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# STPS6M100DEE

## High voltage power Schottky rectifier

### Datasheet – production data

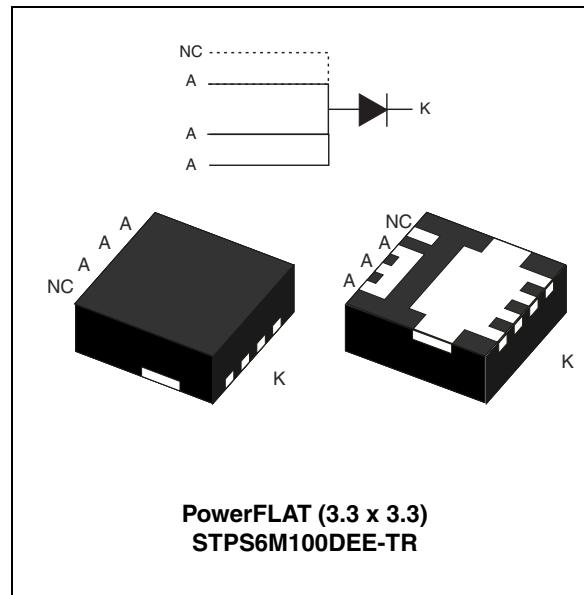
### Features

- Negligible switching losses
- Extremely fast switching
- Low thermal resistance
- High junction temperature capability
- ECOPACK®2 compliant component

### Description

This Schottky rectifier is designed for switch mode power supply and high frequency DC to DC converters.

Packaged in PowerFLAT™, this device is intended for use in low voltage, high frequency, inverters, free-wheeling, by-pass diode and polarity protection applications. Its low profile was especially designed to be used in applications with space-saving constraints.



**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	6 A
$V_{RRM}$	100 V
$T_j$ (max)	150 °C
$V_F$ (typ)	0.64 V

TM: PowerFLAT is a trademark of STMicroelectronics

## Characteristics

## STPS6M100DEE

# 1 Characteristics

**Table 2. Absolute ratings (limiting values  $T_{amb} = 25^\circ\text{C}$  unless otherwise specified)**

Symbol	Parameter	Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage	100	V	
$I_{F(RMS)}$	Forward rms current	15	A	
$I_{F(AV)}$	Average forward current	$T_c = 130^\circ\text{C}$ $\delta = 0.5$	A	
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms sinusoidal}$	100	A
$P_{ARM}^{(1)}$	Repetitive peak avalanche power	$t_p = 10\text{ }\mu\text{s}$ $T_j = 125^\circ\text{C}$	480	W
$T_{stg}$	Storage temperature range	-65 to +150	$^\circ\text{C}$	
$T_j$	Maximum operating junction temperature	150	$^\circ\text{C}$	

1. For pulse time duration deratings, please refer to *Figure 3*. More details regarding the avalanche energy measurements and diode validation in the avalanche are provided in the STMicroelectronics Application notes AN1768, "Admissible avalanche power of Schottky diodes" and AN2025, "Converter improvement using Schottky rectifier avalanche specification".

**Table 3. Thermal resistance**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	4	$^\circ\text{C/W}$

**Table 4. Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$	-		30	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$		-	5	15	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 6\text{A}$			0.78	V
		$T_j = 125^\circ\text{C}$		-	0.58	0.64	

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

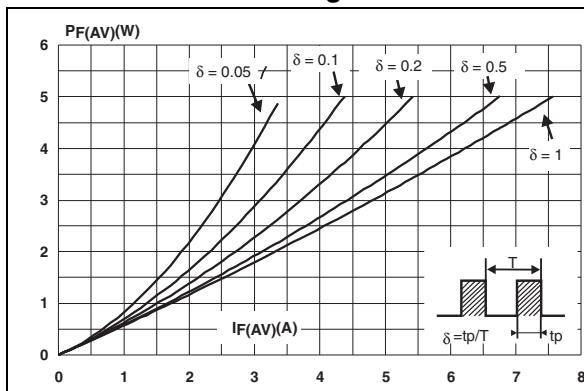
To evaluate the conduction losses use the following equation:

$$P = 0.56 \times I_{F(AV)} + 0.0133 \times I_{F(RMS)}^2$$

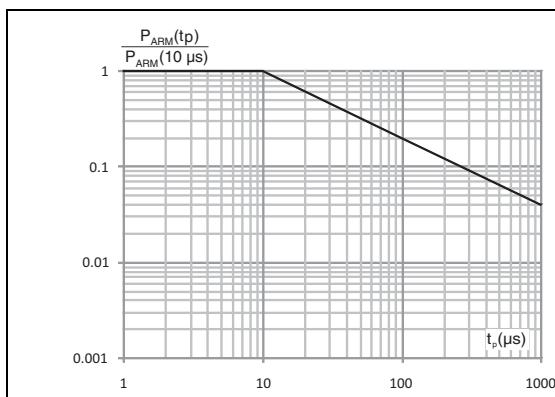
## STPS6M100DEE

## Characteristics

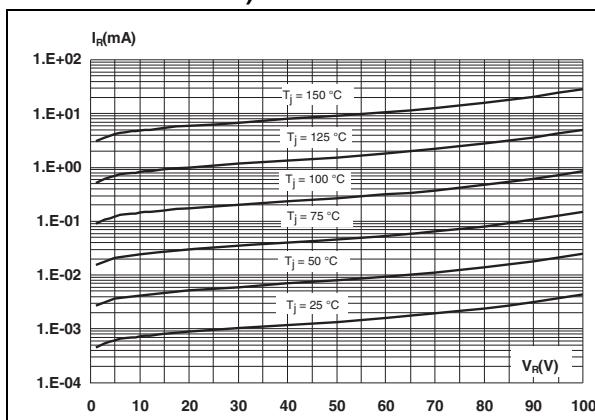
**Figure 1. Average forward power dissipation versus average forward current**



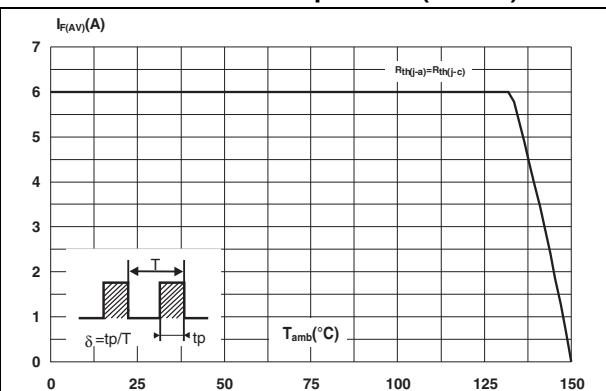
**Figure 3. Normalized avalanche power derating versus pulse duration**



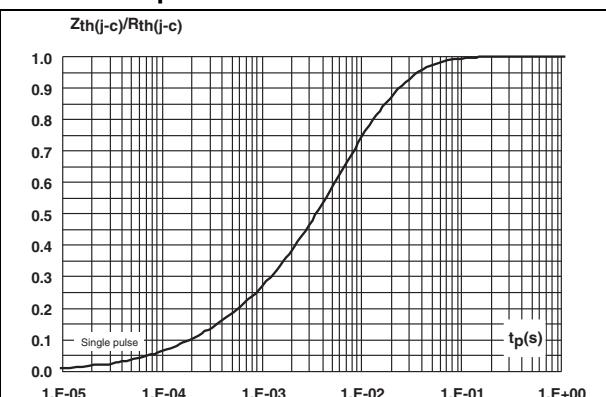
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values)**



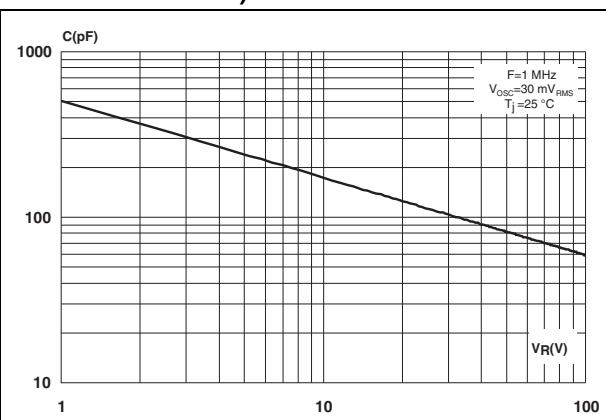
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



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



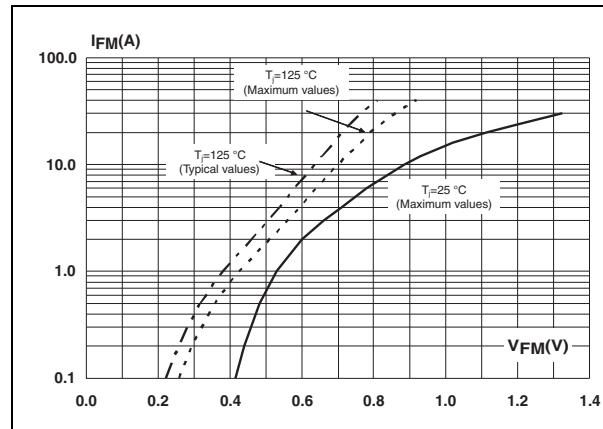
**Figure 6. Junction capacitance versus reverse voltage applied (typical values)**



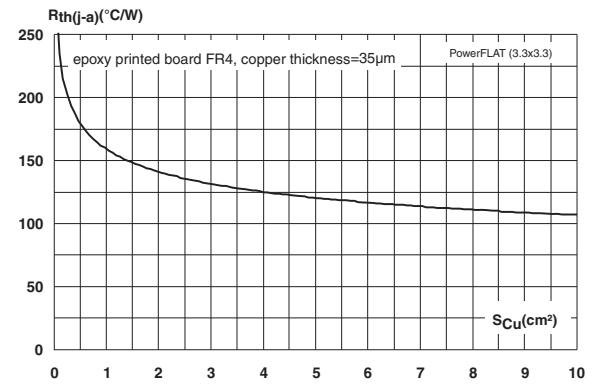
**Characteristics**

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**Figure 7. Forward voltage drop versus forward current**



**Figure 8. Thermal resistance junction to ambient versus copper surface under tab**



## STPS6M100DEE

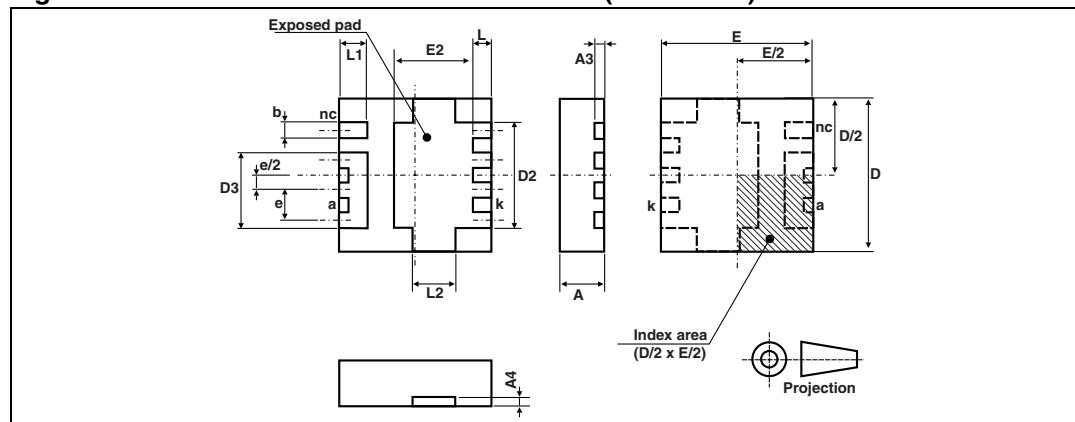
## Package information

## 2 Package information

- Epoxy meets UL94,V0
- Lead-free package

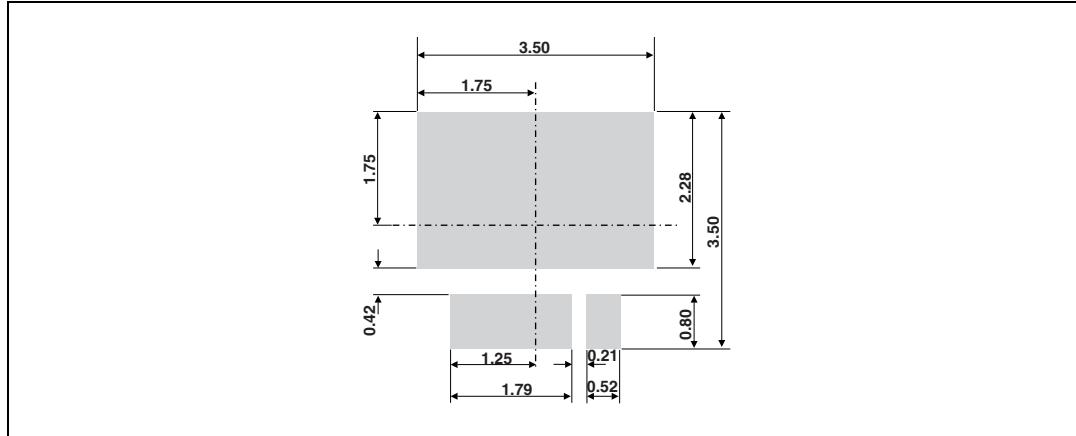
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com).  
 ECOPACK® is an ST trademark.

**Figure 9. PowerFLAT-3.3x3.3-8L dimensions (definitions)**



**Table 5. PowerFLAT-8L dimensions (values)**

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.95	1.00	1.05	0.037	0.039	0.041
A3		0.20			0.0079	
A4		0.20			0.0079	
b	0.30	0.37	0.44	0.012	0.015	0.017
D	3.20	3.30	3.40	0.126	0.130	0.134
D2	2.24	2.31	2.38	0.088	0.091	0.094
D3	1.60	1.67	1.74	0.063	0.066	0.069
e		0.65			0.026	
E	3.20	3.30	3.40	0.126	0.130	0.134
E2	1.68	1.75	1.82	0.066	0.069	0.072
L	0.31	0.38	0.45	0.012	0.015	0.018
L1	0.55	0.62	0.69	0.022	0.024	0.027
L2	0.86	0.93	1.00	0.034	0.037	0.039

**Package information****STPS6M100DEE****Figure 10. Footprint (dimensions in mm)**

**STPS6M100DEE****Ordering information****3 Ordering information****Table 6. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS6M100DEE-TR	S6M100	PowerFLAT (3.3 x 3.3)	34 mg	3000	Tape and reel 13" reel

**4 Revision history****Table 7. Document revision history**

Date	Revision	Changes
09-Sep-2012	1	First issue.

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