

## STPS30L30DJF

## High efficiency power Schottky diode

Datasheet - production data

### **Features**

- Low forward voltage drop
- Very small conduction losses
- Negligible switching losses
- Avalanche rated
- Extremely fast switching
- Low thermal resistance
- 1 mm package thickness
- ECOPACK®2 compliant component

## **Description**

Single Schottky rectifier suited for switch mode power supply and high frequency DC to DC converters.

Packaged in PowerFLAT™ 5x6, this device is intended for use in low voltage high frequency inverters.

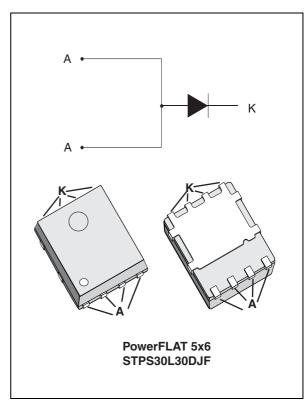


Table 1. Device summary

Symbol	Value
I <sub>F(AV)</sub>	30 A
V <sub>RRM</sub>	30 V
T <sub>j</sub> (max)	150 °C
V <sub>F</sub> (typ)	0.30 V

TM: PowerFLAT is a trademark of STMicroelectronics

Characteristics STPS30L30DJF

## 1 Characteristics

Table 2. Absolute ratings (limiting values with anode terminals short-circuited)

Symbol	Parameter	Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		30	V
I <sub>F(RMS)</sub>	Forward rms current		45	Α
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$ $T_c = 110  ^{\circ}C$		30	Α
I <sub>FSM</sub>	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$		250	Α
P <sub>ARM</sub>	Repetitive peak avalanche power $t_p = 1 \mu s, T_j = 25  ^{\circ}C$		1300	W
V <sub>ARM</sub>			35	٧
T <sub>stg</sub>	Storage temperature range	-65 to + 175	ů	
T <sub>j</sub>	Maximum operating junction temperature	150	°C	

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

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case	2	°C/W

Table 4. Static electrical characteristics (anode terminals short-circuited)

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
<sub>I_</sub> (1)	I <sub>R</sub> <sup>(1)</sup> Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>B</sub> = 30 V	-	-	0.75	mA
'R'		T <sub>j</sub> = 125 °C	v <sub>R</sub> = 30 v	-	100	230	mA
	V <sub>F</sub> <sup>(1)</sup> Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 15 A	-	-	0.44	
V <sub>E</sub> <sup>(1)</sup>		T <sub>j</sub> = 125 °C	I <sub>F</sub> = 15 A	-	0.30	0.35	V
VEV Poliward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 30 A	-	-	0.51	\ \ \	
	T <sub>j</sub> = 125 °C	I <sub>F</sub> = 30 A	-	0.38	0.45		

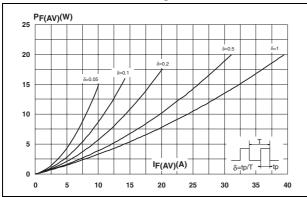
<sup>1.</sup> Pulse test:  $t_p$  = 380  $\mu$ s,  $\delta$  < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.27 \text{ x } I_{F(AV)} + 0.006 \text{ x } I_{F}^{2}_{(RMS)}$$

STPS30L30DJF Characteristics

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



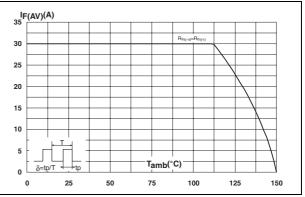
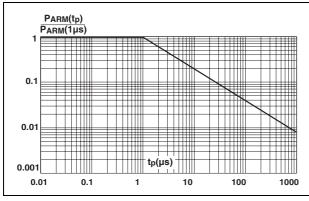


Figure 3. Normalized avalanche power derating versus pulse duration

Figure 4. Normalized avalanche power derating versus junction temperature



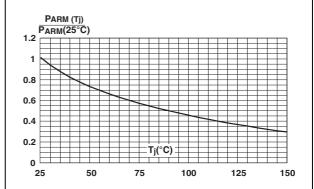
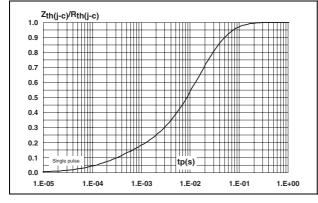
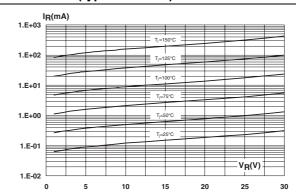


Figure 5. Relative variation of thermal impedance, junction to case, versus pulse duration

Figure 6. Reverse leakage current versus reverse voltage applied (typical values)

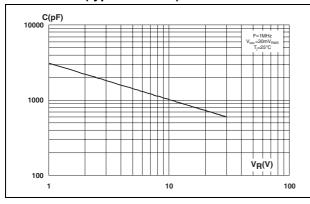




Characteristics STPS30L30DJF

Figure 7. Junction capacitance versus reverse voltage applied (typical values)

Figure 8. Forward voltage drop versus forward current



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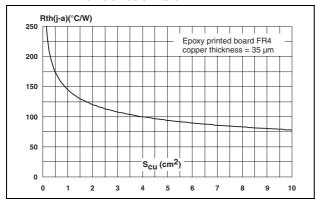
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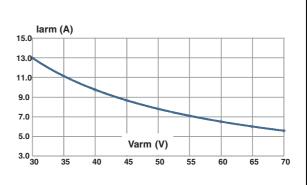
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Figure 9. Thermal resistance junction to ambient versus copper surface under each tab

Figure 10. Reverse safe operating area ( $t_p < 1 \ \mu s$  and  $T_j < 150 \ ^{\circ}C$ )



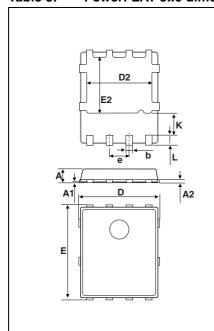


## 2 Package information

- Epoxy meets UL94,V0
- Lead-free package

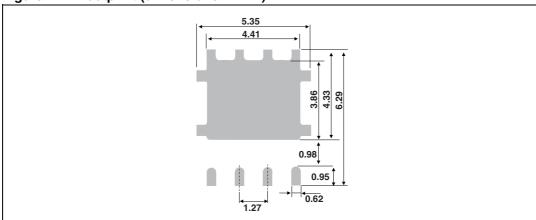
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: <a href="https://www.st.com">www.st.com</a>. ECOPACK<sup>®</sup> is an ST trademark.

Table 5. PowerFLAT 5x6 dimensions



	Dimensions						
Ref.	Ref. Millimeters		S		Inches		
	Min.	Тур.	Max.	Min.	Тур.	Max.	
Α	0.80		1.00	0.031		0.039	
A1	0.02		0.05	0.001		0.002	
A2		0.25			0.010		
b	0.30		0.50	0.012		0.020	
D		5.20			0.205		
D2	4.11		4.31	0.162		0.170	
е		1.27			0.050		
Е		6.15			0.242		
E2	3.50		3.70	0.138		0.146	
L	0.50		0.80	0.020		0.031	
K	1.275		1.575	0.050		0.062	

Figure 11. Footprint (dimensions in mm)



Ordering information STPS30L30DJF

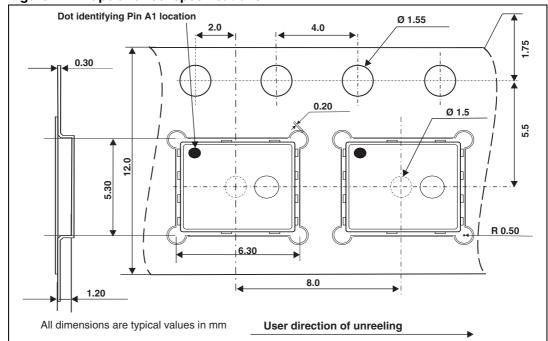


Figure 12. Tape and reel specifications

# 3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS30L30DJF-TR	PS30 L30	PowerFLAT 5x6	0.095 g	3000	Tape and reel

## 4 Revision history

Table 7. Document revision history

Date	Revision	Changes
16-Mar-2012	1	First issue.

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