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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.

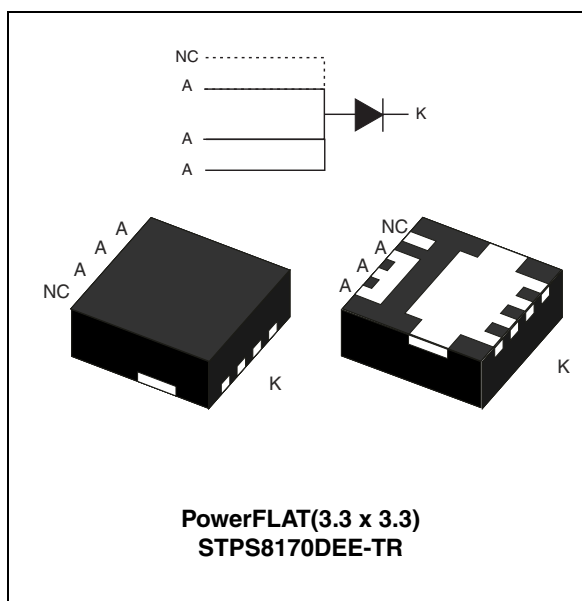


Table 1. Device summary

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

1 Characteristics

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

Symbol	Parameter	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	170	V
$I_{F(RMS)}$	Forward rms current	15	A
$I_{F(AV)}$	Average forward current	$T_c = 145\text{ °C}$ $\delta = 0.5$	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	A
$P_{ARM}^{(1)}$	Repetitive peak avalanche power	$t_p = 10\text{ }\mu\text{s}$ $T_j = 125\text{ °C}$	W
T_{stg}	Storage temperature range	-65 to +175	°C
T_j	Maximum operating junction temperature	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.	Typ.	Max.	Unit	
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		15	μA
		$T_j = 125\text{ °C}$		-	1.5	15	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 8\text{ A}$			0.90	V
		$T_j = 125\text{ °C}$		-	0.66	0.72	

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:

$$P = 0.62 \times I_{F(AV)} + 0.0125 \times I_{F(RMS)}^2$$

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Figure 1. Average forward power dissipation versus average forward current

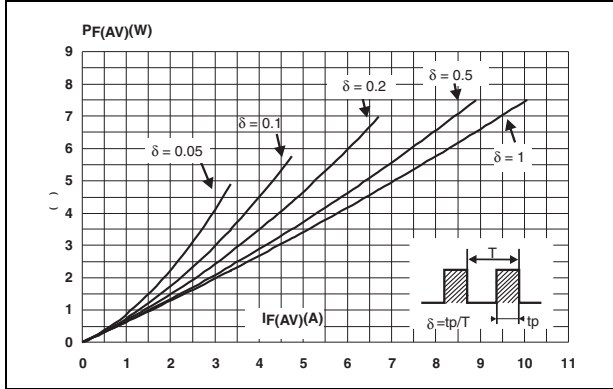


Figure 2. Average forward current versus ambient temperature (delta = 0.5)

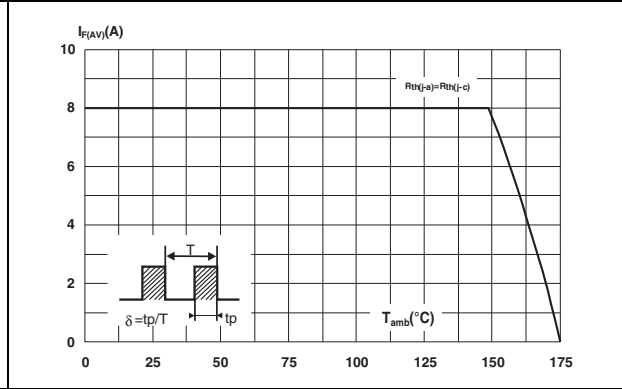


Figure 3. Normalized avalanche power derating versus pulse duration

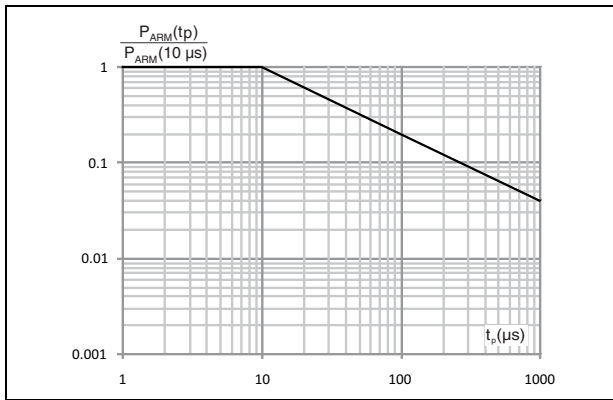


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

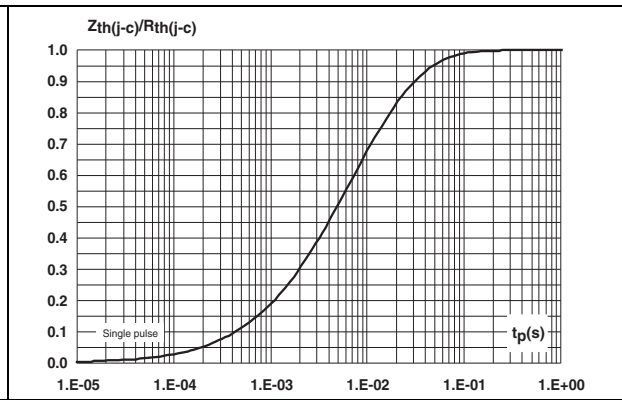


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

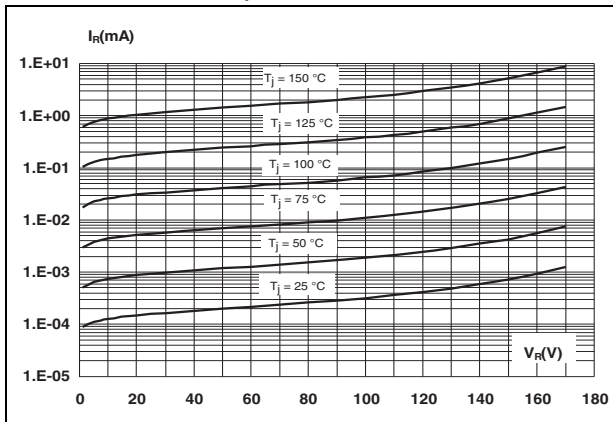
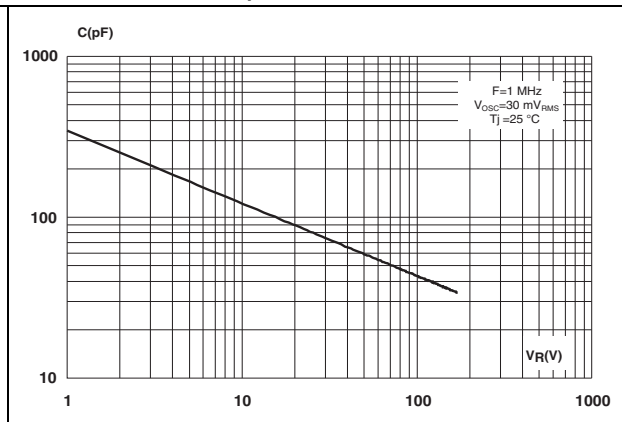


Figure 6. Junction capacitance versus reverse voltage applied (typical values)



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Figure 7. Forward voltage drop versus forward current

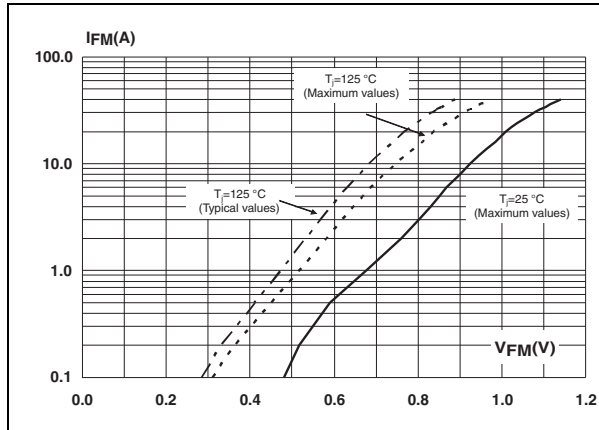
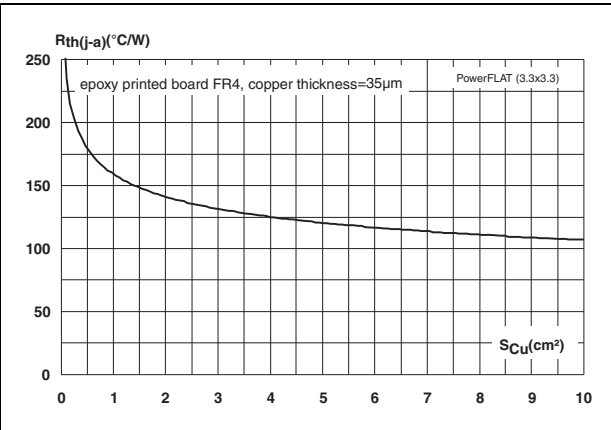


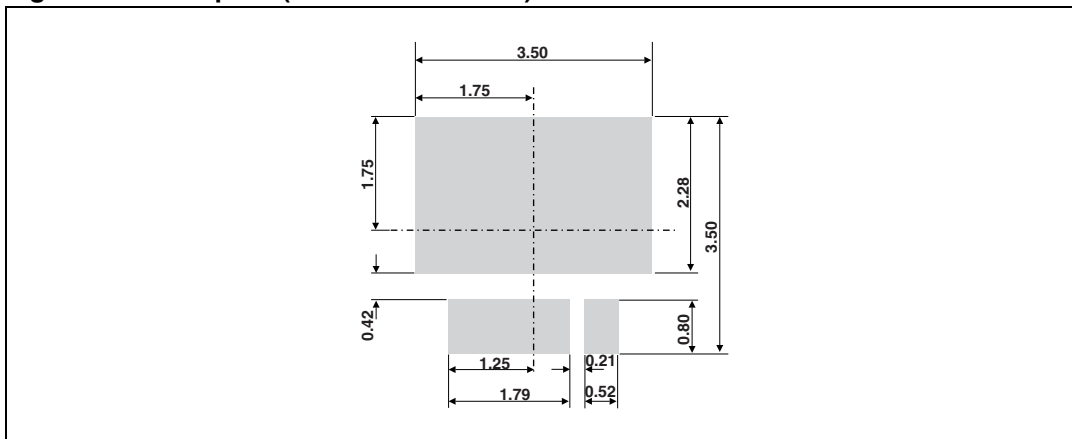
Figure 8. Thermal resistance junction to ambient versus copper surface under tab



Package information

STPS8170DEE

Figure 10. Footprint (dimensions in mm)



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Ordering information

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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