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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.

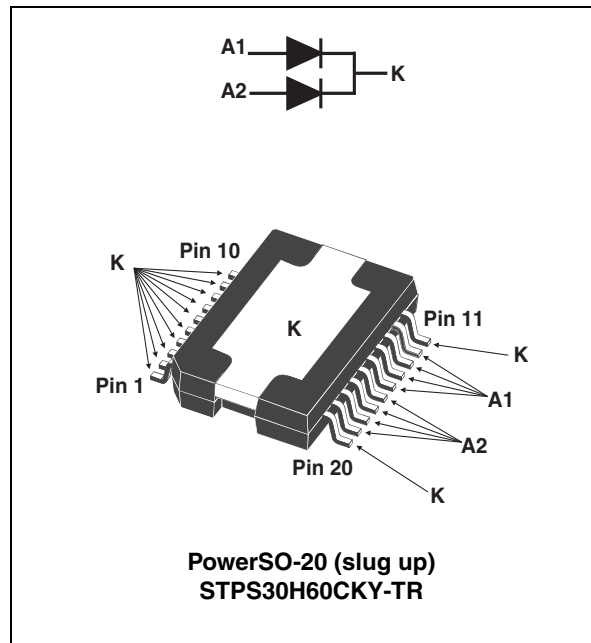


Table 1. Device summary

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	$T_c = 140\text{ °C}, \delta = 0.5$ square pulse	Per diode	15	A
		$T_c = 135\text{ °C}, \delta = 0.5$ 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	°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	0.95	°C/W
		Per device	0.61	
$R_{th(c)}$	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
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$			150	μA
		$T_j = 125\text{ °C}$				45	mA
$V_F^{(1) (2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 15\text{ A}$			0.580	V
		$T_j = 125\text{ °C}$	$I_F = 15\text{ A}$			0.515	
		$T_j = 25\text{ °C}$	$I_F = 30\text{ A}$			0.700	
		$T_j = 125\text{ °C}$	$I_F = 30\text{ A}$			0.645	

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

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)

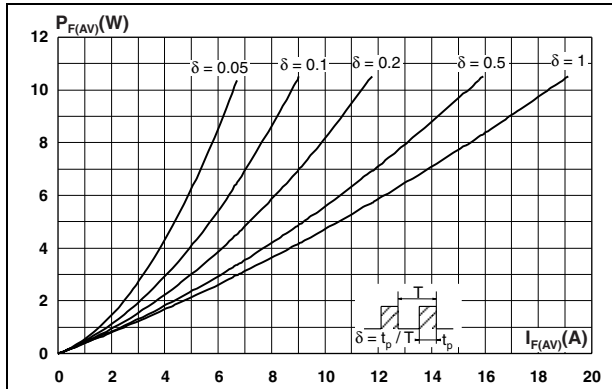


Figure 2. Average forward current versus ambient temperature (per diode, all anode pins connected) ($\delta = 0.5$)

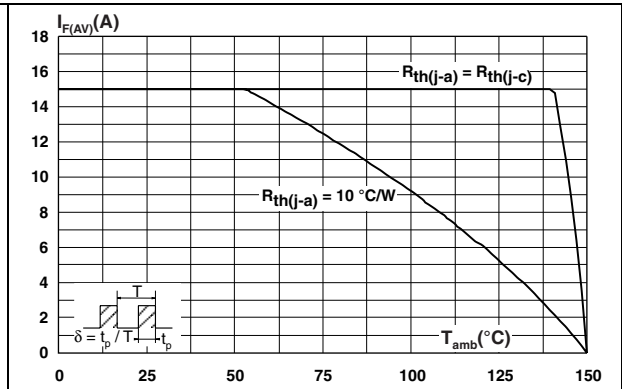


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)

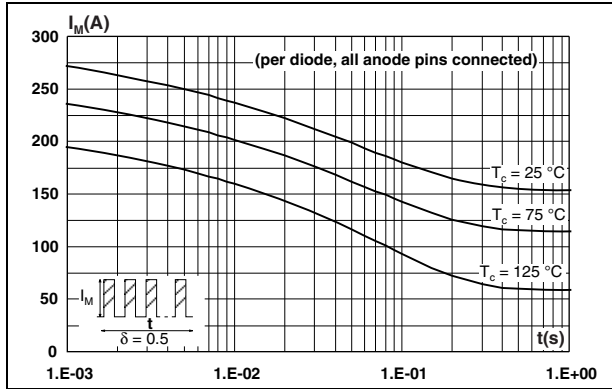


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

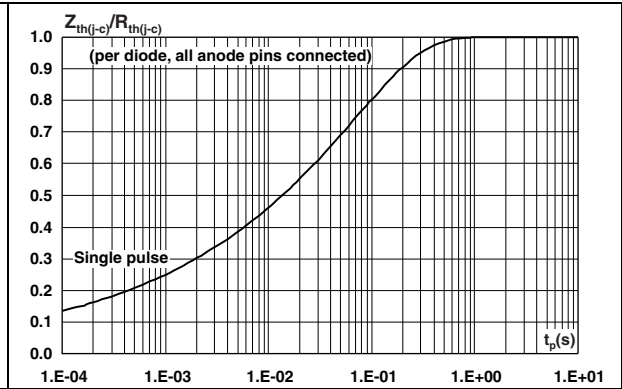


Figure 5. Reverse leakage current versus reverse voltage applied (per diode) (typical values)

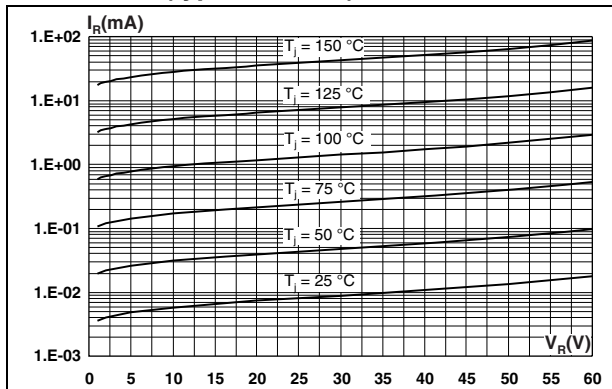


Figure 6. Junction capacitance versus reverse voltage applied (per diode) (typical values)

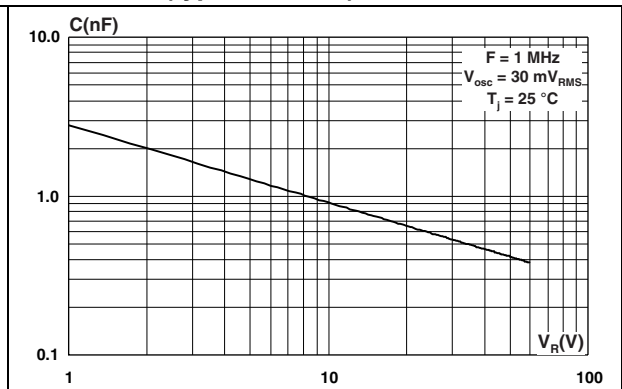


Figure 7. Forward voltage drop versus forward current (per diode, all anode pins connected, low level)

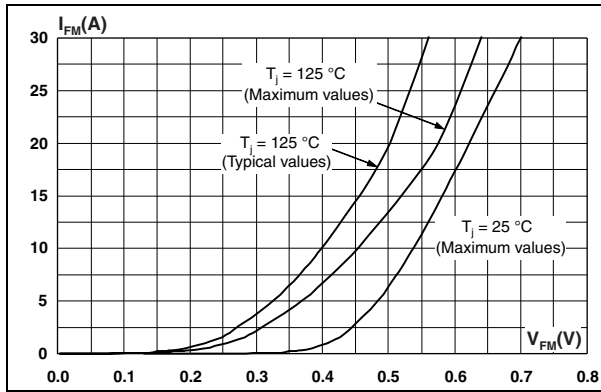
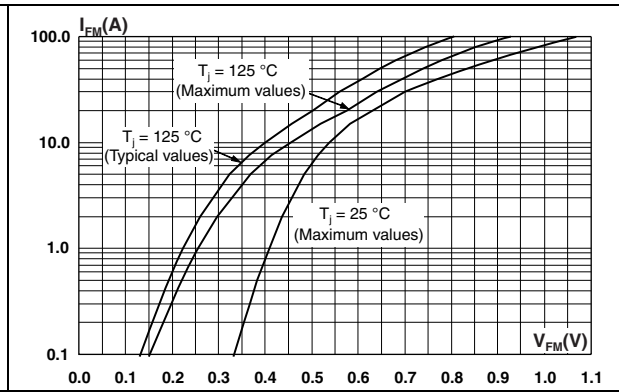


Figure 8. Forward voltage drop versus forward current (per diode, all anode pins connected, high level)



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. 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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