



SMBJ SERIES

瞬变电压抑制二极管 Transient Voltage Suppressor Diodes

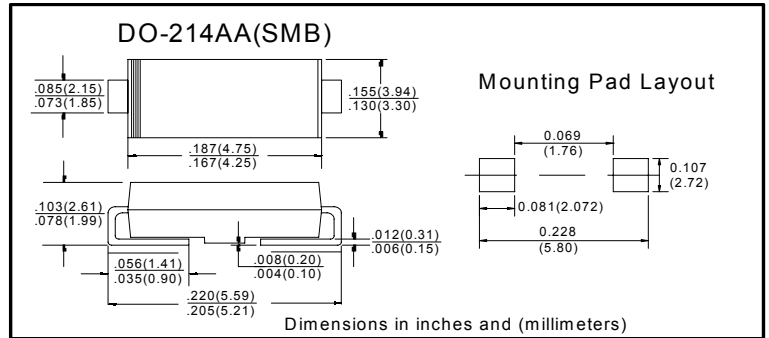
■特征 Features

- P_{PP} 600W
- V_{BR} 5.0V-188V

■用途 Applications

- 箝位电压用 Clamping Voltage

■外形尺寸和印记 Outline Dimensions and Mark



■极限值 (绝对最大额定值)

Limiting Values (Absolute Maximum Rating)

| 参数名称 Item | 符号 Symbol | 单位 Unit | 条件 Conditions | 最大值 Max |
|--|----------------|-------------|---|-------------------------|
| 最大损耗功率(1)(2) Peak power dissipation | P_{PPM} | W | 在10/1000us 波形下测试 with a 10/1000us waveform | 600 |
| 最大脉冲电流(1) Peak pulse current | I_{PPM} | A | 在10/1000us 波形下测试 with a 10/1000us waveform | 见下面表格 See Next Table |
| 最大正向浪涌电流(2) Peak forward surge current | I_{FSM} | A | 8.3ms正弦半波, 仅单向型 8.3 ms single half sine-wave unidirectional only | 100 |
| 工作结温和存储温度范围 Operating junction and storage temperature range | T_J, T_{STG} | $^{\circ}C$ | | -55 to +150 |

■电特性 ($T_A=25^{\circ}C$ 除非另有规定)

Electrical Characteristics ($T_A=25^{\circ}C$ Unless otherwise specified)

| 参数名称 Item | 符号 Symbol | 单位 Unit | 条件 Conditions | 最大值 Max |
|--|-----------------|---------------|---|------------|
| 最大瞬间正向电压 Maximum instantaneous forward Voltage | V_F | V | 在50A下测试, 仅单向型 at 50A for unidirectional only | 3.5 |
| 典型热阻 Thermal resistance | $R_{\theta JL}$ | $^{\circ}C/W$ | 结到引线 junction to lead | 20 |
| | $R_{\theta JA}$ | $^{\circ}C/W$ | 结到环境 junction to ambient | 100 |

备注: Notes:

(1) 不重复脉冲电流, 如图3, 在 $T_A = 25^{\circ}C$ 下功率降额曲线见如图2。

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

(2) 每个端子安装在 0.2 x 0.2" (5.0 x 5.0 mm)铜焊盘上

Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal

■ 电性参数 ($T_A=25^\circ\text{C}$ 除非另有规定)

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

| 产品型号 (单向) Part Number(Uni) | 产品型号 (双向) Part Number(Bi) | 击穿电压 $V_{BR}@I_T$ Breakdown Voltage $V_{BR}@I_T$ | | | 最大反向漏电流 $I_R@V_{WM}$ Maximum Reverse Leakage $I_R^{(3)}$ (μA) | 最大工作电压 V_{RWM} Working Peak Reverse Voltage V_{RWM} (V) | 最大反向浪涌电流 IPP Maximum Reverse Surge Current IPP ⁽²⁾ (A) | 最大箝位电压 Maximum Clamping Voltage V_c @ I_{PP} (V) |
|-------------------------------|------------------------------|---|---------------|--------------------------|--|--|---|---|
| | | 最小 Min(V) | 最大 Max (V) | 测试电流 $I_T^{(1)}$ (mA) | | | | |
| SMBJ5.0 | SMBJ5.0C | 6.40 | 7.82 | 10 | 800 | 5.0 | 62.5 | 9.6 |
| SMBJ5.0A | SMBJ5.0CA ⁽⁴⁾ | 6.40 | 7.07 | 10 | 800 | 5.0 | 65.2 | 9.2 |
| SMBJ6.0 | SMBJ6.0C | 6.67 | 8.15 | 10 | 800 | 6.0 | 52.6 | 11.4 |
| SMBJ6.0A | SMBJ6.0CA | 6.67 | 7.37 | 10 | 800 | 6.0 | 58.3 | 10.3 |
| SMBJ6.5 | SMBJ6.5C | 7.22 | 8.82 | 10 | 500 | 6.5 | 48.8 | 12.3 |
| SMBJ6.5A | SMBJ6.5CA | 7.22 | 7.98 | 10 | 500 | 6.5 | 53.6 | 11.2 |
| SMBJ7.0 | SMBJ7.0C | 7.78 | 9.51 | 10 | 200 | 7.0 | 45.1 | 13.3 |
| SMBJ7.0A | SMBJ7.0CA | 7.78 | 8.60 | 10 | 200 | 7.0 | 50.0 | 12.0 |
| SMBJ7.5 | SMBJ7.5C | 8.33 | 10.2 | 1.0 | 100 | 7.5 | 42.0 | 14.3 |
| SMBJ7.5A | SMBJ7.5CA | 8.33 | 9.21 | 1.0 | 100 | 7.5 | 46.5 | 12.9 |
| SMBJ8.0 | SMBJ8.0C | 8.89 | 10.9 | 1.0 | 50 | 8.0 | 40.0 | 15.0 |
| SMBJ8.0A | SMBJ8.0CA | 8.89 | 9.83 | 1.0 | 50 | 8.0 | 44.1 | 13.6 |
| SMBJ8.5 | SMBJ8.5C | 9.44 | 11.5 | 1.0 | 10 | 8.5 | 37.7 | 15.9 |
| SMBJ8.5A | SMBJ8.5CA | 9.44 | 10.4 | 1.0 | 10 | 8.5 | 41.7 | 14.4 |
| SMBJ9.0 | SMBJ9.0C | 10.0 | 12.2 | 1.0 | 5.0 | 9.0 | 35.5 | 16.9 |
| SMBJ9.0A | SMBJ9.0CA | 10.0 | 11.1 | 1.0 | 5.0 | 9.0 | 39.0 | 15.4 |
| SMBJ10 | SMBJ10C | 11.1 | 13.6 | 1.0 | 1.0 | 10 | 31.9 | 18.8 |
| SMBJ10A | SMBJ10CA | 11.1 | 12.3 | 1.0 | 1.0 | 10 | 35.3 | 17.0 |
| SMBJ11 | SMBJ11C | 12.2 | 14.9 | 1.0 | 1.0 | 11 | 29.9 | 20.1 |
| SMBJ11A | SMBJ11CA | 12.2 | 13.5 | 1.0 | 1.0 | 11 | 33.0 | 18.2 |
| SMBJ12 | SMBJ12C | 13.3 | 16.3 | 1.0 | 1.0 | 12 | 27.3 | 22.0 |
| SMBJ12A | SMBJ12CA | 13.3 | 14.7 | 1.0 | 1.0 | 12 | 30.2 | 19.9 |
| SMBJ13 | SMBJ13C | 14.4 | 17.6 | 1.0 | 1.0 | 13 | 25.2 | 23.8 |
| SMBJ13A | SMBJ13CA | 14.4 | 15.9 | 1.0 | 1.0 | 13 | 27.9 | 21.5 |
| SMBJ14 | SMBJ14C | 15.6 | 19.1 | 1.0 | 1.0 | 14 | 23.3 | 25.8 |
| SMBJ14A | SMBJ14CA | 15.6 | 17.2 | 1.0 | 1.0 | 14 | 25.9 | 23.2 |
| SMBJ15 | SMBJ15C | 16.7 | 20.4 | 1.0 | 1.0 | 15 | 22.3 | 26.9 |
| SMBJ15A | SMBJ15CA | 16.7 | 18.5 | 1.0 | 1.0 | 15 | 24.6 | 24.4 |
| SMBJ16 | SMBJ16C | 17.8 | 21.8 | 1.0 | 1.0 | 16 | 20.8 | 28.8 |
| SMBJ16A | SMBJ16CA | 17.8 | 19.7 | 1.0 | 1.0 | 16 | 23.1 | 26.0 |
| SMBJ17 | SMBJ17C | 18.9 | 23.1 | 1.0 | 1.0 | 17 | 19.7 | 30.5 |
| SMBJ17A | SMBJ17CA | 18.9 | 20.9 | 1.0 | 1.0 | 17 | 21.7 | 27.6 |
| SMBJ18 | SMBJ18C | 20.0 | 24.4 | 1.0 | 1.0 | 18 | 18.6 | 32.2 |
| SMBJ18A | SMBJ18CA | 20.0 | 22.1 | 1.0 | 1.0 | 18 | 20.5 | 29.2 |
| SMBJ20 | SMBJ20C | 22.2 | 27.1 | 1.0 | 1.0 | 20 | 16.8 | 35.8 |
| SMBJ20A | SMBJ20CA | 22.2 | 24.5 | 1.0 | 1.0 | 20 | 18.5 | 32.4 |



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

| 产品型号 (单向) Part Number(Uni) | 产品型号 (双向) Part Number(Bi) | 击穿电压 $V_{BR}@I_T$ Breakdown Voltage $V_{BR}@I_T$ | | | 最大反向漏电 流 $I_R@V_{WM}$ Maximum Reverse Leakage $I_R^{(3)}$ (μA) | 最大工作电压 V_{RWM} Working Peak Reverse Voltage V_{RWM} (V) | 最大反向浪涌 电流 IPP Maximum Reverse Surge Current IPP ⁽²⁾ (A) | 最大箝位电压 Maximum Clamping Voltage Vc @ I_{PP} (V) |
|-------------------------------------|------------------------------------|---|---------------|------------------------------|--|--|---|--|
| | | 最小 Min(V) | 最大 Max (V) | 测试电 流 $I_T^{(1)}$ (mA) | | | | |
| SMBJ22 | SMBJ22C | 24.4 | 29.8 | 1.0 | 1.0 | 22 | 15.2 | 39.4 |
| SMBJ22A | SMBJ22CA | 24.4 | 26.9 | 1.0 | 1.0 | 22 | 16.9 | 35.5 |
| SMBJ24 | SMBJ24C | 26.7 | 32.6 | 1.0 | 1.0 | 24 | 14.0 | 43.0 |
| SMBJ24A | SMBJ24CA | 26.7 | 29.5 | 1.0 | 1.0 | 24 | 15.4 | 38.9 |
| SMBJ26 | SMBJ26C | 28.9 | 35.3 | 1.0 | 1.0 | 26 | 12.9 | 46.6 |
| SMBJ26A | SMBJ26CA | 28.9 | 31.9 | 1.0 | 1.0 | 26 | 14.3 | 42.1 |
| SMBJ28 | SMBJ28C | 31.1 | 38.0 | 1.0 | 1.0 | 28 | 12.0 | 50.0 |
| SMBJ28A | SMBJ28CA | 31.1 | 34.4 | 1.0 | 1.0 | 28 | 13.2 | 45.4 |
| SMBJ30 | SMBJ30C | 33.3 | 40.7 | 1.0 | 1.0 | 30 | 11.2 | 53.5 |
| SMBJ30A | SMBJ30CA | 33.3 | 36.8 | 1.0 | 1.0 | 30 | 12.4 | 48.4 |
| SMBJ33 | SMBJ33C | 36.7 | 44.9 | 1.0 | 1.0 | 33 | 10.2 | 59.0 |
| SMBJ33A | SMBJ33CA | 36.7 | 40.6 | 1.0 | 1.0 | 33 | 11.3 | 53.3 |
| SMBJ36 | SMBJ36C | 40.0 | 48.9 | 1.0 | 1.0 | 36 | 9.3 | 64.3 |
| SMBJ36A | SMBJ36CA | 40.0 | 44.2 | 1.0 | 1.0 | 36 | 10.3 | 58.1 |
| SMBJ40 | SMBJ40C | 44.4 | 54.3 | 1.0 | 1.0 | 40 | 8.4 | 71.4 |
| SMBJ40A | SMBJ40CA | 44.4 | 49.1 | 1.0 | 1.0 | 40 | 9.3 | 64.5 |
| SMBJ43 | SMBJ43C | 47.8 | 58.4 | 1.0 | 1.0 | 43 | 7.8 | 76.7 |
| SMBJ43A | SMBJ43CA | 47.8 | 52.8 | 1.0 | 1.0 | 43 | 8.6 | 69.4 |
| SMBJ45 | SMBJ45C | 50.0 | 61.1 | 1.0 | 1.0 | 45 | 7.5 | 80.3 |
| SMBJ45A | SMBJ45CA | 50.0 | 55.3 | 1.0 | 1.0 | 45 | 8.3 | 72.7 |
| SMBJ48 | SMBJ48C | 53.3 | 65.1 | 1.0 | 1.0 | 48 | 7.0 | 85.5 |
| SMBJ48A | SMBJ48CA | 53.3 | 58.9 | 1.0 | 1.0 | 48 | 7.8 | 77.4 |
| SMBJ51 | SMBJ51C | 56.7 | 69.3 | 1.0 | 1.0 | 51 | 6.6 | 91.1 |
| SMBJ51A | SMBJ51CA | 56.7 | 62.7 | 1.0 | 1.0 | 51 | 7.3 | 82.4 |
| SMBJ54 | SMBJ54C | 60.0 | 73.3 | 1.0 | 1.0 | 54 | 6.2 | 96.3 |
| SMBJ54A | SMBJ54CA | 60.0 | 66.3 | 1.0 | 1.0 | 54 | 6.9 | 87.1 |
| SMBJ58 | SMBJ58C | 64.4 | 78.7 | 1.0 | 1.0 | 58 | 5.8 | 103 |
| SMBJ58A | SMBJ58CA | 64.4 | 71.2 | 1.0 | 1.0 | 58 | 6.4 | 93.6 |
| SMBJ60 | SMBJ60C | 66.7 | 81.5 | 1.0 | 1.0 | 60 | 5.6 | 107 |
| SMBJ60A | SMBJ60CA | 66.7 | 73.7 | 1.0 | 1.0 | 60 | 6.2 | 96.8 |
| SMBJ64 | SMBJ64C | 71.1 | 86.9 | 1.0 | 1.0 | 64 | 5.3 | 114 |
| SMBJ64A | SMBJ64CA | 71.1 | 78.6 | 1.0 | 1.0 | 64 | 5.8 | 103 |
| SMBJ70 | SMBJ70C | 77.8 | 95.1 | 1.0 | 1.0 | 70 | 4.8 | 125 |
| SMBJ70A | SMBJ70CA | 77.8 | 86.0 | 1.0 | 1.0 | 70 | 5.3 | 113 |
| SMBJ75 | SMBJ75C | 83.3 | 102 | 1.0 | 1.0 | 75 | 4.5 | 134 |
| SMBJ75A | SMBJ75CA | 83.3 | 92.1 | 1.0 | 1.0 | 75 | 5.0 | 121 |

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|-------------------------------|------------------------------|---|---------------|--------------------------|--|--|---|---|
| | | 最小 Min(V) | 最大 Max (V) | 测试电流 $I_T^{(1)}$ (mA) | | | | |
| SMBJ78 | SMBJ78C | 86.7 | 106 | 1.0 | 1.0 | 78 | 4.3 | 139 |
| SMBJ78A | SMBJ78CA | 86.7 | 95.8 | 1.0 | 1.0 | 78 | 4.8 | 126 |
| SMBJ85 | SMBJ85C | 94.4 | 115 | 1.0 | 1.0 | 85 | 4.0 | 151 |
| SMBJ85A | SMBJ85CA | 94.4 | 104 | 1.0 | 1.0 | 85 | 4.4 | 137 |
| SMBJ90 | SMBJ90C | 100 | 122 | 1.0 | 1.0 | 90 | 3.8 | 160 |
| SMBJ90A | SMBJ90CA | 100 | 111 | 1.0 | 1.0 | 90 | 4.1 | 146 |
| SMBJ100 | SMBJ100C | 111 | 136 | 1.0 | 1.0 | 100 | 3.4 | 179 |
| SMBJ100A | SMBJ100CA | 111 | 123 | 1.0 | 1.0 | 100 | 3.7 | 162 |
| SMBJ110 | SMBJ110C | 122 | 149 | 1.0 | 1.0 | 110 | 3.1 | 196 |
| SMBJ110A | SMBJ110CA | 122 | 135 | 1.0 | 1.0 | 110 | 3.4 | 177 |
| SMBJ120 | SMBJ120C | 133 | 163 | 1.0 | 1.0 | 120 | 2.8 | 214 |
| SMBJ120A | SMBJ120CA | 133 | 147 | 1.0 | 1.0 | 120 | 3.1 | 193 |
| SMBJ130 | SMBJ130C | 144 | 176 | 1.0 | 1.0 | 130 | 2.6 | 231 |
| SMBJ130A | SMBJ130CA | 144 | 159 | 1.0 | 1.0 | 130 | 2.9 | 209 |
| SMBJ150 | SMBJ150C | 167 | 204 | 1.0 | 1.0 | 150 | 2.2 | 268 |
| SMBJ150A | SMBJ150CA | 167 | 185 | 1.0 | 1.0 | 150 | 2.5 | 243 |
| SMBJ160 | SMBJ160C | 178 | 218 | 1.0 | 1.0 | 160 | 2.1 | 287 |
| SMBJ160A | SMBJ160CA | 178 | 197 | 1.0 | 1.0 | 160 | 2.3 | 259 |
| SMBJ170 | SMBJ170C | 189 | 231 | 1.0 | 1.0 | 170 | 2.0 | 304 |
| SMBJ170A | SMBJ170CA | 189 | 209 | 1.0 | 1.0 | 170 | 2.2 | 275 |
| SMBJ188 | SMBJ188C | 209 | 255 | 1.0 | 1.0 | 188 | 1.7 | 344 |
| SMBJ188A | SMBJ188CA | 209 | 231 | 1.0 | 1.0 | 188 | 2.0 | 328 |

备注: Notes:

(1) 脉冲测试: $t_p \leq 50\text{ms}$ Pulse test: $t_p \leq 50\text{ms}$

(2) 浪涌电流波形, 如图3, 功率降额曲线如图2。

Surge current waveform per Fig. 3 and derated per Fig.2.

(3) 对于双向型, V_{WM} 在10V及10V以下, I_R 值加倍

For bi-directional types having V_{WM} of 10 V and less, the I_R limit is doubled

(4) 对于双向SMBJ5.0CA, V_{BR} 最大值为7.25V

For the bi-directional SMBJ5.0CA, the maximum V_{BR} is 7.25 V



■特性曲线（典型） Characteristics(Typical)

图1: 最大脉冲功率曲线

FIG1: Peak Pulse Power Rating Curve

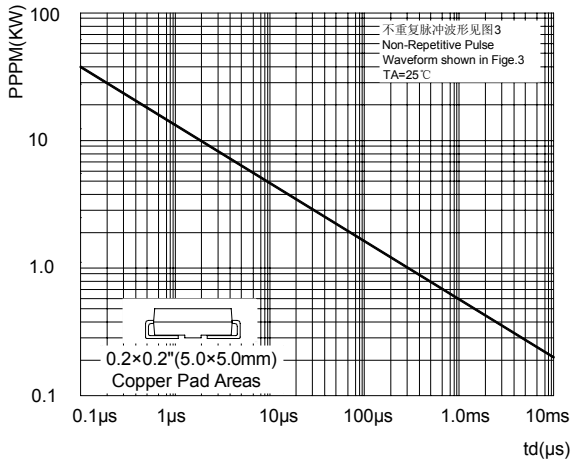


图2: 脉冲功率或电流与结温关系

FIG2: Pulse Power or Current vs. Initial Junction Temperature

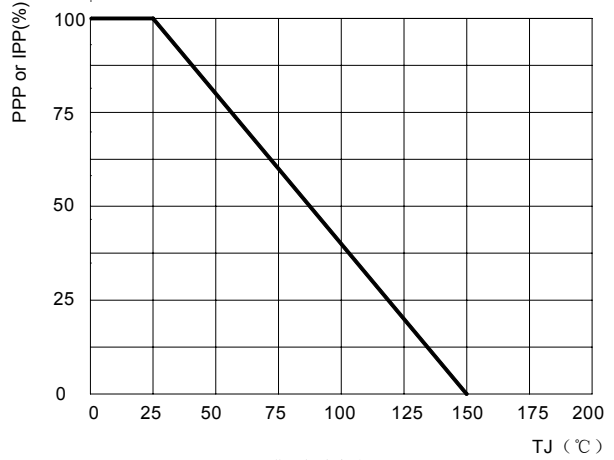


图3: 脉冲波形

FIG3: Pulse Waveform

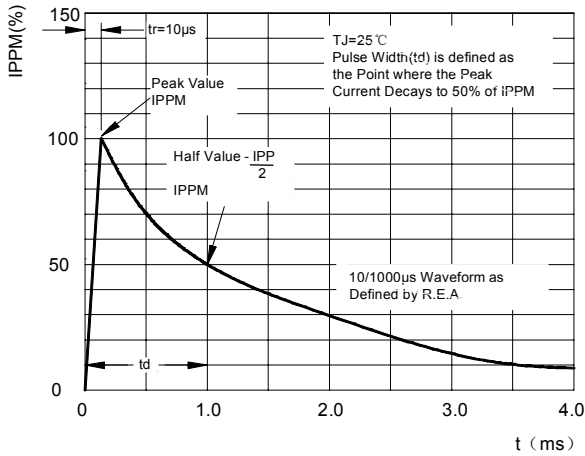


图4: 典型瞬态热阻

FIG4: Typical Transient Thermal Impedance

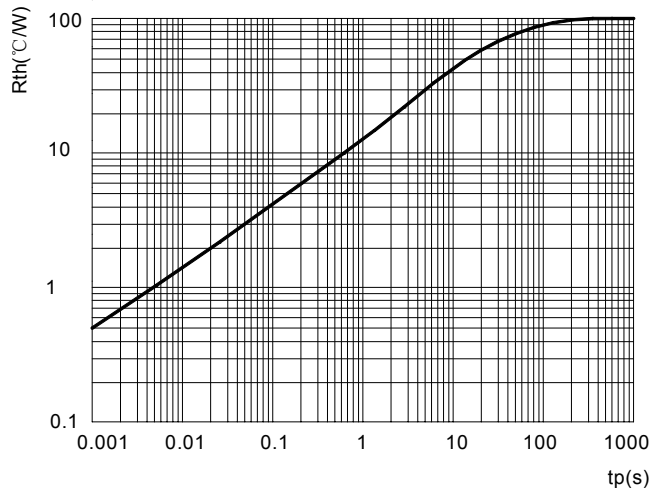


图5: 最大不重复浪涌电流

FIG5: Maximum Non-Repetitive Surge Current

