

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.

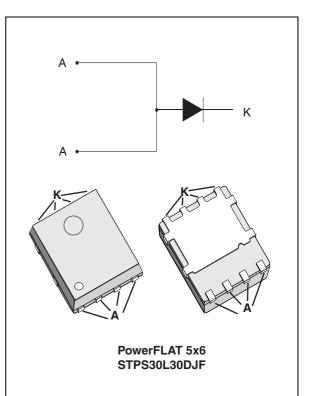


Table 1. Do	evice summary	
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Symbol	Value
I _{F(AV)}	30 A
V _{RRM}	30 V
T _j (max)	150 °C
V _F (typ)	0.30 V

TM: PowerFLAT is a trademark of STMicroelectronics

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This is information on a product in full production.

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 _{F(RMS)}	Forward rms current	45	А	
I _{F(AV)}	Average forward current $\delta = 0.5$ $T_c = 110 \ ^{\circ}C$		30	А
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$		250	А
P _{ARM}	Repetitive peak avalanche power $t_p = 1 \ \mu s, T_j = 25 \ ^{\circ}C$		1300	W
V _{ARM}			35	V
T _{stg}	Storage temperature range	-65 to + 175	°C	
Тj	Maximum operating junction temperatu	150	°C	

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

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Junction to case	2	°C/W

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

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _B ⁽¹⁾	Reverse leakage	T _j = 25 °C	$V_{D} = 30 V$	-	-	0.75	mA
'R`	current	current $T_j = 125 \text{ °C}$ $V_R = 30 \text{ V}$ -		100	230	mA	
		T _j = 25 °C	I _F = 15 A	-	-	0.44	
V _E ⁽¹⁾	Forward voltage drop	T _j = 125 °C	I _F = 15 A	-	0.30	0.35	v
VF FU	Forward voltage drop	T _j = 25 °C	I _F = 30 A	-	-	0.51	v
		T _j = 125 °C	I _F = 30 A	-	0.38	0.45	

1. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

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



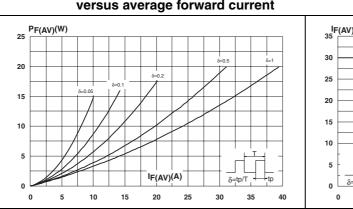
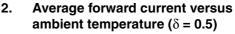


Figure 1. Average forward power dissipation Figure 2. versus average forward current



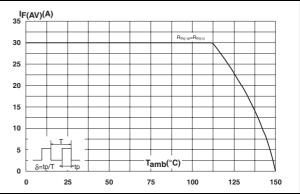


Figure 3. Normalized avalanche power derating versus pulse duration

Figure 4. Normalized avalanche power derating versus junction temperature

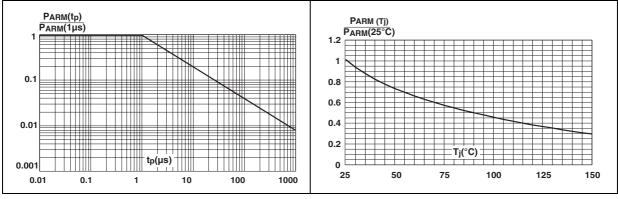
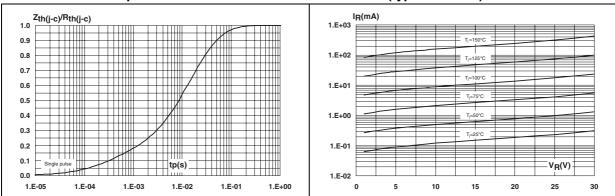


Figure 5. Relative variation of thermal impedance, junction to case, versus pulse duration

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



VFM(V)

0.7

0.6

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

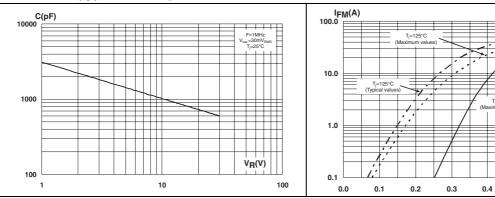
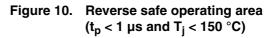


Figure 9. Thermal resistance junction to ambient versus copper surface under each tab



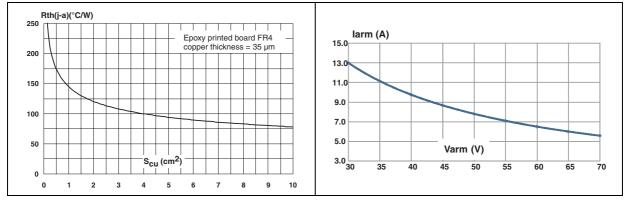


Figure 8. Forward voltage drop versus forward current

T.=25

0.5

57

2 Package information

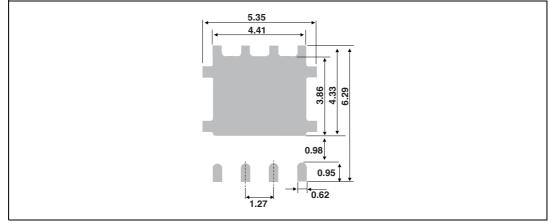
- Epoxy meets UL94,V0
- Lead-free package

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.

Table 5.PowerFLAT 5x6 dimensions

				Dimen	sions		
الخصصا	Ref.	М	illimete	rs		Inches	
		Min.	Тур.	Max.	Min.	Тур.	Max.
	А	0.80		1.00	0.031		0.039
, ,∫κ	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	
	E		6.15			0.242	
	E2	3.50		3.70	0.138		0.146
	L	0.50		0.80	0.020		0.031
	К	1.275		1.575	0.050		0.062

Figure 11. Footprint (dimensions in mm)



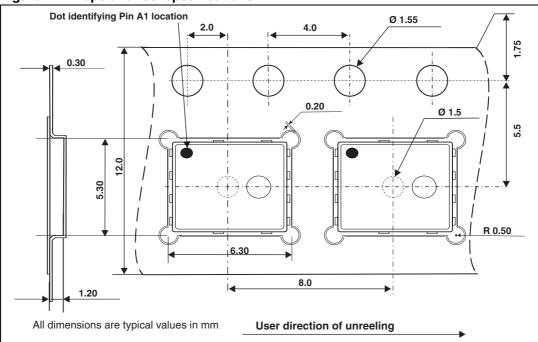


Figure 12. Tape and reel specifications

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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