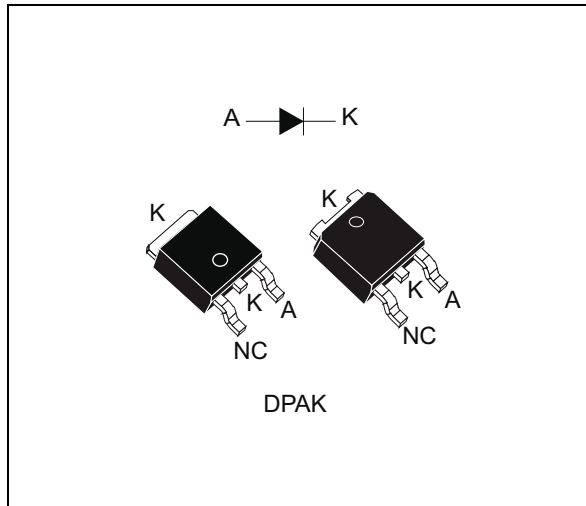


Low drop power Schottky rectifier

Datasheet — production data



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

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

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	$T_c = 140\text{ °C}$, $t_p = 10\text{ ms}$ sinusoidal	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 10\text{ }\mu\text{s}$, $T_j = 125\text{ °C}$	W
T_{stg}	Storage temperature range	-65 to +150	°C
T_j	Maximum operating junction temperature ⁽¹⁾	150	°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	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	$T_j = 25\text{ °C}$	-	-	350	μA
		$T_j = 125\text{ °C}$	-	55	115	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 25\text{ °C}$	-	-	0.47	V
		$T_j = 125\text{ °C}$	-	0.31	0.35	
		$T_j = 25\text{ °C}$	-	-	0.59	
		$T_j = 125\text{ °C}$	-	0.41	0.50	

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

To evaluate the conduction losses use the following equation:

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

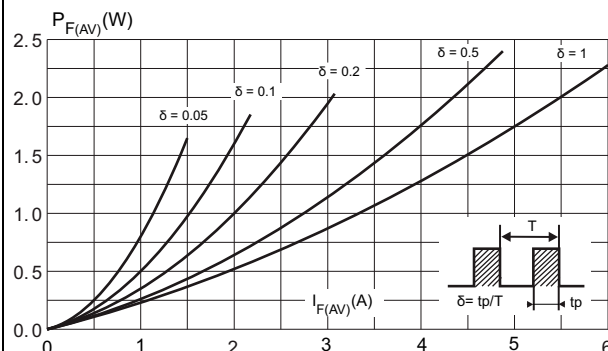
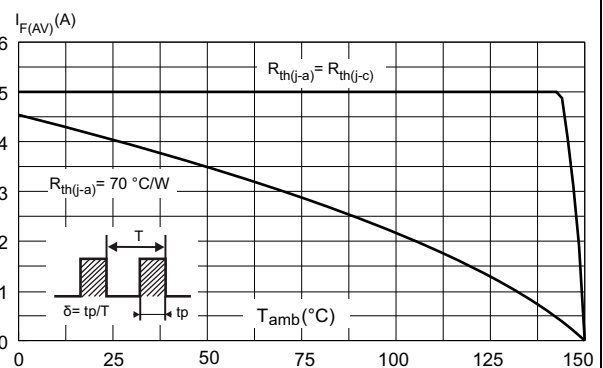
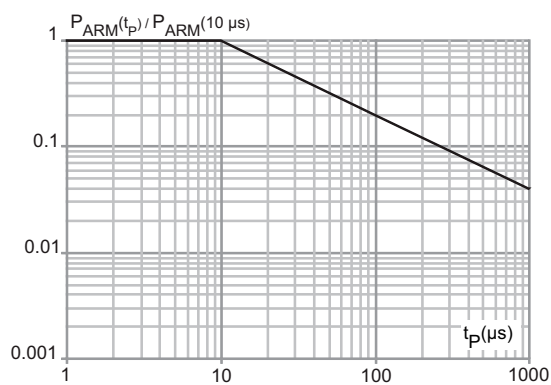
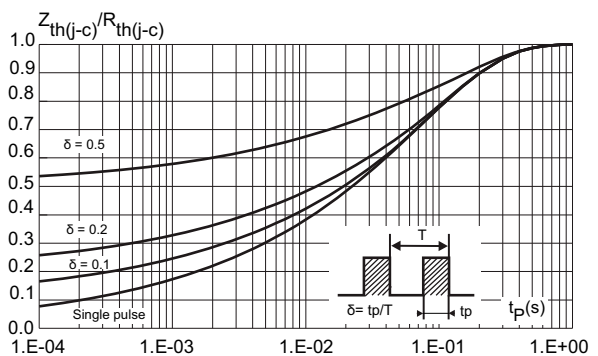
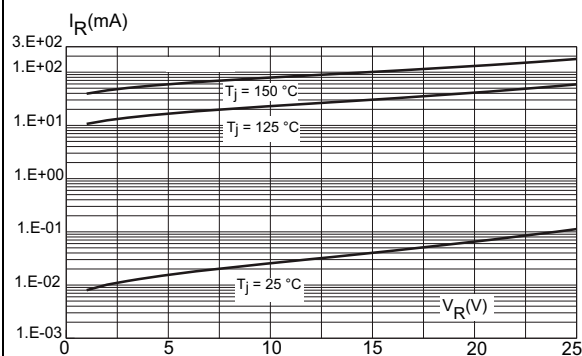
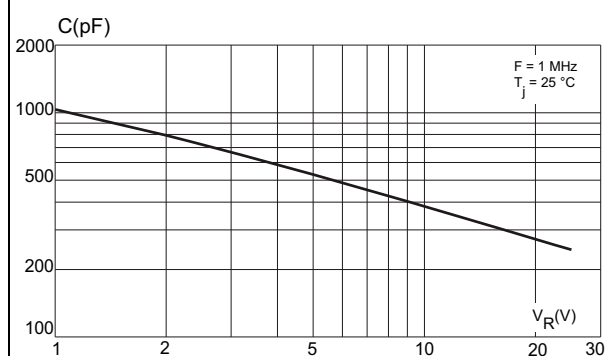
Figure 1. Average forward power dissipation versus average forward current**Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)****Figure 3. Normalized avalanche power derating versus pulse duration at $T_j = 125^\circ\text{C}$** **Figure 4. Relative variation of thermal impedance junction to case versus pulse duration****Figure 5. Reverse leakage current versus reverse reverse voltage applied (typical values)****Figure 6. Junction capacitance versus reverse reverse voltage applied (typical values)**

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

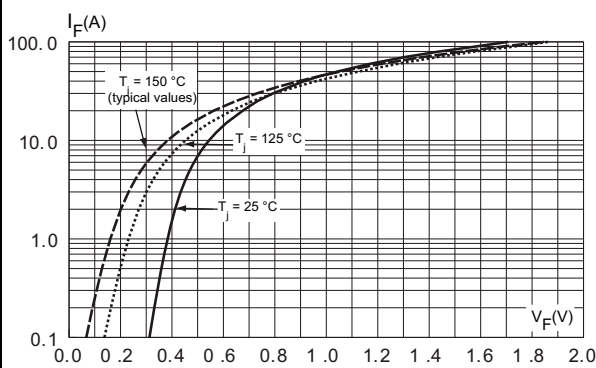
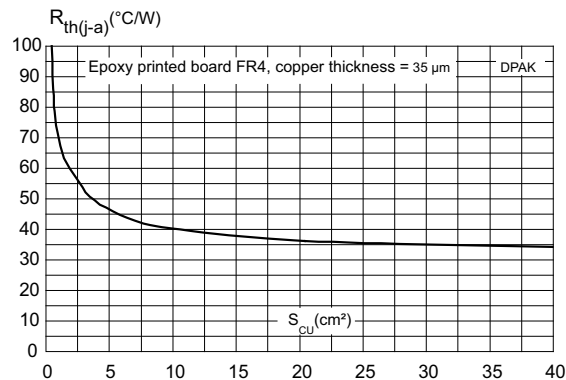


Figure 8. Thermal resistance junction to ambient versus copper surface under tab



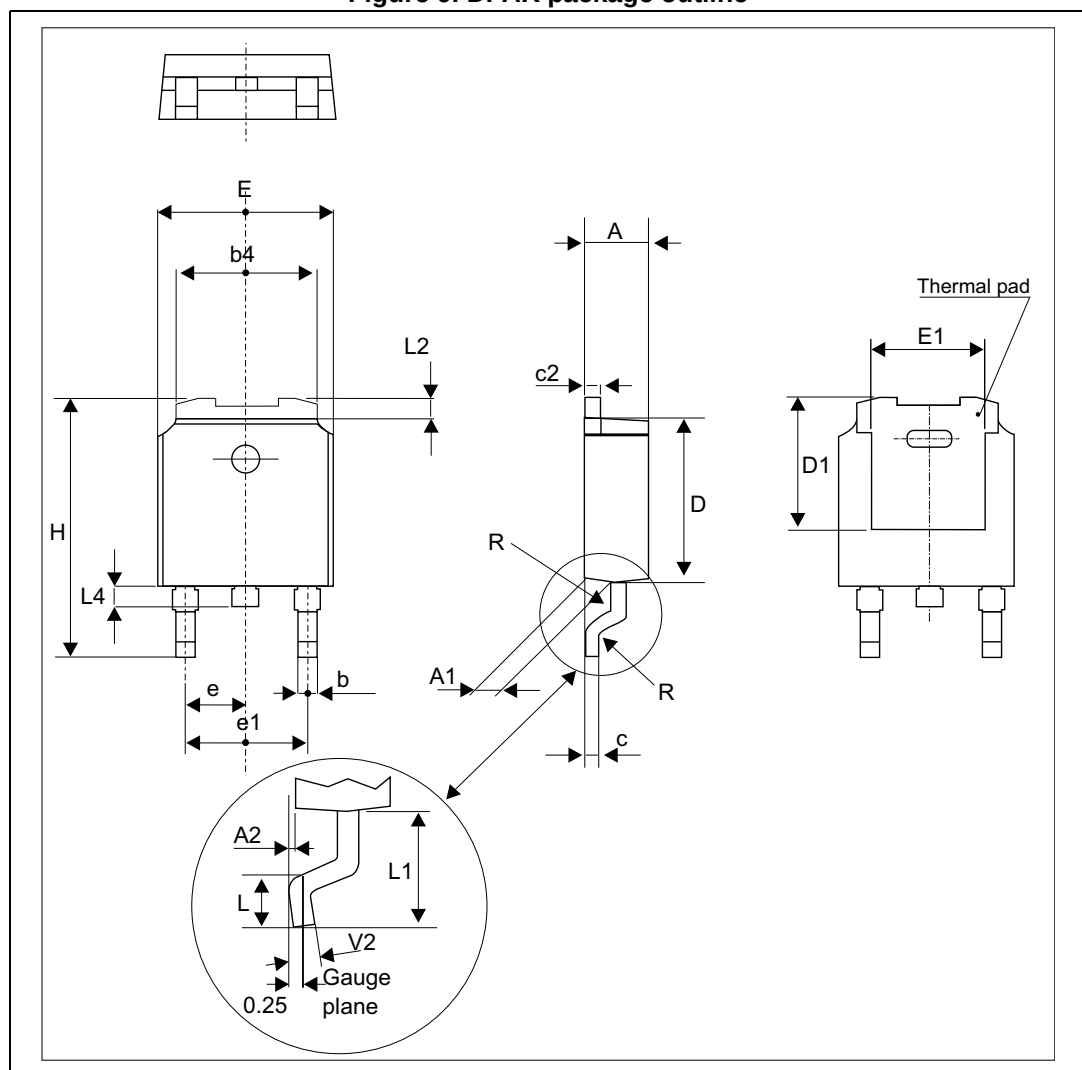
2 Package Information

- 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.

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°

The device must be positioned within $\boxed{\oplus 0.05 \text{ A B}}$

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.

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