# 5.0SMDJ12A~5.0SMDJ170A

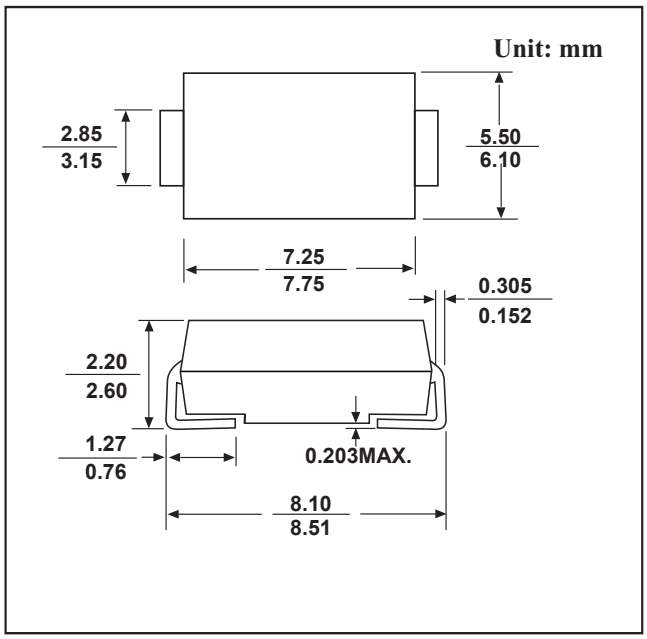
## SMC TRANSIENT VOLTAGE SUPPRESSOR

### FEATURES

- ●Glass passivated chip
- ●Low leakage
- ●Uni and Bidirectional unit
- ●Excellent clamping capability
- ●Very fast response time
- ●RoHS compliant

### MECHANICAL DATA

- ●Case style:SMC plastic molded
- ●Polarity:color band denotes positive end( cathode ) except for bidirectional
- ●Mounting position: any




## DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional use C or CA suffix for types 1.5KE6.8 thru 1.5KE540(e.g. 1.5KE6.8C,1.5KE440CA)

Electrical characteristics apply in both directions.

## MAXIMUM RATINGS AND CHARACTERISTICS

@ 25°C Ambient Temperature (unless otherwise noted)

| Parameter | Symbol | Value | Units |
|---|---|---|---|
| Peak Pulse Power Dissipation on 10/1000 us Waveform (Note 1, 2, FIG.1) | $P_{PPM}$ | 5000 | W |
| Power Dissipation on Infinite Heat Sink at $T_L$=50°C | $P_D$ | 6.5 | W |
| Peak Pulse Current of on 10/1000us Waveform (Note 1, FIG.3) | $I_{PPM}$ | See Table 1 | A |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave (Note 2. 3) | $I_{FSM}$ | 300 | A |
| Operating Junction Temperature Range | $T_J$ | -55 to 150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to 150 | °C |

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above $T_A$=25°C per Fig.2.
2. Mounted on 8.0x8.0mm$^2$ (0.03mm thick) Copper Pads to each terminal.
3. Measured on 8.3ms single half sine-wave, or equivalent square wave, for Unidirectional device only.

## Electrical Characteristics (Ratings at 25℃ ambient temperature unless otherwise specified).

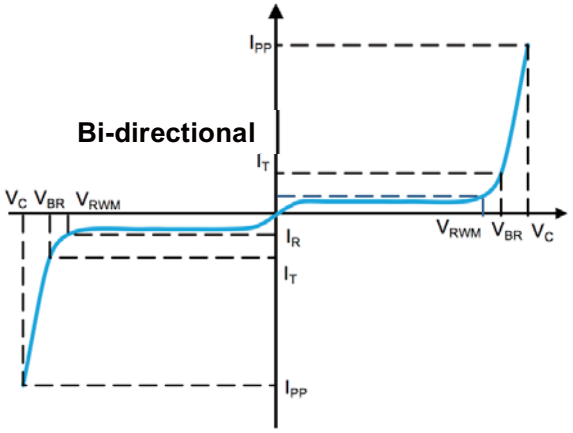
| Type Number | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @$I_T$ | Breakdown Voltage Max. @ $I_T$ | Test Current | Maximum Clamping Voltage @$I_{PP}$ | Peak Pulse Current | Reverse Leakage @$V_{RMW}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| (Uni) | (Bi) | (Uni) | (Bi) | $V_{RMW}$(V) | $V_{BR\ MIN}$(V) | $V_{BR\ MAX}$(V) | $I_T$ (mA) | $V_C$(V) | $I_{PP}$(A) | $I_R$(uA) |
| 5.0SMDJ12A | 5.0SMDJ12CA | 5PEP | 5BEP | 12.0 | 13.30 | 14.70 | 10 | 19.9 | 252.00 | 800 |
| 5.0SMDJ13A | 5.0SMDJ13CA | 5PEQ | 5BEQ | 13.0 | 14.40 | 15.90 | 10 | 21.5 | 233.00 | 500 |
| 5.0SMDJ14A | 5.0SMDJ14CA | 5PER | 5BER | 14.0 | 15.60 | 17.20 | 10 | 23.2 | 216.00 | 200 |
| 5.0SMDJ15A | 5.0SMDJ15CA | 5PES | 5BES | 15.0 | 16.70 | 18.50 | 1 | 24.4 | 205.00 | 100 |
| 5.0SMDJ16A | 5.0SMDJ16CA | 5PET | 5BET | 16.0 | 17.80 | 20.50 | 1 | 26.0 | 193.00 | 50 |
| 5.0SMDJ17A | 5.0SMDJ17CA | 5PEU | 5BEU | 17.0 | 18.90 | 20.90 | 1 | 27.6 | 181.00 | 20 |
| 5.0SMDJ18A | 5.0SMDJ18CA | 5PEV | 5BEV | 18.0 | 20.00 | 22.10 | 1 | 29.2 | 172.00 | 10 |
| 5.0SMDJ20A | 5.0SMDJ20CA | 5PEW | 5BEW | 20.0 | 22.20 | 24.50 | 1 | 32.4 | 155.00 | 5 |
| 5.0SMDJ22A | 5.0SMDJ22CA | 5PEX | 5BEX | 22.0 | 24.40 | 26.90 | 1 | 35.5 | 141.00 | 5 |
| 5.0SMDJ24A | 5.0SMDJ24CA | 5PEZ | 5BEZ | 24.0 | 26.70 | 29.50 | 1 | 38.9 | 129.00 | 5 |
| 5.0SMDJ26A | 5.0SMDJ26CA | 5PFE | 5BFE | 26.0 | 28.90 | 31.90 | 1 | 42.1 | 119.00 | 5 |
| 5.0SMDJ28A | 5.0SMDJ28CA | 5PFG | 5BFG | 28.0 | 31.10 | 34.40 | 1 | 45.4 | 110.00 | 5 |
| 5.0SMDJ30A | 5.0SMDJ30CA | 5PFK | 5BFK | 30.0 | 33.30 | 36.80 | 1 | 48.4 | 103.00 | 5 |
| 5.0SMDJ33A | 5.0SMDJ33CA | 5PFM | 5BFM | 33.0 | 36.70 | 40.60 | 1 | 53.3 | 93.90 | 5 |
| 5.0SMDJ36A | 5.0SMDJ36CA | 5PFP | 5BFP | 36.0 | 40.00 | 44.20 | 1 | 58.1 | 86.10 | 5 |
| 5.0SMDJ40A | 5.0SMDJ40CA | 5PFR | 5BFR | 40.0 | 44.40 | 49.10 | 1 | 64.5 | 77.60 | 5 |
| 5.0SMDJ43A | 5.0SMDJ43CA | 5PFT | 5BFT | 43.0 | 47.80 | 52.80 | 1 | 69.4 | 72.10 | 5 |
| 5.0SMDJ45A | 5.0SMDJ45CA | 5PFV | 5BFV | 45.0 | 50.00 | 55.30 | 1 | 72.7 | 68.80 | 5 |
| 5.0SMDJ48A | 5.0SMDJ48CA | 5PFX | 5BFX | 48.0 | 53.30 | 58.90 | 1 | 77.4 | 64.70 | 5 |
| 5.0SMDJ51A | 5.0SMDJ51CA | 5PFZ | 5BFZ | 51.0 | 56.70 | 62.70 | 1 | 82.4 | 60.70 | 5 |
| 5.0SMDJ54A | 5.0SMDJ54CA | 5PGE | 5BGE | 54.0 | 60.00 | 66.30 | 1 | 87.1 | 57.50 | 5 |
| 5.0SMDJ58A | 5.0SMDJ58CA | 5PGG | 5BGG | 58.0 | 64.40 | 71.20 | 1 | 93.6 | 53.50 | 5 |
| 5.0SMDJ60A | 5.0SMDJ60CA | 5PGK | 5BGK | 60.0 | 66.70 | 73.70 | 1 | 96.8 | 51.70 | 5 |
| 5.0SMDJ64A | 5.0SMDJ64CA | 5PGM | 5BGM | 64.0 | 71.10 | 78.60 | 1 | 103.0 | 48.60 | 5 |
| 5.0SMDJ70A | 5.0SMDJ70CA | 5PGP | 5BGP | 70.0 | 77.80 | 86.00 | 1 | 113.0 | 44.30 | 5 |
| 5.0SMDJ75A | 5.0SMDJ75CA | 5PGR | 5BGR | 75.0 | 83.00 | 92.10 | 1 | 121.0 | 41.40 | 5 |
| 5.0SMDJ78A | 5.0SMDJ78CA | 5PGT | 5BGT | 78.0 | 86.00 | 95.80 | 1 | 126.0 | 39.70 | 5 |
| 5.0SMDJ85A | 5.0SMDJ85CA | 5PGV | 5BGV | 85.0 | 94.00 | 104.00 | 1 | 137.0 | 36.50 | 5 |
| 5.0SMDJ90A | 5.0SMDJ90CA | 5PGX | 5BGX | 90.0 | 100.00 | 111.00 | 1 | 146.0 | 34.30 | 5 |
| 5.0SMDJ100A | 5.0SMDJ100CA | 5PGZ | 5BGZ | 100.0 | 111.00 | 123.00 | 1 | 162.0 | 30.90 | 5 |
| 5.0SMDJ110A | 5.0SMDJ110CA | 5PHE | 5BHE | 110.0 | 122.00 | 135.00 | 1 | 177.0 | 28.30 | 5 |
| 5.0SMDJ120A | 5.0SMDJ120CA | 5PHG | 5BHG | 120.0 | 133.00 | 147.00 | 1 | 193.0 | 26.00 | 5 |
| 5.0SMDJ130A | 5.0SMDJ130CA | 5PHK | 5BHK | 130.0 | 144.00 | 159.00 | 1 | 209.0 | 24.00 | 5 |
| 5.0SMDJ150A | 5.0SMDJ150CA | 5PHM | 5BHM | 150.0 | 167.00 | 185.00 | 1 | 243.0 | 20.60 | 5 |
| 5.0SMDJ160A | 5.0SMDJ160CA | 5PHP | 5BHP | 160.0 | 178.00 | 197.00 | 1 | 259.0 | 19.30 | 5 |
| 5.0SMDJ170A | 5.0SMDJ170CA | 5PHR | 5BHR | 170.0 | 189.00 | 209.00 | 1 | 275.0 | 18.20 | 5 |

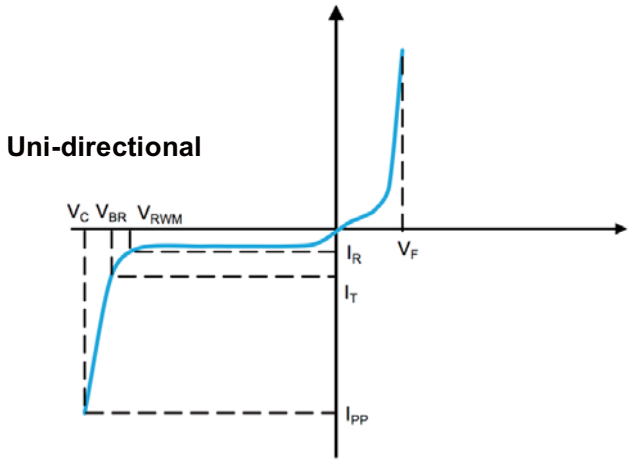
※ For Bi-directional type having $V_{RWM}$ of 20 Volts and less, the $I_R$ limit is double.

※ For parts without A, the VBR is ± 10% and VC is 5% higher than with A parts.

## RATINGS AND CHARACTERISTIC CURVES

### *I-V Curve Characteristics*




| | |
|---|---|
| $P_{PPM}$ | **Peak Pulse Power Dissipation** - Max power dissipation |
| $V_{RWM}$ | **Reverse Stand-off Voltage** - Maximum voltage that can be applied to TVS without operation |
| $V_{BR}$ | **Breakdown Voltage** – Maximum voltage that flows though the TVS at a specified current ($I_T$) |
| $V_C$ | **Clamping Voltage** – Peak voltage measured across the TVS at a specified $I_{PPM}$ (peak impulse current) |
| $I_R$ | **Reverse Leakage Current** – Current measured at $V_R$ |
| $V_F$ | **Forward Voltage Drop for Uni-directional** |

### *Ratings and Characteristic Curves* ($T_A$=25°C unless otherwise noted)

## RATINGS AND CHARACTERISTIC CURVES

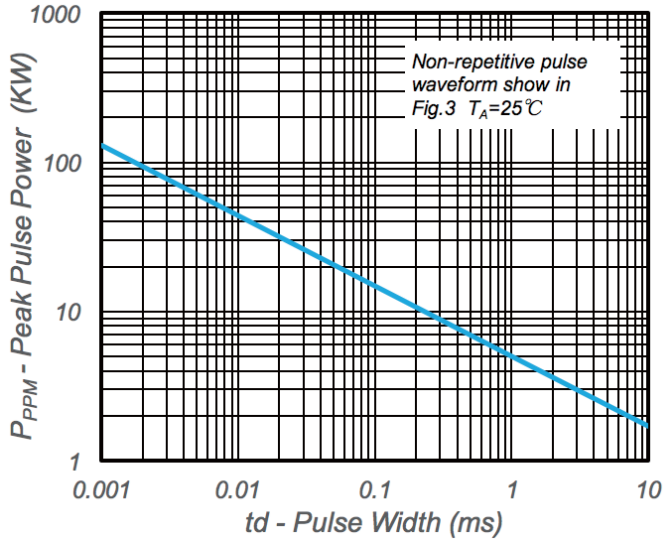



Fig.1 - Peak Pulse Power Rating

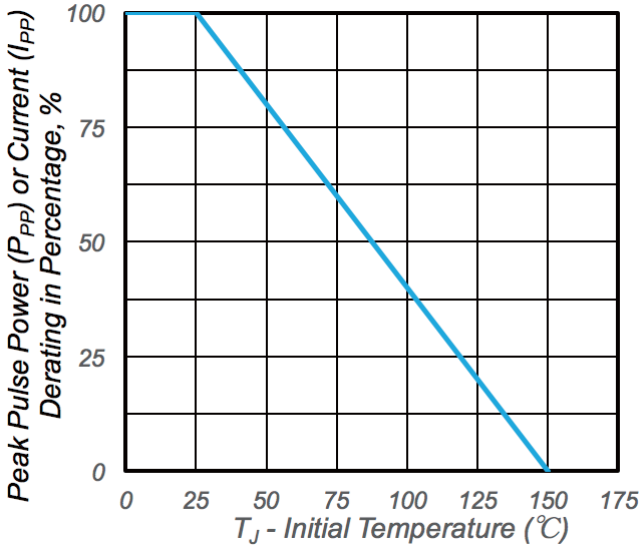



Fig.2 - Pulse Derating Cure

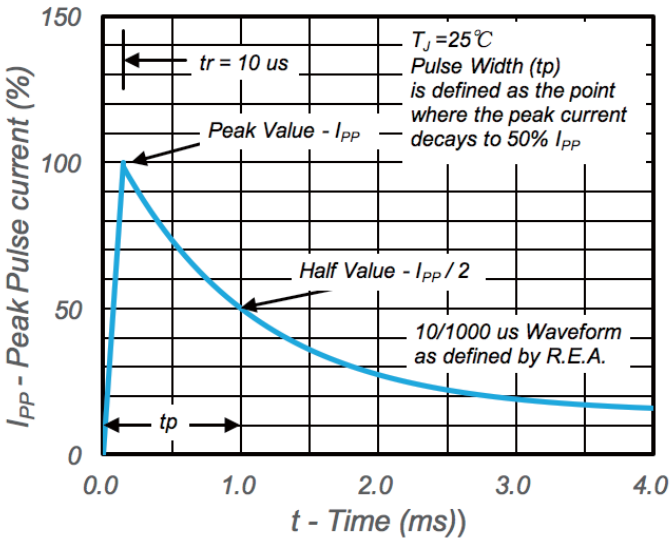



Fig.3 – Pulse Waveform

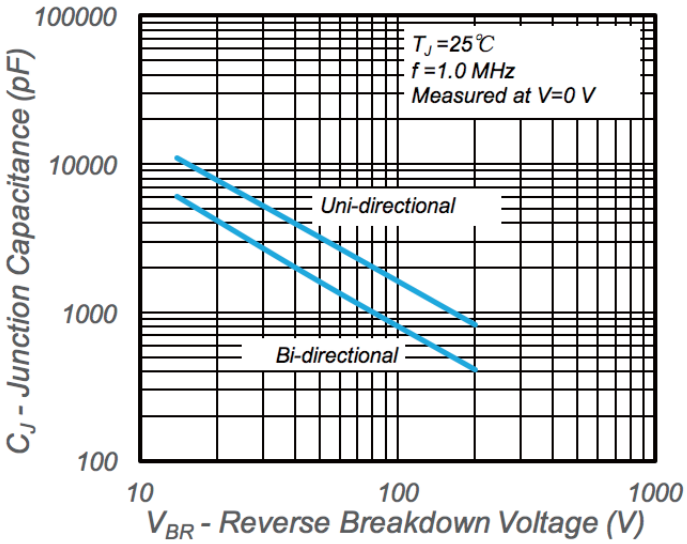



Fig.4 - Typical Junction Capacitance