

1 Characteristics

Table 2. Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		40	V
$I_{F(RMS)}$	Forward rms current	DPAK	6	A
$I_{F(AV)}$	Average forward current	$T_c = 135\text{ °C } \delta = 0.5$ DPAK	3	A
		$T_L = 105\text{ °C } \delta = 0.5$ SMB/SMC		
		$T_L = 115\text{ °C } \delta = 0.5$ SMBflat		
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	75	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s } T_j = 25\text{ °C}$	1300	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	SMB	25	°C/W
		SMBflat	15	
		SMC	20	
$R_{th(j-c)}$	Junction to case	DPAK	5.5	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$			20	μA
		$T_j = 125\text{ °C}$			2	10	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 3\text{ A}$			0.63	V
		$T_j = 125\text{ °C}$			0.52	0.57	
		$T_j = 25\text{ °C}$	$I_F = 6\text{ A}$			0.84	
		$T_j = 125\text{ °C}$			0.63	0.72	

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

To evaluate the conduction losses use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.050 I_{F(RMS)}^2$$

Figure 1. Average forward power dissipation versus average forward current (per diode)

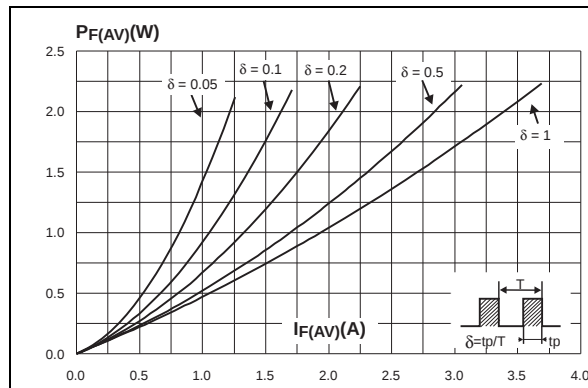


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$, per diode) (DPAK / SMB / SMC)

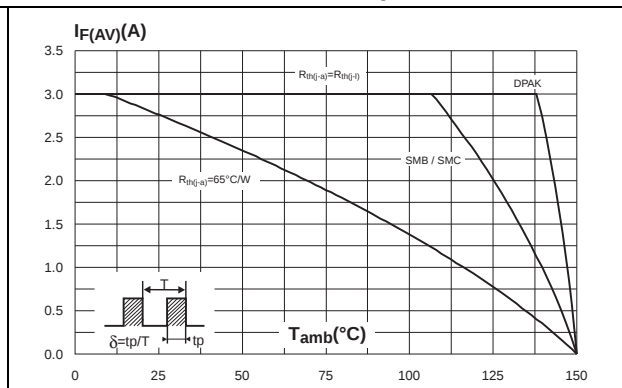


Figure 3. Average forward current versus ambient temperature ($\delta = 0.5$, per diode) (SMBflat)

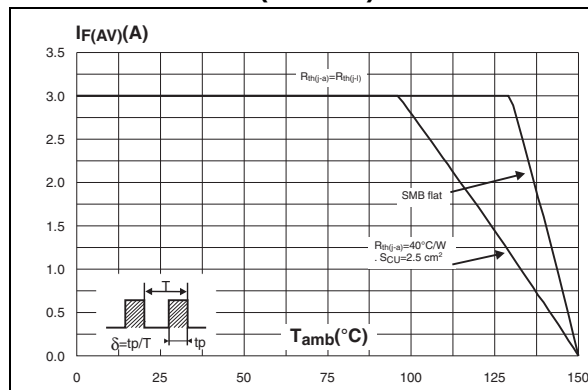


Figure 4. Non repetitive surge peak forward current versus overload duration (maximum values) (DPAK)

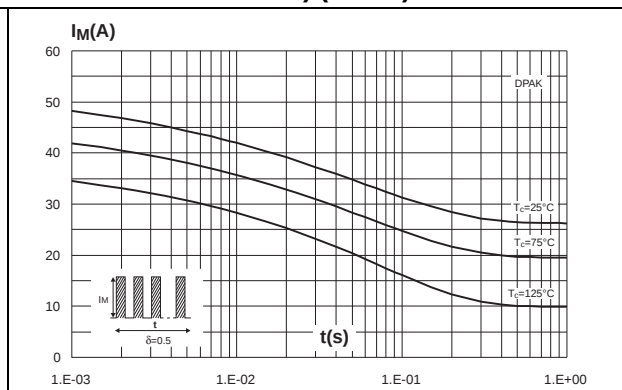


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values) (SMB)

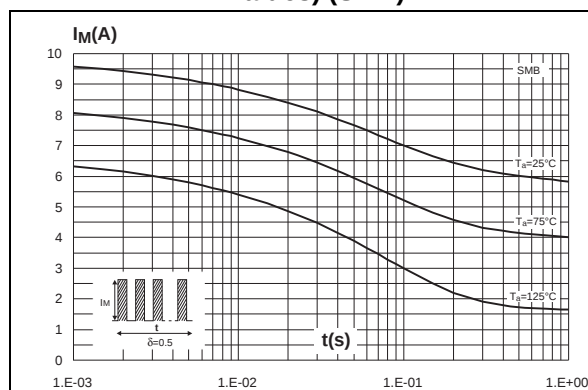


Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values) (SMC)

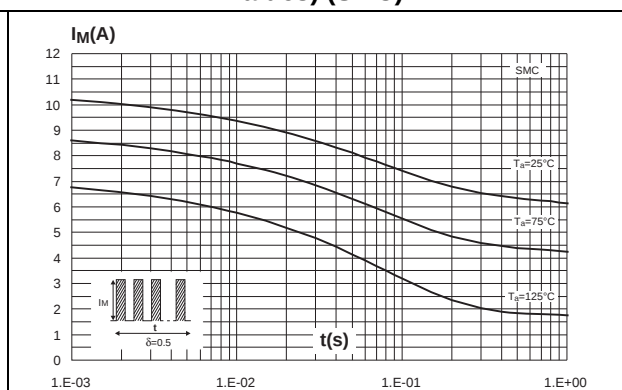


Figure 7. Non repetitive surge peak forward current versus overload duration (maximum values) SMBflat

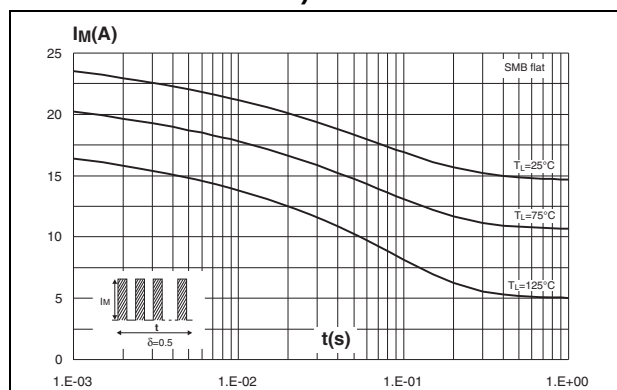


Figure 8. Normalized avalanche power derating versus pulse duration

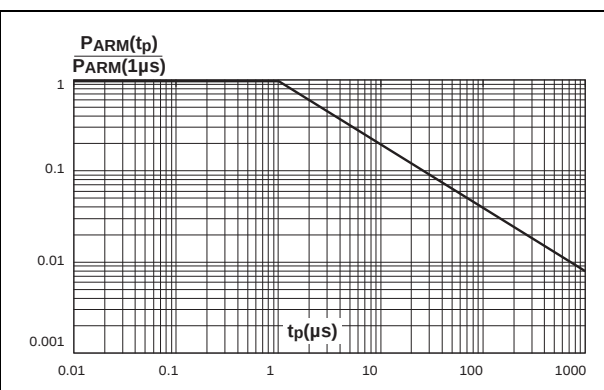


Figure 9. Normalized avalanche power derating versus junction temperature

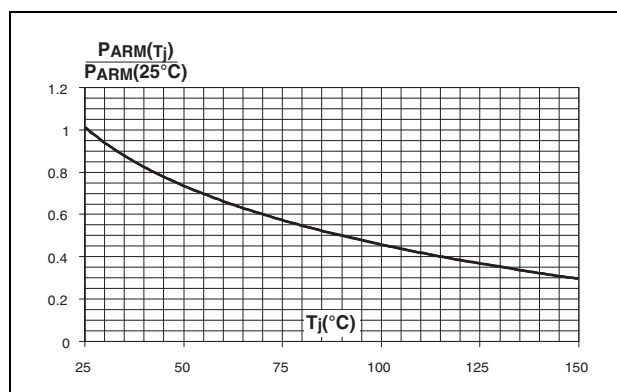


Figure 10. Relative variation of thermal impedance junction to ambient versus pulse duration (DPAK)

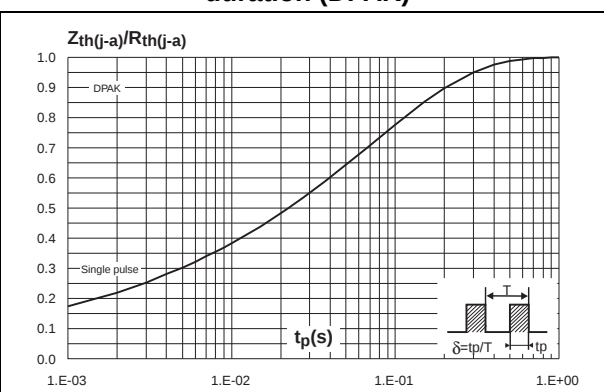


Figure 11. Relative variation of thermal impedance junction to ambient versus pulse duration (SMB)

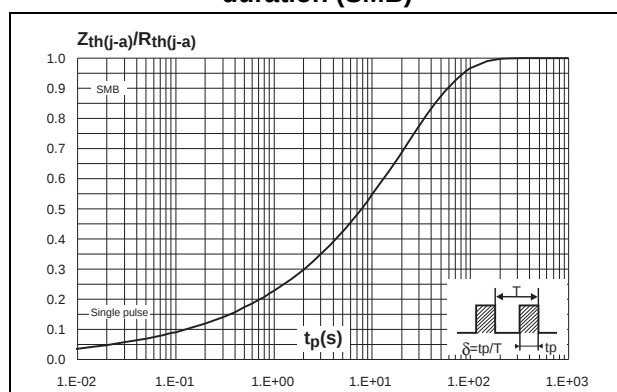


Figure 12. Relative variation of thermal impedance junction to ambient versus pulse duration (SMC)

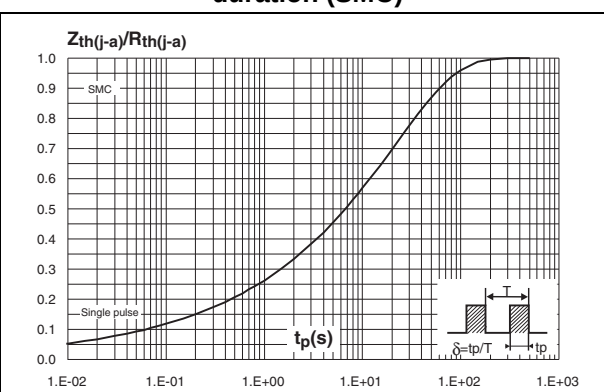


Figure 13. Relative variation of thermal impedance junction to lead versus pulse duration - SMBflat

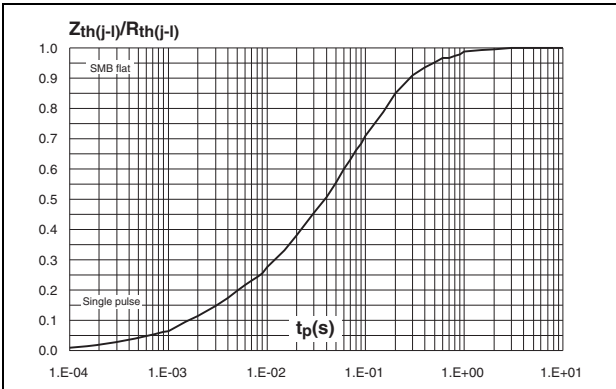


Figure 14. Reverse leakage current versus reverse voltage applied (typical values)

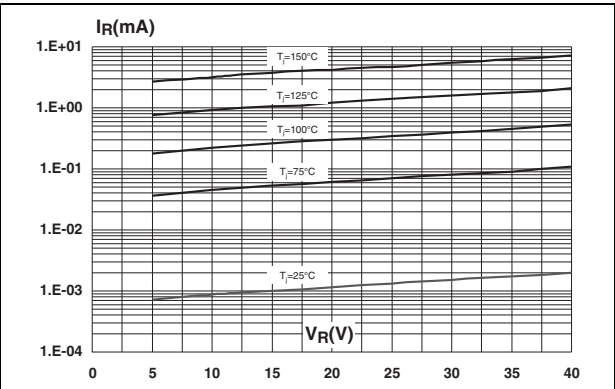


Figure 15. Junction capacitance versus reverse voltage applied (typical values)

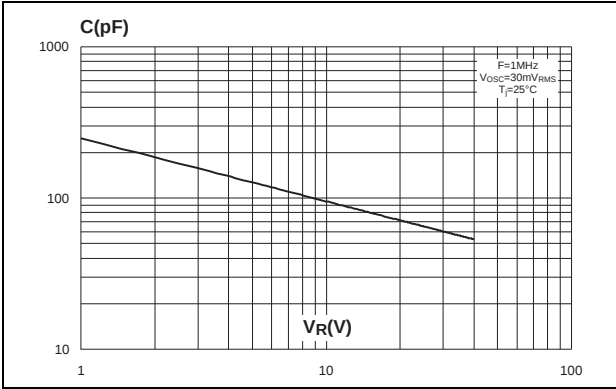


Figure 16. Forward voltage drop versus forward current

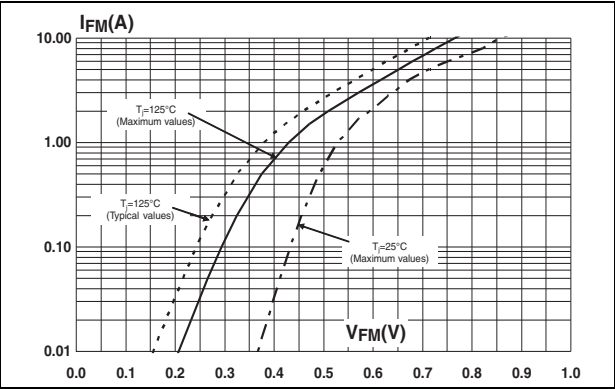


Figure 17. Thermal resistance junction to ambient versus copper surface under each lead (DPAK)

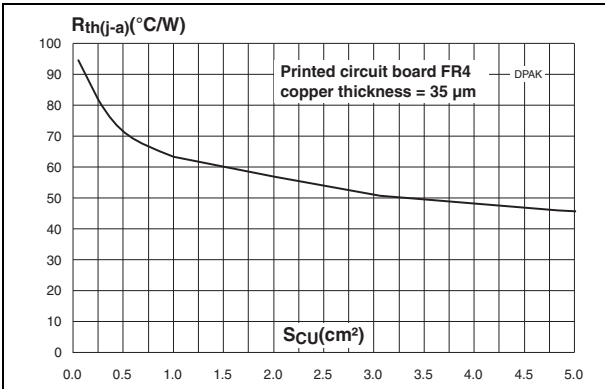


Figure 18. Thermal resistance junction to ambient versus copper surface under each lead (SMB / SMC)

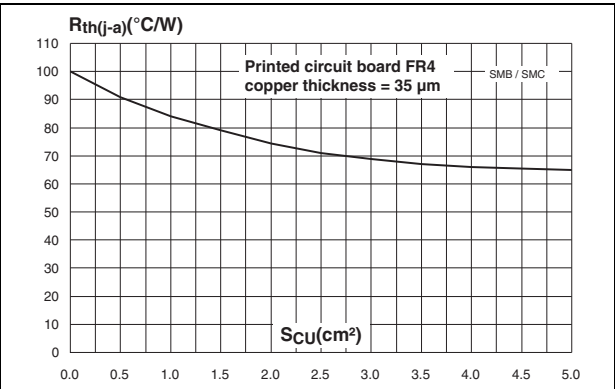
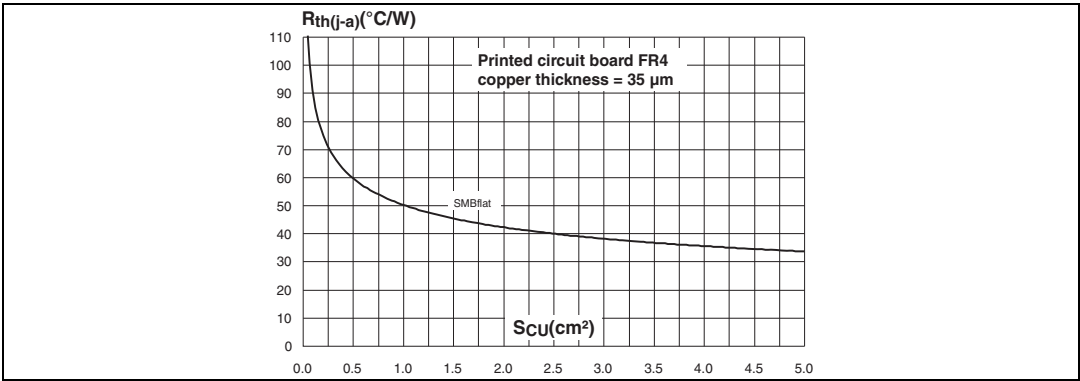


Figure 19. Thermal resistance junction to ambient versus copper surface under each lead (SMBflat)



2 Package Information

- Band indicates cathode on SMB, SMBflat and SMC
- Epoxy meets UL94, V0

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.

Table 5. DPAK dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.18		2.40	0.085		0.094
A1	0.90		1.1	0.035		0.043
A2	0.03		0.23	0.001		0.01
b	0.64		0.90	0.025		0.035
b4	4.95		5.46	0.195		0.215
c	0.46		0.61	0.018		0.024
c2	0.46		0.60	0.018		0.024
D	5.97		6.22	0.235		0.245
E	6.35		6.73	0.250		0.265
e1	4.4		4.7	0.173		0.185
H	9.35		10.34	0.368		0.407
L	1.0		1.78	0.039		0.070
L2			1.27			0.05
L4	0.6		1.02	0.024		0.040
V2	0°		8°	0°		8°

Figure 20. DPAK footprint dimensions (in mm)

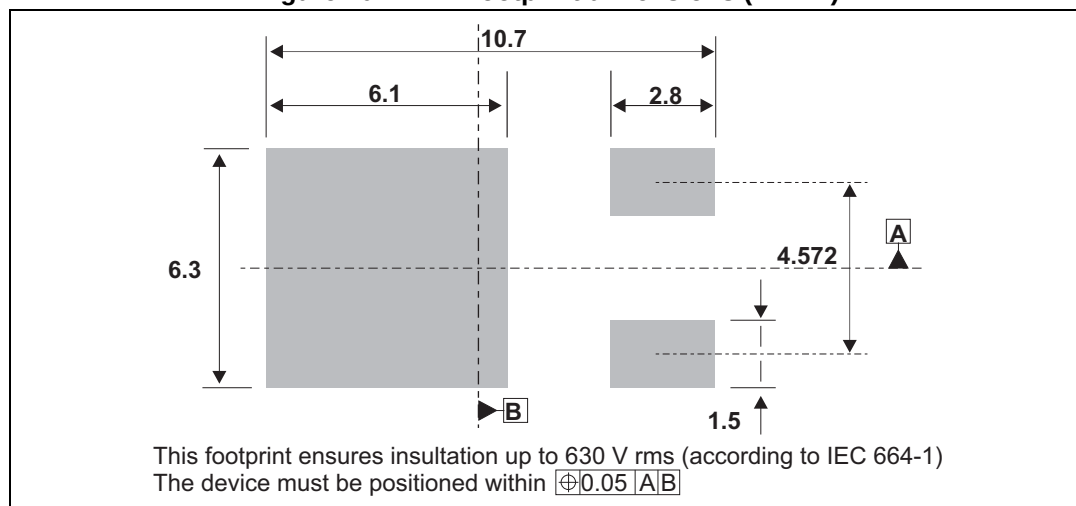


Table 6. SMB dimensions

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	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.50	0.030	0.059

Figure 21. SMB footprint (dimensions in mm)

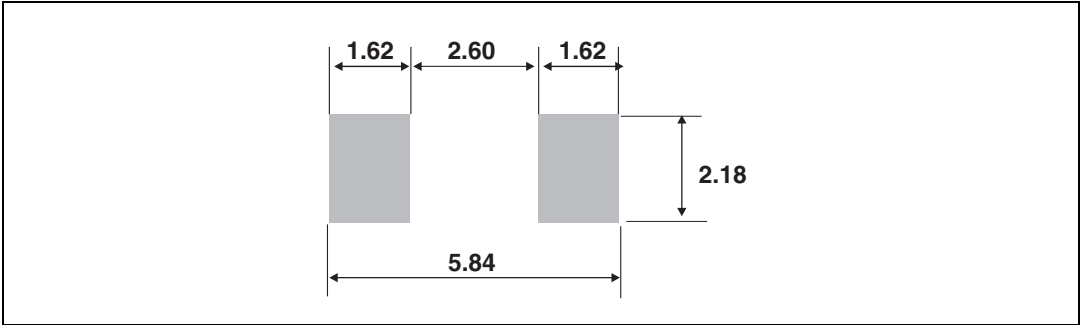
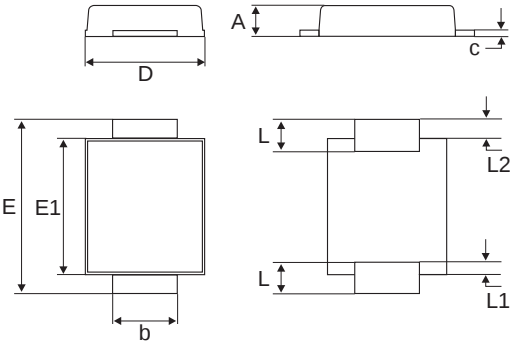


Table 7. SMBflat dimensions

	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 22. SMBflat footprint (dimensions in mm)

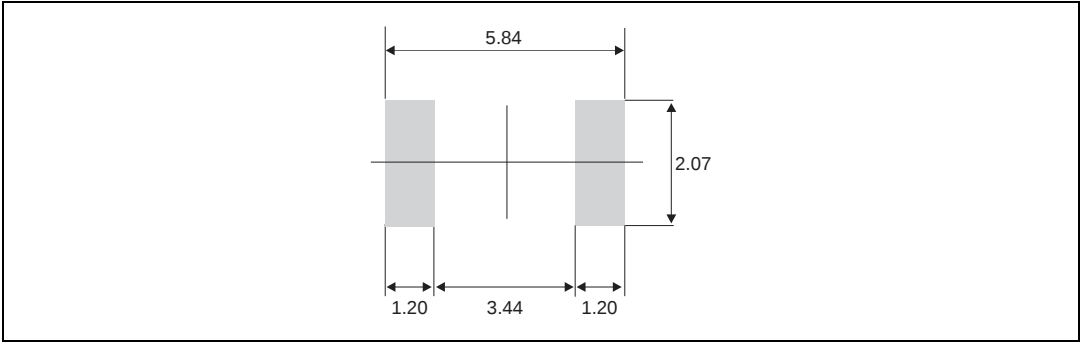
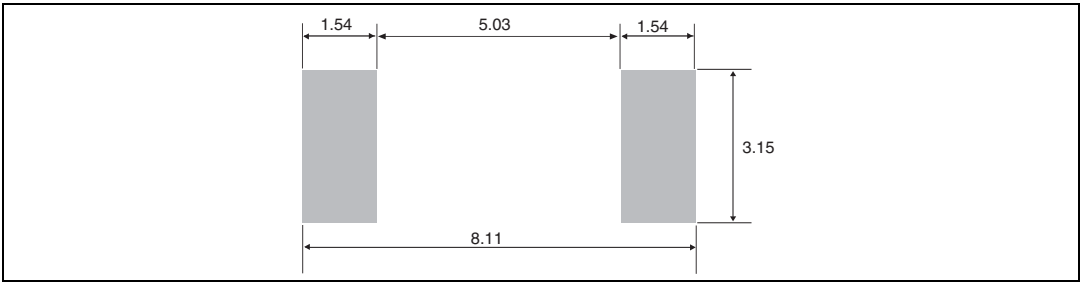


Table 8. SMC package dimensions

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	1.40	0.030	0.063

Figure 23. Footprint dimensions (in millimeters)



3 Ordering information

Table 9. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS340U	U34	SMB	0.107 g	2500	Tape and reel
STPS340S	S34	SMC	0.243 g	2500	
STPS340B	S340	DPAK	0.30 g	75	Tube
STPS340B-TR				2500	Tape and reel
STPS340UF	FU34	ECOPACK®2 SMBflat	0.50 g	5000	Tape and reel

4 Revision history

Table 10. Document revision history

Date	Revision	Description of changes
Jul-2003	7B	Last update.
Feb-2005	8	Layout update. No content change.
08-Feb-2007	9	Reformatted to current standard. Added ECOPACK statement. Added SMBflat package.
16-Apr-2014	10	Updated ECOPACK statement. Corrected Y axis in Figure 16 and Section 2: Package Information .

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.

ST PRODUCTS ARE NOT DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER'S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR "AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL" INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.

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.

© 2014 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 - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com

