

## Automotive power Schottky rectifier

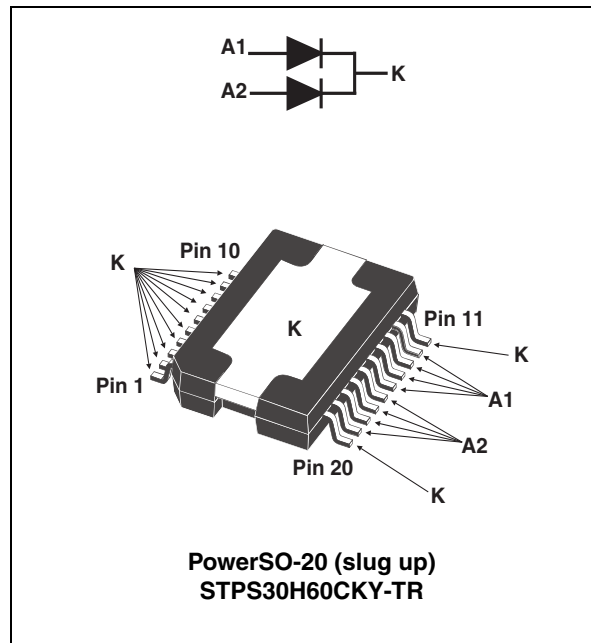
### Features

- 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 <sub>RRM</sub>	Repetitive peak reverse voltage		60	V	
I <sub>F(RMS)</sub> <sup>(1)</sup>	Forward rms current		45	A	
I <sub>F(AV)</sub> <sup>(1)</sup>	Average forward current	T <sub>c</sub> = 140 °C, δ = 0.5 square pulse	Per diode	15	A
		T <sub>c</sub> = 135 °C, δ = 0.5 square pulse	Per device	30	
I <sub>FSM</sub> <sup>(1)</sup>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms Sinusoidal	250	A	
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C	
T <sub>j</sub>	Operating junction temperature range		-40 to +150	°C	
T <sub>R</sub>	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 <sub>th(j-c)</sub>	Junction to case	Per diode Per device	0.95 0.61	°C/W
R <sub>th(c)</sub>	Coupling		0.27	°C/W

When diodes 1 and 2 are used simultaneously:

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

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

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>			150	μA
		T <sub>j</sub> = 125 °C				45	mA
V <sub>F</sub> <sup>(1) (2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 15 A			0.580	V
		T <sub>j</sub> = 125 °C	I <sub>F</sub> = 15 A			0.515	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 30 A			0.700	
		T <sub>j</sub> = 125 °C	I <sub>F</sub> = 30 A			0.645	

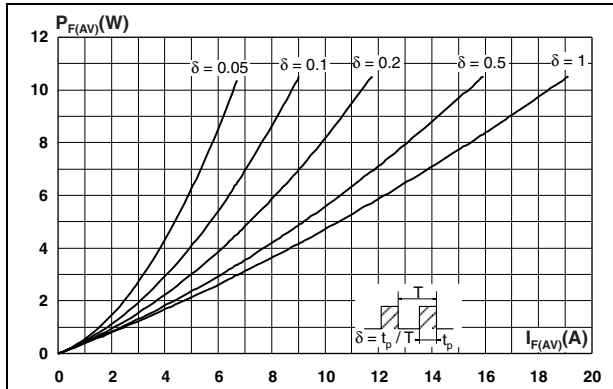
1. Pulse test : t<sub>p</sub> = 380 μs, d < 2%

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

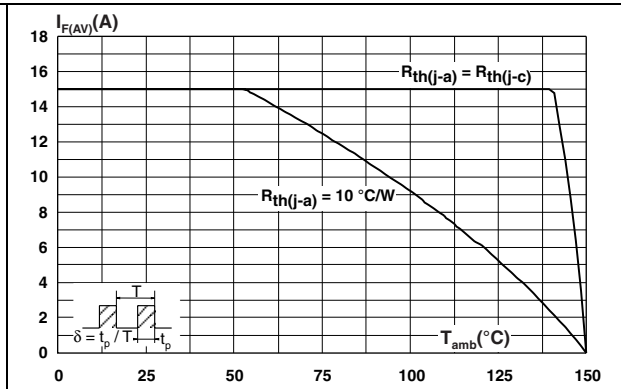
To evaluate the maximum conduction losses use the following equation:

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

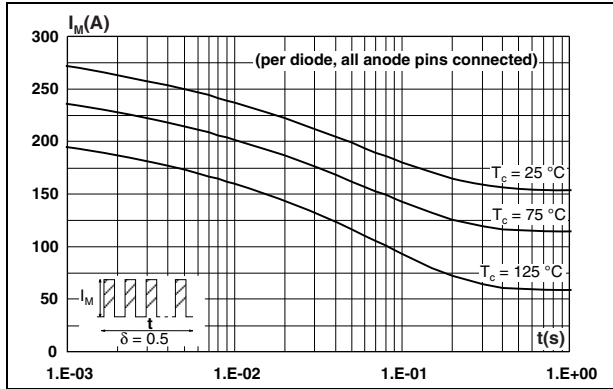
**Figure 1. Average forward power dissipation versus average forward current (per diode, all anode pins connected)**



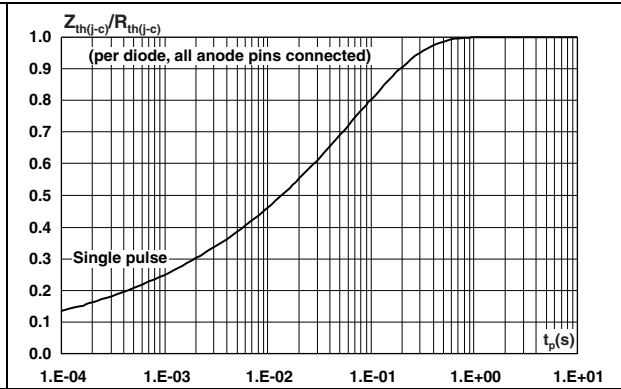
**Figure 2. Average forward current versus ambient temperature (per diode, all anode pins connected) ( $\delta = 0.5$ )**



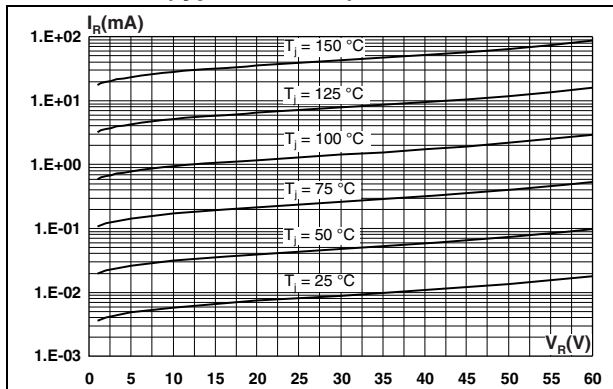
**Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)**



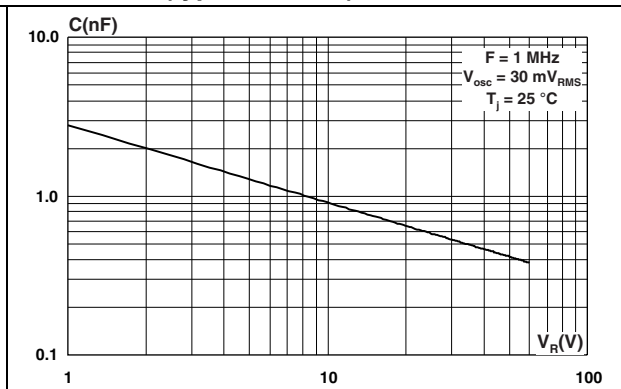
**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**



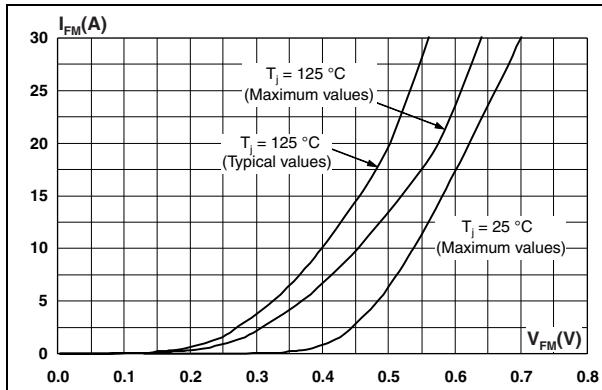
**Figure 5. Reverse leakage current versus reverse voltage applied (per diode) (typical values)**



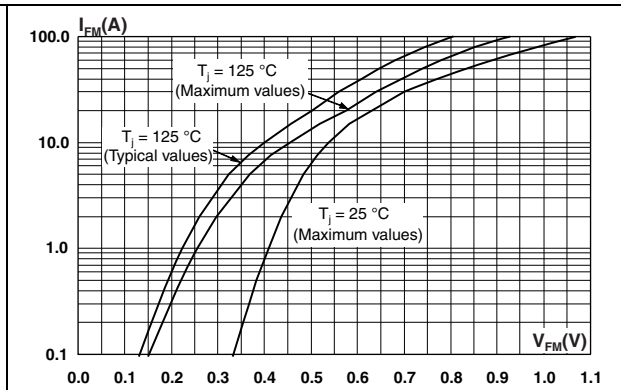
**Figure 6. Junction capacitance versus reverse voltage applied (per diode) (typical values)**



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