

SMBJ5.0A - SMBJ440CA

SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

FEATURES

- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Plastic Case Material has UL Flammability Classification Rating 94V-O
- Typical IR less than 1 μ A above 10V
- Fast Response Time : typically less than 1.0ns from 0v to VBR

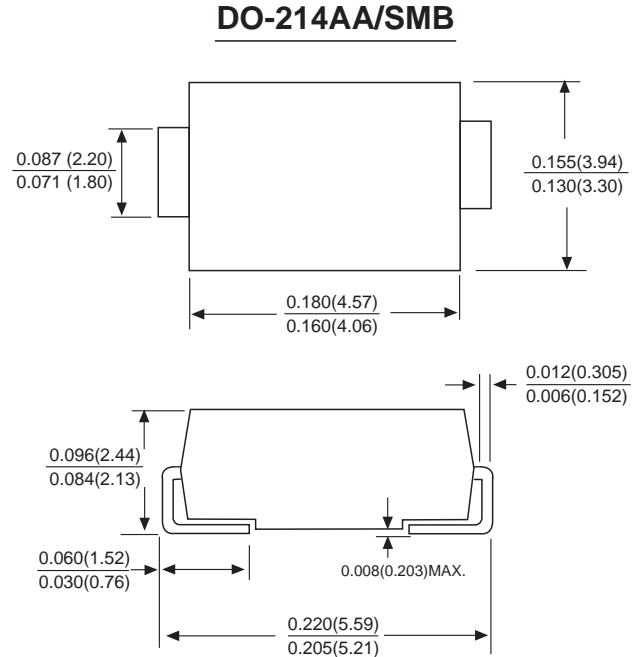
MECHANICAL DATA

Case: JEDEC SMB(DO-214AA), Molded Plastic

Terminals: Solder Plated, Solderable per MIL-STD-750, Method 2026

Polarity: Cathode Band Except Bi-Directional

Weight: 0.093 grams (approx.)



Dimensions in inches and (millimeters)

Maximum Ratings and Electrical Characteristics @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|----------------------|
| Peak Pulse Power Dissipation at $T_A=25^{\circ}\text{C}$ by 10/1000 μs Waveform (Fig.2)(Note 1), (Note 2), (Note 5) | P_{PPM} | 600 | W |
| Power Dissipation on Infinite Heat Sink at $T_L=50^{\circ}\text{C}$ | P_D | 5.0 | W |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3) | I_{FSM} | 100 | A |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only (Note 4) | V_F | 3.5/5.0 | V |
| Operating Temperature Range | T_j | -65 to +150 | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | -65 to +175 | $^{\circ}\text{C}$ |
| Typical Thermal Resistance Junction to Lead | $R_{\theta JL}$ | 20 | $^{\circ}\text{C/W}$ |
| Typical Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | 100 | $^{\circ}\text{C/W}$ |

Note:

1. Non-repetitive current pulse, per Fig. 4 and derated above T_j (initial) = 25°C per Fig. 3.
2. Mounted on copper pad area of 0.2x0.2" (5.0 x 5.0mm) to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.
4. $V_F < 3.5\text{V}$ for single die parts and $V_F < 5.0\text{V}$ for stacked-die parts.
5. The P_{PPM} of stacked-die parts is 800W

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| Electrical Characteristics (T _A =25°C unless otherwise noted) | | | | | | | | |
|--|----------------|--|---|---|---------------------------------------|---|---|---|
| UNI-POLAR 单向 | BI-POLAR 双向 | REVERSE STANDOFF VOLTAGE VRWM (V) 反向对峙电压 | BREAKDOWN VOLTAGE VBR (V) MIN. @ IT 崩溃电压 (最小) | BREAKDOWN VOLTAGE VBR (V) MAX. @ IT 崩溃电压 (最大) | TEST CURRENT (IT) mA 测试电流 | MAXIMUM CLAMPING VOLTAGE @IPP VC (V) 最大嵌位电压 | PEAK PULSE CURRENT IPP (A) 峰值脉冲电流 | REVERSE LEAKAGE @ VRWM IR (µA) 反向漏电 |
| SMBJ5.0A | SMBJ5.0CA | 5.00 | 6.40 | 7.00 | 10 | 9.2 | 65.3 | 800 |
| SMBJ6.0A | SMBJ6.0CA | 6.00 | 6.67 | 7.37 | 10 | 10.3 | 58.3 | 800 |
| SMBJ6.5A | SMBJ6.5CA | 6.50 | 7.22 | 7.98 | 10 | 11.2 | 53.6 | 500 |
| SMBJ7.0A | SMBJ7.0CA | 7.00 | 7.78 | 8.60 | 10 | 12.0 | 50.0 | 200 |
| SMBJ7.5A | SMBJ7.5CA | 7.50 | 8.33 | 9.21 | 1 | 12.9 | 46.6 | 100 |
| SMBJ8.0A | SMBJ8.0CA | 8.00 | 8.89 | 9.83 | 1 | 13.6 | 44.2 | 50 |
| SMBJ8.5A | SMBJ8.5CA | 8.50 | 9.44 | 10.40 | 1 | 14.4 | 41.7 | 20 |
| SMBJ9.0A | SMBJ9.0CA | 9.00 | 10.00 | 11.10 | 1 | 15.4 | 39.0 | 10 |
| SMBJ10A | SMBJ10CA | 10.00 | 11.10 | 12.30 | 1 | 17.0 | 35.3 | 5 |
| SMBJ11A | SMBJ11CA | 11.00 | 12.20 | 13.50 | 1 | 18.2 | 33.0 | 1 |
| SMBJ12A | SMBJ12CA | 12.00 | 13.30 | 14.70 | 1 | 19.9 | 30.2 | 1 |
| SMBJ13A | SMBJ13CA | 13.00 | 14.40 | 15.90 | 1 | 21.5 | 28.0 | 1 |
| SMBJ14A | SMBJ14CA | 14.00 | 15.60 | 17.20 | 1 | 23.2 | 25.9 | 1 |
| SMBJ15A | SMBJ15CA | 15.00 | 16.70 | 18.50 | 1 | 24.4 | 24.6 | 1 |
| SMBJ16A | SMBJ16CA | 16.00 | 17.80 | 19.70 | 1 | 26.0 | 23.1 | 1 |
| SMBJ17A | SMBJ17CA | 17.00 | 18.90 | 20.90 | 1 | 27.6 | 21.8 | 1 |
| SMBJ18A | SMBJ18CA | 18.00 | 20.00 | 22.10 | 1 | 29.2 | 20.6 | 1 |
| SMBJ20A | SMBJ20CA | 20.00 | 22.20 | 24.50 | 1 | 32.4 | 18.6 | 1 |
| SMBJ22A | SMBJ22CA | 22.00 | 24.40 | 26.90 | 1 | 35.5 | 16.9 | 1 |
| SMBJ24A | SMBJ24CA | 24.00 | 26.70 | 29.50 | 1 | 38.9 | 15.5 | 1 |
| SMBJ26A | SMBJ26CA | 26.00 | 28.90 | 31.90 | 1 | 42.1 | 14.3 | 1 |
| SMBJ28A | SMBJ28CA | 28.00 | 31.10 | 34.40 | 1 | 45.4 | 13.3 | 1 |
| SMBJ30A | SMBJ30CA | 30.00 | 33.30 | 36.80 | 1 | 48.4 | 12.4 | 1 |
| SMBJ33A | SMBJ33CA | 33.00 | 36.70 | 40.60 | 1 | 53.3 | 11.3 | 1 |
| SMBJ36A | SMBJ36CA | 36.00 | 40.00 | 44.20 | 1 | 58.1 | 10.4 | 1 |
| SMBJ40A | SMBJ40CA | 40.00 | 44.40 | 49.10 | 1 | 64.5 | 9.3 | 1 |
| SMBJ43A | SMBJ43CA | 43.00 | 47.80 | 52.80 | 1 | 69.4 | 8.7 | 1 |
| SMBJ45A | SMBJ45CA | 45.00 | 50.00 | 55.30 | 1 | 72.7 | 8.3 | 1 |
| SMBJ48A | SMBJ48CA | 48.00 | 53.30 | 58.90 | 1 | 77.4 | 7.8 | 1 |
| SMBJ51A | SMBJ51CA | 51.00 | 56.70 | 62.70 | 1 | 82.4 | 7.3 | 1 |
| SMBJ54A | SMBJ54CA | 54.00 | 60.00 | 66.30 | 1 | 87.1 | 6.9 | 1 |
| SMBJ58A | SMBJ58CA | 58.00 | 64.40 | 71.20 | 1 | 93.6 | 6.5 | 1 |
| SMBJ60A | SMBJ60CA | 60.00 | 66.70 | 73.70 | 1 | 96.8 | 6.2 | 1 |
| SMBJ64A | SMBJ64CA | 64.00 | 71.10 | 78.60 | 1 | 103.0 | 5.9 | 1 |
| SMBJ70A | SMBJ70CA | 70.00 | 77.80 | 86.00 | 1 | 113.0 | 5.3 | 1 |
| SMBJ75A | SMBJ75CA | 75.00 | 83.30 | 92.10 | 1 | 121.0 | 5.0 | 1 |
| SMBJ78A | SMBJ78CA | 78.00 | 86.70 | 95.80 | 1 | 126.0 | 4.8 | 1 |
| SMBJ85A | SMBJ85CA | 85.00 | 94.40 | 104.00 | 1 | 137.0 | 4.4 | 1 |
| SMBJ90A | SMBJ90CA | 90.00 | 100.00 | 111.00 | 1 | 146 | 4.1 | 1 |
| SMBJ100A | SMBJ100CA | 100.00 | 111.00 | 123.00 | 1 | 162 | 3.7 | 1 |
| SMBJ110A | SMBJ110CA | 110.00 | 122.00 | 135.00 | 1 | 177 | 3.4 | 1 |
| SMBJ120A | SMBJ120CA | 120.00 | 133.00 | 147.00 | 1 | 193 | 3.1 | 1 |
| SMBJ130A | SMBJ130CA | 130.00 | 144.00 | 159.00 | 1 | 209 | 2.9 | 1 |
| SMBJ150A | SMBJ150CA | 150.00 | 167.00 | 185.00 | 1 | 243 | 2.5 | 1 |
| SMBJ160A | SMBJ160CA | 160.00 | 178.00 | 197.00 | 1 | 259 | 2.3 | 1 |
| SMBJ170A | SMBJ170CA | 170.00 | 189.00 | 209.00 | 1 | 275 | 2.2 | 1 |
| SMBJ180A | SMBJ180CA | 180.00 | 201.00 | 222.00 | 1 | 292 | 2.1 | 1 |
| SMBJ200A | SMBJ200CA | 200.00 | 224.00 | 247.00 | 1 | 324 | 1.9 | 1 |
| SMBJ220A | SMBJ220CA | 220.00 | 246.00 | 272.00 | 1 | 356 | 1.7 | 1 |
| SMBJ250A | SMBJ250CA | 250.00 | 279.00 | 309.00 | 1 | 405 | 1.5 | 1 |
| SMBJ300A* | SMBJ300CA | 300.00 | 335.00 | 371.00 | 1 | 486 | 1.3 | 1 |
| SMBJ350A | SMBJ350CA | 350.00 | 391.00 | 432.00 | 1 | 567 | 1.1 | 1 |
| SMBJ400A | SMBJ400CA | 400.00 | 447.00 | 494.00 | 1 | 648 | 0.9 | 1 |
| SMBJ440A | SMBJ440CA | 440.00 | 492.00 | 543.00 | 1 | 713 | 0.9 | 1 |

1. For bidirectional type having V_R of 10 volts and less, the I_R limit is double.
2. Components marked with "*" use stacked-die, therefore they have a higher surge capability (typical 1.8*I_{PP}).

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Ratings and Characteristic Curves (TA=25°C unless otherwise noted)

Figure 1 - TVS Transients Clamping Waveform

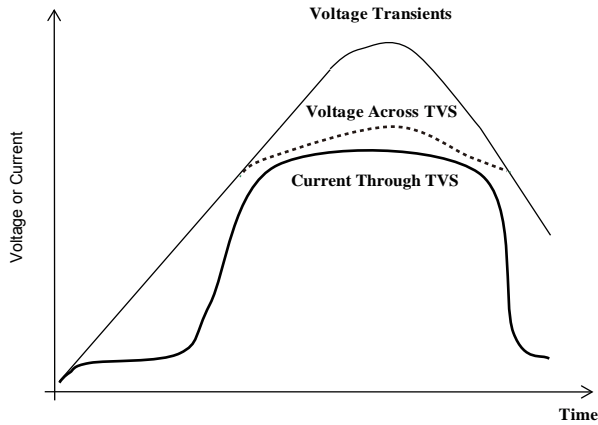


Figure 2 - Peak Pulse Power Rating

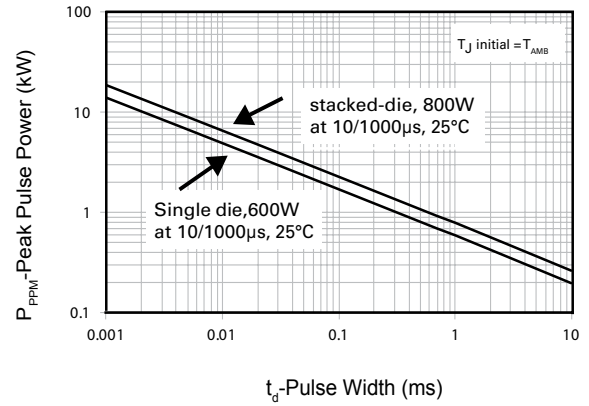


Figure 3 - Peak Pulse Power Derating Curve

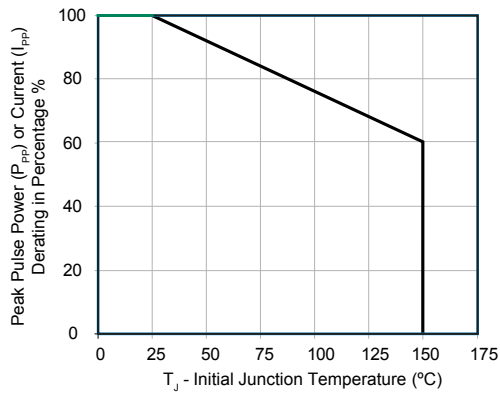


Figure 4 - Pulse Waveform

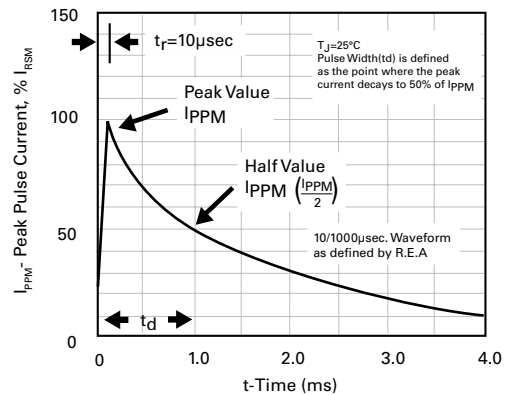


Figure 5 - Typical Junction Capacitance

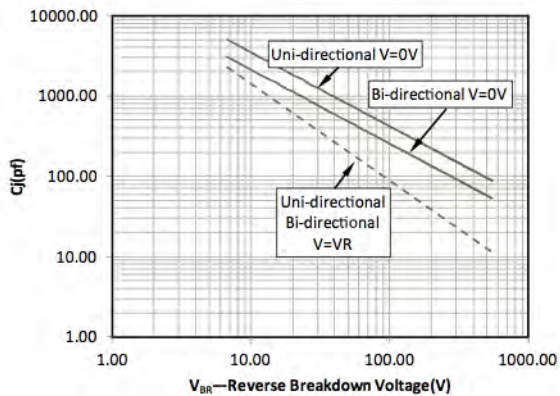


Figure 6 - Typical Transient Thermal Impedance

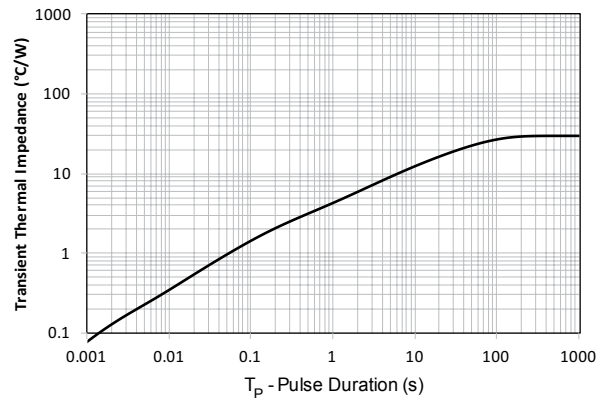


Figure 7 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only

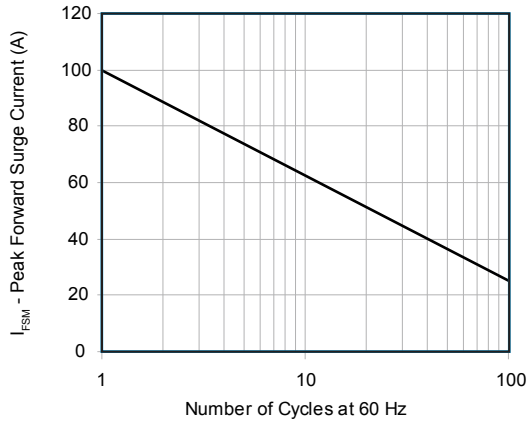


Figure 8 - Peak Forward Voltage Drop vs Peak Forward Current (Typical Values)

