

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.

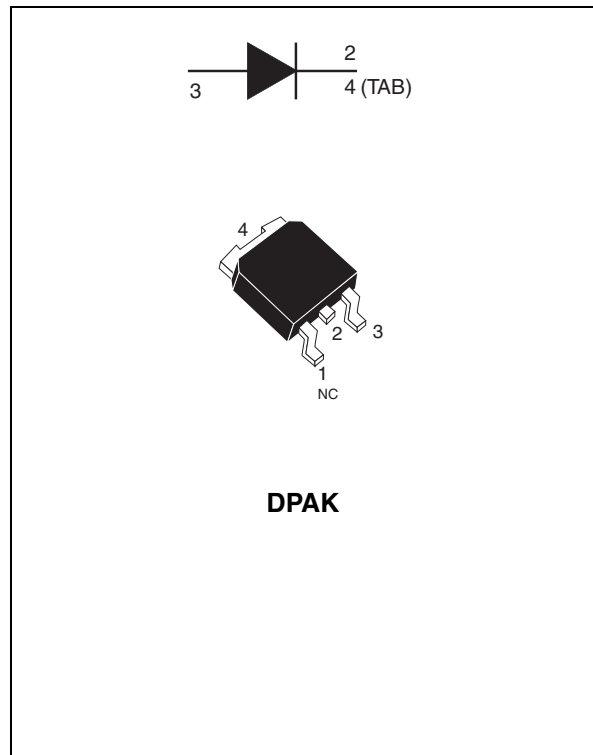


Table 1. Device summary

$I_{F(AV)}$	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 _{RRM}	Repetitive peak reverse voltage	25	V
I _{F(RMS)}	RMS forward current	7	A
I _{F(AV)}	Average forward current	T _C = 145 °C δ = 0.5	A
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms sinusoidal	A
I _{RRM}	Repetitive peak reverse current	t _p = 2 μs square F = 1 kHz	A
I _{RSM}	Non repetitive peak reverse current	t _p = 100 μs square	A
P _{ARM}	Repetitive peak avalanche power	t _p = 1 μs T _J = 25 °C	W
T _{stg}	Storage temperature range	-65 to + 150	°C
T _j	Maximum operating junction temperature ⁽¹⁾	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 _{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	I _F = 5 A	0.31	0.35	
		T _j = 25 °C	I _F = 10 A		0.59	
		T _j = 125 °C	I _F = 10 A	0.41	0.50	

1. Pulse test: t_p = 380 μs, δ < 2%

Figure 1. Average forward power dissipation versus average forward current

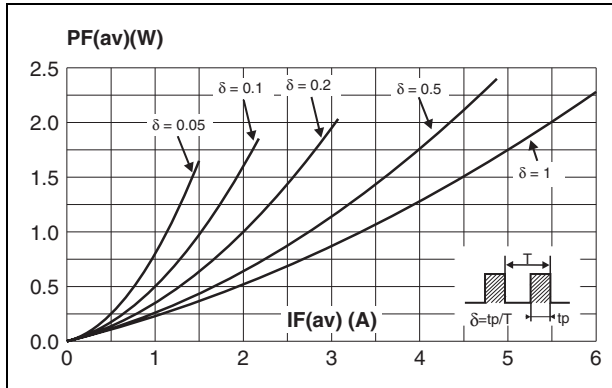


Figure 2. Average forward current versus ambient temperature (delta = 0.5)

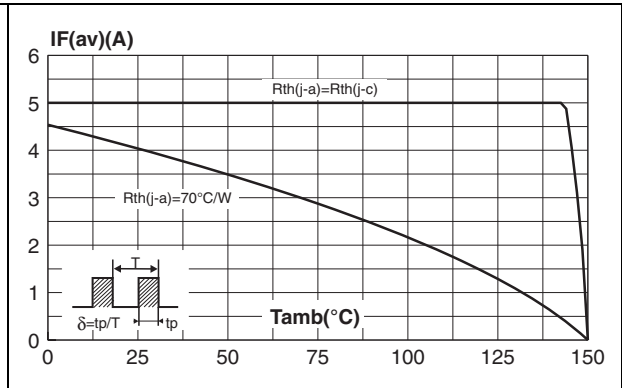


Figure 3. Normalized avalanche power derating versus pulse duration

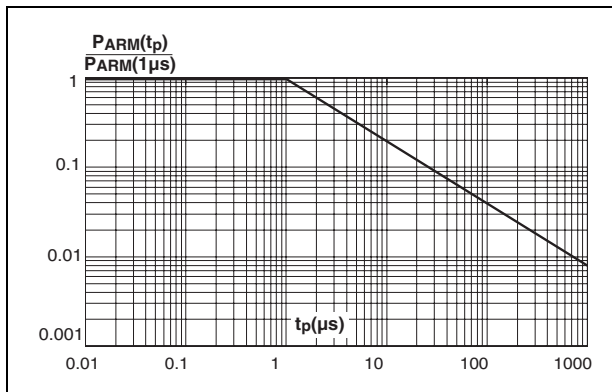


Figure 4. Normalized avalanche power derating versus junction temperature

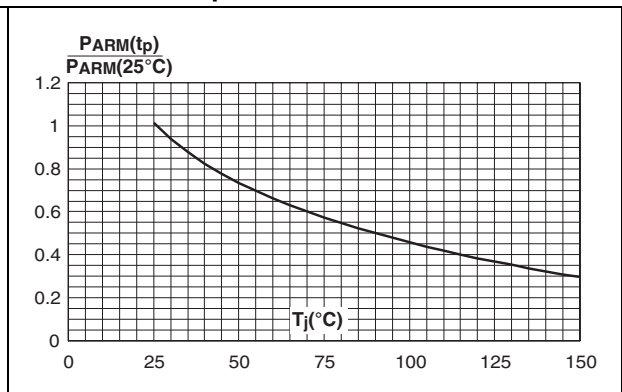


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

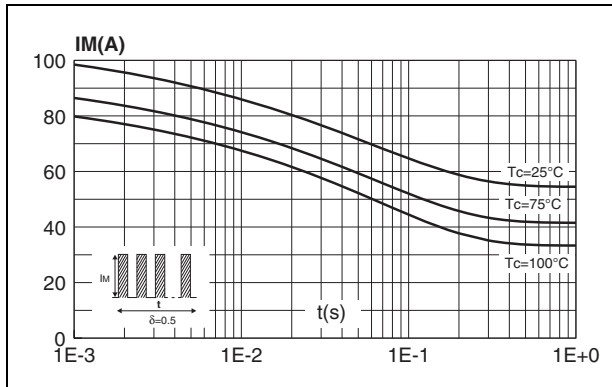


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

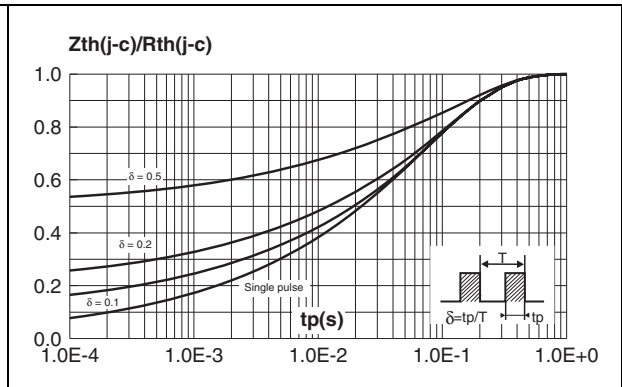


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

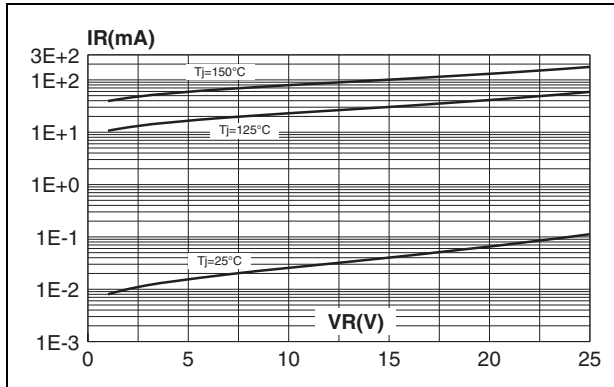


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

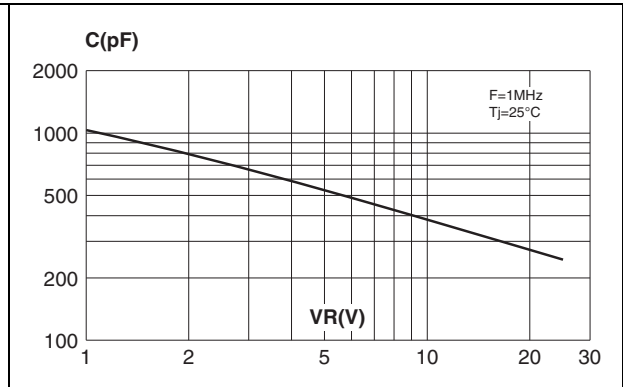


Figure 9. Forward voltage drop versus forward current (maximum values)

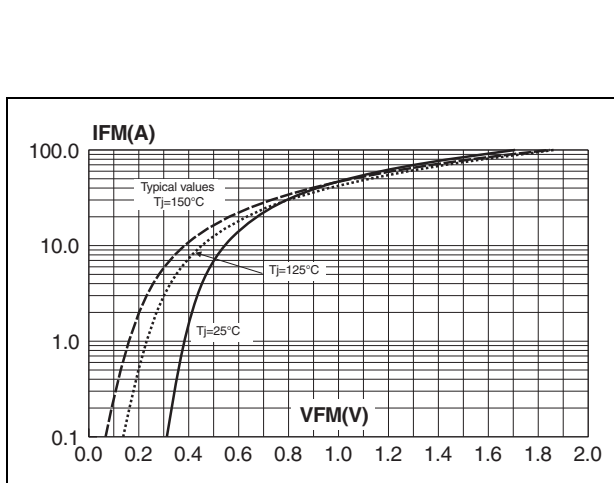
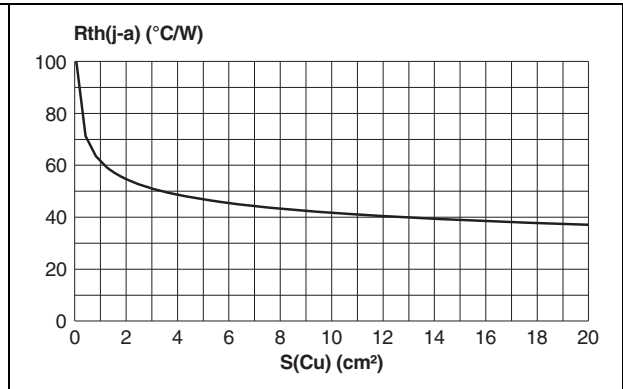


Figure 10. Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35 μm)



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.

Figure 11. DPAK dimensions

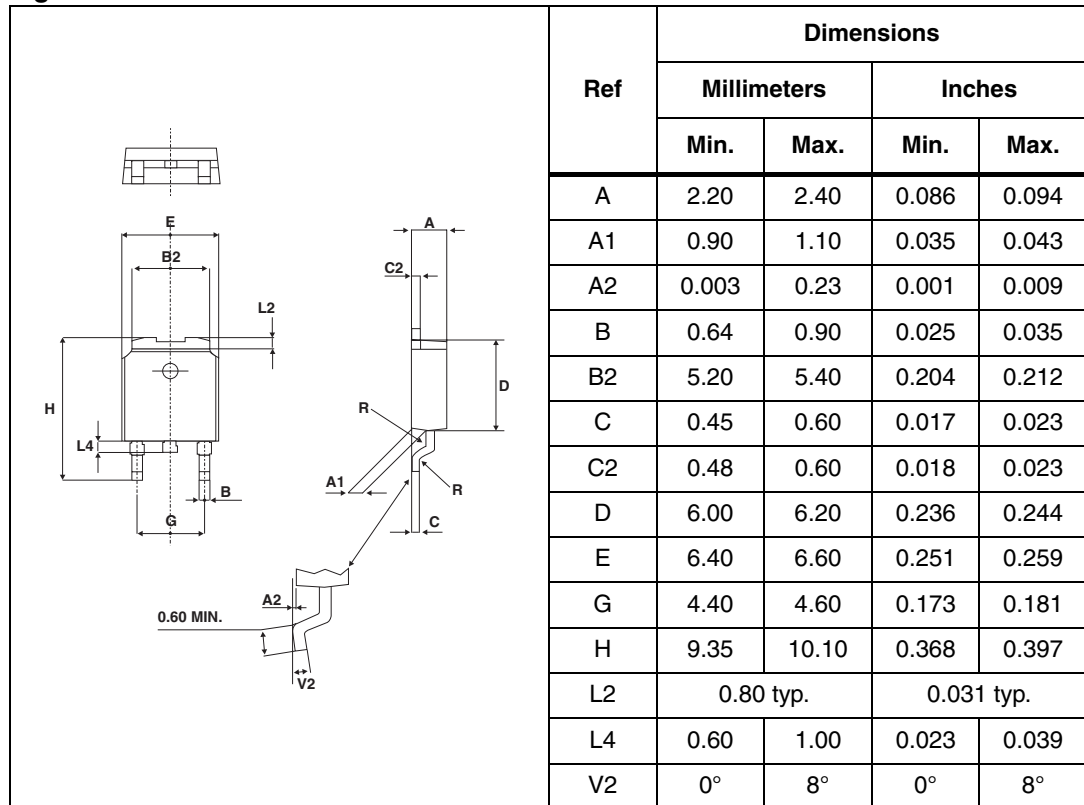
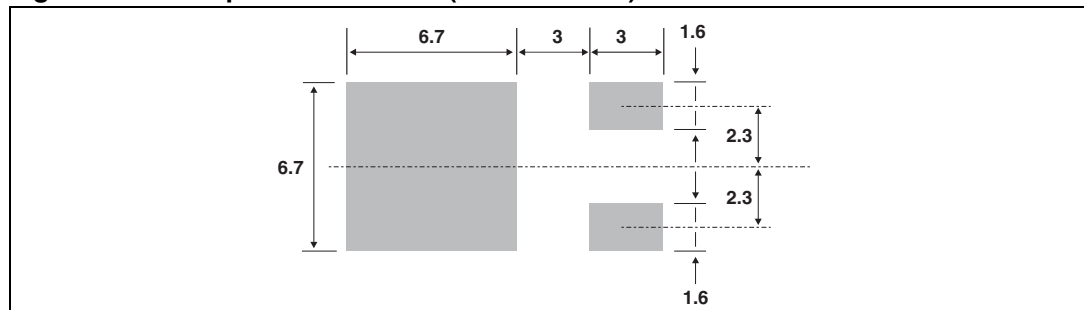


Figure 12. Foot print dimensions (in millimeters)



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 Table 5 .

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