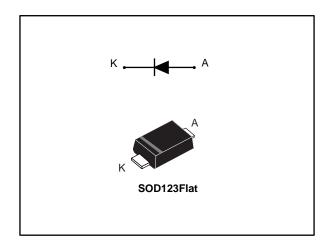


STPS2L60ZFY

Automotive low drop power Schottky rectifier

Datasheet - production data



Features

- AEC-Q101 qualified
- Very small conduction losses
- Negligible switching losses
- Low forward voltage drop
- Surface mount miniature packagesAvalanche capability specified
- PPAP capable

Description

Single chip Schottky rectifiers suited to switched mode power supplies and high frequency DC to DC converters.

Packaged in SOD123Flat, this device is especially intended for surface mounting and used in low voltage, high frequency inverters, free-wheeling and polarity protection in automotive applications.

Table 1: Device summary

Symbol	Value
I _{F(AV)}	2 A
V _{RRM}	60 V
V _F (typ.)	0.60 V
T _j (max.)	175 °C

Characteristics STPS2L60ZFY

1 Characteristics

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

Symbol	Parameter	Value	Unit	
V _{RRM}	Repetitive peak reverse voltage $T_j = -40 \text{ °C to } +175 \text{ °C}$		60	V
I _{F(AV)}	Average forward current δ = 0.5, square wave	T _L = 140 °C	2	Α
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$		50	Α
P _{ARM}	Repetitive peak avalanche power $t_p = 10 \mu s, T_j = 125 ^{\circ} C$		85	W
T _{stg}	Storage temperature range	-65 to +175	°C	
Tj	Operating junction temperature range ⁽¹⁾	-40 to +175	C	

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 cor	nditions	Min.	Тур.	Max.	Unit
1_ (1)	I _R ⁽¹⁾ Reverse leakage current	T _j = 25 °C	$V_R = V_{RRM}$	1		50	μΑ
IR ^(*)		T _j = 125 °C		-	5.6	21	mA
V _F (2)	Forward voltage drop	T _j = 25 °C	I _F = 2 A	-		0.75	V
VF(=)		T _j = 125 °C		-	0.60	0.66	

Notes:

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

(2) Pulse test: $t_p = 380 \ \mu s, \ \delta < 2\%$

To evaluate the conduction losses, use the following equation:

 $P = 0.51 \text{ x } I_{F(AV)} + 0.075 \text{ x } I_{F^{2}(RMS)}$

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)

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

STPS2L60ZFY Characteristics

1.1 Characteristics (curves)

0.6 0.8

0.8

0.2

0.0

0.0

temperature (δ = 0.5)

7

IF(AV)(A)

7

R_{m(i,0)}=R_{m(i,0)}

5

1

Tamb(°C)

0

25

50

75

100

125

150

175

Figure 2: Average forward current versus ambient

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

1.0 1.2 1.4 1.6

1.8

2.0 2.2

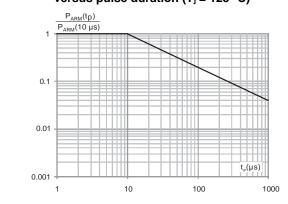


Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration $Z_{th(j-l)}/R_{th(j-l)}$ 1.0 ÌШП SOD123 flat 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.1 tp(s) 0.0 1.E-04 1.E-01 1.E+00

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

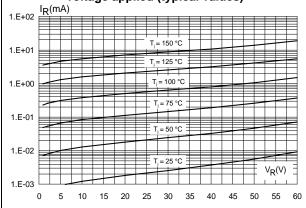


Figure 6: Junction capacitance versus reverse voltage applied (typical values)

C(pF)

F=1 MHz
V_{SSC} = 30 mV_{RMS}
T, = 25 °C

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

10.00

|F(A)

1.00

|T₁ = 125 °C

|T₁ = 75 °C

| T₁ = 75 °C

| V_F(V)

| V_F(V)

| V_F(V)

| V_F(V)

versus copper surface under each lead (typical values) R_{th(j-a)}(C/W) 250 SOD123Flat 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 4.0 4.5 5.0

Figure 8: Thermal resistance junction to ambient

STPS2L60ZFY 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

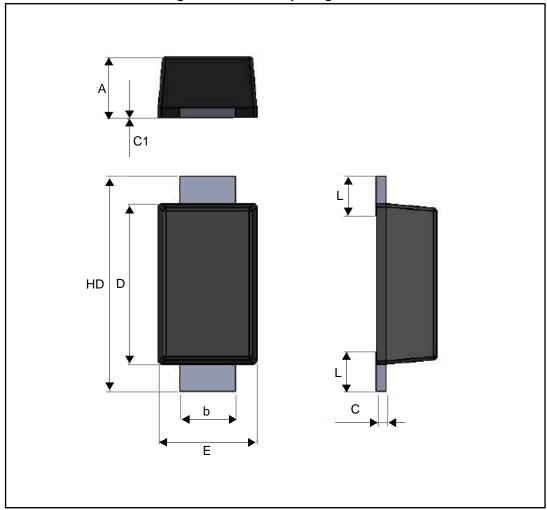
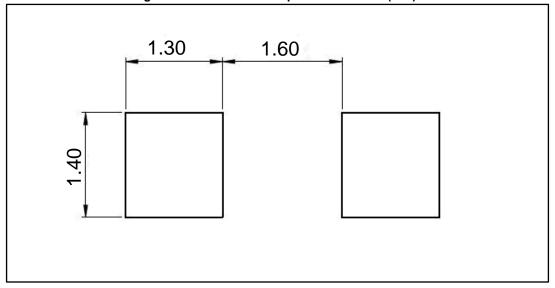


Table 5: SOD123Flat package mechanical data

Dimensions			
Ref.	Millimeters		
	Min.	Тур.	Max.
А	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)



STPS2L60ZFY Ordering information

3 Ordering information

Table 6: Ordering information

Order code	Order code Marking		Weight	Base qty.	Delivery mode
STPS2L60ZFY	2Y6	SOD123Flat	12.5 mg	3000	Tape and reel

4 Revision history

Table 7: Document revision history

Date	Revision	Changes
13-Oct-2016	1	Initial release.
17-Oct-2016	2	Updated Table 4: "Static electrical characteristics".

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