

## Low drop power Schottky rectifier

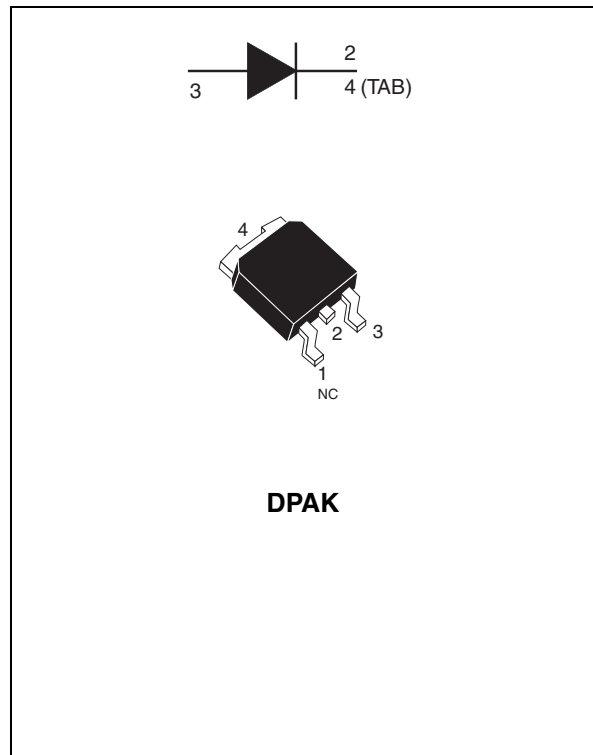
### Features

- 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 capability specified

### Description

Single Schottky rectifier suited to switched mode power supplies and high frequency DC to DC converters.

This device is especially intended for use as a rectifier at the secondary of 3.3 V SMPS units.



**Table 1. Device summary**

$I_{F(AV)}$	5 A
$V_{RRM}$	25 V
$T_j$ (max)	150 °C
$V_F$ (max)	0.35 V

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

Symbol	Parameter	Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage	25	V
I <sub>F(RMS)</sub>	RMS forward current	7	A
I <sub>F(AV)</sub>	Average forward current	T <sub>C</sub> = 145 °C δ = 0.5	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	A
I <sub>RRM</sub>	Repetitive peak reverse current	t <sub>p</sub> = 2 μs square F = 1 kHz	A
I <sub>RSM</sub>	Non repetitive peak reverse current	t <sub>p</sub> = 100 μs square	A
P <sub>ARM</sub>	Repetitive peak avalanche power	t <sub>p</sub> = 1 μs T <sub>J</sub> = 25 °C	W
T <sub>stg</sub>	Storage temperature range	-65 to + 150	°C
T <sub>j</sub>	Maximum operating junction temperature <sup>(1)</sup>	150	°C
dV/dt	Critical rate of rise of reverse voltage	10000	V/μs

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 <sub>th(j-c)</sub>	Junction to case	2.5	°C/W

**Table 4. Static electrical characteristics**

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> = V <sub>RRM</sub>		350	μA
		T <sub>j</sub> = 125 °C		55	115	mA
V <sub>F</sub> <sup>(1)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 5 A		0.47	V
		T <sub>j</sub> = 125 °C	I <sub>F</sub> = 5 A	0.31	0.35	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 10 A		0.59	
		T <sub>j</sub> = 125 °C	I <sub>F</sub> = 10 A	0.41	0.50	

1. Pulse test: t<sub>p</sub> = 380 μs, δ < 2%

Figure 1. Average forward power dissipation versus average forward current

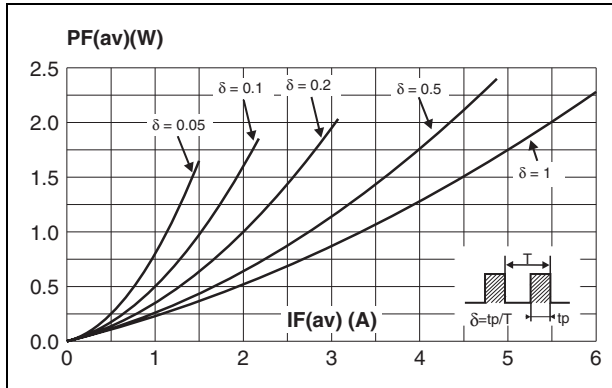


Figure 2. Average forward current versus ambient temperature (delta = 0.5)

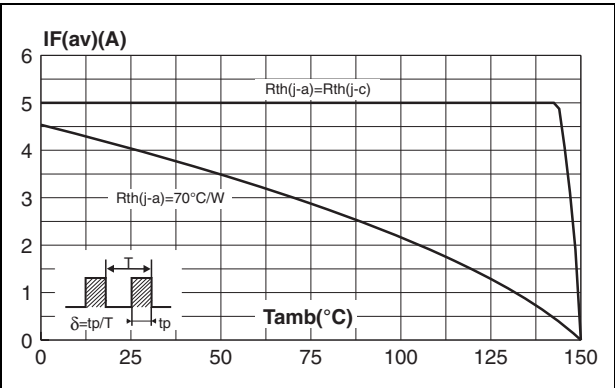


Figure 3. Normalized avalanche power derating versus pulse duration

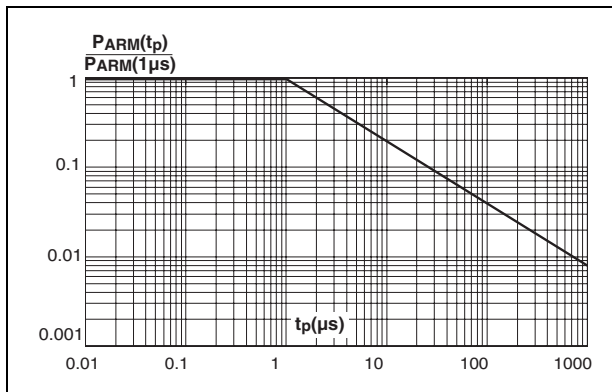


Figure 4. Normalized avalanche power derating versus junction temperature

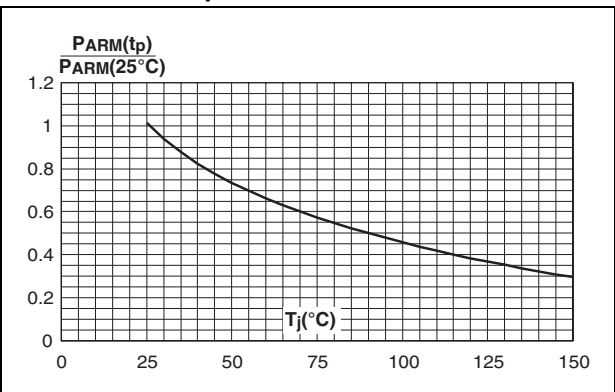


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

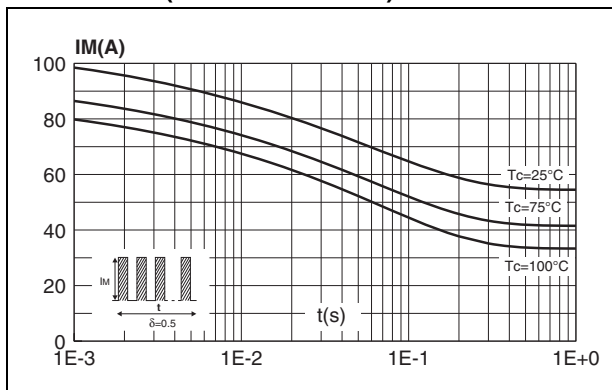
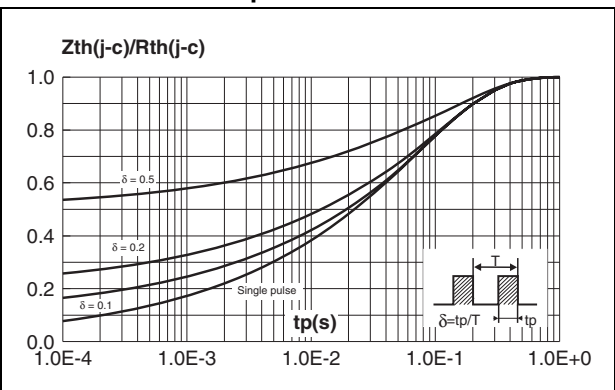
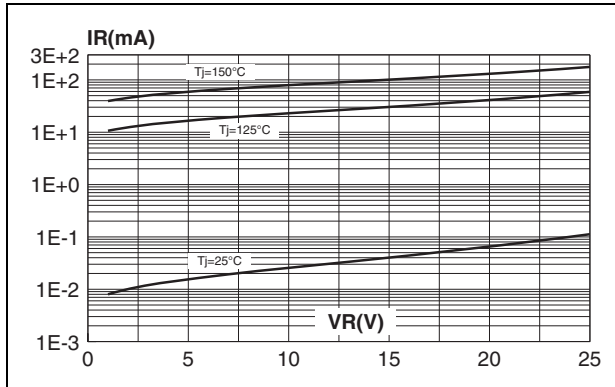


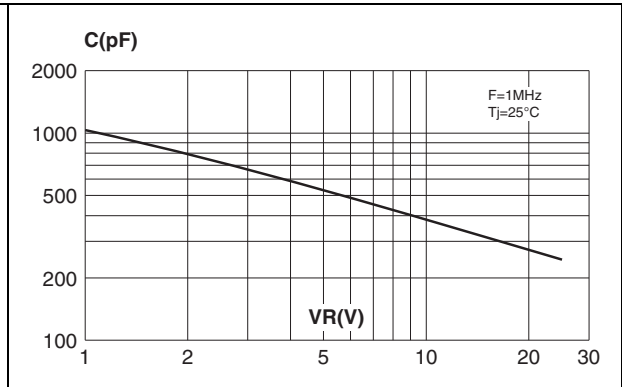
Figure 6. Relative variation of thermal impedance junction to case versus pulse duration



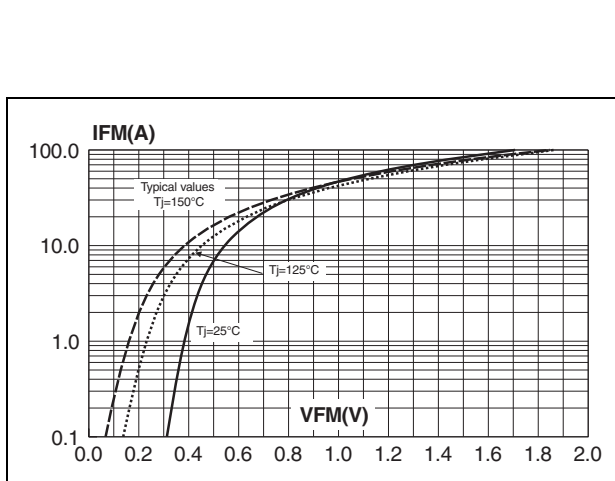
**Figure 7. Reverse leakage current versus reverse voltage applied (typical values)**



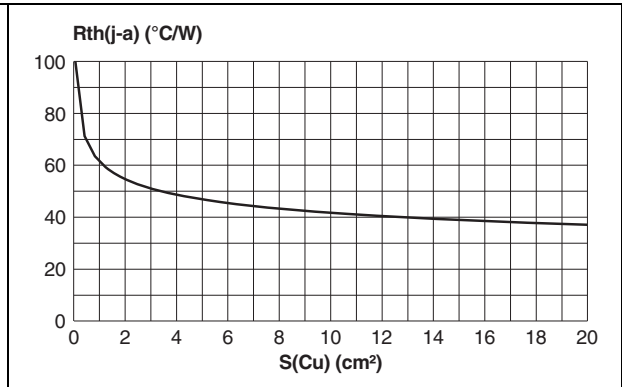
**Figure 8. Junction capacitance versus reverse voltage applied (typical values)**



**Figure 9. Forward voltage drop versus forward current (maximum values)**



**Figure 10. Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35 μm)**



## 2 Package Information

- Epoxy meets UL94, V0

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at [www.st.com](http://www.st.com).

Figure 11. DPAK dimensions

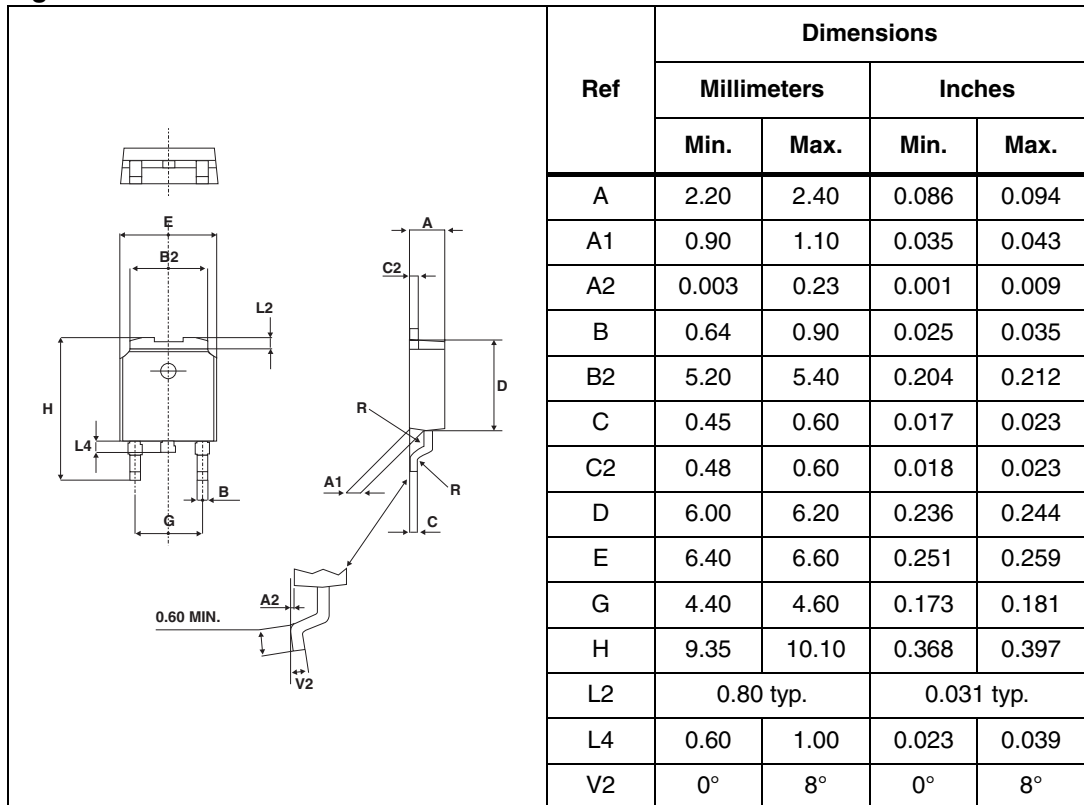
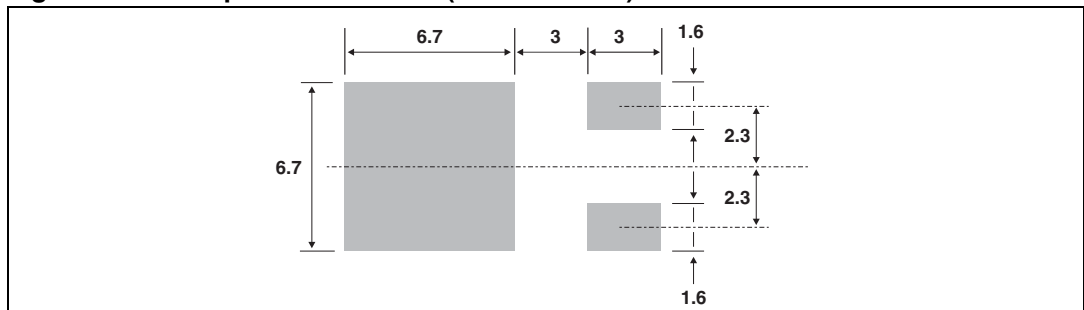


Figure 12. Foot print dimensions (in millimeters)



### 3 Ordering information

Table 5. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS5L25B-TR	STPS5L25B	DPAK	0.30 g	2500	Tape and reel

### 4 Revision history

Table 6. Document revision history

Date	Revision	Changes
Jul-2003	5A	Previous release.
15-Apr-2008	6	Reformatted to current standards. Corrected order code in <a href="#">Table 5</a> .

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2008 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)