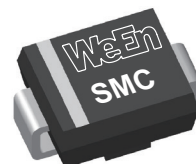


## 1. General description

SMDJ series, 3000W transient voltage suppressor (TVS) in SMC package, designed to protect electronic circuit which induced by lightning surge or other transient voltage situation.

## 2. Features and benefits

- Peak pulse power 3000W @ 10/1000 $\mu$ s waveform
- Excellent clamping capability
- Low incremental surge resistance
- Surface mount package for easy assembly and board space saving
- Typical  $I_R < 2\mu$ A When  $V_R > 12$ V
- Fast response time: Typically less than 1.0ps from 0V to BV min
- IEC 61000-4-2 ESD 30kV (Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- High temperature to reflow soldering guaranteed: 260 $^{\circ}$ C/10sec
- Meet UL94V-0 flammability classification which guaranteed by mold compound
- Meet MSL level1, per J-STD-020
- Lead free lead finish
- Halogen free and RoHS compliant



Bi-directional



Uni-directional

## 3. Applications

- Power supply protection
- Industrial application
- Power management
- I/O interface protection



## 4. Ordering information

| Type number   | Package name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|---------------|--------------|-----------------------|----------------|------------------------|-----------------|--------------------|
| SMDJxxxXX     | SMC          | SMDJxxxXXJ            | Tape and reel  | 3000                   | SMCJ            | 18-Oct-2020        |
| eg. SMDJ9.0CA | SMC          | SMDJ9.0CAJ            | Tape and reel  | 3000                   | SMCJ            | 18-Oct-2020        |

## 5. Absolute maximum ratings

In accordance with the Absolute Maximum Rating System (IEC 60134).

$T_j = 25^{\circ}$ C unless otherwise specified.

| Symbol                         | Parameter                      | Conditions   | Values     | Unit         |
|--------------------------------|--------------------------------|--|------------|--------------|
| <b>Absolute maximum rating</b> |                                |  |            |              |
| $P_{PPM}$                      | peak pulse power               | [1]  | 3000       | W            |
| $P_{M(AV)}$                    | steady state power dissipation | on infinite heatsink at $T_a = 50^{\circ}$ C   | 6.5        | W            |
| $I_{FSM}$                      | peak forward surge current     | $t_p = 8.3$ ms; single half sine-wave pulse; duty cycle = 4 pulses per minute maximum; unidirectional units only | 300        | A            |
| $V_F$                          | forward on-state voltage       | $I_F = 100$ A; unidirectional units only   | 3.5        | V            |
| $T_{stg}$                      | storage temperature range      |  | -65 to 150 | $^{\circ}$ C |
| $T_j$                          | operating temperature range    |  | -65 to 150 | $^{\circ}$ C |

[1] In accordance with IEC 61643-321 (10/1000  $\mu$ s current waveform).

## 6. Characteristics

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

| PN<br>(Uni) | PN<br>(Bi) | Reverse<br>Stand off<br>Voltage<br>$V_R$<br>(V) | Breakdown<br>Voltage $V_{BR}$ @<br>$I_T$<br>(V) |       | Test<br>current<br>$I_T$<br>(mA) | Max.<br>Clamping<br>Voltage $V_C$<br>@ $I_{PP}$<br>(V) | Max. Peak<br>Pulse<br>Current<br>$I_{PP}$<br>(A) | Maximum<br>Reverse<br>Leakage<br>$I_R$ @ $V_R$<br>( $\mu\text{A}$ ) | Marking |        |
|-------------|------------|---|---|-------|----------------------------------|--|--|---|---------|--------|
|             |            |   | Min   | Max   |                                  |  |  |   | Uni     | Bi     |
| SMDJ9.0A    | SMDJ9.0CA  | 9   | 10.1  | 11    | 1                                | 15.4   | 194.8  | 10  | D009AJ  | D009CJ |
| SMDJ10A     | SMDJ10CA   | 10  | 11.21   | 12.19 | 1                                | 17   | 176.5  | 3.5   | D010AJ  | D010CJ |
| SMDJ11A     | SMDJ11CA   | 11  | 12.32   | 13.33 | 1                                | 18.2   | 164.8  | 2   | D011AJ  | D011CJ |
| SMDJ12A     | SMDJ12CA   | 12  | 13.48   | 14.57 | 1                                | 19.9   | 150.8  | 2   | D012AJ  | D012CJ |
| SMDJ13A     | SMDJ13CA   | 13  | 14.54   | 15.76 | 1                                | 21.5   | 139.5  | 2   | D013AJ  | D013CJ |
| SMDJ14A     | SMDJ14CA   | 14  | 15.75   | 17.04 | 1                                | 23.2   | 129.3  | 2   | D014AJ  | D014CJ |
| SMDJ15A     | SMDJ15CA   | 15  | 16.86   | 18.33 | 1                                | 24.4   | 123  | 2   | D015AJ  | D015CJ |
| SMDJ16A     | SMDJ16CA   | 16  | 17.94   | 19.56 | 1                                | 26   | 115.4  | 2   | D016AJ  | D016CJ |
| SMDJ17A     | SMDJ17CA   | 17  | 19.04   | 20.75 | 1                                | 27.6   | 108.7  | 2   | D017AJ  | D017CJ |
| SMDJ18A     | SMDJ18CA   | 18  | 20.19   | 21.9  | 1                                | 29.2   | 102.7  | 2   | D018AJ  | D018CJ |
| SMDJ20A     | SMDJ20CA   | 20  | 22.41   | 24.28 | 1                                | 32.4   | 92.6   | 2   | D020AJ  | D020CJ |
| SMDJ22A     | SMDJ22CA   | 22  | 24.59   | 26.71 | 1                                | 35.5   | 84.5   | 2   | D022AJ  | D022CJ |
| SMDJ24A     | SMDJ24CA   | 24  | 26.9  | 29.18 | 1                                | 38.9   | 77.1   | 2   | D024AJ  | D024CJ |
| SMDJ26A     | SMDJ26CA   | 26  | 29.12   | 31.68 | 1                                | 42.1   | 71.3   | 2   | D026AJ  | D026CJ |
| SMDJ28A     | SMDJ28CA   | 28  | 31.34   | 34.16 | 1                                | 45.4   | 66.1   | 2   | D028AJ  | D028CJ |
| SMDJ30A     | SMDJ30CA   | 30  | 33.6  | 36.59 | 1                                | 48.4   | 62   | 2   | D030AJ  | D030CJ |
| SMDJ33A     | SMDJ33CA   | 33  | 36.98   | 40.3  | 1                                | 53.3   | 56.3   | 2   | D033AJ  | D033CJ |
| SMDJ36A     | SMDJ36CA   | 36  | 40.3  | 43.9  | 1                                | 58.1   | 51.6   | 2   | D036AJ  | D036CJ |
| SMDJ40A     | SMDJ40CA   | 40  | 44.8  | 48.8  | 1                                | 64.5   | 46.5   | 2   | D040AJ  | D040CJ |
| SMDJ43A     | SMDJ43CA   | 43  | 48.2  | 52.4  | 1                                | 69.4   | 43.2   | 2   | D043AJ  | D043CJ |
| SMDJ45A     | SMDJ45CA   | 45  | 50.4  | 54.9  | 1                                | 72.7   | 41.3   | 2   | D045AJ  | D045CJ |
| SMDJ48A     | SMDJ48CA   | 48  | 53.7  | 58.5  | 1                                | 77.4   | 38.8   | 2   | D048AJ  | D048CJ |
| SMDJ51A     | SMDJ51CA   | 51  | 57.1  | 62.3  | 1                                | 82.4   | 36.4   | 2   | D051AJ  | D051CJ |
| SMDJ54A     | SMDJ54CA   | 54  | 60.5  | 65.8  | 1                                | 87.1   | 34.4   | 2   | D054AJ  | D054CJ |
| SMDJ58A     | SMDJ58CA   | 58  | 64.9  | 70.7  | 1                                | 93.6   | 32.1   | 2   | D058AJ  | D058CJ |
| SMDJ60A     | SMDJ60CA   | 60  | 67.2  | 73.2  | 1                                | 96.8   | 31   | 2   | D060AJ  | D060CJ |
| SMDJ64A     | SMDJ64CA   | 64  | 71.6  | 78    | 1                                | 103  | 29.1   | 2   | D064AJ  | D064CJ |
| SMDJ70A     | SMDJ70CA   | 70  | 78.4  | 85.4  | 1                                | 113  | 26.5   | 2   | D070AJ  | D070CJ |
| SMDJ75A     | SMDJ75CA   | 75  | 83.9  | 91.5  | 1                                | 121  | 24.8   | 2   | D075AJ  | D075CJ |
| SMDJ78A     | SMDJ78CA   | 78  | 87.4  | 95.1  | 1                                | 126  | 23.8   | 2   | D078AJ  | D078CJ |
| SMDJ85A     | SMDJ85CA   | 85  | 95.2  | 103.3 | 1                                | 137  | 21.9   | 2   | D085AJ  | D085CJ |



Fig. 1. I-V curve characteristics; Uni-directional



Fig. 2. I-V curve characteristics; Bi-directional



Fig. 3. Peak pulse power derating curve



Fig. 4. Pulse waveform

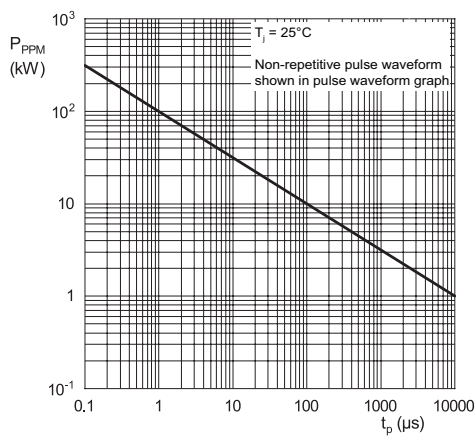


Fig. 5. Peak pulse power rating curve

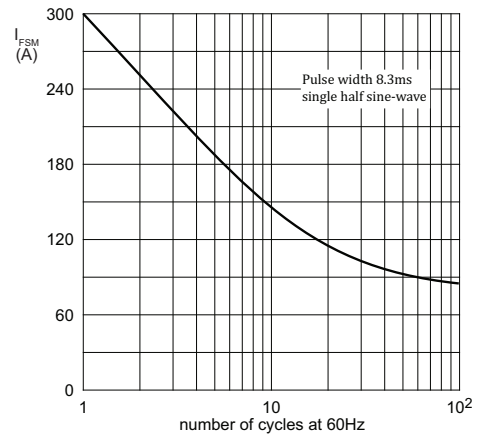


Fig. 6. Maximum non-repetitive surge current



Fig. 7. Typical junction capacitance

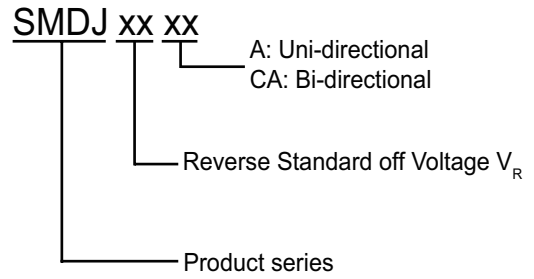


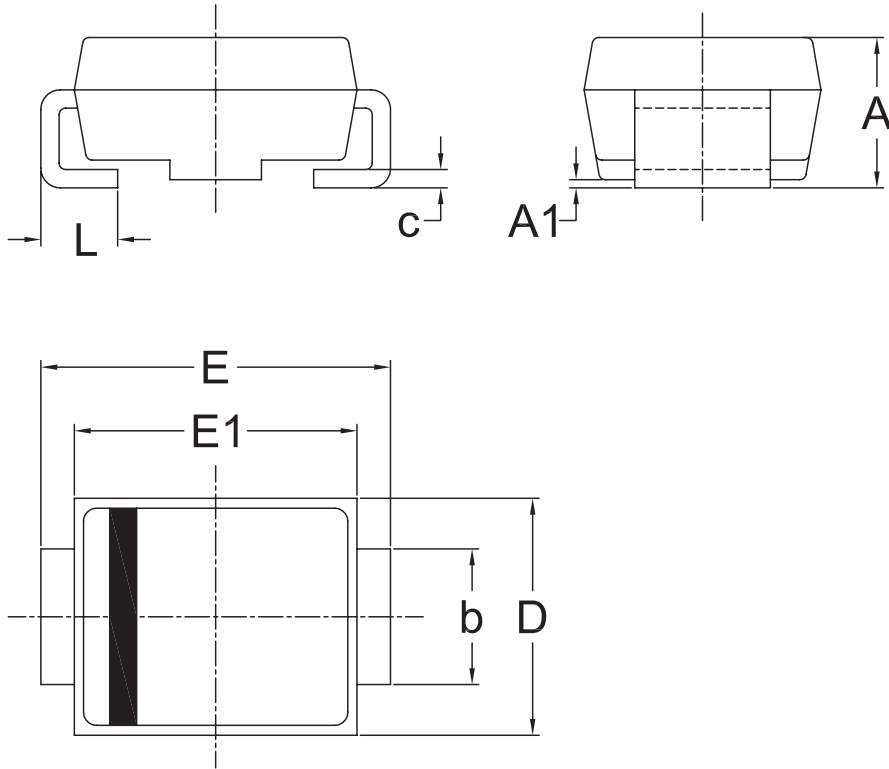
Fig. 8. Part numbering



Fig. 9. Part marking

**7. Package outline**

SMC



| UNIT | A   | A1   | b    | c    | D    | E    | E1   | L    |      |
|------|-----|------|------|------|------|------|------|------|------|
| mm   | Max | 2.83 | 0.30 | 3.10 | 0.25 | 6.15 | 8.15 | 7.05 | 1.60 |
|      | Min | 2.33 | 0.00 | 2.80 | 0.15 | 5.85 | 7.65 | 6.75 | 0.90 |

Remark: Dimensions D and E1 do not include mold flash & gate remain.

## 8. Legal information

### Data sheet status

| Document status [1][2]         | Product status [3] | Definition  |
|--------------------------------|--------------------|---|
| Objective [short] data sheet   | Development        | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification      | This document contains data from the preliminary specification.                       |
| Product [short] data sheet     | Production         | This document contains the product specification.                                     |

- [1] Please consult the most recently issued document before initiating or completing a design.
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