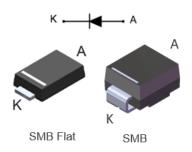


3 A - 100 V power Schottky rectifier



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 Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			100	V
1	Average featured current \$ = 0.5 equate ways	SMB	T _I = 115 °C	3	Α
I _{F(AV)}	Average forward current, δ = 0.5 square wave	SMB Flat	T _I = 140 °C	3	A
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$				Α
P _{ARM}	Repetitive peak avalanche power $t_{p} = 10 \; \mu s,$ $T_{j} = 125 \; ^{\circ} C$				W
T _{stg}	Storage temperature range			-65 to +175	°C
Tj	Maximum operating junction temperature ⁽¹⁾			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		
D	Junction to lead	SMB	25	°C/W	
$R_{th(j-l)}$	Juniculon to lead	SMB Flat	15	C/VV	

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 co	Min.	Тур.	Max.	Unit	
I_ (1)	Doverse leekage current	T _j = 25 °C	\/_ = \/	-		1.00	μΑ
'R''	I _R ⁽¹⁾ Reverse leakage current	T _j = 125 °C	$V_R = V_{RRM}$	-	0.40	1.00	mA
		T _j = 25 °C	I _F = 3 A	-		0.84	V
V _F ⁽²⁾	Convert voltage drep	T _j = 125 °C		-	0.63	0.68	
v _F / Polwai	-	T _j = 25 °C		-		0.92	V
		T _j = 125 °C		-	0.71	0.76	

- 1. Pulse test: t_p = 5 ms, δ < 2%
- 2. Pulse test: t_p = 380 μ s, δ < 2%

To evaluate the conduction losses, use the following equation:

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

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 on a power diode

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1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

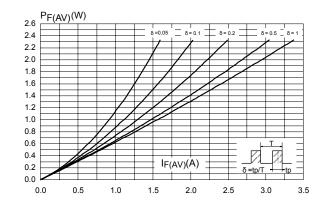


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

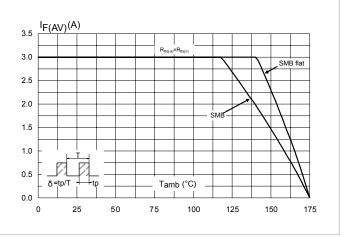


Figure 3. Normalized avalanche power derating versus pulse duration ($T_j = 125$ °C)

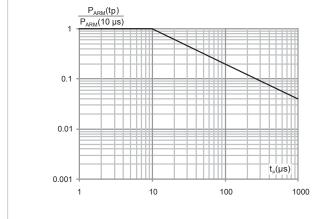
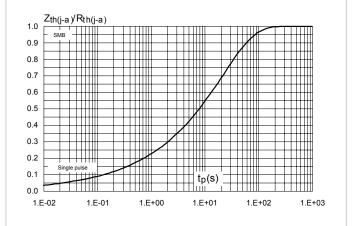


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)



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

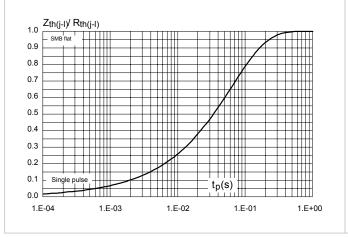


Figure 6. Reverse leakage current versus reverse voltage applied (typical values)

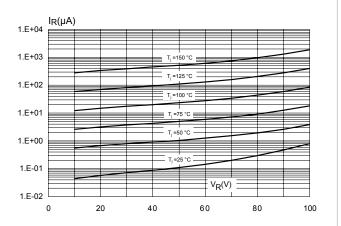


Figure 7. Junction capacitance versus reverse voltage applied (typical values)

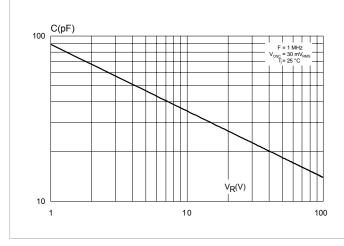


Figure 8. Forward voltage drop versus forward current

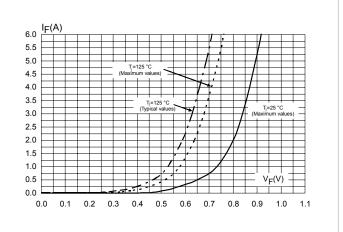


Figure 9. Thermal resistance junction to ambient versus copper surface under each lead (SMB)

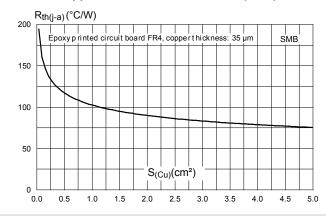
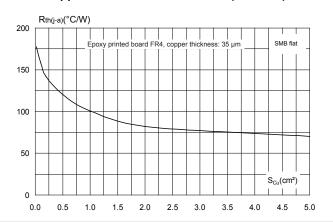


Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMB flat)



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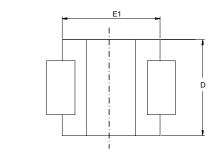
2 Package information

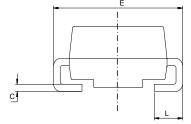
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

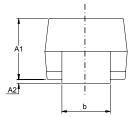
2.1 SMB package information

- Epoxy meets UL94, V0
- · Lead-free package

Figure 11. SMB package outline







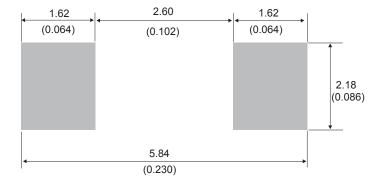
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Table 4. SMB package mechanical data

			Dimensions	
Ref.	Millir	meters	Inches (for re	ference 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
С	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



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2.2 SMB Flat package information

- Epoxy meets UL94, V0
- Lead-free package

Figure 13. SMB Flat package outline

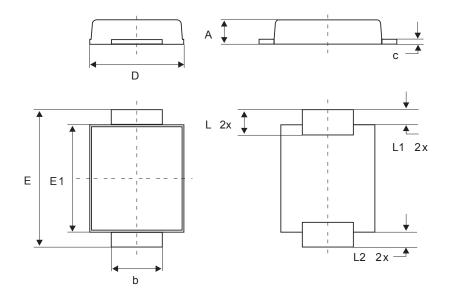


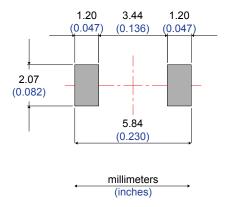
Table 5. SMB Flat mechanical data

	Dimensions					
Ref.		Millimeters		Inc	ches (for reference on	ly)
	Min.	Тур.	Max.	Min.	Тур.	Max.
Α	0.90		1.10	0.035		0.043
b	1.95		2.20	0.077		0.087
С	0.15		0.40	0.006		0.016
D	3.30		3.95	0.130		0.156
Е	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	

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



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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

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Revision history

Table 7. Document revision history

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



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