Reel Information



Ao	10.50 +/– 0.1
Bo	15.80 +/– 0.1
B2	10.25 +/– 0.1
Ko	4.90 +/– 0.1
F	11.50 +/– 0.1
P1	16.00 +/– 0.1
W	24.00 +/– 0.3

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 Ko 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 10^6 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

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code

STPS	30	L	30	C	G	TRL	PbF
1	2	3	4	5	6	7	8

1 - Essential Part Number

2 - Current Rating (30A)

3 - L = Low Voltage

4 - Voltage Rating (30 = 30V)

5 - C = Common cathode

6 - G = D^2Pak package

7 -
- none = Tube (50 pieces)
- TRL = Tape & Reel (Left Oriented)
- TRR = Tape & Reel (Right Oriented)

8 -
- none = Standard Production
- PbF = Lead-Free (for D^2Pak tube)
- P = Lead-Free (for D^2Pak TRR and TRL)

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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 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

RTHERM1     5     4     3.15E-1
RTHERM2     4     3     6.15E-1
RTHERM1     3     2     3.7E-1
RTHERM1     2     1     1.98E-1


.ENDS 30L30CT
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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

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