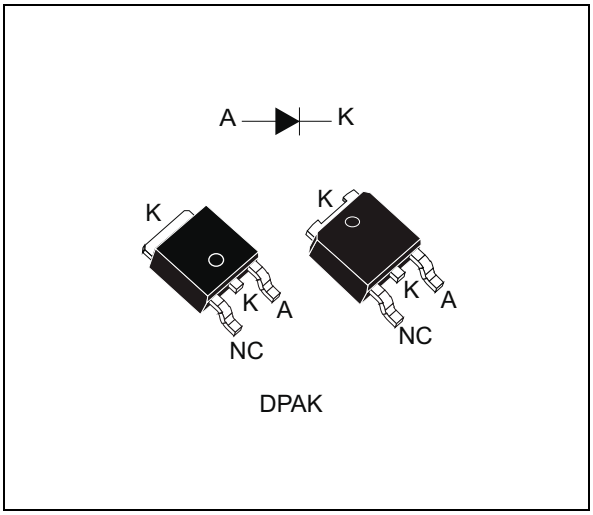
STPS5L25

Low drop power Schottky rectifier

Datasheet – production data



DPAK

Features

- Very low forward voltage drop for less power dissipation and reduced heatsink
- Optimized conduction/reverse losses trade-off which means the highest efficiency in the applications
- High power surface mount miniature package
- Avalanche specification
- ECOPACK®2 compliant component for DPAK on demand

Description

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

Packaged in DPAK, this device is intended for use as a rectifier at the secondary of 3.3 V SMPS units.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	5 A
V_{RRM}	25 V
$T_{j\ (max)}$	150 °C
$V_{F(typ)}$	0.31 V

1 Characteristics

Table 2. Absolute ratings (limiting values, at 25 °C unless otherwise stated)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		25	V
$I_{F(RMS)}$	Forward rms current		7	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$ square wave	T_c = 140 °C,	5	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	75	A
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C	215	W
T_{stg}	Storage temperature range		-65 to +150	°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	Max. value	Unit
$R_{th(j-c)}$	Junction to case	2.5	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	-	350	µA
		T_j = 125 °C		-	55	115	mA
V_F(1)	Forward voltage drop	T_j = 25 °C	I_F = 5 A	-	-	0.47	V
		T_j = 125 °C		-	0.31	0.35	
		T_j = 25 °C	I_F = 10 A	-	-	0.59	
		T_j = 125 °C		-	0.41	0.50	

1. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:

$P = 0.2 \times I_{F(AV)} + 0.03 \times I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

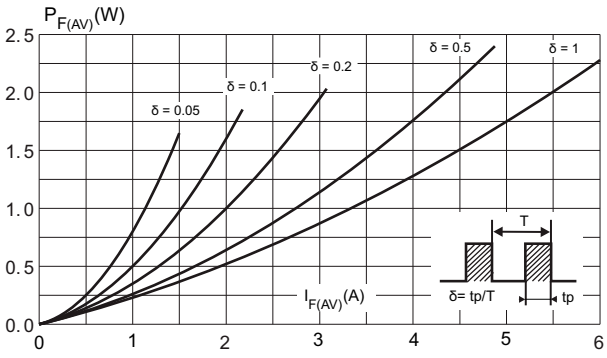


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

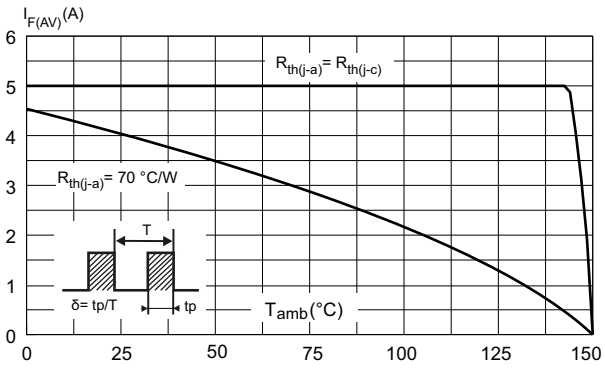


Figure 3. Normalized avalanche power derating versus pulse duration at T_j = 125 °C

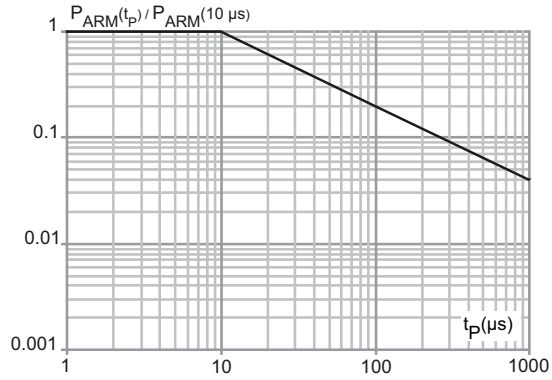


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

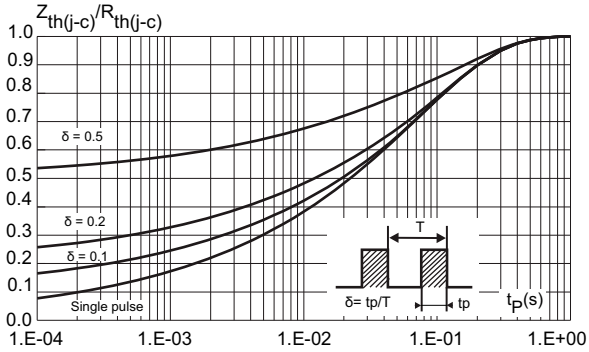


Figure 5. Reverse leakage current versus reverse voltage applied (typical values)

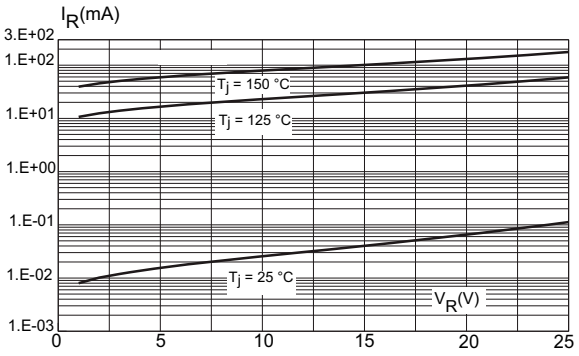


Figure 6. Junction capacitance versus reverse voltage applied (typical values)

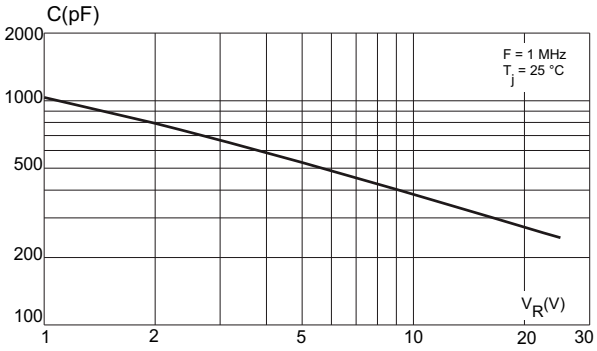


Figure 7. Forward voltage drop versus forward current (maximum values)

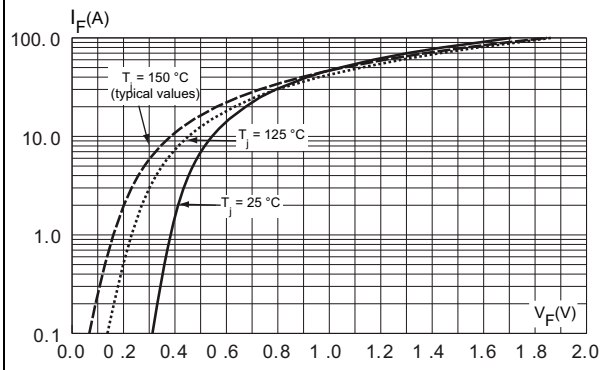
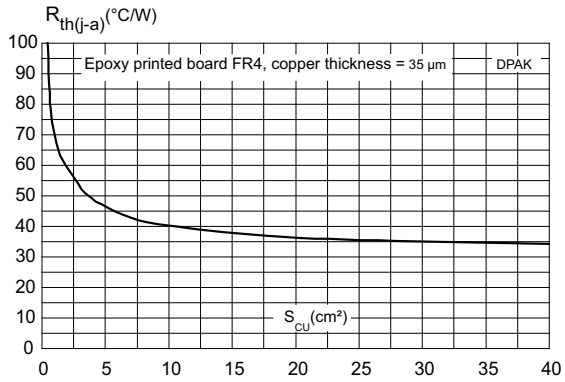


Figure 8. Thermal resistance junction to ambient versus copper surface under tab



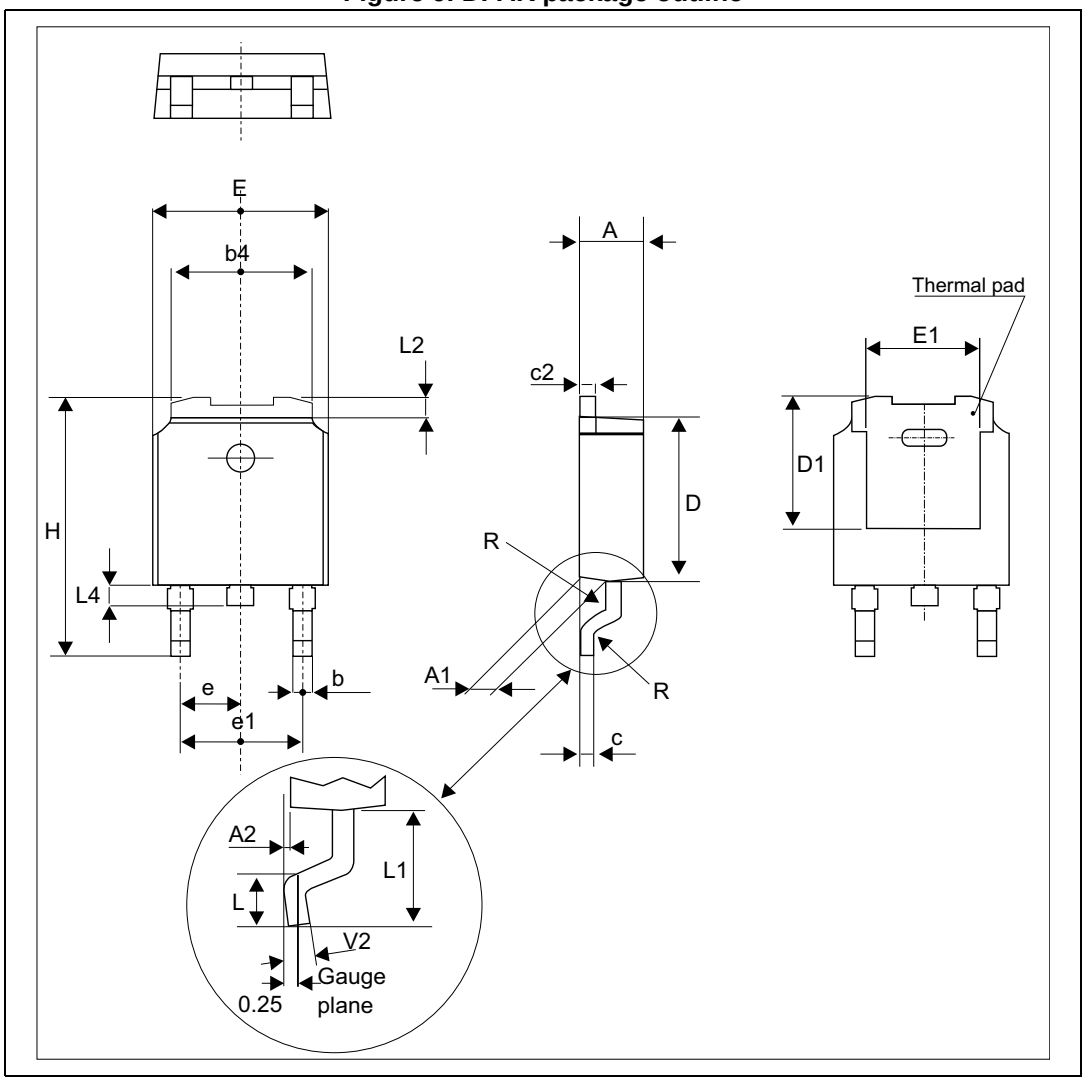
2 Package Information

- Epoxy meets UL94,V0
- Cooling method: by conduction (C)

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.

2.1 DPAK package information

Figure 9. DPAK package outline

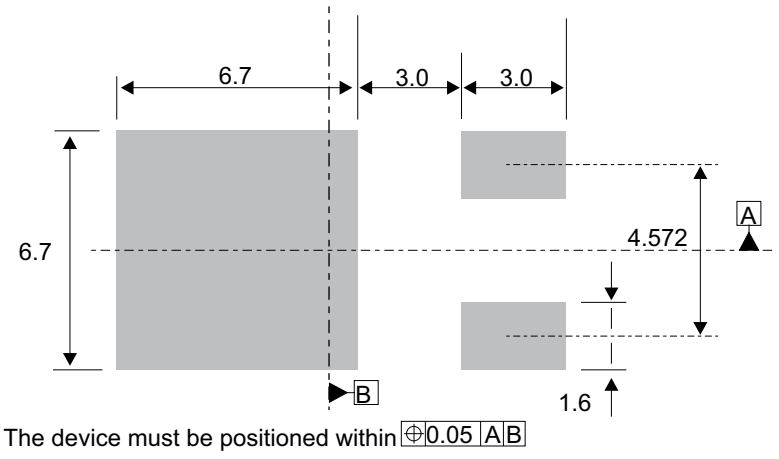


Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 5. DPAK package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.18		2.40	0.085		0.094
A1	0.90		1.10	0.035		0.043
A2	0.03		0.23	0.001		0.009
b	0.64		0.90	0.025		0.035
b4	4.95		5.46	0.194		0.214
c	0.46		0.61	0.018		0.024
c2	0.46		0.60	0.018		0.023
D	5.97		6.22	0.235		0.244
D1	4.95		5.60	0.194		0.220
E	6.35		6.73	0.250		0.264
E1	4.32		5.50	0.170		0.216
e		2.28			0.090	
e1	4.40		4.70	0.173		0.185
H	9.35		10.40	0.368		0.409
L	1.00		1.78	0.039		0.070
L2			1.27			0.050
L4	0.60		1.02	0.023		0.040
V2	-8°		+8°	-8°		8°

Figure 10. DPAK footprint dimensions (in mm)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS5L25B-TR	STPS5 L25B	DPAK	0.32 g	2500	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
Jul-2003	5A	Previous release.
15-Apr-2008	6	Reformatted to current standard. Corrected order code in *Table 5*.
08-Jan-2015	7	Updated package information and reformatted to current standard.
15-May-2017	8	Updated DPAK package information and reformatted to current standard.