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STMicroelectronics
STPS30L30DJF-TR

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STPS30L30DJF

High efficiency power Schottky diode

Datasheet – production data

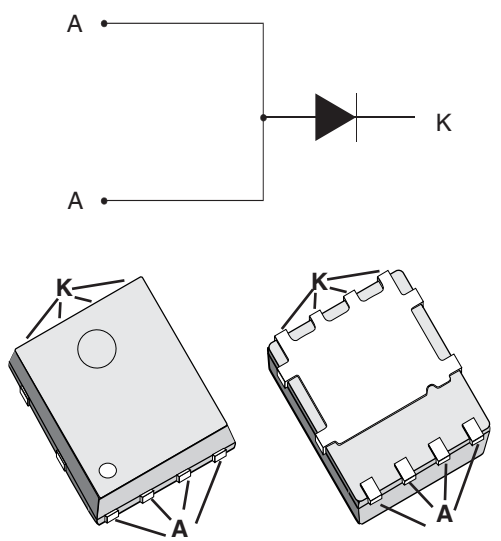
Features

- 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.



PowerFLAT 5x6
STPS30L30DJF

Table 1. Device summary

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

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	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 110$ °C	30	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal	250	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1$ µs, $T_j = 25$ °C	1300	W
V_{ARM}	Maximum repetitive peak avalanche voltage	t_p <1 µs, T_j < 150 °C, I_{AR} < 11 A	35	V
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature (1)		150	°C

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

Table 3. Thermal resistance

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

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

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	$T_j = 25$ °C	$V_R = 30$ V	-	-	0.75	mA
		$T_j = 125$ °C		-	100	230	mA
V_F(1)	Forward voltage drop	$T_j = 25$ °C	$I_F = 15$ A	-	-	0.44	V
		$T_j = 125$ °C	$I_F = 15$ A	-	0.30	0.35	
		$T_j = 25$ °C	$I_F = 30$ A	-	-	0.51	
		$T_j = 125$ °C	$I_F = 30$ A	-	0.38	0.45	

1. Pulse test: $t_p = 380$ µs, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

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

Figure 1. Average forward power dissipation versus average forward current

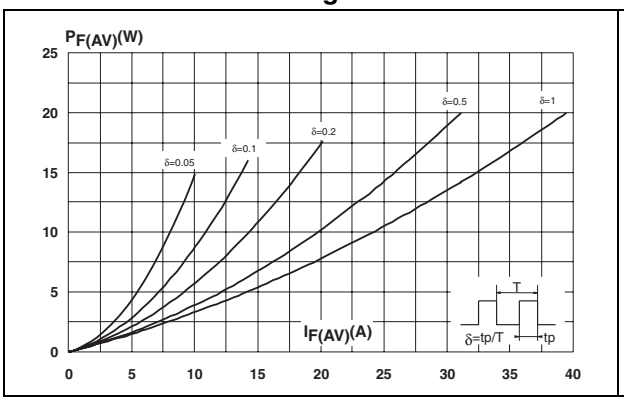


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

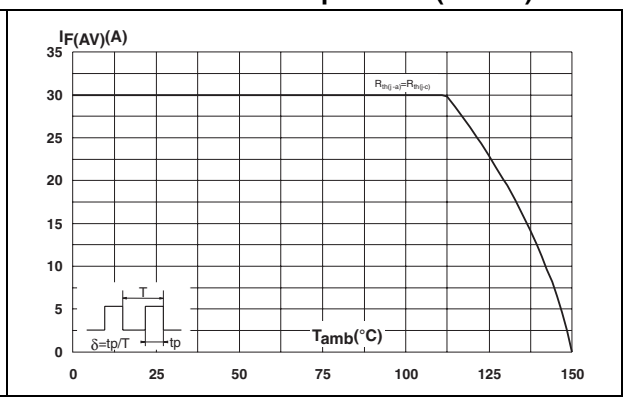


Figure 3. Normalized avalanche power derating versus pulse duration

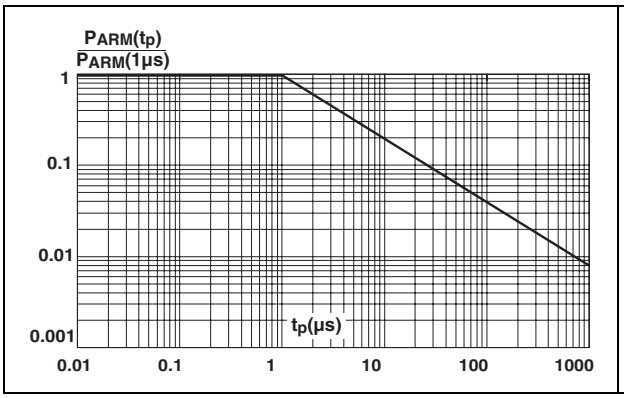


Figure 4. Normalized avalanche power derating versus junction temperature

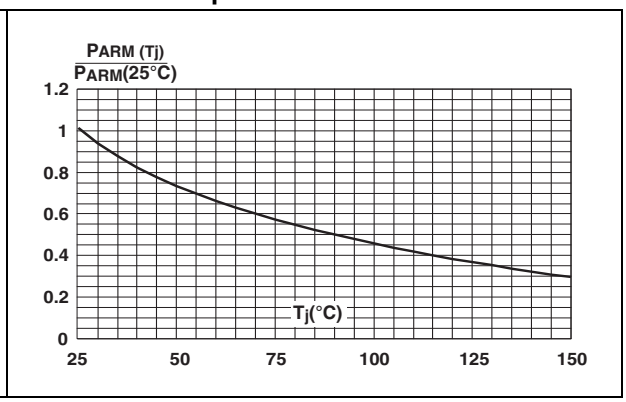


Figure 5. Relative variation of thermal impedance, junction to case, versus pulse duration

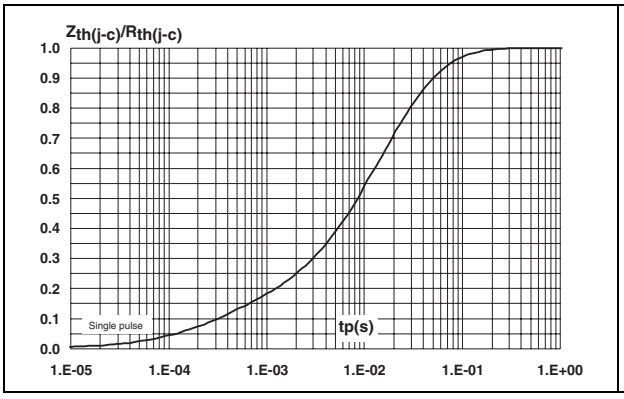


Figure 6. Reverse leakage current versus reverse voltage applied (typical values)

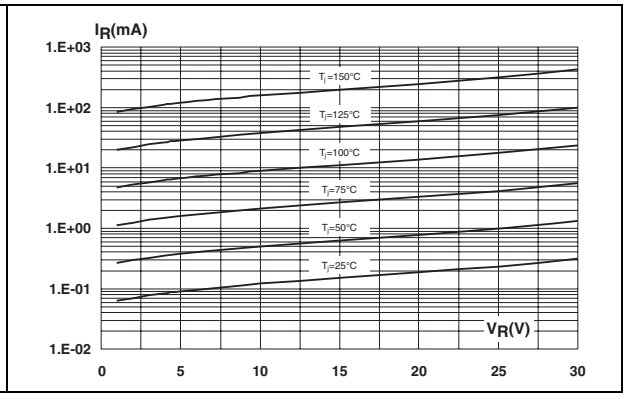


Figure 7. Junction capacitance versus reverse voltage applied (typical values)

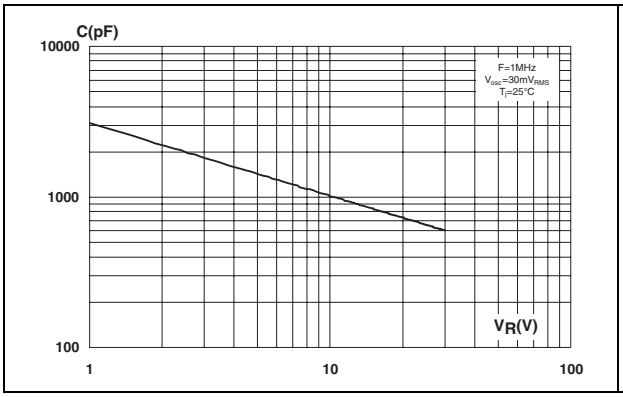


Figure 8. Forward voltage drop versus forward current

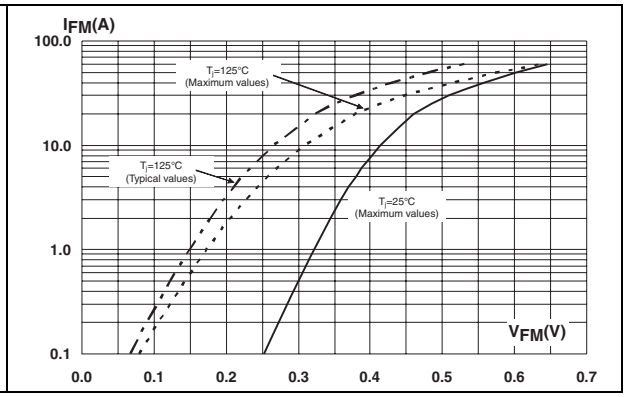


Figure 9. Thermal resistance junction to ambient versus copper surface under each tab

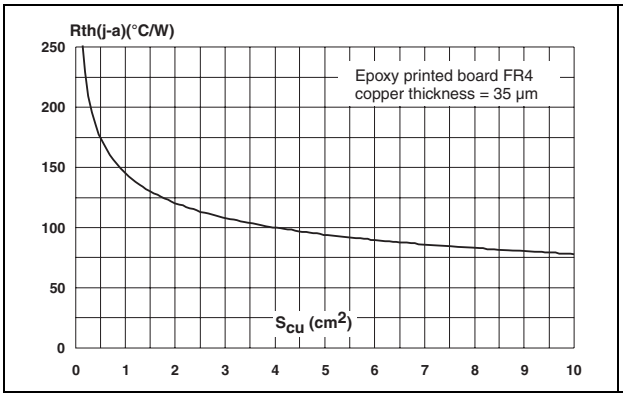
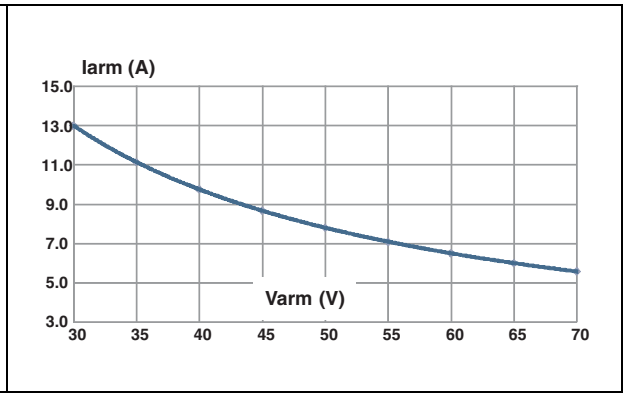


Figure 10. Reverse safe operating area (t_p < 1 µs and T_j < 150 °C)

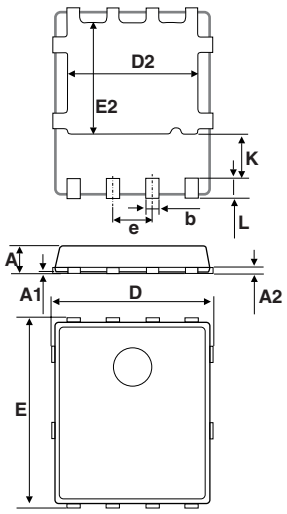


2 Package information

- Epoxy meets UL94,V0
- Lead-free package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® 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.

Table 5. PowerFLAT 5x6 dimensions



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	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
e		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
K	1.275		1.575	0.050		0.062

Figure 11. Footprint (dimensions in mm)

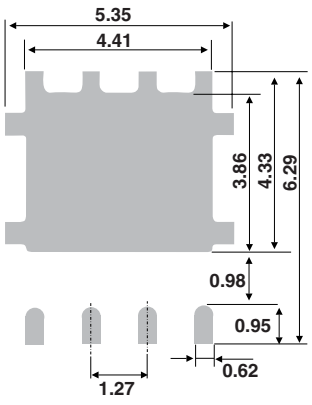
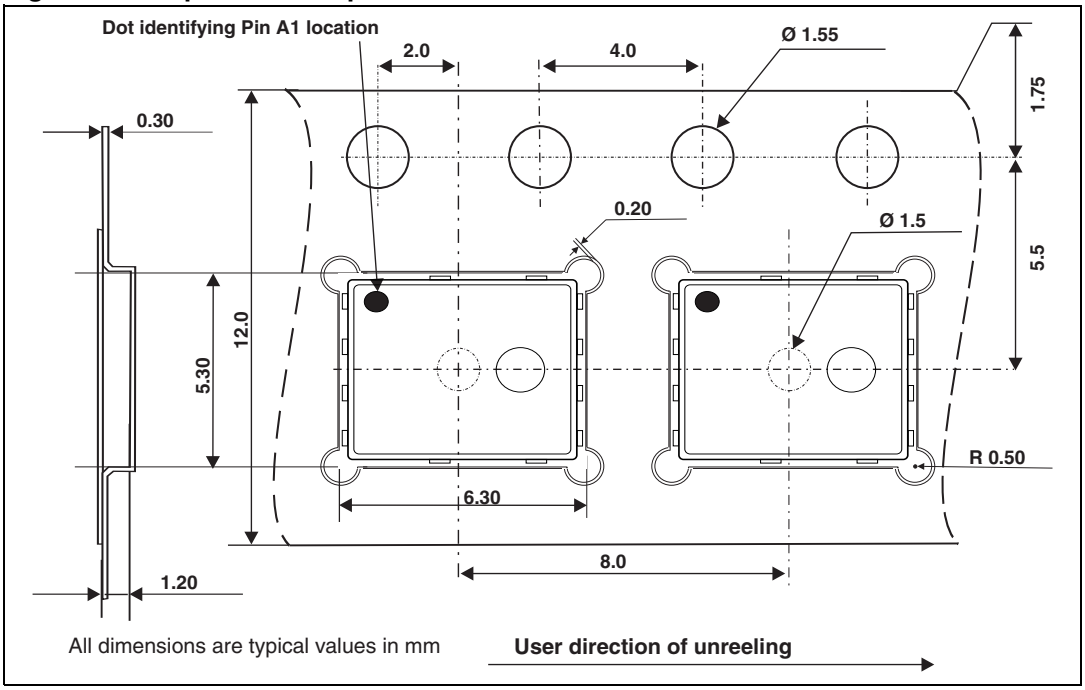


Figure 12. Tape and reel specifications



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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