



SMBJ5.0 THRU SMB440A

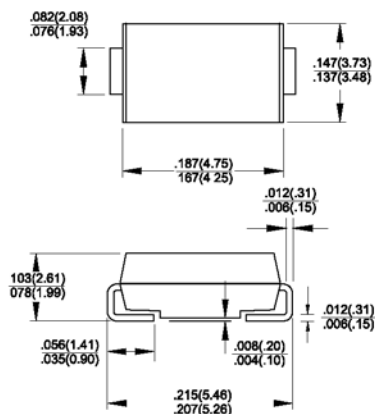
SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

Breskdown voltage: 5.0-440 Volts Peak pulse power: 600 Wallts

Features

- ◆ Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- ◆ Low profile package with built-in strain relief for surface mounted applications
- ◆ Glass passivated junction
- ◆ Low incremental surge resistance, excellent clamping capability
- ◆ 600W peak pulse power capability with a 10/1000us waveform, repetition rate (duty cycle): 0.01%
- ◆ Very fast response time
- ◆ High temperature soldering guaranteed: 250°C/10 seconds at terminals

DO-214AA (SMB)



Dimensions in inches and (millimeters)

Mechanical Data

- ◆ Case: JEDEC DO-214AA(SMB J-Bend) molded plastic over passivated junction
- ◆ Terminals: Solder plated, solderable per MIL-STD-750, Method 2026
- ◆ Polarity: For unidirectional types the band denotes the cathode, which is positive with respect to the anode under normal TVS operation
- ◆ Weight: 0.003oz., 0.093g

Devices for Bidirectional Applications

For bi-directional devices, use suffix CA (e.g. SMBJ10CA). Electrical characteristics apply in both directions.

Maximum Ratings and Thermal Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified.)

| Parameter | Symbol | Value | Unit |
|--|-----------------|----------------|------|
| Peak pulse power dissipation with a 10/1000us waveform ^(1,2) (see Fig. 1) | P_{PPM} | Minimum 600 | W |
| Peak pulse current with a 10/1000us waveform ⁽¹⁾ | I_{PPM} | See Next Table | A |
| Peak forward surge current 8.3ms single half sine-wave uni-directional only ⁽²⁾ | I_{FSM} | 100 | A |
| Typical thermal resistance, junction to ambient ⁽⁴⁾ | $R_{\theta JA}$ | 100 | °C/W |
| Typical thermal resistance, junction to lead | $R_{\theta JL}$ | 20 | °C/W |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | °C |

- Notes:**
1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^\circ\text{C}$ per Fig. 2
 2. Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal
 3. Mounted on minimum recommended pad layout

Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified. $V_F=3.5V$ at $I_F=50A$ (uni-directional only)

| Device Type | Device marking code | | Breakdown voltage $V_{(BR)}$ (Volts) ⁽¹⁾ | | Test current at I_T (mA) | Stand-off voltage V_{WM} (Volts) | Maximum reverse leakage at V_{WM} $I_D^{(3)}$ (μA) | Maximum peak pulse surge current $I_{PPM}^{(2)}$ (A) | Maximum clamping voltage at I_{PPM} V_C (Volts) |
|-------------------------|---------------------|----|---|------|----------------------------|------------------------------------|---|--|---|
| | UNI | BI | Min. | Max. | | | | | |
| SMBJ5.0 | KD | AD | 6.40 | 7.82 | 10 | 5.0 | 800 | 62.5 | 9.6 |
| SMBJ5.0A ⁽⁶⁾ | KE | AE | 6.40 | 7.07 | 10 | 5.0 | 800 | 65.2 | 9.2 |
| SMBJ6.0 | KF | AF | 6.67 | 8.15 | 10 | 6.0 | 800 | 52.6 | 11.4 |
| SMBJ6.0A | KG | AG | 6.67 | 7.37 | 10 | 6.0 | 800 | 58.3 | 10.3 |
| SMBJ6.5 | KH | AH | 7.22 | 8.82 | 10 | 6.5 | 500 | 48.8 | 12.3 |
| SMBJ6.5A | KK | AK | 7.22 | 7.98 | 10 | 6.5 | 500 | 53.6 | 11.2 |
| SMBJ7.0 | KL | AL | 7.78 | 9.51 | 10 | 7.0 | 200 | 45.1 | 13.3 |
| SMBJ7.0A | KM | AM | 7.78 | 8.60 | 10 | 7.0 | 200 | 50.0 | 12.0 |
| SMBJ7.5 | KN | AN | 8.33 | 10.2 | 1.0 | 7.5 | 100 | 42.0 | 14.3 |
| SMBJ7.5A | KP | AP | 8.33 | 9.21 | 1.0 | 7.5 | 100 | 46.5 | 12.9 |
| SMBJ8.0 | KQ | AQ | 8.89 | 10.9 | 1.0 | 8.0 | 50 | 40.0 | 15.0 |
| SMBJ8.0A | KR | AR | 8.89 | 9.83 | 1.0 | 8.0 | 50 | 44.1 | 13.6 |
| SMBJ8.5 | KS | AS | 9.44 | 11.5 | 1.0 | 8.5 | 20 | 37.7 | 15.9 |
| SMBJ8.5A | KT | AT | 9.44 | 10.4 | 1.0 | 8.5 | 20 | 41.7 | 14.4 |
| SMBJ9.0 | KU | AU | 10.0 | 12.2 | 1.0 | 9.0 | 10 | 35.5 | 16.9 |
| SMBJ9.0A | KV | AV | 10.0 | 11.1 | 1.0 | 9.0 | 10 | 39.0 | 15.4 |
| SMBJ10 | KW | AW | 11.1 | 13.6 | 1.0 | 10 | 5.0 | 31.9 | 18.8 |
| SMBJ10A | KX | AX | 11.1 | 12.3 | 1.0 | 10 | 5.0 | 35.3 | 17.0 |
| SMBJ11 | KY | AY | 12.2 | 14.9 | 1.0 | 11 | 5.0 | 29.9 | 20.1 |
| SMBJ11A | KZ | AZ | 12.2 | 13.5 | 1.0 | 11 | 5.0 | 33.0 | 18.2 |
| SMBJ12 | LD | BD | 13.3 | 16.3 | 1.0 | 12 | 5.0 | 27.3 | 22.0 |
| SMBJ12A | LE | BE | 13.3 | 14.7 | 1.0 | 12 | 5.0 | 30.2 | 19.9 |
| SMBJ13 | LF | BF | 14.4 | 17.6 | 1.0 | 13 | 1.0 | 25.2 | 23.8 |
| SMBJ13A | LG | BG | 14.4 | 15.9 | 1.0 | 13 | 1.0 | 27.9 | 21.5 |
| SMBJ14 | LH | BH | 15.6 | 19.1 | 1.0 | 14 | 1.0 | 23.3 | 25.8 |
| SMBJ14A | LK | BK | 15.6 | 17.2 | 1.0 | 14 | 1.0 | 25.9 | 23.2 |
| SMBJ15 | LL | BL | 16.7 | 20.4 | 1.0 | 15 | 1.0 | 22.3 | 26.9 |
| SMBJ15A | LM | BM | 16.7 | 18.5 | 1.0 | 15 | 1.0 | 24.6 | 24.4 |
| SMBJ16 | LN | BN | 17.8 | 21.8 | 1.0 | 16 | 1.0 | 20.8 | 28.8 |
| SMBJ16A | LP | BP | 17.8 | 19.7 | 1.0 | 16 | 1.0 | 23.1 | 26.0 |
| SMBJ17 | LQ | BQ | 18.9 | 23.1 | 1.0 | 17 | 1.0 | 19.7 | 30.5 |
| SMBJ17A | LR | BR | 18.9 | 20.9 | 1.0 | 17 | 1.0 | 21.7 | 27.6 |
| SMBJ18 | LS | BS | 20.0 | 24.4 | 1.0 | 18 | 1.0 | 18.6 | 32.2 |
| SMBJ18A | LT | BT | 20.0 | 22.1 | 1.0 | 18 | 1.0 | 20.5 | 29.2 |
| SMBJ20 | LU | BU | 22.2 | 27.1 | 1.0 | 20 | 1.0 | 16.8 | 35.8 |
| SMBJ20A | LV | BV | 22.2 | 24.5 | 1.0 | 20 | 1.0 | 18.5 | 32.4 |
| SMBJ22 | LW | BW | 24.4 | 29.8 | 1.0 | 22 | 1.0 | 15.2 | 39.4 |
| SMBJ22A | LX | BX | 24.4 | 26.9 | 1.0 | 22 | 1.0 | 16.9 | 35.5 |
| SMBJ24 | LY | BY | 26.7 | 32.6 | 1.0 | 24 | 1.0 | 14.0 | 43.0 |
| SMBJ24A | LZ | BZ | 26.7 | 29.5 | 1.0 | 24 | 1.0 | 15.4 | 38.9 |
| SMBJ26 | MD | CD | 28.9 | 35.3 | 1.0 | 26 | 1.0 | 12.9 | 46.6 |
| SMBJ26A | ME | CE | 28.9 | 31.9 | 1.0 | 26 | 1.0 | 14.3 | 42.1 |
| SMBJ28 | MF | CF | 31.1 | 38.0 | 1.0 | 28 | 1.0 | 12.0 | 50.0 |
| SMBJ28A | MG | CG | 31.1 | 34.4 | 1.0 | 28 | 1.0 | 13.2 | 45.4 |
| SMBJ30 | MH | CH | 33.3 | 40.7 | 1.0 | 30 | 1.0 | 11.2 | 53.5 |
| SMBJ30A | MK | CK | 33.3 | 36.8 | 1.0 | 30 | 1.0 | 12.4 | 48.4 |

- Notes:**
- $V_{(BR)}$ measured after I_T applied for 300us square wave pulse or equivalent
 - Surge current waveform per Fig. 3 and derate per Fig. 2
 - For bi-directional types having V_{WM} of 10 Volts and less, the I_D limit is doubled
 - All terms and symbols are consistent with ANSI/IEEE C62.35
 - For the bidirectional SMBJ5.0CA, the maximum $V_{(BR)}$ is 7.25V.

Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified. $V_F=3.5V$ at $I_F=50A$ (uni-directional only)

| Device type | Device marking code | | Breakdown voltage $V_{(BR)}$ (Volts) ⁽¹⁾ | | Test current at I_T (mA) | Stand-off voltage V_{WM} (Volts) | Maximum reverse leakage at V_{WM} I_{PRM} (μA) | Maximum peak pulse surge current I_{PPM} (A) | Maximum clamping voltage at I_{PPM} V_C (Volts) |
|-------------|---------------------|----|---|------|-------------------------------|--|---|--|---|
| | UNI | BI | Min. | Max. | | | | | |
| SMBJ33 | ML | CL | 36.7 | 44.9 | 1.0 | 33 | 1.0 | 10.2 | 59.0 |
| SMBJ33A | MM | CM | 36.7 | 40.6 | 1.0 | 33 | 1.0 | 11.3 | 53.3 |
| SMBJ36 | MN | CN | 40.0 | 48.9 | 1.0 | 36 | 1.0 | 9.3 | 64.3 |
| SMBJ36A | MP | CP | 40.0 | 44.2 | 1.0 | 36 | 1.0 | 10.3 | 58.1 |
| SMBJ40 | MQ | CQ | 44.4 | 54.3 | 1.0 | 40 | 1.0 | 8.4 | 71.4 |
| SMBJ40A | MR | CR | 44.4 | 49.1 | 1.0 | 40 | 1.0 | 9.3 | 64.5 |
| SMBJ43 | MS | CS | 47.8 | 58.4 | 1.0 | 43 | 1.0 | 7.8 | 76.7 |
| SMBJ43A | MT | CT | 47.8 | 52.8 | 1.0 | 43 | 1.0 | 8.6 | 69.4 |
| SMBJ45 | MU | CU | 50.0 | 61.1 | 1.0 | 45 | 1.0 | 7.5 | 80.3 |
| SMBJ45A | MV | CV | 50.0 | 55.3 | 1.0 | 45 | 1.0 | 8.3 | 72.7 |
| SMBJ48 | MW | CW | 53.3 | 65.1 | 1.0 | 48 | 1.0 | 7.0 | 85.5 |
| SMBJ48A | MX | CX | 53.3 | 58.9 | 1.0 | 48 | 1.0 | 7.8 | 77.4 |
| SMBJ51 | MY | CY | 56.7 | 69.3 | 1.0 | 51 | 1.0 | 6.6 | 91.1 |
| SMBJ51A | MZ | CZ | 56.7 | 62.7 | 1.0 | 51 | 1.0 | 7.3 | 82.4 |
| SMBJ54 | ND | DD | 60.0 | 73.3 | 1.0 | 54 | 1.0 | 6.2 | 96.3 |
| SMBJ54A | NE | DE | 60.0 | 66.3 | 1.0 | 54 | 1.0 | 6.9 | 87.1 |
| SMBJ58 | NF | DF | 64.4 | 78.7 | 1.0 | 58 | 1.0 | 5.8 | 103 |
| SMBJ58A | NG | DG | 64.4 | 71.2 | 1.0 | 58 | 1.0 | 6.4 | 93.6 |
| SMBJ60 | NH | DH | 66.7 | 81.5 | 1.0 | 60 | 1.0 | 5.6 | 107 |
| SMBJ60A | NK | DK | 66.7 | 73.7 | 1.0 | 60 | 1.0 | 6.2 | 96.8 |
| SMBJ64 | NL | DL | 71.1 | 86.9 | 1.0 | 64 | 1.0 | 5.3 | 114 |
| SMBJ64A | NM | DM | 71.1 | 78.6 | 1.0 | 64 | 1.0 | 5.8 | 103 |
| SMBJ70 | NN | DN | 77.8 | 95.1 | 1.0 | 70 | 1.0 | 4.8 | 125 |
| SMBJ70A | NP | DP | 77.8 | 86.0 | 1.0 | 70 | 1.0 | 5.3 | 113 |
| SMBJ75 | NQ | DQ | 83.3 | 102 | 1.0 | 75 | 1.0 | 4.5 | 134 |
| SMBJ75A | NR | DR | 83.3 | 92.1 | 1.0 | 75 | 1.0 | 5.0 | 121 |
| SMBJ78 | NS | DS | 86.7 | 106 | 1.0 | 78 | 1.0 | 4.3 | 139 |
| SMBJ78A | NT | DT | 86.7 | 95.8 | 1.0 | 78 | 1.0 | 4.8 | 126 |
| SMBJ85 | NU | DU | 94.4 | 115 | 1.0 | 85 | 1.0 | 4.0 | 151 |
| SMBJ85A | NV | DV | 94.4 | 104 | 1.0 | 85 | 1.0 | 4.4 | 137 |
| SMBJ90 | NW | DW | 100 | 122 | 1.0 | 90 | 1.0 | 3.8 | 160 |
| SMBJ90A | NX | DX | 100 | 111 | 1.0 | 90 | 1.0 | 4.1 | 146 |
| SMBJ100 | NY | DY | 111 | 136 | 1.0 | 100 | 1.0 | 3.4 | 179 |
| SMBJ100A | NZ | DZ | 111 | 123 | 1.0 | 100 | 1.0 | 3.7 | 162 |
| SMBJ110 | PD | FD | 122 | 149 | 1.0 | 110 | 1.0 | 3.1 | 196 |
| SMBJ110A | PE | FE | 122 | 135 | 1.0 | 110 | 1.0 | 3.4 | 177 |
| SMBJ120 | PF | FF | 133 | 163 | 1.0 | 120 | 1.0 | 2.8 | 214 |
| SMBJ120A | PG | FG | 133 | 147 | 1.0 | 120 | 1.0 | 3.1 | 193 |
| SMBJ130 | PH | FH | 144 | 176 | 1.0 | 130 | 1.0 | 2.6 | 231 |
| SMBJ130A | PK | FK | 144 | 159 | 1.0 | 130 | 1.0 | 2.9 | 209 |
| SMBJ150 | PL | FL | 167 | 204 | 1.0 | 150 | 1.0 | 2.2 | 268 |
| SMBJ150A | PM | FM | 167 | 185 | 1.0 | 150 | 1.0 | 2.5 | 243 |
| SMBJ160 | PN | FN | 178 | 218 | 1.0 | 160 | 1.0 | 2.1 | 287 |
| SMBJ160A | PP | FP | 178 | 197 | 1.0 | 160 | 1.0 | 2.3 | 259 |
| SMBJ170 | PQ | FQ | 189 | 231 | 1.0 | 170 | 1.0 | 2.0 | 304 |
| SMBJ170A | PR | FR | 189 | 209 | 1.0 | 170 | 1.0 | 2.2 | 275 |
| SMBJ180A | PT | FT | 201 | 222 | 1.0 | 180 | 1.0 | 2.1 | 292 |
| SMBJ200A | PV | FV | 224 | 247 | 1.0 | 200 | 1.0 | 1.9 | 324 |
| SMBJ220A | PX | FX | 246 | 272 | 1.0 | 220 | 1.0 | 1.7 | 356 |
| SMBJ250A | PZ | FZ | 279 | 309 | 1.0 | 250 | 1.0 | 1.5 | 405 |
| SMBJ300A | QE | GE | 335 | 371 | 1.0 | 300 | 1.0 | 1.3 | 486 |
| SMBJ350A | QG | GG | 391 | 432 | 1.0 | 350 | 1.0 | 1.1 | 567 |
| SMBJ400A | QK | GK | 447 | 494 | 1.0 | 400 | 1.0 | 0.9 | 648 |
| SMBJ440 | QM | GM | 492 | 543 | 1.0 | 440 | 1.0 | 0.9 | 713 |

- Notes:**
- $V_{(BR)}$ measured after I_T applied for 300us square wave pulse or equivalent
 - Surge current waveform per Fig. 3 and derate per Fig. 2
 - For bi-directional types having V_{WM} of 10 Volts and less, the I_o limit is doubled
 - All terms and symbols are consistent with ANSI/IEEE C62.35
 - For parts without A, the V_{BR} is +10%

RATINGS AND CHARACTERISTIC CURVES

($T_A = 25^\circ\text{C}$ unless otherwise noted)

