

Features

- 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%
- Fast response time
- High temperature soldering guaranteed:250°C/10seconds at terminals



DO-214AA(SMB)



RoHS
COMPLIANT

Mechanical Data

Case: JEDEC DO-214AA(SMB) 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

Weight: 0.003oz., 0.093g

Absolute Maximum Ratings (T_A=25°C 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 _{θJA} | 100 | °C/W |
| Typical Thermal Resistance, Junction To Lead | R _{θJL} | 20 | °C/W |
| Operating Junction Temperature Range | T _J | -55 to +150 | °C |
| Storage Temperature Range | T _{STG} | -55 to +150 | °C |

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25°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 $T_A=25^{\circ}\text{C}$ unless otherwise specified, $V_F=3.5\text{V}$ at $I_F=50\text{A}$ (uni-directional only)

| Part Number (Uni) | Part Number (Bi) | Marking Code | | Breakdown Voltage ¹ | | Test Current | Stand-off Voltage | Maximum Reverse Leakage Current ³ | Maximum Clamping Voltage | Maximum Peak Pulse Current ² |
|----------------------|------------------------|--------------|------|--------------------------------|------|---------------|-------------------|--|--------------------------|---|
| | | | | $V_{(BR)}$ | | | | | | |
| | | Min. | Max. | mA | V | μA | V | A | | |
| | | UNI | BI | | | | | | V | V |
| SMBJ5.0A | SMBJ5.0CA ⁴ | KE | AE | 6.4 | 7.07 | 10 | 5 | 800 | 9.2 | 65.2 |
| SMBJ6.0A | SMBJ6.0CA | KG | AG | 6.67 | 7.37 | 10 | 6 | 800 | 10.3 | 58.3 |
| SMBJ6.5A | SMBJ6.5CA | KK | AK | 7.22 | 7.98 | 10 | 6.5 | 500 | 11.2 | 53.6 |
| SMBJ7.0A | SMBJ7.0CA | KM | AM | 7.78 | 8.6 | 10 | 7 | 200 | 12 | 50 |
| SMBJ7.5A | SMBJ7.5CA | KP | AP | 8.33 | 9.21 | 1 | 7.5 | 100 | 12.9 | 46.5 |
| SMBJ8.0A | SMBJ8.0CA | KR | AR | 8.89 | 9.83 | 1 | 8 | 50 | 13.6 | 44.1 |
| SMBJ8.5A | SMBJ8.5CA | KT | AT | 9.44 | 10.4 | 1 | 8.5 | 20 | 14.4 | 41.7 |
| SMBJ9.0A | SMBJ9.0CA | KV | AV | 10 | 11.1 | 1 | 9 | 10 | 15.4 | 39 |
| SMBJ10A | SMBJ10CA | KX | AX | 11.1 | 12.3 | 1 | 10 | 5 | 17 | 35.3 |
| SMBJ11A | SMBJ11CA | KZ | AZ | 12.2 | 13.5 | 1 | 11 | 5 | 18.2 | 33 |
| SMBJ12A | SMBJ12CA | LE | BE | 13.3 | 14.7 | 1 | 12 | 5 | 19.9 | 30.2 |
| SMBJ13A | SMBJ13CA | LG | BG | 14.4 | 15.9 | 1 | 13 | 1 | 21.5 | 27.9 |
| SMBJ14A | SMBJ14CA | LK | BK | 15.6 | 17.2 | 1 | 14 | 1 | 23.2 | 25.9 |
| SMBJ15A | SMBJ15CA | LM | BM | 16.7 | 18.5 | 1 | 15 | 1 | 24.4 | 24.6 |
| SMBJ16A | SMBJ16CA | LP | BP | 17.8 | 19.7 | 1 | 16 | 1 | 26 | 23.1 |
| SMBJ17A | SMBJ17CA | LR | BR | 18.9 | 20.9 | 1 | 17 | 1 | 27.6 | 21.7 |
| SMBJ18A | SMBJ18CA | LT | BT | 20 | 22.1 | 1 | 18 | 1 | 29.2 | 20.5 |
| SMBJ20A | SMBJ20CA | LV | BV | 22.2 | 24.5 | 1 | 20 | 1 | 32.4 | 18.5 |
| SMBJ22A | SMBJ22CA | LX | BX | 24.4 | 26.9 | 1 | 22 | 1 | 35.5 | 16.9 |
| SMBJ24A | SMBJ24CA | LZ | BZ | 26.7 | 29.5 | 1 | 24 | 1 | 38.9 | 15.4 |
| SMBJ26A | SMBJ26CA | ME | CE | 28.9 | 31.9 | 1 | 26 | 1 | 42.1 | 14.3 |
| SMBJ28A | SMBJ28CA | MG | CG | 31.1 | 34.4 | 1 | 28 | 1 | 45.4 | 13.2 |
| SMBJ30A | SMBJ30CA | MK | CK | 33.3 | 36.8 | 1 | 30 | 1 | 48.4 | 12.4 |
| SMBJ33A | SMBJ33CA | MM | CM | 36.7 | 40.6 | 1 | 33 | 1 | 53.3 | 11.3 |
| SMBJ36A | SMBJ36CA | MP | CP | 40 | 44.2 | 1 | 36 | 1 | 58.1 | 10.3 |
| SMBJ40A | SMBJ40CA | MR | CR | 44.4 | 49.1 | 1 | 40 | 1 | 64.5 | 9.3 |
| SMBJ43A | SMBJ43CA | MT | CT | 47.8 | 52.8 | 1 | 43 | 1 | 69.4 | 8.6 |

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| Part Number (Uni) | Part Number (Bi) | Marking Code | | Breakdown Voltage ¹ | | Test Current | Stand-off Voltage | Maximum Reverse Leakage Current ³ | Maximum Clamping Voltage | Maximum Peak Pulse Current ² |
|----------------------|---------------------|--------------|----|--------------------------------|------|--------------|-------------------|--|--------------------------|---|
| | | | | $V_{(BR)}$ | | | | | | |
| | | UNI | BI | Min. | Max. | I_T | VWM | $I_D@V_{WM}$ | $V_C@I_{PPM}$ | I_{PPM2} |
| | | | | V | V | | | | | |
| SMBJ45A | SMBJ45CA | MV | CV | 50 | 55.3 | 1 | 45 | 1 | 72.7 | 8.3 |
| SMBJ48A | SMBJ48CA | MX | CX | 53.3 | 58.9 | 1 | 48 | 1 | 77.4 | 7.8 |
| SMBJ51A | SMBJ51CA | MZ | CZ | 56.7 | 62.7 | 1 | 51 | 1 | 82.4 | 7.3 |
| SMBJ54A | SMBJ54CA | NE | DE | 60 | 66.3 | 1 | 54 | 1 | 87.1 | 6.9 |
| SMBJ58A | SMBJ58CA | NG | DG | 64.4 | 71.2 | 1 | 58 | 1 | 93.6 | 6.4 |
| SMBJ60A | SMBJ60CA | NK | DK | 66.7 | 73.7 | 1 | 60 | 1 | 96.8 | 6.2 |
| SMBJ64A | SMBJ64CA | NM | DM | 71.1 | 78.6 | 1 | 64 | 1 | 103 | 5.8 |
| SMBJ70A | SMBJ70CA | NP | DP | 77.8 | 86 | 1 | 70 | 1 | 113 | 5.3 |
| SMBJ75A | SMBJ75CA | NR | DR | 83.3 | 92.1 | 1 | 75 | 1 | 121 | 5 |
| SMBJ78A | SMBJ78CA | NT | DT | 86.7 | 95.8 | 1 | 78 | 1 | 126 | 4.8 |
| SMBJ85A | SMBJ85CA | NV | DV | 94.4 | 104 | 1 | 85 | 1 | 137 | 4.4 |
| SMBJ90A | SMBJ90CA | NX | DX | 100 | 111 | 1 | 90 | 1 | 146 | 4.1 |
| SMBJ100A | SMBJ100CA | NZ | DZ | 111 | 123 | 1 | 100 | 1 | 162 | 3.7 |
| SMBJ110A | SMBJ110CA | PE | FE | 122 | 135 | 1 | 110 | 1 | 177 | 3.4 |
| SMBJ120A | SMBJ120CA | PG | FG | 133 | 147 | 1 | 120 | 1 | 193 | 3.1 |
| SMBJ130A | SMBJ130CA | PK | FK | 144 | 159 | 1 | 130 | 1 | 209 | 2.9 |
| SMBJ150A | SMBJ150CA | PM | FM | 167 | 185 | 1 | 150 | 1 | 243 | 2.5 |
| SMBJ160A | SMBJ160CA | PP | FP | 178 | 197 | 1 | 160 | 1 | 259 | 2.3 |
| SMBJ170A | SMBJ170CA | PR | FR | 189 | 209 | 1 | 170 | 1 | 275 | 2.2 |
| SMBJ180A | SMBJ180CA | PT | FT | 201 | 222 | 1 | 180 | 1 | 292 | 2.1 |
| SMBJ200A | SMBJ200CA | PV | FV | 224 | 247 | 1 | 200 | 1 | 324 | 1.9 |
| SMBJ220A | SMBJ220CA | PX | FX | 246 | 272 | 1 | 220 | 1 | 356 | 1.7 |
| SMBJ250A | SMBJ250CA | PZ | FZ | 279 | 309 | 1 | 250 | 1 | 405 | 1.5 |
| SMBJ300A | SMBJ300CA | QE | GE | 335 | 371 | 1 | 300 | 1 | 486 | 1.3 |
| SMBJ350A | SMBJ350CA | QG | GG | 391 | 432 | 1 | 350 | 1 | 567 | 1.1 |
| SMBJ400A | SMBJ400CA | QK | GK | 447 | 494 | 1 | 400 | 1 | 648 | 0.9 |
| SMBJ440A | SMBJ440CA | QM | GM | 492 | 543 | 1 | 440 | 1 | 713 | 0.9 |

- 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
 - For the bidirectional SMBJ5.0CA, the maximum $V(BR)$ is 7.25V.

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

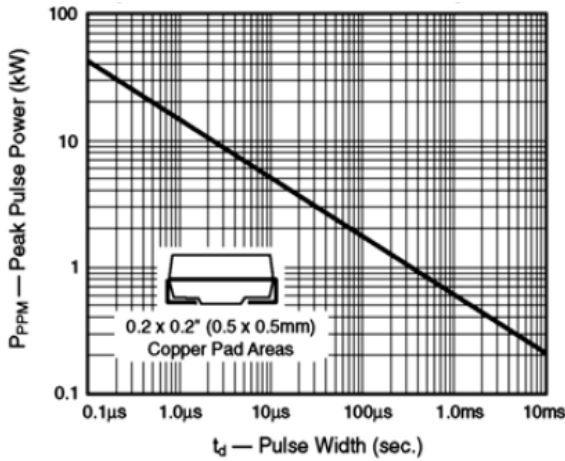


Figure 1. Peak Pulse Power Rating Curve

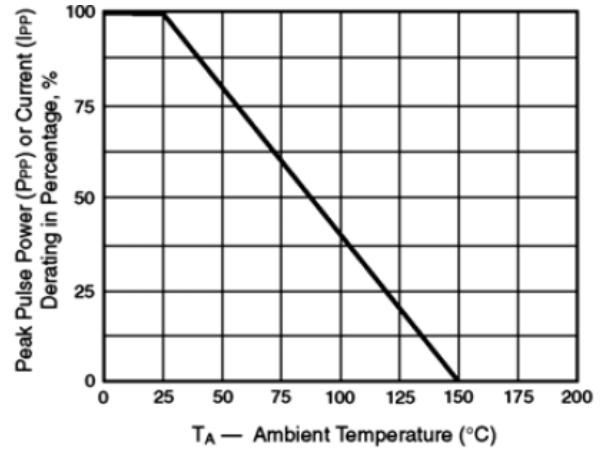


Figure 2. Pulse Derating Curve

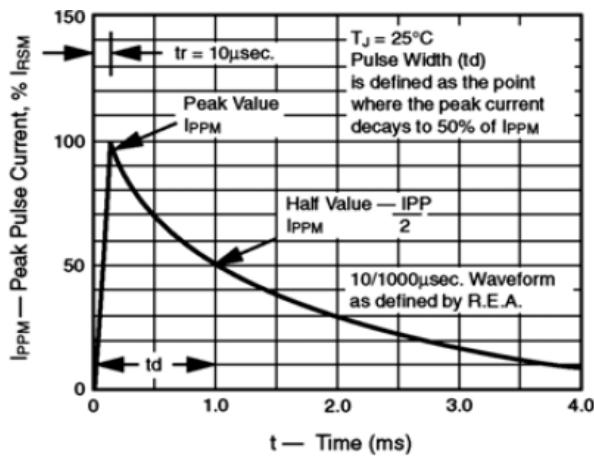


Figure 3. Pulse Waveform

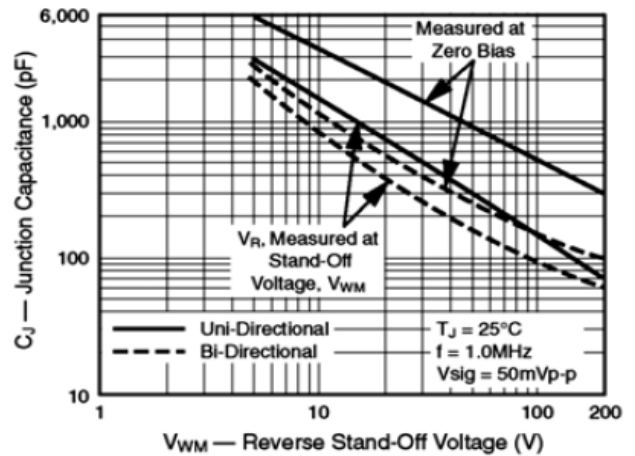


Figure 4. Typical Junction Capacitance

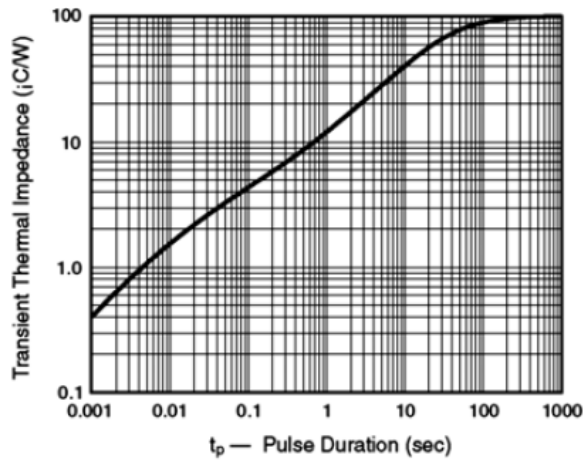


Figure 5. Typical Transient Thermal Impedance

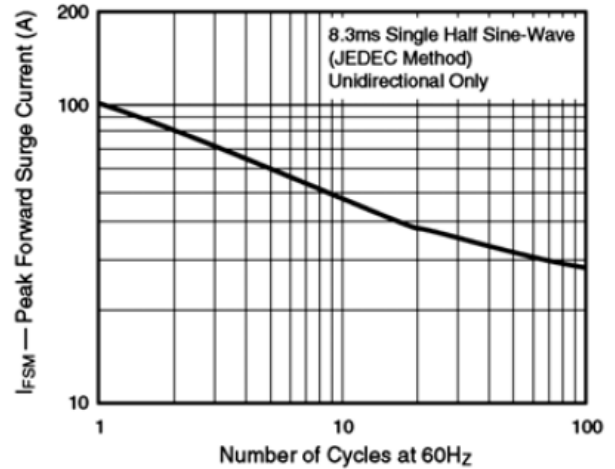
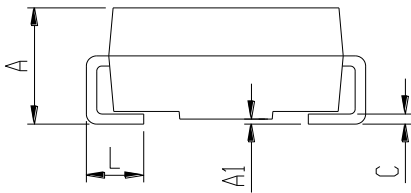
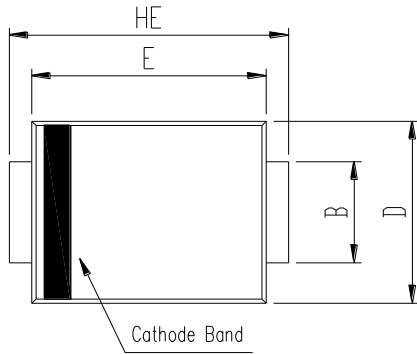


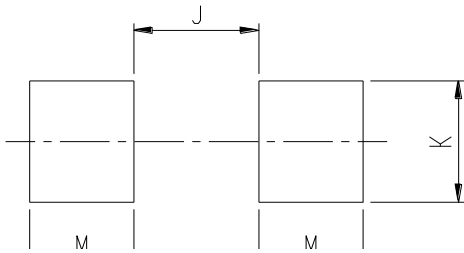
Figure 6. Maximum Non-Repetitive Peak Forward Surge Current

Package Outline Dimensions DO-214AA(SMB)



| SMB (DO-214AA) | | | | |
|----------------|-------------|------|--------|-------|
| DIM | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 1.99 | 2.61 | 0.078 | 0.103 |
| A1 | 0.00 | 0.30 | 0.000 | 0.012 |
| B | 1.70 | 2.30 | 0.067 | 0.091 |
| C | 0.15 | 0.31 | 0.006 | 0.012 |
| D | 3.30 | 3.94 | 0.130 | 0.155 |
| E | 4.06 | 4.75 | 0.160 | 0.187 |
| HE | 4.70 | 5.70 | 0.185 | 0.224 |
| L | 0.76 | 1.52 | 0.030 | 0.060 |

Recommended Pad Layout



| SMB Recommended Pad Layout (Reference Only) | | | | |
|---|-------------|------|--------|-------|
| DIM | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| J | - | 2.60 | - | 0.102 |
| K | 2.20 | - | 0.087 | - |
| M | 1.80 | - | 0.071 | - |