

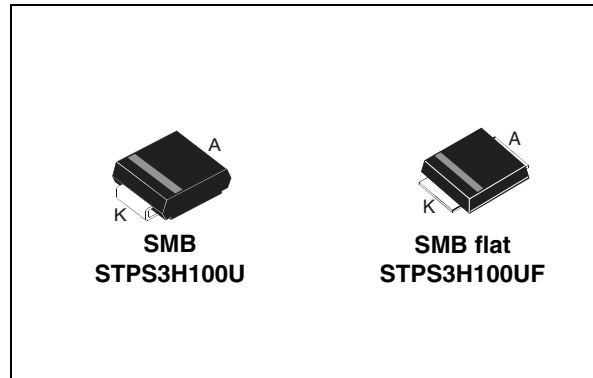
## Power Schottky rectifier

### Features

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

### Description

These Schottky rectifiers are designed for high frequency miniature switched mode power supplies such as adaptators and on board DC/DC converters. They are available in SMB, and low-profile SMB.



**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	3 A
$V_{RRM}$	100 V
$T_j$ (max)	175 °C
$V_F$ (max)	0.68 V

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

Symbol	Parameter		Value	Unit	
V <sub>RRM</sub>	Repetitive peak reverse voltage		100	V	
I <sub>F(AV)</sub>	Average forward current	SMB	T <sub>L</sub> = 115 °C δ = 0.5	3	A
		SMB flat	T <sub>L</sub> = 140 °C δ = 0.5		
I <sub>FSM</sub>	Surge non repetitive forward current		t <sub>p</sub> = 10 ms sinusoidal	75	A
P <sub>ARM</sub>	Repetitive peak avalanche power		t <sub>p</sub> = 1 μs T <sub>j</sub> = 25 °C	2400	W
T <sub>stg</sub>	Storage temperature range		-65 to + 175	°C	
T <sub>j</sub>	Operating junction temperature <sup>(1)</sup>		175	°C	

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

**Table 3. Thermal resistance**

Symbol	Parameter		Value	Unit
R <sub>th(j-l)</sub>	Junction to lead	SMB	25	°C/W
		SMB flat	15	

**Table 4. Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>	-	-	1	μA
		T <sub>j</sub> = 125 °C		-	0.4	1	mA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 3 A	-	-	0.84	V
		T <sub>j</sub> = 125 °C		-	0.63	0.68	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 6 A	-	-	0.92	
		T <sub>j</sub> = 125 °C		-	0.71	0.76	

1. Pulse test: t<sub>p</sub> = 5 ms, δ < 2%

2. Pulse test: t<sub>p</sub> = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

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

Figure 1. Average forward power dissipation versus average forward current

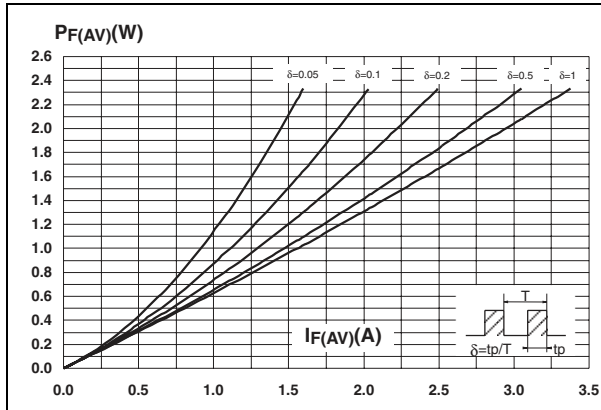


Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )

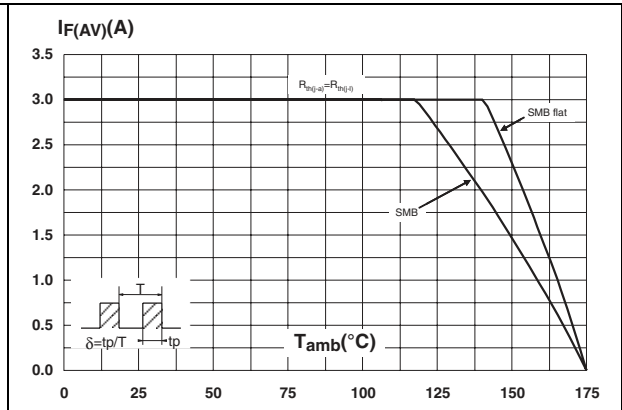


Figure 3. Normalized avalanche power derating versus pulse duration

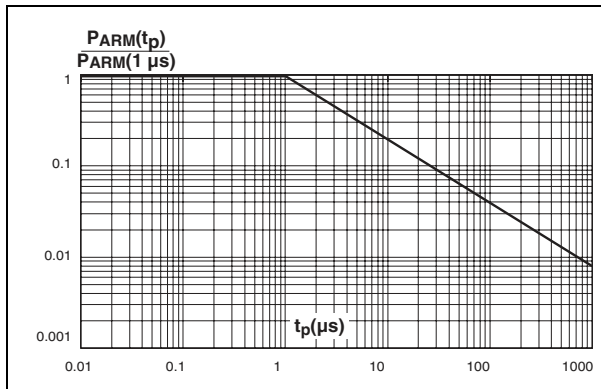


Figure 4. Normalized avalanche power derating versus junction temperature

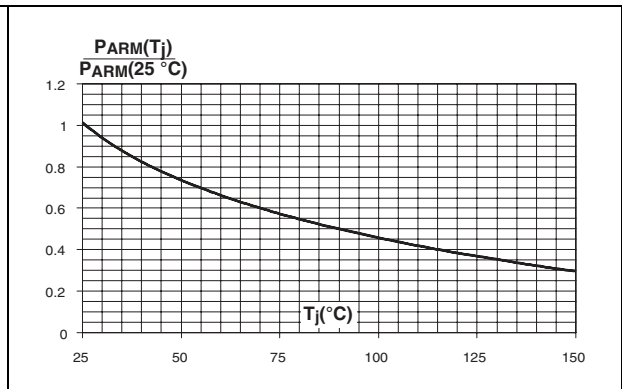


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

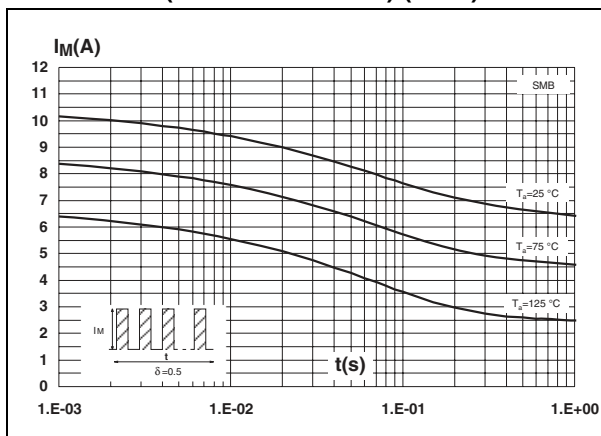
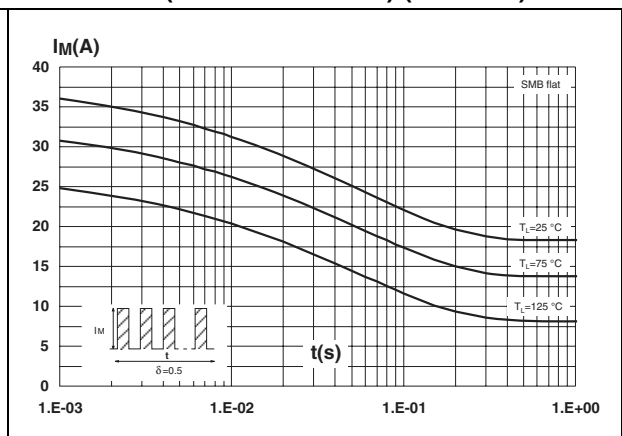
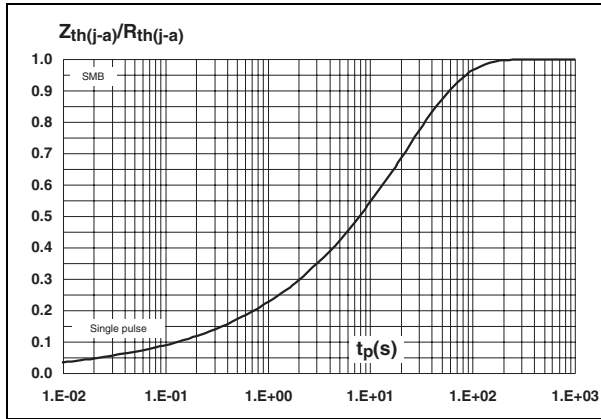


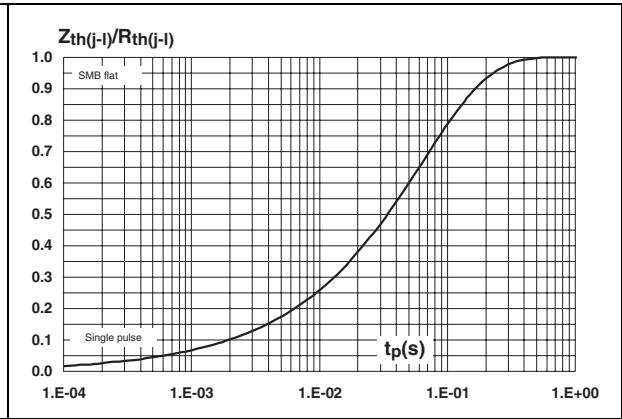
Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB flat)



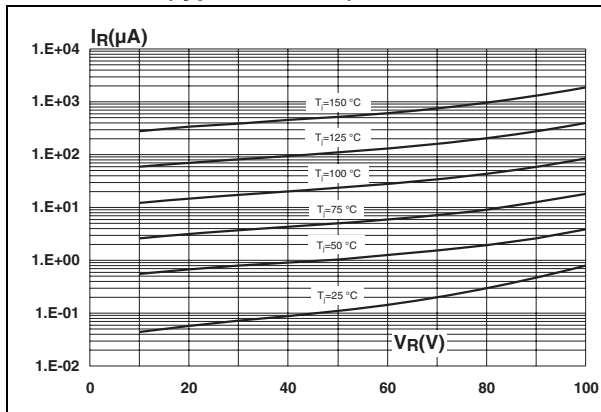
**Figure 7. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)**



**Figure 8. Relative variation of thermal impedance junction to lead versus pulse duration (SMB flat)**



**Figure 9. Reverse leakage current versus reverse voltage applied (typical values)**



**Figure 10. Junction capacitance versus reverse voltage applied (typical values)**

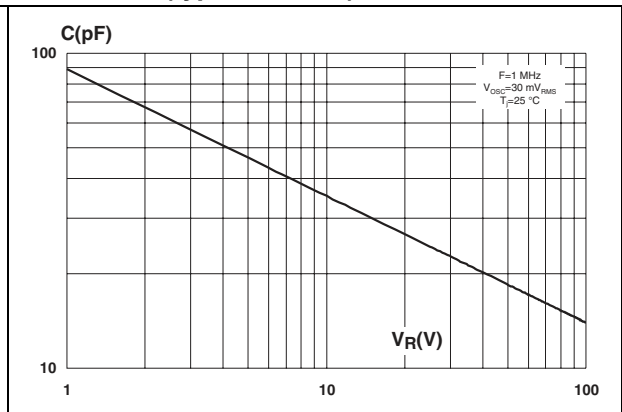


Figure 11. Forward voltage drop versus forward current

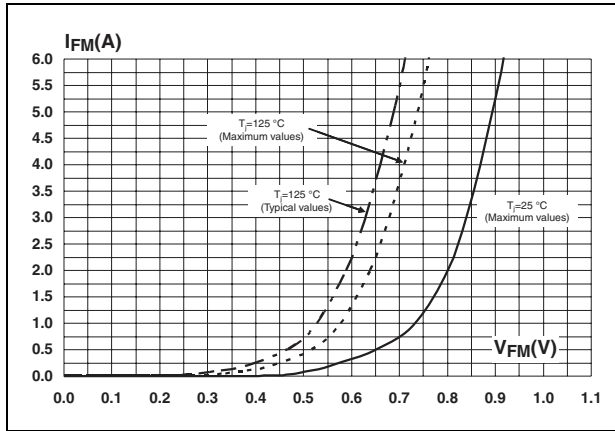


Figure 12. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

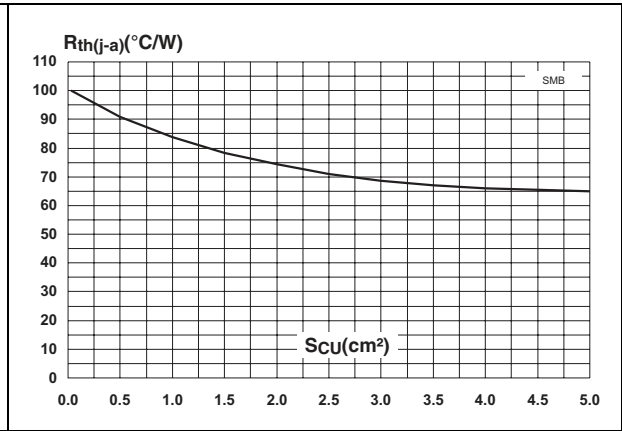
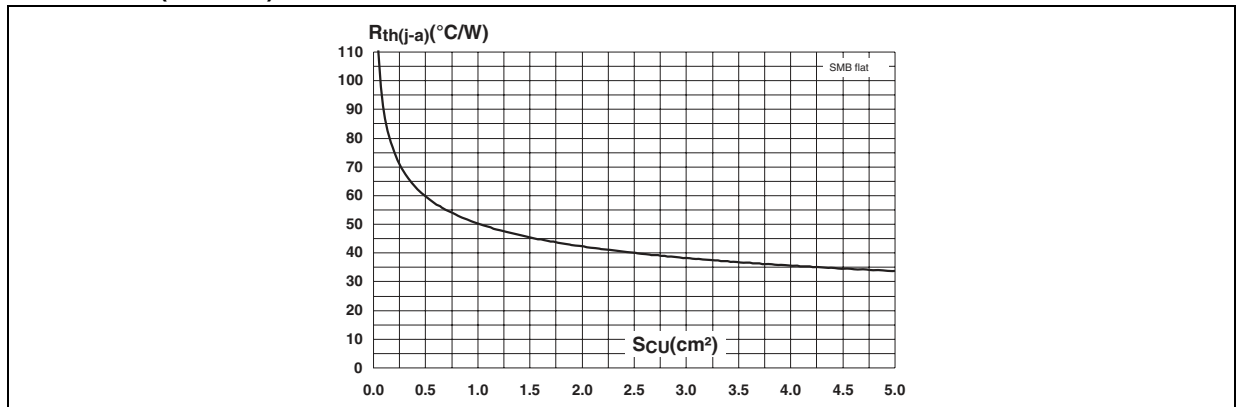


Figure 13. Thermal resistance junction to ambient versus copper surface under each lead (SMBflat)



## 2 Package Information

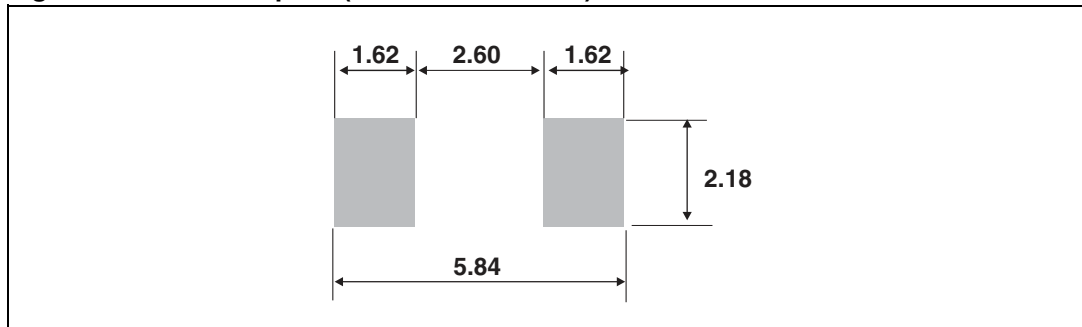
- Epoxy meets UL94, V0
- Lead-free packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

**Table 5. SMB dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.50	0.030	0.059

**Figure 14. SMB footprint (dimensions in mm)**

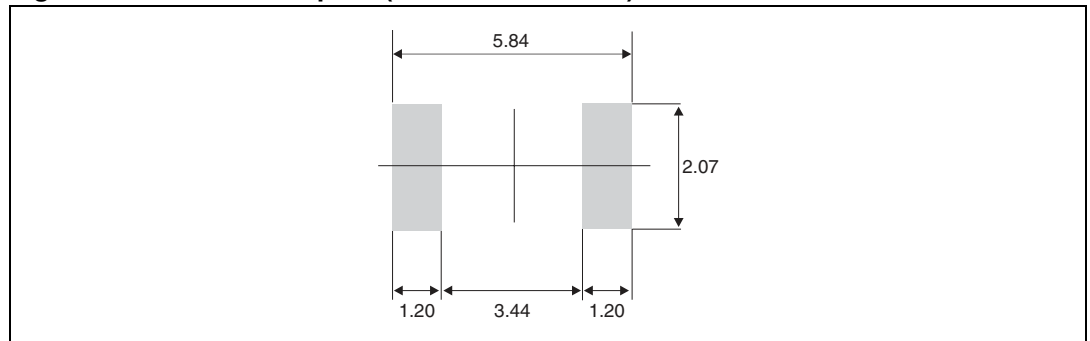


**Table 6. SMBflat dimensions**

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b <sup>(1)</sup>	1.95		2.20	0.077		0.087
c <sup>(1)</sup>	0.15		0.40	0.006		0.016
D	3.30		3.95	0.130		0.156
E	5.10		5.60	0.200		0.220
E1	4.05		4.60	0.189		0.181
L	0.75		1.50	0.029		0.059
L1		0.40			0.016	
L2		0.60			0.024	

1. Applies to plated leads

**Figure 15. SMBflat footprint (dimensions in mm)**



### 3 Ordering information

**Table 7. Ordering information**

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

### 4 Revision history

**Table 8. Document revision history**

Date	Revision	Changes
15-Jan-2010	1	First issue.



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