

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

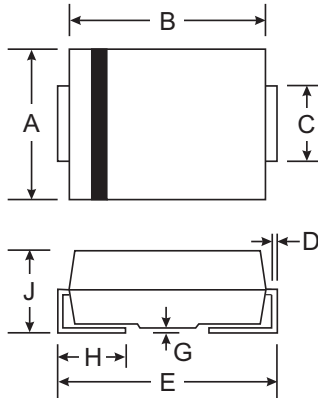
## 600W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### 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<br>(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<br>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.

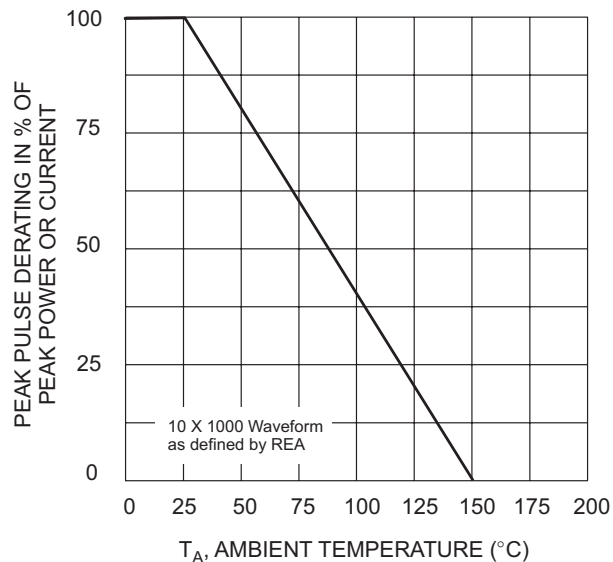


Fig. 1 Pulse Derating Curve

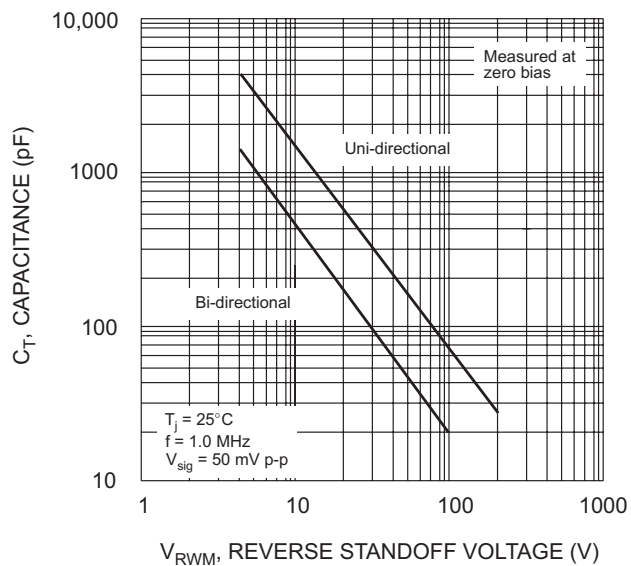


Fig. 2 Typical Total Capacitance

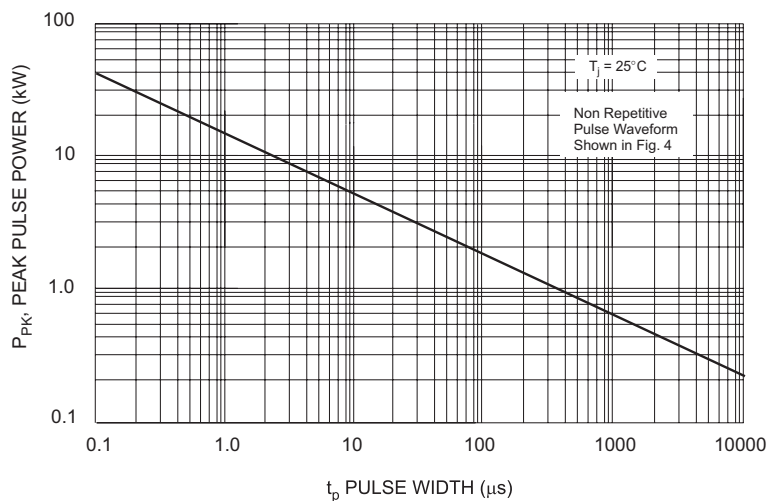


Fig. 3 Pulse Rating Curve

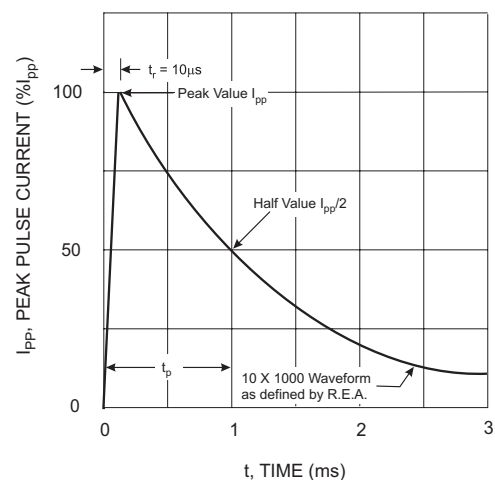


Fig. 4 Pulse Waveform

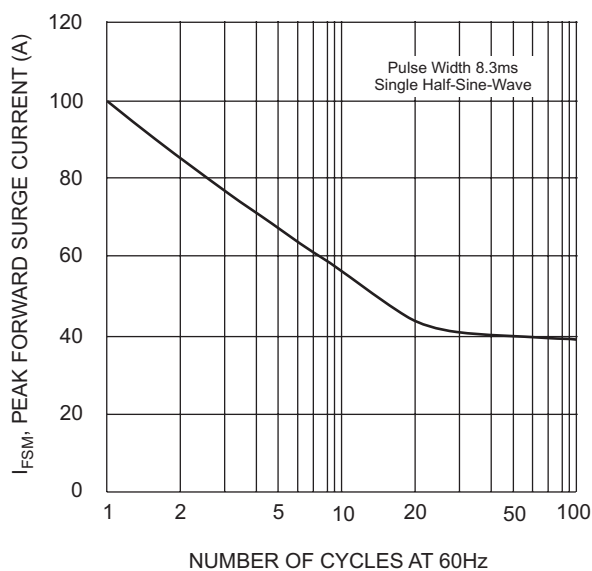


Fig. 5 Maximum Non-Repetitive Surge Current

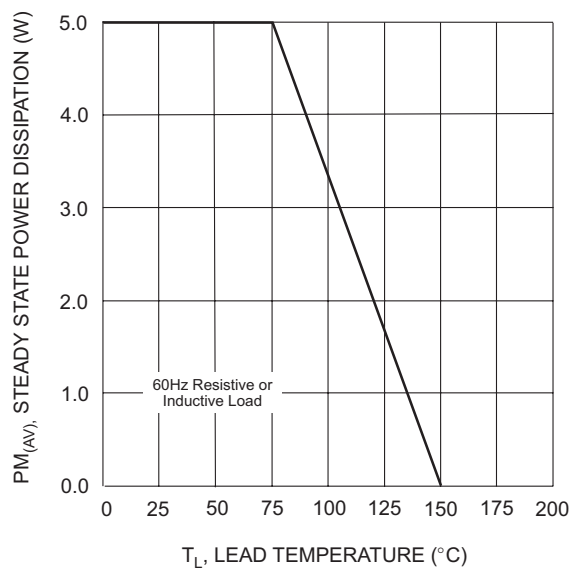


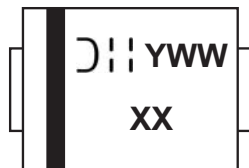
Fig. 6 Steady State Power Derating Curve

**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)

D11 = 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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