

### 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        |



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| Part Number                | Part Marking |
|----------------------------|--------------|
| <p><b>SMBJ XXX C A</b></p> |              |

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