

# STPS60L30C-Y

# Automotive power Schottky rectifier

## Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- AEC-Q101 qualified

## Description

60 A dual center tab Schottky rectifier suitable for automotive applications.

Packaged in PowerSO-20 (slug up), this device is especially intended for use in a low voltage applications.

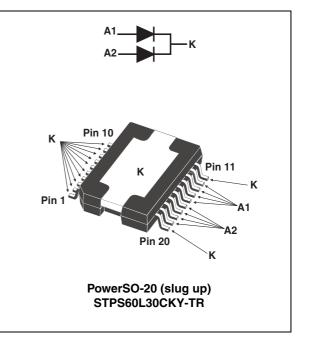


Table 1. Device summary

Symbol	Value
I <sub>F(AV)</sub>	2 x 30 A
V <sub>RRM</sub>	30 V
T <sub>j(max)</sub>	150 °C
V <sub>F(max)</sub>	0.415 V

### **Characteristics** 1

Symbol	Para	Value	Unit			
V <sub>RRM</sub>	Repetitive peak reverse voltage	30	V			
${\rm IF_{(RMS)}}^{(1)}$	Forward rms current				45	А
${\sf IF}_{({\sf AV})}^{(1)}$	Average forward current	$ \begin{array}{ll} T_{c} = & 130 \ ^{\circ}C, \ \delta = 0.5 \\ Square \ pulse \end{array} \begin{array}{l} Per \ diode \\ Per \ device \end{array} $			30 60	A
I <sub>FSM</sub> <sup>(1)</sup>	Surge non repetitive forward cu	250	А			
T <sub>stg</sub>	Storage temperature range	-65 to +175	°C			
Тj	Operating junction temperature	-40 to +150	°C			
T <sub>R</sub>	Recommended reflow soldering temperature range 245 +0/-5					°C

#### Table 2. Absolute rating (limiting value, per diode)

1. All anode pins (A1, A2) must be connected

### Table 3. **Thermal parameters**

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case	0.95 0.61	°C/W
R <sub>th(c)</sub>	Coupling	0.27	°C/W

When diodes 1 and 2 are used simultaneously:

 $\Delta T_{j(diode 1)} = P_{(diode 1)} \times R_{th(j-c)(Per diode)} + P_{(diode 2)} \times R_{th(c)}$ 

#### Static electrical characteristics (per diode) Table 4.

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup> Reverse leakage current	Reverse leakage	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>			2	mA
	T <sub>j</sub> = 125 °C	v <sub>R</sub> = v <sub>RRM</sub>			400	mA	
V <sub>F</sub> <sup>(1) (2)</sup> Forward voltage dro		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 10 A			0.420	
	Forward voltage drop	T <sub>j</sub> = 125 °C	I <sub>F</sub> = 10 A			0.310	V
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 30 A			0.490	
		T <sub>j</sub> = 125 °C	I <sub>F</sub> = 30 A			0.415	

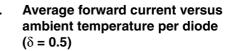
1. Pulse test :  $t_p = 380 \ \mu s, \ \delta < 2\%$ 

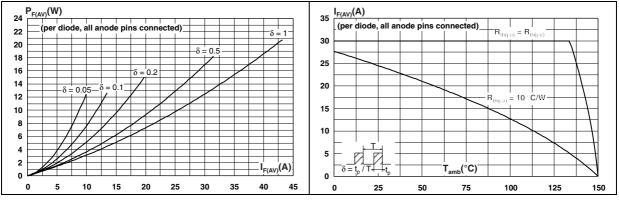
2. All anode pins (A1, A2) must be connected

To evaluate the maximum conduction losses use the following equation: P = 0.315 x  $I_{F(AV)}$  + 0.00333 x  ${I_F}^2_{(RMS)}$ 

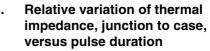


# Figure 1. Average forward power dissipation Figure 2. versus average forward current





### Figure 3. Non repetetive surge peak forward Figure 4. current versus overload duration (maximum values)



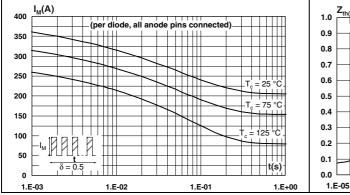


Figure 5. Reverse leakage current versus reverse voltage applied (per diode) (typical values)

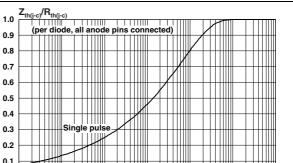


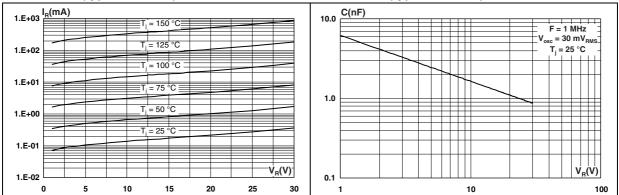
Figure 6. Junction capacitance versus reverse voltage applied (per diode) (typical values)

1.E-02

1.E-01

1.E-04

1.E-03



t<sub>p</sub>(s)

1.E+01

1.E+00

$\begin{array}{c c} 1_{FM}(\mathbf{A}) \\ \hline (\text{per diode, all anode pins connected}) \\ \hline 50 \\ 40 \\ \hline 1_{j} = 125 \ ^{\circ}\mathrm{C} \\ \hline 1$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
40 (Maximum values)
30
20
10 $T_j = 25 \degree C$ (Maximum values)
0 V <sub>FM</sub> (V)
0.00 0.05 0.10 0.15 0.20 0.25 0.30 0.35 0.40 0.45 0.50 0.55 0.60

Figure 7. Forward voltage drop versus forward current



# 2 Package information

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

			Dimensions				
	Ref	I	Villimete	er		Inch	
		Min.	Тур.	Max.	Min.	Тур.	Max.
	А	3.25		3.5	0.128		0.138
	A2	3	3.15	3.3	0.118	0.124	0.13
	A4	0.8		1	0.031		0.039
	A5	0.15	0.2	0.25	0.006	0.008	0.01
	a1	0.03		-0.04	0.0012		-0.0016
	b	0.4		0.53	0.016		0.021
	С	0.23		0.32	0.009		0.012
	D <sup>(1)</sup>	15.8		16	0.622		0.63
	J D1	9.4		9.8	0.37		0.385
DETAIL A5	D2		1			0.039	
	., E	13.9		14.5	0.547		0.57
	E1 <sup>(1)</sup>	10.9		11.1	0.429		0.437
	E2			2.9			0.114
	E3	5.8		6.2	0.228		0.244
	_	1.12	1.27	1.42	0.044	0.05	0.056
	e3		11.43			0.45	
╽╷╷┠╕╪╷╶┨╴╵┑╺╏ <del>╵</del>	G	0		0.1	0		0.004
	н	15.5		15.9	0.61		0.625
	h			1.1			0.043
	L	0.8		1.1	0.031		0.043
	N			10°			10°
	R		0.6			0.024	
	S	0°		8°	0°		8°
	V	5°		7°	5°		7°

Table 5. PowerSO-20 (slug up) dimensions

1. These measurements do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.15 mm (0.006"). Critical dimensions: E, a1, e, and G.



# **3** Ordering information

## Table 6.Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS60L30CKY-TR	PS60L30CY	PowerSO-20	1.93 g	600	Tape and reel

# 4 Revision history

### Table 7.Document revision history

Date	Revision	Changes
02-Dec-2010	1	First issue.



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