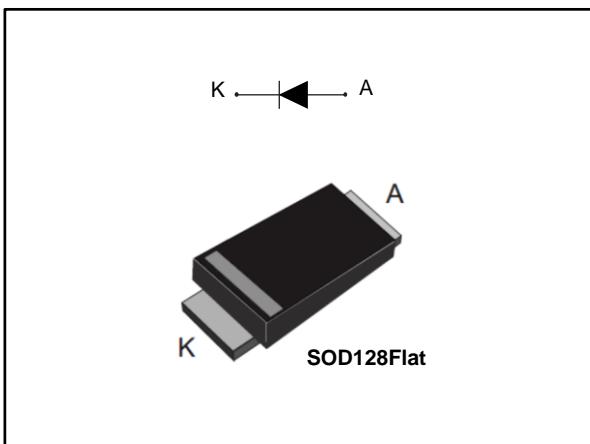


## High voltage power Schottky rectifier

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.

**Table 1: Device summary**

Symbol	Value
$I_{F(AV)}$	3 A
$V_{RRM}$	100 V
$T_j(\text{max.})$	175 °C
$V_F(\text{typ.})$	0.57 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

# 1 Characteristics

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

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		100	V
$I_{F(AV)}$	Average forward current		3	A
$I_{FSM}$	Surge non repetitive forward current		75	A
			79	
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 10 \mu s, T_j = 125 \text{ } ^\circ\text{C}$	172	W
$T_{stg}$	Storage temperature range		-65 to +175	°C
$T_j$	Operating junction temperature range <sup>(1)</sup>		-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	$T_j = 25 \text{ } ^\circ\text{C}$	$V_R = 100 \text{ V}$	-		1.5	µA
		$T_j = 125 \text{ } ^\circ\text{C}$		-	0.6	1.7	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25 \text{ } ^\circ\text{C}$	$I_F = 3 \text{ A}$	-		0.76	V
		$T_j = 125 \text{ } ^\circ\text{C}$		-	0.57	0.61	
		$T_j = 25 \text{ } ^\circ\text{C}$	$I_F = 6 \text{ A}$	-		0.84	
		$T_j = 125 \text{ } ^\circ\text{C}$		-	0.64	0.68	

**Notes:**

(1) Pulse test:  $t_p = 5 \text{ ms}, \delta < 2\%$

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

To evaluate the conduction losses use the following equation:

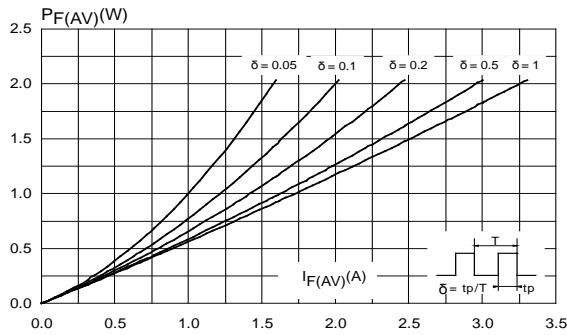
$$P = 0.54 \times I_{F(AV)} + 0.023 \times I_F^2 \text{ (RMS)}$$

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

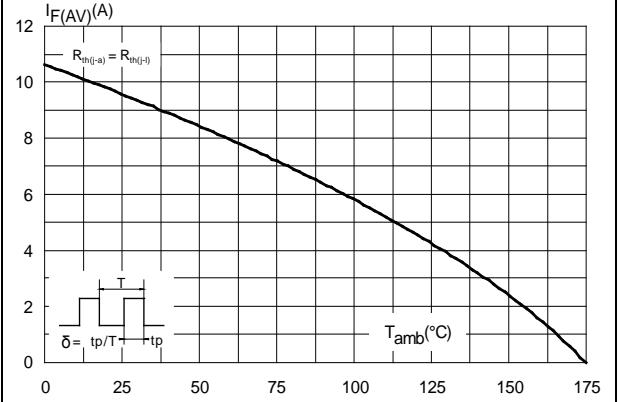
- AN604 (Calculation of conduction losses in a power rectifier)
- AN4021 (Calculation of reverse losses in a power diode)

## 1.1 Characteristics (curves)

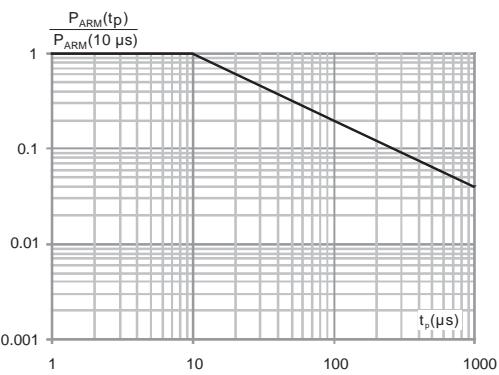
**Figure 1: Average forward power dissipation versus average forward current**



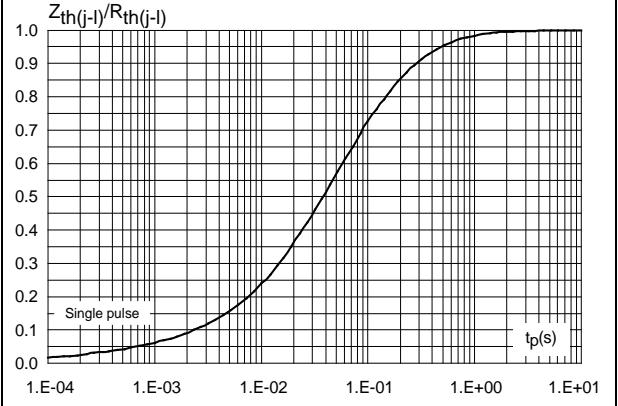
**Figure 2: Average forward current versus ambient temperature ( $\delta = 0.5$ )**



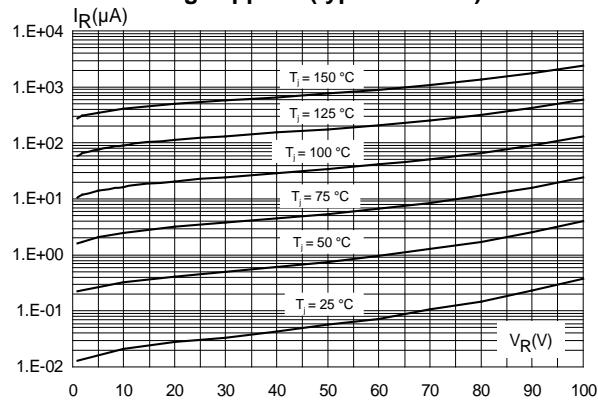
**Figure 3: Normalized avalanche power derating versus pulse duration ( $T_j = 125^\circ\text{C}$ )**



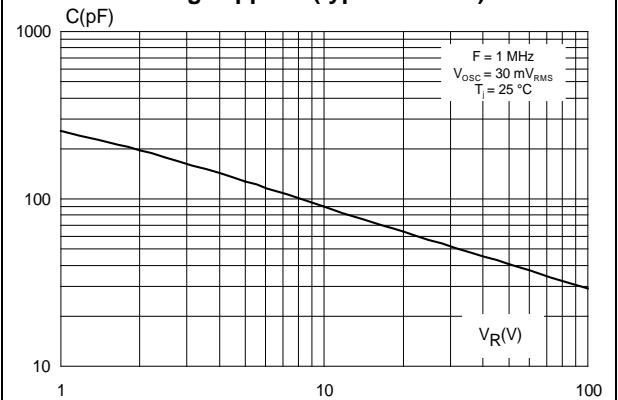
**Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration**



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



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



## Characteristics

STPS3H100AF

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

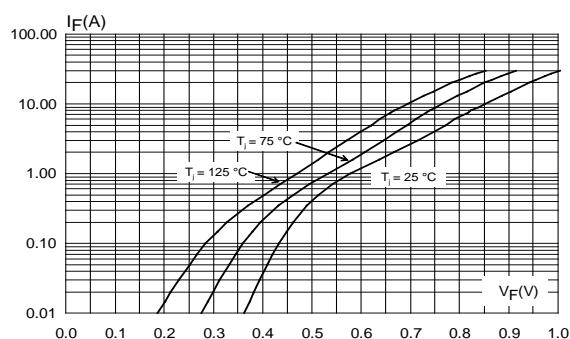
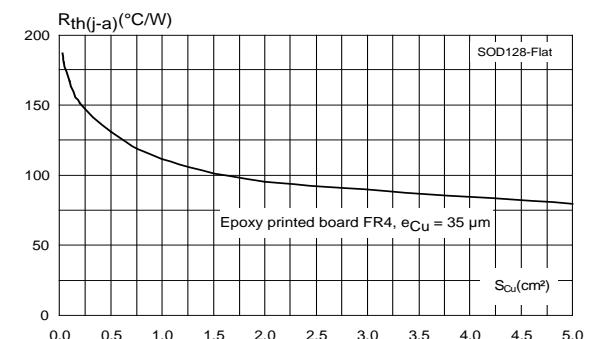


Figure 8: Thermal resistance junction to ambient versus copper surface under each lead (typical values)



## 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](http://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

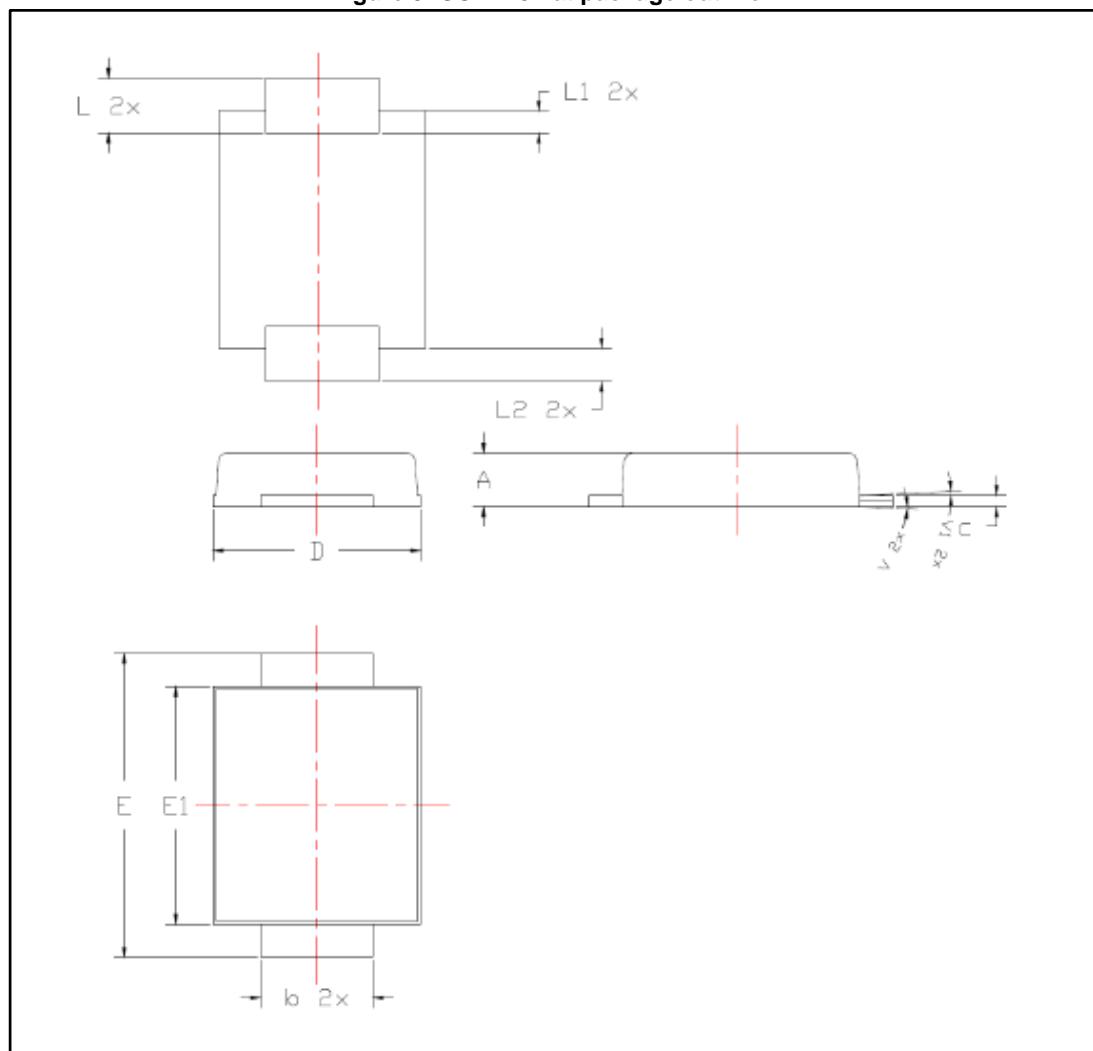
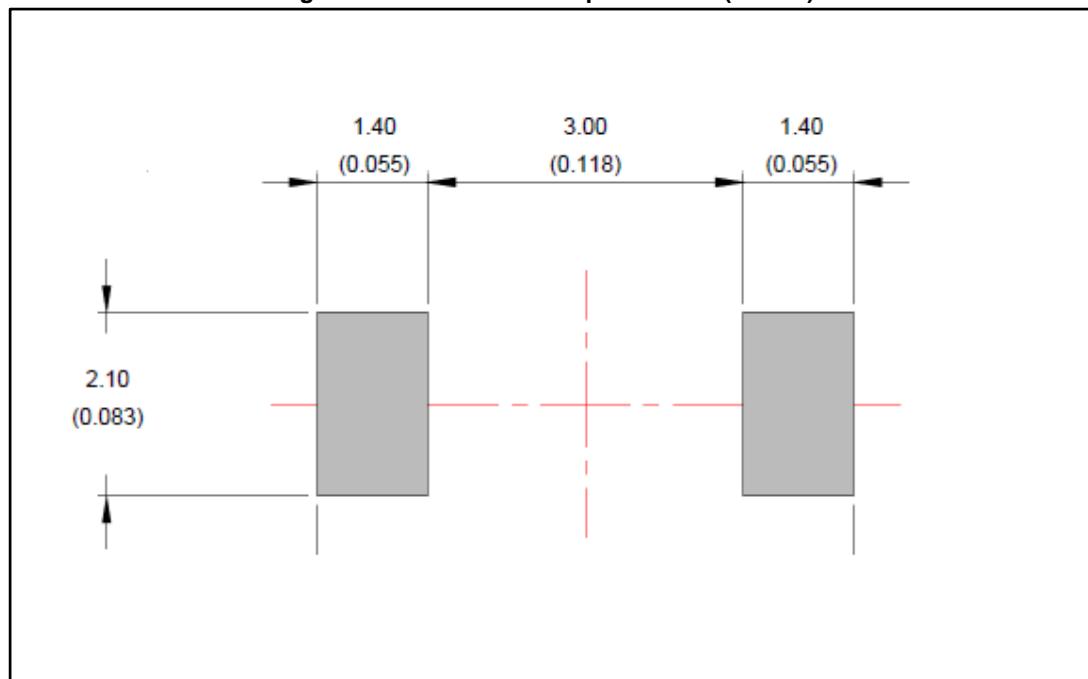


Table 5: SOD128Flat package mechanical data

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
STPS3H100AF	3H100	SOD128Flat	26.4 mg	3000	Tape and reel

### 4 Revision history

Table 7: Document revision history

Date	Revision	Changes
01-Jul-2016	1	Initial release.

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