

## Automotive power Schottky rectifier

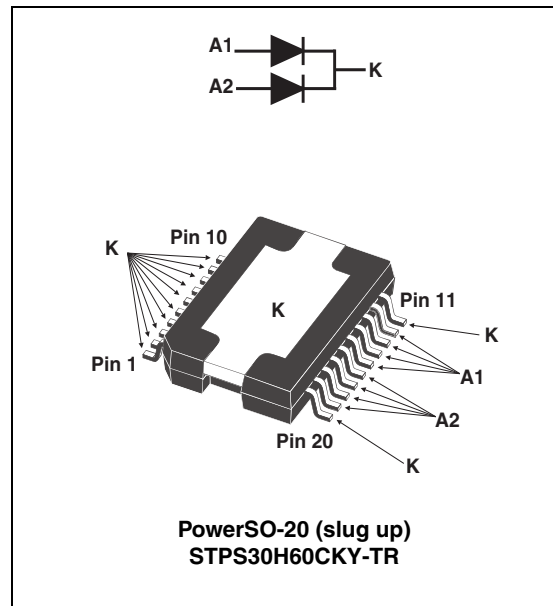
### Features

- 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 intended for use in a low voltage applications.



**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
$I_{F(RMS)}^{(1)}$	Forward rms current		45	A
$I_{F(AV)}^{(1)}$	Average forward current	$T_c = 140\text{ }^\circ\text{C}$ , $\delta = 0.5$ square pulse	Per diode 15	A
		$T_c = 135\text{ }^\circ\text{C}$ , $\delta = 0.5$ square pulse	Per device 30	
$I_{FSM}^{(1)}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ Sinusoidal	250	A
$T_{stg}$	Storage temperature range		-65 to +175	$^\circ\text{C}$
$T_j$	Operating junction temperature range		-40 to +150	$^\circ\text{C}$
$T_R$	Recommended reflow soldering temperature range		245 +0/-5	$^\circ\text{C}$

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	0.95	$^\circ\text{C/W}$
		Per device	0.61	
$R_{th(c)}$	Coupling		0.27	$^\circ\text{C/W}$

When diodes 1 and 2 are used simultaneously:

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

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

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

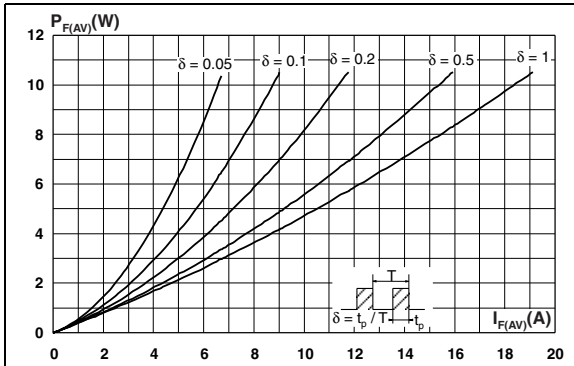
1. Pulse test :  $t_p = 380\text{ }\mu\text{s}$ ,  $d < 2\%$

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

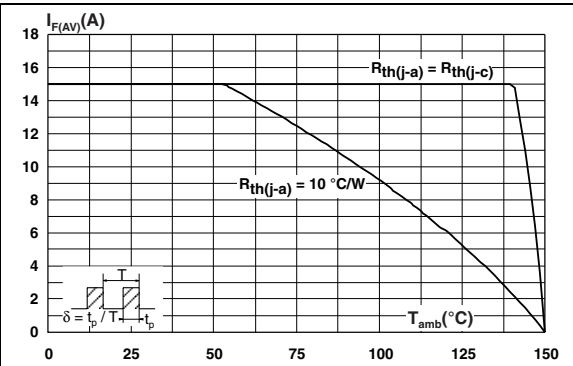
To evaluate the maximum conduction losses use the following equation:

$$P = 0.385 \times I_{F(AV)} + 0.00867 \times I_{F(RMS)}^2$$

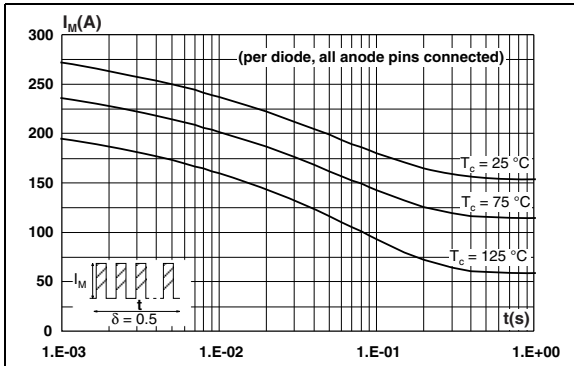
**Figure 1. Average forward power dissipation versus average forward current (per diode, all anode pins connected)**



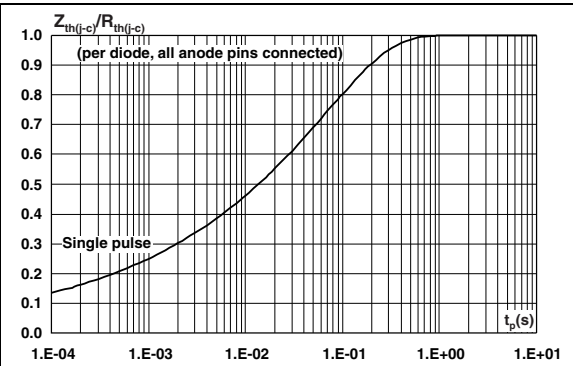
**Figure 2. Average forward current versus ambient temperature (per diode, all anode pins connected) ( $\delta = 0.5$ )**



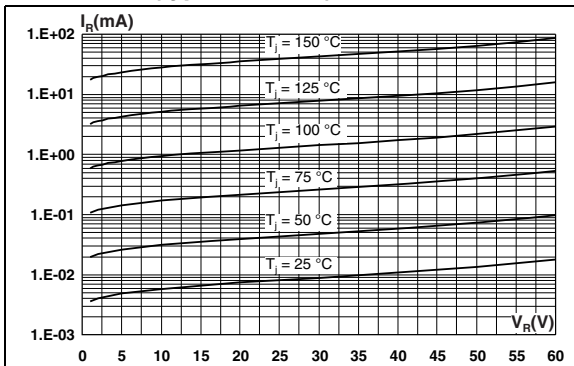
**Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)**



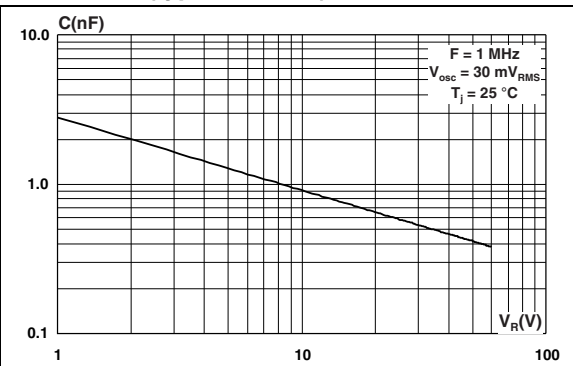
**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**



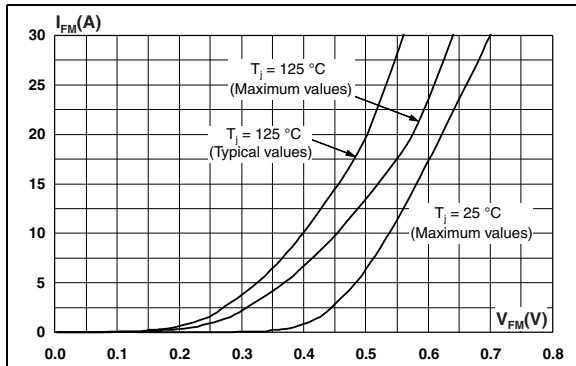
**Figure 5. Reverse leakage current versus reverse voltage applied (per diode) (typical values)**



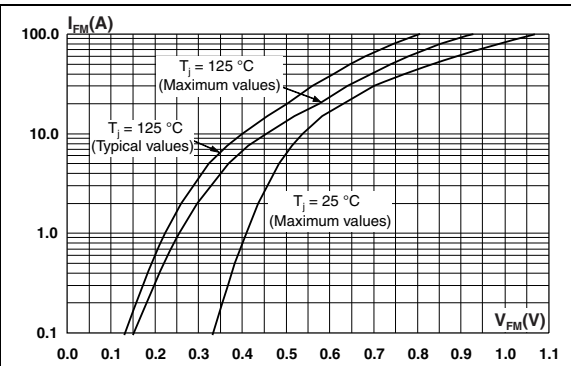
**Figure 6. Junction capacitance versus reverse voltage applied (per diode) (typical values)**



**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<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> 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 <sup>(1)</sup>	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 <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
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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