

STPS3H100

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.

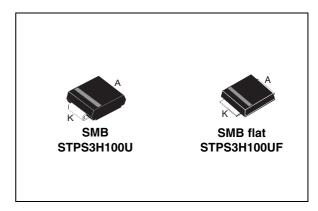


Table 1. Device summary

Symbol	Value
I _{F(AV)}	3 A
V _{RRM}	100 V
T _j (max)	175 °C
V _F (max)	0.68 V

STPS3H100 Characteristics

Characteristics 1

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

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			100	V
I _{F(AV)}	Average forward current	SMB	$T_L = 115 {}^{\circ}\text{C} \delta = 0.5$	3	Α
		SMB flat	$T_L = 140 ^{\circ}\text{C} \delta = 0.5$	3	
I _{FSM}	Surge non repetitive forward current		t _p =10 ms sinusoidal	75	Α
P _{ARM}	Repetitive peak avalanche power		$t_p = 1 \mu s$ $T_j = 25 °C$	2400	W
T _{stg}	Storage temperature range			-65 to + 175	°C
T _j	Operating junction temperature (1)			175	°C

^{1.} $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 3. Thermal resistance

Symbol	Parameter			Unit
В	Junction to lead	SMB	25	°C/W
R _{th(j-l)}		SMB flat	15	0/11

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _R ⁽¹⁾	Reverse leakage current	T _j = 25 °C	$V_R = V_{RRM}$	-	-	1	μΑ
		T _j = 125 °C		-	0.4	1	mA
V _F ⁽²⁾ Forwar		T _j = 25 °C	I _F = 3 A	-	-	0.84	V
	Forward voltage drop	T _j = 125 °C		-	0.63	0.68	
		T _j = 25 °C	I _F = 6 A	-	-	0.92	
		T _j = 125 °C		-	0.71	0.76	

^{1.} Pulse test: $tp = 5 \text{ ms}, \delta < 2\%$

To evaluate the conduction losses use the following equation: P = 0.6 x $I_{F(AV)}$ + 0.027 $I_{F}^{2}_{(RMS)}$

$$P = 0.6 \times I_{E(\Delta V)} + 0.027 I_{E^2(BMS)}$$

^{2.} Pulse test: tp = 380 μ s, δ < 2%

STPS3H100 Characteristics

Figure 1. Average forward power dissipation Figure 2. Average forward current versus versus average forward current ambient temperature (δ = 0.5)

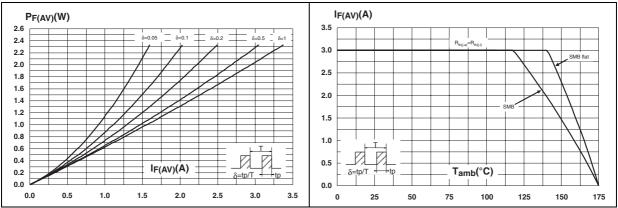


Figure 3. Normalized avalanche power derating versus pulse duration

Figure 4. Normalized avalanche power derating versus junction temperature

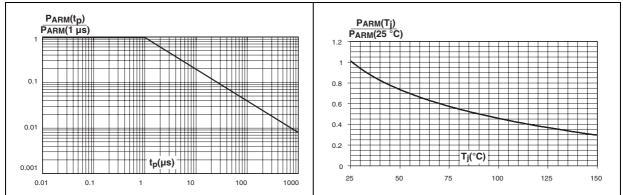
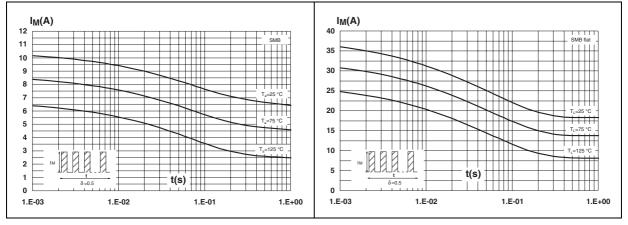


Figure 6.

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

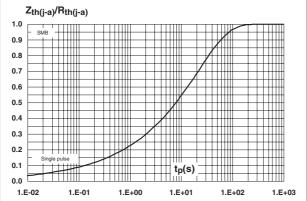
Non repetitive surge peak forward current versus overload duration (maximum values) (SMB flat)



Characteristics STPS3H100

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)



Zth(j-i)/Rth(j-i)

1.0

0.9

0.8

0.7

0.6

0.5

0.4

0.3

0.2

0.1 Single pulse

0.0

1.E-04

1.E-03

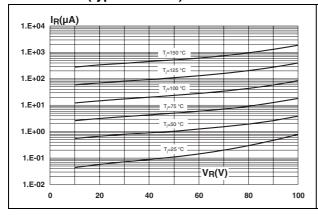
1.E-02

1.E-01

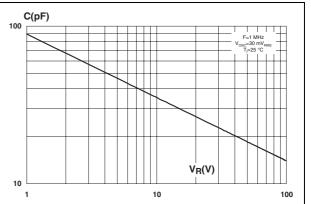
1.E+00

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

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



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STPS3H100 Characteristics

Figure 11. Forward voltage drop versus forward current

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

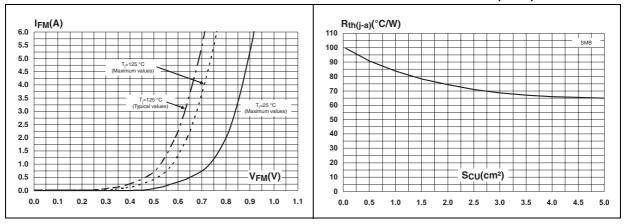
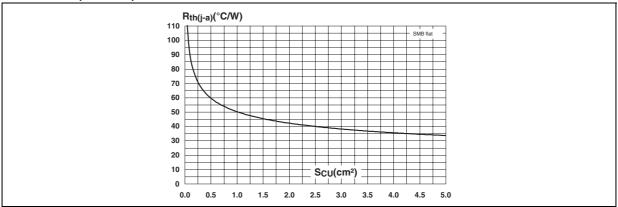


Figure 13. Thermal resistance junction to ambient versus copper surface under each lead (SMBflat)



STPS3H100 Package Information

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® 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.

Inches

Max.

0.096

0.008

0.087

0.016

0.220

0.181

0.156

0.059

Min.

0.075

0.002

0.077

0.006

0.201

0.159

0.130

0.030

Table 5. **SMB** dimensions

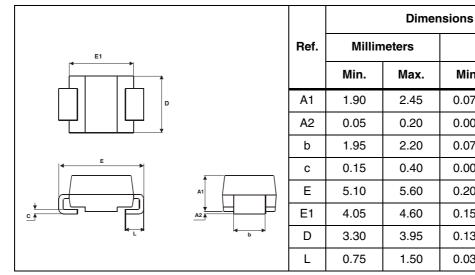


Figure 14. SMB footprint (dimensions in mm)

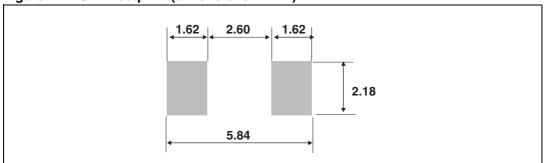
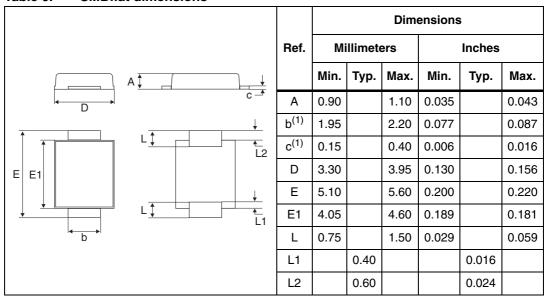
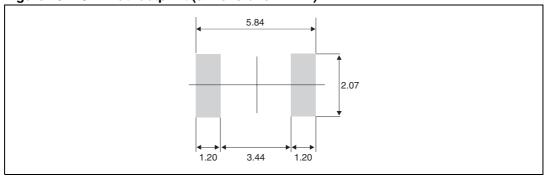


Table 6. SMBflat dimensions



^{1.} Applies to plated leads

Figure 15. SMBflat footprint (dimensions in mm)



Ordering information STPS3H100

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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