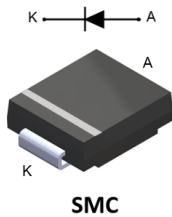




# THE DATASHEET OF STPS3L60S



## 60 V power Schottky rectifier



### Features

- Negligible switching losses
- Low thermal resistance
- Avalanche capability
- Low forward voltage drop
- ECOPACK<sup>®</sup>2 compliant

### Applications

- Set-top box
- Battery charger
- DC/DC converter
- Telecom power
- Switching diode

### Description

Schottky rectifier suited for SMPS and high frequency DC to DC converters.

Packaged in SMC, the [STPS3L60S](#) is intended for use in DC/DC battery chargers, lighting applications, telecom converters.

#### Product status link

[STPS3L60S](#)

#### Product summary

$I_{F(AV)}$	3 A
$V_{RRM}$	60 V
$T_j$ (max.)	150 °C
$V_F$ (typ.)	0.56 V

# 1 Characteristics

**Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	60	V
$I_{F(RMS)}$	Forward rms current	10	A
$I_{F(AV)}$	Average forward current , $\delta = 0.5$ square wave	$T_I = 100\text{ °C}$	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 10\text{ }\mu\text{s}$ , $T_j = 125\text{ °C}$	W
$T_{stg}$	Storage temperature range	-65 to +175	°C
$T_j$	Maximum operating junction temperature <sup>(1)</sup>	150	°C

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

**Table 2. Thermal resistance parameter**

Symbol	Parameter	Max. value	Unit
$R_{th(j-l)}$	Junction to lead	20	°C/W

For more information, please refer to the following application note :

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

**Table 3. Static electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit	
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		55	$\mu\text{A}$
		$T_j = 125\text{ °C}$		-	10	15	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 3\text{ A}$	-		0.7	V
		$T_j = 125\text{ °C}$		-	0.56	0.65	
		$T_j = 25\text{ °C}$	$I_F = 6\text{ A}$	-		0.94	
		$T_j = 125\text{ °C}$		-	0.67	0.76	

1. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

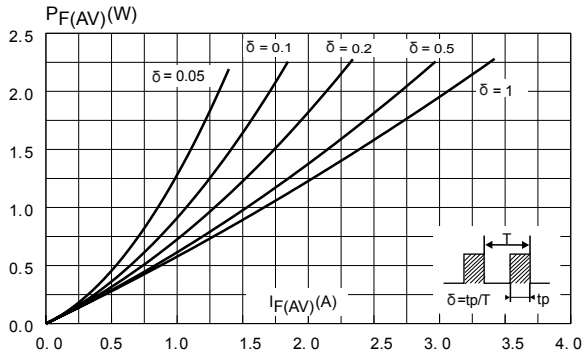
$$P = 0.54 \times I_{F(AV)} + 0.037 \times I_{F(RMS)}^2$$

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

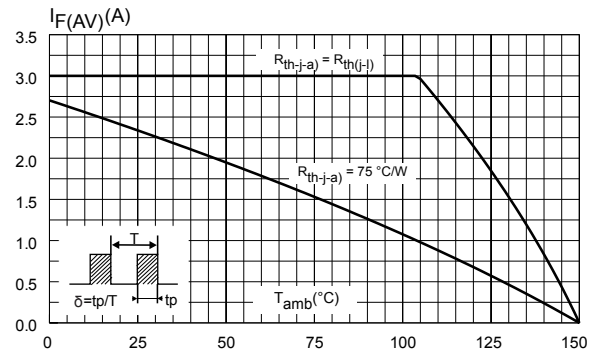
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

### 1.1 Characteristics (curves)

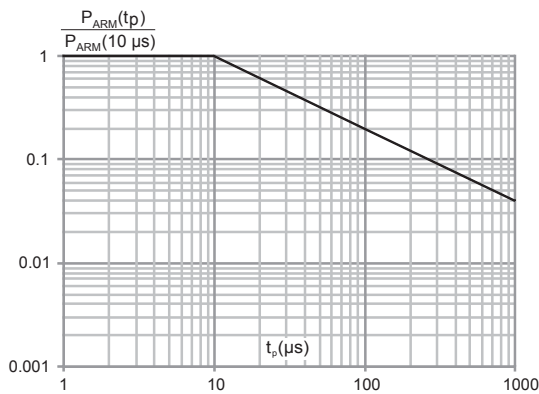
**Figure 1. Average forward power dissipation versus average forward current**



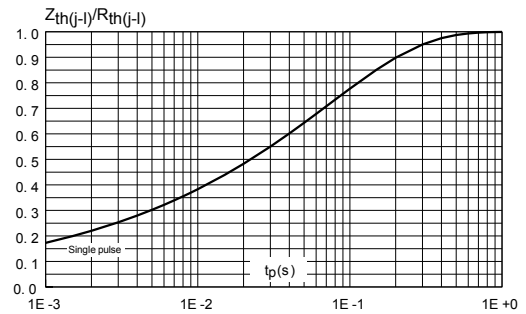
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



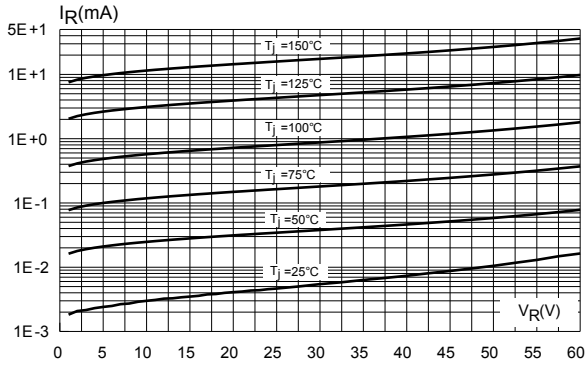
**Figure 3. Normalized avalanche power derating versus pulse duration ( $T_j = 125\text{ °C}$ )**



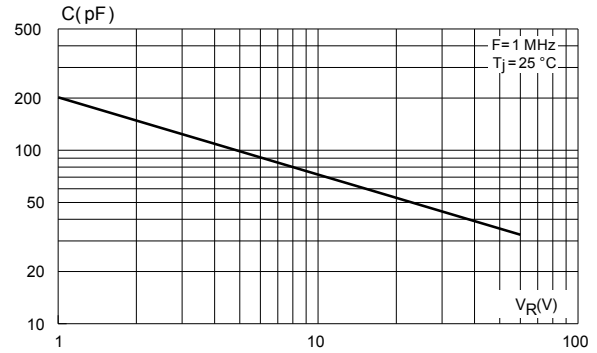
**Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration**



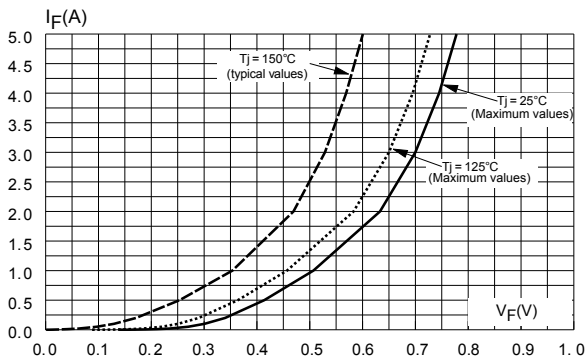
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values)**



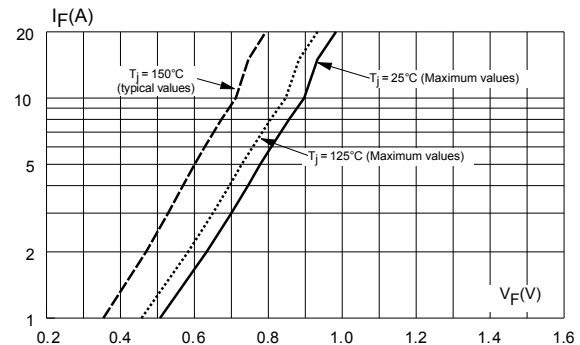
**Figure 6. Junction capacitance versus reverse voltage applied (typical values)**



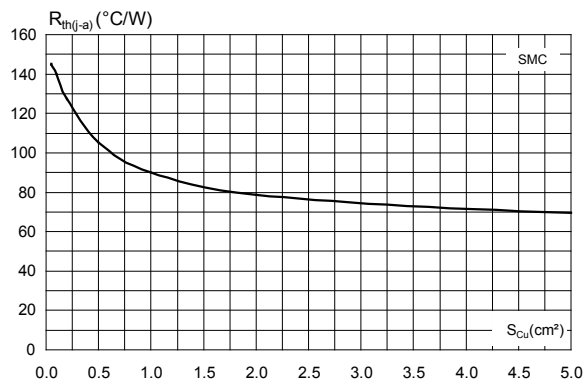
**Figure 7. Forward voltage drop versus forward current (low level)**



**Figure 8. Forward voltage drop versus forward current (high level)**



**Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4,  $e_{Cu}$ : 35  $\mu\text{m}$ )**



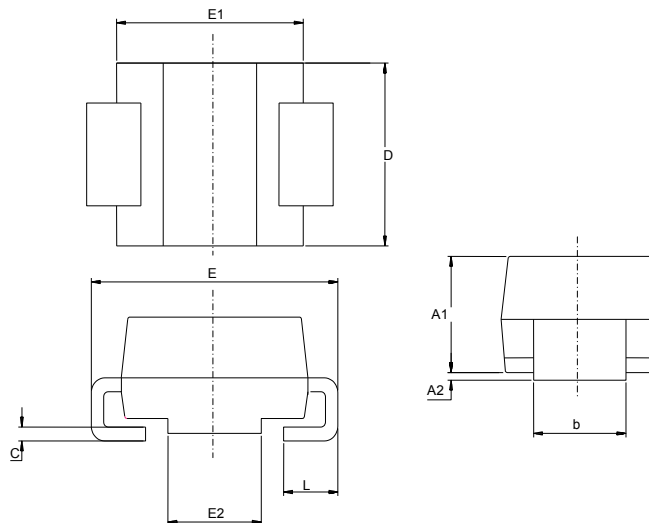
## 2 Package information

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.

### 2.1 SMC package information

- Epoxy meets UL94, V0

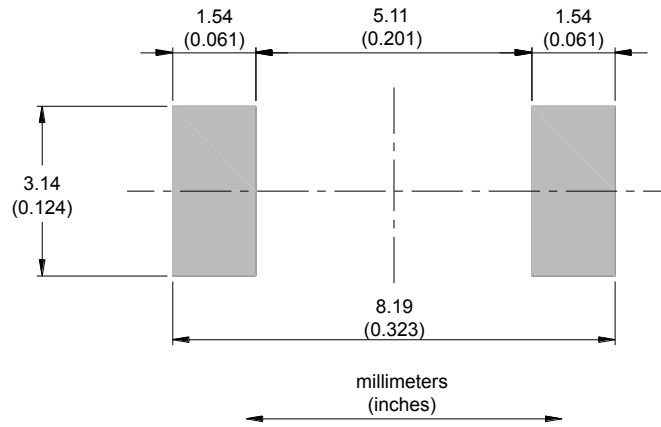
**Figure 10. SMC package outline**



**Table 4. SMC package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches (for reference only)	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.0748	0.0965
A2	0.05	0.20	0.0020	0.0079
b	2.90	3.20	0.1142	0.1260
c	0.15	0.40	0.0059	0.0157
D	5.55	6.25	0.2185	0.2461
E	7.75	8.15	0.3051	0.3209
E1	6.60	7.15	0.2598	0.2815
E2	4.40	4.70	0.1732	0.1850
L	0.75	1.50	0.0295	0.0591

**Figure 11. SMC recommended footprint**



### 3 Ordering information

**Table 5. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS3L60S	S36	SMC	0.245 g	2500	Tape and reel

## Revision history

**Table 6. Document revision history**

Date	Version	Changes
July-2003	2	Previous release.
13-Nov-2018	3	Updated cover page. Removed figure 3, figure 4 and figure 5. Updated <a href="#">Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)</a> , <a href="#">Section 1.1 Characteristics (curves)</a> and <a href="#">Table 5. Ordering information</a> . Minor text changes to improve readability.

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