

**600W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR****Features**

- 600W Peak Pulse Power Dissipation
- 5.0V - 170V Standoff Voltages
- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- **Lead Free Finish/RoHS Compliant (Note 1)**
- **Green Molding Compound (No Halogen and Antimony) (Note 2)**

**Mechanical Data**

- Case: SMB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208
- Polarity Indicator: Cathode Band (Note: Bi-directional devices have no polarity indicator.)
- Marking: Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.1 grams (approximate)

Top View

Bottom View

**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Characteristic  | Symbol                    | Value | Unit                |
|---|---------------------------|-------|---------------------|
| Peak Pulse Power Dissipation<br>(Non repetitive current pulse derated above $T_A = 25^\circ\text{C}$ ) (Note 3) | $P_{PK}$                  | 600   | W                   |
| Peak Power Derating Above $25^\circ\text{C}$  | $P_{der}$                 | 4.8   | W/ $^\circ\text{C}$ |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (Notes 3, 4, & 5)            | $I_{FSM}$                 | 100   | A                   |
| Steady State Power Dissipation @ $T_L = 75^\circ\text{C}$   | $PM_{(AV)}$               | 5.0   | W                   |
| Instantaneous Forward Voltage @ $I_{PP} = 35\text{A}$<br>(Notes 3, 4, & 5)                                      | $V_{BR < 100\text{V}}$    | 3.5   | V                   |
|   | $V_{BR \geq 100\text{V}}$ | 5.0   | V                   |

**Thermal Characteristics**

| Characteristic              | Symbol    | Value       | Unit             |
|-----------------------------|-----------|-------------|------------------|
| Operating Temperature Range | $T_J$     | -55 to +150 | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{STG}$ | -55 to +175 | $^\circ\text{C}$ |

- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html).
  2. No purposefully added lead. Halogen and Antimony free.
  3. Valid provided that terminals are kept at ambient temperature.
  4. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
  5. Unidirectional units only.

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

| Part Number<br>Add C For Bi-<br>Directional<br>(Note 6) | Reverse<br>Standoff<br>Voltage<br>V <sub>RWM</sub> (V) | Breakdown<br>Voltage<br>V <sub>BR</sub> @ I <sub>T</sub> (Note 7) |         | Test<br>Current<br>I <sub>T</sub> (mA) | Max. Reverse<br>Leakage @ V <sub>RWM</sub><br>(Note 8)<br>I <sub>R</sub> (μA) | Max. Clamping<br>Voltage @ I <sub>pp</sub><br>V <sub>C</sub> (V) | Max. Peak Pulse<br>Current<br>I <sub>pp</sub><br>(A) | Marking Code |      |
|---|--|---|---------|--|---|--|--|--------------|------|
|   |  | Min (V)   | Max (V) |  |   |  |  | BI-          | UNI- |
| See Note 4  | V <sub>RWM</sub> (V)                                   | Min (V)   | Max (V) | I <sub>T</sub> (mA)                    | I <sub>R</sub> (μA)   | V <sub>C</sub> (V)   | (A)  | BI-          | UNI- |
| SMBJ5.0(C)A   | 5.0  | 6.40  | 7.23    | 10                                     | 800   | 9.2  | 65.2   | AE           | KE   |
| SMBJ6.0(C)A   | 6.0  | 6.67  | 7.67    | 10                                     | 800   | 10.3   | 58.3   | AG           | KG   |
| SMBJ6.5(C)A   | 6.5  | 7.22  | 8.30    | 10                                     | 500   | 11.2   | 53.6   | AK           | KK   |
| SMBJ7.0(C)A   | 7.0  | 7.78  | 8.95    | 10                                     | 200   | 12.0   | 50.0   | AM           | KM   |
| SMBJ7.5(C)A   | 7.5  | 8.33  | 9.58    | 1.0                                    | 100   | 12.9   | 46.5   | AP           | KP   |
| SMBJ8.0(C)A   | 8.0  | 8.89  | 10.23   | 1.0                                    | 50  | 13.6   | 44.1   | AR           | KR   |
| SMBJ8.5(C)A   | 8.5  | 9.44  | 10.82   | 1.0                                    | 10  | 14.4   | 41.7   | AT           | KT   |
| SMBJ9.0(C)A   | 9.0  | 10.00   | 11.50   | 1.0                                    | 5.0   | 15.4   | 39.0   | AV           | KV   |
| SMBJ10(C)A  | 10.0   | 11.10   | 12.80   | 1.0                                    | 5.0   | 17.0   | 35.3   | AX           | KX   |
| SMBJ11(C)A  | 11.0   | 12.20   | 14.40   | 1.0                                    | 5.0   | 18.2   | 33.0   | AZ           | KZ   |
| SMBJ12(C)A  | 12.0   | 13.30   | 15.30   | 1.0                                    | 5.0   | 19.9   | 30.2   | BE           | LE   |
| SMBJ13(C)A  | 13.0   | 14.40   | 16.50   | 1.0                                    | 5.0   | 21.5   | 27.9   | BG           | LG   |
| SMBJ14(C)A  | 14.0   | 15.60   | 17.90   | 1.0                                    | 5.0   | 23.2   | 25.8   | BK           | LK   |
| SMBJ15(C)A  | 15.0   | 16.70   | 19.20   | 1.0                                    | 5.0   | 24.4   | 24.0   | BM           | LM   |
| SMBJ16(C)A  | 16.0   | 17.80   | 20.50   | 1.0                                    | 5.0   | 26.0   | 23.1   | BP           | LP   |
| SMBJ17(C)A  | 17.0   | 18.90   | 21.70   | 1.0                                    | 5.0   | 27.6   | 21.7   | BR           | LR   |
| SMBJ18(C)A  | 18.0   | 20.00   | 23.30   | 1.0                                    | 5.0   | 29.2   | 20.5   | BT           | LT   |
| SMBJ20(C)A  | 20.0   | 22.20   | 25.50   | 1.0                                    | 5.0   | 32.4   | 18.5   | BV           | LV   |
| SMBJ22(C)A  | 22.0   | 24.40   | 28.00   | 1.0                                    | 5.0   | 35.5   | 16.9   | BX           | LX   |
| SMBJ24(C)A  | 24.0   | 26.70   | 30.70   | 1.0                                    | 5.0   | 38.9   | 15.4   | BZ           | LZ   |
| SMBJ26(C)A  | 26.0   | 28.90   | 33.20   | 1.0                                    | 5.0   | 42.1   | 14.2   | CE           | ME   |
| SMBJ28(C)A  | 28.0   | 31.10   | 35.80   | 1.0                                    | 5.0   | 45.4   | 13.2   | CG           | MG   |
| SMBJ30(C)A  | 30.0   | 33.30   | 38.30   | 1.0                                    | 5.0   | 48.4   | 12.4   | CK           | MK   |
| SMBJ33(C)A  | 33.0   | 36.70   | 42.20   | 1.0                                    | 5.0   | 53.3   | 11.3   | CM           | MM   |
| SMBJ36(C)A  | 36.0   | 40.00   | 46.00   | 1.0                                    | 5.0   | 58.1   | 10.3   | CP           | MP   |
| SMBJ40(C)A  | 40.0   | 44.40   | 51.10   | 1.0                                    | 5.0   | 64.5   | 9.3  | CR           | MR   |
| SMBJ43(C)A  | 43.0   | 47.80   | 54.90   | 1.0                                    | 5.0   | 69.4   | 8.6  | CT           | MT   |
| SMBJ45(C)A  | 45.0   | 50.00   | 57.50   | 1.0                                    | 5.0   | 72.7   | 8.3  | CV           | MV   |
| SMBJ48(C)A  | 48.0   | 53.30   | 61.30   | 1.0                                    | 5.0   | 77.4   | 7.7  | CX           | MX   |
| SMBJ51(C)A  | 51.0   | 56.70   | 65.20   | 1.0                                    | 5.0   | 82.4   | 7.3  | CZ           | MZ   |
| SMBJ54(C)A  | 54.0   | 60.00   | 69.00   | 1.0                                    | 5.0   | 87.1   | 6.9  | DE           | NE   |
| SMBJ58(C)A  | 58.0   | 64.40   | 74.60   | 1.0                                    | 5.0   | 93.6   | 6.4  | DG           | NG   |
| SMBJ60(C)A  | 60.0   | 66.70   | 76.70   | 1.0                                    | 5.0   | 96.8   | 6.2  | DK           | NK   |
| SMBJ64(C)A  | 64.0   | 71.10   | 81.80   | 1.0                                    | 5.0   | 103.0  | 5.8  | DM           | NM   |
| SMBJ70(C)A  | 70.0   | 77.80   | 89.50   | 1.0                                    | 5.0   | 113.0  | 5.3  | DP           | NP   |
| SMBJ75(C)A  | 75.0   | 83.30   | 95.80   | 1.0                                    | 5.0   | 121.0  | 4.9  | DR           | NR   |
| SMBJ78(C)A  | 78.0   | 86.70   | 99.70   | 1.0                                    | 5.0   | 126.0  | 4.7  | DT           | NT   |
| SMBJ85(C)A  | 85.0   | 94.40   | 108.20  | 1.0                                    | 5.0   | 137.0  | 4.4  | DV           | NV   |
| SMBJ90(C)A  | 90.0   | 100.0   | 115.50  | 1.0                                    | 5.0   | 146.0  | 4.1  | DX           | NX   |
| SMBJ100(C)A   | 100.0  | 111.0   | 128.00  | 1.0                                    | 5.0   | 162.0  | 3.7  | DZ           | NZ   |
| SMBJ110(C)A   | 110.0  | 122.0   | 140.00  | 1.0                                    | 5.0   | 177.0  | 3.4  | EE           | PE   |
| SMBJ120(C)A   | 120.0  | 133.0   | 153.00  | 1.0                                    | 5.0   | 193.0  | 3.1  | EG           | PG   |
| SMBJ130(C)A   | 130.0  | 144.0   | 165.50  | 1.0                                    | 5.0   | 209.0  | 2.9  | EK           | PK   |
| SMBJ150(C)A   | 150.0  | 167.0   | 192.50  | 1.0                                    | 5.0   | 243.0  | 2.5  | EM           | PM   |
| SMBJ160(C)A   | 160.0  | 178.0   | 205.00  | 1.0                                    | 5.0   | 259.0  | 2.3  | EP           | PP   |
| SMBJ170(C)A   | 170.0  | 189.0   | 217.50  | 1.0                                    | 5.0   | 275.0  | 2.2  | ER           | PR   |

- Notes:
- Suffix C denotes Bi-directional device.
  - V<sub>BR</sub> measured with I<sub>T</sub> current pulse = 300μs
  - For Bi-Directional devices having V<sub>RWM</sub> of 10V and under, the I<sub>R</sub> is doubled.

**SMBJ5.0(C)A - SMBJ170(C)A**

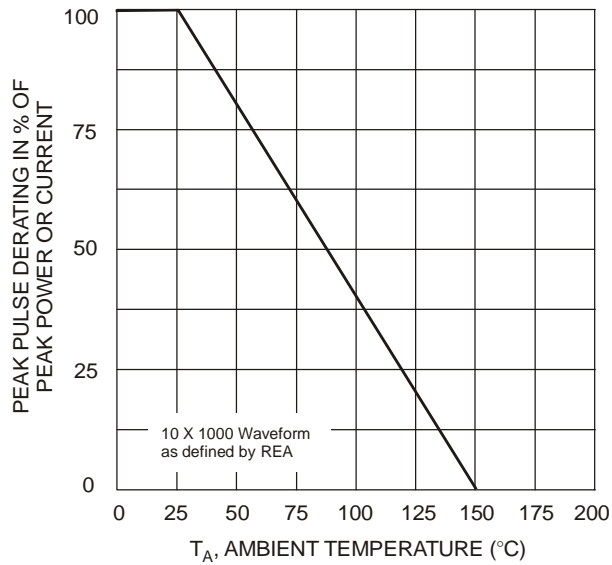


Fig. 1 Pulse Derating Curve

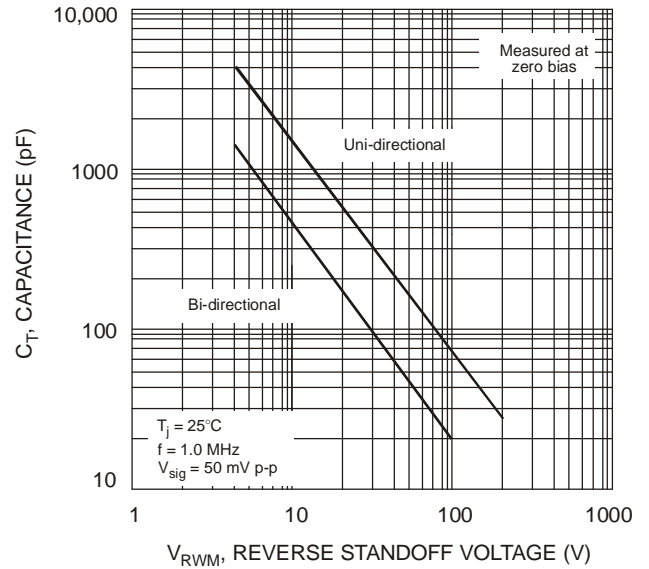


Fig. 2 Typical Total Capacitance

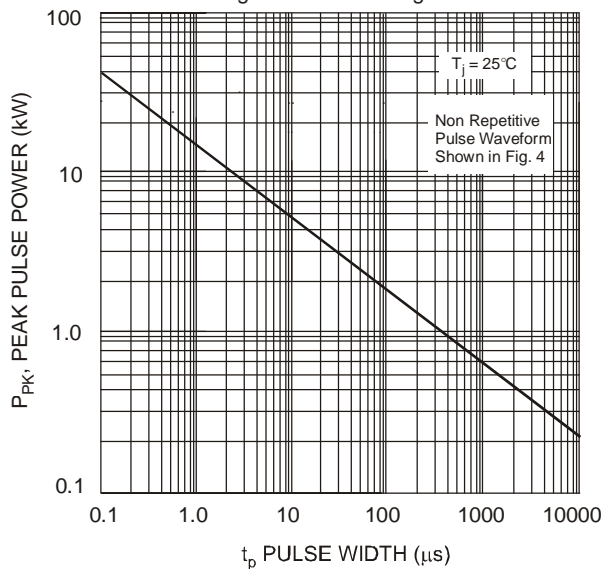


Fig. 3 Pulse Rating Curve

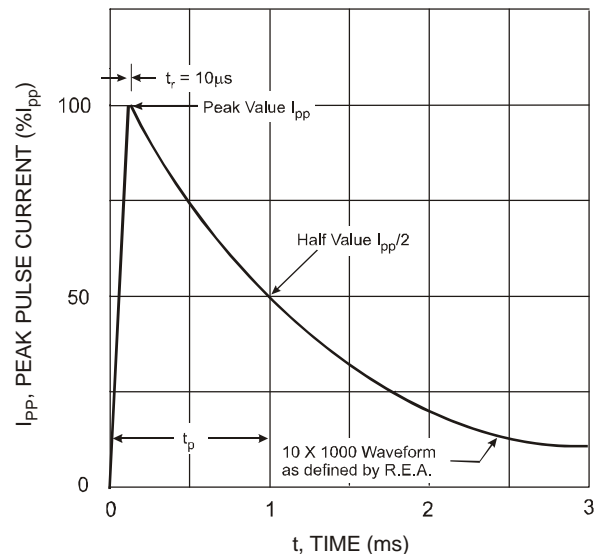


Fig. 4 Pulse Waveform

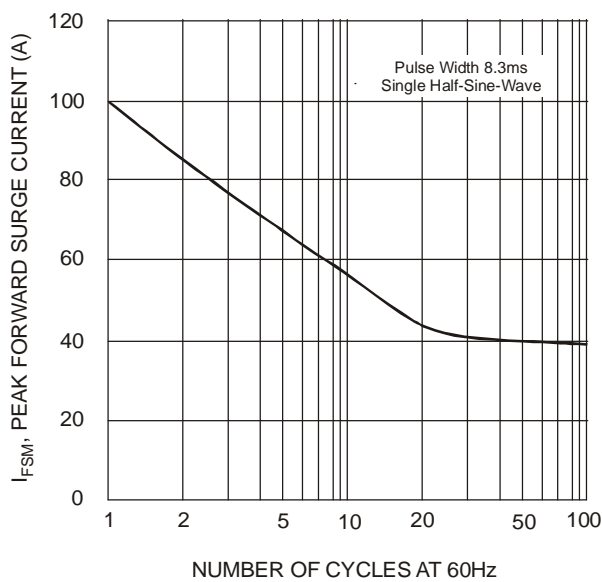


Fig. 5 Maximum Non-Repetitive Surge Current

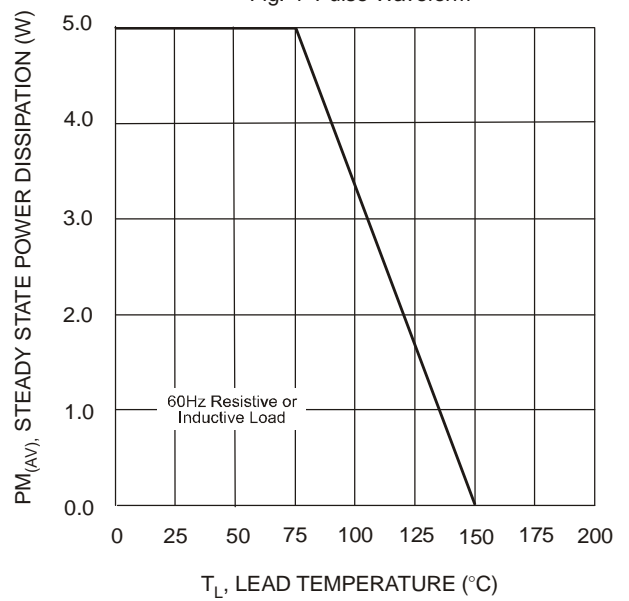


Fig. 6 Steady State Power Derating Curve

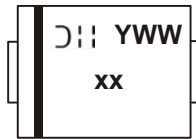
**Ordering Information** (Note 9)

| Part Number      | Case | Packaging        |
|------------------|------|------------------|
| SMBJXXX(C)A-13-F | SMB  | 3000/Tape & Reel |

\*x = Device Voltage, e.g., SMBJ170A-13-F.

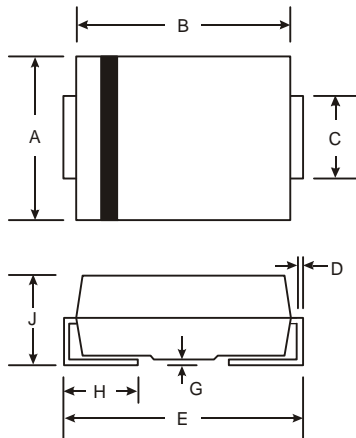
Notes: 9. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



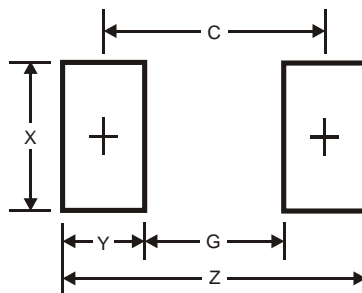
xx = Product type marking code (See Page 2)  
 DII = Manufacturers' code marking  
 YWW = Date code marking  
 Y = Last digit of year (ex: 2 for 2002)  
 WW = Week code 01 to 52

**Package Outline Dimensions**



| SMB                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 3.30 | 3.94 |
| B                    | 4.06 | 4.57 |
| C                    | 1.96 | 2.21 |
| D                    | 0.15 | 0.31 |
| E                    | 5.00 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 2.00 | 2.62 |
| All Dimensions in mm |      |      |

**Suggested Pad Layout**



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 6.8           |
| G          | 1.8           |
| X          | 2.3           |
| Y          | 2.5           |
| C          | 4.3           |

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