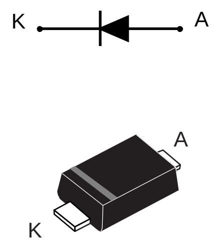
STPS2H100ZFY

Automotive high voltage power Schottky rectifier

Datasheet - production data



SOD123Flat

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

This is information on a product in full production. www.st.com

1 Characteristics

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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage	T_j = -40 °C to +175 °C	100	V
$I_{F(AV)}$	Average forward current δ = 0.5, square wave	T_L = 140 °C	2	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	50	A
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C	105	W
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Operating junction temperature range[(1)]		-40 to +175	

Notes:

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

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.	Typ.	Max.	Unit
I_R[(1)]	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-		1	µA
		T_j = 125 °C		-	0.2	0.5	mA
V_F[(2)]	Forward voltage drop	T_j = 25 °C	I_F = 2 A	-		0.86	V
		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%

[(2)]Pulse test: t_p = 380 µs, 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)

1.1 Characteristics (curves)

Figure 1: Average forward power dissipation versus average forward current

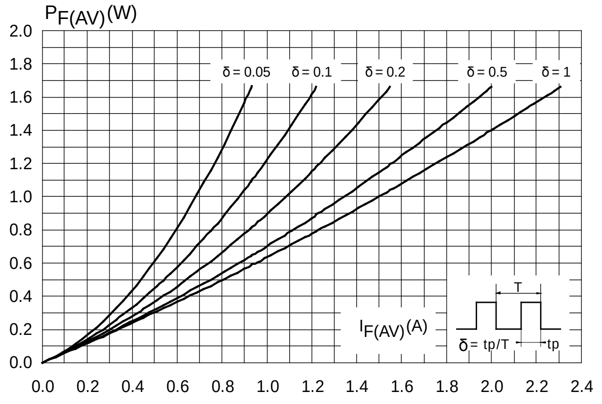


Figure 2: Average forward current versus ambient temperature (δ = 0.5)

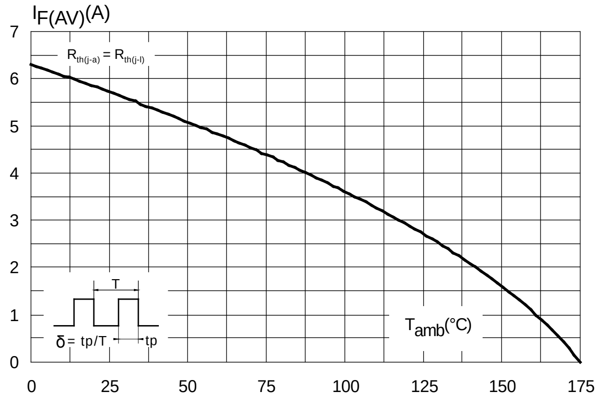


Figure 3: Normalized avalanche power derating versus pulse duration (T_j = 125 °C)

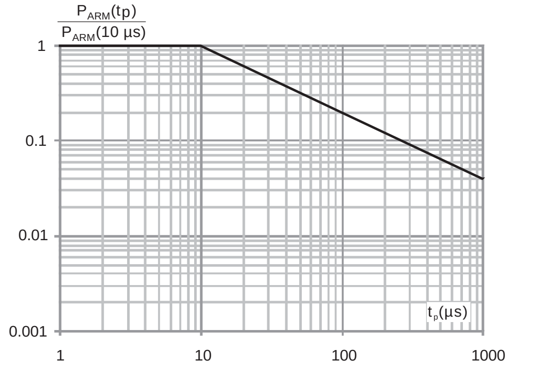


Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration

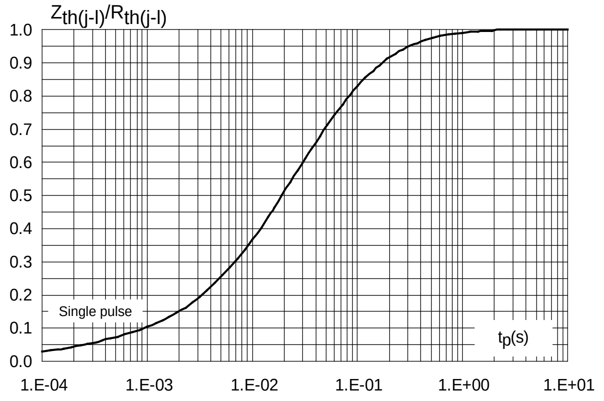


Figure 5: Reverse leakage current versus reverse voltage applied (typical values)

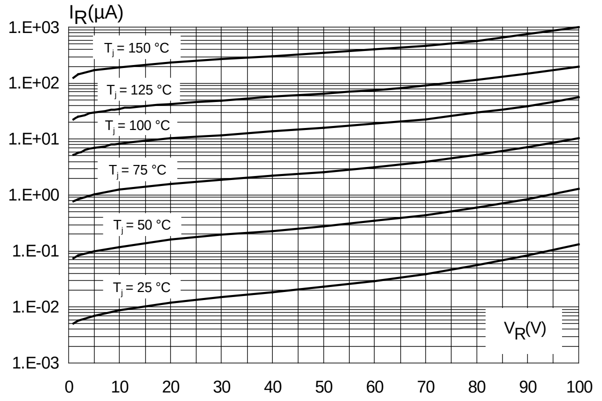


Figure 6: Junction capacitance versus reverse voltage applied (typical values)

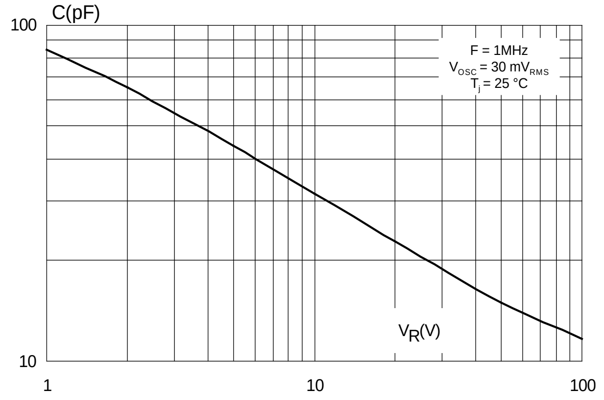


Figure 7: Forward voltage drop versus forward current (typical values)

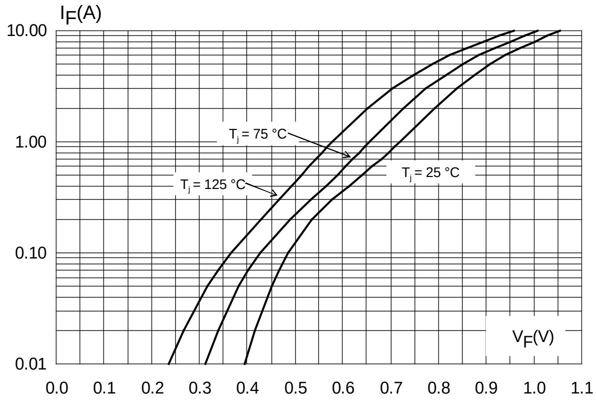
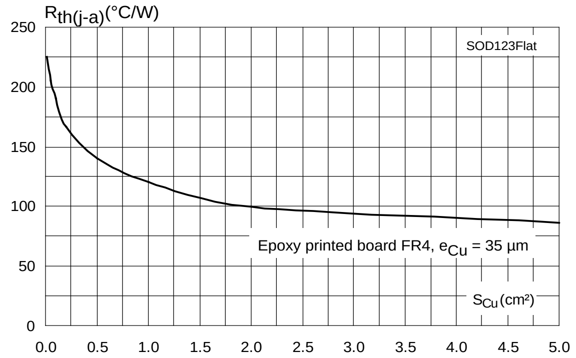


Figure 8: Thermal resistance junction to ambient versus copper surface under each lead (typical values)



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

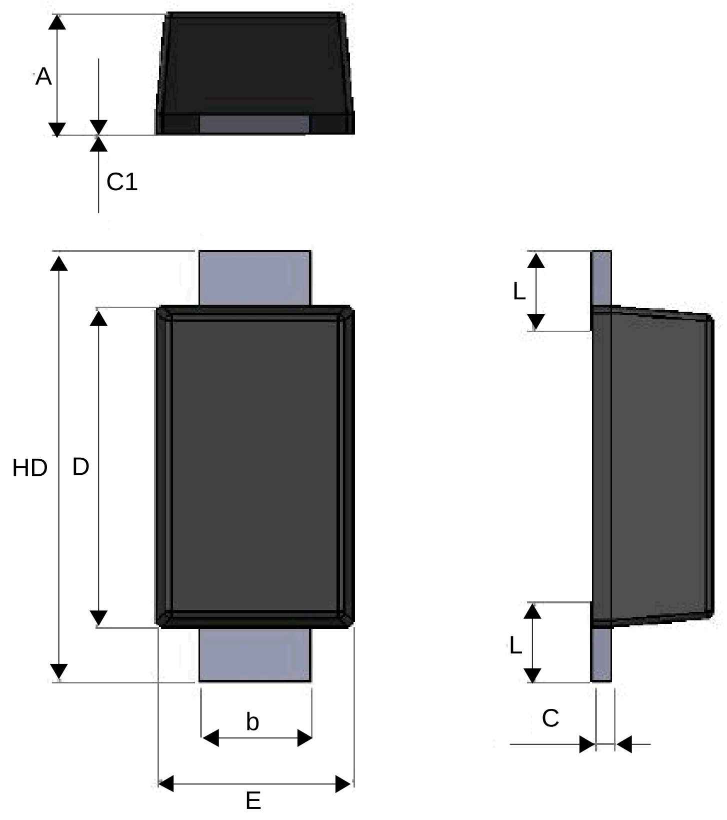
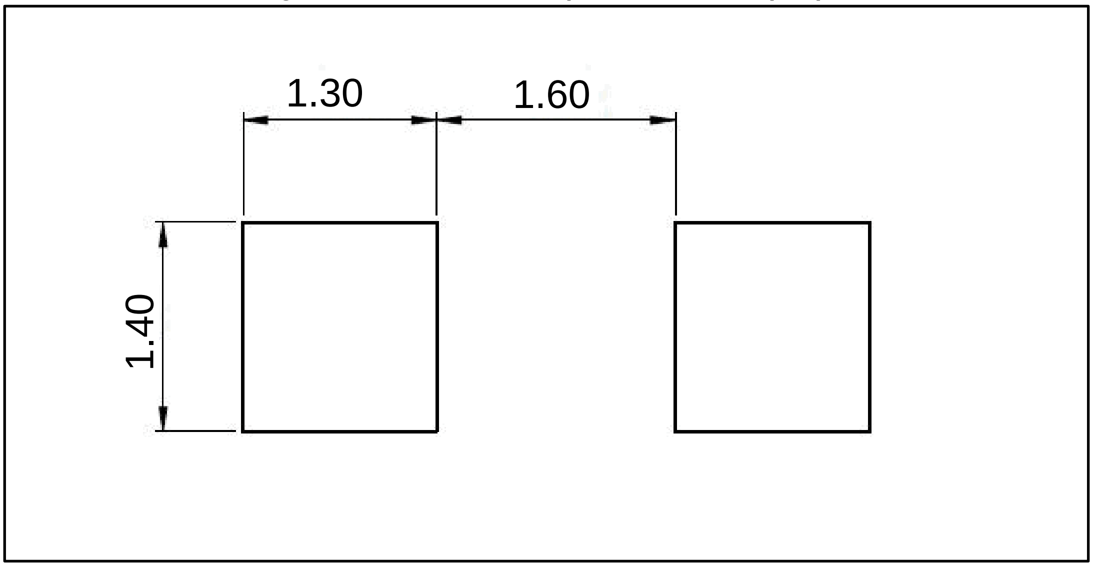


Table 5: SOD123Flat package mechanical data

Ref.	Dimensions		
	Millimeters		
	Min.	Typ.	Max.
A	0.86	0.98	1.10
b	0.80	0.90	1.00
c	0.08	0.15	0.25
c1	0.00		0.10
D	2.50	2.60	2.70
E	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)



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.

Mouser Electronics

Authorized Distributor

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STMicroelectronics:

STPS2H100ZFY