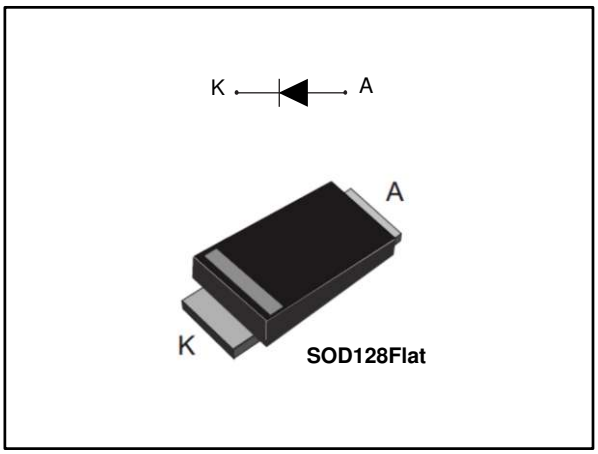
STPS5H100AFY

Automotive high voltage power Schottky rectifier

Datasheet - production data



Description

This high voltage Schottky barrier rectifier device is packaged in SOD128Flat and designed for high frequency miniature switched mode power supplies and for board DC to DC converters for automotive applications.

Table 1: Device summary

Symbol	Value
$I_{F(AV)}$	5 A
V_{RRM}	100 V
T_j(max.)	175 °C
V_F(typ.)	0.51 V

Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche specification
- ECOPACK® compliant component
- AEC-Q101
- PPAP capable
- V_{RRM} guaranteed from -40 to +175 °C

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	T_L = 115 °C, δ = 0.5, square pulse	5	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	125	A
		t_p = 8.3 ms sinusoidal	130	
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C	300	W
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Operating junction temperature range(1)		-40 to +175	°C

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	16	°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 = 100 V	-	0.7	3.5	µA
		T_j = 125 °C		-	1	4	mA
		T_j = 150 °C		-		16	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 2.5 A	-		0.67	V
		T_j = 125 °C		-	0.51	0.55	
		T_j = 25 °C	I_F = 5 A	-		0.76	
		T_j = 125 °C		-	0.57	0.61	

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:

$P = 0.49 \times I_{F(AV)} + 0.024 \times I_{F^2(RMS)}$

1.1 Characteristics (curves)

Figure 1: Average forward power dissipation versus average forward current

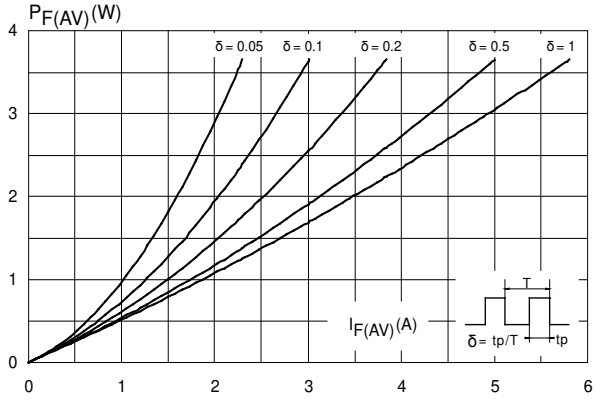


Figure 2: Average forward current versus ambient temperature (δ = 0.5)

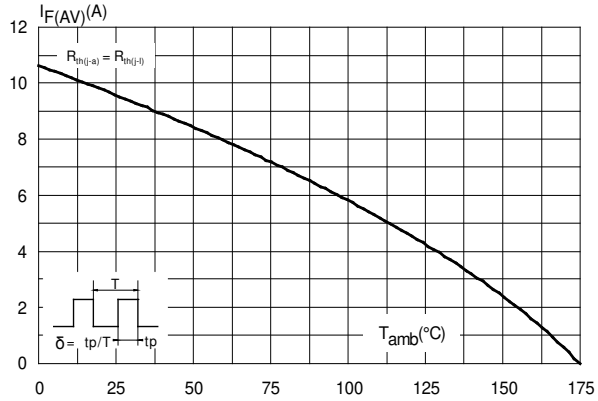


Figure 3: Normalized avalanche power derating versus pulse duration

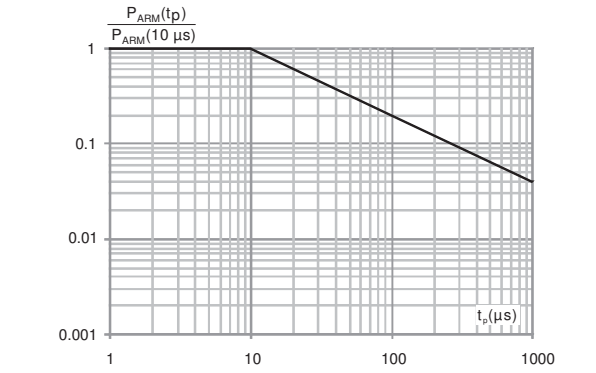


Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration

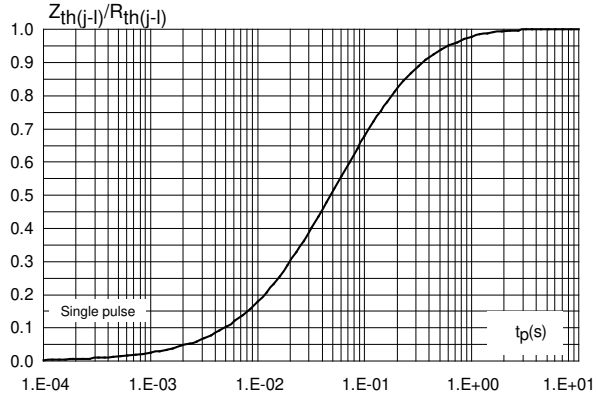


Figure 5: Reverse leakage current versus reverse voltage applied (typical values)

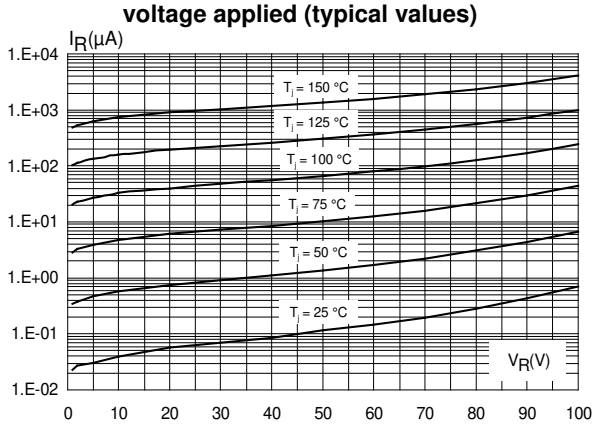


Figure 6: Junction capacitance versus reverse voltage applied (typical values)

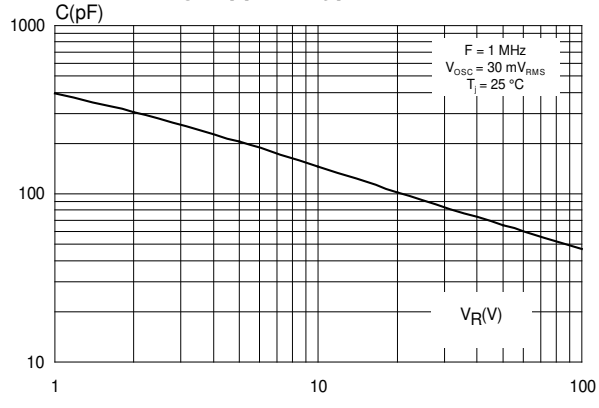


Figure 7: Forward voltage drop versus forward current (typical values)

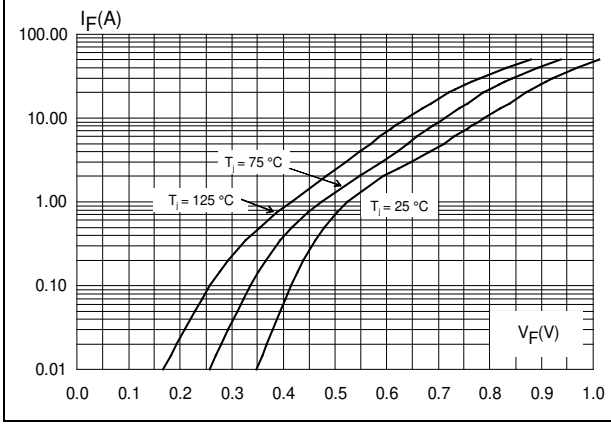
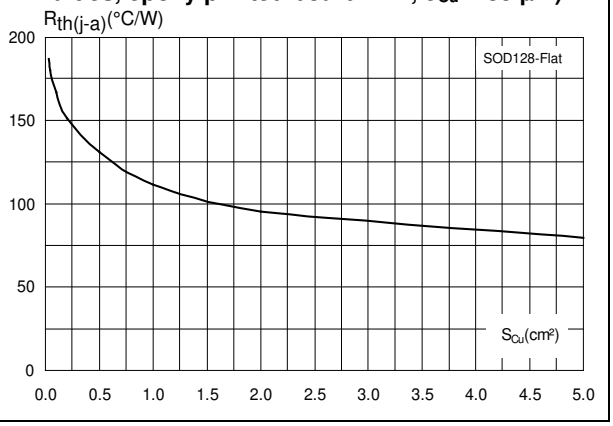


Figure 8: Thermal resistance junction to ambient versus copper surface under each lead (typical values, epoxy printed board FR4, e_{Cu} = 35 µm)



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
- Lead-free package

2.1 SOD128Flat package information

Figure 9: SOD128Flat package outline

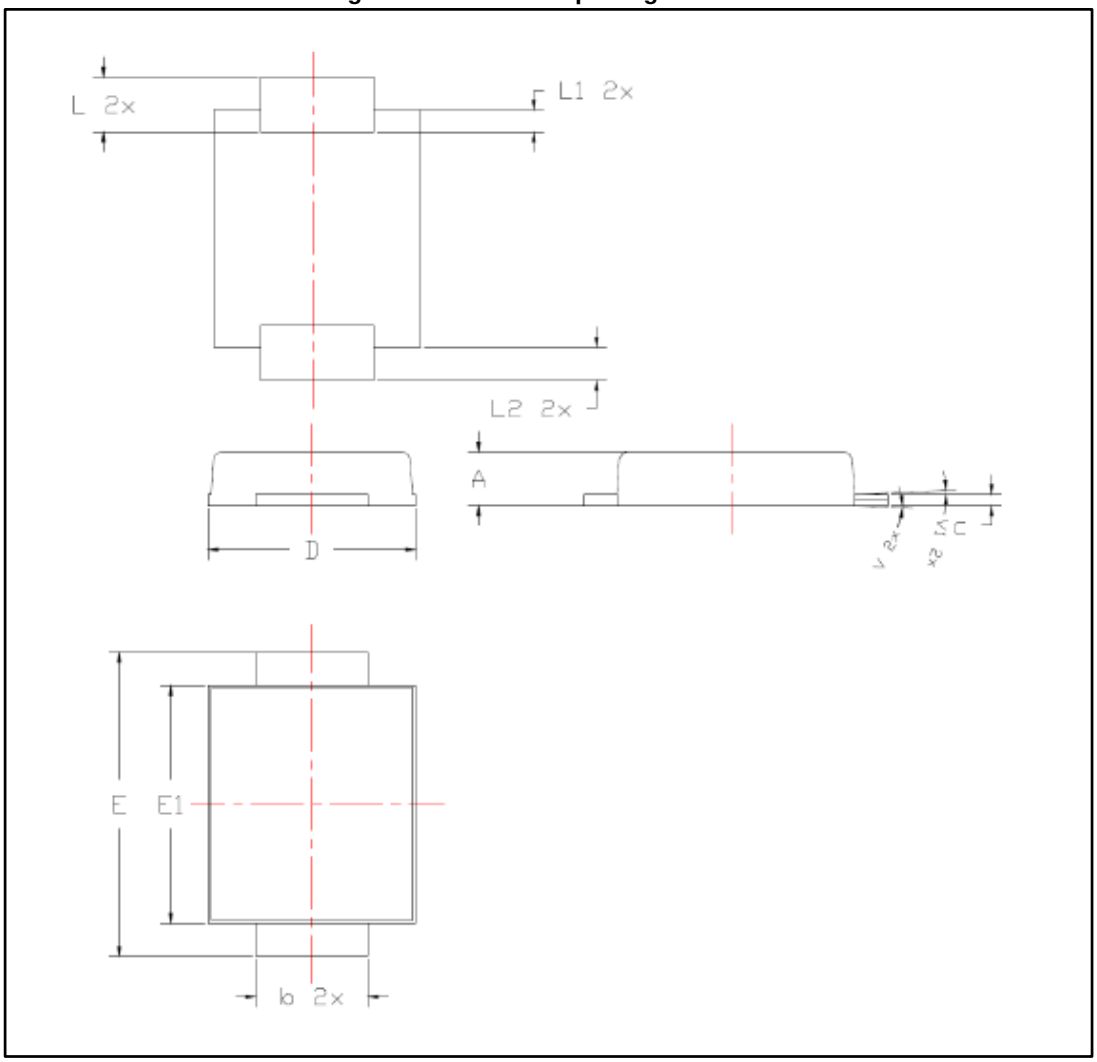
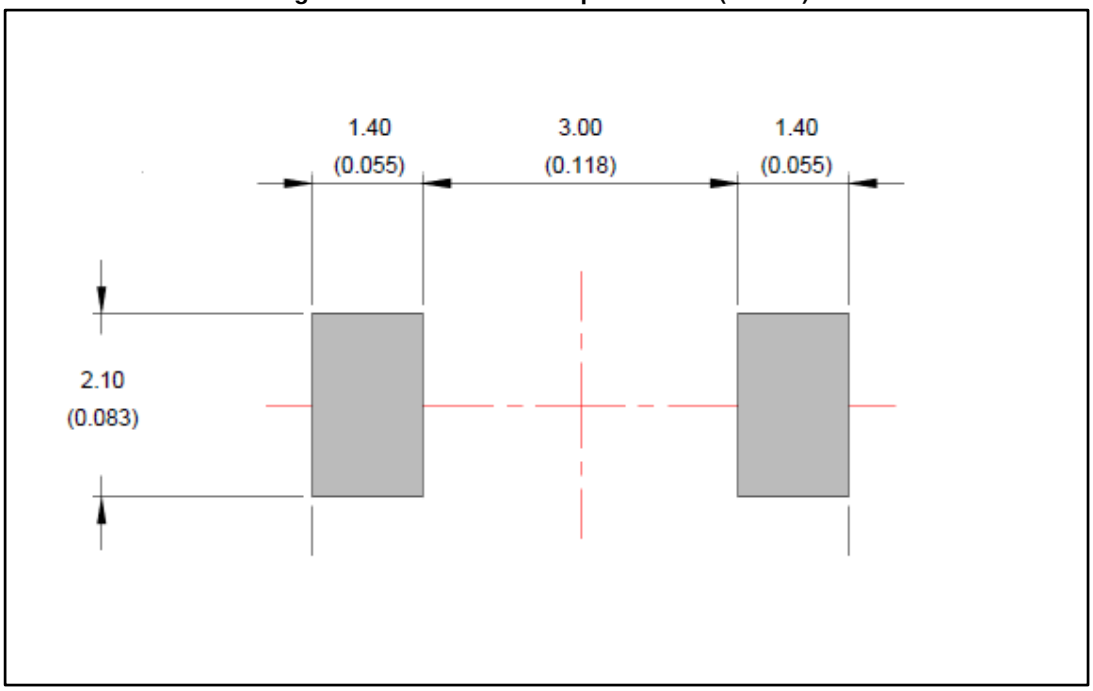


Table 5: SOD128Flat package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.93	1.03	0.037	0.041
b	1.69	1.81	0.067	0.071
c	0.10	0.22	0.004	0.009
D	2.30	2.50	0.091	0.098
E	4.60	4.80	0.181	0.189
E1	3.70	3.90	0.146	0.154
L	0.55	0.85	0.026	0.033
L1	0.30 typ.		0.012 typ.	
L2	0.45 typ.		0.018 typ.	

Figure 10: SOD128Flat footprint in mm (inches)



3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS5H100AFY	5H100Y	SOD128Flat	26.4 mg	3000	Tape and reel

4 Revision history

Table 7: Document revision history

Date	Revision	Changes
14-Jun-2016	1	Initial release.
24-Jun-2016	2	Updated *Table 2: "Absolute ratings (limiting values at 25 °C, unless otherwise specified)"*.

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