STPS30H60-Y

Automotive power Schottky rectifier

Datasheet – production data

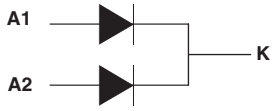
Features

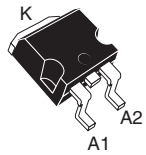
- High junction temperature capability
- Avalanche rated
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- High frequency operation
- AEC-Q 101 qualified

Description

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

Packaged in D^2PAK, this device is designed for use in automotive applications. In these applications this device provides a good margin between the remaining voltage applied on the diode and the voltage capability of the diode.





D^2PAK
STPS30H60CGY-TR

Table 1. Device summary

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

This is information on a product in full production. www.st.com

1 Characteristics

Table 2. Absolute ratings (limiting values per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			60	V
$I_{F(RMS)}$	Forward rms current			30	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 155$ °C	Per diode	15	A
			Total package	30	
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal		230	A
P_{ARM}	Relative peak avalanche power	$T_j = 125$ °C	$t_p = 10$ µs	715	W
T_j	Operating junction temperature range(1)			-40 to + 175	°C
T_{stg}	Storage temperature range			-65 to + 175	°C

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 3. 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 4. 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			550	mV
		$T_j = 125$ °C			435	470	
		$T_j = 25$ °C	$I_F = 15$ A			660	
		$T_j = 125$ °C			535	570	
		$T_j = 25$ °C	$I_F = 30$ A			820	
		$T_j = 125$ °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

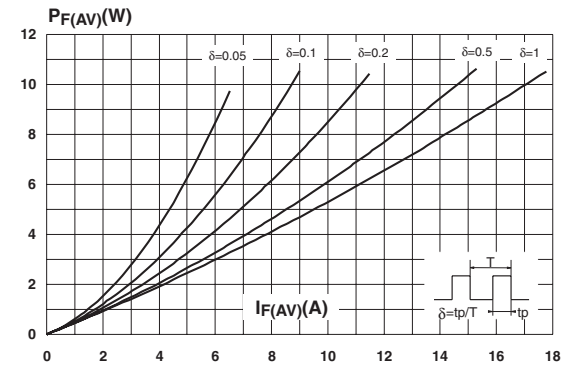


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

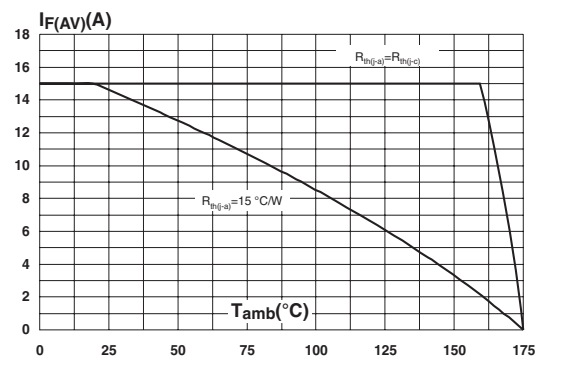


Figure 3. Normalized avalanche power derating versus pulse duration

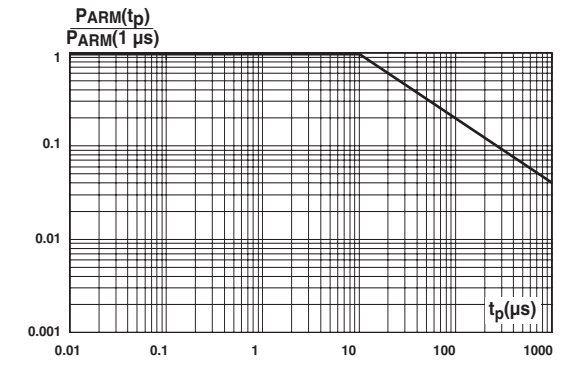


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

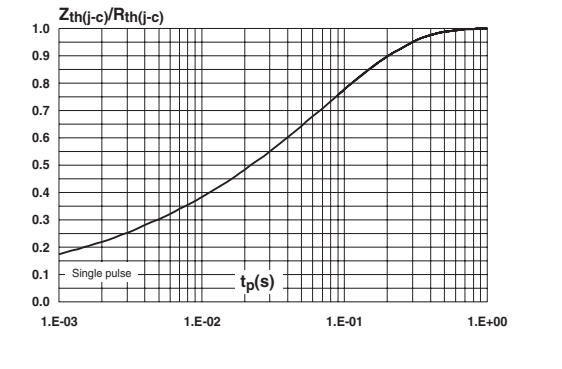


Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)

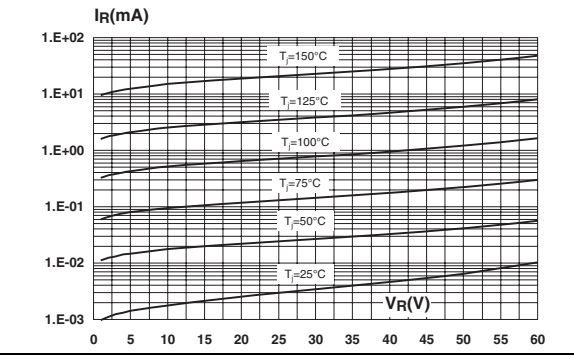


Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)

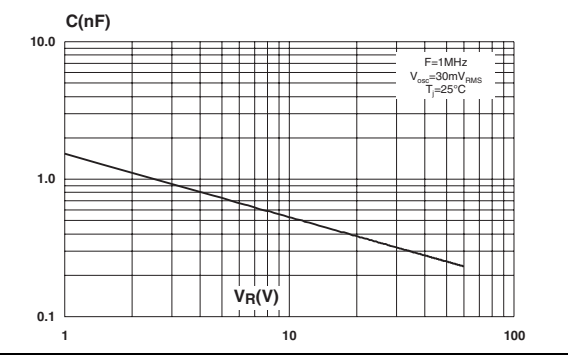


Figure 7. Forward voltage drop versus forward current (per diode)

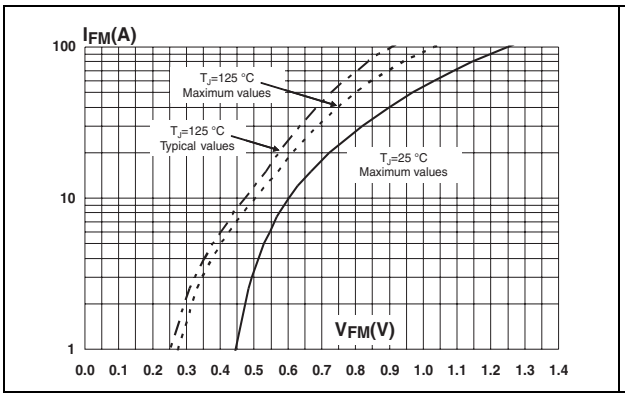
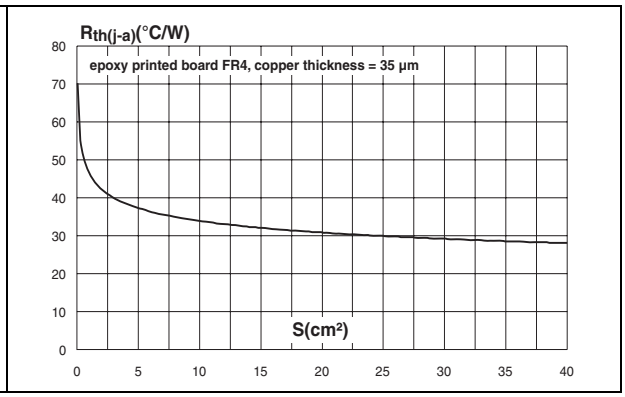


Figure 8. Thermal resistance junction to ambient versus copper surface under tab

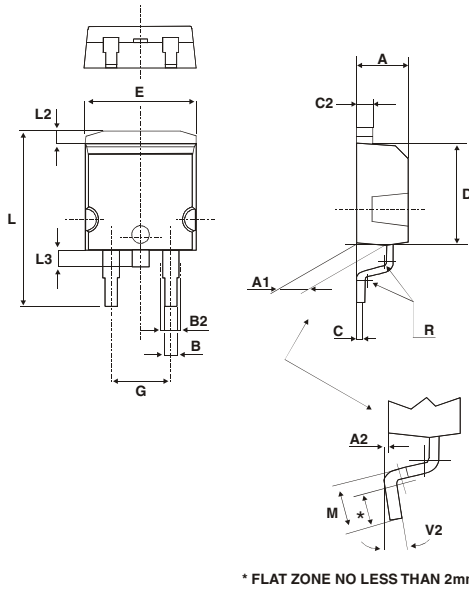


2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

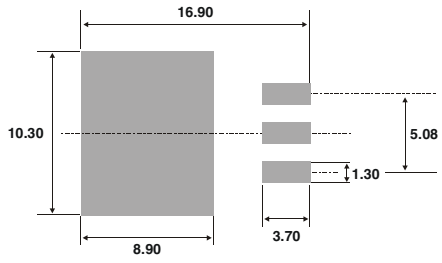
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 5. 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 9. Footprint (dimensions in millimeters)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS30H60CGY-TR	STPS30H60CGY-TR	D^2PAK	1.48 g	1000	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
20-Mar-2012	1	First issue.

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