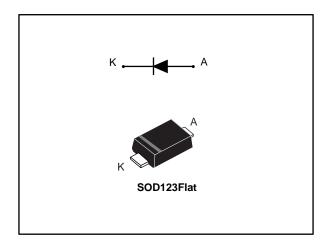


STPS2H100ZFY

Automotive high voltage power Schottky rectifier

Datasheet - production data



Features



- AEC-Q101 qualified
- High junction temperature capability
- Low leakage current
- Negligible switching losses
- Avalanche capability specified
- ECOPACK®2 compliant component
- PPAP capable

Description

Single chip Schottky rectifiers suited to automotive applications, such as lighting, diesel injection, or engine control unit.

Packaged in SOD123Flat, this device is especially intended for surface mounting and used in high frequency converters, free wheeling and reverse polarity protection in automotive applications.

Table 1: Device summary

Symbol	Value
I _{F(AV)}	2 A
V_{RRM}	100 V
V _F (typ.)	0.65 V
T _j (max.)	175 °C

Characteristics STPS2H100ZFY

1 Characteristics

Table 2: Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter	Value	Unit	
VRRM	Repetitive peak reverse voltage $T_j = -40 \text{ °C to } +175 \text{ °C}$		100	V
I _{F(AV)}	Average forward current δ = 0.5, square wave $T_L = 140 ^{\circ}\text{C}$		2	А
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$		50	Α
P _{ARM}	Repetitive peak avalanche power $t_p = 10 \mu s, T_j = 125 ^{\circ} C$		105	W
T _{stg}	Storage temperature range	-65 to +175	°C	
Tj	Operating junction temperature range ⁽¹⁾	-40 to +175	J	

Notes:

Table 3: Thermal parameters

Symbol	Parameter	Max. value	Unit
R _{th(j-l)}	Junction to lead	20	°C/W

Table 4: Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
. (1)	I _R ⁽¹⁾ Reverse leakage current	T _j = 25 °C	$V_R = V_{RRM}$	•		1	μΑ
IR ^(*)		T _j = 125 °C		ı	0.2	0.5	mΑ
V _F ⁽²⁾	Forward voltage drop	T _j = 25 °C	I _F = 2 A	•		0.86	>
		T _j = 125 °C		-	0.65	0.70	
		T _j = 25 °C	F = 4 A	-		0.96	
		T _j = 125 °C		-	0.75	0.83	

Notes:

 $^{(1)}$ Pulse test: t_p = 5 ms, δ < 2%

To evaluate the conduction losses, use the following equation:

$$P = 0.57 \times I_{F(AV)} + 0.065 \times I_{F^{2}(RMS)}$$

For more information, please refer to the following application notes related to the power losses.

- AN604 (Calculation of conduction losses in a power rectifier)
- AN4021 (Calculation of reverse losses in a power diode)

 $^{^{(1)}(}dP_{tot}/dT_j) < (1/R_{th(j-a)}) \ condition \ to \ avoid \ thermal \ runaway \ for \ a \ diode \ on \ its \ own \ heatsink.$

⁽²⁾Pulse test: t_p = 380 μs, δ < 2%

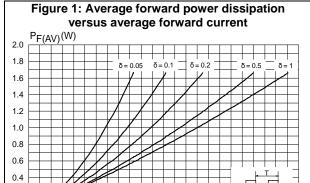
STPS2H100ZFY Characteristics

1.1 Characteristics (curves)

0.2

0.0

0.0



1.0

 $I_{F(AV)}(A)$

 $\delta_i = tp/T$

1.2 1.4 1.6 1.8 2.0 2.2 2.4

Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$) $I_{F(AV)}(A)$ $R_{th(j-a)} = R_{th(j-l)}$ 6 5 3 2 T_{amb}(°C) $\delta = tp/T$ 0 25 50 75 100 0 125 175

Figure 3: Normalized avalanche power derating versus pulse duration (T_j = 125 °C)

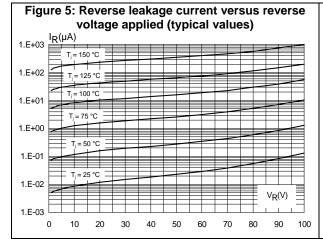
PARM(tp)
PARM(10 µs)

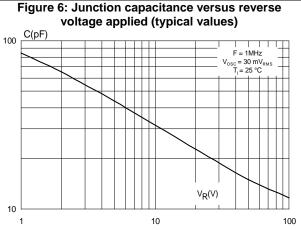
0.01

0.01

1 10 100 1000

Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration Z_{th(j-I)}/R_{th(j-I)} 1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 tp(s) 0.0 1.E-04 1.E-03 1.E-02 1.E-01





Characteristics STPS2H100ZFY

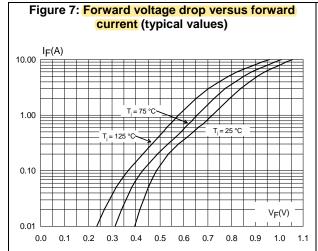


Figure 8: Thermal resistance junction to ambient versus copper surface under each lead (typical values) R_{th(j-a)}(°C/W) 250 200 150 100 Epoxy printed board FR4, e_{Cu} = 35 μm 50 $S_{Cu}(cm^2)$ 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.5 5.0 4.0

STPS2H100ZFY Package information

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.

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

2.1 SOD123Flat package information

Figure 9: SOD123Flat package outline

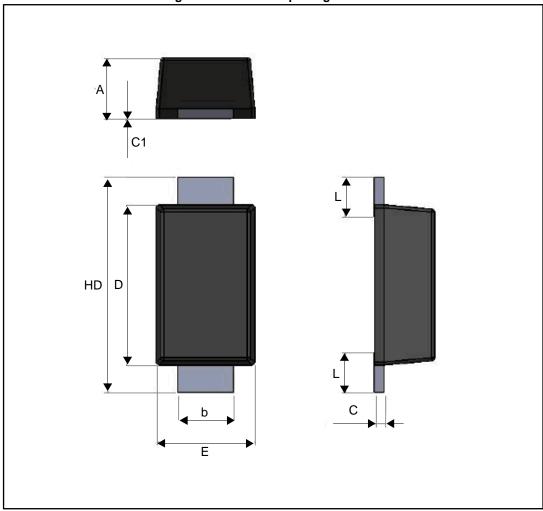
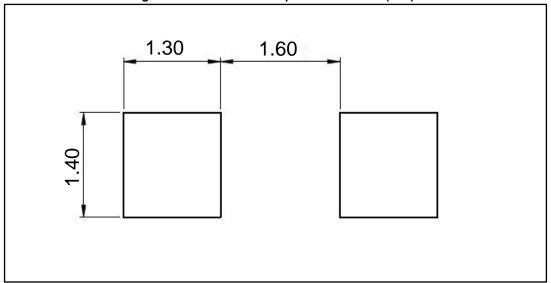


Table 5: SOD123Flat package mechanical data

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	Dimensions				
Ref.	Millimeters				
	Min.	Тур.	Max.		
Α	0.86	0.98	1.10		
b	0.80	0.90	1.00		
С	0.08	0.15	0.25		
c1	0.00		0.10		
D	2.50	2.60	2.70		
Е	1.50	1.60	1.80		
HD	3.30	3.50	3.70		
L	0.45	0.65	0.85		

Figure 10: SOD123Flat footprint dimensions (mm)



STPS2H100ZFY Ordering information

3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS2H100ZFY	2Y1	SOD123Flat	12.5 mg	3000	Tape and reel

4 Revision history

Table 7: Document revision history

Date	Revision	Changes
20-Oct-2016	1	Initial release.

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