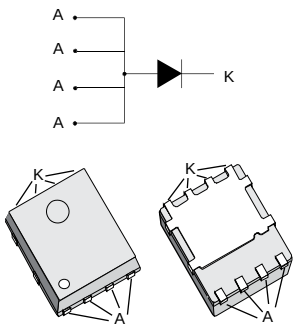
STPS30H100DJF

Power Schottky rectifier

Datasheet - production data



PowerFLAT 5x6

Features

- Low forward voltage drop
- Very low conduction losses
- Negligible switching losses
- Extremely fast switching
- Low thermal resistance
- High specified avalanche capability
- High integration
- Thin package: 1 mm
- ECOPACK®2 compliant component

Description

Power Schottky rectifier suited for switch mode power supply and high frequency DC to DC converters.

Housed in a PowerFLAT™ package, this device is intended to be used in adaptors requiring good efficiency at both low and high load. Its low profile was especially designed to be used in applications with space-saving constraints.

Table 1: Device summary

Symbol	Value
$I_{F(AV)}$	30 A
V_{RRM}	100 V
V_F (typ.)	0.56 V
T_j	150 °C

TM: PowerFLAT is a trademark of STMicroelectronics

1 Characteristics

Table 2: Absolute ratings (limiting values, anode terminals short circuited)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		100	V
$I_{F(RMS)}$	Forward rms current		45	A
$I_{F(AV)}$	Average forward current δ = 0.5, square wave	T_C = 100 °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 = 10 µs, T_j = 125 °C	265	W
V_{ARM}	Maximum repetitive peak avalanche voltage	t_p < 1 µs, T_j < 150 °C, I_{AR} < 9.3A	120	V
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Operating junction temperature range(1)		150	

Notes:

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

Table 3: Thermal parameters

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	$V_R = V_{RRM}$	-		6	µA
		T_j = 125 °C		-	2.5	6.5	mA
V_F(1)	Forward voltage drop	T_j = 25 °C	I_F = 15 A	-		0.76	V
		T_j = 125 °C		-	0.56	0.62	
		T_j = 25 °C	I_F = 30 A	-		0.84	
		T_j = 125 °C		-	0.63	0.71	

Notes:

(1)Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses, use the following equation:

$P = 0.60 \times I_{F(AV)} + 0.00367 \times I_{F^2(RMS)}$

1.1 Characteristics (curves)

Figure 1: Average forward power dissipation versus average forward current

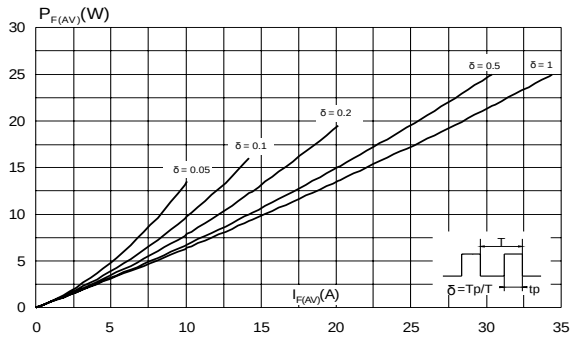


Figure 2: Average forward current versus ambient temperature (δ = 0.5)

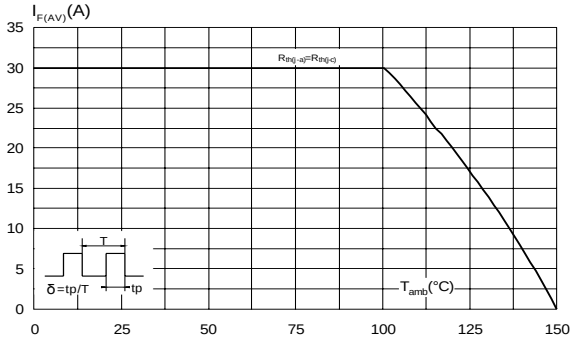


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration

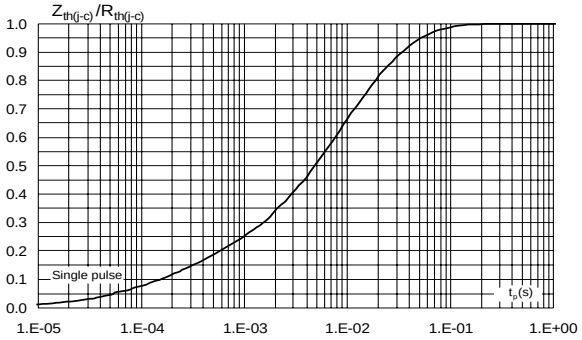


Figure 4: Reverse leakage current versus reverse voltage applied (typical values)

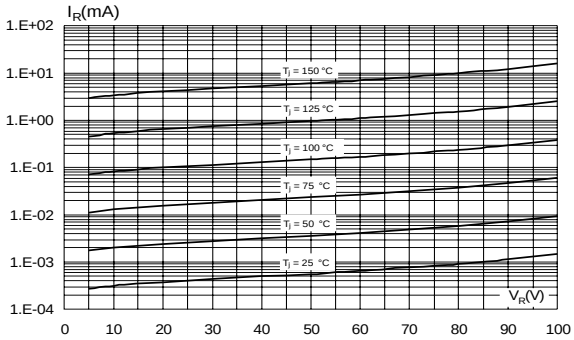


Figure 5: Junction capacitance versus reverse voltage applied (typical values)

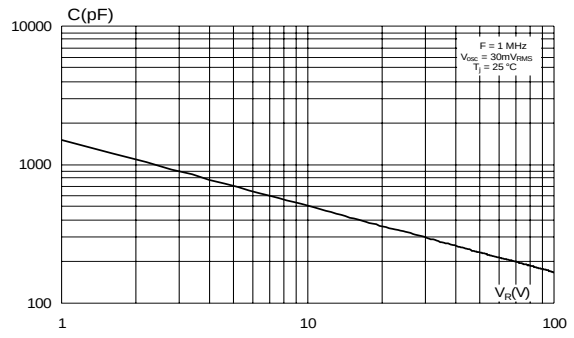


Figure 6: Forward voltage drop versus forward current

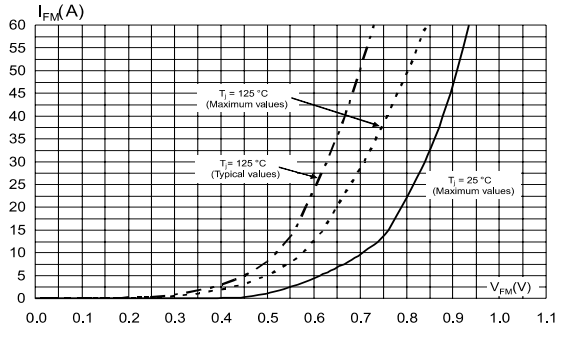
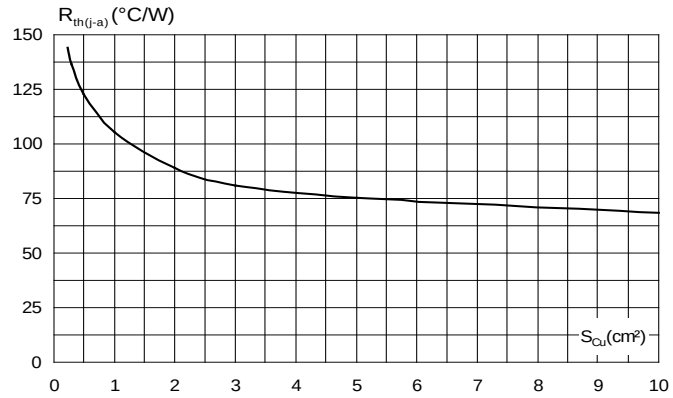


Figure 7: Thermal resistance junction to ambient versus copper surface under tab (typical values, epoxy printed board FR4, e_{Cu} = 35 µm)



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***. ECOPACK® is an ST trademark.

- Epoxy meets UL 94,V0
- Lead-free package

2.1 PowerFLAT™ 5x6 package information

Figure 8: PowerFLAT™ 5x6 package outline

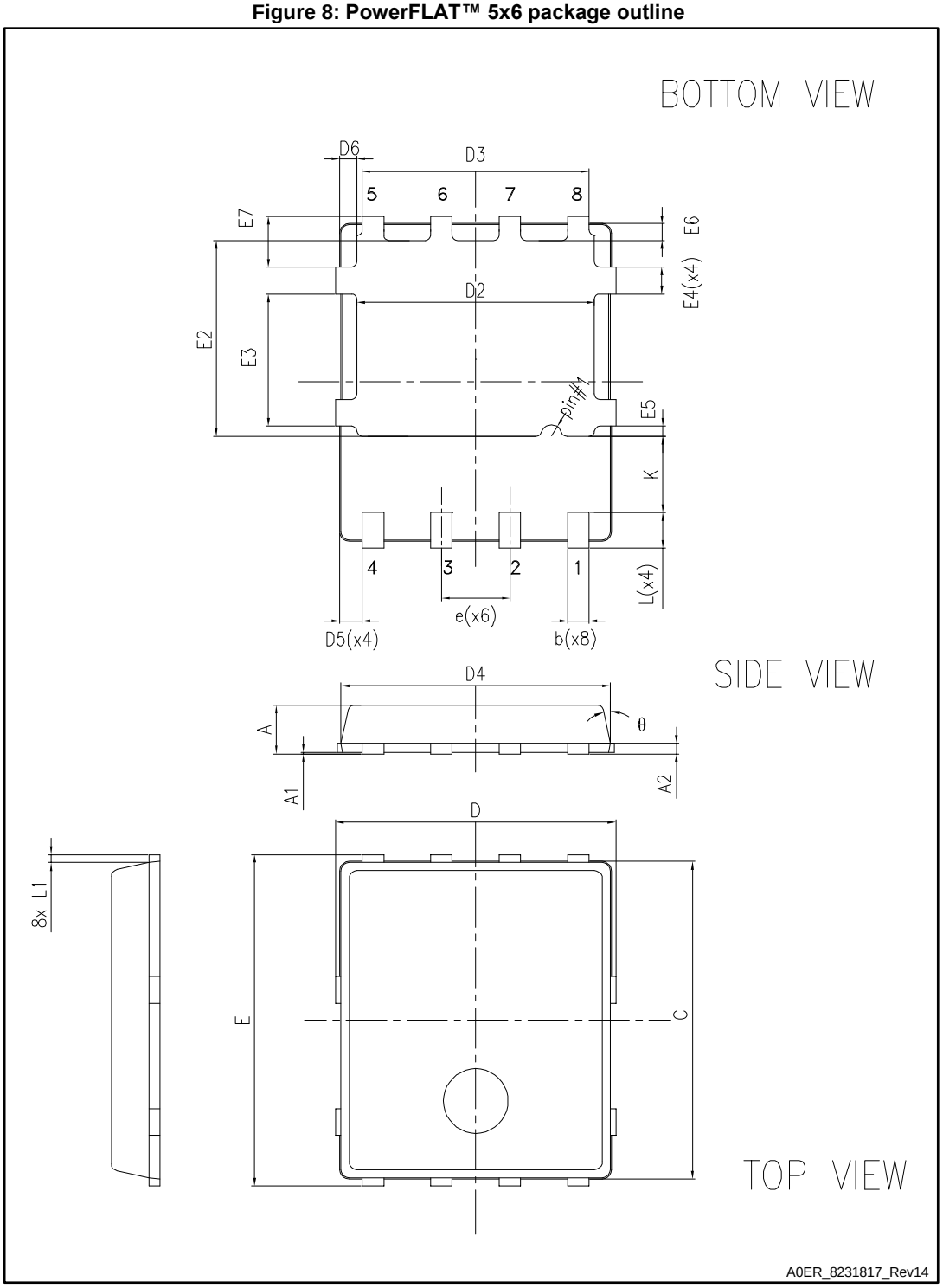


Table 5: PowerFLAT™ 5x6 mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	0.80		1.00
A1	0.02		0.05
A2		0.25	
b	0.30		0.50
C	5.80	6.00	6.20
D	5.00	5.20	5.40
D2	4.15		4.45
D3	4.05	4.20	4.35
D4	4.80	5.00	5.20
D5	0.25	0.40	0.55
D6	0.15	0.30	0.45
e		1.27	
E	5.95	6.15	6.35
E2	3.50		3.70
E3	2.35		2.55
E4	0.40		0.60
E5	0.08		0.28
E6	0.20	0.325	0.45
E7	0.75	0.90	1.05
K	1.275		1.575
L	0.60		0.80
L1	0.05	0.15	0.25
θ	0°		12°

Figure 9: PowerFLAT™ 5x6 recommended footprint (dimensions are in mm)

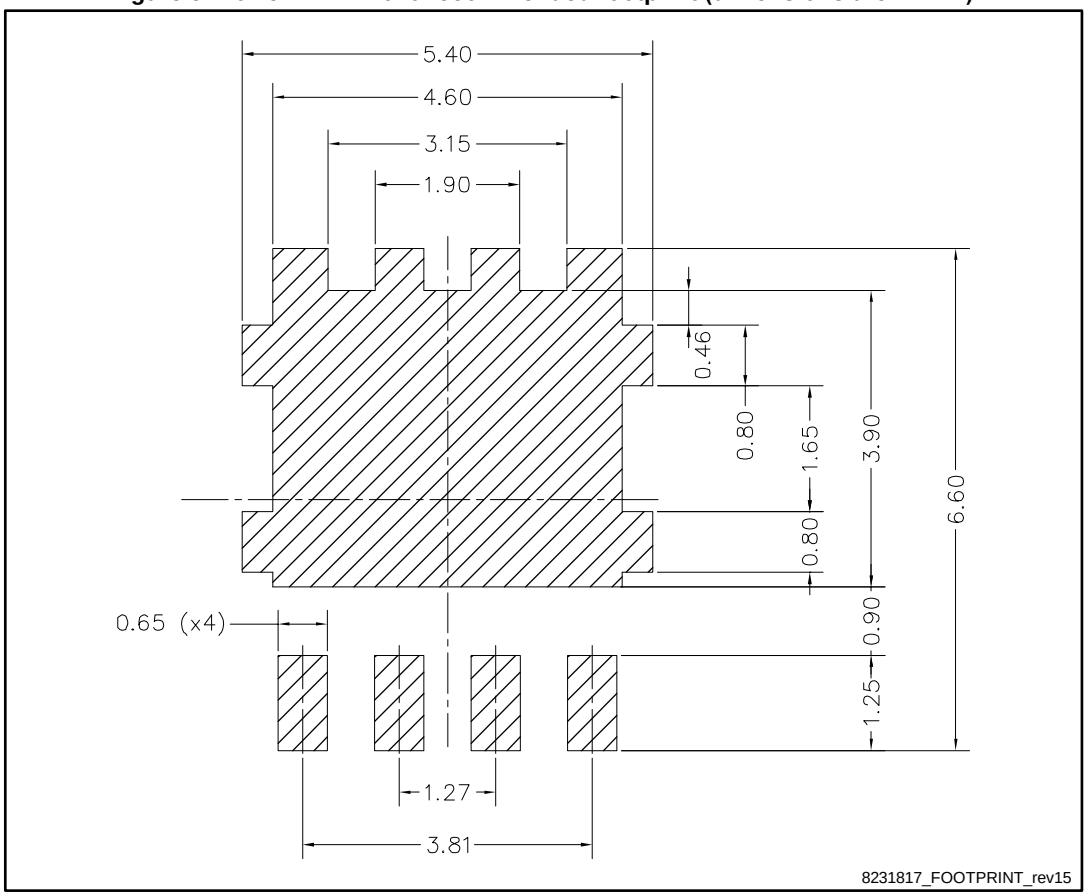
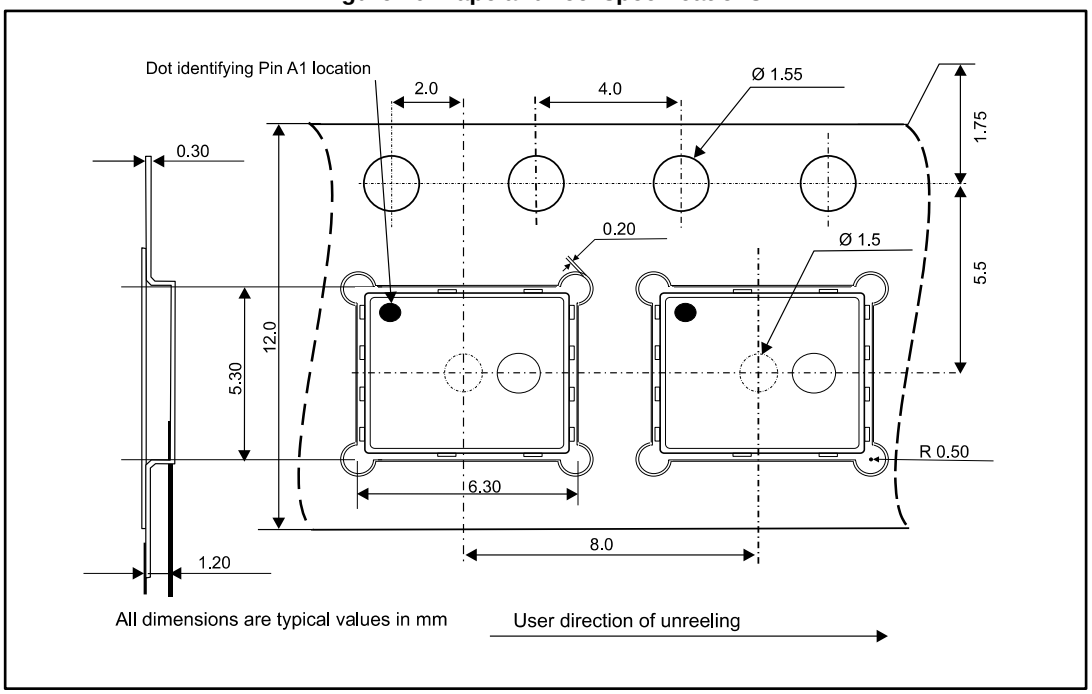


Figure 10: Tape and reel specifications



3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS30H100DJF-TR	PS30 H100	PowerFLAT 5x6	95 g	3000	Tape and reel

4 Revision history

Table 7: Document revision history

Date	Revision	Changes
29-Mar-2012	1	Initial release.
26-Jun-2017	2	Updated cover image and *Section 2.1: "PowerFLAT™ 5x6 package information"*.

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