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

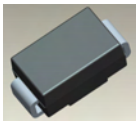
## 600W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

## Features

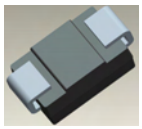
- 600W Peak Pulse Power Dissipation
- 5.0V - 170V Standoff Voltages
- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- **Lead Free Finish/RoHS Compliant (Note 1)**
- **Green Molding Compound (No Halogen and Antimony)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

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Peak Pulse Power Dissipation (Non repetitive current pulse derated above $T_A$ = 25° C) (Note 3) | $P_{PK}$ | 600 | W |
| Peak Power Derating Above 25°C | $P_{der}$ | 4.8 | W/°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°C | $PM_{(AV)}$ | 5.0 | W |
| Instantaneous Forward Voltage @ $I_{PP}$ = 35A (Notes 3, 4, & 5) $V_{BR}$<100V<br>$V_{BR}\geq$100V | $V_F$ | 3.5<br>5.0 | V<br>V |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Operating Temperature Range | $T_J$ | -55 to +150 | °C |
| Storage Temperature Range | $T_{STG}$ | -55 to +175 | °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.
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.


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## Electrical Characteristics @$T_A$ = 25°C unless otherwise specified

| Part Number Add C For Bi-Directional (Note 6) | Reverse Standoff Voltage | Breakdown Voltage $V_{BR}$ @ $I_T$ (Note 7) | | Test Current | Max. Reverse Leakage @ $V_{RWM}$ (Note 8) | Max. Clamping Voltage @ $I_{pp}$ | Max. Peak Pulse Current $I_{pp}$ | Marking Code | |
|---|---|---|---|---|---|---|---|---|---|
| See Note 4 | $V_{RWM}$ (V) | Min (V) | Max (V) | $I_T$(mA) | $I_R$ (µA) | $V_C$ (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: 6. Suffix C denotes Bi-directional device.
7. $V_{BR}$ measured with $I_T$ current pulse = 300µs
8. For Bi-Directional devices having $V_{RWM}$ of 10V and under, the $I_R$ is doubled.


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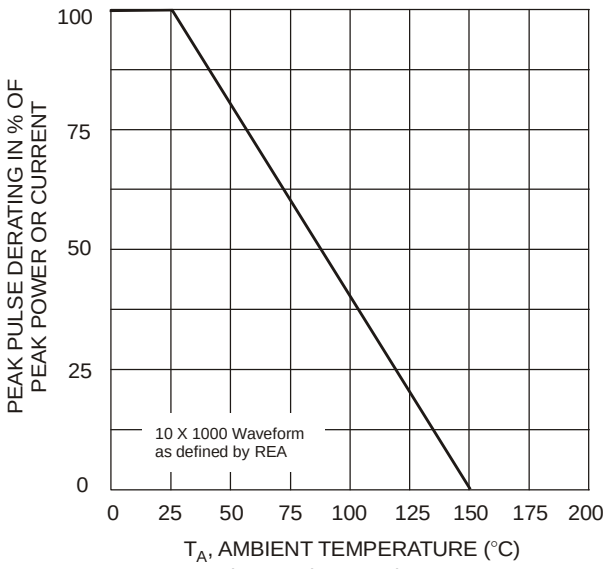



Fig. 1 Pulse Derating Curve

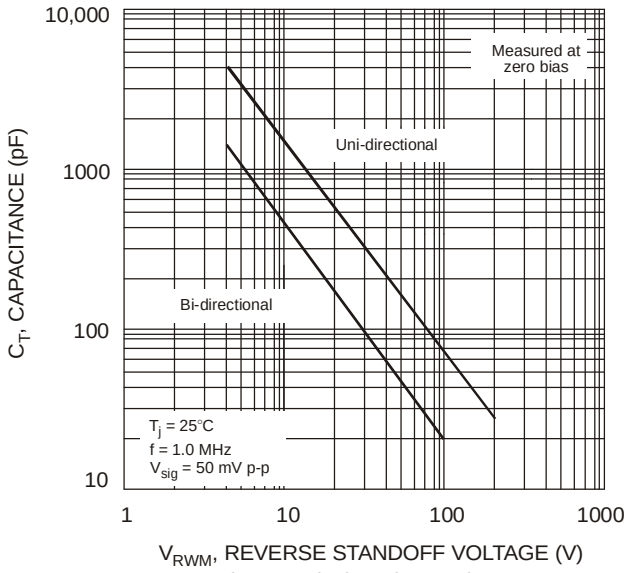



Fig. 2 Typical Total Capacitance

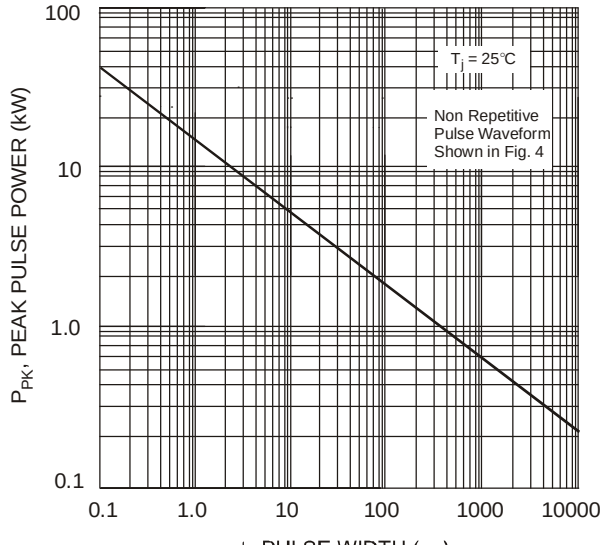



Fig. 3 Pulse Rating Curve

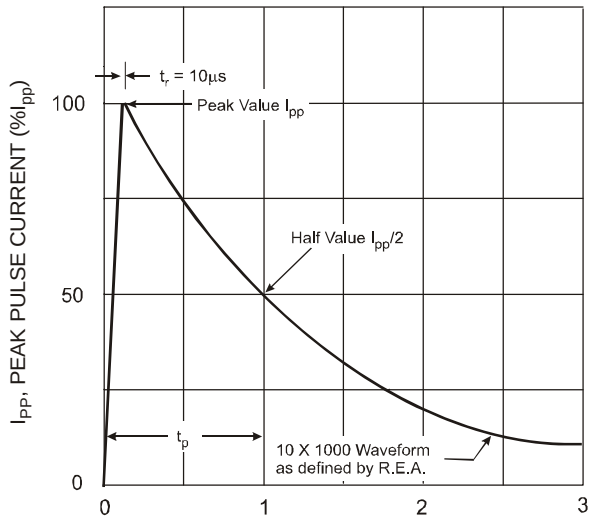



Fig. 4 Pulse Waveform

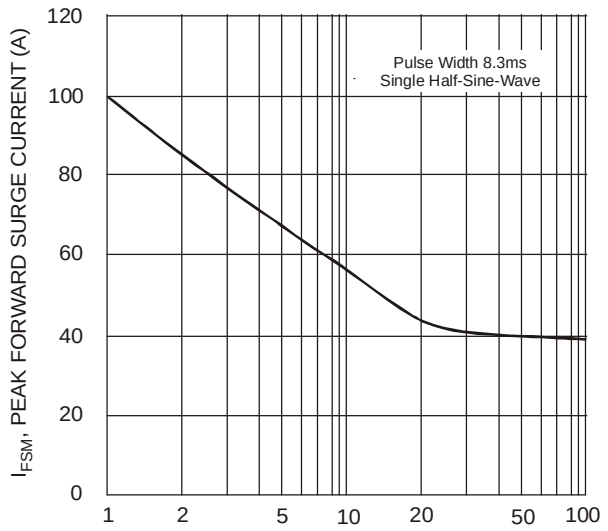



Fig. 5 Maximum Non-Repetitive Surge Current

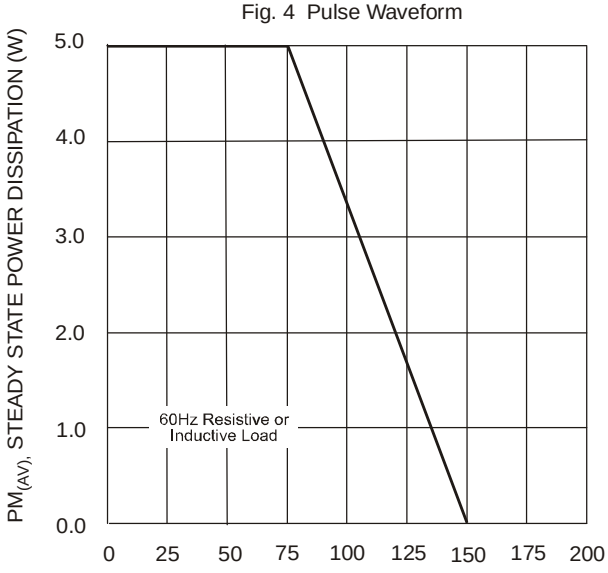



Fig. 6 Steady State Power Derating Curve


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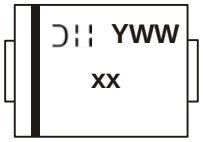
## Ordering Information (Note 9)

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

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

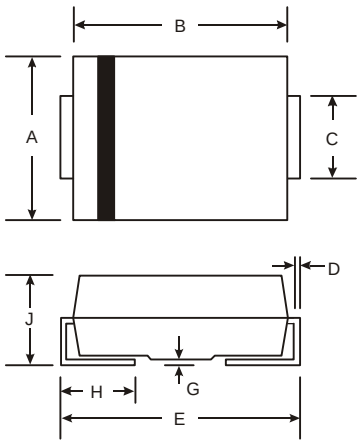
Notes: 9. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

## Marking Information



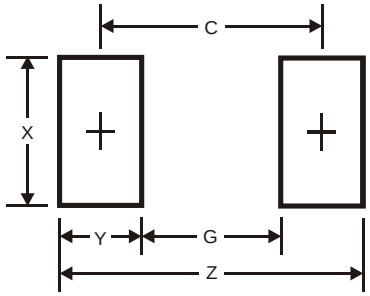

xx = Product type marking code (See Page 2)
= Manufacturers' code marking
YWW = Date code marking
Y = Last digit of year (ex: 2 for 2002)
WW = Week code 01 to 52

## 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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