

STPS8170DEE

Power Schottky rectifier

Datasheet - production data

Features

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

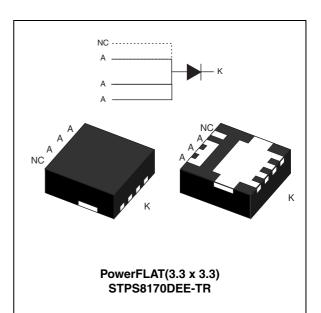


Table 1. Device summary

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Symbol	Value	
I _{F(AV)}	8 A	
V _{RRM}	170 V	
T _j (max)	175 °C	
V _F (typ)	0.66 V	

TM: PowerFLAT is a trademark of STMicroelectronics

This is information on a product in full production.

1 Characteristics

Table 2.	Absolute ratings (limiting values T _{amb} = 25 °C unless otherwise specified)
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Symbol	Parameter	Value	Unit	
V _{RRM}	Repetitive peak reverse voltage		170	V
I _{F(RMS)}	Forward rms current		15	А
I _{F(AV)}	Average forward current	8	А	
I _{FSM}	Surge non repetitive forward current	100	А	
P _{ARM} ⁽¹⁾	Repetitive peak avalanche power	400	W	
T _{stg}	Storage temperature range	-65 to +175	°C	
Тj	Maximum operating junction temperat	175	°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	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _B ⁽¹⁾	Reverse leakage current	T _j = 25 °C	V - V	-		15	μA
'R` ′	neverse leakage current	T _j = 125 °C	$V_{R} = V_{RRM}$	-	1.5	15	mA
V _F ⁽²⁾	Forward voltage drop	T _j = 25 °C	I _F = 8A			0.90	V
		T _j = 125 °C		-	0.66	0.72	

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

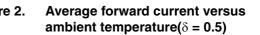
2. Pulse test: t_p = 380 µs, δ < 2%

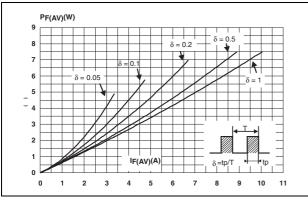
To evaluate the conduction losses use the following equation:

 $P = 0.62 \text{ x } I_{F(AV)} + 0.0125 \text{ x } {I_F}^2_{(RMS)}$



Figure 1. Average forward power dissipation Figure 2. versus average forward current





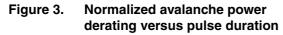


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

75

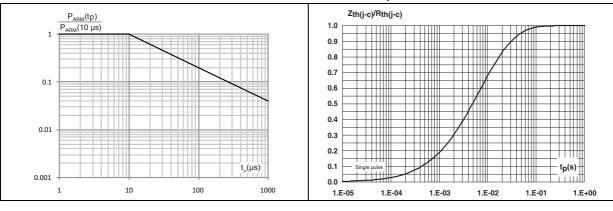
T_{amb}(°C)

125

150

175

100



I_{F(AV)}(A)

8

6

4

2

0

0

δ=tp/T

25

٩tr

50

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

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

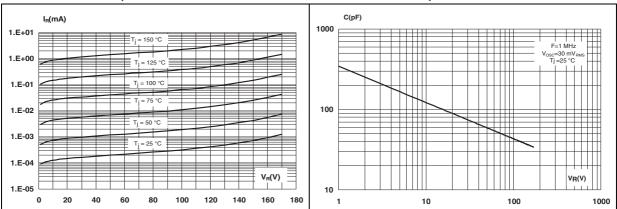
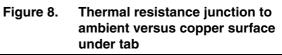
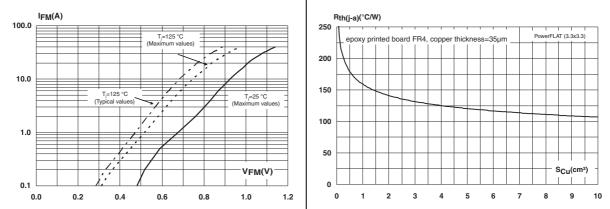




Figure 7. Forward voltage drop versus forward current







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: <u>www.st.com</u>. ECOPACK[®] is an ST trademark.

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

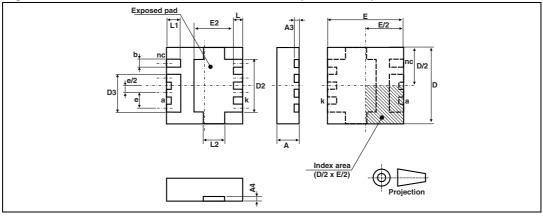
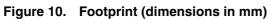
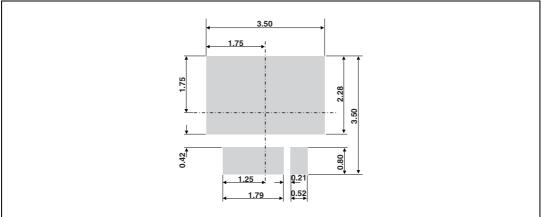


Table 5. PowerFLAT-8L dimensions (values)

	Dimensions						
Ref.	Millimeters			Inches			
	Min.	Тур.	Max.	Min.	Тур.	Max.	
А	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	
е		0.65			0.026		
Е	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	0.22	0.024	0.027	
L2	0.86	0.93	1.00	0.034	0.037	0.039	









3 Ordering information

Table 6.Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS8170DEE-TR	PS8170	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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