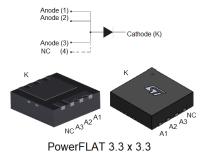




Datasheet

45 V, 10 A power Schottky rectifier



Product status link	
STPS1045DEE	

Product summary			
Symbol Value			
I _{F(AV)}	10 A		
V _{RRM}	45 V		
T _j (max.)	175 °C		
V _F (typ.)	0.45 V		

Features

- Very low conduction losses
- Negligible switching losses
- Extremely fast switching
- Low thermal resistance
- Avalanche capacity specified
- High junction temperature capability
- ECOPACK2 compliant

Application

- Cordless appliance
 - SSD

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- Battery charger
- Telecom power
- DC / DC converter
- Polarity protection
- Freewheeling

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.

1 Characteristics

Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage	Repetitive peak reverse voltage			V
I _{F(RMS)}	Forward rms current	Forward rms current			Α
I _{F(AV)}	Average forward current, $\delta = 0.5$ squa	Average forward current, δ = 0.5 square wave T_c = 145 °C			Α
I _{FSM}	Surge non repetitive forward current t_p = 10 ms sinusoidal		100	Α	
P _{ARM}	Repetitive peak avalanche power $t_p = 10 \ \mu s$ $T_c = 125 \ ^{\circ}C$		300	W	
T _{stg}	Storage temperature range			-65 to +175	°C
Тj	Maximum operating junction temperature			+175	°C

Table 2. Thermal resistance parameters

Symbol	Parameter	Max. value	Unit
R _{th(j-c)}	Junction to case	4	°C/W

For more information, please refer to the following application note:

AN5088: Rectifiers thermal management, handling and mounting recommendations

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _R ¹	Poverao lookago ourrent	T _j = 25 °C	V _R = V _{RRM}	-		200	μA
'R'	Reverse leakage current	T _j = 125 °C		-	15	40	mA
		T _j = 25 °C	I _F = 10 A	-		0.59	V
V _F ²	Forward valtage drag	T _j = 125 °C		-	0.45	0.53	
VF ² Forward voltage dro	Forward voltage drop	T _j = 25 °C		-		0.72	V
		T _j = 125 °C	I _F = 20 A	-	0.57	0.65	

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:

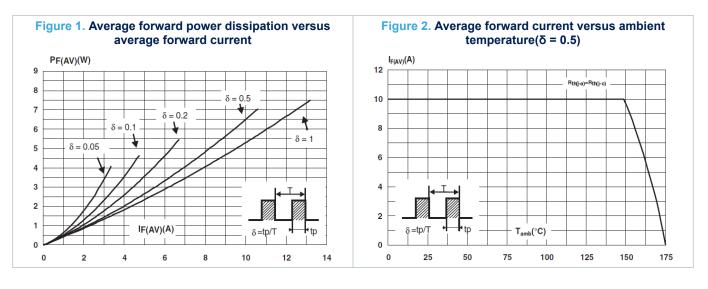
 $P = 0.41 \text{ x } I_{F(AV)} + 0.012 \text{ x } I_{F}^{2}(RMS)$

For more information, please refer to the following application notes related to the power losses:

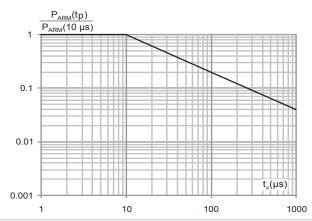
- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses in a power diode

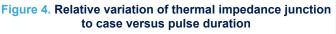


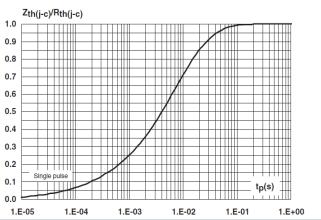
1.1 Characteristics (curves)

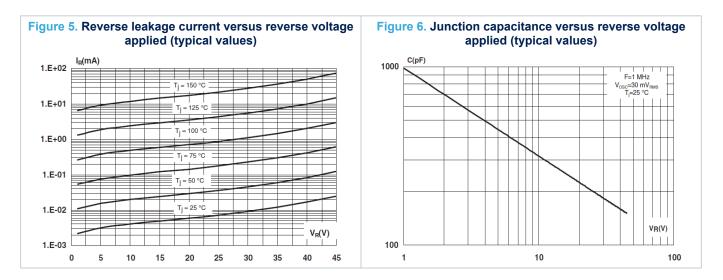




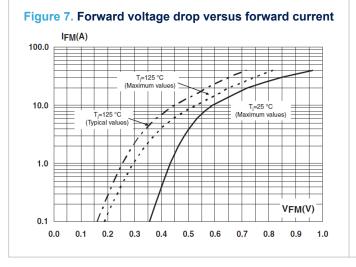






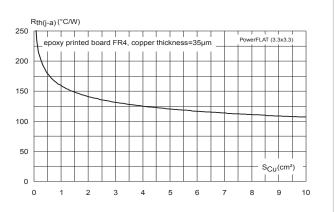






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Figure 8. Thermal resistance junction to ambient versus copper surface under tab



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 PowerFLAT 3.3x3.3 mm package information

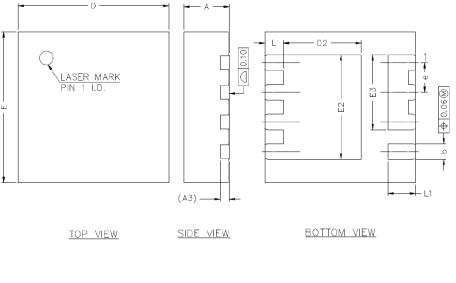


Figure 9. PowerFLAT 3.3x3.3 mm package outline



<u>SIDE VIEW</u>

Table 4. PowerFLAT 3.3x3.3 mm mechanical data

	Dimensions					
Ref.	Millimeters					
	Min.	Тур.	Max.			
A	0.90		1.10			
A3		0.20				
b	0.29		0.44			
D	3.20		3.40			
D2	1.61		1.82			
E	3.20		3.40			
E2	2.19		2.39			
E3	1.54		1.74			
е	0.55		0.75			
L	0.30		0.50			
L1	0.50		0.70			

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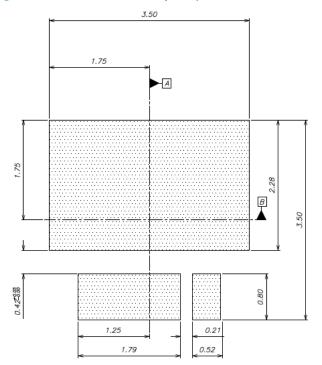


Figure 10. Recommended footprint (dimensions are in mm)



3 Ordering information

Table 5. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS1045DEE-TR	PS1045	PowerFLAT 3.3 x 3.3	34 mg	3000	Tape and 13" reel

Revision history

Table 6. Document revision history

Date	Version	Changes
09-Sep-2012	1	First issue.
18-May-2022	2	Updated package outline PowerFLAT 3.3 x 3.3.

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