

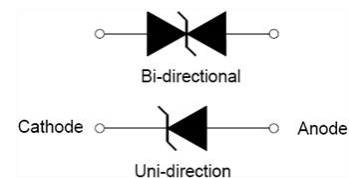
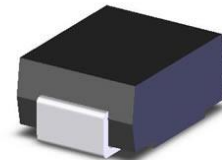
SMBJ

Surface Mount Unidirectional and Bidirectional Transient Voltage Suppressors

The SMBJ TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.

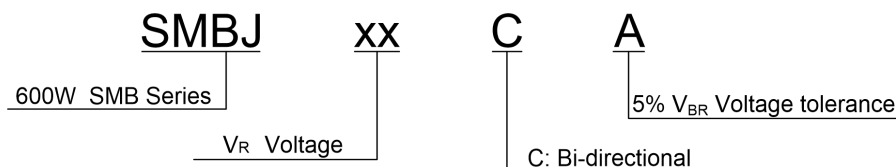
Features

- Glass passivated or planar junction
- 600W Peak Pulse Power Dissipation
- Excellent clamping capability
- Repetition rate (duty cycle): 0.01%
- Low profile package and low inductance
- Fast response time: typically less than 1.0ps from 0V to VBR min
- High temperature soldering: 260°C/10s at terminals
- For surface mounted applications in order to optimize board space



| Ordering Information | | |
|----------------------|--------------|-----------|
| Device | Qty per Reel | Reel Size |
| SMBJxxxx | 3000 | 13Inch |

Part Number Code



| Maximum Ratings and Electrical Characteristics | | | |
|---|-----------|---------------|------------------|
| Characteristics | Symbols | Value | Unit |
| Peak Power Dissipation At $T_j = 25^\circ\text{C}$, $T_p = 1\text{ms}$ (Note 1,2) | P_{PK} | 600 | W |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional | V_F | 5.0 | V |
| Lead Soldering Temperature | T_L | 260 (10 sec.) | $^\circ\text{C}$ |
| Operating Temperature Range | T_J | -55 to +150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{STG} | -55 to +150 | $^\circ\text{C}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Non-repetitive current pulse, per fig. 4 and derated above $T_A = 25^\circ\text{C}$ per fig.1.

2. Thermal Resistance junction to Lead

3. 8.3ms single half-sine wave duty cycle= 4 pulses maximum per minute (unidirectional units only).

4. Ratings at 25°C ambient temperature unless otherwise specified.

5. Single phase, half wave, 60Hz, resistive or inductive load.

6. For Capacitive Load, Derate Current By 20%

Electrical Characteristics ($T_{amb}=25^{\circ}C$ Unless Otherwise Specified)

| Part Number | | Marking | | V_R | $I_R@V_R$ | $V_{BR}@I_T$ | | I_T | $V_C@I_{PP}$ | $I_{PP}^{\textcircled{1}}$ |
|-------------|-----------|----------|-----------|-------|-----------|--------------|--------|-------|--------------|----------------------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V | μA | min(V) | max(V) | mA | max(V) | A |
| SMBJ5.0A | SMBJ5.0CA | SMBJ5.0A | SMBJ5.0CA | 5.0 | 800 | 6.40 | 7.00 | 10 | 9.2 | 65.2 |
| SMBJ6.0A | SMBJ6.0CA | SMBJ6.0A | SMBJ6.0CA | 6.0 | 800 | 6.67 | 7.37 | 10 | 10.3 | 58.3 |
| SMBJ6.5A | SMBJ6.5CA | SMBJ6.5A | SMBJ6.5CA | 6.5 | 500 | 7.22 | 7.98 | 10 | 11.2 | 53.6 |
| SMBJ7.0A | SMBJ7.0CA | SMBJ7.0A | SMBJ7.0CA | 7.0 | 200 | 7.78 | 8.60 | 10 | 12.0 | 50.0 |
| SMBJ7.5A | SMBJ7.5CA | SMBJ7.5A | SMBJ7.5CA | 7.5 | 100 | 8.33 | 9.21 | 1 | 12.9 | 46.5 |
| SMBJ8.0A | SMBJ8.0CA | SMBJ8.0A | SMBJ8.0CA | 8.0 | 50 | 8.89 | 9.83 | 1 | 13.6 | 44.1 |
| SMBJ8.5A | SMBJ8.5CA | SMBJ8.5A | SMBJ8.5CA | 8.5 | 20 | 9.44 | 10.40 | 1 | 14.4 | 41.7 |
| SMBJ9.0A | SMBJ9.0CA | SMBJ9.0A | SMBJ9.0CA | 9.0 | 10 | 10.00 | 11.10 | 1 | 15.4 | 39.0 |
| SMBJ10A | SMBJ10CA | SMBJ10A | SMBJ10CA | 10 | 5 | 11.10 | 12.30 | 1 | 17.0 | 35.3 |
| SMBJ11A | SMBJ11CA | SMBJ11A | SMBJ11CA | 11 | 1 | 12.20 | 13.50 | 1 | 18.2 | 33.0 |
| SMBJ12A | SMBJ12CA | SMBJ12A | SMBJ12CA | 12 | 1 | 13.30 | 14.70 | 1 | 19.9 | 30.2 |
| SMBJ13A | SMBJ13CA | SMBJ13A | SMBJ13CA | 13 | 1 | 14.40 | 15.90 | 1 | 21.5 | 27.9 |
| SMBJ14A | SMBJ14CA | SMBJ14A | SMBJ14CA | 14 | 1 | 15.60 | 17.20 | 1 | 23.2 | 25.9 |
| SMBJ15A | SMBJ15CA | SMBJ15A | SMBJ15CA | 15 | 1 | 16.70 | 18.50 | 1 | 24.4 | 24.6 |
| SMBJ16A | SMBJ16CA | SMBJ16A | SMBJ16CA | 16 | 1 | 17.80 | 19.70 | 1 | 26.0 | 23.1 |
| SMBJ17A | SMBJ17CA | SMBJ17A | SMBJ17CA | 17 | 1 | 18.90 | 20.90 | 1 | 27.6 | 21.8 |
| SMBJ18A | SMBJ18CA | SMBJ18A | SMBJ18CA | 18 | 1 | 20.00 | 22.10 | 1 | 29.2 | 20.6 |
| SMBJ20A | SMBJ20CA | SMBJ20A | SMBJ20CA | 20 | 1 | 22.20 | 24.50 | 1 | 32.4 | 18.6 |
| SMBJ22A | SMBJ22CA | SMBJ22A | SMBJ22CA | 22 | 1 | 24.40 | 26.90 | 1 | 35.5 | 16.9 |
| SMBJ24A | SMBJ24CA | SMBJ24A | SMBJ24CA | 24 | 1 | 26.70 | 29.50 | 1 | 38.9 | 15.4 |
| SMBJ26A | SMBJ26CA | SMBJ26A | SMBJ26CA | 26 | 1 | 28.90 | 31.90 | 1 | 42.1 | 14.3 |
| SMBJ28A | SMBJ28CA | SMBJ28A | SMBJ28CA | 28 | 1 | 31.10 | 34.40 | 1 | 45.4 | 13.2 |
| SMBJ30A | SMBJ30CA | SMBJ30A | SMBJ30CA | 30 | 1 | 33.30 | 36.80 | 1 | 48.4 | 12.4 |
| SMBJ33A | SMBJ33CA | SMBJ33A | SMBJ33CA | 33 | 1 | 36.70 | 40.60 | 1 | 53.3 | 11.3 |
| SMBJ36A | SMBJ36CA | SMBJ36A | SMBJ36CA | 36 | 1 | 40.00 | 44.20 | 1 | 58.1 | 10.4 |
| SMBJ40A | SMBJ40CA | SMBJ40A | SMBJ40CA | 40 | 1 | 44.40 | 49.10 | 1 | 64.5 | 9.3 |
| SMBJ43A | SMBJ43CA | SMBJ43A | SMBJ43CA | 43 | 1 | 47.80 | 52.80 | 1 | 69.4 | 8.7 |
| SMBJ45A | SMBJ45CA | SMBJ45A | SMBJ45CA | 45 | 1 | 50.00 | 55.30 | 1 | 72.7 | 8.3 |
| SMBJ48A | SMBJ48CA | SMBJ48A | SMBJ48CA | 48 | 1 | 53.30 | 58.90 | 1 | 77.4 | 7.8 |
| SMBJ51A | SMBJ51CA | SMBJ51A | SMBJ51CA | 51 | 1 | 56.70 | 62.70 | 1 | 82.4 | 7.3 |

Electrical Characteristics ($T_{amb}=25^{\circ}C$ Unless Otherwise Specified)

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

① Surge waveform: 10/1000 μs

V_R : Stand-off Voltage -- Maximum voltage that can be applied

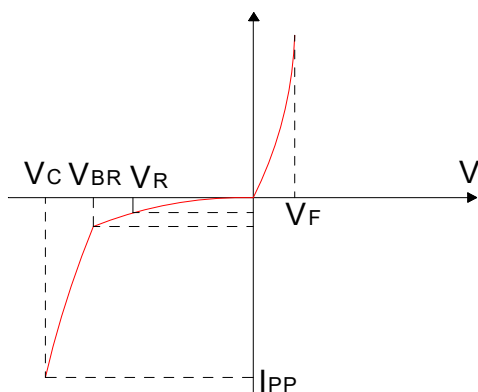
V_{BR} : Breakdown Voltage

V_C : Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{PP}

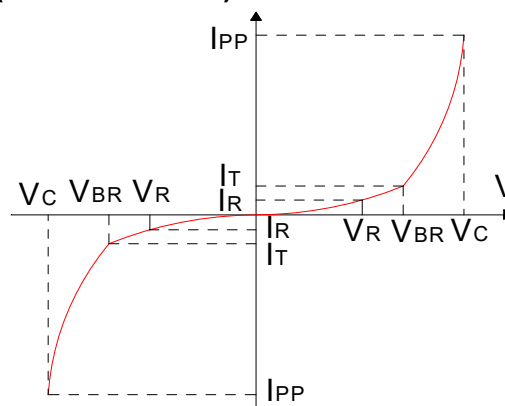
I_R : Reverse Leakage Current

Ratings And V-I Characteristics curves ($T_A=25^{\circ}\text{C}$, unless otherwise noted)

**FIG.1:V- I curve characteristics
(Uni-directional)**



**FIG.2:V- I curve characteristics
(Bi-directional)**



Typical electrical characterist applications

Rating and Characteristics Curves

Figure 1: Peak Pulse Power Rating Curve

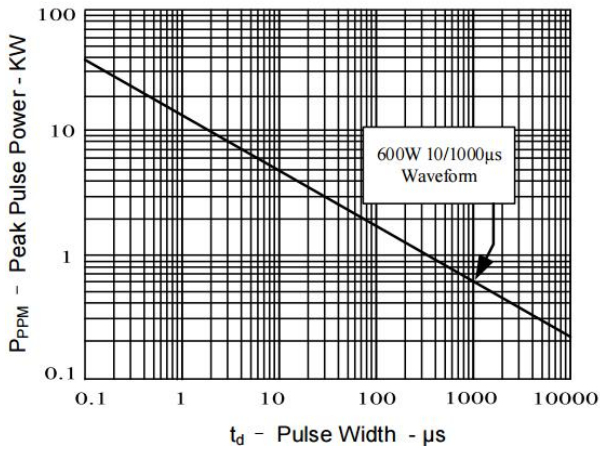


Figure 2: Pulse Derating Curve

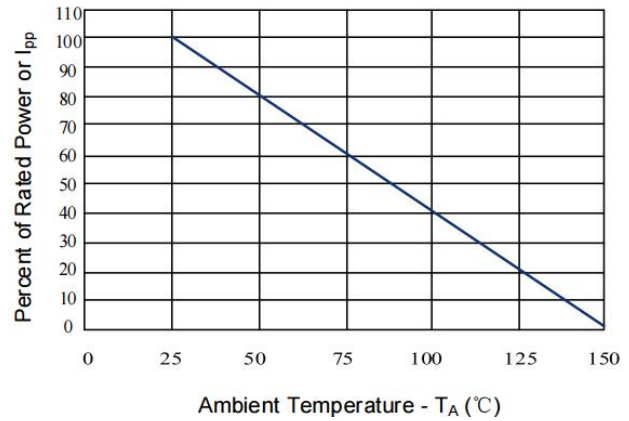


Figure 3: Pulse Waveform

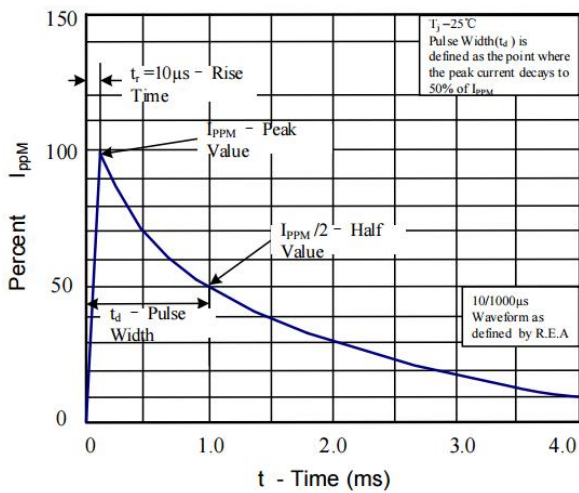


Figure 4: Typical Junction Capacitance

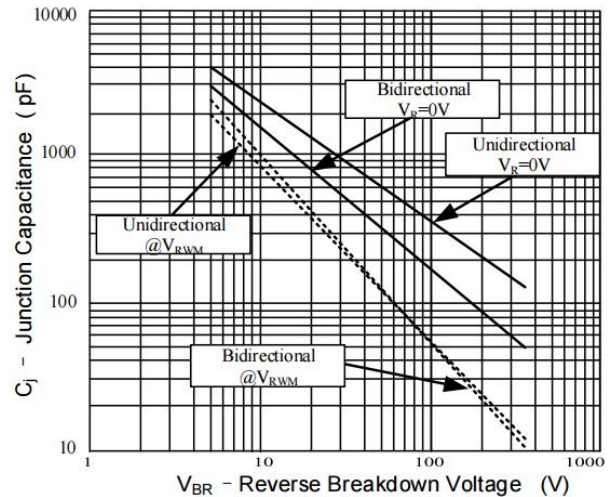


Figure 5: Steady State Power Dissipation Derating Curve

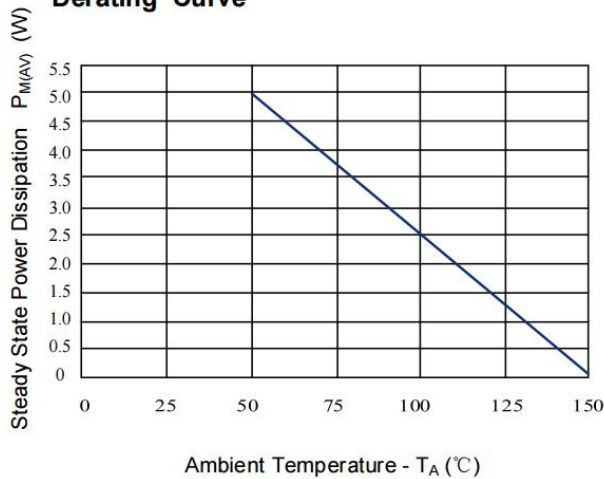
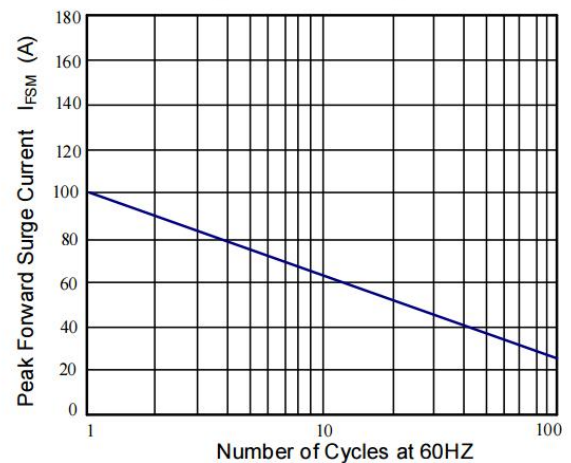
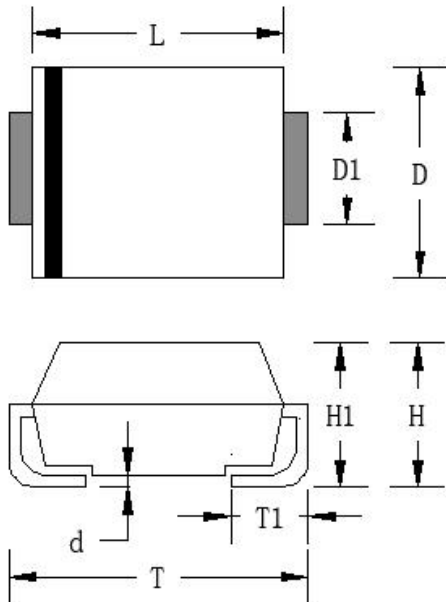


Figure 6: Maximum Non-Repetitive Forward Surge Current Only Unidirectional



Package Information

SMB



| Ref.(mm) | Millimeters | |
|----------|-------------|------|
| | Min. | Max. |
| D | 3.40 | 3.94 |
| D1 | 1.90 | 2.10 |
| L | 4.22 | 4.70 |
| T | 5.21 | 5.59 |
| T1 | 0.90 | 1.42 |
| d | 0 | 0.23 |
| H | 1.95 | 2.60 |
| H1 | 2.0 | 2.34 |