

## DATA SHEET

### SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE - 5.0 to 440 Volts 600 Watt Peak Pulse Power

#### FEATURE

- ✧ For surface mounted applications in order to optimize board space.
- ✧ Low profile package.
- ✧ Built-in strain relief.
- ✧ Glass passivated junction.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ Repetition Rate (duty cycle):0.01%.
- ✧ Fast response time: typically less than 1.0ps from 0 Volts to BV for unidirectional types.
- ✧ Typical  $I_R$  less than 1mA above 10V.
- ✧ High Temperature soldering: 250°C/10 seconds at terminals.
- ✧ Plastic package has Underwriters Laboratory Flammability 94V-O.



**DO-241AA  
(SMB J-Bend)**

#### MECHANICAL DATE

- ✧ Case: JEDEC DO214AA. Molded plastic over glass passivated junction.
- ✧ Terminal: Solder plated, solderable per MIL-STD-750, Method 2026.
- ✧ Polarity: Color band denoted positive end (cathode) except Bidirectional.
- ✧ Standard Packaging: 12mm tape (EIA STD RS-481).
- ✧ Weight: 0.003 ounce, 0.093 grams.

#### DEVICES FOR BIPOLAR APPLICATION

For bidirectional use C or CA suffix for types SMBJ5.0 thru types SMBJ440 (e.g.SMBJ5.0CA, SMBJ440CA), electrical characteristics apply in both directions.

#### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

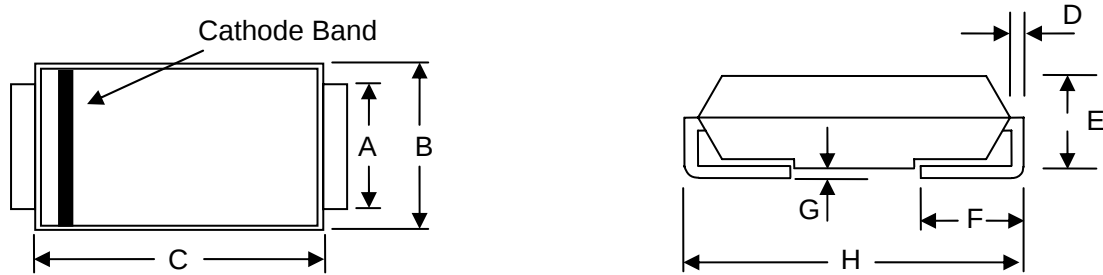
| RATING                                                                                                     | SYMBOL         | VALUE       | UNITS |
|------------------------------------------------------------------------------------------------------------|----------------|-------------|-------|
| Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1, 2, FIG.1).                                     | $P_{PPM}$      | Minimum 600 | Watts |
| Peak Pulse Current of on 10/1000μs waveform (Note 1, FIG.3).                                               | $P_{M(AV)}$    | See Table 1 | Amps  |
| Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load,(JEDEC Method) (Note2,3) | $I_{FSM}$      | 100         | Amps  |
| Operating junction and Storage Temperature Range.                                                          | $T_J, T_{STG}$ | -55 to +150 | °C    |

Notes: 1. Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per Fig. 2.

2. Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.

3.8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

## PACKAGE DIMENSIONS



| Item<br>DO-214AA(SMB J-Bend) | Inches |       | Millimeters |       |
|------------------------------|--------|-------|-------------|-------|
|                              | MIN.   | MAX.  | MIN.        | MAX.  |
| A                            | 0.077  | 0.086 | 1.950       | 2.200 |
| B                            | 0.130  | 0.155 | 3.300       | 3.940 |
| C                            | 0.160  | 0.180 | 4.060       | 4.570 |
| D                            | 0.006  | 0.012 | 0.152       | 0.305 |
| E                            | 0.084  | 0.096 | 2.130       | 2.440 |
| F                            | 0.030  | 0.060 | 0.760       | 1.520 |
| G                            | -      | 0.008 | -           | 0.203 |
| H                            | 0.205  | 0.220 | 5.210       | 5.590 |

## ELECTRICAL CHARACTERISTICS

| Part Number |           | Device Marking Code |    | Reverse Stand-Off Voltage | Breakdown Voltage                          | Breakdown Voltage                          | Test Current        | Maximum Clamping Voltage @I <sub>PP</sub> | Peak Pulse Current  | Reverse Leakage @V <sub>RWM</sub> |
|-------------|-----------|---------------------|----|---------------------------|--------------------------------------------|--------------------------------------------|---------------------|-------------------------------------------|---------------------|-----------------------------------|
| UNI- POLAR  | BI-POLAR  | UNI                 | BI | V <sub>RWM</sub> (V)      | V <sub>BR</sub> (V)<br>MIN.@I <sub>T</sub> | V <sub>BR</sub> (V)<br>MAX.@I <sub>T</sub> | I <sub>T</sub> (mA) | V <sub>C</sub> (V)                        | I <sub>PP</sub> (A) | I <sub>R</sub> (μA)               |
| SMBJ5.0A    | SMBJ5.0CA | KE                  | AE | 5.0                       | 6.40                                       | 7.00                                       | 10                  | 9.2                                       | 65.3                | 800                               |
| SMBJ6.0A    | SMBJ6.0CA | KG                  | AG | 6.0                       | 6.67                                       | 7.37                                       | 10                  | 10.3                                      | 58.3                | 800                               |
| SMBJ6.5A    | SMBJ6.5CA | KK                  | AK | 6.5                       | 7.22                                       | 7.98                                       | 10                  | 11.2                                      | 53.6                | 500                               |
| SMBJ7.0A    | SMBJ7.0CA | KM                  | AM | 7.0                       | 7.78                                       | 8.60                                       | 10                  | 12.0                                      | 50.0                | 200                               |
| SMBJ7.5A    | SMBJ7.5CA | KP                  | AP | 7.5                       | 8.33                                       | 9.21                                       | 1                   | 12.9                                      | 46.6                | 100                               |
| SMBJ8.0A    | SMBJ8.0CA | KR                  | AR | 8.0                       | 8.89                                       | 9.83                                       | 1                   | 13.6                                      | 44.2                | 50                                |
| SMBJ8.5A    | SMBJ8.5CA | KT                  | AT | 8.5                       | 9.44                                       | 10.40                                      | 1                   | 14.4                                      | 41.7                | 20                                |
| SMBJ9.0A    | SMBJ9.0CA | KV                  | AV | 9.0                       | 10.00                                      | 11.10                                      | 1                   | 15.4                                      | 39.0                | 10                                |
| SMBJ10A     | SMBJ10CA  | KX                  | AX | 10.0                      | 11.10                                      | 12.30                                      | 1                   | 17.0                                      | 35.3                | 5                                 |
| SMBJ11A     | SMBJ11CA  | KZ                  | AZ | 11.0                      | 12.20                                      | 13.50                                      | 1                   | 18.2                                      | 33.0                | 5                                 |
| SMBJ12A     | SMBJ12CA  | LE                  | BE | 12.0                      | 13.30                                      | 14.70                                      | 1                   | 19.9                                      | 30.2                | 5                                 |
| SMBJ13A     | SMBJ13CA  | LG                  | BG | 13.0                      | 14.40                                      | 15.90                                      | 1                   | 21.5                                      | 28.0                | 5                                 |
| SMBJ14A     | SMBJ14CA  | LK                  | BK | 14.0                      | 15.60                                      | 17.20                                      | 1                   | 23.2                                      | 25.9                | 5                                 |
| SMBJ15A     | SMBJ15CA  | LM                  | BM | 15.0                      | 16.70                                      | 18.50                                      | 1                   | 24.4                                      | 24.6                | 5                                 |
| SMBJ16A     | SMBJ16CA  | LP                  | BP | 16.0                      | 17.80                                      | 19.70                                      | 1                   | 26.0                                      | 23.1                | 5                                 |
| SMBJ17A     | SMBJ17CA  | LR                  | BR | 17.0                      | 18.90                                      | 20.90                                      | 1                   | 27.6                                      | 21.8                | 5                                 |
| SMBJ18A     | SMBJ18CA  | LT                  | BT | 18.0                      | 20.00                                      | 22.10                                      | 1                   | 29.2                                      | 20.6                | 5                                 |
| SMBJ20A     | SMBJ20CA  | LV                  | BV | 20.0                      | 22.20                                      | 24.50                                      | 1                   | 32.4                                      | 18.6                | 5                                 |

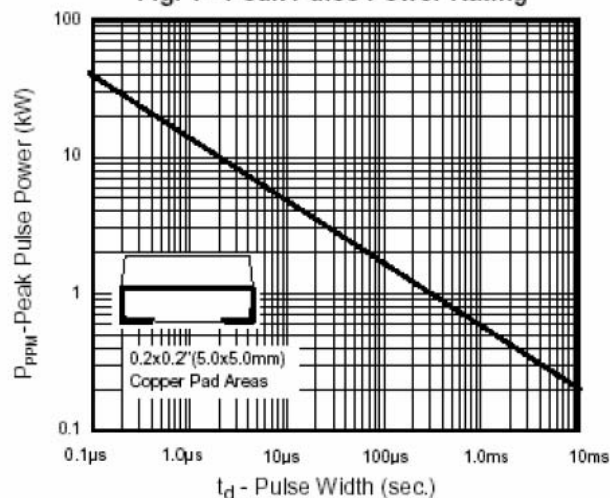
**ELECTRICAL CHARACTERISTICS**

| Part Number |           | Device Marking Code |    | Reverse Stand-Off Voltage | Breakdown Voltage       | Breakdown Voltage       | Test Current | Maximum Clamping Voltage @IPP | Peak Pulse Current | Reverse Leakage @VRWM |
|-------------|-----------|---------------------|----|---------------------------|-------------------------|-------------------------|--------------|-------------------------------|--------------------|-----------------------|
| UNI- POLAR  | BI-POLAR  | UNI                 | BI | $V_{RWM}$ (V)             | $V_{BR}$ (V)<br>MIN.@IT | $V_{BR}$ (V)<br>MAX.@IT | $I_T$ (mA)   | $V_C$ (V)                     | $I_{PP}$ (A)       | $I_R$ ( $\mu$ A)      |
| SMBJ22A     | SMBJ22CA  | LX                  | BX | 22.0                      | 24.40                   | 26.90                   | 1            | 35.5                          | 16.9               | 5                     |
| SMBJ24A     | SMBJ24CA  | LZ                  | BZ | 24.0                      | 26.70                   | 29.50                   | 1            | 38.9                          | 15.5               | 5                     |
| SMBJ26A     | SMBJ26CA  | ME                  | CE | 26.0                      | 28.90                   | 31.90                   | 1            | 42.1                          | 14.3               | 5                     |
| SMBJ28A     | SMBJ28CA  | MG                  | CG | 28.0                      | 31.10                   | 34.40                   | 1            | 45.4                          | 13.3               | 5                     |
| SMBJ30A     | SMBJ30CA  | MK                  | CK | 30.0                      | 33.30                   | 36.80                   | 1            | 48.4                          | 12.4               | 5                     |
| SMBJ33A     | SMBJ33CA  | MM                  | CM | 33.0                      | 36.70                   | 40.60                   | 1            | 53.3                          | 11.3               | 5                     |
| SMBJ36A     | SMBJ36CA  | MP                  | CP | 36.0                      | 40.00                   | 44.20                   | 1            | 58.1                          | 10.4               | 5                     |
| SMBJ40A     | SMBJ40CA  | MR                  | CR | 40.0                      | 44.40                   | 49.10                   | 1            | 64.5                          | 9.3                | 5                     |
| SMBJ43A     | SMBJ43CA  | MT                  | CT | 43.0                      | 47.80                   | 52.80                   | 1            | 69.4                          | 8.7                | 5                     |
| SMBJ45A     | SMBJ45CA  | MV                  | CV | 45.0                      | 50.00                   | 55.30                   | 1            | 72.7                          | 8.3                | 5                     |
| SMBJ48A     | SMBJ48CA  | MX                  | CX | 48.0                      | 53.30                   | 58.90                   | 1            | 77.4                          | 7.8                | 5                     |
| SMBJ51A     | SMBJ51CA  | MZ                  | CZ | 51.0                      | 56.70                   | 62.70                   | 1            | 82.4                          | 7.3                | 5                     |
| SMBJ54A     | SMBJ54CA  | NE                  | DE | 54.0                      | 60.00                   | 66.30                   | 1            | 87.1                          | 6.9                | 5                     |
| SMBJ58A     | SMBJ58CA  | NG                  | DG | 58.0                      | 64.40                   | 71.20                   | 1            | 93.6                          | 6.5                | 5                     |
| SMBJ60A     | SMBJ60CA  | NK                  | DK | 60.0                      | 66.70                   | 73.70                   | 1            | 96.8                          | 6.2                | 5                     |
| SMBJ64A     | SMBJ64CA  | NM                  | DM | 64.0                      | 71.10                   | 78.60                   | 1            | 103.0                         | 5.9                | 5                     |
| SMBJ70A     | SMBJ70CA  | NP                  | DP | 70.0                      | 77.80                   | 86.00                   | 1            | 113.0                         | 5.3                | 5                     |
| SMBJ75A     | SMBJ75CA  | NR                  | DR | 75.0                      | 83.30                   | 92.10                   | 1            | 121.0                         | 5.0                | 5                     |
| SMBJ78A     | SMBJ78CA  | NT                  | DT | 78.0                      | 86.70                   | 95.80                   | 1            | 126.0                         | 4.8                | 5                     |
| SMBJ85A     | SMBJ85CA  | NV                  | DV | 85.0                      | 94.40                   | 104.00                  | 1            | 137.0                         | 4.4                | 5                     |
| SMBJ90A     | SMBJ90CA  | NX                  | DX | 90.0                      | 100.00                  | 111.00                  | 1            | 146.0                         | 4.1                | 5                     |
| SMBJ100A    | SMBJ100CA | NZ                  | DZ | 100.0                     | 111.00                  | 123.00                  | 1            | 162.0                         | 3.7                | 5                     |
| SMBJ110A    | SMBJ110CA | PE                  | EE | 110.0                     | 122.00                  | 135.00                  | 1            | 177.0                         | 3.4                | 5                     |
| SMBJ120A    | SMBJ120CA | PG                  | EG | 120.0                     | 133.00                  | 147.00                  | 1            | 193.0                         | 3.1                | 5                     |
| SMBJ130A    | SMBJ130CA | PK                  | EK | 130.0                     | 144.00                  | 159.00                  | 1            | 209.0                         | 2.9                | 5                     |
| SMBJ150A    | SMBJ150CA | PM                  | EM | 150.0                     | 167.00                  | 185.00                  | 1            | 243.0                         | 2.5                | 5                     |
| SMBJ160A    | SMBJ160CA | PP                  | EP | 160.0                     | 178.00                  | 197.00                  | 1            | 259.0                         | 2.3                | 5                     |
| SMBJ170A    | SMBJ170CA | PR                  | ER | 170.0                     | 189.00                  | 209.00                  | 1            | 275.0                         | 2.2                | 5                     |
| SMBJ180A    | SMBJ180CA | PT                  | ET | 180.0                     | 201.00                  | 222.00                  | 1            | 292.0                         | 2.1                | 5                     |
| SMBJ200A    | SMBJ200CA | PV                  | EV | 200.0                     | 224.00                  | 247.00                  | 1            | 324.0                         | 1.9                | 5                     |
| SMBJ220A    | SMBJ220CA | PX                  | EX | 220.0                     | 246.00                  | 272.00                  | 1            | 356.0                         | 1.7                | 5                     |
| SMBJ250A    | SMBJ250CA | PZ                  | EZ | 250.0                     | 279.00                  | 309.00                  | 1            | 405.0                         | 1.5                | 5                     |
| SMBJ300A    | SMBJ300CA | QE                  | FE | 300.0                     | 335.00                  | 371.00                  | 1            | 486.0                         | 1.3                | 5                     |
| SMBJ350A    | SMBJ350CA | QG                  | FG | 350.0                     | 391.00                  | 432.00                  | 1            | 567.0                         | 1.1                | 5                     |
| SMBJ400A    | SMBJ400CA | QK                  | FK | 400.0                     | 447.00                  | 494.00                  | 1            | 648.0                         | 0.9                | 5                     |
| SMBJ440A    | SMBJ440CA | QM                  | FM | 440.0                     | 492.00                  | 543.00                  | 1            | 713.0                         | 0.9                | 5                     |

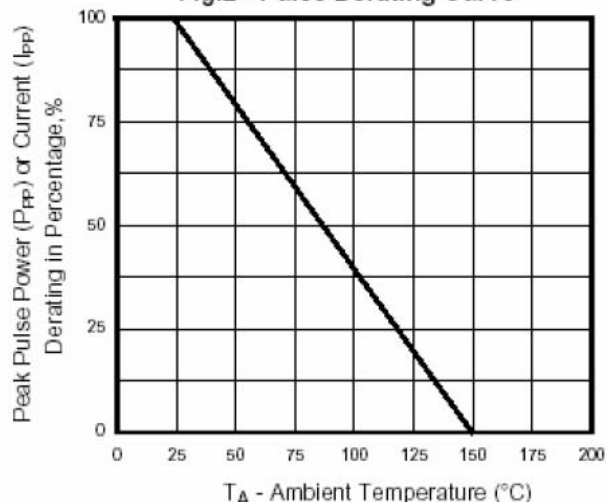
Notes: 1. For bidirectional type having  $V_{RWM}$  of 10 volts and less, the  $I_R$  limit is double.  
2. For parts without A , the  $V_{BR}$  is  $\pm 10\%$ .

# RATINGS AND CHARACTERISTIC CURVES (TA=25°C unless otherwise noted)

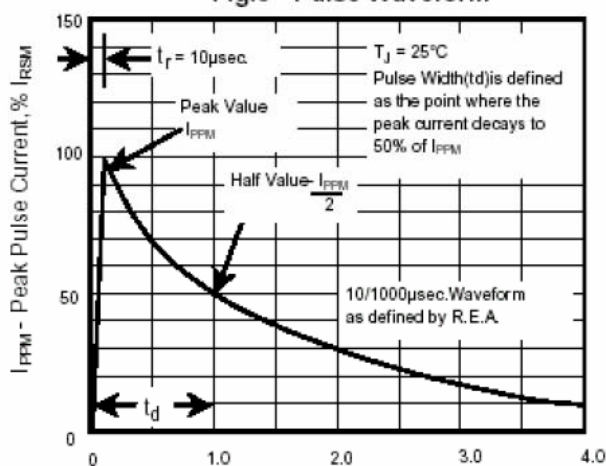
**Fig. 1 - Peak Pulse Power Rating**



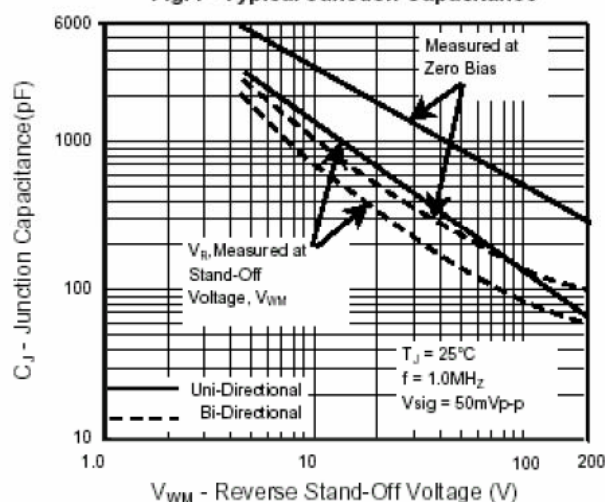
**Fig.2 - Pulse Derating Curve**



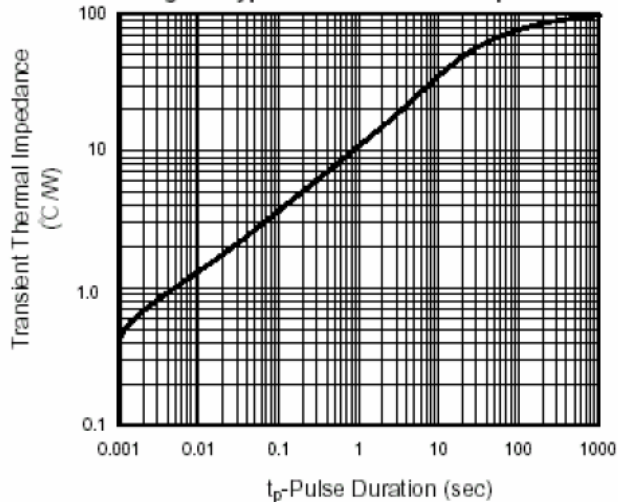
**Fig.3 - Pulse Waveform**



**Fig.4 - Typical Junction Capacitance**



**Fig. 5 - Typ.Transient Thermal Impedance**



**Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current**

