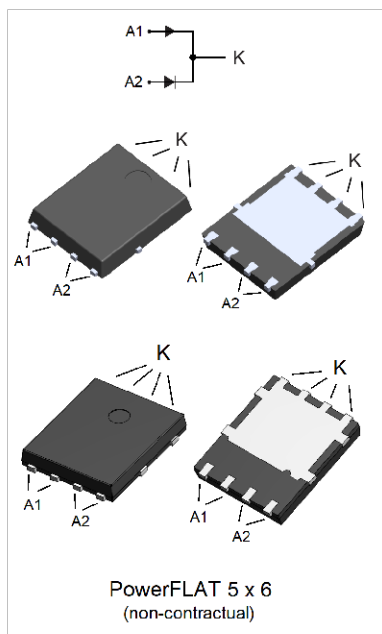


## 30 V, 15 A high efficiency PowerFLAT power Schottky diode



### Features

- Low forward voltage drop
- Very low conduction losses
- Negligible switching losses
- Extremely fast switching
- Low thermal resistance
- Avalanche rated
- High integration
- Thin package: 1 mm
- ECOPACK2 compliant

### Applications

- Switching diode
- SMPS
- DC/DC converter
- Telecom power

### Description

This dual center tap Schottky rectifier is ideally suited for switch mode power supply and high frequency DC to DC converters.

Packaged in PowerFLAT 5x6, the [STPS15L30CDJF](#) is optimized for use in low voltage high frequency inverters, free-wheeling and polarity protection applications. Its low profile was especially designed to be used in applications with space-saving constraints.

#### Product status link

[STPS15L30CDJF](#)

#### Product 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

# 1 Characteristics

**Table 1. Absolute ratings (limiting values, per diode)**

Symbol	Parameter			Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage			30	V
I <sub>F(RMS)</sub>	Forward rms current			10	A
I <sub>F(AV)</sub>	Average forward current, δ = 0.5 square wave	T <sub>c</sub> = 140 °C	Per diode	7.5	A
		T <sub>c</sub> = 135 °C	Per device	15	
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal		75	A
P <sub>ARM</sub>	Repetitive peak avalanche power	t <sub>p</sub> = 10 μs, T <sub>j</sub> = 125 °C		200	W
T <sub>stg</sub>	Storage temperature range			-65 to +175	°C
T <sub>j</sub>	Maximum operating junction temperature <sup>(1)</sup>			+150	°C

1.  $(dP_{tot}/dT_j) < (1/R_{th(j-a)})$  condition to avoid thermal runaway for a diode on its own heatsink.

**Table 2. Thermal resistance parameters**

Symbol	Parameter		Max.	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	2.5	°C/W
		Per device	1.6	
R <sub>th(c)</sub>	Coupling		0.7	

When the diodes 1 and 2 are used simultaneously :

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

For more information, please refer to the following application note :

- [AN5046](#): Printed circuit board assembly recommendations for STMicroelectronics PowerFLAT packages

**Table 3. Static electrical characteristics (per diode)**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = 30 V	-		1	mA
		T <sub>j</sub> = 125 °C		-	70	140	mA
V <sub>F</sub> <sup>(1)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 7.5 A	-		0.48	V
		T <sub>j</sub> = 125 °C		-	0.34	0.39	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 15 A	-		0.57	
		T <sub>j</sub> = 125 °C		-	0.44	0.51	

1. Pulse test: t<sub>p</sub> = 380  $\mu$ s,  $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

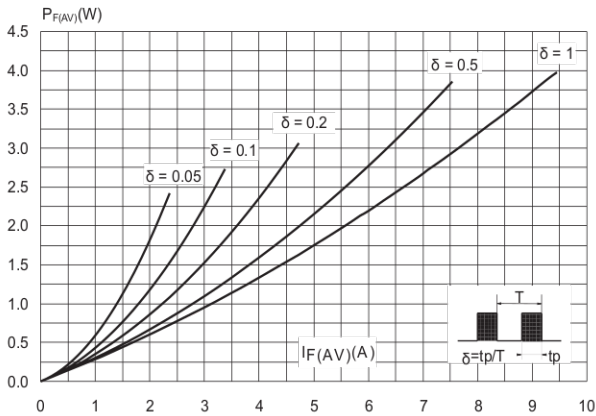
$$P = 0.27 \times I_{F(AV)} + 0.016 \times I_{F(RMS)}^2$$

For more information, please refer to the following application notes related to the power losses:

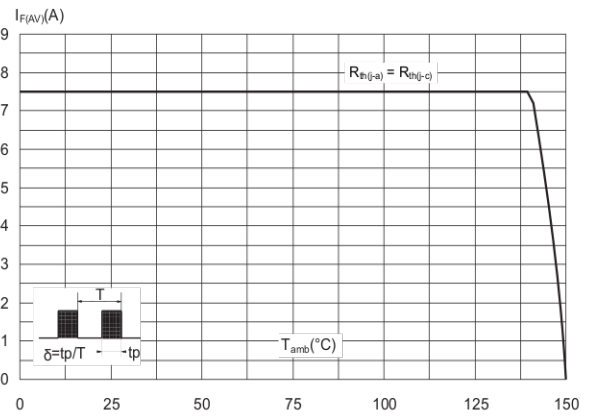
- [AN604](#): Calculation of conduction losses in a power rectifier
- [AN4021](#): Calculation of reverse losses in a power diode

## 1.1 Characteristics (curves)

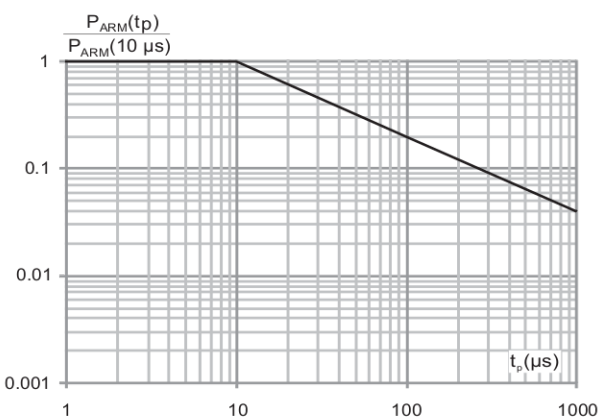
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



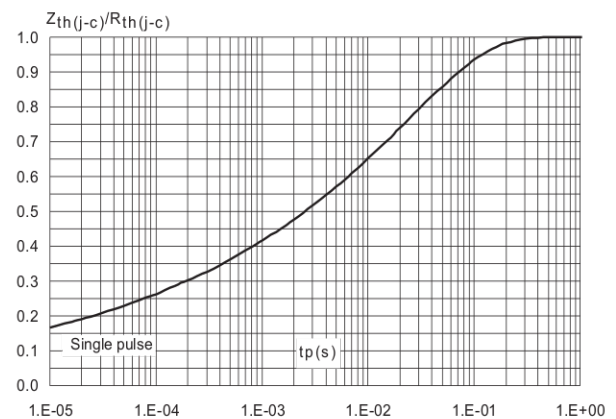
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)**



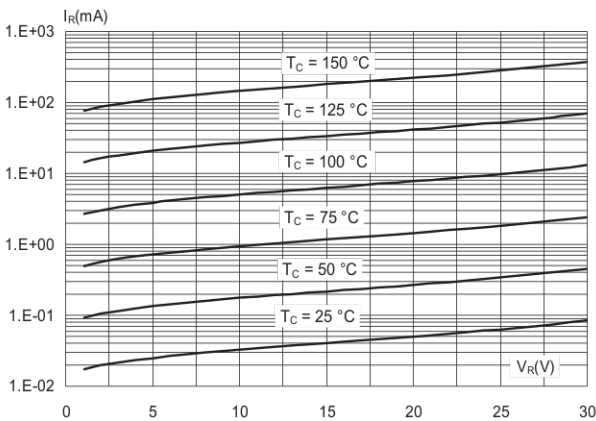
**Figure 3. Normalized avalanche power derating versus pulse duration**



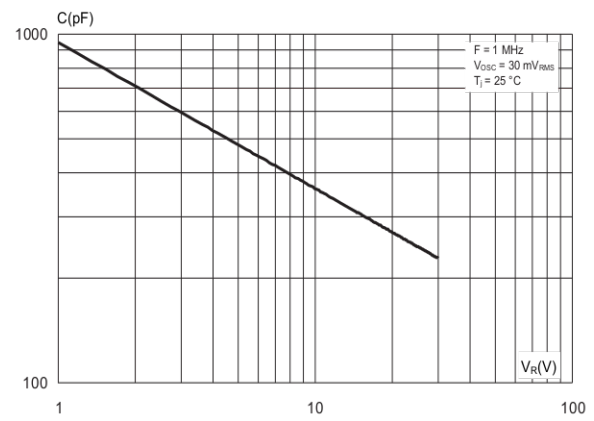
**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**



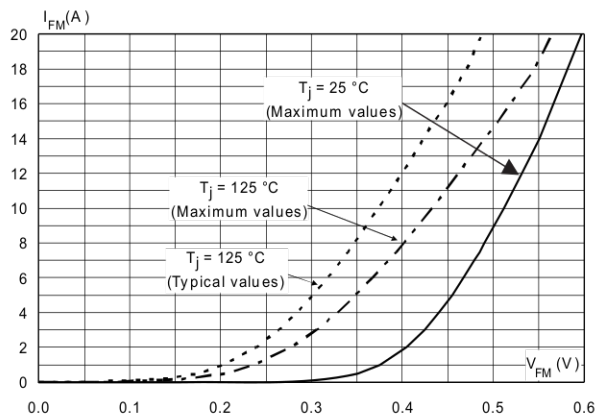
**Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



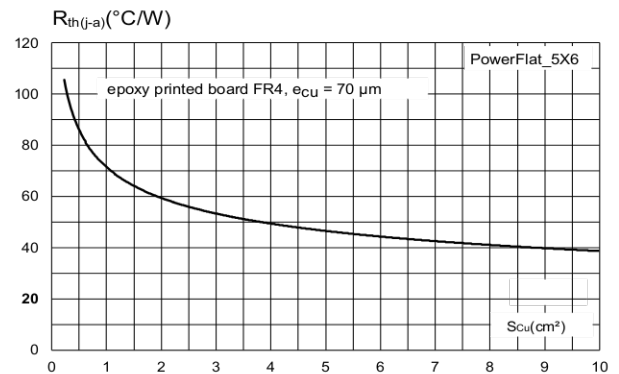
**Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)**



**Figure 7. Forward voltage drop versus forward current (per diode)**



**Figure 8. Thermal resistance junction to ambient versus copper surface under tab (typical values)**



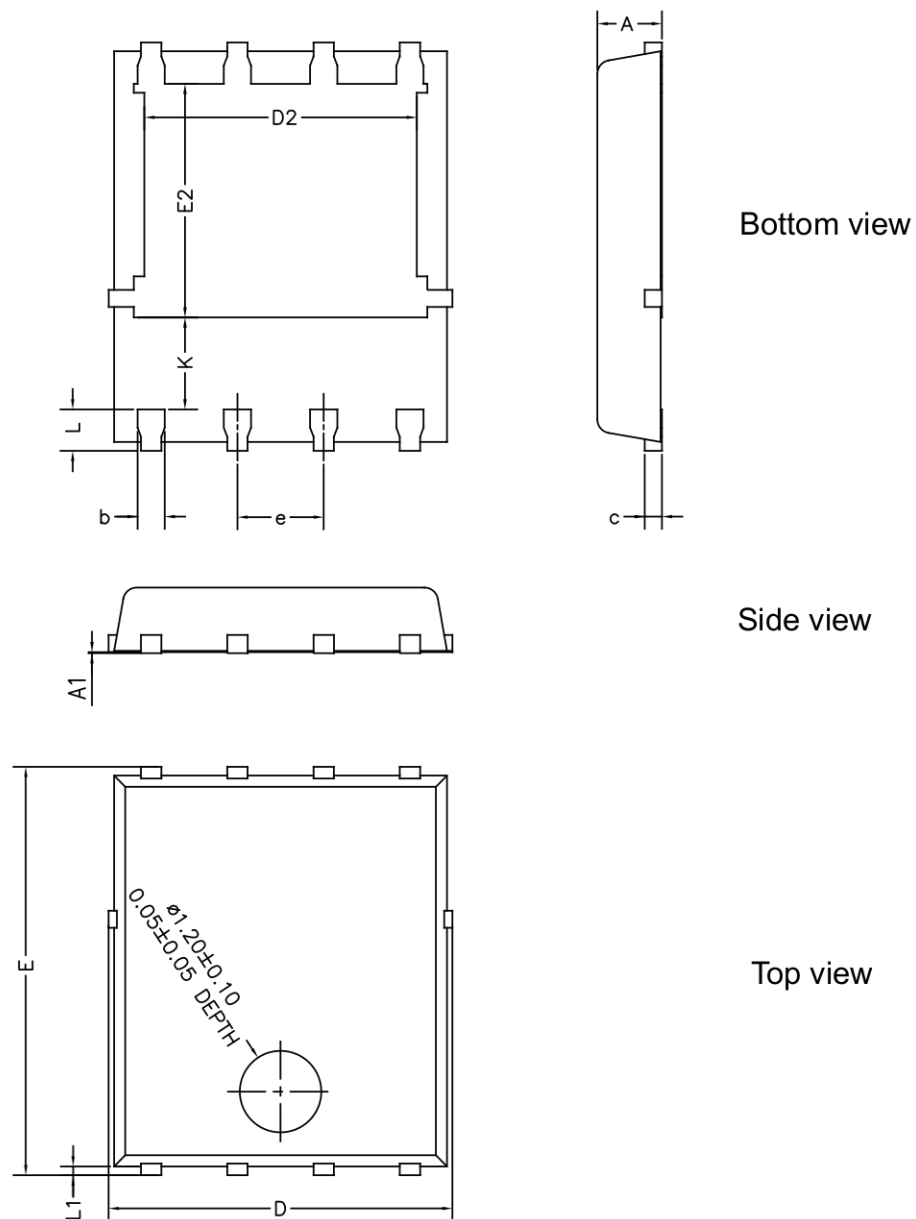
## 2 Package information

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.

### 2.1 PowerFLAT 5x6 package information

- Epoxy meets UL 94, V0
- Cooling method: by conduction (C)

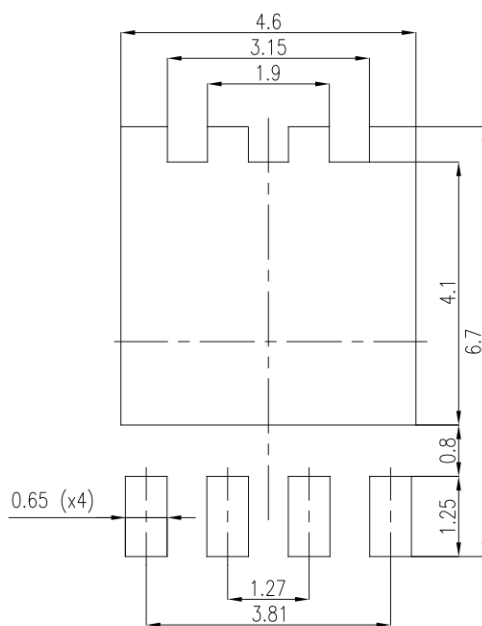
**Figure 9. PowerFLAT 5x6 package outline (non-contractual)**



**Note:** This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

**Table 4. PowerFLAT 5x6 mechanical data**

Ref	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.80		1.00	0.031		0.039
A1	0.00		0.05	0.000		0.002
b	0.30		0.50	0.01		0.02
c		0.25			0.010	
D	4.80		5.40	0.189		0.212
D2	3.91		4.45	0.154		0.175
e		1.27			0.050	
E	5.90		6.35	0.232		0.250
E2	3.34		3.70	0.138		0.146
L	0.50		0.80	0.020		0.031
K	1.10		1.575	0.015		0.023
L1	0.05	0.15	0.25	0.002	0.006	0.009

**Figure 10. PowerFLAT 5x6 recommended footprint (dimensions are in mm)**


**Note:** For packing information, please refer to [TN1173](#).



### 3 Ordering information

**Table 5. Ordering information**

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

## Revision history

**Table 6. 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.
15-Mar-2023	5	Updated cover image and <a href="#">Section 2.1 PowerFLAT 5x6 package information</a> .



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