STPS30H60C

Power Schottky rectifier

Main product characteristics

$I_{F(AV)}$	2 X 15 A
V_{RRM}	60 V
T_j	175° C
V_F (typ)	0.535 V

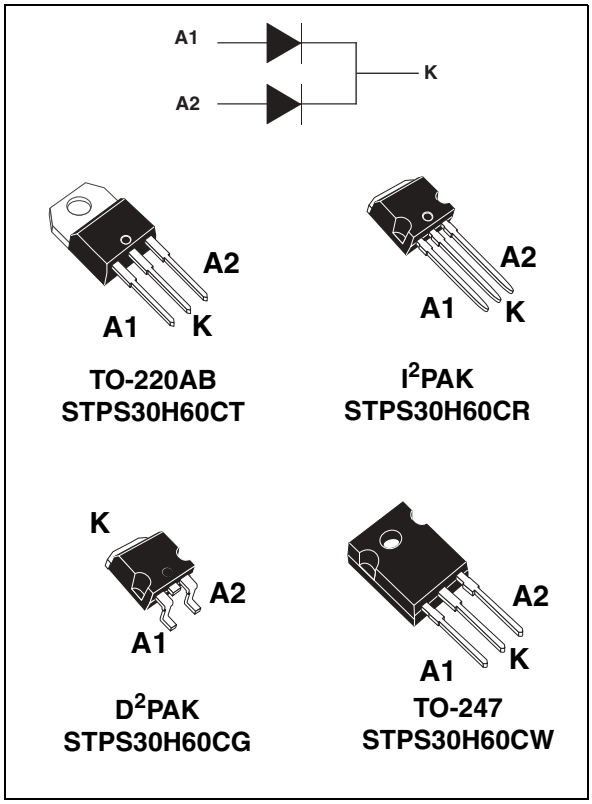
Features and benefits

- High junction temperature capability
- Avalanche rated
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- High frequency operation

Description

Dual centre tab Schottky rectifier suited for high frequency switch mode power supply.

Packaged in TO-220AB, TO-247, I^2PAK, and D^2PAK, this device is intended to be used in notebook and LCD adaptors and desktop SMPS. In these applications the STPS30H60C provides a good margin between the remaining voltages applied on the diode and the voltage capability of the diode



Order codes

Part Number	Marking
STPS30H60CT	STPS30H60CT
STPS30H60CR	STPS30H60CR
STPS30H60CG-TR	STPS30H60CG
STPS30H60CG	STPS30H60CG
STPS30H60CW	STPS30H60CW

1 Characteristics

Table 1. Absolute ratings (limiting values per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			60	V
$I_{F(RMS)}$	RMS forward current			30	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	TO-220AB $T_c = 155°$ C	Per diode	15	A
			Total package	30	
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms Sinusoidal		230	A
P_{ARM}	Releative peak avalanche power	$T_j = 25°$ C	$t_p = 1$ µs	10 200	W
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Maximum operating junction temperature(1)			175	°C

1. $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

Table 2. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.5	°C/W
		Total	0.8	
$R_{th(c)}$	Coupling		0.1	

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R(1)	Reverse leakage current	$T_j = 25°$ C	$V_R = V_{RRM}$			60	µA
		$T_j = 125°$ C			8	25	mA
V_F(2)	Forward voltage drop	$T_j = 25°$ C	$I_F = 7.5$ A			530	mV
		$T_j = 125°$ C			435	470	
		$T_j = 25°$ C	$I_F = 15$ A			640	
		$T_j = 125°$ C			535	570	
		$T_j = 25°$ C	$I_F = 30$ A			790	
		$T_j = 125°$ C			635	690	

1. Pulse test: $t_p = 5$ ms, $\delta < 2\%$
2. Pulse test: $t_p = 380$ µs, $\delta < 2\%$

To evaluate the conduction losses use the following equation:
$P = 0.45 \times I_{F(AV)} + 0.008 \times I_F{}^2{}_{(RMS)}$

Figure 1. Conduction losses versus average forward current

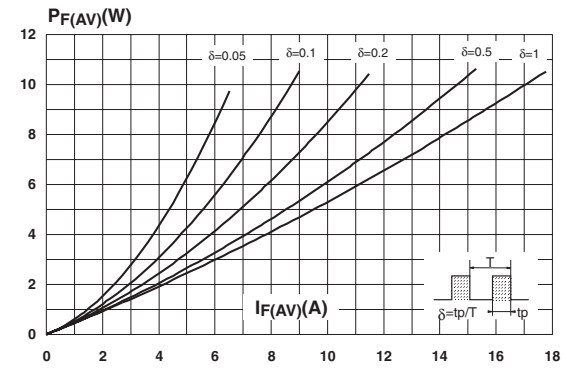


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

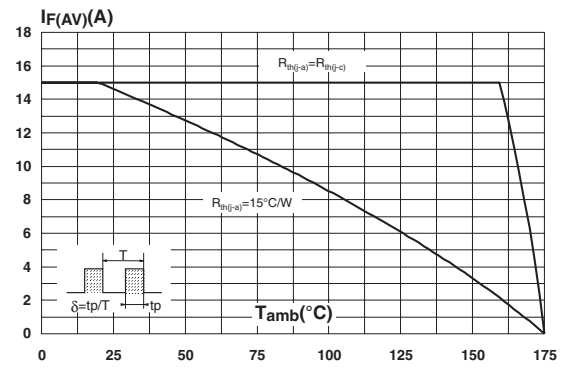


Figure 3. Normalized avalanche power derating versus pulse duration

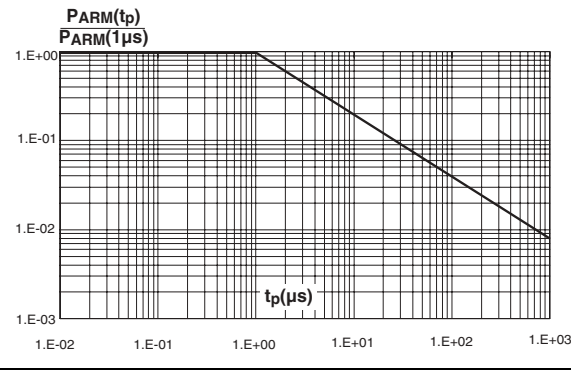


Figure 4. Normalized avalanche power derating versus junction temperature

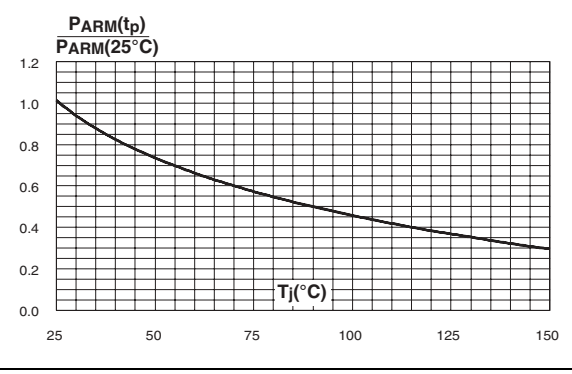


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

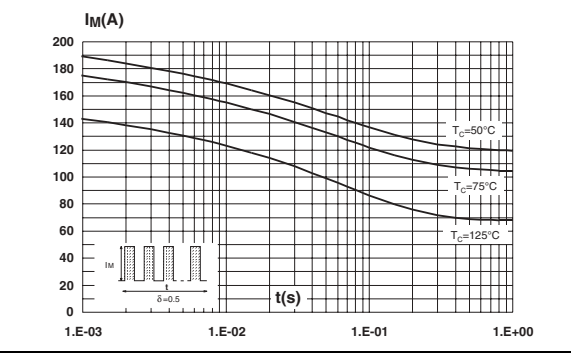


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

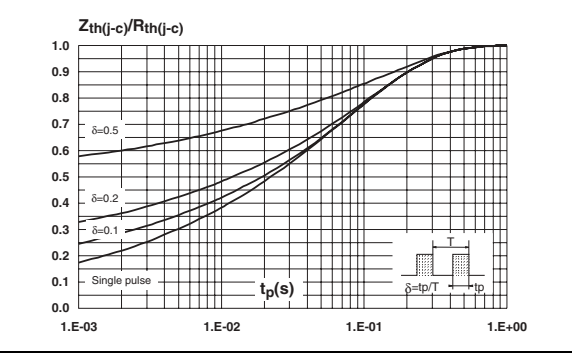


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

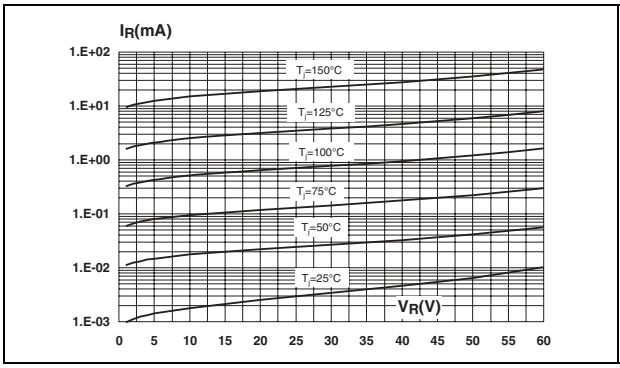


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

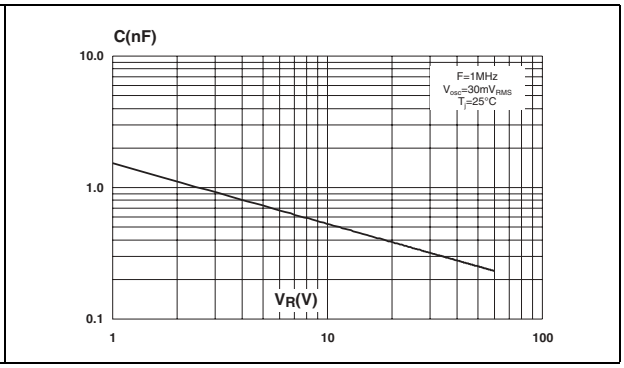


Figure 9. Forward voltage drop versus forward current (per diode)

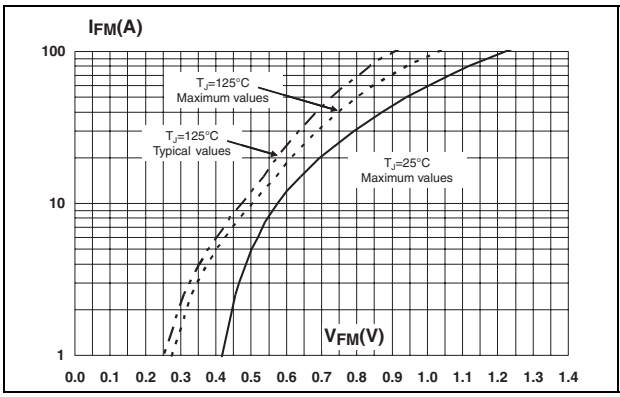
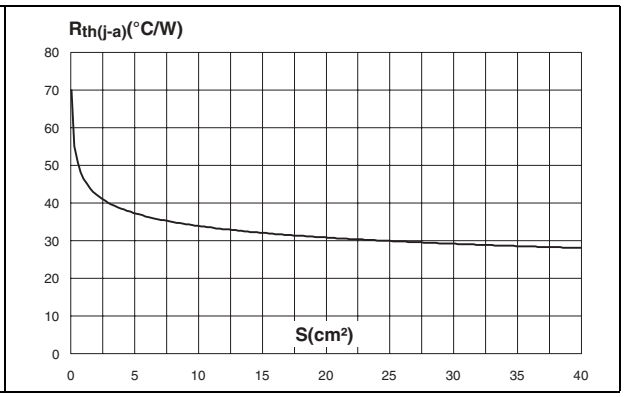
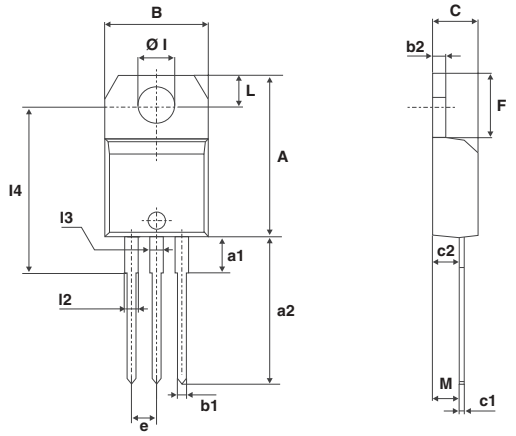


Figure 10. Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, copper thickness = 35 µm) (D^2PAK)



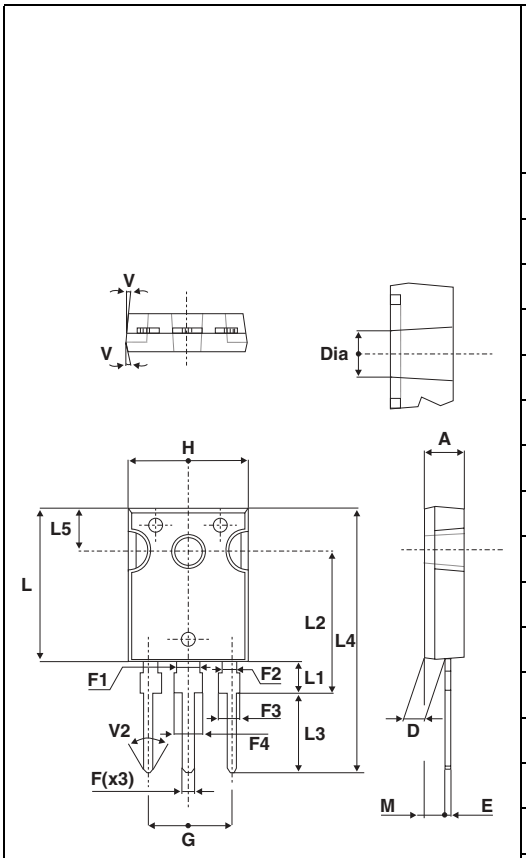
2 Package mechanical data

Table 4. T0-220AB dimensions



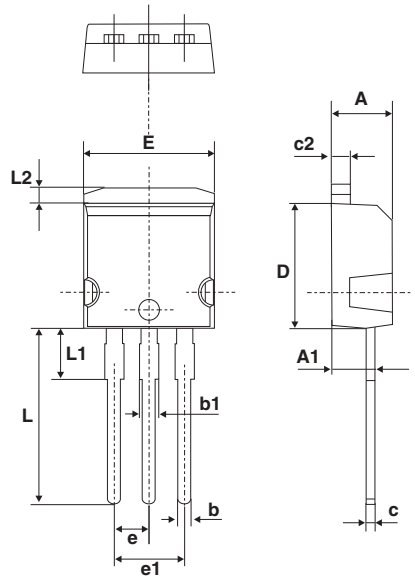
REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1		3.75			0.147	
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
ØI	3.75		3.85	0.147		0.151
l4	15.80	16.40	16.80	0.622	0.646	0.661
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	1.14		1.70	0.044		0.066
M		2.60			0.102	

Table 5. T0-247 dimensions



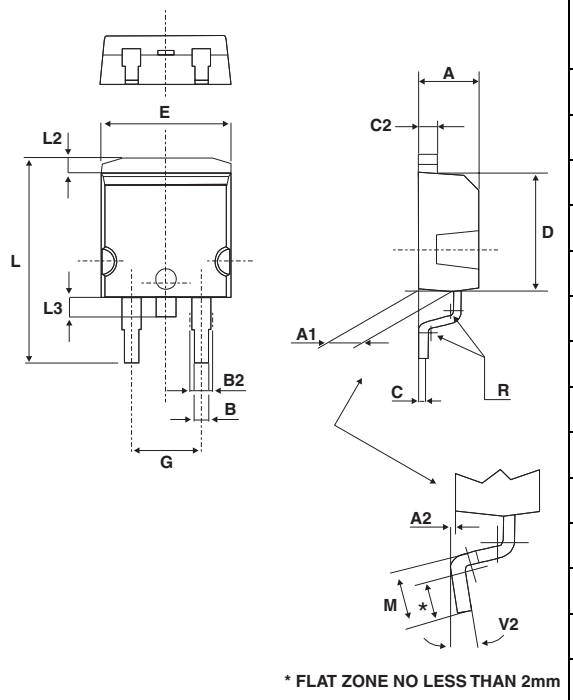
REF	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

Table 6. I^2PAK dimensions



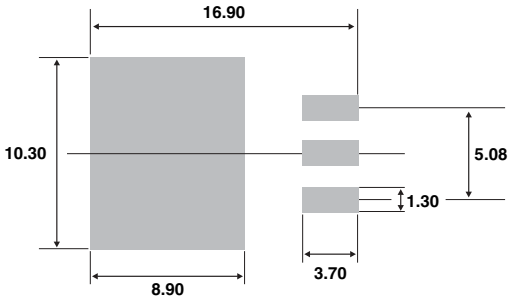
REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.40	2.72	0.094	0.107
b	0.61	0.88	0.024	0.035
b1	1.14	1.70	0.044	0.067
c	0.49	0.70	0.019	0.028
c2	1.23	1.32	0.048	0.052
D	8.95	9.35	0.352	0.368
e	2.40	2.70	0.094	0.106
e1	4.95	5.15	0.195	0.203
E	10	10.40	0.394	0.409
L	13	14	0.512	0.551
L1	3.50	3.93	0.138	0.155
L2	1.27	1.40	0.050	0.055

Table 7. D²PAK dimensions



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

Figure 11. D²PAK footprint



All dimensions in mm

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STPS30H60CT	STPS30H60CT	TO-220AB	2.23 g	50	Tube
STPS30H60CR	STPS30H60CR	I^2PAK	1.49 g	50	Tube
STPS30H60CG	STPS30H60CG	D^2PAK	1.48 g	50	Tube
STPS30H60CG-TR	STPS30H60CG-TR	D^2PAK	1.48 g	1000	Tape & reel
STPS30H60CW	STPS30H60W	TO-247	4.46 g	30	Tube

4 Revision history

Date	Revision	Description of Changes
27-Feb-2006	1	First issue.

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