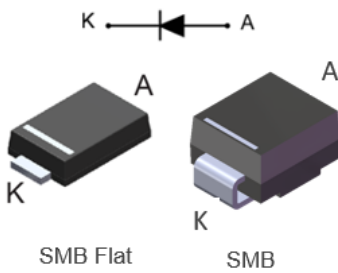


## 3 A - 100 V power Schottky rectifier



### Features

- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified
- **ECOPACK2** compliant

### Applications

- Switching diode
- SMPS
- DC/DC converter
- LED lighting

### Description

This 100 V power Schottky rectifier is ideal for switch mode power supplies, for 12 V rails and high frequency converters.

Packaged in SMB and SMB Flat, the **STPS3H100** is optimized for use in consumer and computer applications where low drop forward voltage is required to reduce power dissipation.

#### Product status link

[STPS3H100](#)

#### Product summary

$I_{F(AV)}$	3 A
$V_{RRM}$	100 V
$T_j$ (max.)	175 °C
$V_F$ (typ.)	0.63 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		100	V	
$I_{F(AV)}$	Average forward current, $\delta = 0.5$ square wave	SMB $T_I = 115\text{ °C}$	3	A	
		SMB Flat $T_I = 140\text{ °C}$			
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10\text{ ms}$ sinusoidal	75	A
$P_{ARM}$	Repetitive peak avalanche power		$t_p = 10\text{ }\mu\text{s}$ , $T_j = 125\text{ °C}$	172	W
$T_{stg}$	Storage temperature range		-65 to +175	°C	
$T_j$	Maximum operating junction temperature <sup>(1)</sup>		175	°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	SMB	25	°C/W
		SMB Flat	15	

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	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		1.00	$\mu\text{A}$
		$T_j = 125\text{ °C}$		-	0.40	1.00	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 3\text{ A}$	-		0.84	V
		$T_j = 125\text{ °C}$		-	0.63	0.68	
		$T_j = 25\text{ °C}$	$I_F = 6\text{ A}$	-		0.92	
		$T_j = 125\text{ °C}$		-	0.71	0.76	

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

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

To evaluate the conduction losses, use the following equation:

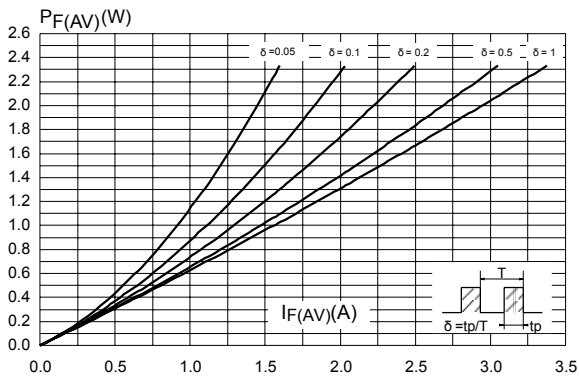
$$P = 0.6 \times I_{F(AV)} + 0.027 \times I_{F(RMS)}^2$$

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

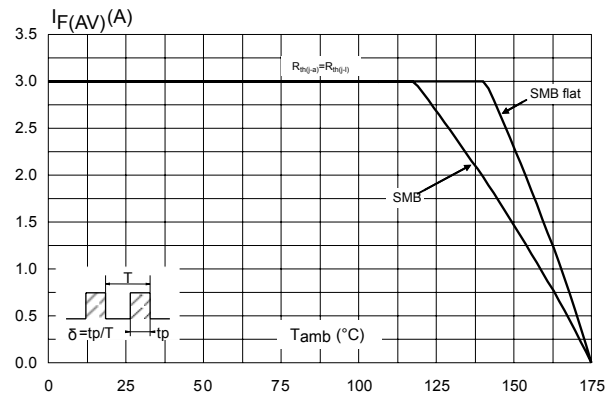
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

## 1.1 Characteristics (curves)

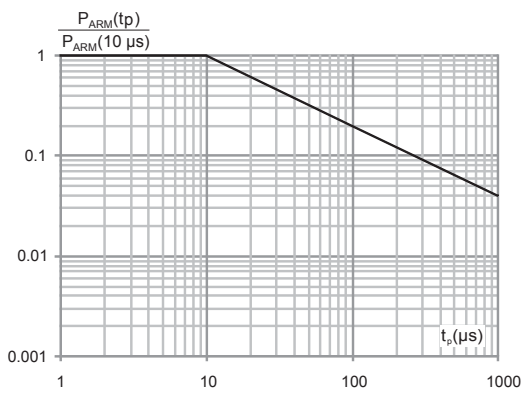
**Figure 1. Average forward power dissipation versus average forward current**



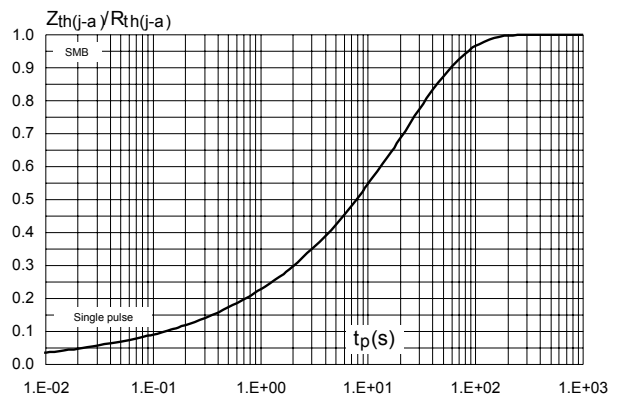
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



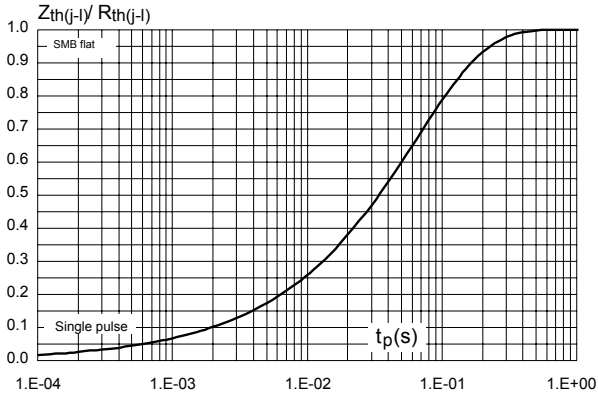
**Figure 3. Normalized avalanche power derating versus pulse duration ( $T_j = 125$  °C)**



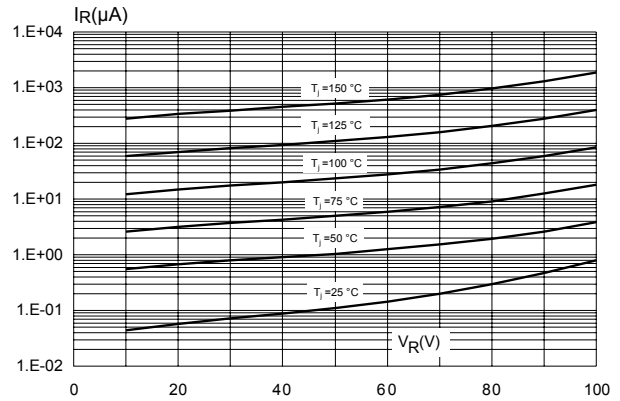
**Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)**



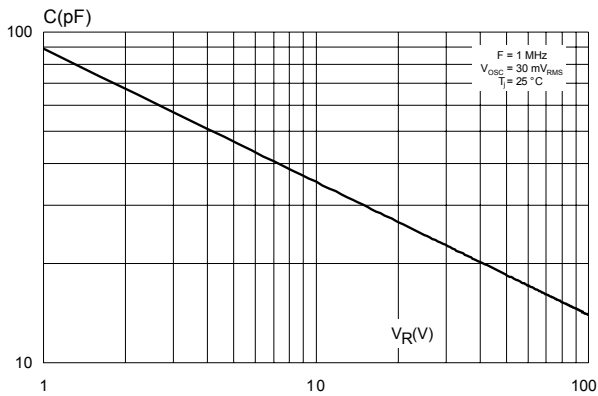
**Figure 5. Relative variation of thermal impedance junction to lead versus pulse duration (SMB Flat)**



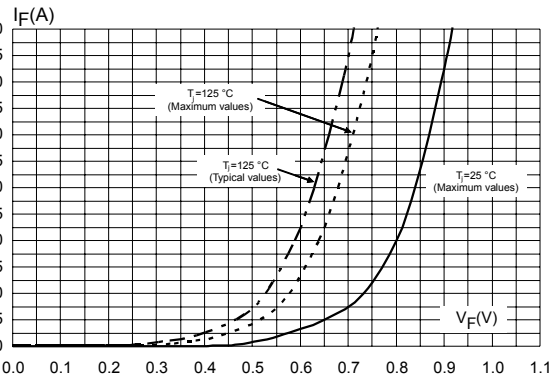
**Figure 6. Reverse leakage current versus reverse voltage applied (typical values)**



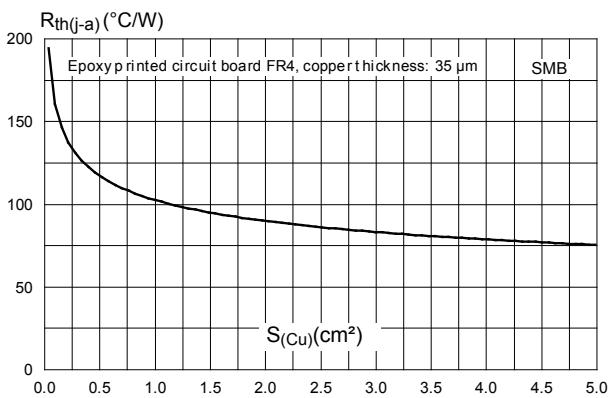
**Figure 7. Junction capacitance versus reverse voltage applied (typical values)**



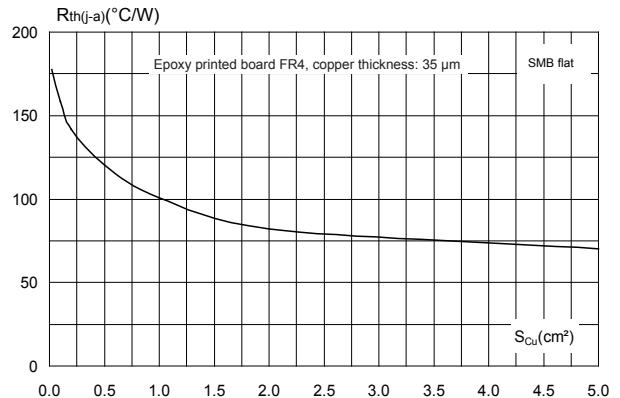
**Figure 8. Forward voltage drop versus forward current**



**Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (SMB)**



**Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMB flat)**



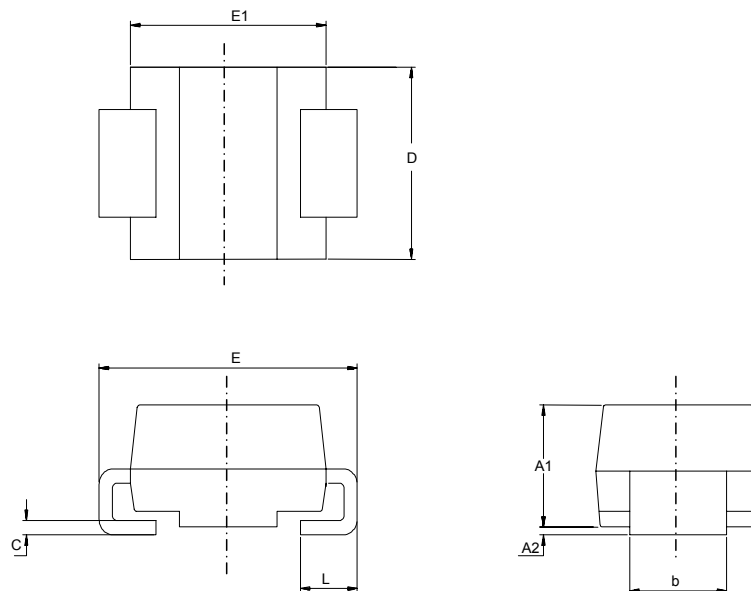
## 2 Package information

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 SMB package information

- Epoxy meets UL94, V0
- Lead-free package

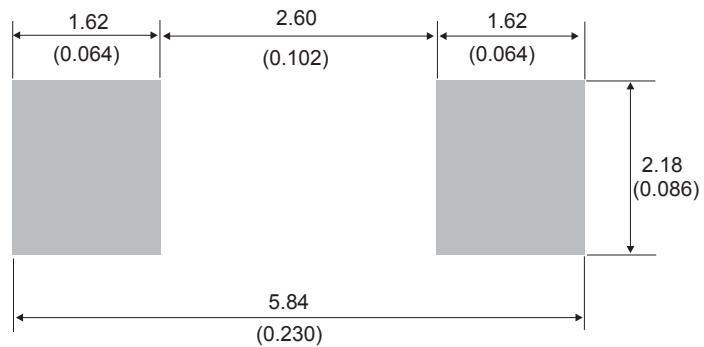
**Figure 11. SMB package outline**



**Table 4. SMB 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	1.95	2.20	0.0768	0.0867
c	0.15	0.40	0.0059	0.0157
D	3.30	3.95	0.1299	0.1556
E	5.10	5.60	0.2008	0.2205
E1	4.05	4.60	0.1594	0.1811
L	0.75	1.50	0.0295	0.0591

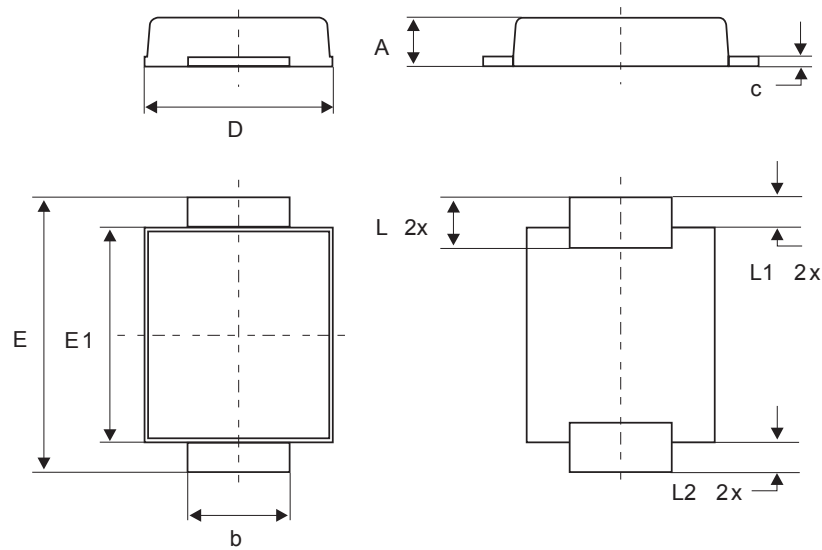
**Figure 12. SMB recommended footprint**



## 2.2 SMB Flat package information

- Epoxy meets UL94, V0
- Lead-free package

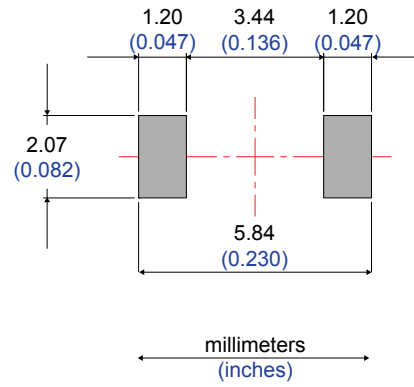
**Figure 13. SMB Flat package outline**



**Table 5. SMB Flat mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b	1.95		2.20	0.077		0.087
c	0.15		0.40	0.006		0.016
D	3.30		3.95	0.130		0.156
E	5.10		5.60	0.201		0.220
E1	4.05		4.60	0.159		0.181
L	0.75		1.50	0.030		0.059
L1		0.40			0.016	
L2		0.60			0.024	

**Figure 14. Footprint recommendations, dimensions in mm (inches)**





### 3 Ordering information

**Table 6. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS3H100U	G31	SMB	0.107 g	2500	Tape and reel
STPS3H100UF	FG31	SMB Flat	0.050 g	5000	Tape and reel

## Revision history

**Table 7. Document revision history**

Date	Version	Changes
15-Jan-2010	1	First issue.
27-Sept-2018	2	Updated cover page. Updated <a href="#">Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)</a> . Removed figure 3, figure 4, figure 5 and figure 6. Minor text changes to improve readability.
14-Janv-2020	3	Updated <a href="#">Figure 3</a> . Minor text changes to improve readability.

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