

## Low drop power Schottky rectifier

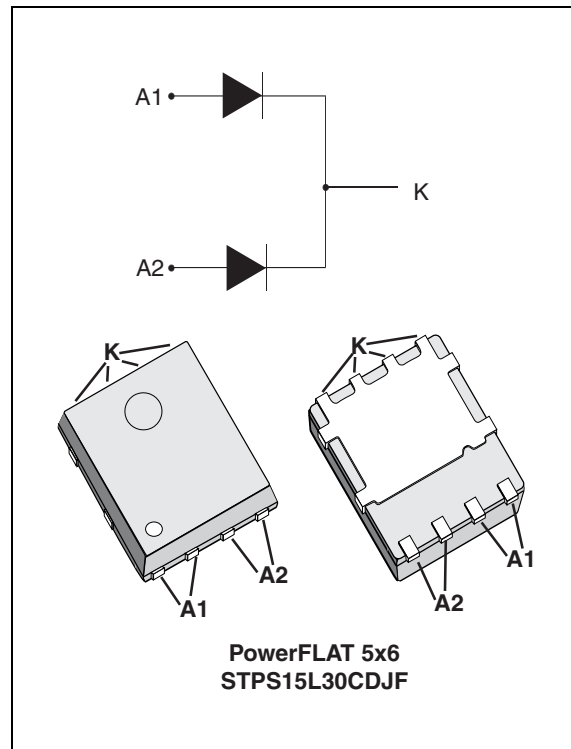
### Features

- 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.



**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 $\delta = 0.5$	$T_c = 140\text{ }^\circ\text{C}$	Per diode	7.5	A
			Per device	15	
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	75	A	
$I_{RRM}$	Peak repetitive reverse current	$t_p = 2\text{ }\mu\text{s}$ square F= 1 kHz	1	A	
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s}$ $T_j = 25\text{ }^\circ\text{C}$	2800	W	
$T_{stg}$	Storage temperature range		-65 to + 175	$^\circ\text{C}$	
$T_j$	Maximum operating junction temperature <sup>(1)</sup>		150	$^\circ\text{C}$	

1.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  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	$^\circ\text{C/W}$
		Total	1.6	
$R_{th(c)}$	Coupling		0.7	

When diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)}(\text{per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

**Table 4. Static electrical characteristics (per diode)**

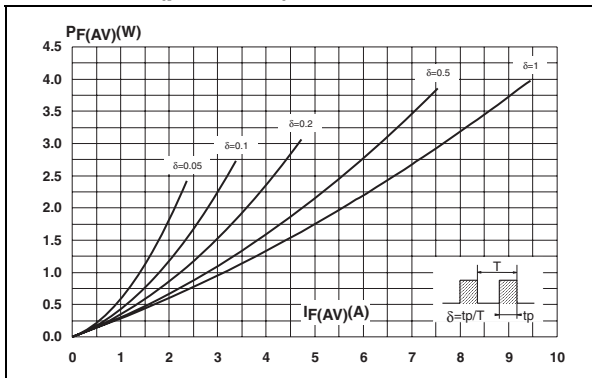
Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ }^\circ\text{C}$	$V_R = V_{RRM}$	-	-	1	mA
		$T_j = 125\text{ }^\circ\text{C}$		-	70	140	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 25\text{ }^\circ\text{C}$	$I_F = 7.5\text{ A}$	-	-	0.48	V
		$T_j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

1. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

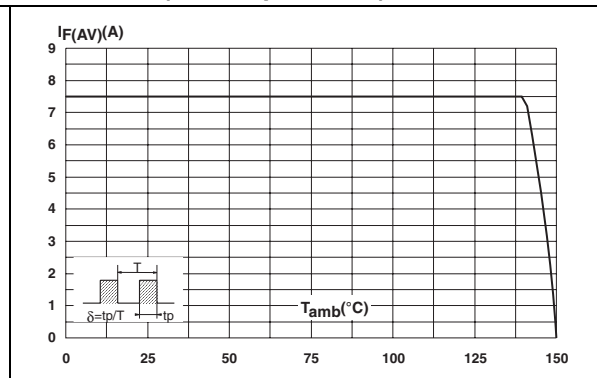
To evaluate the conduction losses use the following equation:

$$P = 0.27 \times I_{F(AV)} + 0.016 I_{F(RMS)}^2$$

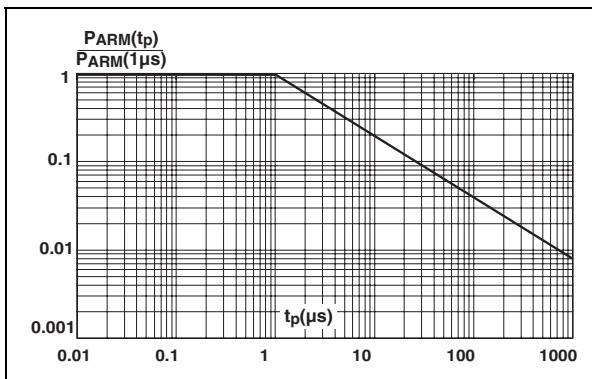
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



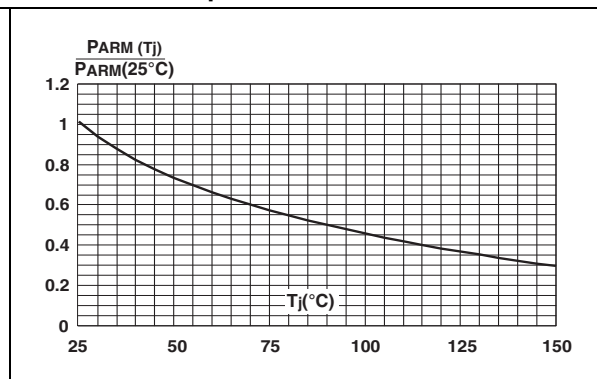
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)**



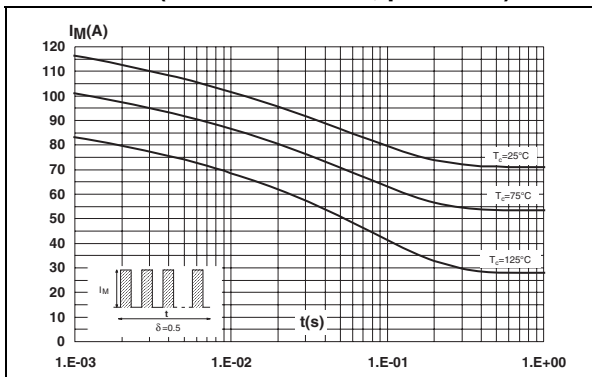
**Figure 3. Normalized avalanche power derating versus pulse duration**



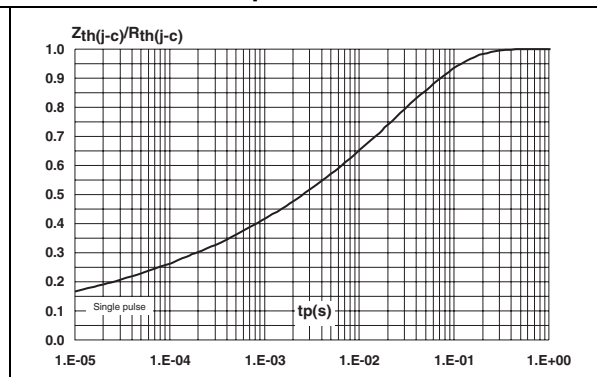
**Figure 4. Normalized avalanche power derating versus junction temperature**



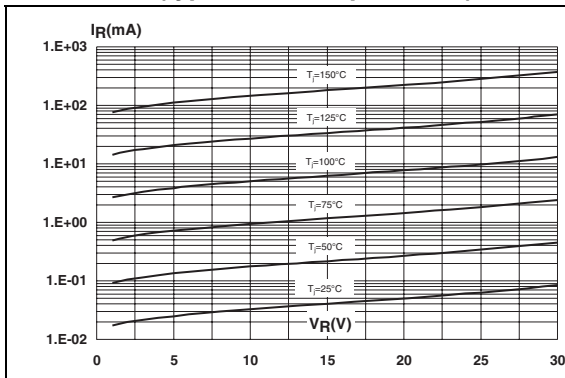
**Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)**



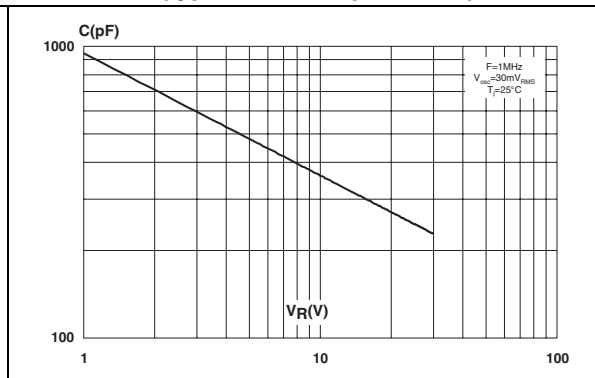
**Figure 6. Relative variation of thermal impedance, junction to case, versus pulse duration**



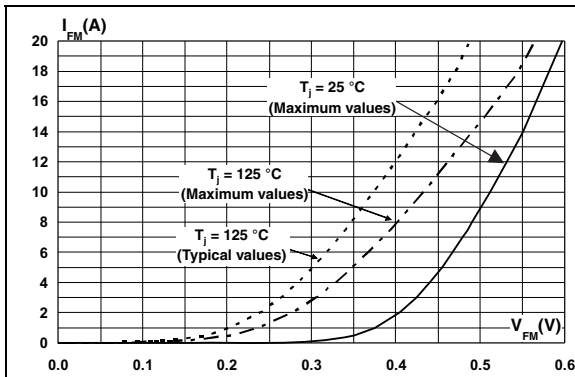
**Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



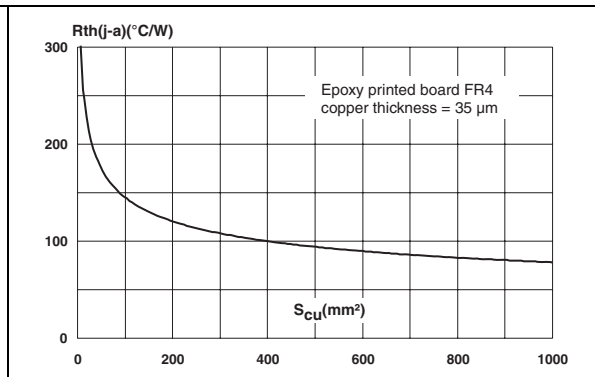
**Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)**



**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](http://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)**

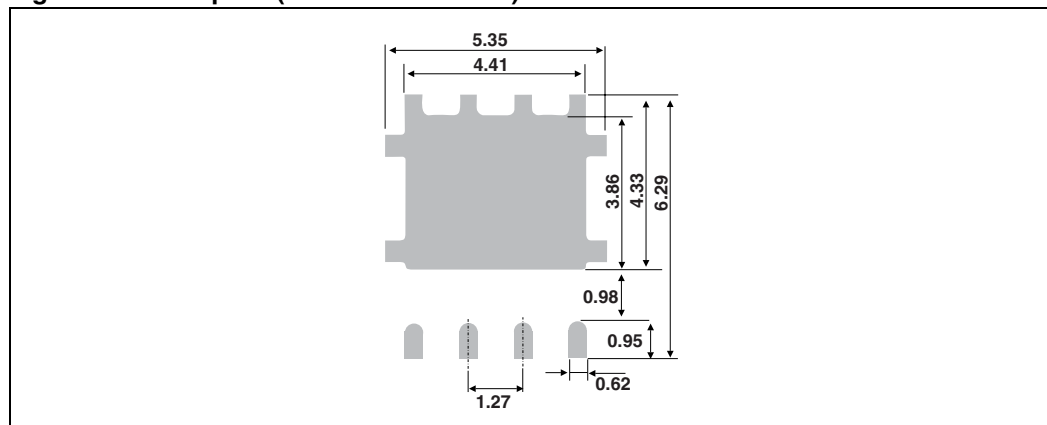
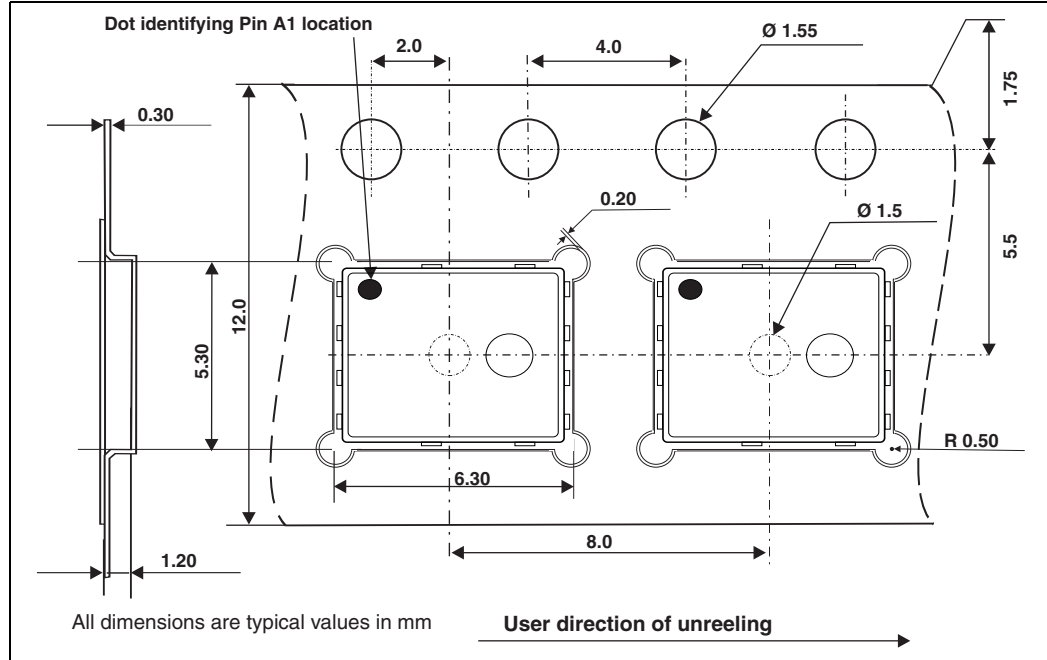


Figure 12. Tape and reel specifications



### 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 <a href="#">Table 1</a> .
30-Jul-2010	3	Replace Power QFN with PowerFLAT. Updated <a href="#">Figure 9</a> .
18-May-2011	4	Added reference E in <a href="#">Table 5</a> . Updated package graphics. Removed dash from order code and updated marking in <a href="#">Table 6</a> . Added <a href="#">Figure 12</a> .

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