STPS30H60C-Y

Automotive power Schottky rectifier

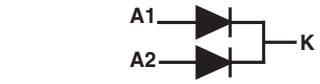
Features

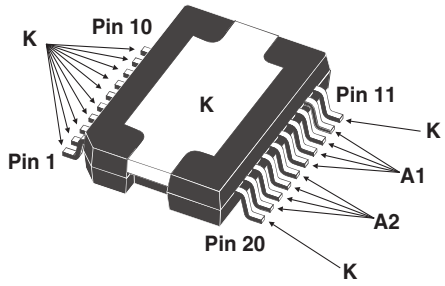
- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- AEC-Q101 qualified

Description

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

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





PowerSO-20 (slug up)
STPS30H60CKY-TR

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 15 A
V_{RRM}	60 V
$T_{j(max)}$	150 °C
$V_{F(max)}$	0.645 V

1 Characteristics

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

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			60	V
$IF_{(RMS)}$ (1)	Forward rms current			45	A
$IF_{(AV)}$ (1)	Average forward current	T_c = 140 °C, δ = 0.5 square pulse	Per diode	15	A
		T_c = 135 °C, δ = 0.5 square pulse	Per device	30	
I_{FSM} (1)	Surge non repetitive forward current	t_p = 10 ms Sinusoidal		250	A
T_{stg}	Storage temperature range			-65 to +175	°C
T_j	Operating junction temperature range			-40 to +150	°C
T_R	Recommended reflow soldering temperature range			245 +0/-5	°C

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

Table 3. Thermal parameters

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode Per device	0.95 0.61	°C/W
$R_{th(c)}$	Coupling		0.27	°C/W

When diodes 1 and 2 are used simultaneously:
$\Delta T_{j(diode\ 1)} = P_{(diode1)} \times R_{th(j-c)(Per\ diode)} + P_{(diode\ 2)} \times R_{th(c)}$

Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			150	µA
		T_j = 125 °C				45	mA
V_F (1) (2)	Forward voltage drop	T_j = 25 °C	I_F = 15 A			0.580	V
		T_j = 125 °C	I_F = 15 A			0.515	
		T_j = 25 °C	I_F = 30 A			0.700	
		T_j = 125 °C	I_F = 30 A			0.645	

1. Pulse test : tp = 380 µs, d < 2%
2. All anode pins (A1, A2) must be connected

To evaluate the maximum conduction losses use the following equation:
$P = 0.385 \times I_{F(AV)} + 0.00867 \times I_{F}^{2}{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current (per diode, all anode pins connected)

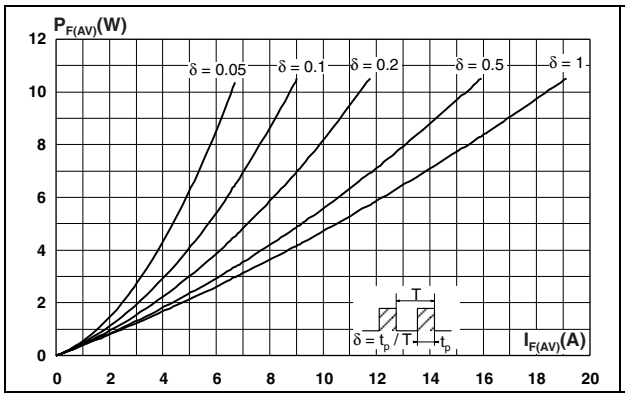


Figure 2. Average forward current versus ambient temperature (per diode, all anode pins connected) (δ = 0.5)

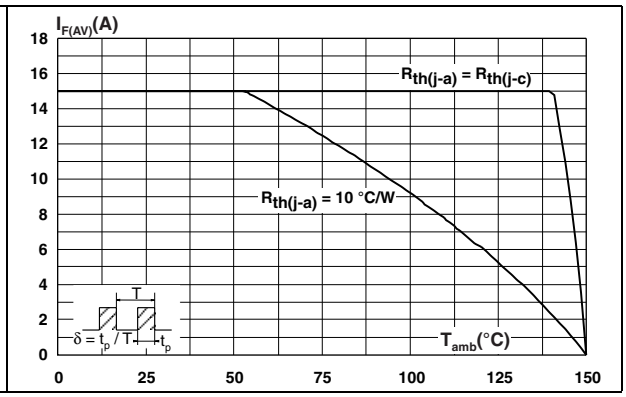


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)

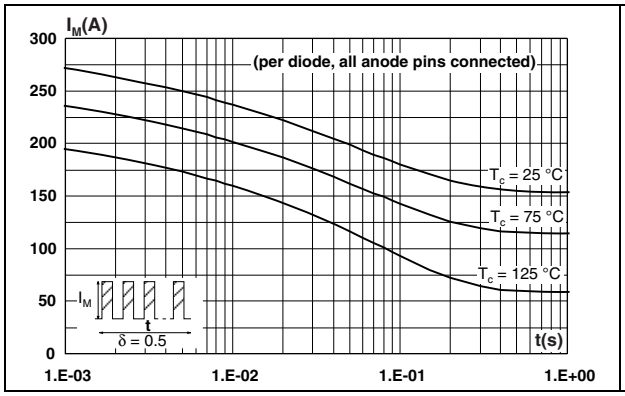


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

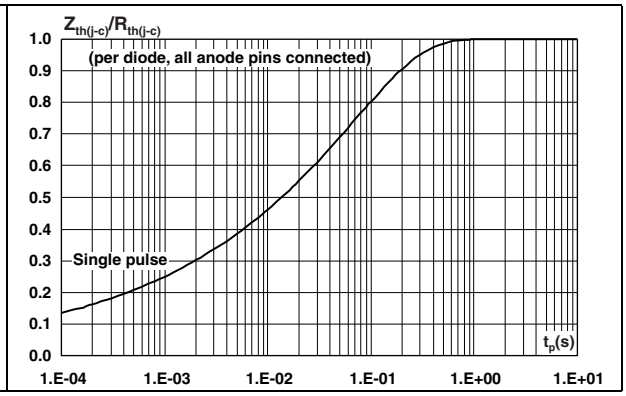


Figure 5. Reverse leakage current versus reverse voltage applied (per diode) (typical values)

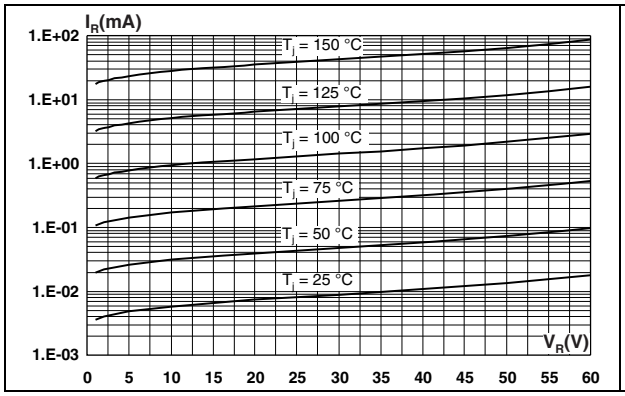


Figure 6. Junction capacitance versus reverse voltage applied (per diode) (typical values)

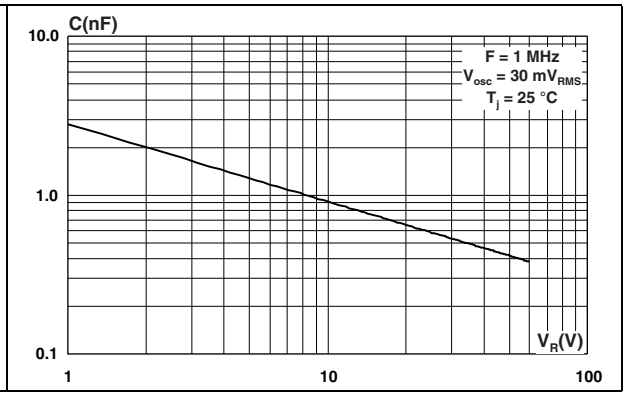


Figure 7. Forward voltage drop versus forward current (per diode, all anode pins connected, low level)

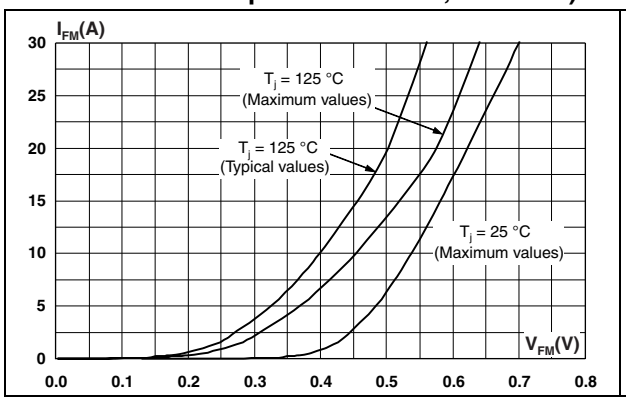
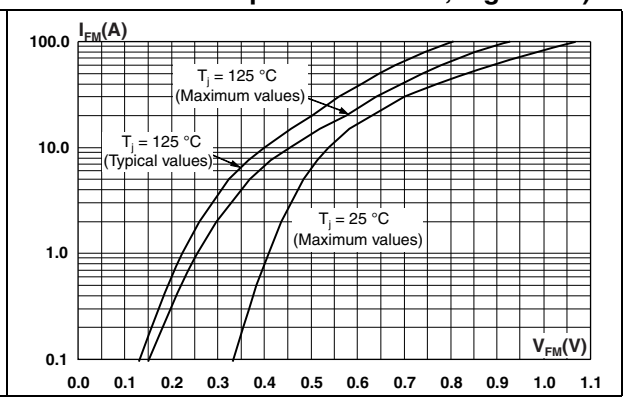


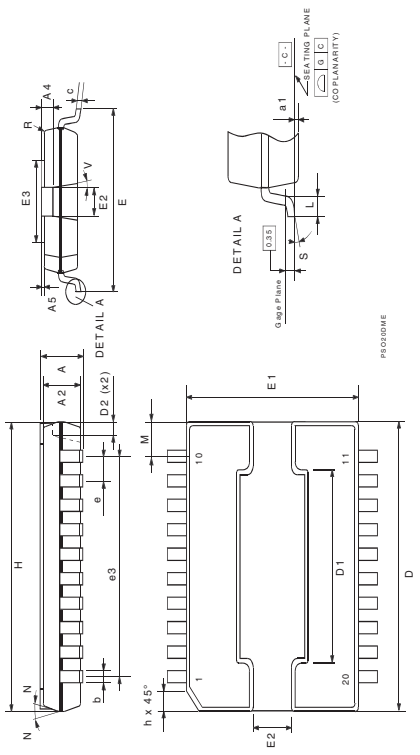
Figure 8. Forward voltage drop versus forward current (per diode, all anode pins connected, high level)



2 Package information

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. PowerSO-20 (slug up) dimensions



Ref	Dimensions					
	Millimeter			Inch		
	Min	Typ	Max	Min	Typ	Max
A	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
c	0.23		0.32	0.009		0.012
D(1)	15.8		16	0.622		0.63
D1	9.4		9.8	0.37		0.385
D2		1			0.039	
E	13.9		14.5	0.547		0.57
E1(1)	10.9		11.1	0.429		0.437
E2			2.9			0.114
E3	5.8		6.2	0.228		0.244
e	1.12	1.27	1.42	0.044	0.05	0.056
e3		11.43			0.45	
G	0		0.1	0		0.004
H	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°

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
STPS30H60CKY-TR	PS30H60CY	PowerSO-20	1.93 g	600	Tape and reel

4 Revision history

Table 7. Document revision history

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

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