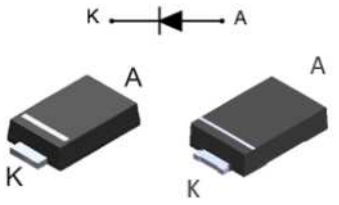
STPS3H100-Y

Datasheet

Automotive 3 A - 100 V power Schottky rectifier



SMB Flat

SMB Flat
Wettable leads

Features

- AEC-Q101 qualified revision C
- Negligible switching losses
- High junction temperature capability
- Low leakage current
- Good trade-off between leakage current and forward voltage drop
- Avalanche capability specified
- ECOPACK2 or ECOPACK3 compliant component on demand
- PPAP capable
- V_{RRM} guaranteed from -40 to +175 °C

Applications

- DC/DC converter
- Reverse polarity protection
- Freewheeling diodes
- Switching diode

Description

This Schottky rectifier is packaged in SMB Flat designed for high frequency miniature switched mode power supplies such as adaptors and on board DC to DC converters for automotive applications.

Product status link
STPS3H100-Y

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, Tj = -40 °C to +175 °C		100	V
$I_{F(AV)}$	Average forward current, δ = 0.5 square wave	T_l = 125 °C	3	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	25	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	Typ. 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	$V_R = V_{RRM}$	-		1.00	µA
		T_j = 125 °C		-	0.40	1.00	mA
		T_j = 150 °C		-		3.3	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 3 A	-		0.84	V
		T_j = 125 °C		-	0.63	0.68	
		T_j = 25 °C	I_F = 6 A	-		0.94	
		T_j = 125 °C		-	0.71	0.80	

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:

$P = 0.56 \times I_{F(AV)} + 0.04 \times I_F{}^2{}_{(RMS)}$

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

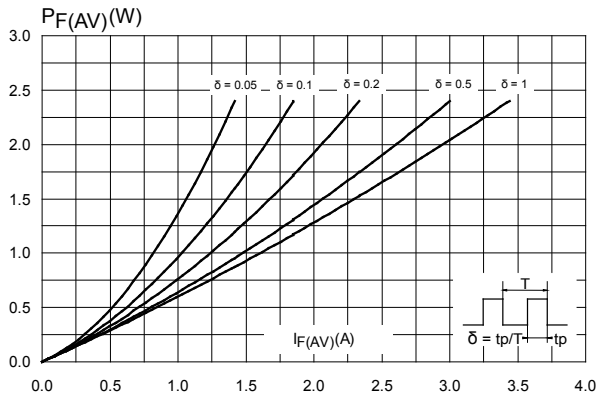


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

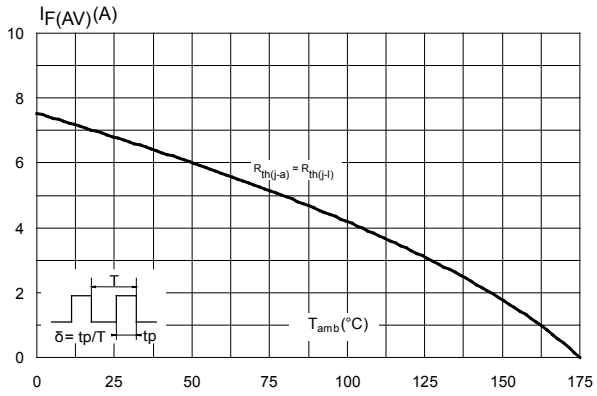


Figure 3. Normalized avalanche power derating versus junction temperature (T_j = 125 °C)

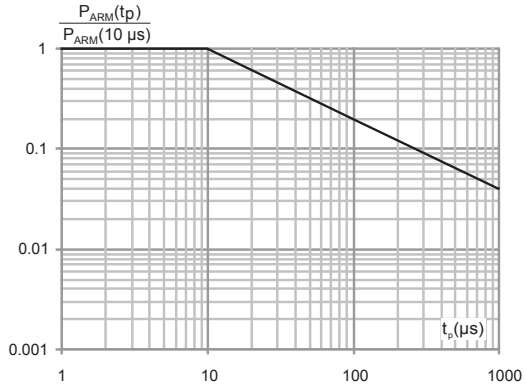


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration

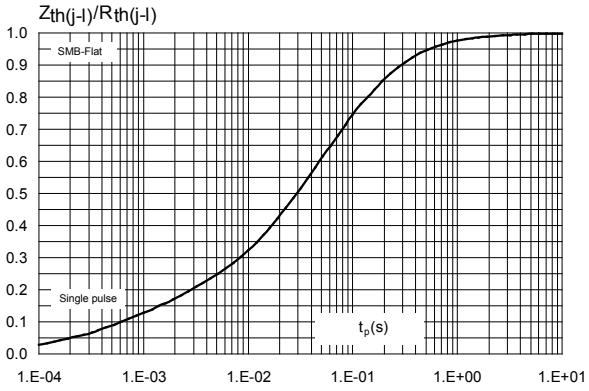


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

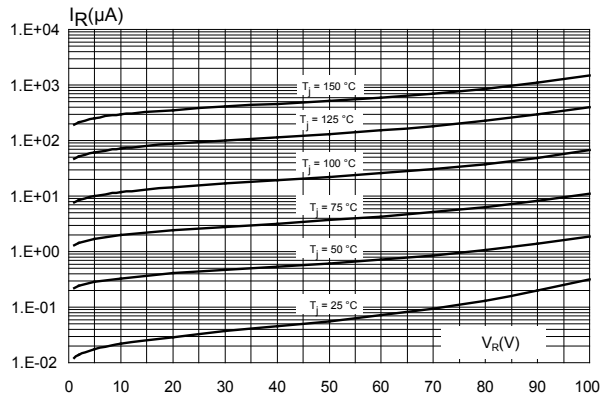


Figure 6. Junction capacitance versus reverse voltage applied (typical values)

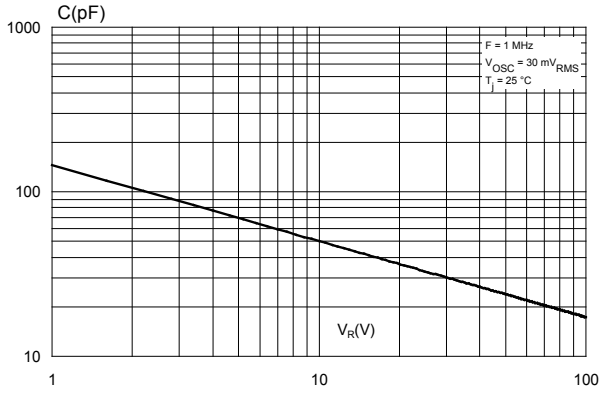


Figure 7. Forward voltage drop versus forward current (typical values)

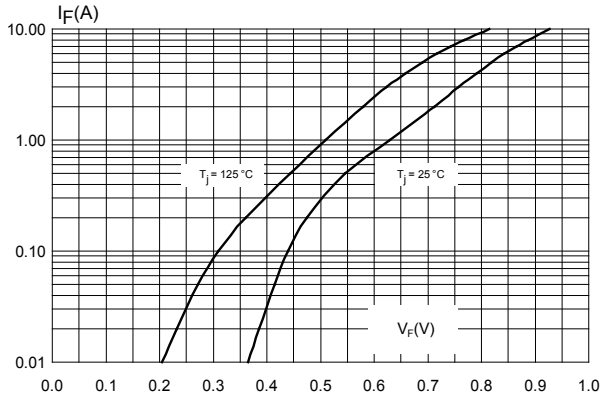


Figure 8. Forward voltage drop versus forward current (maximum values)

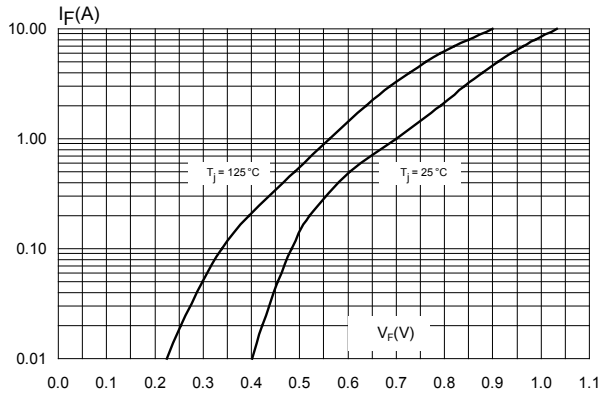
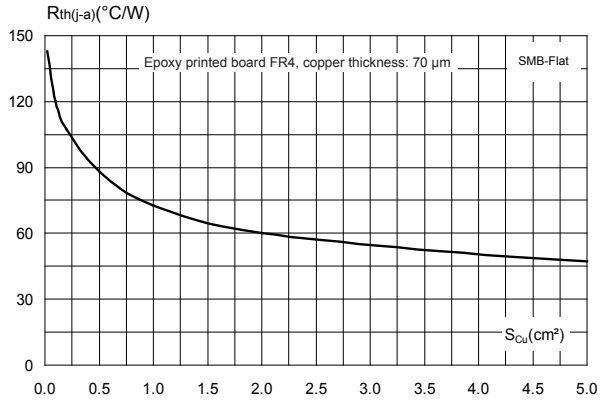


Figure 9. Thermal resistance junction to ambient versus copper surface under each lead



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 package information

- Epoxy meets UL94, V0
- Lead-free package

Figure 10. SMB Flat package outline

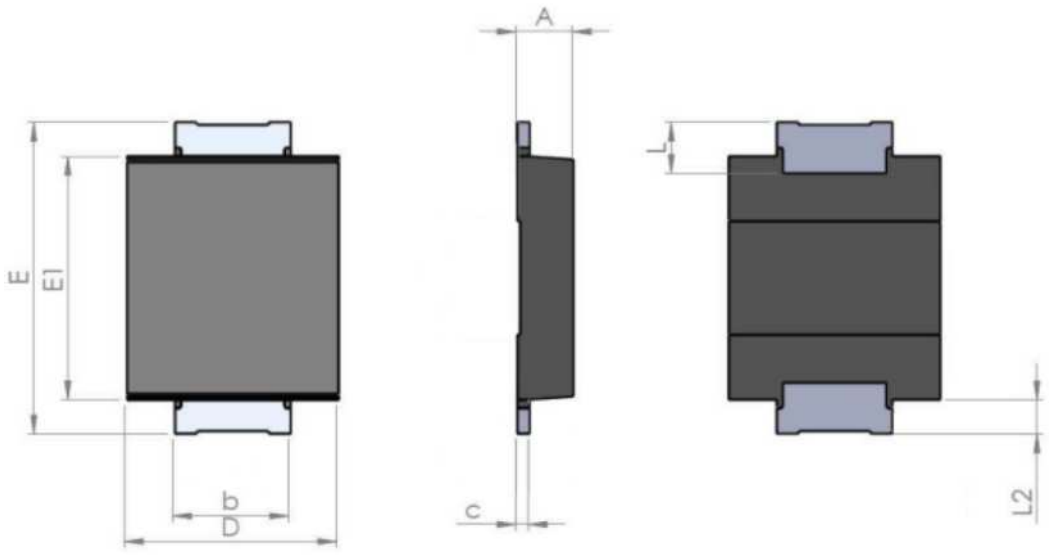
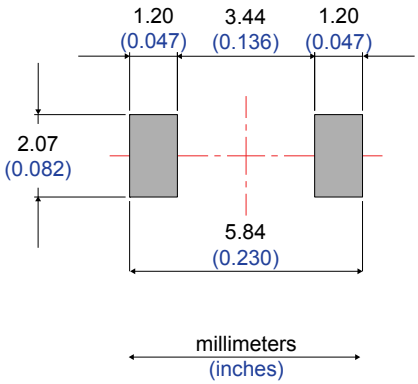


Table 4. SMB Flat mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	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	0.200		0.220
E1	4.05		4.60	0.159		0.181
L	0.75		1.50	0.030		0.060
L2		0.60			0.024	

Figure 11. Footprint recommendations, dimensions in mm (inches)



3 Ordering information

Table 5. **Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS3H100UFY	3H10Y	SMB Flat	50 mg	5000	Tape and reel

Revision history

Table 6. **Document revision history**

Date	Version	Changes
07-Nov-2016	1	Initial release.
14-Jan-2020	2	Updated Figure 3. Minor text changes to improve readability.
11-Apr-2022	3	Updated Figure 9, Section 2.1 SMB Flat package information and Table 5.

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