



## SM2T3V3A

### Low voltage Transil™

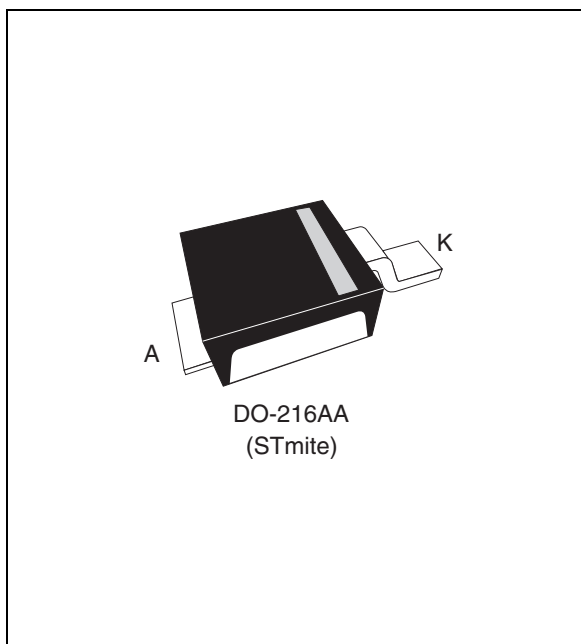
#### Features

- unidirectional Transil diode
- high peak pulse power: 200 w (10/1000  $\mu$ s)
- stand-off voltage 3.3 V
- low clamping factor  $V_{CL}/V_{BR}$
- fast response time
- JEDEC registered package outline

#### Description

The SM2T3V3A is a Transil diode designed specifically for portable equipment and miniaturized electronic devices subject to ESD transient overvoltages. Its low stand-off voltage makes it suitable for low voltage applications very sensitive to EOS and ESD events.

Transil diodes provide high overvoltage protection by clamping action.



TM: Transil is a trademark of STMicroelectronics

# 1 Characteristics

**Table 1. Absolute rating (limiting value)**

Symbol	Parameter		Value	Unit
P <sub>PP</sub>	Peak pulse power dissipation <sup>(1)</sup>	T <sub>j</sub> initial = T <sub>amb</sub>	200	W
P	Power dissipation on infinite heatsink	T <sub>amb</sub> = 100°C	2.5	W
I <sub>FSM</sub>	Non repetitive surge peak forward current	t <sub>p</sub> = 10 ms T <sub>j</sub> initial = T <sub>amb</sub>	25	A
T <sub>stg</sub> T <sub>j</sub>	Storage temperature range Maximum operating junction temperature		-65 to +175 150	°C
T <sub>l</sub>	Lead solder temperature (10 seconds duration)		260	°C

1. 10/1000 μs pulse waveform

**Table 2. Thermal resistance**

Symbol	Parameter	Value	Unit
R <sub>th(j-l)</sub>	Junction to leads	20	°C/W
R <sub>th(j-a)</sub>	Junction to ambient on PCB with recommended pad layout	250	°C/W

**Table 3. Electrical characteristics - parameters (T<sub>amb</sub> = 25 °C)**

Symbol	Parameter
V <sub>RM</sub>	Stand-off voltage.
V <sub>BR</sub>	Breakdown voltage.
V <sub>CL</sub>	Clamping voltage.
I <sub>RM</sub>	Leakage current @ V <sub>RM</sub> .
I <sub>PP</sub>	Peak pulse current.
αT	Voltage temperature coefficient
V <sub>F</sub>	Forward voltage drop

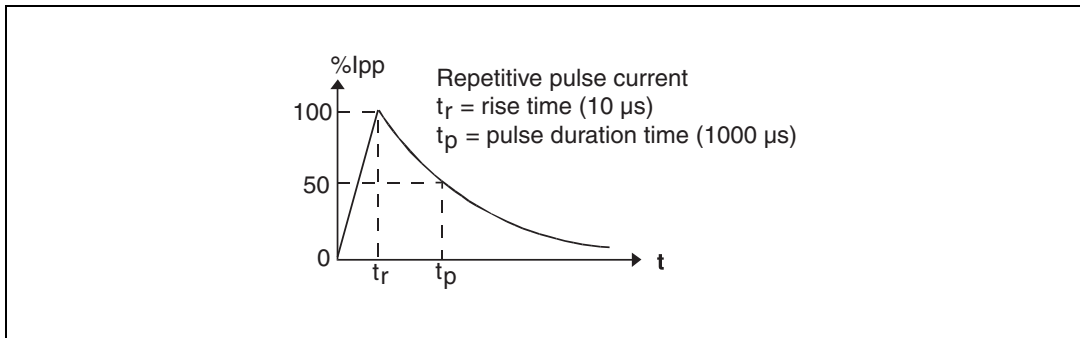
The graph shows the current-voltage (I-V) characteristics of the diode. The vertical axis is current (I) and the horizontal axis is voltage (V). In the reverse bias region (negative V, negative I), the clamping voltage V<sub>CL</sub> is indicated at the top of the reverse current I<sub>RM</sub>. The breakdown voltage V<sub>BR</sub> is the point where the reverse current begins to increase sharply. The forward bias region (positive V, positive I) shows the forward voltage drop V<sub>F</sub> at a current I<sub>F</sub>. The peak pulse current I<sub>PP</sub> is also indicated in the forward region.

**Table 4. Electrical characteristics - values (T<sub>amb</sub> = 25 °C)**

Order code	I <sub>RM</sub> max @ V <sub>RM</sub>		V <sub>BR</sub> min @ I <sub>R</sub> <sup>(1)</sup>		V <sub>CL</sub> max @ I <sub>PP</sub> 10/1000 μs		V <sub>CL</sub> max @ I <sub>PP</sub> 10/1000 μs		αT max <sup>(2)</sup>	C max <sup>(3)</sup>
	μA	V	V	mA	V	A	V	A	10 <sup>-4</sup> /°C	pF
SM2T3V3A	500	3.3	3.6	1	6.5	25	6.8	30	-5.3	2500

1. Pulse test t<sub>p</sub> < 50 ms
2. ΔV<sub>BR</sub> = αT \* (T<sub>amb</sub> - 25) + V<sub>BR</sub> (25 °C)
3. V<sub>R</sub> = 0 V, F = 1 MHz

**Table 5. Pulse waveform**

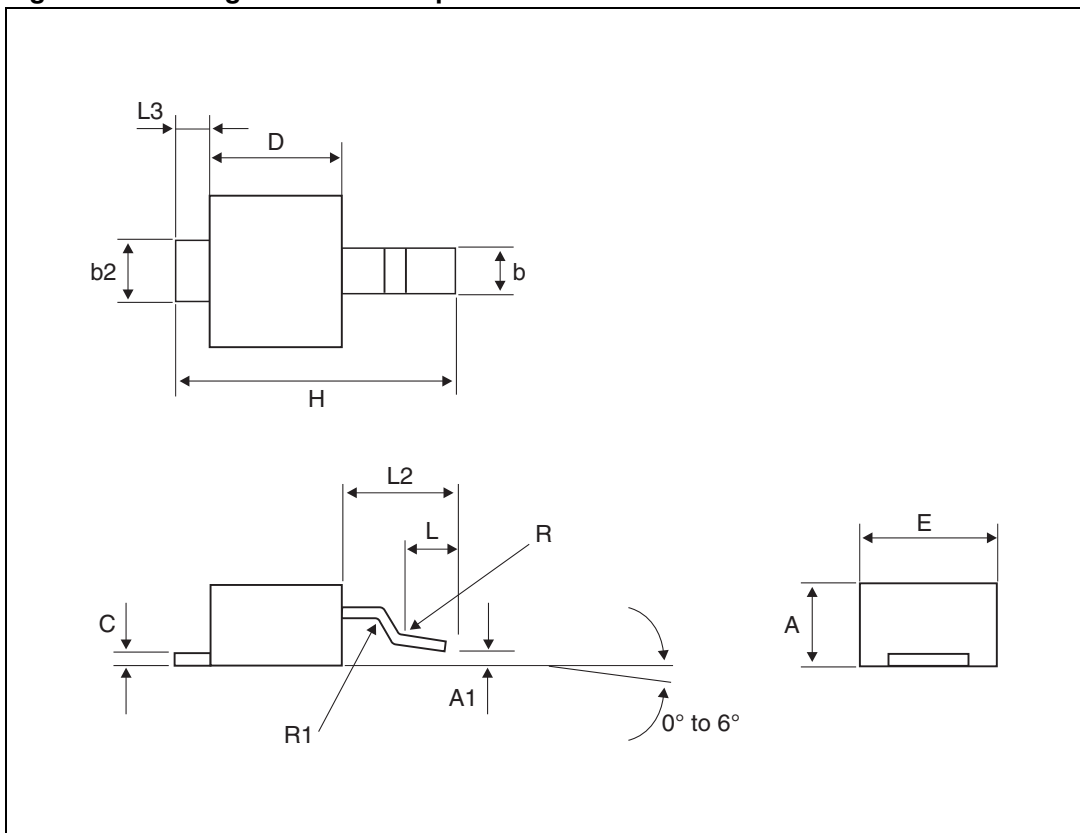


## 2 Package information

- epoxy meets ul94, v0
- band indicates cathode

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](http://www.st.com). ECOPACK® is an ST trademark.

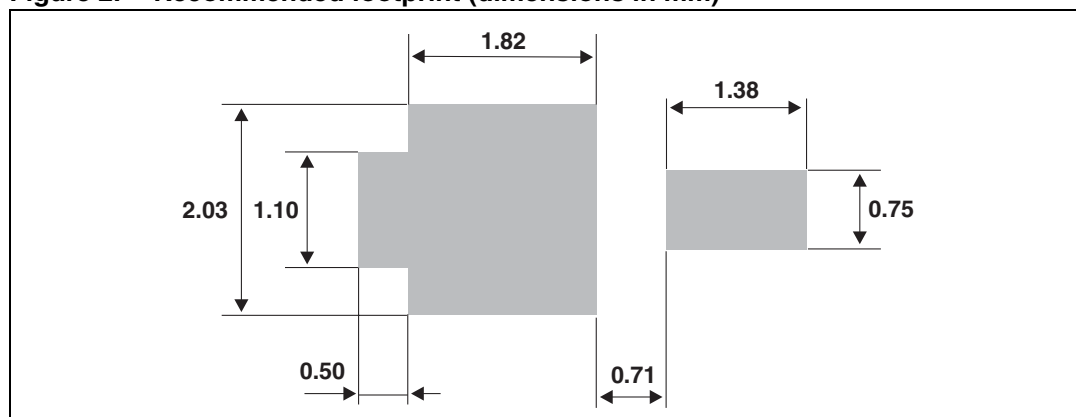
**Figure 1. Package dimensions - parameters**



**Table 6. Package dimensions - values**

Ref.	Dimensions					
	Millimetres			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.85	1.00	1.15	0.033	0.039	0.045
A1	-0.05		0.105	-0.002		0.002
b	0.40		0.65	0.016		0.025
b2	0.70		1.00	0.027		0.039
c	0.10		0.25	0.004		0.010
D	1.75	1.90	2.05	0.069	0.007	0.081
E	1.75	1.90	2.05	0.069	0.007	0.081
H	3.60	3.75	3.90	0.142	0.148	0.154
L	0.50	0.63	0.80	0.047	0.025	0.031
L2	1.20	1.35	1.50	0.047	0.053	0.059
L3		0.50 ref			0.019 ref	
R	0.07			0.003		
R1	0.07			0.003		

**Figure 2. Recommended footprint (dimensions in mm)**



### 3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base quantity	Delivery mode
SM2T3V3A	MUL	STmite	15.5 mg	12000	Tape and reel

### 4 Revision history

Table 8. Document revision history

Date	Revision	Changes
10-Oct-2005	1	First Issue
09-Dec-2010	2	Cathode band added to package illustration.

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries (right to make changes, corrections, modifications or improvements, to this document, and the products and services described here, 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 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. 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 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 WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION 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 RIGHTS. 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" 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 not create or extend in any manner the warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner the 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.

© 2010 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

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

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