

DATA SHEET

TRANSIENT VOLTAGE SUPPRESSORS – SMBJ SERIES

FEATURE

- ✧ For surface mounted applications in order to optimize board space.
- ✧ Low profile package.
- ✧ Built-in strain relief.
- ✧ Glass passivated junction.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ Repetition Rate (duty cycle):0.01%.
- ✧ Fast response time: typically less than 1.0ps from 0 Volts to BV for unidirectional types.
- ✧ Typical I_R less than $1\mu A$ above 10V.
- ✧ High Temperature soldering: $260^\circ C/10$ seconds at terminals.
- ✧ Plastic package has Underwriters Laboratory Flammability 94V-O.



SMB/DO-214AA

MECHANICAL DATE

- ✧ Case: JEDEC DO214AA. Molded plastic over glass passivated junction.
- ✧ Terminal: Solder plated, solderable per MIL-STD-750, Method 2026.
- ✧ Polarity: Color band denoted positive end (cathode) except Bidirectional.
- ✧ Standard Packaging: 12mm tape (EIA STD RS-481).
- ✧ Weight: 0.003 ounce, 0.093 grams.

DEVICES FOR BIPOLAR APPLICATION

For bidirectional use C or CA suffix for types SMBJ5.0 thru types SMBJ440 (e.g.SMBJ5.0CA, SMBJ440CA), electrical characteristics apply in both directions.

MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at $25^\circ C$ ambient temperature unless otherwise specified.

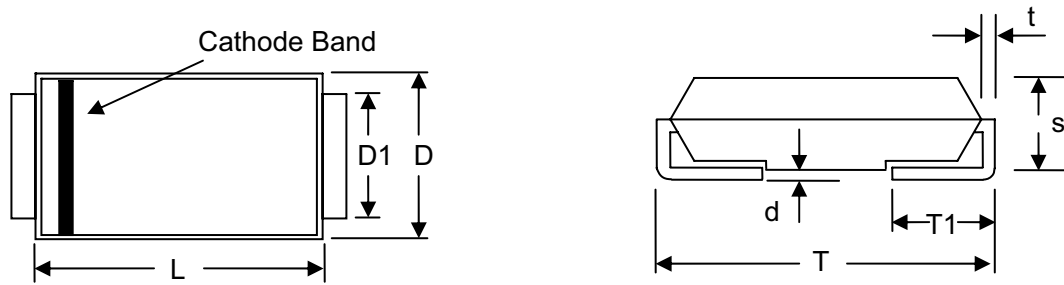
| RATING | SYMBOL | VALUE | UNITS |
|---|----------------|-------------|------------|
| Peak Pulse Power Dissipation on 10/1000 μs waveform (Note1,Note2, Fig.1). | P_{PPM} | Minimum 600 | Watts |
| Peak Pulse Current of on 10/1000 μs waveform.(Note1,Fig.3) | I_{PPM} | See Table | Amps |
| Steady State Power Dissipation at $T_L = 75^\circ C$,Lead lengths.375", (9.5mm) (Note2,Fig.5). | $P_{M(AV)}$ | 5.0 | Watts |
| Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note 3,Fig.6). | I_{FSM} | 100 | Amps |
| Operating junction and Storage Temperature Range. | T_J, T_{STG} | -65 to +150 | $^\circ C$ |

Notes: 1. Non-repetitive current pulse, per Fig. 3 and derated above $T_A = 25^\circ C$ per Fig. 2.

2. Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.

3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

DIMENSIONS



SMB/DO-214AA

| Item | Millimeters | | Inches | |
|------|-------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| L | 4.06 | 4.57 | 0.160 | 0.180 |
| D | 3.30 | 3.94 | 0.130 | 0.155 |
| D1 | 1.95 | 2.20 | 0.077 | 0.086 |
| T | 5.21 | 5.59 | 0.205 | 0.220 |
| T1 | 0.76 | 1.52 | 0.030 | 0.060 |
| d | - | 0.203 | - | 0.008 |
| s | 2.13 | 2.47 | 0.084 | 0.097 |
| t | 0.152 | 0.305 | 0.006 | 0.012 |

ELECTRICAL CHARACTERISTICS

| Part Number | | Device Marking Code | | Reverse Stand-Off Voltage | Breakdown Voltage NIN.@I _T | Breakdown Voltage MAX.@I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RWM} |
|-------------|-----------|---------------------|----|---------------------------|---------------------------------------|---------------------------------------|---------------------|---|---------------------|-----------------------------------|
| UNT-POLAR | BI-POLAR | UNI | BI | V _{RWM} (V) | V _{BR MIN.} (V) | V _{BR MAX.} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (μA) |
| SMBJ5.0A | SMBJ5.0CA | KE | AE | 5.0 | 6.40 | 7.00 | 10 | 9.2 | 65.3 | 800 |
| SMBJ6.0A | SMBJ6.0CA | KG | AG | 6.0 | 6.67 | 7.37 | 10 | 10.3 | 58.3 | 800 |
| SMBJ6.5A | SMBJ6.5CA | KK | AK | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 53.6 | 500 |
| SMBJ7.0A | SMBJ7.0CA | KM | AM | 7.0 | 7.78 | 8.60 | 10 | 12.0 | 50.0 | 200 |
| SMBJ7.5A | SMBJ7.5CA | KP | AP | 7.5 | 8.33 | 9.21 | 1 | 12.9 | 46.6 | 100 |
| SMBJ8.0A | SMBJ8.0CA | KR | AR | 8.0 | 8.89 | 9.83 | 1 | 13.6 | 44.2 | 50 |
| SMBJ8.5A | SMBJ8.5CA | KT | AT | 8.5 | 9.44 | 10.40 | 1 | 14.4 | 41.7 | 20 |
| SMBJ9.0A | SMBJ9.0CA | KV | AV | 9.0 | 10.00 | 11.10 | 1 | 15.4 | 39.0 | 10 |
| SMBJ10A | SMBJ10CA | KX | AX | 10.0 | 11.10 | 12.30 | 1 | 17.0 | 35.3 | 5 |
| SMBJ11A | SMBJ11CA | KZ | AZ | 11.0 | 12.20 | 13.50 | 1 | 18.2 | 33.0 | 1 |
| SMBJ12A | SMBJ12CA | LE | BE | 12.0 | 13.30 | 14.70 | 1 | 19.9 | 30.2 | 1 |
| SMBJ13A | SMBJ13CA | LG | BG | 13.0 | 14.40 | 15.90 | 1 | 21.5 | 28.0 | 1 |
| SMBJ14A | SMBJ14CA | LK | BK | 14.0 | 15.60 | 17.20 | 1 | 23.2 | 25.9 | 1 |
| SMBJ15A | SMBJ15CA | LM | BM | 15.0 | 16.70 | 18.50 | 1 | 24.4 | 24.6 | 1 |
| SMBJ16A | SMBJ16CA | LP | BP | 16.0 | 17.80 | 19.70 | 1 | 26.0 | 23.1 | 1 |
| SMBJ17A | SMBJ17CA | LR | BR | 17.0 | 18.90 | 20.90 | 1 | 27.6 | 21.8 | 1 |
| SMBJ18A | SMBJ18CA | LT | BT | 18.0 | 20.00 | 22.10 | 1 | 29.2 | 20.6 | 1 |
| SMBJ20A | SMBJ20CA | LV | BV | 20.0 | 22.20 | 24.50 | 1 | 32.4 | 18.6 | 1 |

ELECTRICAL CHARACTERISTICS

| Part Number | | Device Marking Code | | Reverse Stand-Off Voltage | Breakdown Voltage NIN.@I _T | Breakdown Voltage MAX.@I _T | Test Current | Maximum Clamping Voltage @I _{PP} | Peak Pulse Current | Reverse Leakage @V _{RWM} |
|-------------|-----------|---------------------|----|---------------------------|---------------------------------------|---------------------------------------|---------------------|---|---------------------|-----------------------------------|
| UNT-POLAR | BI-POLAR | UNI | BI | V _{RWM} (V) | V _{BR MIN.} (V) | V _{BR MAX.} (V) | I _T (mA) | V _C (V) | I _{PP} (A) | I _R (μA) |
| SMBJ22A | SMBJ22CA | LX | BX | 22.0 | 24.40 | 26.90 | 1 | 35.5 | 16.9 | 1 |
| SMBJ24A | SMBJ24CA | LZ | BZ | 24.0 | 26.70 | 29.50 | 1 | 38.9 | 15.5 | 1 |
| SMBJ26A | SMBJ26CA | ME | CE | 26.0 | 28.90 | 31.90 | 1 | 42.1 | 14.3 | 1 |
| SMBJ28A | SMBJ28CA | MG | CG | 28.0 | 31.10 | 34.40 | 1 | 45.4 | 13.3 | 1 |
| SMBJ30A | SMBJ30CA | MK | CK | 30.0 | 33.30 | 36.80 | 1 | 48.4 | 12.4 | 1 |
| SMBJ33A | SMBJ33CA | MM | CM | 33.0 | 36.70 | 40.60 | 1 | 53.3 | 11.3 | 1 |
| SMBJ36A | SMBJ36CA | MP | CP | 36.0 | 40.00 | 44.20 | 1 | 58.1 | 10.4 | 1 |
| SMBJ40A | SMBJ40CA | MR | CR | 40.0 | 44.40 | 49.10 | 1 | 64.5 | 9.3 | 1 |
| SMBJ43A | SMBJ43CA | MT | CT | 43.0 | 47.80 | 52.80 | 1 | 69.4 | 8.7 | 1 |
| SMBJ45A | SMBJ45CA | MV | CV | 45.0 | 50.00 | 55.30 | 1 | 72.7 | 8.3 | 1 |
| SMBJ48A | SMBJ48CA | MX | CX | 48.0 | 53.30 | 58.90 | 1 | 77.4 | 7.8 | 1 |
| SMBJ51A | SMBJ51CA | MZ | CZ | 51.0 | 56.70 | 62.70 | 1 | 82.4 | 7.3 | 1 |
| SMBJ54A | SMBJ54CA | NE | DE | 54.0 | 60.00 | 66.30 | 1 | 87.1 | 6.9 | 1 |
| SMBJ58A | SMBJ58CA | NG | DG | 58.0 | 64.40 | 71.20 | 1 | 93.6 | 6.5 | 1 |
| SMBJ60A | SMBJ60CA | NK | DK | 60.0 | 66.70 | 73.70 | 1 | 96.8 | 6.2 | 1 |
| SMBJ64A | SMBJ64CA | NM | DM | 64.0 | 71.10 | 78.60 | 1 | 103.0 | 5.9 | 1 |
| SMBJ70A | SMBJ70CA | NP | DP | 70.0 | 77.80 | 86.00 | 1 | 113.0 | 5.3 | 1 |
| SMBJ75A | SMBJ75CA | NR | DR | 75.0 | 83.30 | 92.10 | 1 | 121.0 | 5.0 | 1 |
| SMBJ78A | SMBJ78CA | NT | DT | 78.0 | 86.70 | 95.80 | 1 | 126.0 | 4.8 | 1 |
| SMBJ85A | SMBJ85CA | NV | DV | 85.0 | 94.40 | 104.00 | 1 | 137.0 | 4.4 | 1 |
| SMBJ90A | SMBJ90CA | NX | DX | 90.0 | 100.00 | 111.00 | 1 | 146.0 | 4.1 | 1 |
| SMBJ100A | SMBJ100CA | NZ | DZ | 100.0 | 111.00 | 123.00 | 1 | 162.0 | 3.7 | 1 |
| SMBJ110A | SMBJ110CA | PE | EE | 110.0 | 122.00 | 135.00 | 1 | 177.0 | 3.4 | 1 |
| SMBJ120A | SMBJ120CA | PG | EG | 120.0 | 133.00 | 147.00 | 1 | 193.0 | 3.1 | 1 |
| SMBJ130A | SMBJ130CA | PK | EK | 130.0 | 144.00 | 159.00 | 1 | 209.0 | 2.9 | 1 |
| SMBJ150A | SMBJ150CA | PM | EM | 150.0 | 167.00 | 185.00 | 1 | 243.0 | 2.5 | 1 |
| SMBJ160A | SMBJ160CA | PP | EP | 160.0 | 178.00 | 197.00 | 1 | 259.0 | 2.3 | 1 |
| SMBJ170A | SMBJ170CA | PR | ER | 170.0 | 189.00 | 209.00 | 1 | 275.0 | 2.2 | 1 |
| SMBJ180A | SMBJ180CA | PT | ET | 180.0 | 201.00 | 222.00 | 1 | 292.0 | 2.1 | 1 |
| SMBJ190A | SMBJ190CA | PA | EC | 190.0 | 211.00 | 233.00 | 1 | 308.0 | 2.0 | 1 |
| SMBJ200A | SMBJ200CA | PV | EV | 200.0 | 224.00 | 247.00 | 1 | 324.0 | 1.9 | 1 |
| SMBJ210A | SMBJ210CA | PB | ED | 210.0 | 237.00 | 263.00 | 1 | 340.0 | 1.8 | 1 |
| SMBJ220A | SMBJ220CA | PX | EX | 220.0 | 246.00 | 272.00 | 1 | 356.0 | 1.7 | 1 |
| SMBJ250A | SMBJ250CA | PZ | EZ | 250.0 | 279.00 | 309.00 | 1 | 405.0 | 1.5 | 1 |
| SMBJ300A | SMBJ300CA | QE | FE | 300.0 | 335.00 | 371.00 | 1 | 486.0 | 1.3 | 1 |
| SMBJ350A | SMBJ350CA | QG | FG | 350.0 | 391.00 | 432.00 | 1 | 567.0 | 1.1 | 1 |
| SMBJ400A | SMBJ400CA | QK | FK | 400.0 | 447.00 | 494.00 | 1 | 648.0 | 0.9 | 1 |
| SMBJ440A | SMBJ440CA | QM | FM | 440.0 | 492.00 | 543.00 | 1 | 713.0 | 0.9 | 1 |

Notes: For bidirectional type having V_{RWM} of 10 volts and less, the I_R limit is double.

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

Figure 1 - Peak Pulse Power Rating Curve

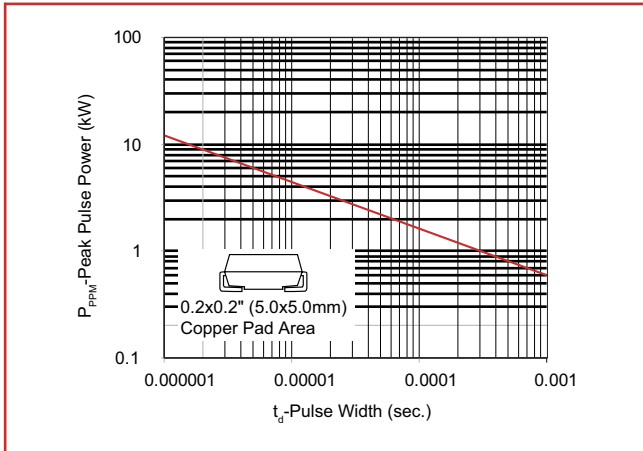


Figure 2 - Pulse Derating Curve

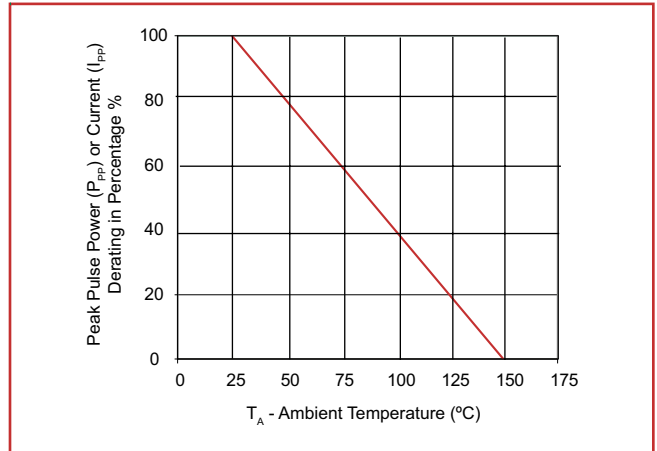


Figure 3 - Pulse Waveform

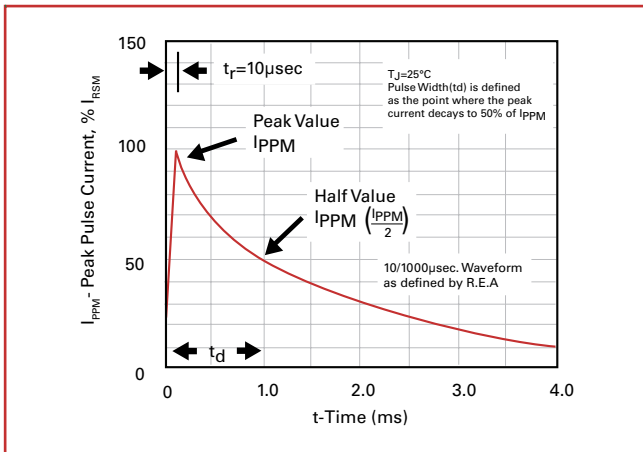


Figure 4 - Typical Junction Capacitance

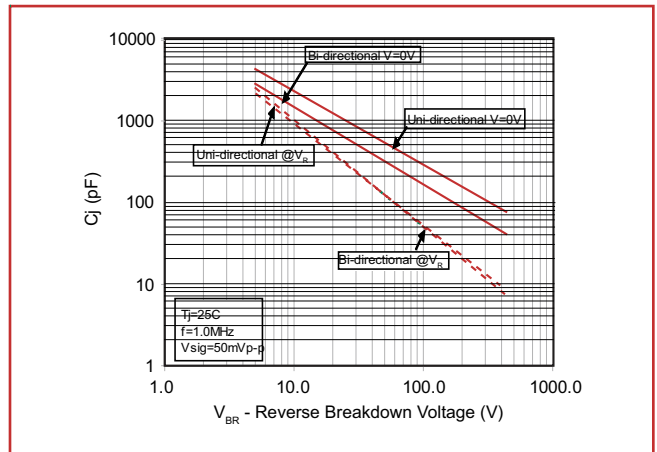


Figure 5 - Steady State Power Dissipation Derating Curve

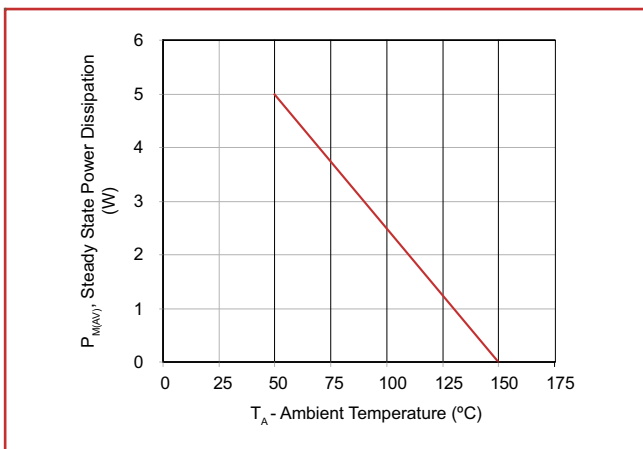


Figure 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

