

## Features

- 600W Peak Pulse Power Dissipation
- 5.0V to 200V Standoff Voltages
- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SMB
- Case Material: Molded Plastic.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead Free Plating (Matte Tin Finish).  
Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.1 grams (Approximate)



Top View



Bottom View

## Ordering Information (Note 4)

| Part Number      | Qualification | Case | Packaging         |
|------------------|---------------|------|-------------------|
| SMBJXXX(C)A-13-F | Commercial    | SMB  | 3,000/Tape & Reel |

\*x = Device Voltage, e.g., SMBJ170A-13-F.

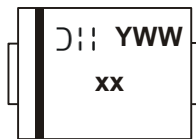
- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

Bi-Directional Device



Cathode Band for Uni-Directional Device



xx = Product Type Marking Code (See Page 3)  
 ⌋|| = Manufacturers' Code Marking  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 7 for 2017)  
 WW = Week Code (01 to 53)

### Maximum Ratings (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| Characteristic   | Symbol      | Value                     | Unit                |   |
|--|-------------|---------------------------|---------------------|---|
| Peak Pulse Power Dissipation<br>(Non Repetitive Current Pulse Derated above $T_A = +25^\circ\text{C}$ ) (Note 5) | $P_{PK}$    | 600                       | W                   |   |
| Peak Power Derating Above $+25^\circ\text{C}$  | $P_{DER}$   | 4.8                       | W/ $^\circ\text{C}$ |   |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed on Rated Load (Notes 5, 6 & 7)              | $I_{FSM}$   | 100                       | A                   |   |
| Steady State Power Dissipation @ $T_L = +75^\circ\text{C}$   | $PM_{(AV)}$ | 5.0                       | W                   |   |
| Instantaneous Forward Voltage @ $I_{PP} = 35\text{A}$<br>(Notes 5, 6 & 7)  | $V_F$       | $V_{BR < 100\text{V}}$    | 3.5                 | V |
|  |             | $V_{BR \geq 100\text{V}}$ | 5.0                 | V |

### Thermal Characteristics

| Characteristic              | Symbol    | Value       | Unit             |
|-----------------------------|-----------|-------------|------------------|
| Operating Temperature Range | $T_J$     | -55 to +150 | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{STG}$ | -55 to +175 | $^\circ\text{C}$ |

- Notes:
5. Valid provided that terminals are kept at ambient temperature.
  6. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
  7. Unidirectional units only.

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Part Number<br>Add C For Bi-<br>Directional<br>(Note 8) | Reverse<br>Standoff<br>Voltage | Breakdown<br>Voltage<br>V <sub>BR</sub> @ I <sub>T</sub> (Note 9) |         | Test<br>Current     | Max. Reverse<br>Leakage @ V <sub>RWM</sub><br>(Note 10) | Max. Clamping<br>Voltage @ I <sub>pp</sub> | Max. Peak Pulse<br>Current<br>I <sub>pp</sub> | Marking Code |      |
|---|--------------------------------|---|---------|---------------------|---|--|---|--------------|------|
|   |                                | Min (V)   | Max (V) |                     |   |  |   | BI-          | UNI- |
| See Note 6  | V <sub>RWM</sub> (V)           | Min (V)   | Max (V) | I <sub>T</sub> (mA) | I <sub>R</sub> (μA)                                     | V <sub>C</sub> (V)                         | (A)   | BI-          | UNI- |
| SMBJ5.0(C)A   | 5.0                            | 6.40  | 7.23    | 10                  | 800   | 9.2  | 65.2  | AE           | KE   |
| SMBJ6.0(C)A   | 6.0                            | 6.67  | 7.67    | 10                  | 800   | 10.3                                       | 58.3  | AG           | KG   |
| SMBJ6.5(C)A   | 6.5                            | 7.22  | 8.30    | 10                  | 500   | 11.2                                       | 53.6  | AK           | KK   |
| SMBJ7.0(C)A   | 7.0                            | 7.78  | 8.95    | 10                  | 200   | 12.0                                       | 50.0  | AM           | KM   |
| SMBJ7.5(C)A   | 7.5                            | 8.33  | 9.58    | 1.0                 | 100   | 12.9                                       | 46.5  | AP           | KP   |
| SMBJ8.0(C)A   | 8.0                            | 8.89  | 10.23   | 1.0                 | 50  | 13.6                                       | 44.1  | AR           | KR   |
| SMBJ8.5(C)A   | 8.5                            | 9.44  | 10.82   | 1.0                 | 10  | 14.4                                       | 41.7  | AT           | KT   |
| SMBJ9.0(C)A   | 9.0                            | 10.00   | 11.50   | 1.0                 | 5.0   | 15.4                                       | 39.0  | AV           | KV   |
| SMBJ10(C)A  | 10.0                           | 11.10   | 12.80   | 1.0                 | 5.0   | 17.0                                       | 35.3  | AX           | KX   |
| SMBJ11(C)A  | 11.0                           | 12.20   | 14.40   | 1.0                 | 5.0   | 18.2                                       | 33.0  | AZ           | KZ   |
| SMBJ12(C)A  | 12.0                           | 13.30   | 15.30   | 1.0                 | 5.0   | 19.9                                       | 30.2  | BE           | LE   |
| SMBJ13(C)A  | 13.0                           | 14.40   | 16.50   | 1.0                 | 5.0   | 21.5                                       | 27.9  | BG           | LG   |
| SMBJ14(C)A  | 14.0                           | 15.60   | 17.90   | 1.0                 | 5.0   | 23.2                                       | 25.8  | BK           | LK   |
| SMBJ15(C)A  | 15.0                           | 16.70   | 19.20   | 1.0                 | 5.0   | 24.4                                       | 24.0  | BM           | LM   |
| SMBJ16(C)A  | 16.0                           | 17.80   | 20.50   | 1.0                 | 5.0   | 26.0                                       | 23.1  | BP           | LP   |
| SMBJ17(C)A  | 17.0                           | 18.90   | 21.70   | 1.0                 | 5.0   | 27.6                                       | 21.7  | BR           | LR   |
| SMBJ18(C)A  | 18.0                           | 20.00   | 23.30   | 1.0                 | 5.0   | 29.2                                       | 20.5  | BT           | LT   |
| SMBJ20(C)A  | 20.0                           | 22.20   | 25.50   | 1.0                 | 5.0   | 32.4                                       | 18.5  | BV           | LV   |
| SMBJ22(C)A  | 22.0                           | 24.40   | 28.00   | 1.0                 | 5.0   | 35.5                                       | 16.9  | BX           | LX   |
| SMBJ24(C)A  | 24.0                           | 26.70   | 30.70   | 1.0                 | 5.0   | 38.9                                       | 15.4  | BZ           | LZ   |
| SMBJ26(C)A  | 26.0                           | 28.90   | 33.20   | 1.0                 | 5.0   | 42.1                                       | 14.2  | CE           | ME   |
| SMBJ28(C)A  | 28.0                           | 31.10   | 35.80   | 1.0                 | 5.0   | 45.4                                       | 13.2  | CG           | MG   |
| SMBJ30(C)A  | 30.0                           | 33.30   | 38.30   | 1.0                 | 5.0   | 48.4                                       | 12.4  | CK           | MK   |
| SMBJ33(C)A  | 33.0                           | 36.70   | 42.20   | 1.0                 | 5.0   | 53.3                                       | 11.3  | CM           | MM   |
| SMBJ36(C)A  | 36.0                           | 40.00   | 46.00   | 1.0                 | 5.0   | 58.1                                       | 10.3  | CP           | MP   |
| SMBJ40(C)A  | 40.0                           | 44.40   | 51.10   | 1.0                 | 5.0   | 64.5                                       | 9.3   | CR           | MR   |
| SMBJ43(C)A  | 43.0                           | 47.80   | 54.90   | 1.0                 | 5.0   | 69.4                                       | 8.6   | CT           | MT   |
| SMBJ45(C)A  | 45.0                           | 50.00   | 57.50   | 1.0                 | 5.0   | 72.7                                       | 8.3   | CV           | MV   |
| SMBJ48(C)A  | 48.0                           | 53.30   | 61.30   | 1.0                 | 5.0   | 77.4                                       | 7.7   | CX           | MX   |
| SMBJ51(C)A  | 51.0                           | 56.70   | 65.20   | 1.0                 | 5.0   | 82.4                                       | 7.3   | CZ           | MZ   |
| SMBJ54(C)A  | 54.0                           | 60.00   | 69.00   | 1.0                 | 5.0   | 87.1                                       | 6.9   | DE           | NE   |
| SMBJ58(C)A  | 58.0                           | 64.40   | 74.60   | 1.0                 | 5.0   | 93.6                                       | 6.4   | DG           | NG   |
| SMBJ60(C)A  | 60.0                           | 66.70   | 76.70   | 1.0                 | 5.0   | 96.8                                       | 6.2   | DK           | NK   |
| SMBJ64(C)A  | 64.0                           | 71.10   | 81.80   | 1.0                 | 5.0   | 103.0                                      | 5.8   | DM           | NM   |
| SMBJ70(C)A  | 70.0                           | 77.80   | 89.50   | 1.0                 | 5.0   | 113.0                                      | 5.3   | DP           | NP   |
| SMBJ75(C)A  | 75.0                           | 83.30   | 95.80   | 1.0                 | 5.0   | 121.0                                      | 4.9   | DR           | NR   |
| SMBJ78(C)A  | 78.0                           | 86.70   | 99.70   | 1.0                 | 5.0   | 126.0                                      | 4.7   | DT           | NT   |
| SMBJ85(C)A  | 85.0                           | 94.40   | 108.20  | 1.0                 | 5.0   | 137.0                                      | 4.4   | DV           | NV   |
| SMBJ90(C)A  | 90.0                           | 100.0   | 115.50  | 1.0                 | 5.0   | 146.0                                      | 4.1   | DX           | NX   |
| SMBJ100(C)A   | 100.0                          | 111.0   | 128.00  | 1.0                 | 5.0   | 162.0                                      | 3.7   | DZ           | NZ   |
| SMBJ110(C)A   | 110.0                          | 122.0   | 140.00  | 1.0                 | 5.0   | 177.0                                      | 3.4   | EE           | PE   |
| SMBJ120(C)A   | 120.0                          | 133.0   | 153.00  | 1.0                 | 5.0   | 193.0                                      | 3.1   | EG           | PG   |
| SMBJ130(C)A   | 130.0                          | 144.0   | 165.50  | 1.0                 | 5.0   | 209.0                                      | 2.9   | EK           | PK   |
| SMBJ150(C)A   | 150.0                          | 167.0   | 192.50  | 1.0                 | 5.0   | 243.0                                      | 2.5   | EM           | PM   |
| SMBJ160(C)A   | 160.0                          | 178.0   | 205.00  | 1.0                 | 5.0   | 259.0                                      | 2.3   | EP           | PP   |
| SMBJ170(C)A   | 170.0                          | 189.0   | 217.50  | 1.0                 | 5.0   | 275.0                                      | 2.2   | ER           | PR   |
| SMBJ180A  | 180.0                          | 200.00  | 220.00  | 1.0                 | 1.0   | 291.6                                      | 2.06  | -            | PT   |
| SMBJ200A  | 200.0                          | 224.00  | 247.00  | 1.0                 | 1.0   | 324.0                                      | 1.9   | -            | PV   |

Notes: 8. Suffix C denotes Bi-directional device.  
9. V<sub>BR</sub> measured with I<sub>T</sub> current pulse = 10ms to 15ms.  
10. For Bi-Directional devices having V<sub>RWM</sub> of 10V and under, the I<sub>R</sub> is doubled.

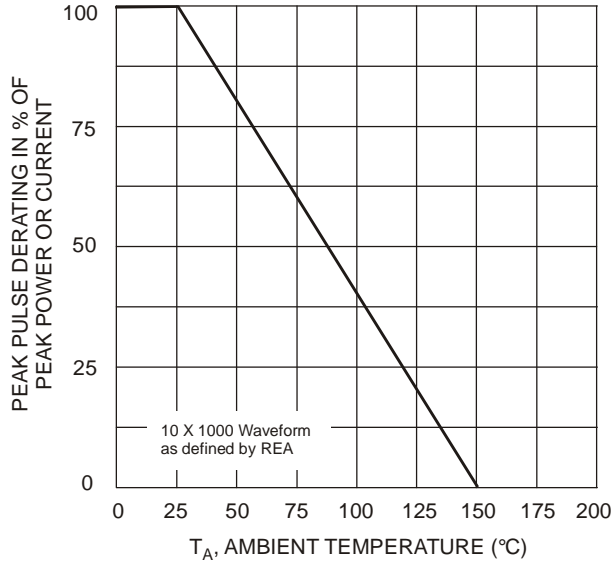


Fig. 1 Pulse Derating Curve

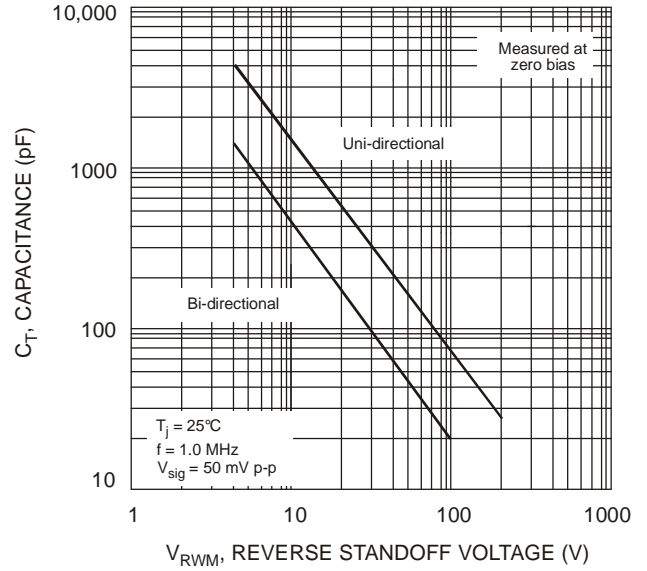


Fig. 2 Typical Total Capacitance

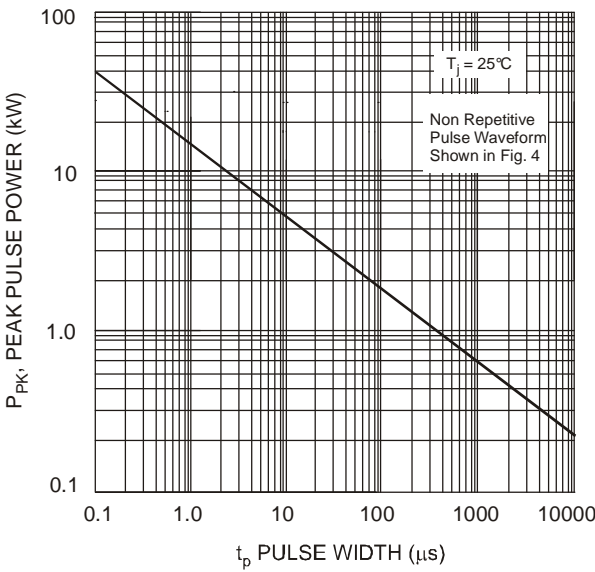


Fig. 3 Pulse Rating Curve

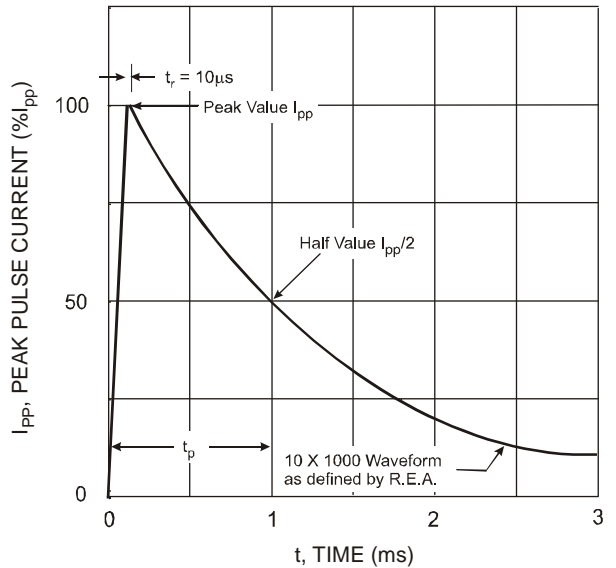


Fig. 4 Pulse Waveform

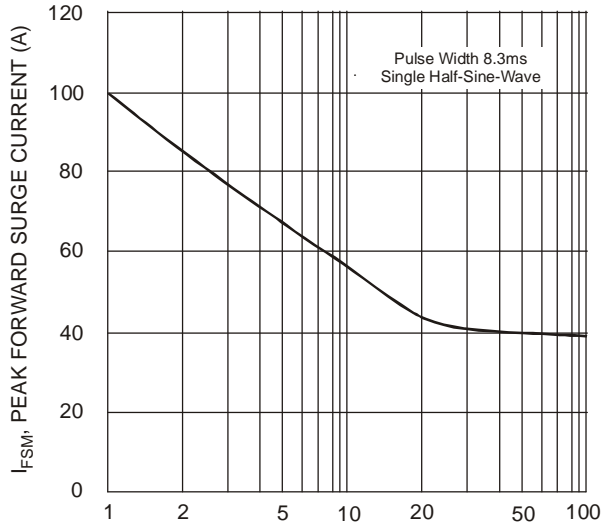


Fig. 5 Maximum Non-Repetitive Surge Current

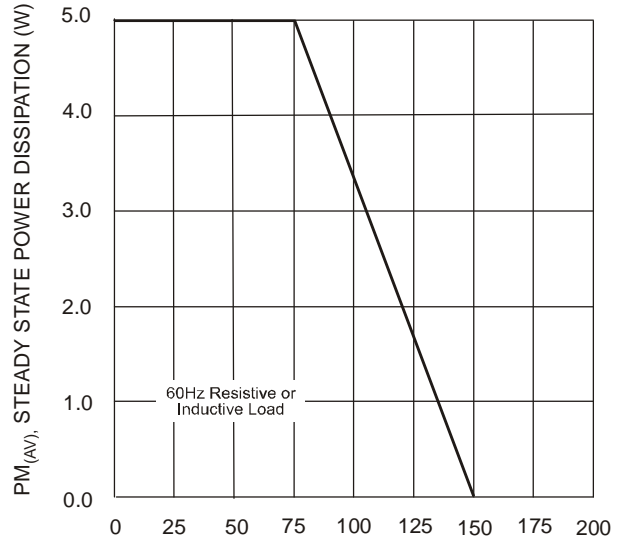
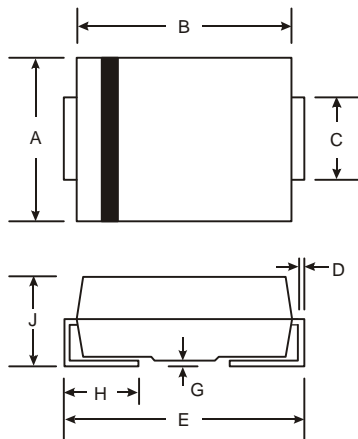


Fig. 6 Steady State Power Derating Curve

## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SMB



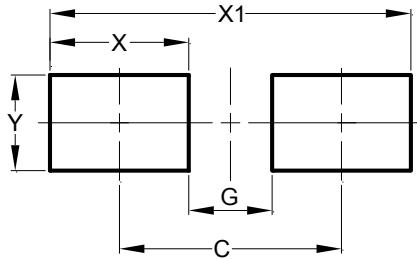
| SMB                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 3.30 | 3.94 |
| B                    | 4.06 | 4.57 |
| C                    | 1.96 | 2.21 |
| D                    | 0.15 | 0.31 |
| E                    | 5.00 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 2.00 | 2.50 |
| All Dimensions in mm |      |      |

Note: 11. The bar in the upper drawing is polarity indicator for Cathode Band. It is for Uni-directional devices only. Bi-directional devices have no polarity Indicator.

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SMB



| Dimensions | Value (in mm) |
|------------|---------------|
| <b>C</b>   | 4.30          |
| <b>G</b>   | 1.80          |
| <b>X</b>   | 2.50          |
| <b>X1</b>  | 6.80          |
| <b>Y</b>   | 2.30          |

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