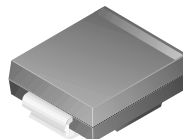


# Transient Voltage Suppressors

## SMCJ5V0(C)A - SMCJ170(C)A

### Features

- Glass passivated junction.
- 1500 W Peak Pulse Power capability on 10/1000  $\mu$ s waveform.
- Excellent clamping capability.
- Low incremental surge resistance.
- Fast response time; typically less than 1.0 ps from 0 volts to BV for unidirectional and 5.0 ns for bidirectional.
- Typical  $I_R$  less than 1.0  $\mu$ A above 10V.
- UL certificate #E326243 and E210467.
- UL94V-0 Flammability Classification.



**SMC/DO-214AB**

COLOR BAND DENOTES CATHODE ON UNIDIRECTIONAL DEVICES ONLY. NO COLOR BAND ON BIDIRECTIONAL DEVICES.

### DEVICES FOR BIPOLAR APPLICATIONS

- Bidirectional types use CA suffix.
- Electrical Characteristics apply in both directions.

## 1500 Watt Transient Voltage Suppressors

### Absolute Maximum Ratings\*

$T_A = 25^\circ\text{C}$  unless otherwise noted

| Symbol    | Parameter                                                                                    | Value       | Units            |
|-----------|----------------------------------------------------------------------------------------------|-------------|------------------|
| $P_{PPM}$ | Peak Pulse Power Dissipation on 10/1000 $\mu$ s waveform                                     | 1500        | W                |
| $I_{PPM}$ | Peak Pulse Current on 10/1000 $\mu$ s waveform                                               | see table   | A                |
| $I_{FSM}$ | Non-repetitive Peak Forward Surge Current superimposed on rated load (JEDEC method) (Note 1) | 200         | A                |
| $T_{stg}$ | Storage Temperature Range                                                                    | -55 to +150 | $^\circ\text{C}$ |
| $T_J$     | Operating Junction Temperature                                                               | + 150       | $^\circ\text{C}$ |

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**Note 1:** Measured on 8.3 ms single half-sine wave or equivalent square wave; Duty cycle = 4 pulses per minute maximum.

# Transient Voltage Suppressors

(continued)

## Electrical Characteristics

T<sub>A</sub> = 25°C unless otherwise noted

| Uni-directional<br>Bi-directional (C)<br>Device | Part<br>Marking* | Reverse<br>Stand-off<br>Voltage<br>V <sub>RWM</sub> (V) | Breakdown<br>Voltage<br>V <sub>BR</sub> (V) |       | Test<br>Current<br>I <sub>T</sub> (mA) | Clamping<br>Voltage<br>@ I <sub>PPM</sub><br>V <sub>C</sub> (V) | Peak Pulse<br>Current<br>I <sub>PPM</sub> (A) | Reverse<br>Leakage<br>@ V <sub>RWM</sub><br>I <sub>R</sub> (uA)** |
|-------------------------------------------------|------------------|---------------------------------------------------------|---------------------------------------------|-------|----------------------------------------|-----------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------------------------|
|                                                 |                  |                                                         | min                                         | max   |                                        |                                                                 |                                               |                                                                   |
| SMCJ5V0(C)A                                     | GDE              | 5.0                                                     | 6.40                                        | 7.0   | 10                                     | 9.2                                                             | 163.0                                         | 1000                                                              |
| SMCJ6V0(C)A                                     | GDG              | 6.0                                                     | 6.67                                        | 7.37  | 10                                     | 10.3                                                            | 145.6                                         | 1000                                                              |
| SMCJ6V5(C)A                                     | GDK              | 6.5                                                     | 7.22                                        | 7.98  | 10                                     | 11.2                                                            | 133.9                                         | 500                                                               |
| SMCJ7V0(C)A                                     | GDM              | 7.0                                                     | 7.78                                        | 8.60  | 10                                     | 12.0                                                            | 125.0                                         | 200                                                               |
| SMCJ7V5(C)A                                     | GDP              | 7.5                                                     | 8.33                                        | 9.21  | 1                                      | 12.9                                                            | 116.3                                         | 100                                                               |
| SMCJ8V0(C)A                                     | GDR              | 8.0                                                     | 8.89                                        | 9.83  | 1                                      | 13.6                                                            | 110.3                                         | 50                                                                |
| SMCJ8V5(C)A                                     | GDT              | 8.5                                                     | 9.44                                        | 10.4  | 1                                      | 14.4                                                            | 104.2                                         | 20                                                                |
| SMCJ9V0(C)A                                     | GDV              | 9.0                                                     | 10.0                                        | 11.1  | 1                                      | 15.4                                                            | 97.4                                          | 10                                                                |
| SMCJ10(C)A                                      | GDX              | 10                                                      | 11.1                                        | 12.3  | 1                                      | 17.0                                                            | 88.2                                          | 5                                                                 |
| SMCJ11(C)A                                      | GDZ              | 11                                                      | 12.2                                        | 13.5  | 1                                      | 18.2                                                            | 82.4                                          | 5                                                                 |
| SMCJ12(C)A                                      | GEE              | 12                                                      | 13.3                                        | 14.7  | 1                                      | 19.9                                                            | 75.3                                          | 5                                                                 |
| SMCJ13(C)A                                      | GEG              | 13                                                      | 14.4                                        | 15.9  | 1                                      | 21.5                                                            | 69.8                                          | 5                                                                 |
| SMCJ14(C)A                                      | GEK              | 14                                                      | 15.6                                        | 17.2  | 1                                      | 23.2                                                            | 64.7                                          | 5                                                                 |
| SMCJ15(C)A                                      | GEM              | 15                                                      | 16.7                                        | 18.5  | 1                                      | 24.4                                                            | 61.5                                          | 5                                                                 |
| SMCJ16(C)A                                      | GEP              | 16                                                      | 17.8                                        | 19.7  | 1                                      | 26.0                                                            | 57.7                                          | 5                                                                 |
| SMCJ17(C)A                                      | GER              | 17                                                      | 18.9                                        | 20.9  | 1                                      | 27.6                                                            | 54.3                                          | 5                                                                 |
| SMCJ18(C)A                                      | GET              | 18                                                      | 20.0                                        | 22.1  | 1                                      | 29.2                                                            | 51.4                                          | 5                                                                 |
| SMCJ20(C)A                                      | GEV              | 20                                                      | 22.2                                        | 24.5  | 1                                      | 32.4                                                            | 46.3                                          | 5                                                                 |
| SMCJ22(C)A                                      | GEX              | 22                                                      | 24.4                                        | 26.9  | 1                                      | 35.5                                                            | 42.3                                          | 5                                                                 |
| SMCJ24(C)A                                      | GEZ              | 24                                                      | 26.7                                        | 29.5  | 1                                      | 38.9                                                            | 38.6                                          | 5                                                                 |
| SMCJ26(C)A                                      | GFE              | 26                                                      | 28.9                                        | 31.9  | 1                                      | 42.1                                                            | 35.6                                          | 5                                                                 |
| SMCJ28(C)A                                      | GFG              | 28                                                      | 31.1                                        | 34.4  | 1                                      | 45.4                                                            | 33.0                                          | 5                                                                 |
| SMCJ30(C)A                                      | GFK              | 30                                                      | 33.3                                        | 36.8  | 1                                      | 48.4                                                            | 31.0                                          | 5                                                                 |
| SMCJ33(C)A                                      | GFM              | 33                                                      | 36.7                                        | 40.6  | 1                                      | 53.3                                                            | 28.1                                          | 5                                                                 |
| SMCJ36(C)A                                      | GFP              | 36                                                      | 40.0                                        | 44.2  | 1                                      | 58.1                                                            | 25.8                                          | 5                                                                 |
| SMCJ40(C)A                                      | GFR              | 40                                                      | 44.4                                        | 49.1  | 1                                      | 64.5                                                            | 23.3                                          | 5                                                                 |
| SMCJ43(C)A                                      | GFT              | 43                                                      | 47.8                                        | 52.8  | 1                                      | 69.4                                                            | 21.6                                          | 5                                                                 |
| SMCJ45(C)A                                      | GFV              | 45                                                      | 50.0                                        | 55.3  | 1                                      | 72.7                                                            | 20.6                                          | 5                                                                 |
| SMCJ48(C)A                                      | GFX              | 48                                                      | 53.3                                        | 58.9  | 1                                      | 77.4                                                            | 19.4                                          | 5                                                                 |
| SMCJ51(C)A                                      | GFZ              | 51                                                      | 56.7                                        | 62.7  | 1                                      | 82.4                                                            | 18.2                                          | 5                                                                 |
| SMCJ54(C)A                                      | GGE              | 54                                                      | 60.0                                        | 66.3  | 1                                      | 87.1                                                            | 17.2                                          | 5                                                                 |
| SMCJ58(C)A                                      | GGG              | 58                                                      | 64.4                                        | 71.2  | 1                                      | 93.6                                                            | 16.0                                          | 5                                                                 |
| SMCJ60(C)A                                      | GGK              | 60                                                      | 66.7                                        | 73.7  | 1                                      | 96.8                                                            | 15.5                                          | 5                                                                 |
| SMCJ64(C)A                                      | GGM              | 64                                                      | 71.1                                        | 78.6  | 1                                      | 103.0                                                           | 14.6                                          | 5                                                                 |
| SMCJ70(C)A                                      | GGP              | 70                                                      | 77.8                                        | 86.0  | 1                                      | 113.0                                                           | 13.3                                          | 5                                                                 |
| SMCJ75(C)A                                      | GGR              | 75                                                      | 83.3                                        | 92.1  | 1                                      | 121.0                                                           | 12.4                                          | 5                                                                 |
| SMCJ78(C)A                                      | GGT              | 78                                                      | 86.7                                        | 95.8  | 1                                      | 126.0                                                           | 11.9                                          | 5                                                                 |
| SMCJ85(C)A                                      | GGV              | 85                                                      | 94.4                                        | 104.0 | 1                                      | 137.0                                                           | 10.9                                          | 5                                                                 |
| SMCJ90(C)A                                      | GGX              | 90                                                      | 100.0                                       | 111.0 | 1                                      | 146.0                                                           | 10.3                                          | 5                                                                 |
| SMCJ100(C)A                                     | GGZ              | 100                                                     | 111.0                                       | 123.0 | 1                                      | 162.0                                                           | 9.3                                           | 5                                                                 |
| SMCJ110(C)A                                     | GHE              | 110                                                     | 122.0                                       | 135.0 | 1                                      | 177.0                                                           | 8.5                                           | 5                                                                 |
| SMCJ120(C)A                                     | GHG              | 120                                                     | 133.0                                       | 147.0 | 1                                      | 193.0                                                           | 7.8                                           | 5                                                                 |
| SMCJ130(C)A                                     | GHK              | 130                                                     | 144.0                                       | 159.0 | 1                                      | 209.0                                                           | 7.2                                           | 5                                                                 |
| SMCJ150(C)A                                     | GHM              | 150                                                     | 167.0                                       | 185.0 | 1                                      | 243.0                                                           | 6.2                                           | 5                                                                 |
| SMCJ160(C)A                                     | GHP              | 160                                                     | 178.0                                       | 197.0 | 1                                      | 259.0                                                           | 5.8                                           | 5                                                                 |
| SMCJ170(C)A                                     | GHR              | 170                                                     | 189.0                                       | 209.0 | 1                                      | 275.0                                                           | 5.5                                           | 5                                                                 |

\* Color band denotes cathode on unidirectional devices only. No color band on bidirectional devices.

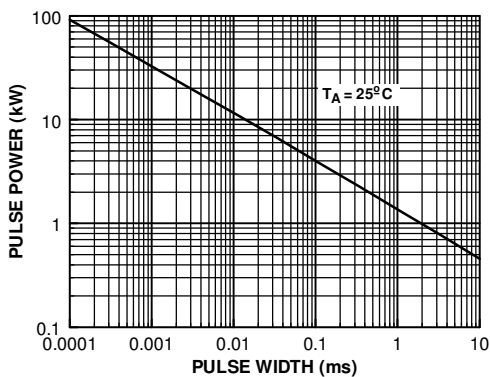
\*\* For bidirectional parts with V<sub>RWM</sub> < 10V, the I<sub>R</sub> max limit is doubled.

SMCJ5V0(C)A - SMCJ170(C)A

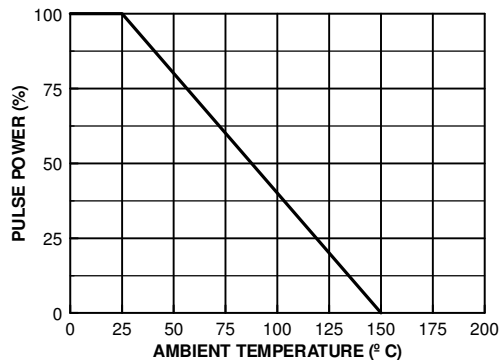
# Transient Voltage Suppressors (continued)

## Typical Characteristics

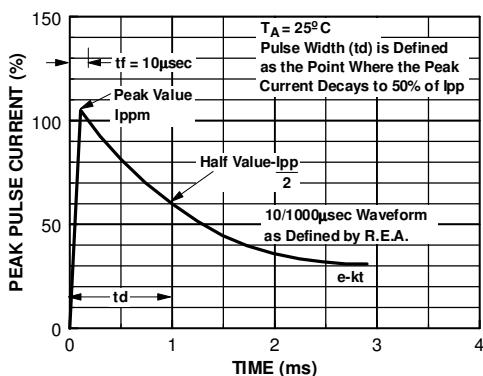
Peak Pulse Power Rating Curve



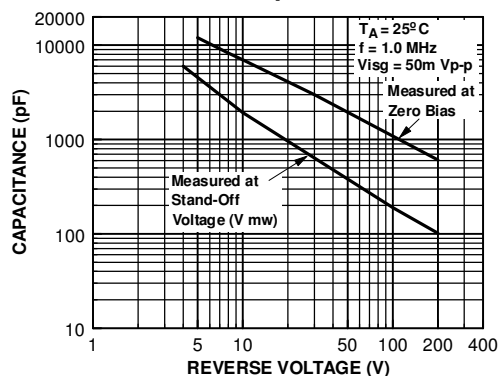
Pulse Derating Curve



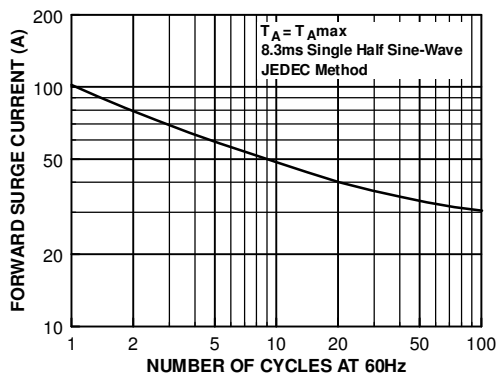
Pulse Waveform



Junction Capacitance



Non-Repetitive Surge Current



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