

### DO-214AA (SMB J-Bend)



Dimensions in inches and (millimeters)

| Agency   | Agency File Number |
|--|--------------------|
|  | E521119            |

| PRIMARY CHARACTERISTICS |                                  |
|-------------------------|----------------------------------|
| V <sub>RWM</sub>        | 5.0V to 440V                     |
| V <sub>BR</sub>         | 6.4V to 543V                     |
| P <sub>PPM</sub>        | 600W                             |
| T <sub>J max</sub>      | 150°C                            |
| Polarity                | Uni-directional & Bi-directional |
| Package                 | DO-214AA                         |

### FEATURES

- For surface mounted applications in order to optimize board space
- Typical maximum temperature coefficient  $\Delta V_{BR} = 0.1\% \times V_{BR} @ 25^\circ\text{C} \times \Delta T$
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Excellent clamping capability
- Repetition Rate (duty cycle): 0.01%
- Fast response time: typically less than 1.0ps from 0 Volts to BV
- Meet MSL1 Level, per J-STD-020, LF maximum peak of 260 °C
- Plastic package has Underwriters Laboratory Flammability 94V-0
- Matte Tin Lead-free plated



### MECHANICAL DATA

**Case:** JEDEC DO-214AA. Molded plastic

**Terminal:** Solderable per MIL-STD-750, Method 2026

**Polarity:** Color band denoted positive end (cathode) except Bidirectional

### DEVICES FOR BIPOLAR APPLICATION

- For Bidirectional use C or CA Suffix for types SMBJ5.0 thru types SMBJ440 (e.g. SMBJ5.0C, SMBJ440CA)
- Electrical characteristics apply in both directions

### MAXIMUM RATINGS (25°C ambient temperature unless otherwise specified)

| Parameter   | Symbol                          | Value          | Unit  |
|---|---------------------------------|----------------|-------|
| Peak Pulse Power Dissipation on 10/1000µs waveform (Note 1, 2)      | P <sub>PPM</sub>                | 600            | Watts |
| Peak Pulse Current of on 10/1000µs waveform (Note 1)                | I <sub>PPM</sub>                | See Next Table | Amps  |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave (Note 2, 3) | I <sub>FSM</sub>                | 100            | Amps  |
| Operating junction and Storage Temperature Range                    | T <sub>J</sub> T <sub>STG</sub> | -55 to +150    | °C    |
| Typical Thermal Resistance Junction to Lead                         | R <sub>θJL</sub>                | 20             | °C/W  |
| Typical Thermal Resistance Junction to Ambient                      | R <sub>θJA</sub>                | 100            | °C/W  |

Note

- (1) Non-repetitive current pulse above T<sub>A</sub> = 25 °C
- (2) Mounted on 5.0mm x 5.0mm Copper Pads to each terminal
- (3) 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

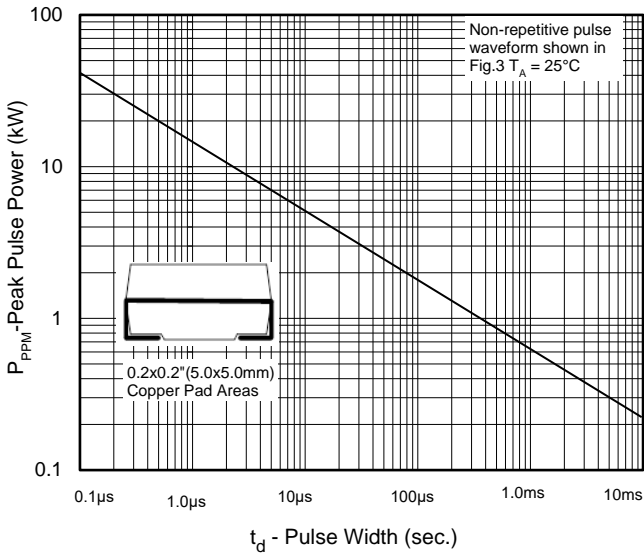
## ELECTRICAL CHARACTERISTICS

| PART NUMBER |           | MARKING CODE |    | TEST CURRENT IT (mA) | BREAKDOWN VOLTAGE VBR(V) @IT |        | REVERSE STAND-OFF VOLTAGE V <sub>RWM</sub> (V) | MAXIMUM CLAMPING VOLTAGE @I <sub>pp</sub> V <sub>c</sub> (V) | MAXIMUM PEAK PULSE CURRENT I <sub>pp</sub> (A) | MAXIMUM REVERSE LEAKAGE @ V <sub>RWM</sub> I <sub>r</sub> (μA) |
|-------------|-----------|--------------|----|----------------------|------------------------------|--------|--|--|--|--|
| UNI- POLAR  | BI-POLAR  | UNI          | BI |                      | MIN                          | MAX    |  |  |  |  |
| SMBJ5.0A    | SMBJ5.0CA | KE           | AE | 10                   | 6.40                         | 7.00   | 5.0  | 9.2  | 67.20  | 800.0  |
| SMBJ6.0A    | SMBJ6.0CA | KG           | AG | 10                   | 6.67                         | 7.37   | 6.0  | 10.3   | 60.00  | 800.0  |
| SMBJ6.5A    | SMBJ6.5CA | KK           | AK | 10                   | 7.22                         | 7.98   | 6.5  | 11.2   | 55.20  | 500.0  |
| SMBJ7.0A    | SMBJ7.0CA | KM           | AM | 10                   | 7.78                         | 8.60   | 7.0  | 12.0   | 51.50  | 200.0  |
| SMBJ7.5A    | SMBJ7.5CA | KP           | AP | 1                    | 8.33                         | 9.21   | 7.5  | 12.9   | 47.90  | 100.0  |
| SMBJ8.0A    | SMBJ8.0CA | KR           | AR | 1                    | 8.89                         | 9.83   | 8.0  | 13.6   | 45.40  | 50.0   |
| SMBJ8.5A    | SMBJ8.5CA | KT           | AT | 1                    | 9.44                         | 10.40  | 8.5  | 14.4   | 42.90  | 20.0   |
| SMBJ9.0A    | SMBJ9.0CA | KV           | AV | 1                    | 10.00                        | 11.10  | 9.0  | 15.4   | 40.10  | 10.0   |
| SMBJ10A     | SMBJ10CA  | KX           | AX | 1                    | 11.10                        | 12.30  | 10.0   | 17.0   | 36.40  | 5.0  |
| SMBJ11A     | SMBJ11CA  | KZ           | AZ | 1                    | 12.20                        | 13.50  | 11.0   | 18.2   | 34.00  | 1.0  |
| SMBJ12A     | SMBJ12CA  | LE           | BE | 1                    | 13.30                        | 14.70  | 12.0   | 19.9   | 31.10  | 1.0  |
| SMBJ13A     | SMBJ13CA  | LG           | BG | 1                    | 14.40                        | 15.90  | 13.0   | 21.5   | 28.70  | 1.0  |
| SMBJ14A     | SMBJ14CA  | LK           | BK | 1                    | 15.60                        | 17.20  | 14.0   | 23.2   | 26.60  | 1.0  |
| SMBJ15A     | SMBJ15CA  | LM           | BM | 1                    | 16.70                        | 18.50  | 15.0   | 24.4   | 25.30  | 1.0  |
| SMBJ16A     | SMBJ16CA  | LP           | BP | 1                    | 17.80                        | 19.70  | 16.0   | 26.0   | 23.80  | 1.0  |
| SMBJ17A     | SMBJ17CA  | LR           | BR | 1                    | 18.90                        | 20.90  | 17.0   | 27.6   | 22.40  | 1.0  |
| SMBJ18A     | SMBJ18CA  | LT           | BT | 1                    | 20.00                        | 22.10  | 18.0   | 29.2   | 21.20  | 1.0  |
| SMBJ20A     | SMBJ20CA  | LV           | BV | 1                    | 22.20                        | 24.50  | 20.0   | 32.4   | 19.10  | 1.0  |
| SMBJ22A     | SMBJ22CA  | LX           | BX | 1                    | 24.40                        | 26.90  | 22.0   | 35.5   | 17.40  | 1.0  |
| SMBJ24A     | SMBJ24CA  | LZ           | BZ | 1                    | 26.70                        | 29.50  | 24.0   | 38.9   | 15.90  | 1.0  |
| SMBJ26A     | SMBJ26CA  | ME           | CE | 1                    | 28.90                        | 31.90  | 26.0   | 42.1   | 14.70  | 1.0  |
| SMBJ28A     | SMBJ28CA  | MG           | CG | 1                    | 31.10                        | 34.40  | 28.0   | 45.4   | 13.60  | 1.0  |
| SMBJ30A     | SMBJ30CA  | MK           | CK | 1                    | 33.30                        | 36.80  | 30.0   | 48.4   | 12.80  | 1.0  |
| SMBJ33A     | SMBJ33CA  | MM           | CM | 1                    | 36.70                        | 40.60  | 33.0   | 53.3   | 11.60  | 1.0  |
| SMBJ36A     | SMBJ36CA  | MP           | CP | 1                    | 40.00                        | 44.20  | 36.0   | 58.1   | 10.60  | 1.0  |
| SMBJ40A     | SMBJ40CA  | MR           | CR | 1                    | 44.40                        | 49.10  | 40.0   | 64.5   | 9.60   | 1.0  |
| SMBJ43A     | SMBJ43CA  | MT           | CT | 1                    | 47.80                        | 52.80  | 43.0   | 69.4   | 8.90   | 1.0  |
| SMBJ45A     | SMBJ45CA  | MV           | CV | 1                    | 50.00                        | 55.30  | 45.0   | 72.7   | 8.50   | 1.0  |
| SMBJ48A     | SMBJ48CA  | MX           | CX | 1                    | 53.30                        | 58.90  | 48.0   | 77.4   | 8.00   | 1.0  |
| SMBJ51A     | SMBJ51CA  | MZ           | CZ | 1                    | 56.70                        | 62.70  | 51.0   | 82.4   | 7.50   | 1.0  |
| SMBJ54A     | SMBJ54CA  | NE           | DE | 1                    | 60.00                        | 66.30  | 54.0   | 87.1   | 7.10   | 1.0  |
| SMBJ58A     | SMBJ58CA  | NG           | DG | 1                    | 64.40                        | 71.20  | 58.0   | 93.6   | 6.60   | 1.0  |
| SMBJ60A     | SMBJ60CA  | NK           | DK | 1                    | 66.70                        | 73.70  | 60.0   | 96.8   | 6.40   | 1.0  |
| SMBJ64A     | SMBJ64CA  | NM           | DM | 1                    | 71.10                        | 78.60  | 64.0   | 103.0  | 6.00   | 1.0  |
| SMBJ70A     | SMBJ70CA  | NP           | DP | 1                    | 77.80                        | 86.00  | 70.0   | 113.0  | 5.50   | 1.0  |
| SMBJ75A     | SMBJ75CA  | NR           | DR | 1                    | 83.30                        | 92.10  | 75.0   | 121.0  | 5.10   | 1.0  |
| SMBJ78A     | SMBJ78CA  | NT           | DT | 1                    | 86.70                        | 95.80  | 78.0   | 126.0  | 4.90   | 1.0  |
| SMBJ85A     | SMBJ85CA  | NV           | DV | 1                    | 94.40                        | 104.00 | 85.0   | 137.0  | 4.50   | 1.0  |
| SMBJ90A     | SMBJ90CA  | NX           | DX | 1                    | 100.00                       | 111.00 | 90.0   | 146.0  | 4.20   | 1.0  |
| SMBJ100A    | SMBJ100CA | NZ           | DZ | 1                    | 111.00                       | 123.00 | 100.0  | 162.0  | 3.80   | 1.0  |
| SMBJ110A    | SMBJ110CA | PE           | EE | 1                    | 122.00                       | 135.00 | 110.0  | 177.0  | 3.50   | 1.0  |
| SMBJ120A    | SMBJ120CA | PG           | EG | 1                    | 133.00                       | 147.00 | 120.0  | 193.0  | 3.20   | 1.0  |
| SMBJ130A    | SMBJ130CA | PK           | EK | 1                    | 144.00                       | 159.00 | 130.0  | 209.0  | 3.00   | 1.0  |
| SMBJ150A    | SMBJ150CA | PM           | EM | 1                    | 167.00                       | 185.00 | 150.0  | 243.0  | 2.50   | 1.0  |
| SMBJ160A    | SMBJ160CA | PP           | EP | 1                    | 178.00                       | 197.00 | 160.0  | 259.0  | 2.35   | 1.0  |
| SMBJ170A    | SMBJ170CA | PR           | ER | 1                    | 189.00                       | 209.00 | 170.0  | 275.0  | 2.20   | 1.0  |
| SMBJ180A    | SMBJ180CA | PT           | ET | 1                    | 201.00                       | 222.00 | 180.0  | 292.0  | 2.10   | 1.0  |
| SMBJ200A    | SMBJ200CA | PV           | EV | 1                    | 224.00                       | 247.00 | 200.0  | 324.0  | 1.90   | 1.0  |
| SMBJ220A    | SMBJ220CA | PX           | EX | 1                    | 246.00                       | 272.00 | 220.0  | 356.0  | 1.70   | 1.0  |
| SMBJ250A    | SMBJ250CA | PZ           | EZ | 1                    | 279.00                       | 309.00 | 250.0  | 405.0  | 1.50   | 1.0  |
| SMBJ300A    | SMBJ300CA | QE           | FE | 1                    | 335.00                       | 371.00 | 300.0  | 486.0  | 1.30   | 1.0  |
| SMBJ350A    | SMBJ350CA | QG           | FG | 1                    | 391.00                       | 432.00 | 350.0  | 567.0  | 1.10   | 1.0  |
| SMBJ400A    | SMBJ400CA | QK           | FK | 1                    | 447.00                       | 494.00 | 400.0  | 648.0  | 0.93   | 1.0  |
| SMBJ440A    | SMBJ440CA | QM           | FM | 1                    | 492.00                       | 543.00 | 440.0  | 713.0  | 0.90   | 1.0  |

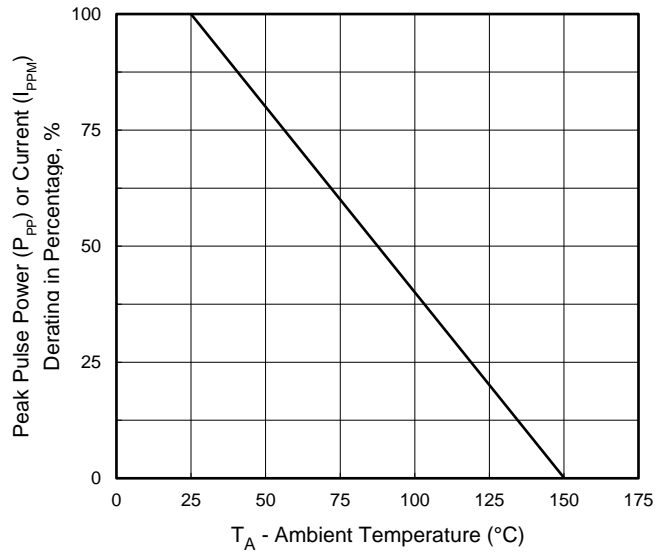
For bidirectional type having V<sub>rwm</sub> of 10 volts and less, the I<sub>r</sub> limit is double

## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25°C unless otherwise noted)

**Peak Pulse Power Rating**



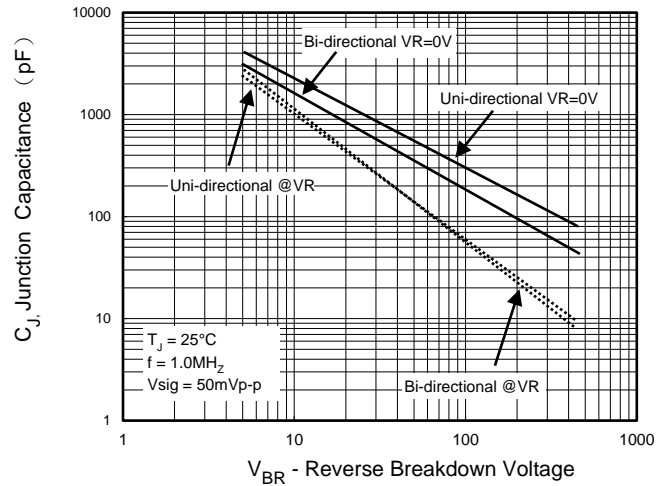
**Pulse Derating Curve**



**Pulse Waveform**



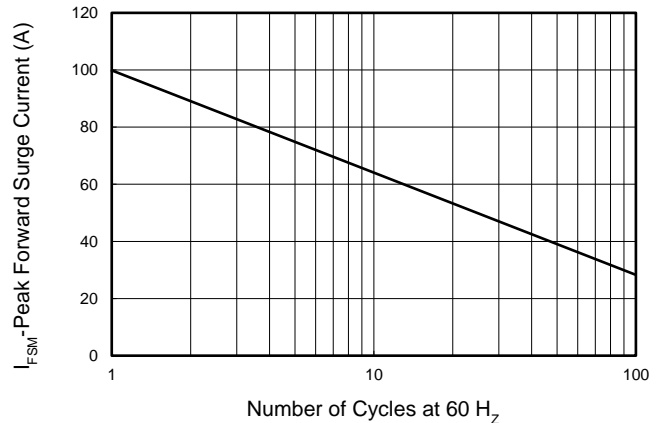
**Typical Junction Capacitance**



**Steady State Power Derating Curve**



**Maximum Non-repetitive Forward Surge current uni-directional only**



## Ordering Information

| Part Number | Quantity | Packing Option              | Component Package | Packing Specification |
|-------------|----------|-----------------------------|-------------------|-----------------------|
| SMBJxxxA    | 3000     | Tape & Reel - 12mm/13" tape | DO-214AA          | EIA STD RS-481        |



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant. Please visit [www.aosmd.com/media/AOSGreenPolicy.pdf](http://www.aosmd.com/media/AOSGreenPolicy.pdf) for additional information.

Note: Green Product means Pb-free, RoHS and Halogens free compliant.

| Part Number  | Part Marking  |
|--|---|
| <p><b>SMBJ XXX C A</b></p> <ul style="list-style-type: none"> <li>SERIES</li> <li>V<sub>r</sub> VOLTAGE</li> <li>BI-DIRECTIONAL</li> <li>Narrow V<sub>r</sub> VOLTAGE TOLERANCE</li> </ul> | <p>Cathode Band</p> <p>Logo</p> <p>Marking Code<br/>Date Code</p> |

## LEGAL DISCLAIMER

APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO MAKE CHANGES TO PRODUCT SPECIFICATIONS WITHOUT NOTICE. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO EVALUATE SUITABILITY OF THE PRODUCT FOR THEIR INTENDED APPLICATION. CUSTOMER SHALL COMPLY WITH APPLICABLE LEGAL REQUIREMENTS, INCLUDING ALL APPLICABLE EXPORT CONTROL RULES, REGULATIONS AND LIMITATIONS.

AOS' products are provided subject to AOS' terms and conditions of sale which are set forth at: [http://www.aosmd.com/terms\\_and\\_conditions\\_of\\_sale](http://www.aosmd.com/terms_and_conditions_of_sale)

## LIFE SUPPORT POLICY

ALPHA AND OMEGA SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.