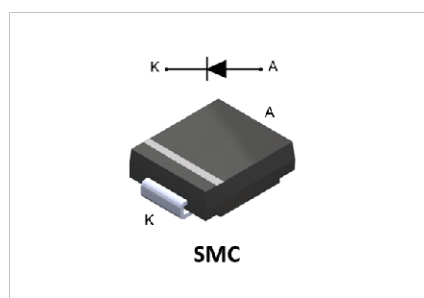


## 60 V power Schottky rectifier



### 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:

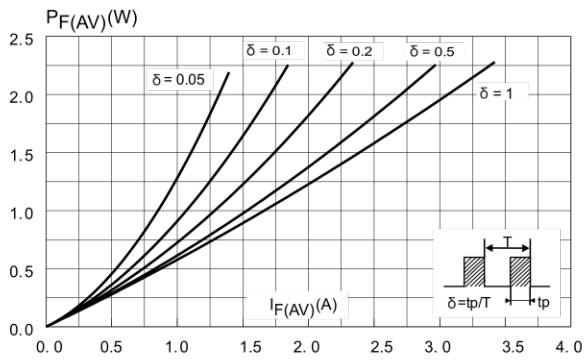
$$P = 0.54 \times I_{F(AV)} + 0.037 \times I_{F(RMS)}^2$$

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

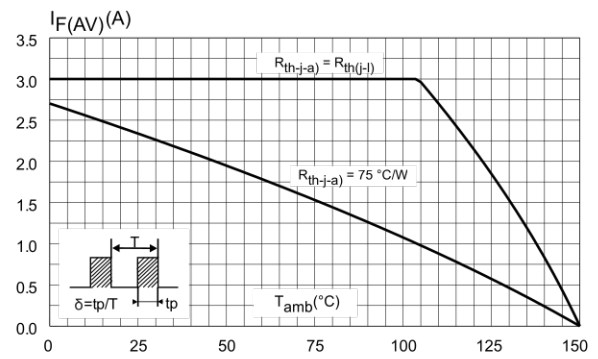
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

### 1.1 Characteristics (curves)

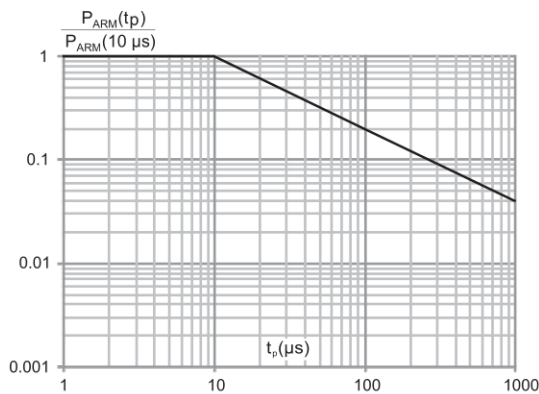
**Figure 1. Average forward power dissipation versus average forward current**



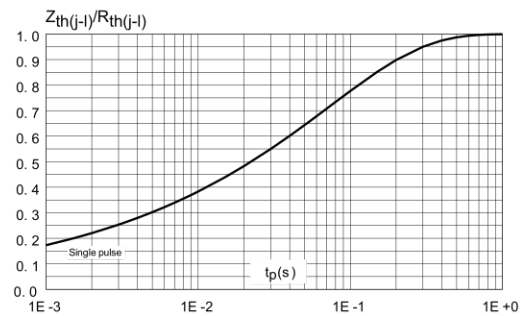
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



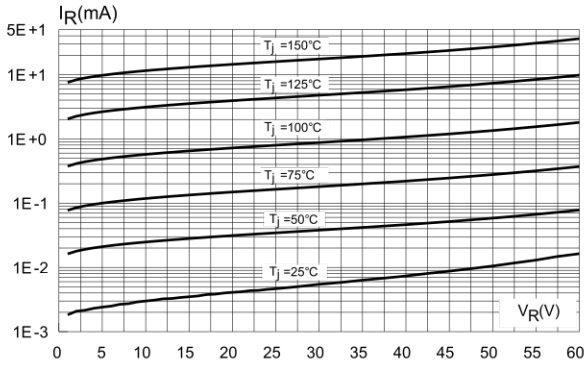
**Figure 3. Normalized avalanche power derating versus pulse duration ( $T_j = 125\text{ }^\circ\text{C}$ )**



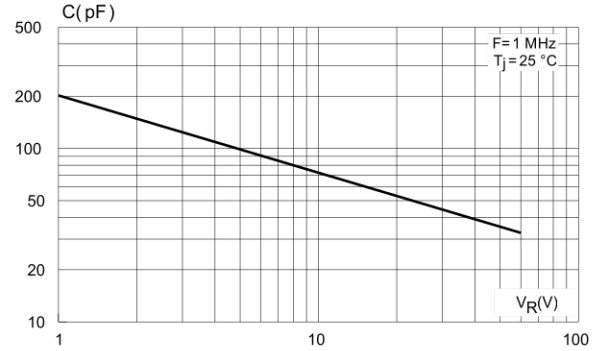
**Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration**



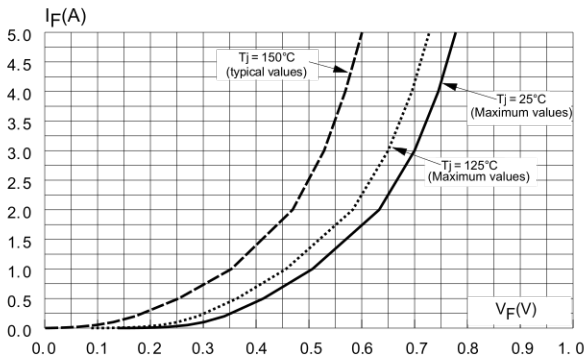
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values)**



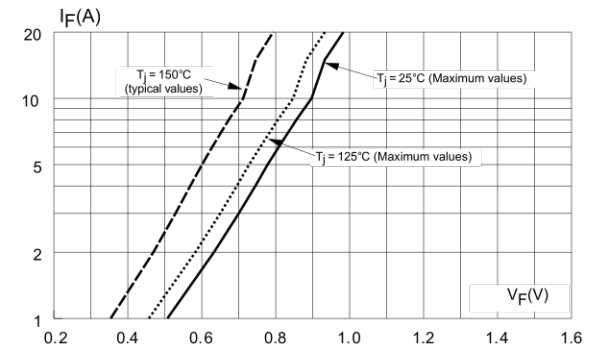
**Figure 6. Junction capacitance versus reverse voltage applied (typical values)**



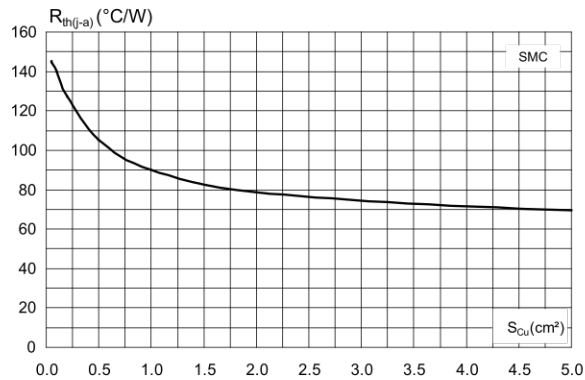
**Figure 7. Forward voltage drop versus forward current (low level)**



**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  $\mu\text{m}$ )**



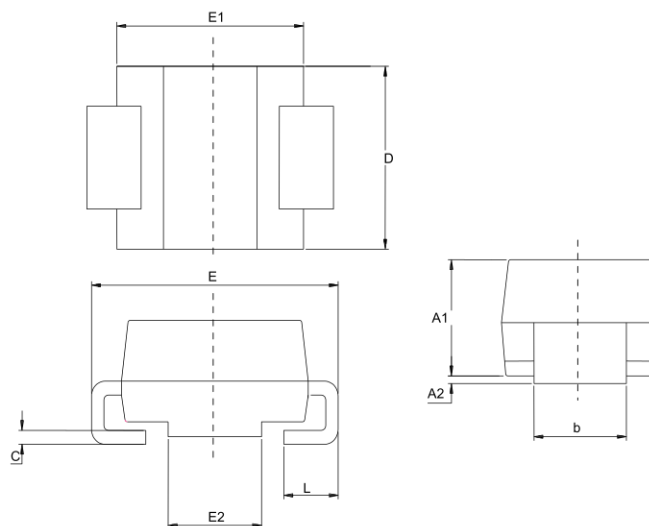
## 2 Package information

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

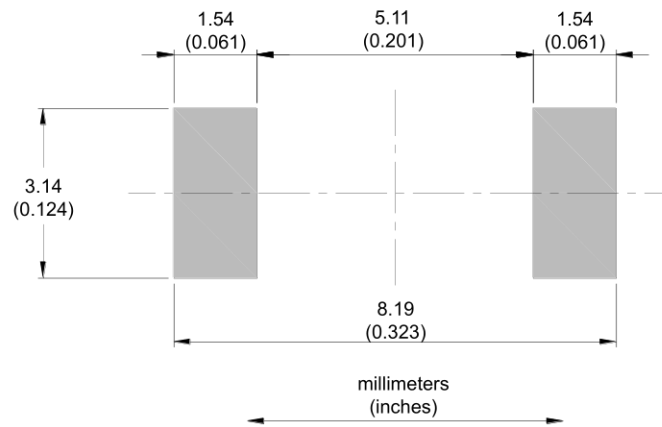
**Figure 10. SMC package outline**



**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.



**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2018 STMicroelectronics – All rights reserved