



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

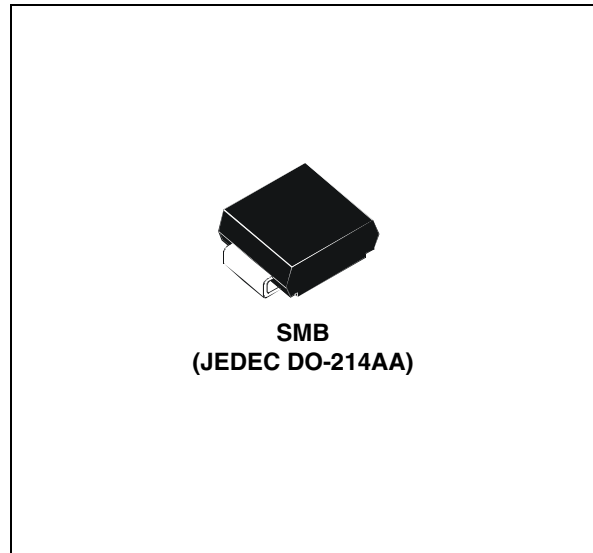


## Features

- 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  $I_{\text{PP}}$**

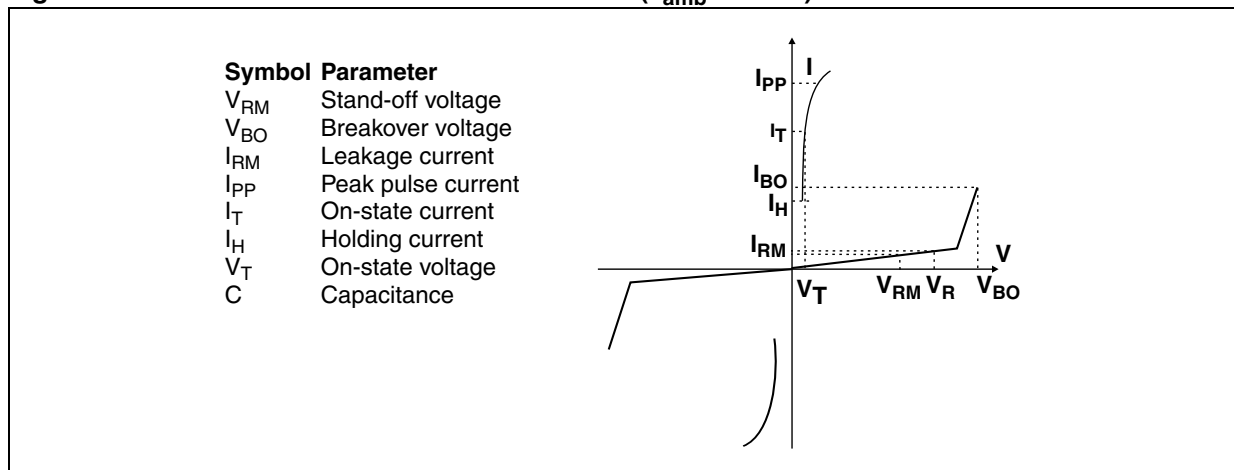
|                                   |         |      |        |        |        |       |        |         |        |               |
|-----------------------------------|---------|------|--------|--------|--------|-------|--------|---------|--------|---------------|
| <b>Voltage pulse</b>              | 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 ( $T_{\text{amb}} = 25\text{ °C}$ )**

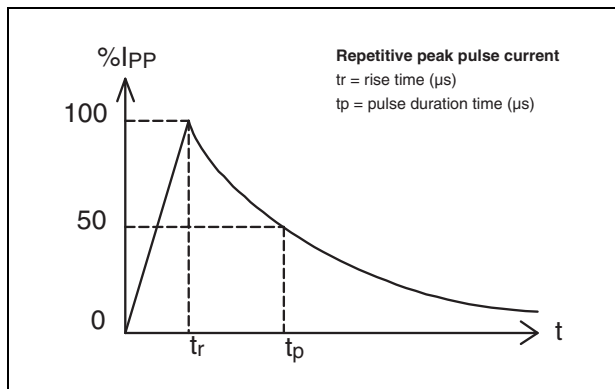


**Table 3. Electrical characteristics - values ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

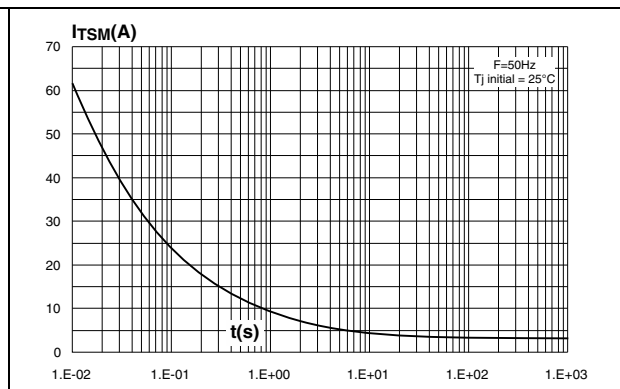
| Order code  | $I_{RM} \text{ max @ } V_{RM}$ |     | $V_{BR}$  | $V_{BO}$  | $I_H$      | $V_T \text{ @ } 2.2 \text{ A}$ | $C \text{ @ } 2 \text{ V}$ | $C \text{ @ } 50 \text{ V}$ | $\alpha T^{(1)}$           |
|-------------|--------------------------------|-----|-----------|-----------|------------|--------------------------------|----------------------------|-----------------------------|----------------------------|
|             | Max.<br>$\mu\text{A}$          | V   | Typ.<br>V | Max.<br>V | Min.<br>mA | Max.<br>V                      | Max.<br>pF                 | Max.<br>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:  $V_{BR} \text{ @ } T_J = V_{BR} \text{ @ } 25\text{ }^{\circ}\text{C} \times (1 + \alpha T \times (T_J - 25))$

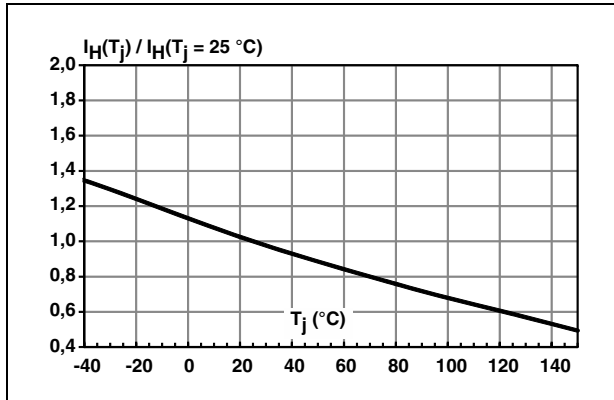
**Figure 2. Pulse waveform**



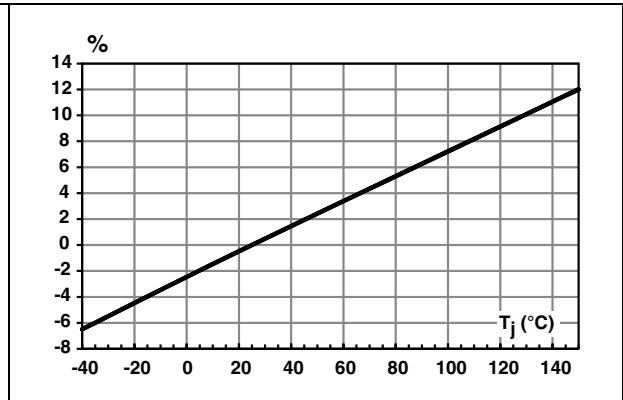
**Figure 3. Non repetitive surge peak on-state current versus overload duration**



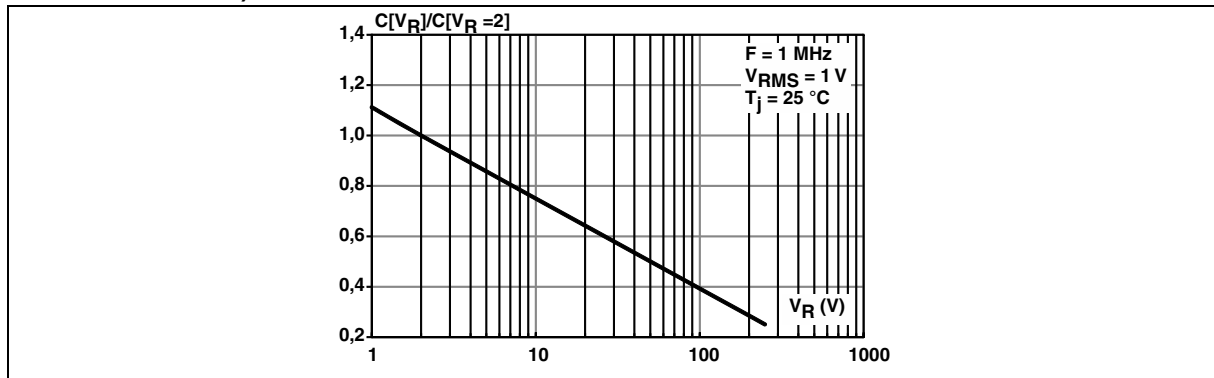
**Figure 4. Relative variation of holding current versus junction temperature**



**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

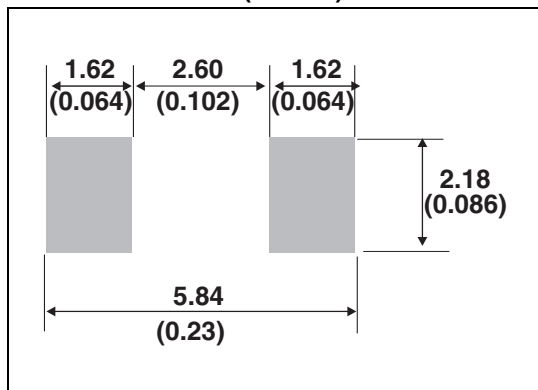
- Epoxy meets UL94, V0
- Lead-free package

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.

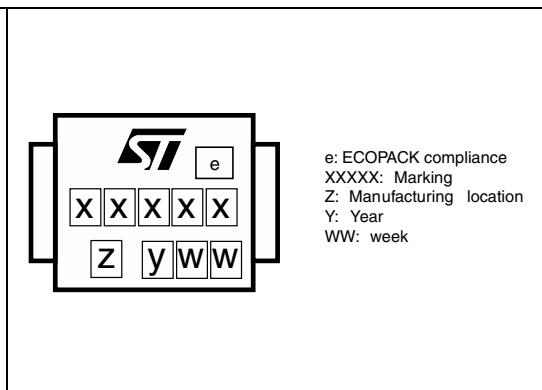
**Table 4. SMB dimensions**

| 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. |

**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 TWO AUTHORIZED ST REPRESENTATIVES, 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.

© 2013 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](http://www.st.com)

