

## 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.

## 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

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

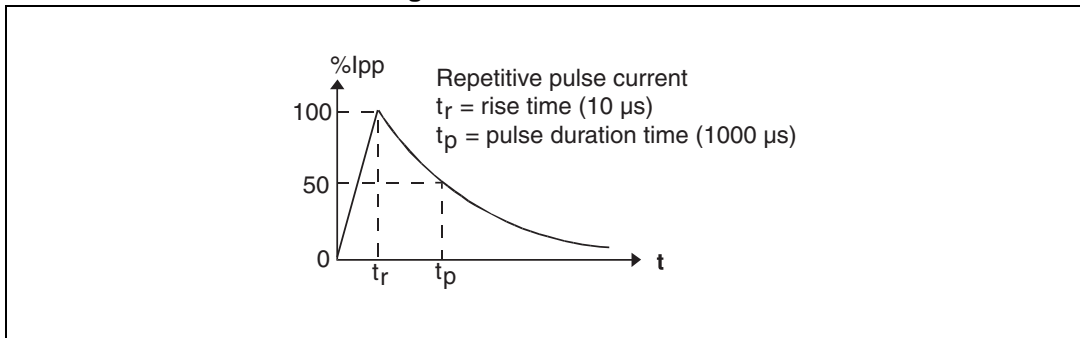
The graph shows the current-voltage (I-V) characteristics of the diode. The vertical axis is current (I) and the horizontal axis is voltage (V). In the reverse bias region (left), the clamping voltage V<sub>CL</sub> is indicated at a certain current level. The breakdown voltage V<sub>BR</sub> is the voltage at which the reverse current begins to increase significantly. The reverse leakage current I<sub>RM</sub> is shown at the stand-off voltage V<sub>RM</sub>. In the forward bias region (right), the forward voltage drop V<sub>F</sub> is shown at a certain current level. The peak forward current I<sub>FF</sub> and peak pulse current I<sub>PP</sub> are also indicated.

**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> 10/100 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

Figure 1. 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 2. Package dimensions - parameters

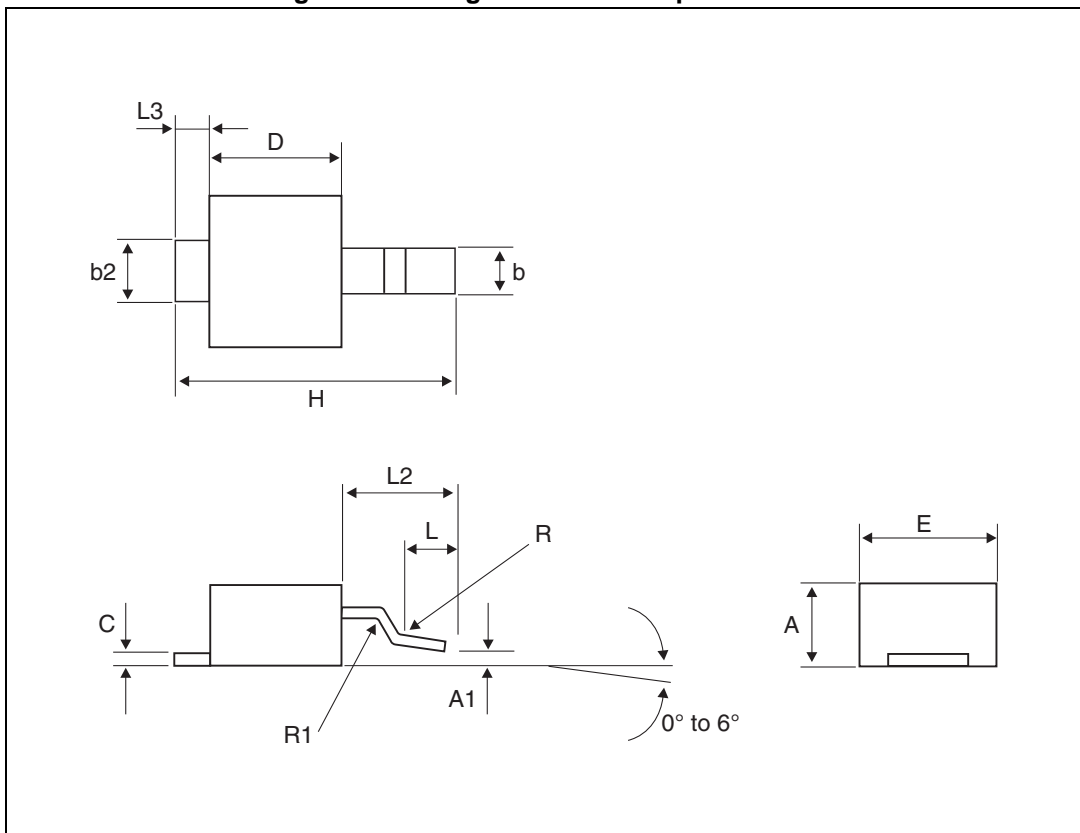
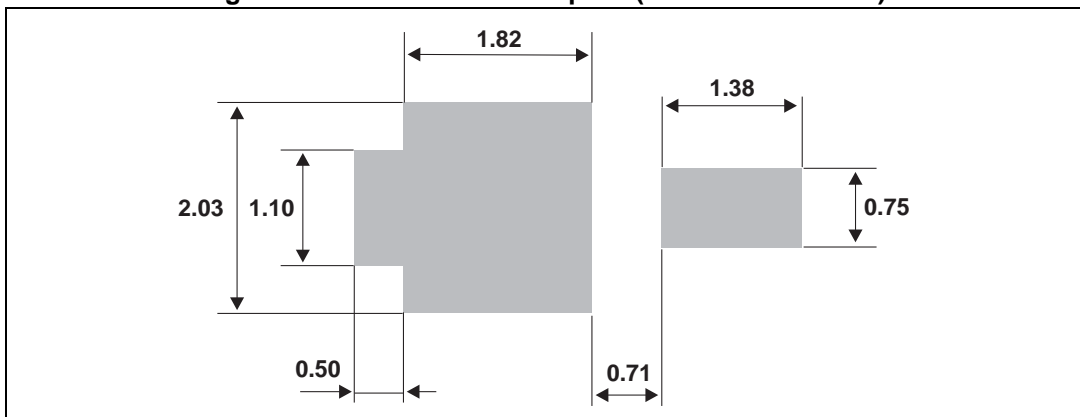


Table 5. Package dimensions - values

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 3. Recommended footprint (dimensions in mm)



### 3 Ordering information

**Table 6. 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 7. Document revision history**

Date	Revision	Changes
10-Oct-2005	1	First Issue
09-Dec-2010	2	Cathode band added to package illustration.
10-Aug-2015	3	Updated features on cover page. Minor text changes

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