STPS15L30CDJF

Low drop power Schottky rectifier

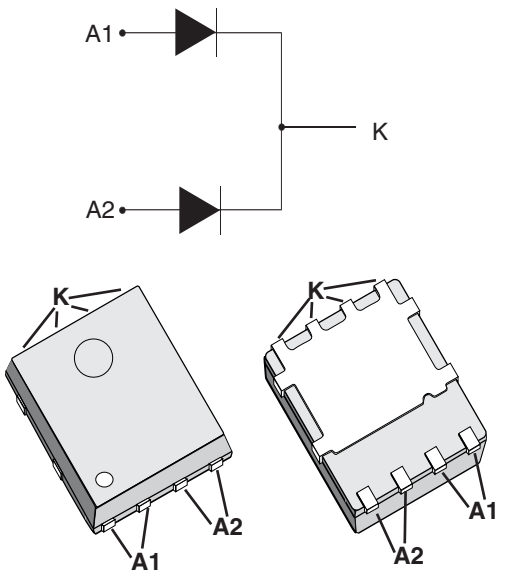
Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- Low forward voltage drop
- Low thermal resistance
- High avalanche capability specified

Description

Dual center tap Schottky rectifier suited 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 and polarity protection applications.



PowerFLAT 5x6
STPS15L30CDJF

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 7.5 A
V_{RRM}	30 V
T_j (max)	150 °C
V_F(typ)	0.34 V

TM: PowerFLAT is a trademark of STMicroelectronics

1 Characteristics

Table 2. Absolute ratings (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			30	V
$I_{F(RMS)}$	Forward rms current			10	A
$I_{F(AV)}$	Average forward current δ = 0.5	T_c = 140 °C	Per diode	7.5	A
			Per device	15	
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal		75	A
I_{RRM}	Peak repetitive reverse current	t_p = 2 µs square F= 1 kHz		1	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs T_j = 25 °C		2800	W
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	Per diode	2.5	°C/W
		Total	1.6	
$R_{th(c)}$	Coupling		0.7	

When diodes 1 and 2 are used simultaneously:

ΔT_j(diode 1) = P(diode1) x $R_{th(j-c)}$(per diode) + P(diode 2) x $R_{th(c)}$

Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	-	1	mA
		T_j = 125 °C		-	70	140	mA
V_F(1)	Forward voltage drop	T_j = 25 °C	I_F = 7.5 A	-	-	0.48	V
		T_j = 125 °C	I_F = 7.5 A	-	0.34	0.39	
		T_j = 25 °C	I_F = 15 A	-	-	0.57	
		T_j = 125 °C	I_F = 15 A	-	0.44	0.51	

1. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.27 \times I_{F(AV)} + 0.016\ I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current (per diode)

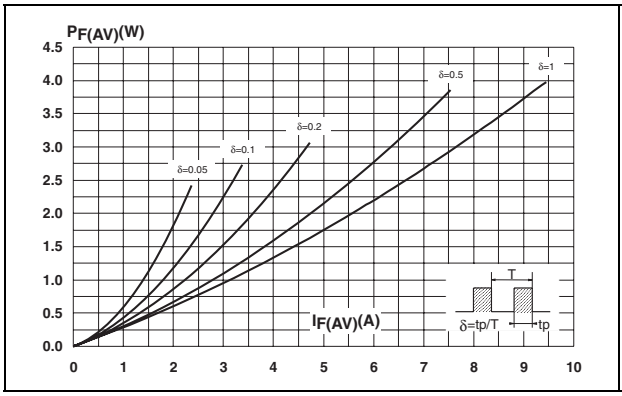


Figure 2. Average forward current versus ambient temperature (δ = 0.5, per diode)

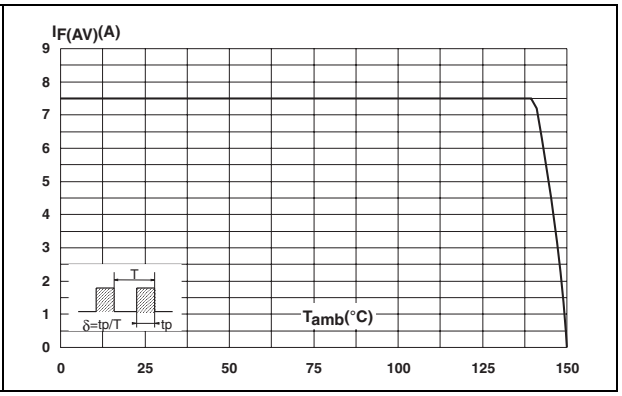


Figure 3. Normalized avalanche power derating versus pulse duration

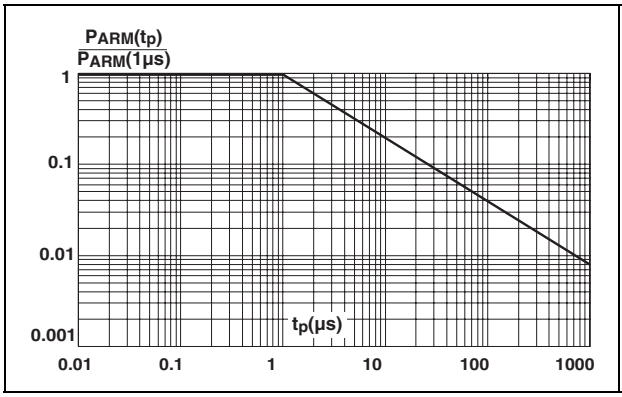


Figure 4. Normalized avalanche power derating versus junction temperature

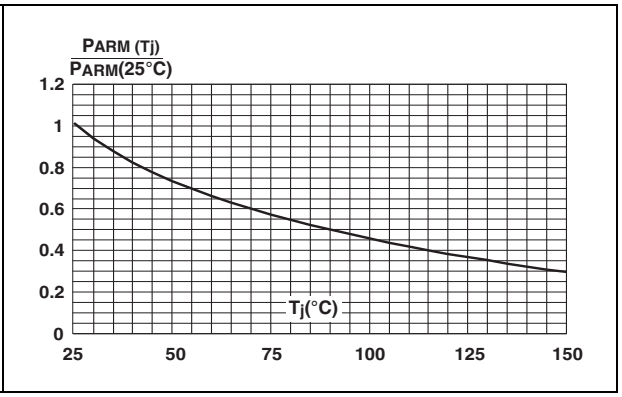


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)

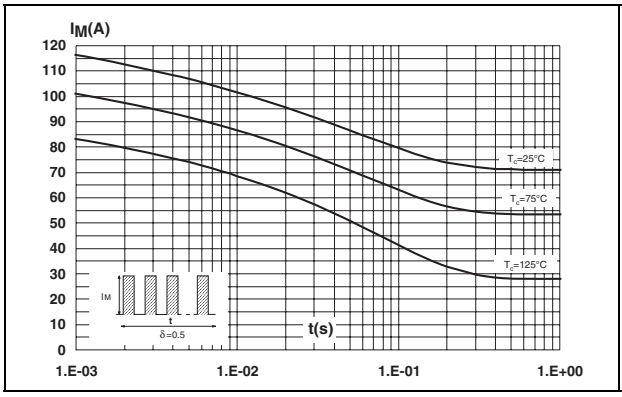


Figure 6. Relative variation of thermal impedance, junction to case, versus pulse duration

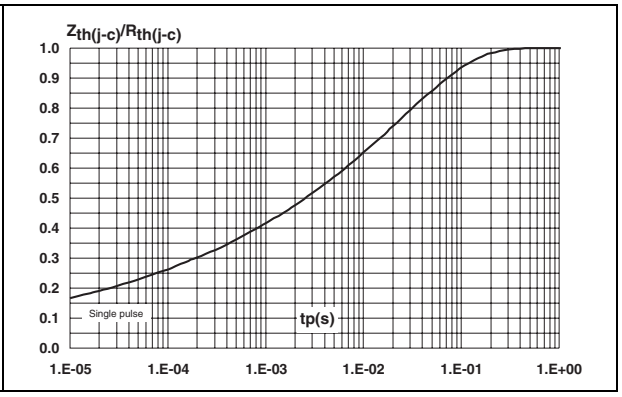


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

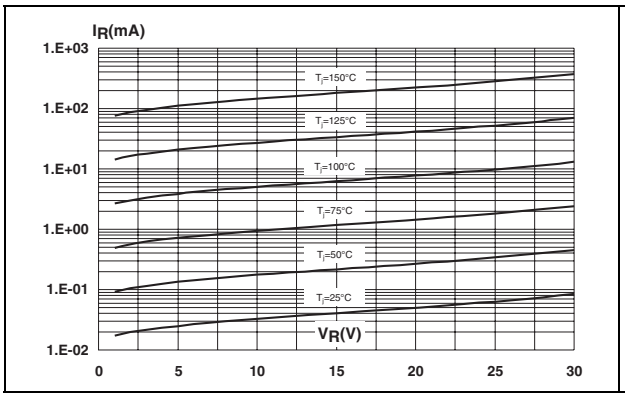


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

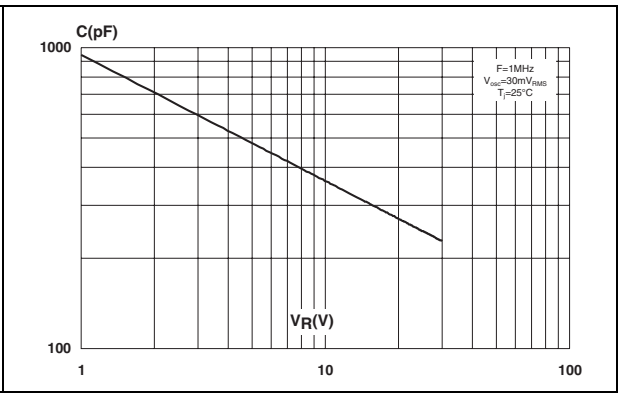


Figure 9. Forward voltage drop versus forward current (per diode)

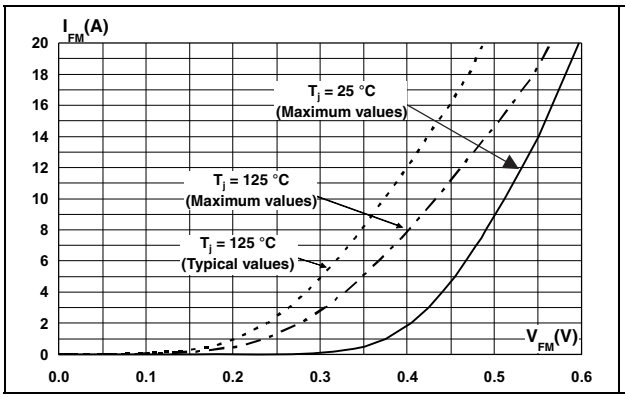
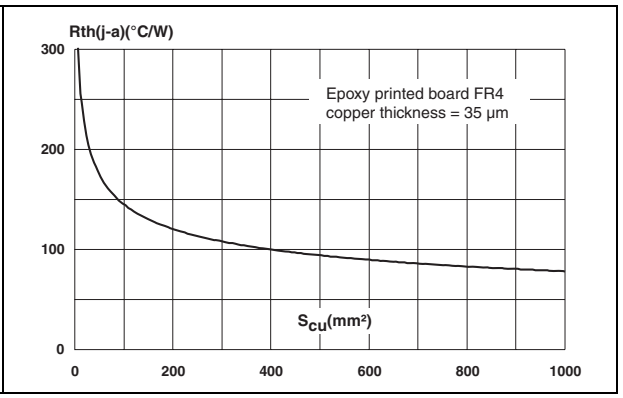


Figure 10. Thermal resistance junction to ambient versus copper surface under each lead

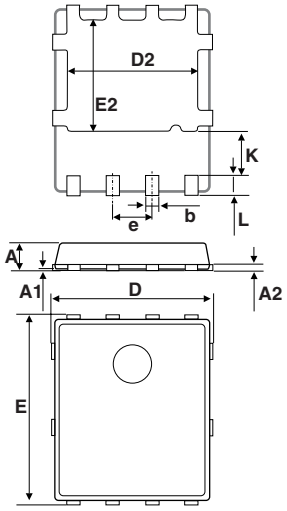


2 Package information

- 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)

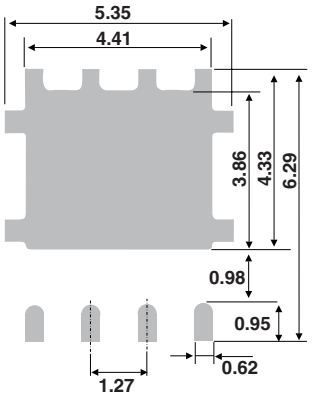
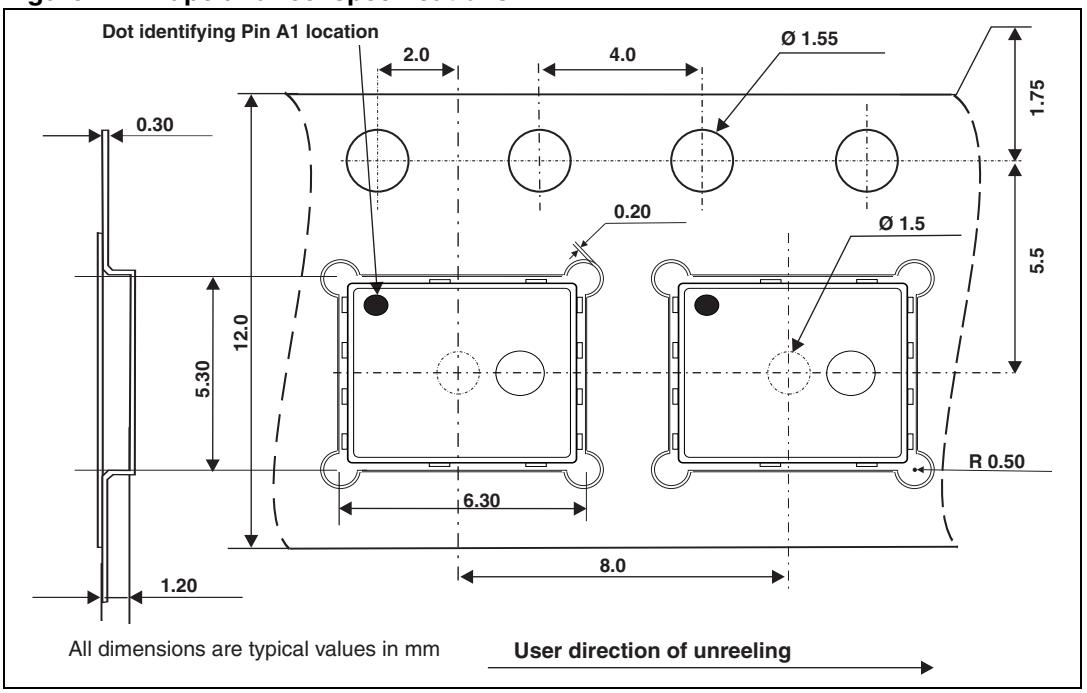


Figure 12. Tape and reel specifications



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS15L30CDJFTR	PS15 L30C	PowerFLAT 5x6	0.095 g	3000	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
13-May-2009	1	First issue.
09-Nov-2009	2	Updated *Table 1.*
30-Jul-2010	3	Replace Power QFN with PowerFLAT. Updated *Figure 9.*
18-May-2011	4	Added reference E in *Table 5*. Updated package graphics. Removed dash from order code and updated marking in *Table 6*. Added *Figure 12.*

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