



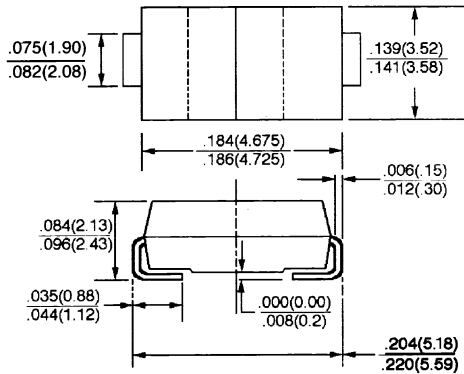
# SMBJ SERIES

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR



**VOLTAGE RANGE**  
50 to 170 Volts  
**CURRENT**  
600Watts Peak Power

### SMB/DO-214AA



Dimensions in inches and (millimeters)

### FEATURES

- \* For surface mounted application
- \* Low profile package
- \* Built-in strain relief
- \* Glass passivated junction
- \* Excellent clamping capability
- \* Fast response time: typically less than 1.0ps from 0 volts to BV min.
- \* Typical  $I_R$  less than  $1\mu A$  above 10V
- \* High temperature soldering:  $250^\circ C/10$ seconds at terminals
- \* Plastic material used carries Underwriters Laboratory Flammability Classification 94V-0

### MECHANICAL DATA

- \* Case: Molded plastic
- \* Terminals: Solder plated
- \* Polarity: Indicated by cathode band
- \* Standard Packaging: 12mm tape (EIA STD RS-481)
- \* Weight: 0.093 grams

### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating at  $25^\circ C$  ambient temperature unless otherwise specified.

| TYPE NUMBER   | SYMBOL         | VALUE         | UNITS      |
|---|----------------|---------------|------------|
| Peak Power Dissipation at $T_A = 25^\circ C$ , $T_P = 1ms$ (Note 1)   | $P_{PPM}$      | Minimum 600   | Watts      |
| Peak Forward Surge Current, 8.3 ms single half Sine-Wave Superimposed on Rated Load (JEDEC method) (Note 2,3)<br>Unidirectional only. | $I_{FSM}$      | 100           | Amps       |
| Operating and Storage Temperature Range   | $T_J, T_{STG}$ | - 65 to + 150 | $^\circ C$ |

- NOTES:**
1. Non-repetitive current pulse, per Fig. 3 and derated above  $T_a = 25^\circ C$  per Fig. 2.
  2. Mounted on  $0.2 \times 0.2$ " ( $5.0 \times 5.0mm$ ) copper pads to each terminal.
  3. 8.3ms single half sine-wave duty cycle-4 pulses per Minutes maximum.

### DEVICE FOR BIPOLAR APPLICATIONS OR EQUIVALENT SQUARE WAVE

1. For Bidirectional use C or CA Suffix for types SMBJ5.0 through types SMBJ170.
2. Electrical characteristics apply in both directions.

## RATINGS AND CHARACTERISTIC CURVES (SMBJ SERIES)

FIG. 1 – PULSE RATING CURVE

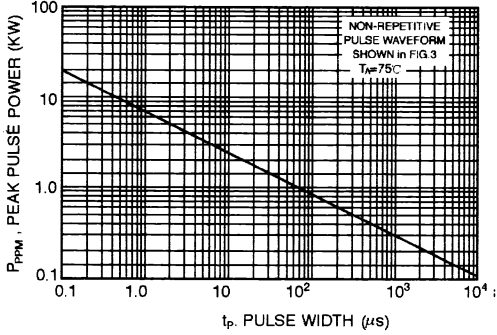


FIG. 2 – PULSE DERATING CURVE

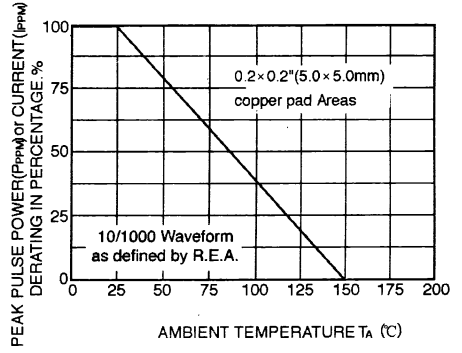


FIG. 3 – PULSE WAVEFORM

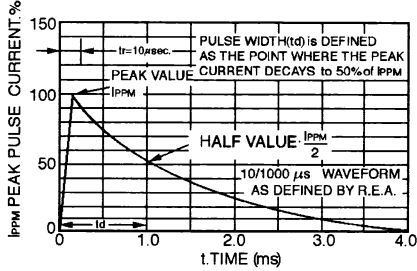


FIG. 4 – TYPICAL JUNCTION CAPACITANCE

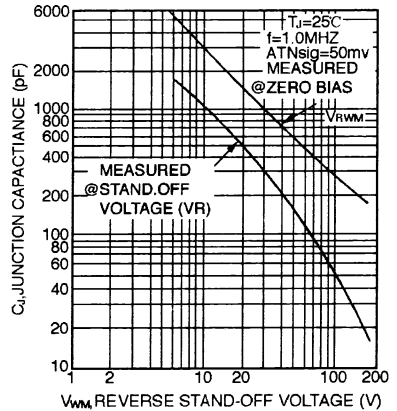
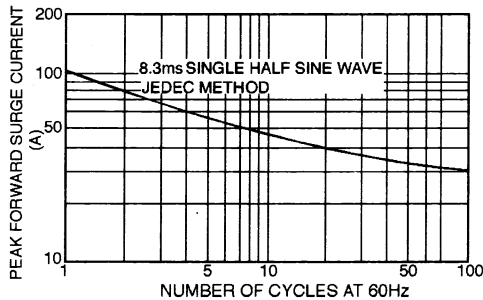


FIG. 5 – MAXIMUM NON-REPETITIVE SURGE CURRENT



**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)**

| Device   | Breakdown Voltage   |      | test current<br>I <sub>T</sub> (mA) | Maximum<br>Working peak<br>Reverse Voltage<br>V <sub>WM(V)</sub> | Maximum<br>Revers<br>Leakage<br>at V <sub>WM</sub><br>I <sub>D</sub> (μA) <sup>(3)</sup> | Maximum<br>Revers Surge<br>Current I <sub>PPM</sub> <sup>(2)</sup><br>(Amps) | Maximum Revers<br>VOLTAGE at I <sub>PPM</sub><br>(Clamping Voltage)<br>V <sub>C(V)</sub> |
|----------|---|------|-------------------------------------|--|--|--|--|
|          | V <sub>(BR)</sub><br>at I <sub>T</sub> <sup>(1)</sup> (V) |      |                                     |  |  |  |  |
|          | Min   | Max  |                                     |  |  |  |  |
| SMBJ5.0  | 6.40  | 7.30 | 10.0                                | 5.0  | 800.0  | 62.5   | 9.6  |
| SMBJ5.0A | 6.40  | 7.00 | 10.0                                | 5.0  | 800.0  | 65.2   | 9.2  |
| SMBJ6.0  | 6.67  | 8.15 | 10.0                                | 6.0  | 800.0  | 52.6   | 11.4   |
| SMBJ6.0A | 6.67  | 7.37 | 10.0                                | 6.0  | 800.0  | 58.3   | 10.3   |
| SMBJ6.5  | 7.22  | 8.82 | 10.0                                | 6.5  | 500.0  | 48.7   | 12.3   |
| SMBJ6.5A | 7.22  | 7.98 | 10.0                                | 6.5  | 500.0  | 53.6   | 11.2   |
| SMBJ7.0  | 7.78  | 9.51 | 10.0                                | 7.0  | 200.0  | 45.1   | 13.3   |
| SMBJ7.0A | 7.78  | 8.60 | 10.0                                | 7.0  | 200.0  | 50.0   | 12.0   |
| SMBJ7.5  | 8.33  | 10.3 | 1.0                                 | 7.5  | 100.0  | 42.0   | 14.3   |
| SMBJ7.5A | 8.33  | 9.21 | 1.0                                 | 7.5  | 100.0  | 46.5   | 12.9   |
| SMBJ8.0  | 8.89  | 10.9 | 1.0                                 | 8.0  | 50.0   | 40.0   | 15.0   |
| SMBJ8.0A | 8.89  | 9.83 | 1.0                                 | 8.0  | 50.0   | 44.1   | 13.6   |
| SMBJ8.5  | 9.44  | 11.5 | 1.0                                 | 8.5  | 20.0   | 37.7   | 15.9   |
| SMBJ8.5A | 9.44  | 10.4 | 1.0                                 | 8.5  | 20.0   | 41.7   | 14.4   |
| SMBJ9.0  | 10.0  | 12.2 | 1.0                                 | 9.0  | 10.0   | 35.5   | 16.9   |
| SMBJ9.0A | 10.0  | 11.1 | 1.0                                 | 9.0  | 10.0   | 39.0   | 15.4   |
| SMBJ10   | 11.1  | 13.6 | 1.0                                 | 10   | 5.0  | 31.9   | 18.8   |
| SMBJ10A  | 11.1  | 12.3 | 1.0                                 | 10   | 5.0  | 35.3   | 17.0   |
| SMBJ11   | 12.2  | 14.9 | 1.0                                 | 11   | 5.0  | 29.9   | 20.1   |
| SMBJ11A  | 12.2  | 13.5 | 1.0                                 | 11   | 5.0  | 33.0   | 18.2   |
| SMBJ12   | 13.3  | 16.3 | 1.0                                 | 12   | 5.0  | 27.3   | 22.0   |
| SMBJ12A  | 13.3  | 14.7 | 1.0                                 | 12   | 5.0  | 30.2   | 19.9   |
| SMBJ13   | 14.4  | 17.6 | 1.0                                 | 13   | 5.0  | 25.2   | 23.8   |
| SMBJ13A  | 14.4  | 15.9 | 1.0                                 | 13   | 5.0  | 27.9   | 21.5   |
| SMBJ14   | 15.6  | 19.1 | 1.0                                 | 14   | 5.0  | 23.3   | 25.8   |
| SMBJ14A  | 15.6  | 17.2 | 1.0                                 | 14   | 5.0  | 25.8   | 23.2   |
| SMBJ15   | 16.7  | 20.4 | 1.0                                 | 15   | 5.0  | 22.3   | 26.9   |
| SMBJ15A  | 16.7  | 18.5 | 1.0                                 | 15   | 5.0  | 24.0   | 24.4   |
| SMBJ16   | 17.8  | 21.8 | 1.0                                 | 16   | 5.0  | 20.8   | 28.8   |
| SMBJ16A  | 17.8  | 19.7 | 1.0                                 | 16   | 5.0  | 23.1   | 26.0   |
| SMBJ17   | 18.9  | 23.1 | 1.0                                 | 17   | 5.0  | 19.7   | 30.5   |
| SMBJ17A  | 18.9  | 20.9 | 1.0                                 | 17   | 5.0  | 21.7   | 27.6   |
| SMBJ18   | 20.0  | 24.4 | 1.0                                 | 18   | 5.0  | 18.6   | 32.4   |
| SMBJ18A  | 20.0  | 22.1 | 1.0                                 | 18   | 5.0  | 20.5   | 29.2   |
| SMBJ20   | 22.2  | 27.1 | 1.0                                 | 20   | 5.0  | 16.7   | 35.8   |
| SMBJ20A  | 22.2  | 24.5 | 1.0                                 | 20   | 5.0  | 18.5   | 32.4   |
| SMBJ22   | 24.4  | 29.8 | 1.0                                 | 22   | 5.0  | 15.2   | 39.4   |
| SMBJ22A  | 24.4  | 26.9 | 1.0                                 | 22   | 5.0  | 16.9   | 35.5   |
| SMBJ24   | 26.7  | 32.6 | 1.0                                 | 24   | 5.0  | 14.0   | 43.0   |
| SMBJ24A  | 26.7  | 29.5 | 1.0                                 | 24   | 5.0  | 15.4   | 38.5   |
| SMBJ26   | 28.9  | 35.3 | 1.0                                 | 26   | 5.0  | 12.4   | 46.6   |
| SMBJ26A  | 28.9  | 31.9 | 1.0                                 | 26   | 5.0  | 14.2   | 42.1   |
| SMBJ28   | 31.1  | 38.0 | 1.0                                 | 28   | 5.0  | 12.0   | 50.0   |
| SMBJ28A  | 31.1  | 34.4 | 1.0                                 | 28   | 5.0  | 13.2   | 45.4   |
| SMBJ30   | 33.3  | 40.7 | 1.0                                 | 30   | 5.0  | 11.2   | 53.5   |
| SMBJ30A  | 33.3  | 36.8 | 1.0                                 | 30   | 5.0  | 12.4   | 46.6   |
| SMBJ33   | 36.7  | 44.9 | 1.0                                 | 33   | 5.0  | 10.2   | 59.0   |
| SMBJ33A  | 36.7  | 40.6 | 1.0                                 | 33   | 5.0  | 11.3   | 53.3   |

| Device   | Breakdown Voltage                |      | test current<br>$I_T$ (mA) | Maximum Working peak Reverse Voltage<br>$V_{WM(V)}$ | Maximum Revers Leakage at $V_{WM}$<br>$I_P$ ( $\mu$ A) <sup>(3)</sup> | Maximum Revers Surge Current $I_{PPM}^{(2)}$<br>(Amps) | Maximum Revers VOLTAGE at $I_{PPM}$<br>(Clamping Voltage)<br>$V_C(V)$ |
|----------|----------------------------------|------|----------------------------|---|---|--|---|
|          | $V_{(BR)}$<br>at $I_T^{(1)}$ (V) |      |                            |   |   |  |   |
|          | Min                              | Max  |                            |   |   |  |   |
| SMBJ36   | 40.0                             | 48.9 | 1.0                        | 36  | 5.0   | 9.3  | 64.3  |
| SMBJ36A  | 40.0                             | 44.2 | 1.0                        | 36  | 5.0   | 10.3   | 58.1  |
| SMBJ40   | 44.4                             | 54.3 | 1.0                        | 40  | 5.0   | 8.4  | 71.4  |
| SMBJ40A  | 44.4                             | 49.1 | 1.0                        | 40  | 5.0   | 9.3  | 64.5  |
| SMBJ43   | 47.8                             | 58.4 | 1.0                        | 43  | 5.0   | 7.8  | 76.7  |
| SMBJ43A  | 47.8                             | 52.8 | 1.0                        | 43  | 5.0   | 8.6  | 69.4  |
| SMBJ45   | 50.0                             | 61.1 | 1.0                        | 45  | 5.0   | 7.5  | 80.3  |
| SMBJ45A  | 50.0                             | 55.3 | 1.0                        | 45  | 5.0   | 8.3  | 72.7  |
| SMBJ48   | 53.3                             | 65.1 | 1.0                        | 48  | 5.0   | 7.0  | 85.5  |
| SMBJ48A  | 53.3                             | 58.9 | 1.0                        | 48  | 5.0   | 7.7  | 77.4  |
| SMBJ51   | 56.7                             | 69.3 | 1.0                        | 51  | 5.0   | 6.6  | 91.1  |
| SMBJ51A  | 56.7                             | 62.7 | 1.0                        | 51  | 5.0   | 7.3  | 82.4  |
| SMBJ54   | 60.0                             | 73.3 | 1.0                        | 54  | 5.0   | 6.2  | 96.3  |
| SMBJ54A  | 60.0                             | 66.3 | 1.0                        | 54  | 5.0   | 6.9  | 87.1  |
| SMBJ58   | 64.4                             | 78.7 | 1.0                        | 58  | 5.0   | 5.8  | 103.0   |
| SMBJ58A  | 64.4                             | 71.2 | 1.0                        | 58  | 5.0   | 6.4  | 93.6  |
| SMBJ60   | 66.7                             | 81.5 | 1.0                        | 60  | 5.0   | 5.6  | 107.0   |
| SMBJ60A  | 66.7                             | 73.7 | 1.0                        | 60  | 5.0   | 6.2  | 96.8  |
| SMBJ64   | 71.1                             | 86.9 | 1.0                        | 64  | 5.0   | 5.3  | 114.0   |
| SMBJ64A  | 71.1                             | 78.6 | 1.0                        | 64  | 5.0   | 5.8  | 103.0   |
| SMBJ70   | 77.6                             | 95.1 | 1.0                        | 70  | 5.0   | 4.8  | 125   |
| SMBJ70A  | 77.8                             | 86.0 | 1.0                        | 70  | 5.0   | 5.3  | 113   |
| SMBJ75   | 83.3                             | 102  | 1.0                        | 75  | 5.0   | 4.5  | 134   |
| SMBJ75A  | 83.3                             | 92.1 | 1.0                        | 75  | 5.0   | 4.9  | 121   |
| SMBJ78   | 86.7                             | 106  | 1.0                        | 78  | 5.0   | 4.3  | 139   |
| SMBJ78A  | 86.7                             | 65.8 | 1.0                        | 48  | 5.0   | 4.7  | 126   |
| SMBJ85   | 94.4                             | 115  | 1.0                        | 85  | 5.0   | 3.9  | 151   |
| SMBJ85A  | 94.4                             | 104  | 1.0                        | 85  | 5.0   | 4.4  | 137   |
| SMBJ90   | 100                              | 122  | 1.0                        | 90  | 5.0   | 3.5  | 160   |
| SMBJ90A  | 100                              | 111  | 1.0                        | 90  | 5.0   | 4.1  | 146   |
| SMBJ100  | 111                              | 136  | 1.0                        | 100   | 5.0   | 3.4  | 179   |
| SMBJ100A | 111                              | 123  | 1.0                        | 100   | 5.0   | 3.7  | 162   |
| SMBJ110  | 122                              | 149  | 1.0                        | 110   | 5.0   | 3.0  | 177   |
| SMBJ110A | 122                              | 135  | 1.0                        | 110   | 5.0   | 3.4  | 196   |
| SMBJ120  | 133                              | 163  | 1.0                        | 120   | 5.0   | 2.8  | 177   |
| SMBJ120A | 133                              | 147  | 1.0                        | 120   | 5.0   | 3.1  | 214   |
| SMBJ130  | 144                              | 176  | 1.0                        | 130   | 5.0   | 2.6  | 193   |
| SMBJ130A | 144                              | 159  | 1.0                        | 130   | 5.0   | 2.9  | 231   |
| SMBJ150  | 167                              | 204  | 1.0                        | 150   | 5.0   | 2.2  | 268   |
| SMBJ150A | 167                              | 185  | 1.0                        | 150   | 5.0   | 2.5  | 243   |
| SMBJ160  | 178                              | 218  | 1.0                        | 160   | 5.0   | 2.1  | 287   |
| SMBJ160A | 178                              | 197  | 1.0                        | 160   | 5.0   | 2.3  | 259   |
| SMBJ170  | 189                              | 231  | 1.0                        | 170   | 5.0   | 2.0  | 304   |
| SMBJ170A | 189                              | 209  | 1.0                        | 170   | 5.0   | 2.2  | 275   |

**NOTES:**

1. Pulse test:  $t_p \leq 50ms$
2. Surge Current Waveform per Figure 3 and Derate per Figure 2.
3. For bipolar types having  $V_{WM}$  of 10 volts(SMBJ8.0C)and under the  $I_D$  limit is doubled.
4. For Bidirectional use C or CA Suffix for types SMBJ5.0 thorough types SMBJ 170.