



THE DATASHEET OF SMBJ6.0A



SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR DIODE

Features

- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- Plastic Material: UL Flammability Classification Rating 94V-0



Mechanical Data

- Case: SMB/DO-214AA, Molded Plastic
- Terminals: Solder Plated, Solderable per MIL-STD-750, Method 2026
- Polarity: Cathode Band or Cathode Notch
- Marking: Type Number
- Weight: 0.093 grams (approx.)



| SMB(DO-214AA) | | |
|----------------------|------|------|
| 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 Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (JEDEC Method) (Notes 1, 2, & 3) | I_{FSM} | 100 | A |
| Instantaneous Forward Voltage @ $I_{PP} = 35\text{A}$ (Notes 1, 2, & 3) | V_F | $V_{BR} < 100\text{V}$ 3.5 $V_{BR} \geq 100\text{V}$ 5.0 | V V |
| Operating and Storage Temperature Range | T_j, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

- 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.



SMBJ5.0 - SMBJ170CA

| TYPE | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I _T | Breakdown Voltage Max. @ I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RWM} |
|----------|-----------|---------|------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni) | (Bi) | (Uni) | (Bi) | V _{RWM} (V) | V _{BR MIN} (V) | V _{BR MAX} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (μ A) |
| SMBJ5.0 | SMBJ5.0C | KD | KD | 5.0 | 6.40 | 7.55 | 10 | 9.6 | 62.5 | 800.0 |
| SMBJ5.0A | SMBJ5.0CA | KE | KE | 5.0 | 6.40 | 7.25 | 10 | 9.2 | 65.2 | 800.0 |
| SMBJ6.0 | SMBJ6.0C | KF | KF | 6.0 | 6.67 | 8.45 | 10 | 11.4 | 52.6 | 800.0 |
| SMBJ6.0A | SMBJ6.0CA | KG | KG | 6.0 | 6.67 | 7.67 | 10 | 10.3 | 58.3 | 800.0 |
| SMBJ6.5 | SMBJ6.5C | KH | AH | 6.5 | 7.22 | 9.14 | 10 | 12.3 | 48.8 | 500.0 |
| SMBJ6.5A | SMBJ6.5CA | KK | AK | 6.5 | 7.22 | 8.30 | 10 | 11.2 | 53.6 | 500.0 |
| SMBJ7.0 | SMBJ7.0C | KL | KL | 7.0 | 7.78 | 9.86 | 10 | 13.3 | 45.1 | 200.0 |
| SMBJ7.0A | SMBJ7.0CA | KM | KM | 7.0 | 7.78 | 8.95 | 10 | 12.0 | 50.0 | 200.0 |
| SMBJ7.5 | SMBJ7.5C | KN | AN | 7.5 | 8.33 | 10.67 | 1.0 | 14.3 | 42.0 | 100.0 |
| SMBJ7.5A | SMBJ7.5CA | KP | AP | 7.5 | 8.33 | 9.58 | 1.0 | 12.9 | 46.5 | 100.0 |
| SMBJ8.0 | SMBJ8.0C | KQ | AQ | 8.0 | 8.89 | 11.3 | 1.0 | 15.0 | 40.0 | 50.0 |
| SMBJ8.0A | SMBJ8.0CA | KR | AR | 8.0 | 8.89 | 10.23 | 1.0 | 13.6 | 44.1 | 50.0 |
| SMBJ8.5 | SMBJ8.5C | KS | AS | 8.5 | 9.44 | 11.92 | 1.0 | 15.9 | 37.7 | 20.0 |
| SMBJ8.5A | SMBJ8.5CA | KT | AT | 8.5 | 9.44 | 10.82 | 1.0 | 14.4 | 41.7 | 20.0 |
| SMBJ9.0 | SMBJ9.0C | KU | AU | 9.0 | 10.0 | 12.6 | 1.0 | 16.9 | 35.5 | 10.0 |
| SMBJ9.0A | SMBJ9.0CA | KV | AV | 9.0 | 10.0 | 11.5 | 1.0 | 15.4 | 39.0 | 10.0 |
| SMBJ10 | SMBJ10C | KW | AW | 10 | 11.1 | 14.1 | 1.0 | 18.8 | 31.9 | 5.0 |
| SMBJ10A | SMBJ10CA | KX | AX | 10 | 11.1 | 12.8 | 1.0 | 17.0 | 35.3 | 5.0 |
| SMBJ11 | SMBJ11C | KY | KY | 11 | 12.2 | 15.4 | 1.0 | 20.1 | 29.9 | 5.0 |
| SMBJ11A | SMBJ11CA | KZ | KZ | 11 | 12.2 | 14.0 | 1.0 | 18.2 | 33.0 | 5.0 |
| SMBJ12 | SMBJ12C | LD | BD | 12 | 13.3 | 16.9 | 1.0 | 22.0 | 27.3 | 5.0 |
| SMBJ12A | SMBJ12CA | LE | BE | 12 | 13.3 | 15.3 | 1.0 | 19.9 | 30.2 | 5.0 |
| SMBJ13 | SMBJ13C | LF | LF | 13 | 14.4 | 18.2 | 1.0 | 23.8 | 25.2 | 5.0 |
| SMBJ13A | SMBJ13CA | LG | LG | 13 | 14.4 | 16.5 | 1.0 | 21.5 | 27.9 | 5.0 |
| SMBJ14 | SMBJ14C | LH | BH | 14 | 15.6 | 19.8 | 1.0 | 25.8 | 23.3 | 5.0 |
| SMBJ14A | SMBJ14CA | LK | BK | 14 | 15.6 | 17.9 | 1.0 | 23.2 | 25.9 | 5.0 |
| SMBJ15 | SMBJ15C | LL | BL | 15 | 16.7 | 21.1 | 1.0 | 26.9 | 22.3 | 5.0 |
| SMBJ15A | SMBJ15CA | LM | BM | 15 | 16.7 | 19.2 | 1.0 | 24.4 | 24.6 | 5.0 |
| SMBJ16 | SMBJ16C | LN | LN | 16 | 17.8 | 22.6 | 1.0 | 28.8 | 20.8 | 5.0 |
| SMBJ16A | SMBJ16CA | LP | LM | 16 | 17.8 | 20.5 | 1.0 | 26.0 | 23.1 | 5.0 |
| SMBJ17 | SMBJ17C | LQ | LQ | 17 | 18.9 | 23.9 | 1.0 | 30.5 | 19.7 | 5.0 |
| SMBJ17A | SMBJ17CA | LR | LR | 17 | 18.9 | 21.7 | 1.0 | 27.6 | 21.7 | 5.0 |
| SMBJ18 | SMBJ18C | LS | BS | 18 | 20.0 | 25.3 | 1.0 | 32.2 | 18.6 | 5.0 |
| SMBJ18A | SMBJ18CA | LT | BT | 18 | 20.0 | 23.3 | 1.0 | 29.2 | 20.5 | 5.0 |
| SMBJ20 | SMBJ20C | LU | LU | 20 | 22.2 | 28.1 | 1.0 | 35.8 | 16.8 | 5.0 |
| SMBJ20A | SMBJ20CA | LV | LV | 20 | 22.2 | 25.5 | 1.0 | 32.4 | 18.5 | 5.0 |
| SMBJ22 | SMBJ22C | LW | BW | 22 | 24.4 | 30.9 | 1.0 | 39.4 | 15.2 | 5.0 |
| SMBJ22A | SMBJ22CA | LX | BX | 22 | 24.4 | 28.0 | 1.0 | 35.5 | 16.9 | 5.0 |

Note:

- (1) V_{BR} measured after I_T applied for 300 μ s., I_T = square wave pulse or equivalent.
- (2) Surge Current Waveform per Figure 5 and Derate per Figure 1
- (3) A Transient suppressor is normally selected according to the reverse " Stand-off Voltage " (V_{RWM}) which should be equal to or greater than the D.C. or continuous peak operating voltage level.



SMBJ5.0 - SMBJ170CA

| TYPE | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I _T | Breakdown Voltage Max. @ I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RWM} |
|---------|----------|---------|------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni) | (Bi) | (Uni) | (Bi) | V _{RWM} (V) | V _{BR} MIN(V) | V _{BR} MAX(V) | I _T (mA) | V _c (V) | I _{PP} (A) | I _R (μ A) |
| SMBJ24 | SMBJ24C | LY | BY | 24 | 26.7 | 33.8 | 1.0 | 43.0 | 14.0 | 5.0 |
| SMBJ24A | SMBJ24CA | LZ | BZ | 24 | 26.7 | 30.7 | 1.0 | 38.9 | 15.4 | 5.0 |
| SMBJ26 | SMBJ26C | MD | CD | 26 | 28.9 | 36.6 | 1.0 | 46.6 | 12.9 | 5.0 |
| SMBJ26A | SMBJ26CA | ME | CE | 26 | 28.9 | 33.2 | 1.0 | 42.1 | 14.3 | 5.0 |
| SMBJ28 | SMBJ28C | MF | MF | 28 | 31.1 | 39.4 | 1.0 | 50.0 | 12.0 | 5.0 |
| SMBJ28A | SMBJ28CA | MG | MG | 28 | 31.1 | 35.8 | 1.0 | 45.4 | 13.2 | 5.0 |
| SMBJ30 | SMBJ30C | MH | CH | 30 | 33.3 | 42.2 | 1.0 | 53.5 | 11.2 | 5.0 |
| SMBJ30A | SMBJ30CA | MK | CK | 30 | 33.3 | 38.3 | 1.0 | 48.4 | 12.4 | 5.0 |
| SMBJ33 | SMBJ33C | ML | CL | 33 | 36.7 | 46.5 | 1.0 | 59.0 | 10.2 | 5.0 |
| SMBJ33A | SMBJ33CA | MM | CM | 33 | 36.7 | 42.2 | 1.0 | 53.3 | 11.3 | 5.0 |
| SMBJ36 | SMBJ36C | MN | CN | 36 | 40.0 | 50.7 | 1.0 | 64.3 | 9.3 | 5.0 |
| SMBJ36A | SMBJ36CA | MP | CP | 36 | 40.0 | 46.0 | 1.0 | 58.1 | 10.3 | 5.0 |
| SMBJ40 | SMBJ40C | MQ | CQ | 40 | 44.4 | 56.3 | 1.0 | 71.4 | 8.4 | 5.0 |
| SMBJ40A | SMBJ40CA | MR | CR | 40 | 44.4 | 51.1 | 1.0 | 64.5 | 9.3 | 5.0 |
| SMBJ43 | SMBJ43C | MS | CS | 43 | 47.8 | 60.5 | 1.0 | 76.7 | 7.8 | 5.0 |
| SMBJ43A | SMBJ43CA | MT | CT | 43 | 47.8 | 54.9 | 1.0 | 69.4 | 8.6 | 5.0 |
| SMBJ45 | SMBJ45C | MU | MU | 45 | 50.0 | 63.3 | 1.0 | 80.3 | 7.5 | 5.0 |
| SMBJ45A | SMBJ45CA | MV | MV | 45 | 50.0 | 57.5 | 1.0 | 72.7 | 8.3 | 5.0 |
| SMBJ48 | SMBJ48C | MW | MW | 48 | 53.3 | 67.5 | 1.0 | 85.5 | 7.0 | 5.0 |
| SMBJ48A | SMBJ48CA | MX | MX | 48 | 53.3 | 61.3 | 1.0 | 77.4 | 7.8 | 5.0 |
| SMBJ51 | SMBJ51C | MY | MY | 51 | 56.7 | 71.8 | 1.0 | 91.1 | 6.6 | 5.0 |
| SMBJ51A | SMBJ51CA | MZ | MZ | 51 | 56.7 | 65.2 | 1.0 | 82.4 | 7.3 | 5.0 |
| SMBJ54 | SMBJ54C | ND | ND | 54 | 60.0 | 76.0 | 1.0 | 96.3 | 6.2 | 5.0 |
| SMBJ54A | SMBJ54CA | NE | NE | 54 | 60.0 | 69.0 | 1.0 | 87.1 | 6.9 | 5.0 |
| SMBJ58 | SMBJ58C | NF | NF | 58 | 64.4 | 81.6 | 1.0 | 103 | 5.8 | 5.0 |
| SMBJ58A | SMBJ58CA | NG | NG | 58 | 64.4 | 74.1 | 1.0 | 93.6 | 6.4 | 5.0 |
| SMBJ60 | SMBJ60C | NH | NH | 60 | 66.7 | 84.5 | 1.0 | 107 | 5.6 | 5.0 |
| SMBJ60A | SMBJ60CA | NK | NK | 60 | 66.7 | 76.7 | 1.0 | 96.8 | 6.2 | 5.0 |
| SMBJ64 | SMBJ64C | NL | NL | 64 | 71.1 | 90.1 | 1.0 | 114 | 5.3 | 5.0 |
| SMBJ64A | SMBJ64CA | NM | NM | 64 | 71.1 | 81.8 | 1.0 | 103 | 5.8 | 5.0 |
| SMBJ70 | SMBJ70C | NN | NN | 70 | 77.8 | 98.6 | 1.0 | 125 | 4.8 | 5.0 |
| SMBJ70A | SMBJ70CA | NP | NP | 70 | 77.8 | 89.5 | 1.0 | 113 | 5.3 | 5.0 |
| SMBJ75 | SMBJ75C | NQ | NQ | 75 | 83.0 | 105.7 | 1.0 | 134 | 4.5 | 5.0 |
| SMBJ75A | SMBJ75CA | NR | NR | 75 | 83.0 | 95.8 | 1.0 | 121 | 5.0 | 5.0 |
| SMBJ78 | SMBJ78C | NS | NS | 78 | 86.0 | 109.8 | 1.0 | 139 | 4.3 | 5.0 |
| SMBJ78A | SMBJ78CA | NT | NT | 78 | 86.0 | 99.7 | 1.0 | 126 | 4.8 | 5.0 |
| SMBJ85 | SMBJ85C | NU | NU | 85 | 94.0 | 119.2 | 1.0 | 151 | 4.0 | 5.0 |
| SMBJ85A | SMBJ85CA | NV | NV | 85 | 94.0 | 108.2 | 1.0 | 137 | 4.4 | 5.0 |

Note:

- (1) V_{BR} measured after I_T applied for 300 μ s., I_T = square wave pulse or equivalent.
- (2) Surge Current Waveform per Figure 5 and Derate per Figure 1
- (3) A Transient suppressor is normally selected according to the reverse " Stand-off Voltage " (V_{RWM}) which should be equal to or greater then the D.C. or continuous peak operating voltage level.



SMBJ5.0 - SMBJ170CA

| TYPE | | Marking | | Reverse Stand-Off Voltage | Breakdown Voltage Min. @I _T | Breakdown Voltage Max. @ I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RWM} |
|----------|-----------|---------|------|---------------------------|--|---|---------------------|---|---------------------|-----------------------------------|
| (Uni) | (Bi) | (Uni) | (Bi) | V _{RWM} (V) | V _{BR MIN} (V) | V _{BR MAX} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (uA) |
| SMBJ90 | SMBJ90C | NW | NW | 90 | 100 | 126.5 | 1.0 | 160 | 3.8 | 5.0 |
| SMBJ90A | SMBJ90CA | NX | NX | 90 | 100 | 115.5 | 1.0 | 146 | 4.1 | 5.0 |
| SMBJ100 | SMBJ100C | NY | NY | 100 | 111 | 141.0 | 1.0 | 179 | 3.4 | 5.0 |
| SMBJ100A | SMBJ100CA | NZ | NZ | 100 | 111 | 128.0 | 1.0 | 162 | 3.7 | 5.0 |
| SMBJ110 | SMBJ110C | PD | PD | 110 | 122 | 154.5 | 1.0 | 196 | 3.1 | 5.0 |
| SMBJ110A | SMBJ110CA | PE | PE | 110 | 122 | 140.5 | 1.0 | 177 | 3.4 | 5.0 |
| SMBJ120 | SMBJ120C | PF | PF | 120 | 133 | 169.0 | 1.0 | 214 | 2.8 | 5.0 |
| SMBJ120A | SMBJ120CA | PG | PG | 120 | 133 | 153.0 | 1.0 | 193 | 3.1 | 5.0 |
| SMBJ130 | SMBJ130C | PH | PH | 130 | 144 | 182.5 | 1.0 | 231 | 2.6 | 5.0 |
| SMBJ130A | SMBJ130CA | PK | PK | 130 | 144 | 165.5 | 1.0 | 209 | 2.9 | 5.0 |
| SMBJ150 | SMBJ150C | PL | PL | 150 | 167 | 211.5 | 1.0 | 268 | 2.2 | 5.0 |
| SMBJ150A | SMBJ150CA | PM | PM | 150 | 167 | 192.5 | 1.0 | 243 | 2.5 | 5.0 |
| SMBJ160 | SMBJ160C | PN | PN | 160 | 178 | 226.0 | 1.0 | 287 | 2.1 | 5.0 |
| SMBJ160A | SMBJ160CA | PP | PP | 160 | 178 | 205.0 | 1.0 | 259 | 2.3 | 5.0 |
| SMBJ170 | SMBJ170C | PQ | PQ | 170 | 189 | 239.5 | 1.0 | 304 | 2.0 | 5.0 |
| SMBJ170A | SMBJ170CA | PR | PR | 170 | 189 | 217.5 | 1.0 | 275 | 2.2 | 5.0 |

Ratings and Characteristic Curves $T_A = 25^\circ\text{C}$ unless otherwise noted

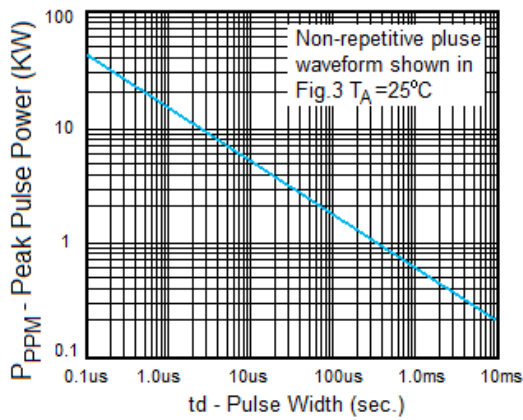


Fig. 1 Peak Pulse Power Rating

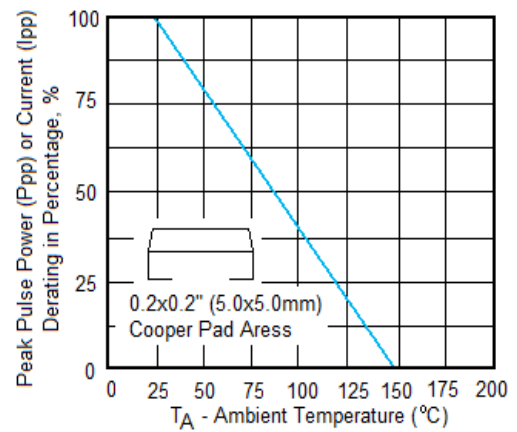


Fig. 2 Pulse Derating Curve

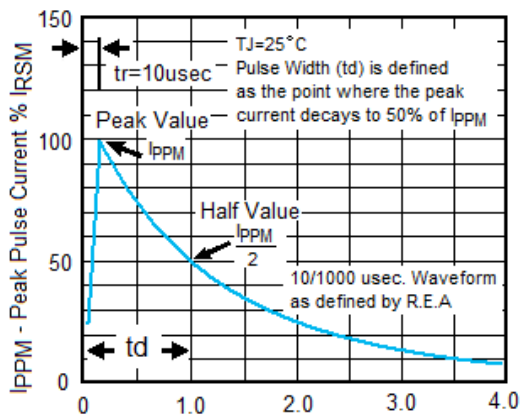


Fig. 3 Pulse Waveform

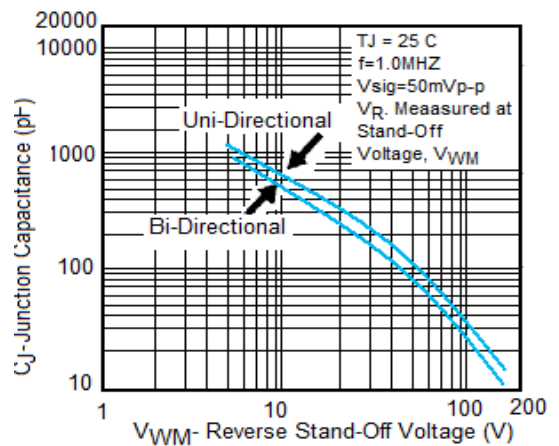


Fig. 4- Typical Junction Capacitance

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