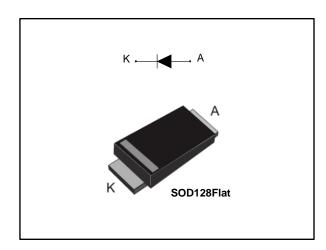


## Power Schottky rectifier

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 on board DC to DC converters.

**Table 1: Device summary** 

Symbol	Value
I <sub>F(AV)</sub>	3 A
$V_{RRM}$	60 V
T <sub>j</sub> (max.)	175 °C
V <sub>F</sub> (typ.)	0.49 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

Characteristics STPS360

## 1 Characteristics

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

Symbol	Pa	Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		60	V
I <sub>F(AV)</sub>	Average forward current	$T_L$ = 140 °C, $\delta$ = 0.5, square pulse	3	Α
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	65	Α
P <sub>ARM</sub>	Repetitive peak avalanche power $t_p = 10 \ \mu s, T_j = 125 \ ^{\circ}C$		140	W
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C
Tj	Operating junction temperature range <sup>(1)</sup>		-40 to +175	°C

#### Notes:

**Table 3: Thermal parameters** 

Symbol	Parameter	Max. value	Unit
R <sub>th(j-l)</sub>	Junction to lead	16	°C/W

**Table 4: Static electrical characteristics** 

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Deverage leaders as surrout	T <sub>j</sub> = 25 °C	V <sub>R</sub> = 60 V	-		150	μΑ
IR <sup>(*)</sup>	Reverse leakage current	T <sub>j</sub> = 125 °C		-	20	30	mA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 3 A	-		0.61	V
		T <sub>j</sub> = 125 °C		-	0.49	0.58	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 6 A	-		0.80	
		T <sub>j</sub> = 125 °C		-	0.62	0.72	

### Notes:

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

(2) Pulse test:  $t_p$  = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

 $P = 0.44 \text{ x } I_{F(AV)} + 0.047 \text{ x } I_{F^2(RMS)}$ 

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)

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

**STPS360** Characteristics

#### **Characteristics (curves)** 1.1

0.0

0.001

Figure 1: Average forward power dissipation versus average forward current PF(AV)(W)  $\delta = 0.05$ 2.0 1.0 0.5 I<sub>F(AV)</sub>(A) 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0

Figure 2: Average forward current versus ambient temperature ( $\delta = 0.5$ ) I<sub>F(AV)</sub>(A) 6 Tamb(°C) 0 0 25 75 125 175

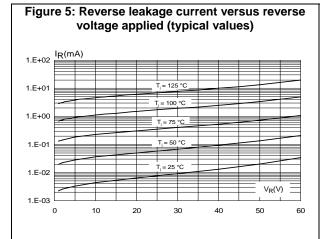
Figure 3: Normalized avalanche power derating versus pulse duration  $(T_j = 125 °C)$  $\frac{P_{ARM}(t_p)}{P_{ARM}(10 \ \mu s)}$ 0.1 0.01

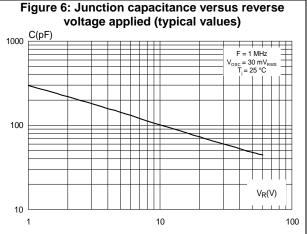
100

1000

10

Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration  $Z_{th(j-l)}/R_{th(j-l)}$ 1.0 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 Single pulse 0.1 t<sub>P</sub>(s) 0.0 1.E-04 1.E-03 1.E-02 1.E-01 1.E+00 1.E+01





Characteristics STPS360

Figure 7: Forward voltage drop versus forward current (typical values) 10.00 1.00 T<sub>j</sub> = 125 °C 0.10 0.01 0.0 0.1 0.2 0.3 0.5 0.6 0.4 0.7 8.0 0.9

versus copper surface under each lead (typical values) R<sub>th(j-a)</sub>(°C/W) SOD128-Flat 150 100 Epoxy printed board FR4, e<sub>Cu</sub> = 35 μm 0.5 1.0 1.5 3.0 3.5 5.0 0.0 2.0 2.5 4.0 4.5

Figure 8: Thermal resistance junction to ambient

STPS360 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
- Lead-free package

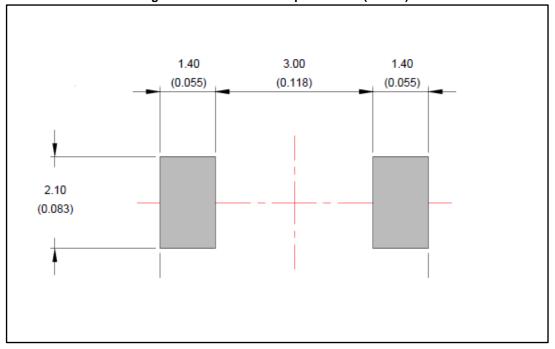
## 2.1 SOD128Flat package information

Figure 9: SOD128Flat package outline

Table 5: SOD128Flat package mechanical data

	Dimensions				
Ref.	Millimeters		Inc	hes	
	Min.	Max.	Min.	Max.	
А	0.93	1.03	0.037	0.041	
b	1.69	1.81	0.067	0.071	
С	0.10	0.22	0.004	0.009	
D	2.30	2.50	0.091	0.098	
Е	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	2 typ.	
L2	0.45 typ.		0.018	3 typ.	

Figure 10: SOD128Flat footprint in mm (inches)



STPS360 Ordering information

# 3 Ordering information

**Table 6: Ordering information** 

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS360AF	360F	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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