



# THE DATASHEET OF SMP2300SCMC

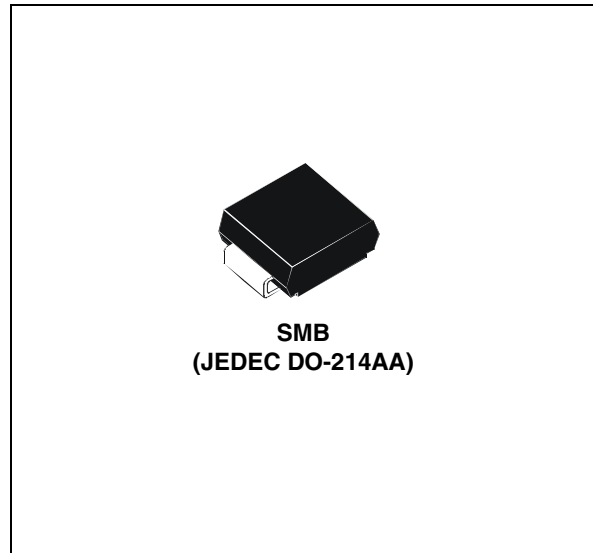


## Features

- Bidirectional crowbar protection
- Repetitive peak pulse current ( $T_{amb}$  -40 °C to +85 °C)
  - $I_{PP} = 100$  A (10/1000  $\mu$ s)
  - $I_{PP} = 200$  A (5/310  $\mu$ s)
  - $I_{PP} = 500$  A (2/10  $\mu$ s)
- Breakdown voltage: from 72 V to 310 V
- Operating  $T_j$  max: 150 °C
- Micro capacitance technology
- JEDEC registered package outline

## Complies with the following standards

- Telcordia GR-1089
- ITU-T K20/21/45 enhanced level
- TIA-968
- YD/T 950 / 993 / 1082
- IEC 61000-4-5
- IEC 61000-4-2 level 4
  - $\pm 15$  kV (air discharge)
  - $\pm 8$  kV (contact discharge)
- MIL STD 883H - Method 3015-8 Class 3B
- Resin meets UL 94, V0
- MIL-STD-750, method 2026 solderability
- EIA STD RS-481 and IEC 60286-3 packing
- IPC 7531 footprint
- UL497B recognized, UL file E136224



## Description

The devices in the SMP-0SCMC series are micro capacitance Trisils designed to protect broadband telecommunication equipment such as DSL modems, subscriber gateways and DSLAMs from lightning surges and power faults.

Trisils are not subject to aging and provide a failsafe mode in short circuit for a better protection. They are used to help equipment to meet main standards such as UL60950, IEC950 / CSA C22.2 and UL1459.

The SMP-0SCMC series is packaged in SMB.

TM: Trisil is a trademark of STMicroelectronics

# 1 Characteristics

**Table 1. Absolute ratings ( $-40\text{ °C} < T_{\text{amb}} < 85\text{ °C}$ ) for repetitive peak pulse current  $I_{\text{PP}}$**

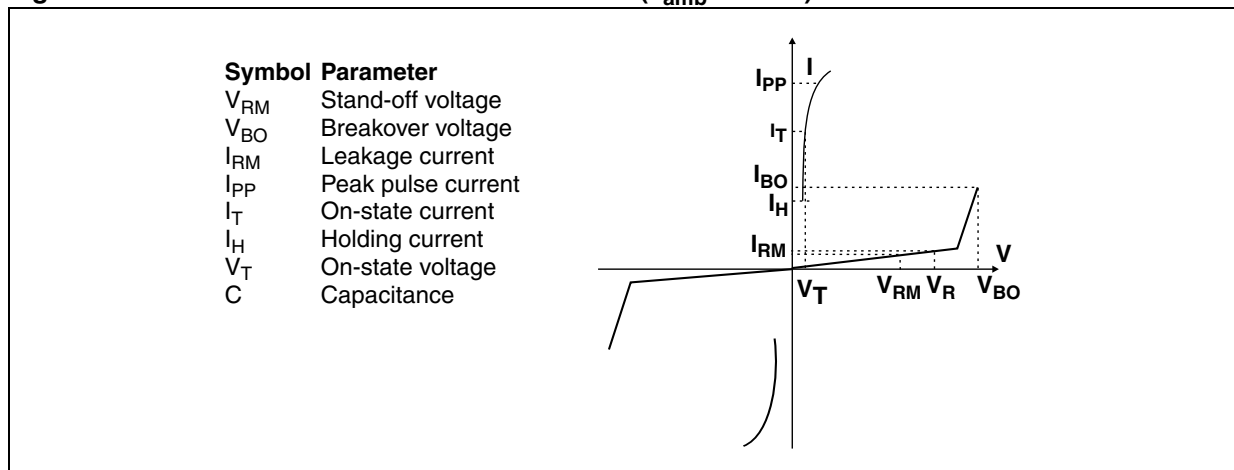
<b>Voltage pulse</b>	0.5/700	2/10	1.2/50	10/160	10/560	9/720	10/360	10/1000	10/700	$\mu\text{s}$
<b>Current pulse</b>	0.2/310	2/10	8/20	10/160	10/560	5/320	10/360	10/1000	5/310	$\mu\text{s}$
<b><math>I_{\text{PP}}</math></b>	100	500	400	200	150	200	175	100	200	A

**Table 2. Absolute ratings ( $T_{\text{amb}} = 25\text{ °C}$ ) for other parameters**

Symbol	Parameter	Value	Unit	
$I_{\text{TSM}}$	Non repetitive surge peak on-state current (sinusoidal) <sup>(1)</sup>	$t = 10\text{ ms}$	61	A
		$t = 0.2\text{ s}$	18	
		$t = 1\text{ s}$	9	
		$t = 2\text{ s}$	7	
		$t = 15\text{ mn}$	4	
$T_{\text{stg}}$	Storage temperature range	-55 to 150	$^{\circ}\text{C}$	
$T_{\text{j}}$	Operating junction temperature range	-40 to 150	$^{\circ}\text{C}$	
$T_{\text{L}}$	Maximum lead temperature for soldering during 10 s.	260	$^{\circ}\text{C}$	

1. In fail safe mode, the device acts as a short circuit.

**Figure 1. Electrical characteristics - definitions ( $T_{\text{amb}} = 25\text{ °C}$ )**

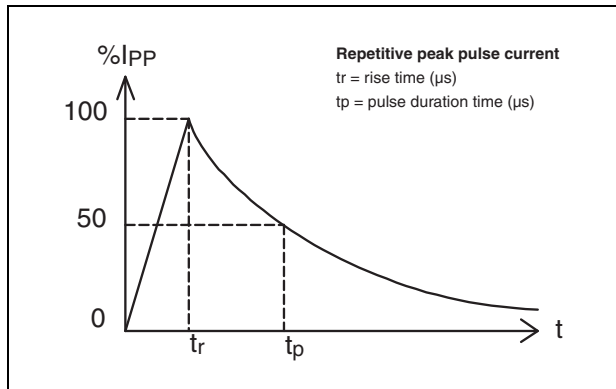


**Table 3. Electrical characteristics - values ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

Order code	$I_{RM} \text{ max @ } V_{RM}$		$V_{BR}$	$V_{BO}$	$I_H$	$V_T @ 2.2 \text{ A}$	$C @ 2 \text{ V}$	$C @ 50 \text{ V}$	$\alpha T^{(1)}$
	Max.		Typ.	Max.	Min.	Max.	Max.	Max.	
	$\mu\text{A}$	V	V	V	mA	V	pF	pF	$10^{-4}/^{\circ}\text{C}$
SMP0720SCMC	5	65	72	88	150	3	80	45	9
SMP0900SCMC	5	75	90	98	150	3	80	45	9.1
SMP1100SCMC	5	90	110	130	150	3	75	40	9.3
SMP1300SCMC	5	120	130	160	150	3	75	40	9.5
SMP1500SCMC	5	140	150	180	150	3	75	40	9.7
SMP1800SCMC	5	170	180	220	150	3	70	35	9.9
SMP2100SCMC	5	180	210	240	150	3	45	25	10.2
SMP2300SCMC	5	190	230	260	150	3	45	25	10.3
SMP2600SCMC	5	220	260	300	150	3	40	20	10.6
SMP3100SCMC	5	275	310	350	150	3	40	20	11

1. For  $V_{BR}$  versus junction temperature, use the following formula:  $V_{BR} @ T_J = V_{BR} @ 25\text{ }^{\circ}\text{C} \times (1 + \alpha T \times (T_J - 25))$

**Figure 2. Pulse waveform**



**Figure 3. Non repetitive surge peak on-state current versus overload duration**

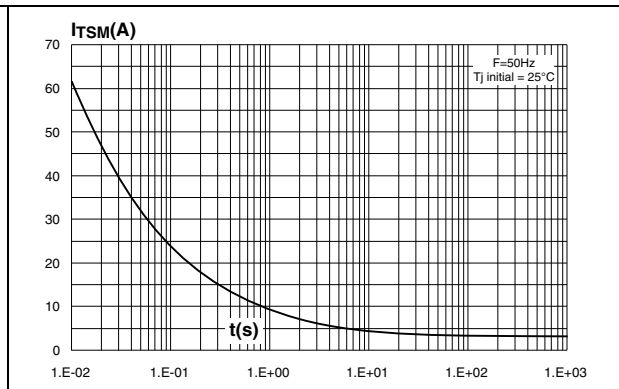


Figure 4. Relative variation of holding current versus junction temperature

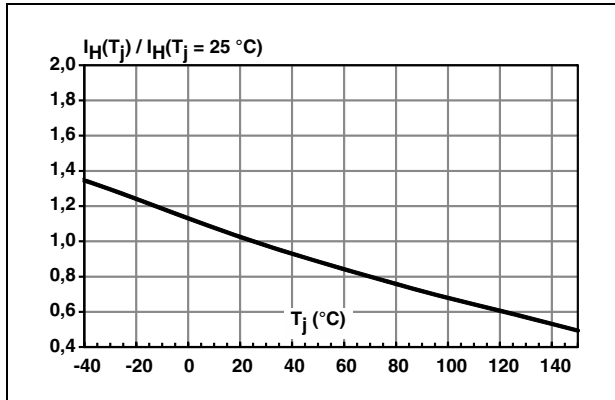


Figure 5. Percentage of change of break over voltage versus junction temperature

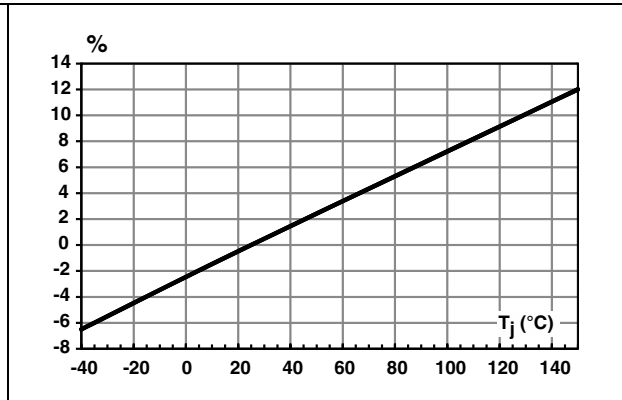
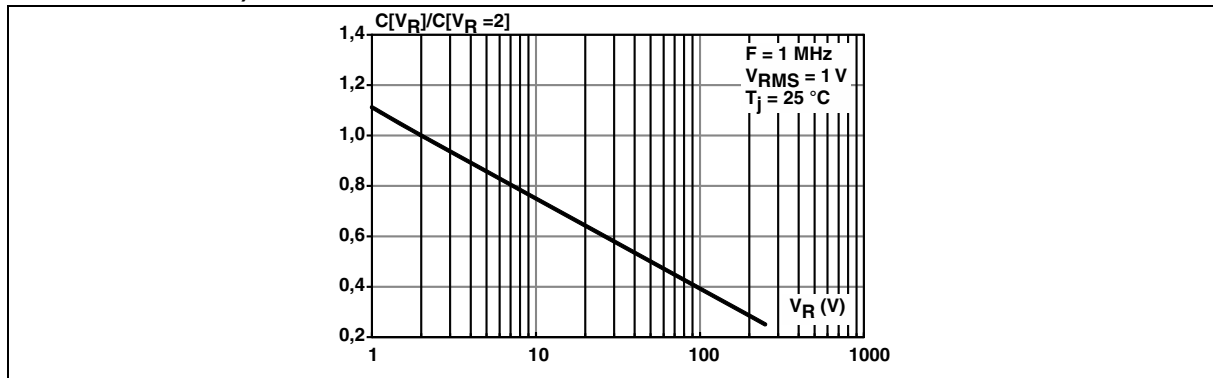


Figure 6. Relative variation of junction capacitance versus reverse applied voltage (typical values)



## 2 Package information

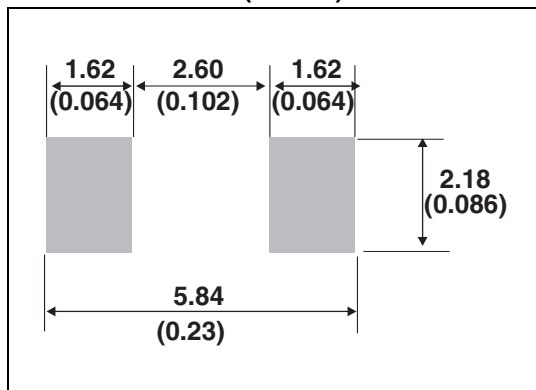
- Epoxy meets UL94, V0
- Lead-free package

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.

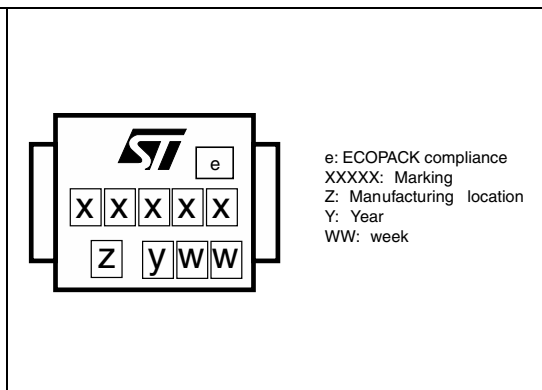
**Table 4. SMB dimensions**

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 7. Footprint dimensions in mm (inches)**



**Figure 8. Marking layout**



### 3 Ordering information

**Table 5. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
SMP0720SCMC	P07CM	SMB	98 mg	2500	Tape and reel
SMP0900SCMC	P09CM				
SMP1100SCMC	P11CM				
SMP1300SCMC	P13CM				
SMP1500SCMC	P15CM				
SMP1800SCMC	P18CM				
SMP2100SCMC	P21CM				
SMP2300SCMC	P23CM				
SMP2600SCMC	P26CM				
SMP3100SCMC	P31CM				

### 4 Revision history

**Table 6. Document revision history**

Date	Revision	Changes
17-Jan-2013	1	Initial version.

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