

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

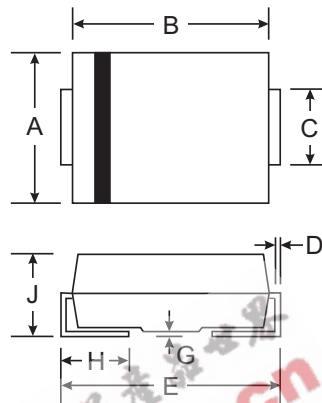
## 600W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### 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 4)**

### Mechanical Data

- Case: SMB
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- 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: Date Code and Marking Code See Page 4
- Ordering Info: See Page 4
- Weight: 0.1 grams (approximate)



| SMB                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 3.30 | 3.94 |
| B                    | 4.06 | 4.70 |
| C                    | 1.91 | 2.21 |
| D                    | 0.15 | 0.31 |
| E                    | 5.00 | 5.59 |
| G                    | 0.10 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 2.00 | 2.62 |
| All Dimensions in mm |      |      |

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

| Characteristic   | Symbol      | Value       | Unit                |
|--|-------------|-------------|---------------------|
| Peak Pulse Power Dissipation (Non repetitive current pulse derated above $T_A = 25^\circ\text{C}$ ) (Note 1) | $P_{PK}$    | 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 1, 2, & 3)         | $I_{FSM}$   | 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 1, 2, & 3)                                   | $V_F$       | 3.5<br>5.0  | V<br>V              |
| Operating Temperature Range  | $T_j$       | -55 to +150 | $^\circ\text{C}$    |
| Storage Temperature Range  | $T_{STG}$   | -55 to +175 | $^\circ\text{C}$    |

- Notes:
1. Valid provided that terminals are kept at ambient temperature.
  2. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
  3. Unidirectional units only.
  4. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

| Part Number<br>Add C For<br>Bi-Directional<br>(Note 5) | Reverse<br>Standoff<br>Voltage<br>$V_{RWM}$ (V) | Breakdown<br>Voltage<br>$V_{BR}$ @ $I_T$ (Note 6) |         | Test<br>Current<br>$I_T$ (mA) | Max. Reverse<br>Leakage @<br>$V_{RWM}$ (Note 7)<br>$I_R$ ( $\mu$ A) | Max. Clamping<br>Voltage @ $I_{pp}$<br>$V_C$ (V) | Max. Peak Pulse<br>Current<br>$I_{pp}$<br>(A) | Marking Code |      |
|--|---|---|---------|-------------------------------|---|--|---|--------------|------|
|  |   | Min (V)   | Max (V) |                               |   |  |   | 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: 5. Suffix C denotes Bi-directional device.  
6.  $V_{BR}$  measured with  $I_T$  current pulse = 300 $\mu$ s  
7. For Bi-Directional devices having  $V_{RWM}$  of 10V and under, the  $I_R$  is doubled.

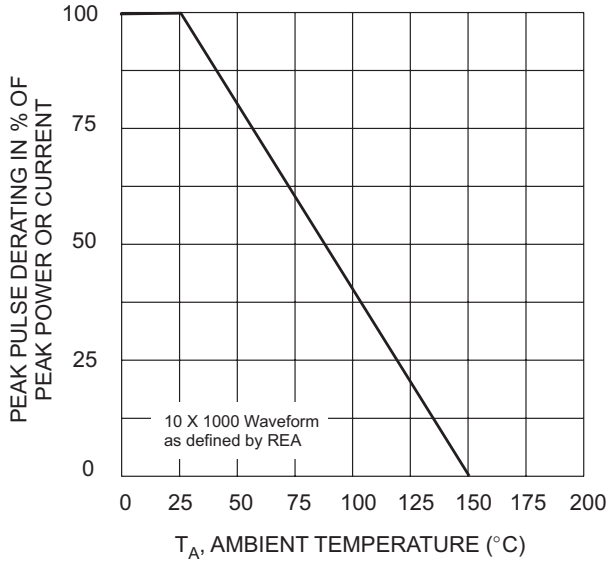


Fig. 1 Pulse Derating Curve

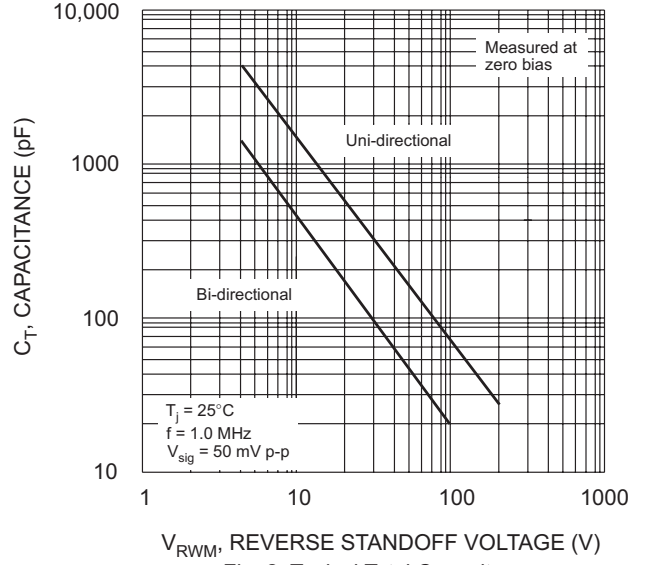


Fig. 2 Typical Total Capacitance

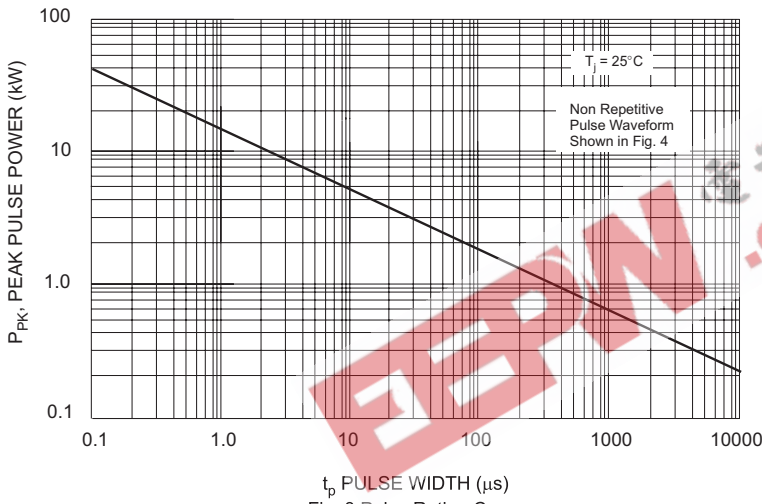


Fig. 3 Pulse Rating Curve

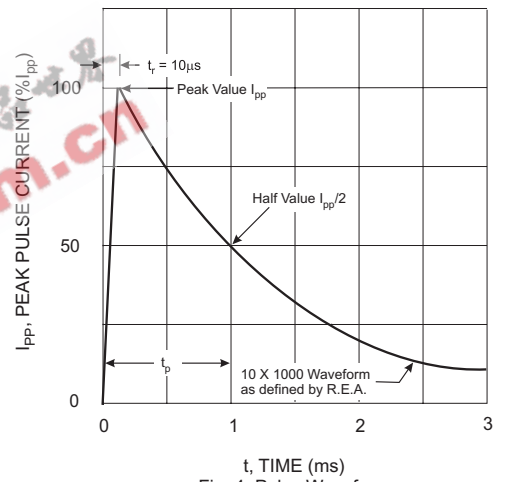


Fig. 4 Pulse Waveform

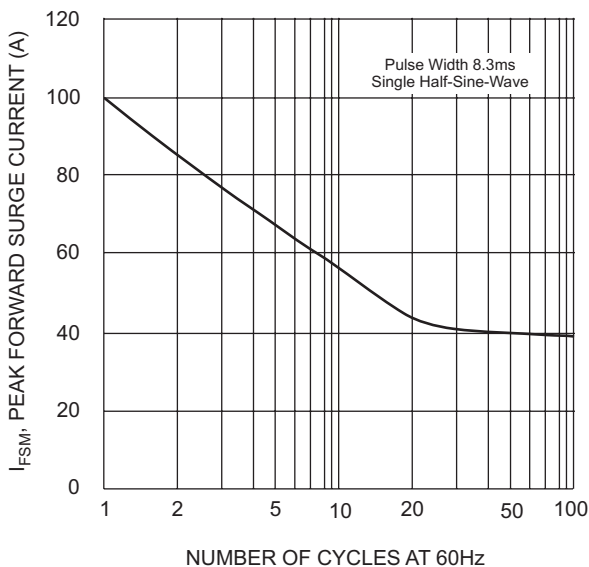


Fig. 5 Maximum Non-Repetitive Surge Current

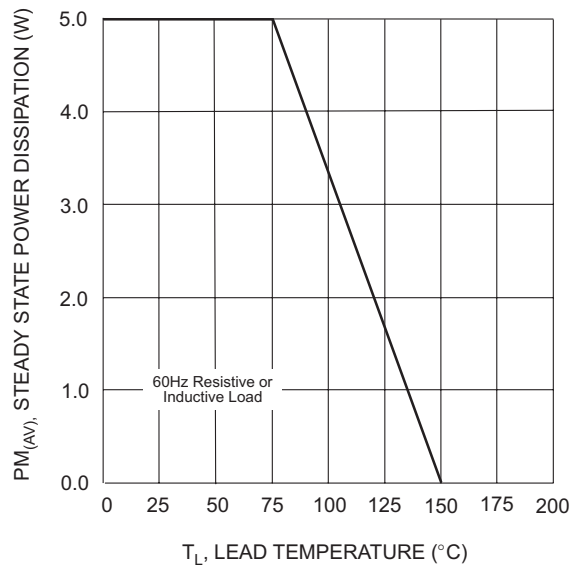


Fig. 6 Steady State Power Derating Curve

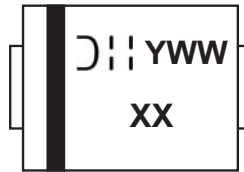
## Ordering Information (Note 8)

| Device*          | Packaging | Shipping         |
|------------------|-----------|------------------|
| SMBJXXX(C)A-13-F | SMB       | 5000/Tape & Reel |

Notes: 8. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

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

## Marking Information



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

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