



LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

I_{F(AV)}	3 A
V_{RRM}	25 V
T_j (max)	150°C
V_F (max)	0.44 V

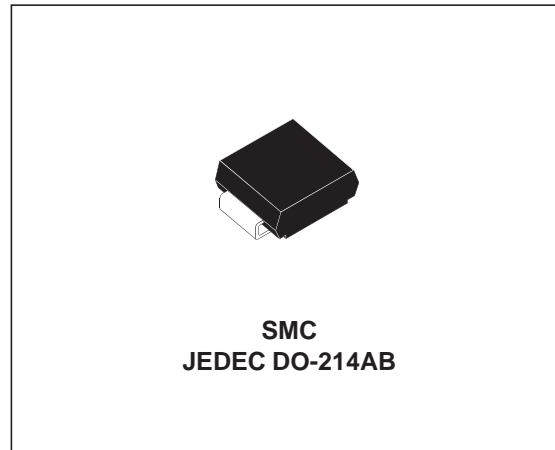
FEATURES AND BENEFITS

- VERY LOW FORWARD VOLTAGE DROP FOR LESS POWER DISSIPATION
- 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.

Packaged in SMC, this device is especially intended for use as an antiparallel diode on synchronous rectification freewheel MOSFET's at the secondary of 3.3V SMPS and DC/DC units.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter	Value	Unit
V _{RRM}	Repetitive peak reverse voltage	25	V
I _{F(RMS)}	RMS forward current	10	A
I _{F(AV)}	Average forward current	T _L = 115°C δ = 0.5 3	A
I _{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal 75	A
I _{RRM}	Repetitive peak reverse current	tp = 2 μs square F=1kHz 1	A
I _{RSM}	Non repetitive peak reverse current	tp = 100 μs square 1	A
T _{stg}	Storage temperature range	- 65 to + 150	°C
P _{ARM}	Repetitive peak avalanche power	tp = 1 μs T _j = 25°C 1500	W
T _j	Maximum operating junction temperature *	150	°C
dV/dt	Critical rate of rise of reverse voltage	10000	V/μs

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th}(j-a)}$ thermal runaway condition for a diode on its own heatsink

STPS3L25S

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to lead	20	$^{\circ}\text{C/W}$

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Tests Conditions	Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$		90	μA
		$T_j = 125^{\circ}\text{C}$		15	30	mA
V_F^*	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 3\text{ A}$		0.49	V
		$T_j = 125^{\circ}\text{C}$		0.37	0.44	
		$T_j = 25^{\circ}\text{C}$	$I_F = 6\text{ A}$		0.6	
		$T_j = 125^{\circ}\text{C}$		0.5	0.58	

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

To evaluate the maximum conduction losses use the following equation :

$$P = 0.3 \times I_{F(AV)} + 0.047 \times I_{F(RMS)}^2$$

Fig. 1: Average forward power dissipation versus average forward current.

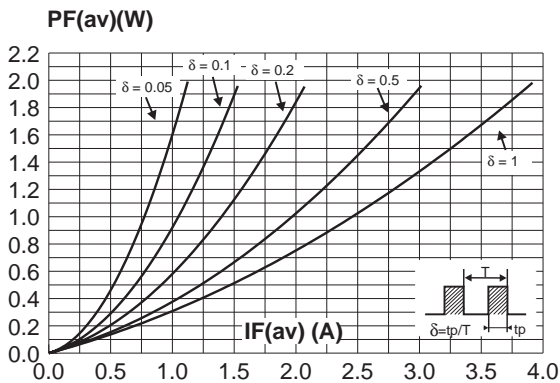


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$).

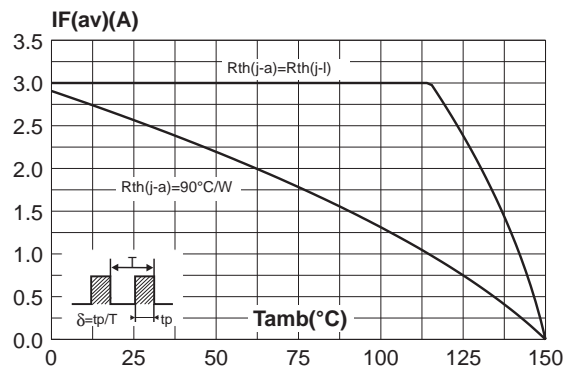


Fig. 3: Normalized avalanche power derating versus pulse duration.

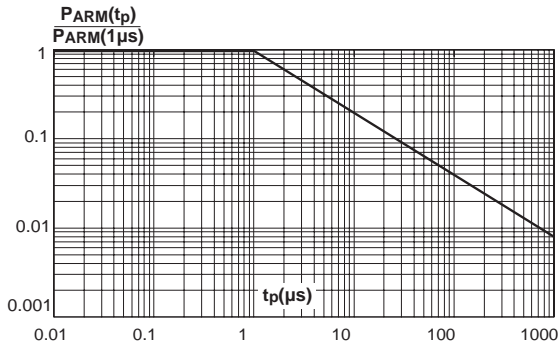


Fig. 4: Normalized avalanche power derating versus junction temperature.

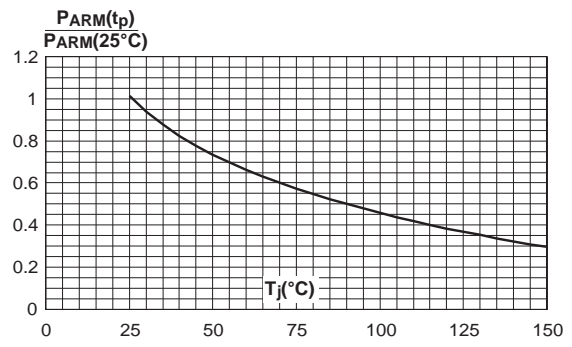


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

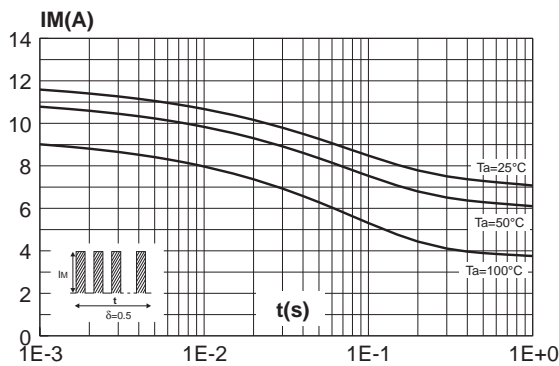


Fig. 6: Relative variation of thermal impedance junction to ambient versus pulse duration.

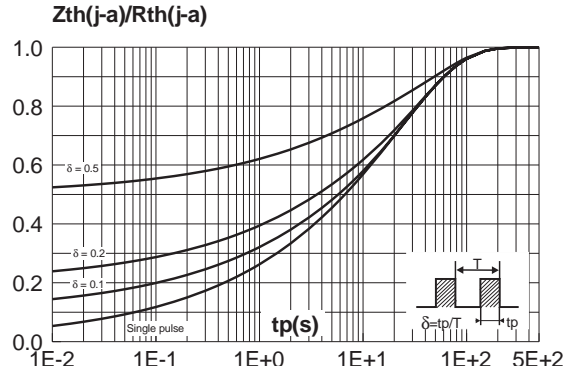


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

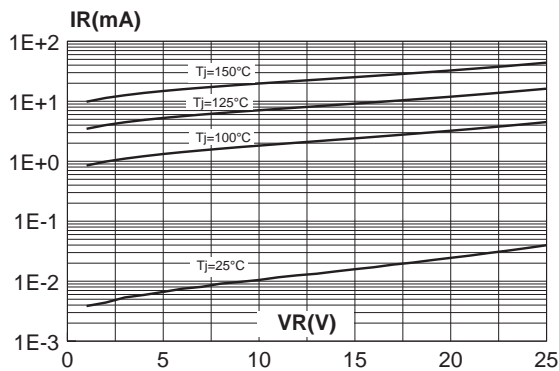


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

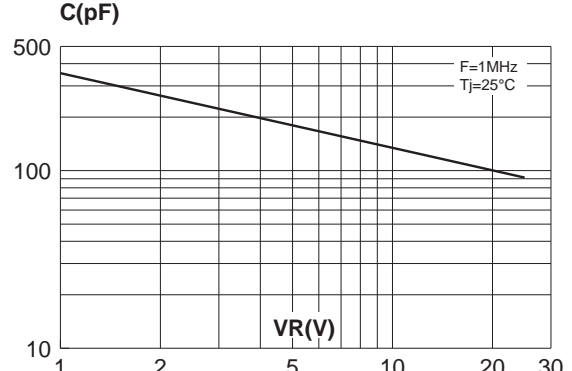


Fig. 9-1: Forward voltage drop versus forward current (maximum values, high level).

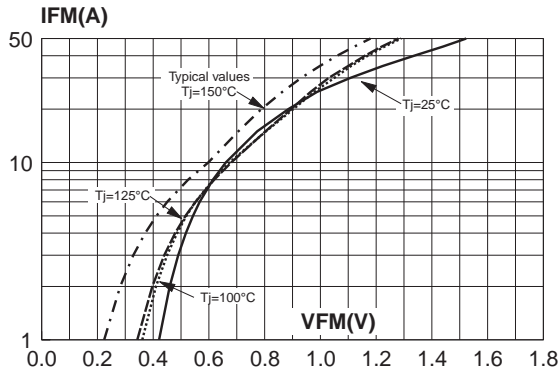


Fig. 9-2: Forward voltage drop versus forward current (maximum values, low level).

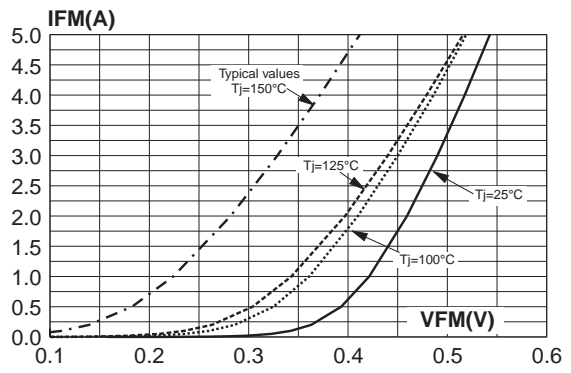
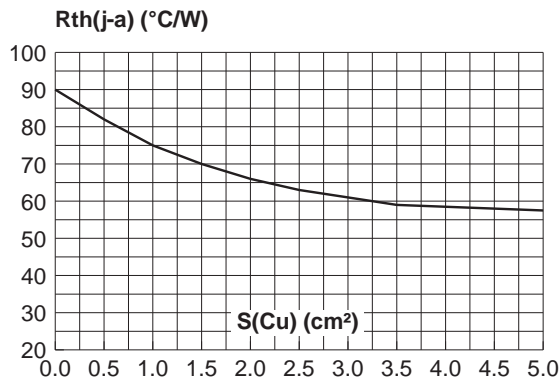
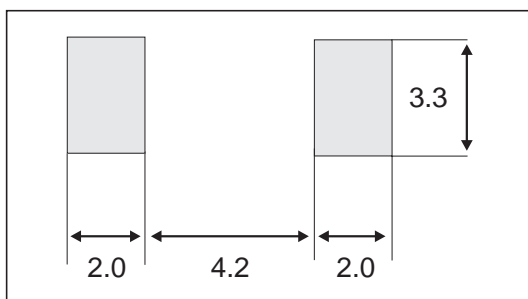


Fig. 10: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: ...)



PACKAGE MECHANICAL DATA
 SMC

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	2.90	3.2	0.114	0.126
c	0.15	0.41	0.006	0.016
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
D	5.55	6.25	0.218	0.246
L	0.75	1.60	0.030	0.063

FOOT PRINT DIMENSIONS (in millimeters)


Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS3L25S	S23	SMC	0.243g	2500	Tape & reel

- BAND INDICATES CATHODE
- EPOXY MEETS UL94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 2003 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

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

<http://www.st.com>

