

Low drop power Schottky rectifier

Features

- Low cost device with low drop forward voltage for less power dissipation
- Optimized conduction/reverse losses trade-off which lead to the highest yield in the applications
- Surface mount miniature packages
- Avalanche capability specified

Description

Single Schottky rectifier suited to switched mode power supplies and high frequency DC to DC converters, freewheel diode and integrated circuit latch up protection.

Packaged in SMA and low profile SMA and SMB, this device is especially intended for use in parallel with MOSFETs in synchronous rectification.

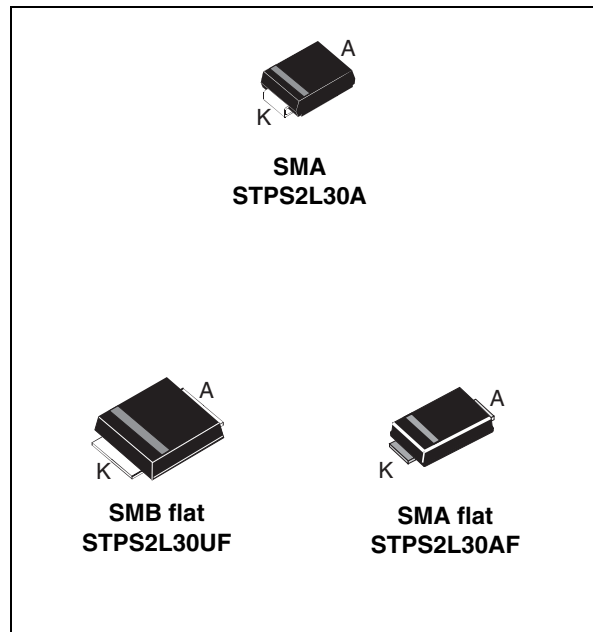


Table 1. Device summary

$I_{F(AV)}$	2 A
V_{RRM}	30 V
$T_j(\text{max})$	150 °C
$V_F(\text{max})$	0.375 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit	
V_{RRM}	Repetitive peak reverse voltage		30	V	
$I_{F(AV)}$	Average forward current	SMA flat	$T_L = 130\text{ °C } \delta = 0.5$	2	A
		SMA	$T_L = 120\text{ °C } \delta = 0.5$		
		SMB flat	$T_L = 135\text{ °C } \delta = 0.5$		
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ ms}$ sinusoidal	75	A
P_{ARM}	Repetitive peak avalanche power		$t_p = 1\text{ }\mu\text{s } T_j = 25\text{ °C}$	1500	W
T_{stg}	Storage temperature range		-65 to + 150	°C	
T_j	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		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMA flat	20	°C/W
		SMA	30	
		SMB flat	15	

Table 4. Static electrical characteristics

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$			200	μA
		$T_j = 100\text{ °C}$			6	15	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 2\text{ A}$			0.45	V
		$T_j = 125\text{ °C}$			0.325	0.375	
		$T_j = 25\text{ °C}$	$I_F = 4\text{ A}$			0.53	
		$T_j = 125\text{ °C}$			0.43	0.51	

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

To evaluate the conduction losses use the following equation:

$$P = 0.24 \times I_{F(AV)} + 0.068 I_F^2 (RMS)$$

Figure 1. Average forward power dissipation versus average forward current

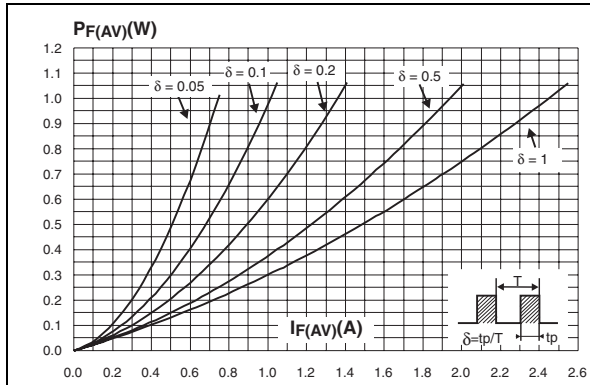


Figure 2. Average forward current versus ambient temperature (delta = 0.5) SMA

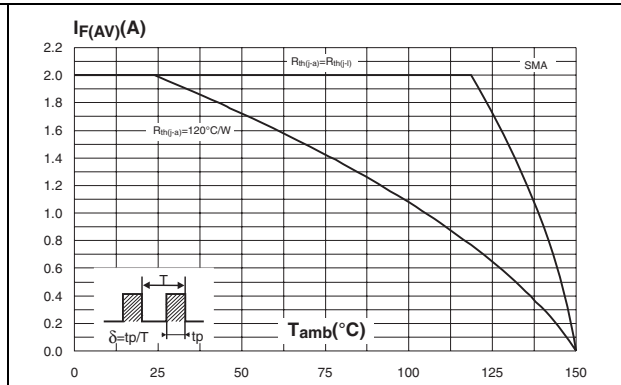


Figure 3. Average forward current versus ambient temperature (delta = 0.5) SMB flat

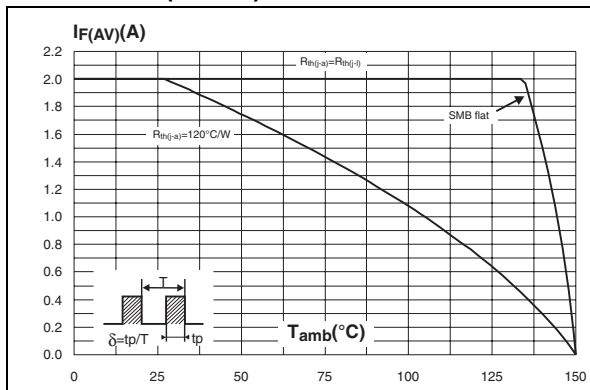


Figure 4. Average forward current versus ambient temperature (delta = 0.5) SMA flat

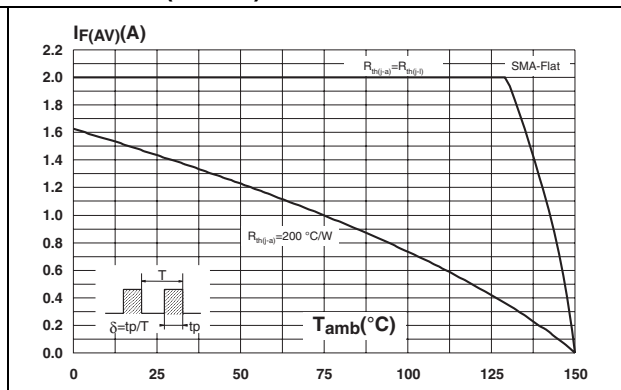


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values) SMA

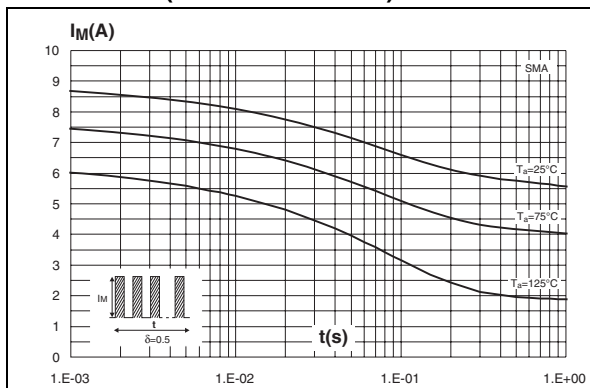


Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) SMB flat

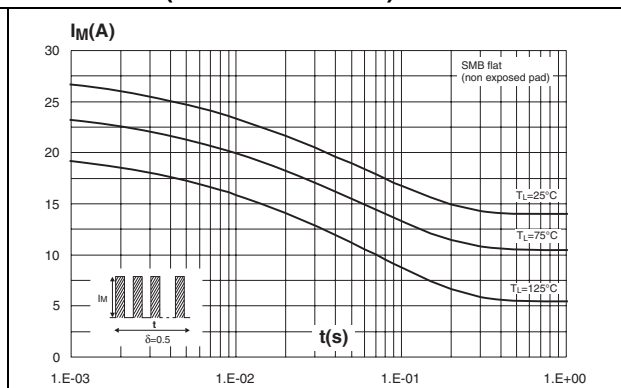


Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) SMA flat

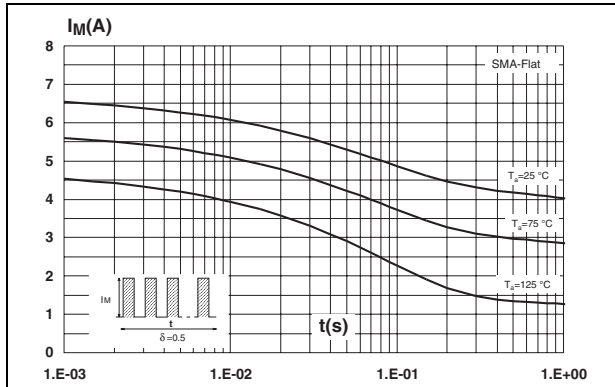


Figure 8. Normalized avalanche power derating versus pulse duration

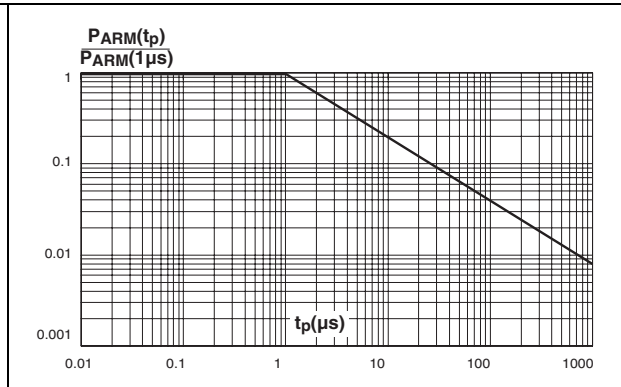


Figure 9. Normalized avalanche power derating versus junction temperature

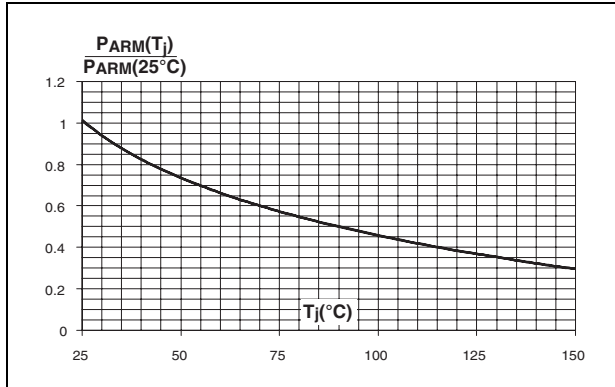


Figure 10. Relative variation of thermal impedance, junction to ambient, versus pulse duration - SMA

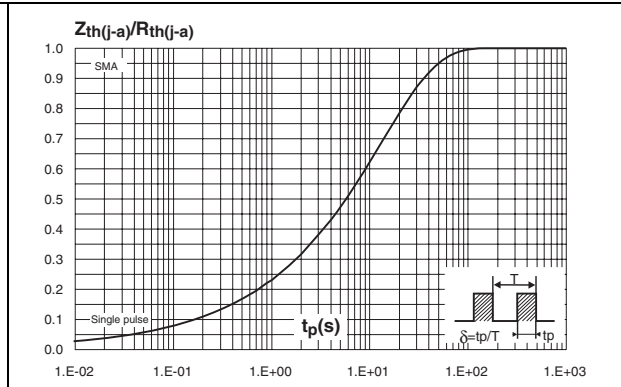


Figure 11. Relative variation of thermal impedance junction to lead versus pulse duration - SMB flat

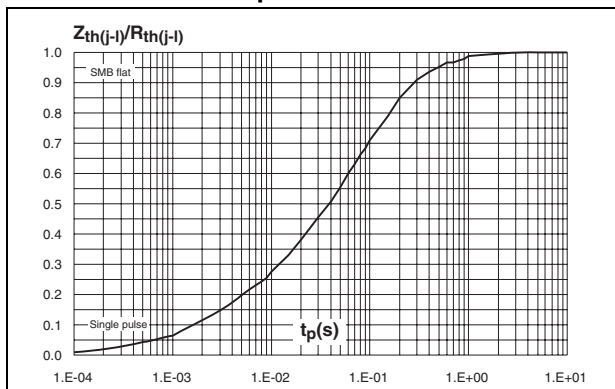


Figure 12. Relative variation of thermal impedance junction to ambient versus pulse duration - SMA flat

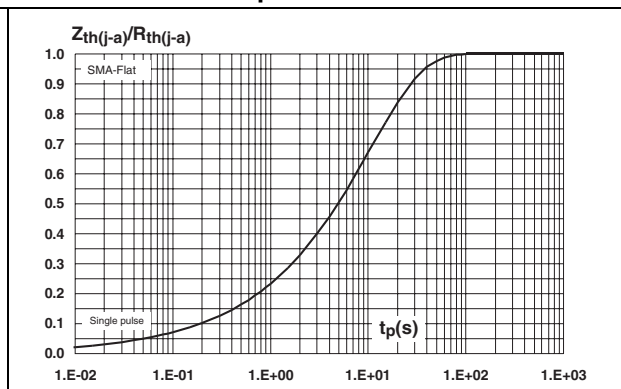


Figure 13. Reverse leakage current versus reverse voltage applied (typical values)

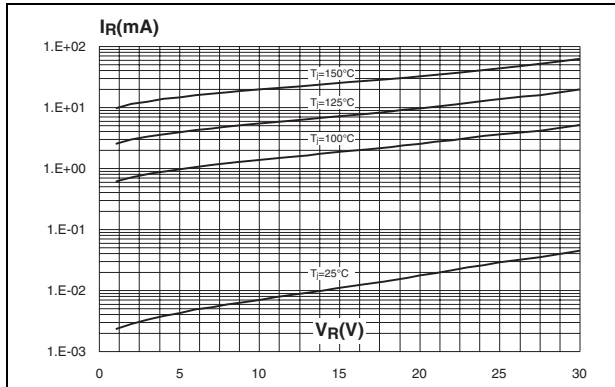


Figure 14. Junction capacitance versus reverse voltage applied (typical values)

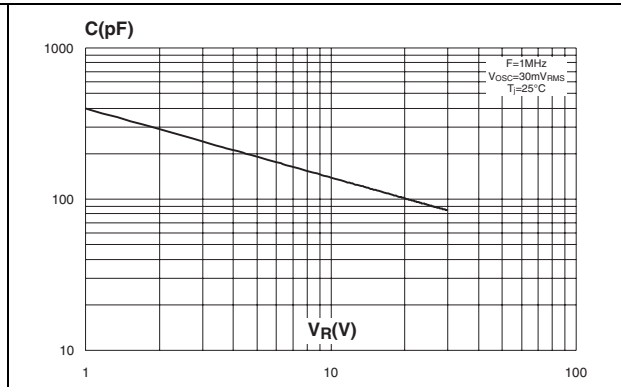


Figure 15. Forward voltage drop versus forward current (high level)

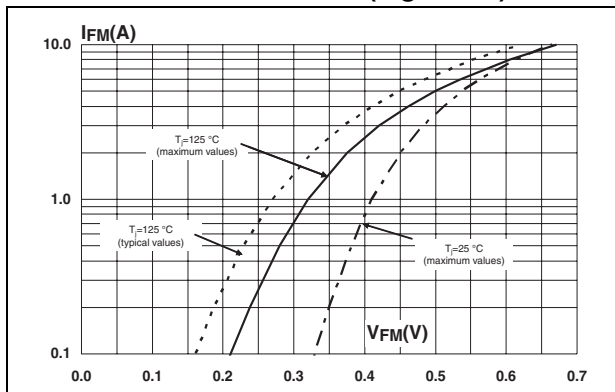


Figure 16. Forward voltage drop versus forward current (low level)

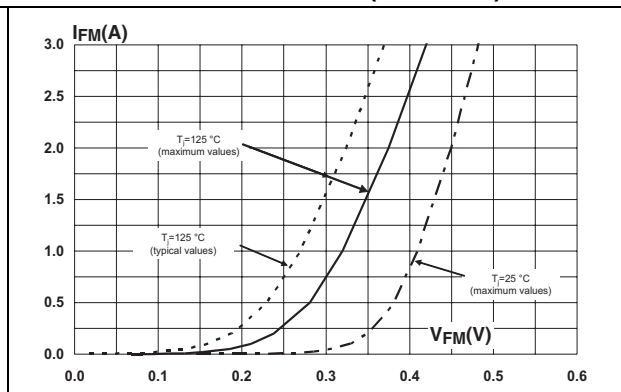


Figure 17. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, copper thickness = 35 μm) (SMA, SMB flat)

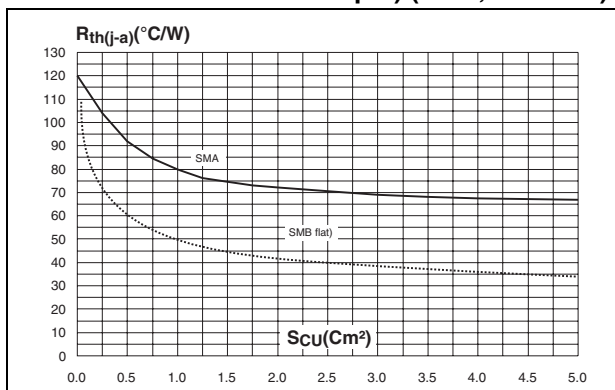
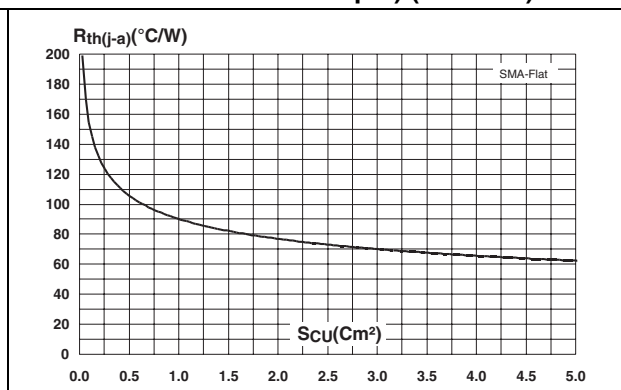


Figure 18. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, copper thickness = 35 μm) (SMA flat)



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.

Table 5. SMA dimensions

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.094
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.40	0.006	0.016
D	2.25	2.90	0.089	0.114
E	4.80	5.35	0.189	0.211
E1	3.95	4.60	0.156	0.181
L	0.75	1.50	0.030	0.059

Figure 19. SMA footprint (dimensions in mm)

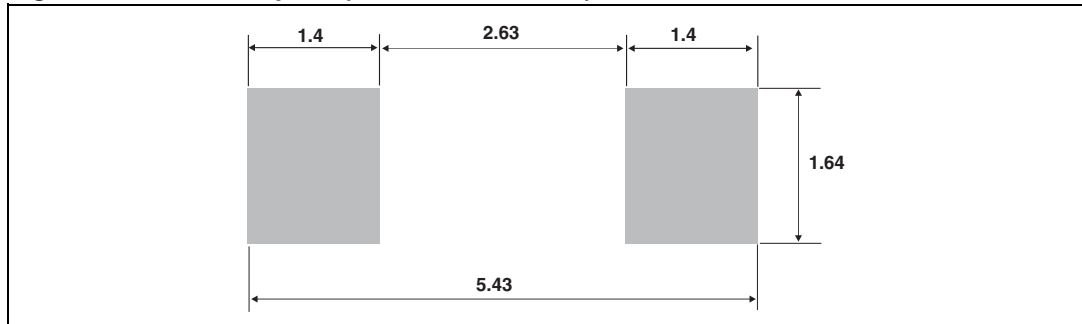


Table 6. SMA flat (non exposed pad) dimensions

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b	1.25		1.65	0.049		0.065
c	0.15		0.40	0.006		0.016
D	2.25		2.95	0.088		0.116
E	4.80		5.60	0.189		0.220
E1	3.95		4.60	0.156		0.181
L	0.75		1.50	0.030		0.059
L1		0.50			0.019	
L2		0.50			0.019	

Figure 20. SMA flat (non exposed pad) footprint dimensions

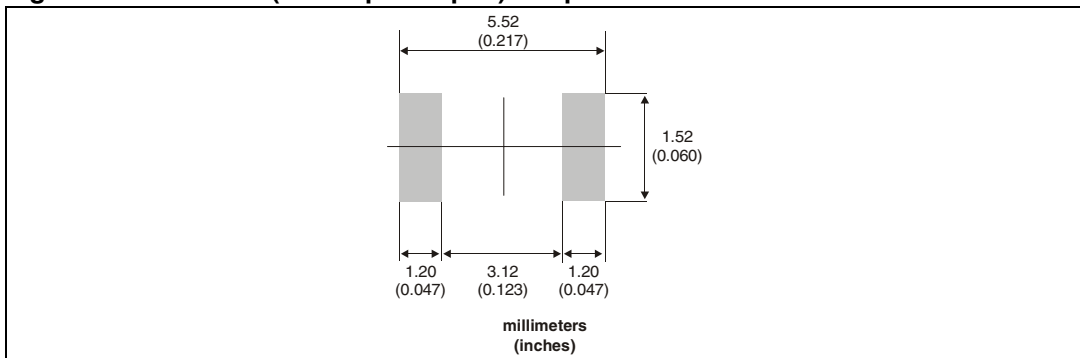
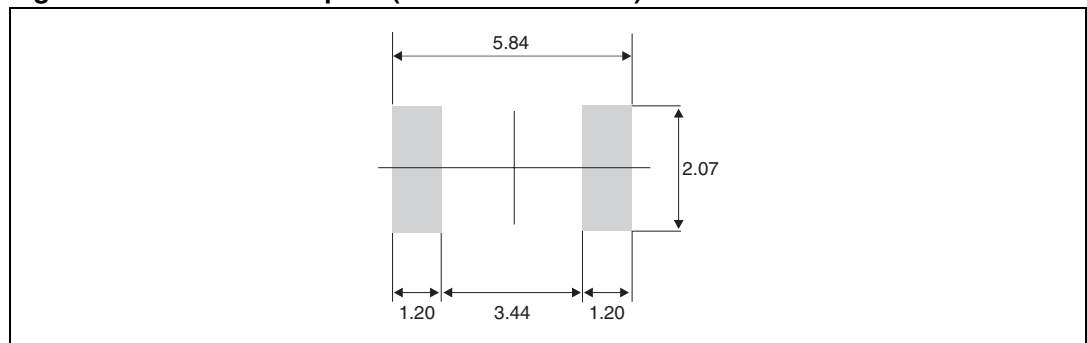


Table 7. SMB flat dimensions

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b ⁽¹⁾	1.95		2.20	0.077		0.087
c ⁽¹⁾	0.15		0.40	0.006		0.016
D	3.30		3.95	0.130		0.156
E	5.10		5.60	0.200		0.220
E1	4.05		4.60	0.189		0.181
L	0.75		1.50	0.029		0.059
L1		0.40			0.016	
L2		0.60			0.024	

1. Applies to plated leads

Figure 21. SMB flat footprint (dimensions in mm)



3 Ordering information

Table 8. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS2L30A	G30	SMA	0.068 g	5000	Tape and reel
STPS2L30UF	FG30	SMB flat	0.050 g	5000	Tape and reel
STPS2L30AF	F30	SMA flat	0.035 g	10000	Tape and reel

4 Revision history

Table 9. Document revision history

Date	Revision	Changes
Jul-2003	3A	Last update.
Aug-2004	4	SMA package dimensions update. Reference A1 max. changed from 2.70mm (0.106inc.) to 2.03mm (0.080).
31-Jan-2007	5	Reformatted to current standard. Added ECOPACK statement. Added SMB flat package.
23-Apr-2008	6	Reformatted to current standards. Added SMA flat package.

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

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[STPS2L30A](#) [STPS2L30UF](#) [STPS2L30AF](#)