TECH PUBLIC
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# SMBJ Series

## 600W Surface Mount Transient Voltage Suppressors

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## Features

- Peak power disspation
  600W@10 x 1000 us Pluse
- Low incremental surge resistance
- Excellent clamping capability
- Fast response time
- Low leakage current
- Halogen free and RoHS compliant

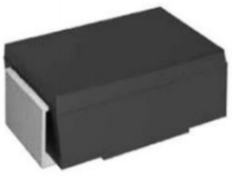
## Applications

- Personal digital assistants (PDA)
- Cellular handsets & Accessories
- Handhelds and notebooks
- Portable instrumentation

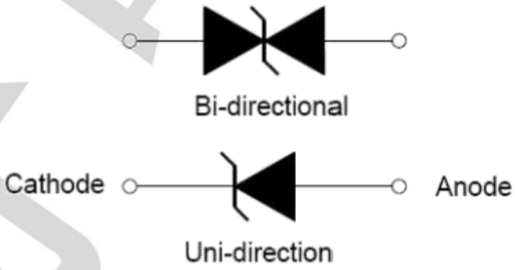
## Mechanical Characteristics

- DO-214AA(SMB) surface mount package

## Dimensions and Pin Configuration



DO-214AA(SMB)




Pin Configuration

## Maximum Ratings& Thermal Characteristics

**(Tamb=25°C unless otherwise specified)**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Peak pulse power (tp=10/1000μs waveform) | $P_{PPM}$ | 600 | W |
| Steady state power dissipation at $T_A$=50℃ | $P_{M(AV)}$ | 5.0 | W |
| Peak Pulse Current of on 10/1000us Waveform | IPPM | See Table | A |
| Typical thermal resistance junction to ambient | $R_{\theta JA}$ | 100 | ℃/W |
| Storage & operating temperature range | $T_{STG}$ ,$T_J$ | -55~+150 | ℃ |



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## Electrical Characteristics (TA=25°C unless otherwise specified)

| Part Number | | $V_R$ | $I_R$@$V_R$ | $V_{BR}$@$I_T$ | | $I_T$ | $V_C$@$I_{PP}$ | IPP |
|---|---|---|---|---|---|---|---|---|
| Uni-Polar | Bi-Polar | V | μA | min(V) | max(V) | mA | max(V) | A |
| SMBJ5.0A | SMBJ5.0CA | 5.0 | 120 | 6.40 | 7.00 | 10 | 9.2 | 65.2 |
| SMBJ6.0A | SMBJ6.0CA | 6.0 | 120 | 6.67 | 7.37 | 10 | 10.3 | 58.3 |
| SMBJ6.5A | SMBJ6.5CA | 6.5 | 120 | 7.22 | 7.98 | 10 | 11.2 | 53.6 |
| SMBJ7.0A | SMBJ7.0CA | 7.0 | 50 | 7.78 | 8.60 | 10 | 12.0 | 50.0 |
| SMBJ7.5A | SMBJ7.5CA | 7.5 | 50 | 8.33 | 9.21 | 1 | 12.9 | 46.5 |
| SMBJ8.0A | SMBJ8.0CA | 8.0 | 20 | 8.89 | 9.83 | 1 | 13.6 | 44.1 |
| SMBJ8.5A | SMBJ8.5CA | 8.5 | 10 | 9.44 | 10.40 | 1 | 14.4 | 41.7 |
| SMBJ9.0A | SMBJ9.0CA | 9.0 | 5 | 10.00 | 11.10 | 1 | 15.4 | 39.0 |
| SMBJ10A | SMBJ10CA | 10 | 2 | 11.10 | 12.30 | 1 | 17.0 | 35.3 |
| SMBJ11A | SMBJ11CA | 11 | 1 | 12.20 | 13.50 | 1 | 18.2 | 33.0 |
| SMBJ12A | SMBJ12CA | 12 | 1 | 13.30 | 14.70 | 1 | 19.9 | 30.2 |
| SMBJ13A | SMBJ13CA | 13 | 1 | 14.40 | 15.90 | 1 | 21.5 | 27.9 |
| SMBJ14A | SMBJ14CA | 14 | 1 | 15.60 | 17.20 | 1 | 23.2 | 25.9 |
| SMBJ15A | SMBJ15CA | 15 | 1 | 16.70 | 18.50 | 1 | 24.4 | 24.6 |
| SMBJ16A | SMBJ16CA | 16 | 1 | 17.80 | 19.70 | 1 | 26.0 | 23.1 |
| SMBJ17A | SMBJ17CA | 17 | 1 | 18.90 | 20.90 | 1 | 27.6 | 21.8 |
| SMBJ18A | SMBJ18CA | 18 | 1 | 20.00 | 22.10 | 1 | 29.2 | 20.6 |
| SMBJ20A | SMBJ20CA | 20 | 1 | 22.20 | 24.50 | 1 | 32.4 | 18.6 |
| SMBJ22A | SMBJ22CA | 22 | 1 | 24.40 | 26.90 | 1 | 35.5 | 16.9 |
| SMBJ24A | SMBJ24CA | 24 | 1 | 26.70 | 29.50 | 1 | 38.9 | 15.4 |
| SMBJ26A | SMBJ26CA | 26 | 1 | 28.90 | 31.90 | 1 | 42.1 | 14.3 |
| SMBJ28A | SMBJ28CA | 28 | 1 | 31.10 | 34.40 | 1 | 45.4 | 13.2 |
| SMBJ30A | SMBJ30CA | 30 | 1 | 33.30 | 36.80 | 1 | 48.4 | 12.4 |
| SMBJ33A | SMBJ33CA | 33 | 1 | 36.70 | 40.60 | 1 | 53.3 | 11.3 |
| SMBJ36A | SMBJ36CA | 36 | 1 | 40.00 | 44.20 | 1 | 58.1 | 10.4 |
| SMBJ40A | SMBJ40CA | 40 | 1 | 44.40 | 49.10 | 1 | 64.5 | 9.3 |
| SMBJ43A | SMBJ43CA | 43 | 1 | 47.80 | 52.80 | 1 | 69.4 | 8.7 |
| SMBJ45A | SMBJ45CA | 45 | 1 | 50.00 | 55.30 | 1 | 72.7 | 8.3 |
| SMBJ48A | SMBJ48CA | 48 | 1 | 53.30 | 58.90 | 1 | 77.4 | 7.8 |

## Electrical Characteristics (TA=25°C unless otherwise specified)

| Part Number | | $V_R$ | $I_R$@$V_R$ | $V_{BR}$@$I_T$ | | $I_T$ | $V_C$@$I_{PP}$ | IPP |
|---|---|---|---|---|---|---|---|---|
| Uni-Polar | Bi-Polar | V | μA | min(V) | max(V) | mA | max(V) | A |
| SMBJ51A | SMBJ51CA | 51 | 1 | 56.70 | 62.70 | 1 | 82.4 | 7.3 |
| SMBJ54A | SMBJ54CA | 54 | 1 | 60.00 | 66.30 | 1 | 87.1 | 6.9 |
| SMBJ58A | SMBJ58CA | 58 | 1 | 64.40 | 71.20 | 1 | 93.6 | 6.4 |
| SMBJ60A | SMBJ60CA | 60 | 1 | 66.70 | 73.70 | 1 | 96.8 | 6.2 |
| SMBJ64A | SMBJ64CA | 64 | 1 | 71.10 | 78.60 | 1 | 103.0 | 5.8 |
| SMBJ70A | SMBJ70CA | 70 | 1 | 77.80 | 86.00 | 1 | 113.0 | 5.3 |
| SMBJ75A | SMBJ75CA | 75 | 1 | 83.30 | 92.10 | 1 | 121.0 | 5.0 |
| SMBJ78A | SMBJ78CA | 78 | 1 | 86.70 | 95.80 | 1 | 126.0 | 4.8 |
| SMBJ85A | SMBJ85CA | 85 | 1 | 94.40 | 104.0 | 1 | 137.0 | 4.4 |
| SMBJ90A | SMBJ90CA | 90 | 1 | 100.0 | 111.0 | 1 | 146.0 | 4.1 |
| SMBJ100A | SMBJ100CA | 100 | 1 | 111.0 | 123.0 | 1 | 162.0 | 3.7 |
| SMBJ110A | SMBJ110CA | 110 | 1 | 122.0 | 135.0 | 1 | 177.0 | 3.4 |
| SMBJ120A | SMBJ120CA | 120 | 1 | 133.0 | 147.0 | 1 | 193.0 | 3.1 |
| SMBJ130A | SMBJ130CA | 130 | 1 | 144.0 | 159.0 | 1 | 209.0 | 2.9 |
| SMBJ150A | SMBJ150CA | 150 | 1 | 167.0 | 185.0 | 1 | 243.0 | 2.5 |
| SMBJ160A | SMBJ160CA | 160 | 1 | 178.0 | 197.0 | 1 | 259.0 | 2.3 |
| SMBJ170A | SMBJ170CA | 170 | 1 | 189.0 | 209.0 | 1 | 275.0 | 2.2 |
| SMBJ180A | SMBJ180CA | 180 | 1 | 201.0 | 222.0 | 1 | 292.0 | 2.1 |
| SMBJ190A | SMBJ190CA | 190 | 1 | 211.0 | 234.0 | 1 | 307.0 | 2.0 |
| SMBJ200A | SMBJ200CA | 200 | 1 | 224.0 | 247.0 | 1 | 324.0 | 1.9 |
| SMBJ210A | SMBJ210CA | 210 | 1 | 233.0 | 258.0 | 1 | 337.0 | 1.8 |
| SMBJ220A | SMBJ220CA | 220 | 1 | 246.0 | 272.0 | 1 | 356.0 | 1.7 |
| SMBJ250A | SMBJ250CA | 250 | 1 | 279.0 | 309.0 | 1 | 405.0 | 1.5 |
| SMBJ300A | SMBJ300CA | 300 | 1 | 335.0 | 371.0 | 1 | 486.0 | 1.3 |
| SMBJ350A | SMBJ350CA | 350 | 1 | 391.0 | 432.0 | 1 | 567.0 | 1.1 |
| SMBJ400A | SMBJ400CA | 400 | 1 | 447.0 | 494.0 | 1 | 648.0 | 0.9 |
| SMBJ440A | SMBJ440CA | 440 | 1 | 492.0 | 543.0 | 1 | 713.0 | 0.8 |

For bi-directional type having Vrwm of 10 Volts and less, the IR limit is double.

For parts without A, the VBR is +10%.

## Typical Characteristics Curves

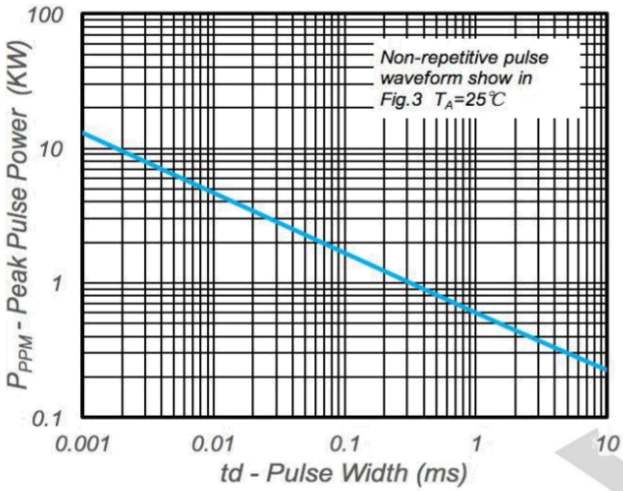



Fig.1 - Peak Pulse Power Rating

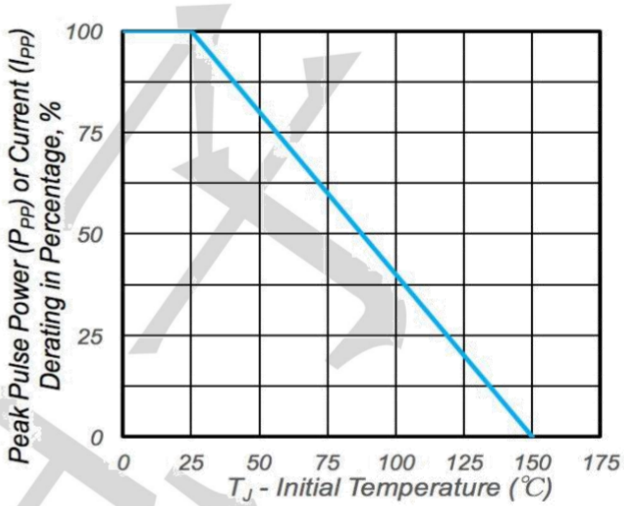



Fig.2 - Pulse Derating Cure

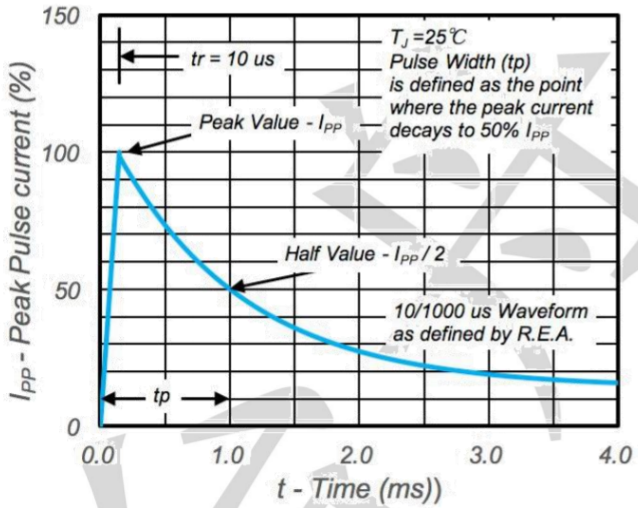



Fig.3 – Pulse Waveform

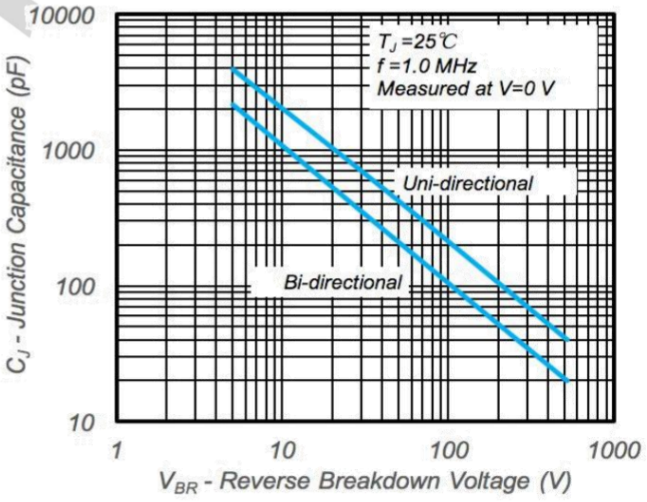
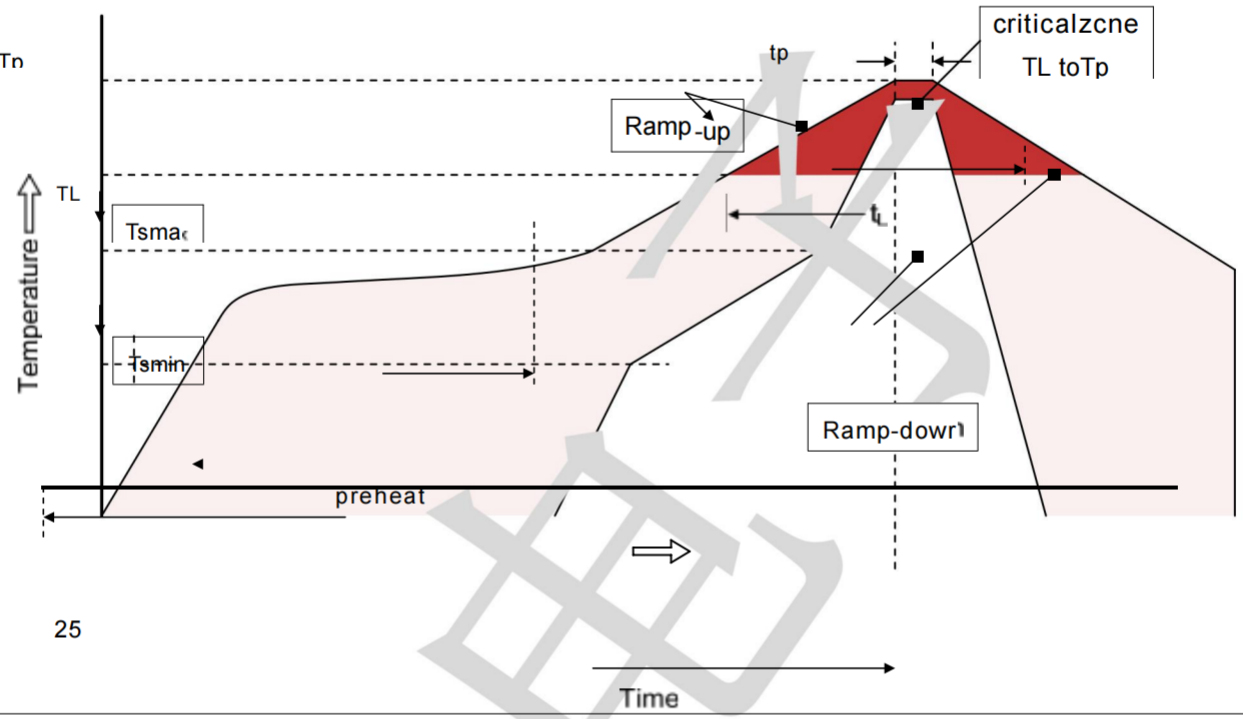



Fig.4 - Typical Junction Capacitance

## Recommended Soldering Conditions

Reflow Soldering

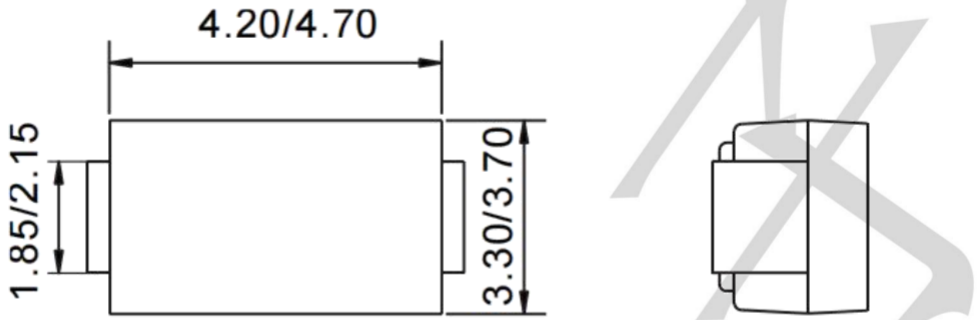


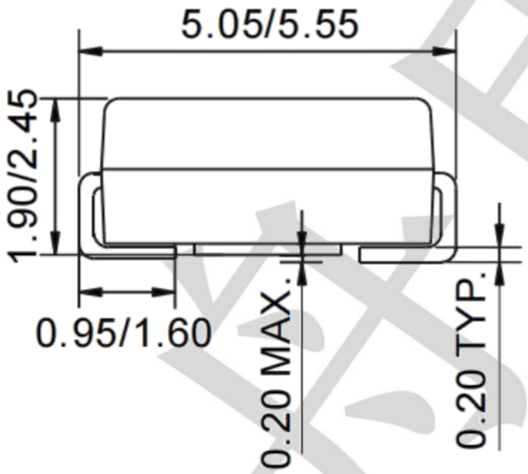

Recommended Conditions

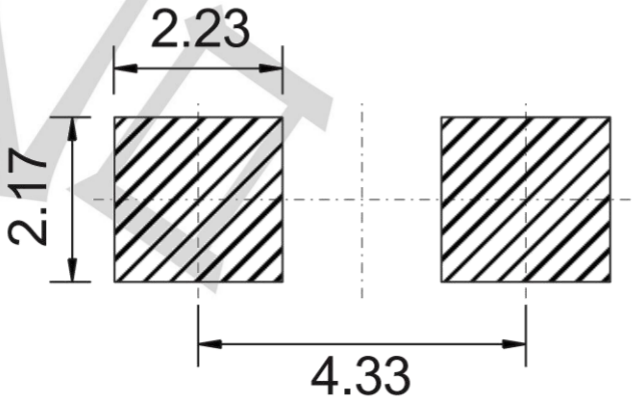
| Profile Feature | Pb-Free Assembly |
|---|---|
| Average ramp-up rate ($T_L$ to $T_P$) | 3℃/second max. |
| Preheat<br>-Temperature Min ($T_{S\ min}$)<br>-Temperature Max ($T_{S\ max}$)<br>-Time (minto max) (ts) | <br>150℃<br>200℃<br>60-180 seconds |
| $T_{S\ max}$ to $T_L$<br>-Ramp-up Rate | <br>3℃/second max. |
| Time maintained above:<br>-Temperature ($T_L$)<br>-Time ($t_L$) | <br>217℃<br>60-150 seconds |
| Peak Temperature ($T_P$) | 260℃ |
| Time within 5℃ of actual Peak Temperature ($t_P$) | 20-40 seconds |
| Ramp-down Rate | 6℃/second max. |
| Time 25℃ to Peak Temperature | 8 minutes max. |

## Package Outline Dimensions (unit: mm)

### SMB




## Mounting Pad Layout (unit: mm)