

5 A - 100 V power Schottky rectifier



Features

- Low profile design package height of 1.1 mm
- · Wettable flanks for automatic visual inspection
- · Low forward voltage drop
- Avalanche capability
- ECOPACK2 compliant

Applications

- · Switching diode
- · Notebook adapter
- LED lighting
- DC/DC converter

Description

This high voltage Schottky barrier rectifier has been optimized for use in high frequency miniature DC/DC converters, reverse battery protection, battery chargers and adaptors.

Packaged in SMB Flat Notch, the STPS5H100UFN provides a high level of performance in a compact and flat package which can withstand very high operating junction temperature.

Product status link
STPS5H100UFN

Product summary				
Symbol Value				
I _{F(AV)}	5 A			
V _{RRM}	100 V			
T _j (max.)	175 °C			
V _F (typ.)	0.545 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, δ = 0.5 square wave	T _L = 115 °C	5	Α
I _{FSM}	Surge non repetitive forward current	190	Α	
P _{ARM}	Repetitive peak avalanche power	518	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 parameters

Symbol	Parameter	Тур.	Unit
R _{th(j-l)}	Junction to lead	6.6	°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.	Тур.	Max.	Unit
L (1)	Deverse legicas current	T _j = 25 °C	$V_R = V_{RRM}$	-		8	μA
IR ^(*)	I _R ⁽¹⁾ Reverse leakage current	T _j = 125 °C		-	1.5	5	mA
V _F ⁽²⁾ Forward voltage drop		T _j = 25 °C	I _E = 2.5 A	-		0.640	
	Famurand walkama duam	T _j = 125 °C	1F - 2.5 A	-	0.480	0.540	.,
		T _j = 25 °C	I _F = 5 A	-		0.745	V
		T _j = 125 °C		-	0.545	0.610	

- 1. Pulse test: $t_p = 5$ ms, $\delta < 2\%$
- 2. Pulse test: $t_p = 380 \ \mu s, \ \delta < 2\%$

To evaluate the conduction losses, use the following equation:

 $P = 0.470 \times I_{F(AV)} + 0.028 \times I_{F^{2}(RMS)}$

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 in a power diode

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1.1 Characteristics (curves)

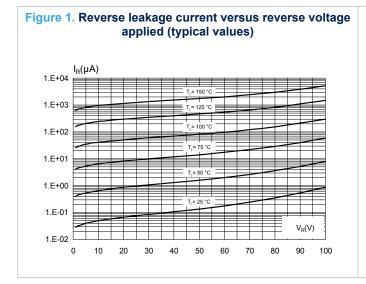


Figure 2. Junction capacitance versus reverse voltage applied (typical values)

C(pF)

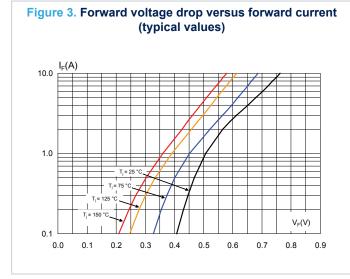
Vonc= 30 mVenss
T, = 25 °C

VR(V)

10

100

100



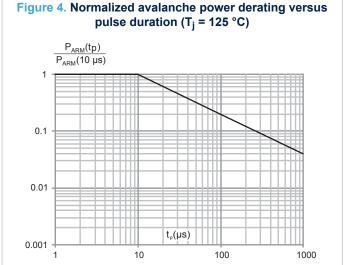
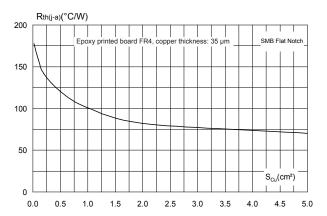


Figure 5. Thermal resistance junction to ambient versus copper surface under each lead (SMB Flat Notch)



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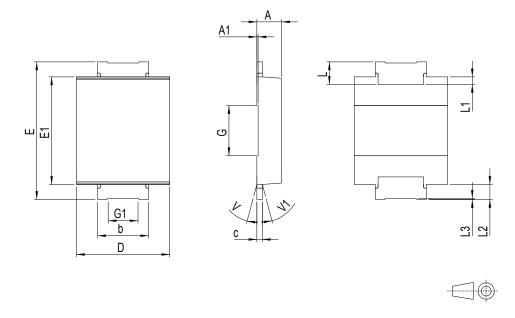
Package information

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 Flat Notch package information

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

Figure 6. SMB Flat Notch package outline



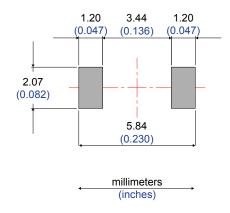
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Table 4. SMB Flat Notch mechanical data

		Dimensions					
Ref.		Millimeters			Inches		
	Min.	Тур.	Max.	Min.	Тур.	Max.	
Α	0.90		1.10	0.035		0.043	
A1		0.05			0.002		
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	
E	5.20		5.60	0.205		0.220	
E1	4.05		4.60	0.159		0.181	
G		2.00			0.079		
G1		1.20			0.047		
L	0.75		1.20	0.030		0.047	
L1		0.30			0.012		
L2		0.60			0.024		
L3	0.02			0.001			
V			8°			8°	
V1			8°			8°	

Figure 7. Footprint recommendations, dimensions in mm (inches)



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3 Ordering information

Table 5. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS5H100UFN	B51	SMB Flat Notch	0.056 g	5000	Tape and Reel

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Revision history

Table 6. Document revision history

Date	Version	Changes
31-Jan-2020	1	Initial release.

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