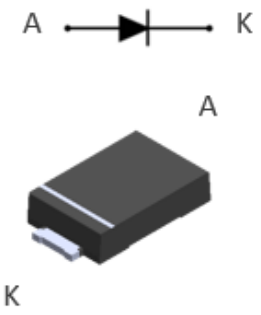
STPS3H100UFN

Datasheet

100 V, 3 A Schottky rectifier



SMB Flat Notch

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
- Notebook adapter
- LED lighting
- DC/DC converter

Description

This high voltage Schottky barrier rectifier device is packaged in SMB Flat Notch and designed for high frequency miniature switched mode power supplies and for board DC to DC converters.

Product status link
STPS3H100UFN

Product summary	
$I_{F(AV)}$	3 A
V_{RRM}	100 V
T_j (max.)	175 °C
V_F (typ.)	0.57 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 = 140 °C	3	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	135	A
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C	170	W
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum operating junction temperature range(1)		-40 to +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	15	°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 °C	$V_R = V_{RRM}$	-		1.5	µA
		T_j = 125 °C		-	0.6	1.7	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 3 A	-		0.76	V
		T_j = 125 °C		-	0.57	0.61	
		T_j = 25 °C	I_F = 6 A	-		0.84	
		T_j = 125 °C		-	0.64	0.68	

1. *Pulse test: t_p = 5 ms, δ < 2%*
2. *Pulse test: t_p = 380 µs, δ < 2%*

To evaluate the conduction losses, use the following equation:

$P = 0.54 \times I_{F(AV)} + 0.023 \times I_F{}^2{}_{(RMS)}$

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

1.1 Characteristics (curves)

Figure 1. Average forward power dissipation versus average forward current

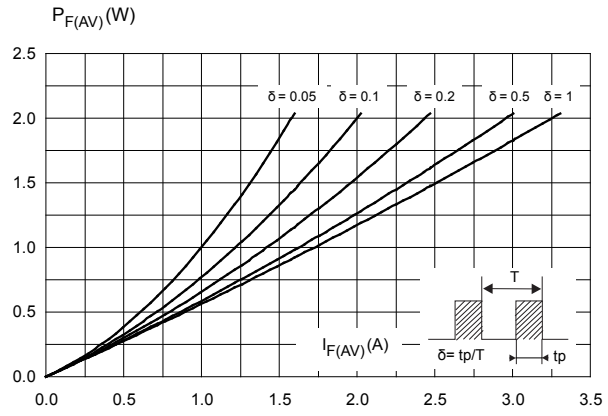


Figure 2. Average forward current versus lead temperature (δ = 0.5)

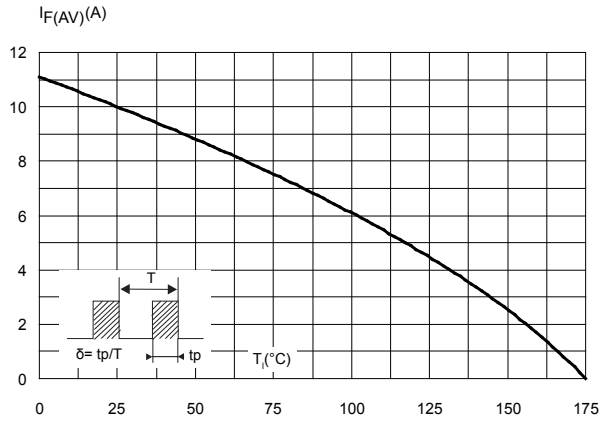


Figure 3. Normalized avalanche power derating versus pulse duration (T_j = 125 °C)

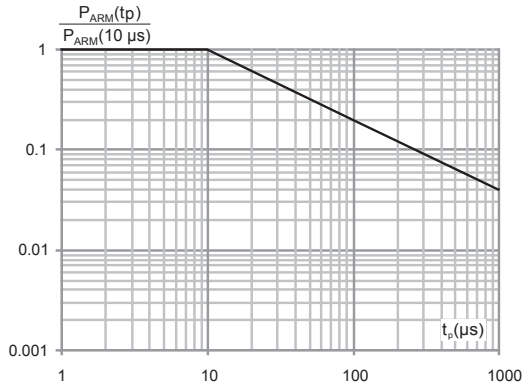


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration

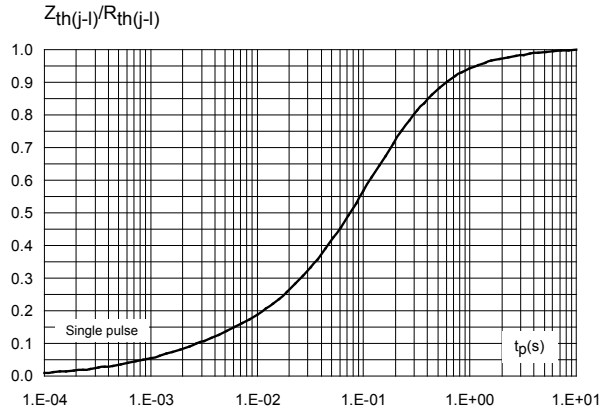


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

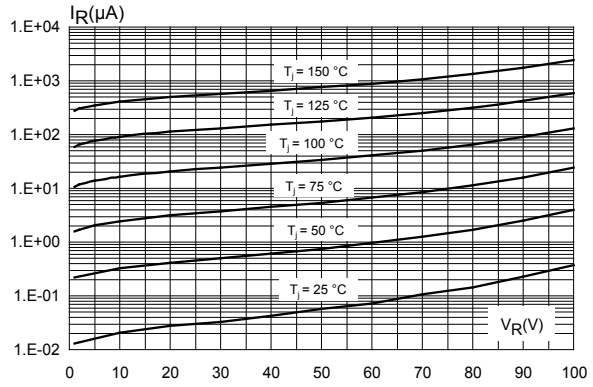


Figure 6. Junction capacitance versus reverse voltage applied (typical values)

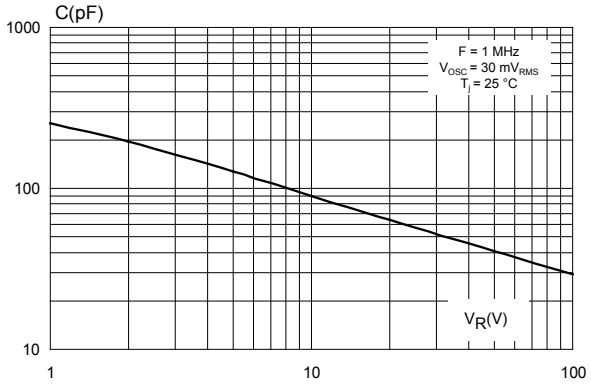


Figure 7. Forward voltage drop versus forward current (typical values)

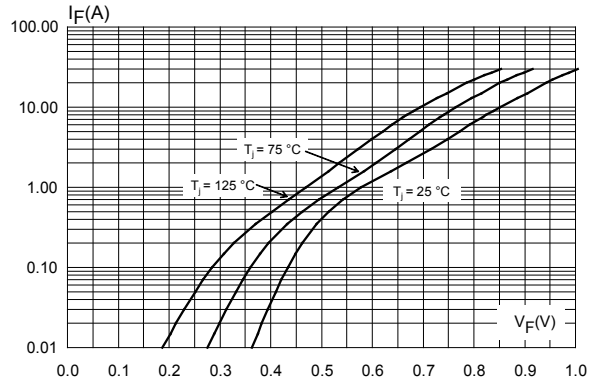
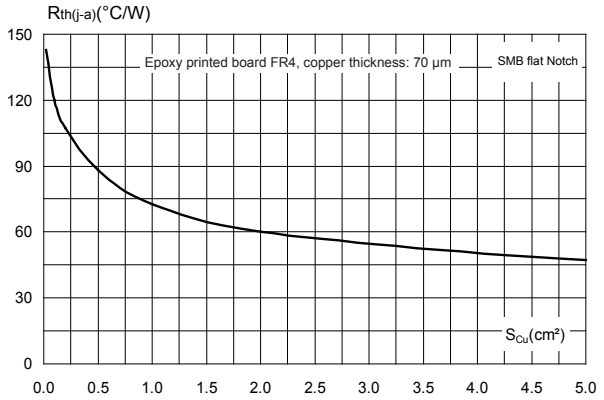


Figure 8. Thermal resistance junction to ambient versus copper surface under each lead (SMB flat Notch)(typical values)



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 Flat Notch package information

- Epoxy meets UL94, V0
- Lead-free package

Figure 9. SMB Flat Notch package outline

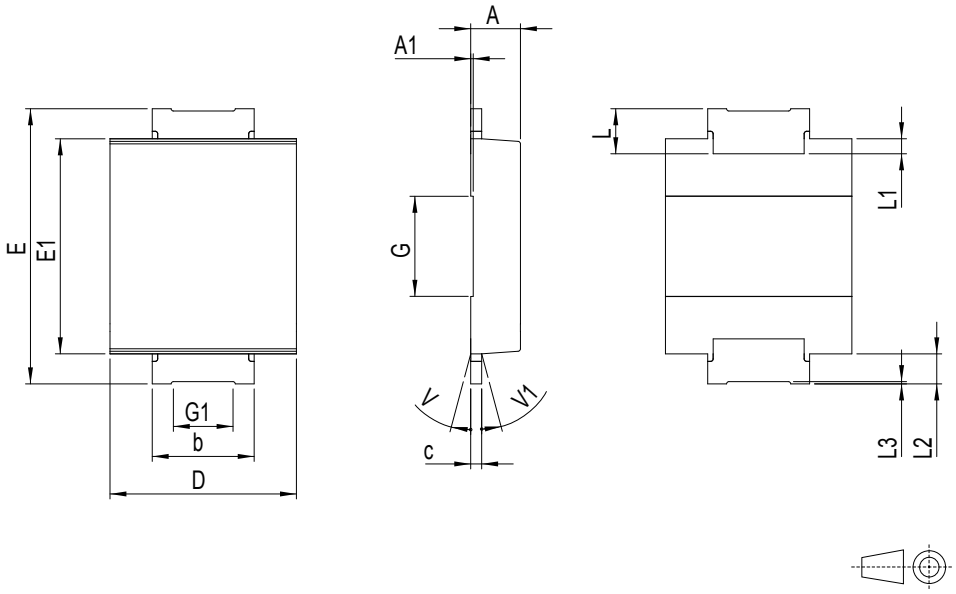
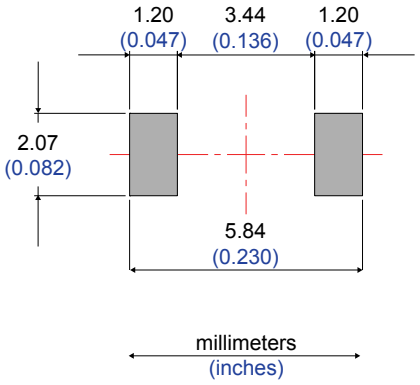


Table 4. SMB Flat Notch mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
A1		0.05			0.002	
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	5.20		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 10. Footprint recommendations, dimensions in mm (inches)



3 Ordering information

Table 5. **Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS3H100UFN	B31	SMB Flat Notch	56 mg	5000	Tape and reel

Revision history

Table 6. **Document revision history**

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