


### DO-214AC (SMA J-Bend)



Dimensions in inches and(millimeters)

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

| PRIMARY CHARACTERISTICS |                                  |
|-------------------------|----------------------------------|
| VRWM                    | 5.0V to 440V                     |
| VBR                     | 6.4V to 543V                     |
| PPPM                    | ≥400W                            |
| TJ max                  | 150°C                            |
| Polarity                | Uni-directional & Bi-directional |
| Package                 | DO-214AC                         |

### FEATURES

- For surface mounted applications in order to optimize board space
- Typical maximum temperature coefficient  $\Delta VBR=0.1\% \times VBR @ 25^{\circ}C \times \Delta T$
- 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-214AC. 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 SMAJ5.0 thru types SMAJ440 (e.g. SMAJ5.0A , SMAJ440CA)
- Electrical characteristics apply in both direction

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

| Parameter   | Symbol           | Value          | Unit  |
|---|------------------|----------------|-------|
| Peak Pulse Power Dissipation on 10/1000µs waveform (Note 1, 2)    | PPPM             | ≥400           | Watts |
| Peak Pulse Current of on 10/1000µs waveform (Note 1)              | IPPM             | See Next Table | Amps  |
| Peak Forward Surge Current,8.3ms Single Half Sine-Wave(Note 2, 3) | IFSM             | 40             | Amps  |
| Operating junction and Storage Temperature Range                  | TJ TSTG          | -55 to +150    | °C    |
| Typical Thermal Resistance Junction to Lead                       | R <sub>θJL</sub> | 30             | °C/W  |
| Typical Thermal Resistance Junction to Ambient                    | R <sub>θJA</sub> | 120            | °C/W  |

Note

- (1) Non-repetitive current pulse above T<sub>A</sub> = 25 °C
- (2) Mounted on 8.0mm x 8.0mm 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<br>I <sub>T</sub> (mA) | BREAKDOWN VOLTAGE<br>V <sub>BR</sub> (V) @I <sub>T</sub> |        | REVERSE STAND-OFF VOLTAGE<br>V <sub>RWM</sub> (V) | MAXIMUM CLAMPING VOLTAGE<br>@I <sub>pp</sub> V <sub>c</sub> (V) | MAXIMUM PEAK PULSE CURRENT<br>I <sub>pp</sub> (A) | MAXIMUM REVERSE LEAKAGE<br>@ V <sub>RWM</sub><br>I <sub>R</sub> (μA) |
|-------------|-----------|--------------|----|-------------------------------------|--|--------|---|---|---|--|
| UNI- POLAR  | BI-POLAR  | UNI          | BI |                                     | MIN  | MAX    |   |   |   |  |
| SMAJ5.0A    | SMAJ5.0CA | AE           | WE | 10                                  | 6.40   | 7.00   | 5.0   | 9.2   | 43.5  | 800.0  |
| SMAJ6.0A    | SMAJ6.0CA | AG           | WG | 10                                  | 6.67   | 7.37   | 6.0   | 10.3  | 38.8  | 800.0  |
| SMAJ6.5A    | SMAJ6.5CA | AK           | WK | 10                                  | 7.22   | 7.98   | 6.5   | 11.2  | 35.7  | 500.0  |
| SMAJ7.0A    | SMAJ7.0CA | AM           | WM | 10                                  | 7.78   | 8.60   | 7.0   | 12.0  | 33.3  | 200.0  |
| SMAJ7.5A    | SMAJ7.5CA | AP           | WP | 1                                   | 8.33   | 9.21   | 7.5   | 12.9  | 31.0  | 100.0  |
| SMAJ8.0A    | SMAJ8.0CA | AR           | WR | 1                                   | 8.89   | 9.83   | 8.0   | 13.6  | 29.4  | 50.0   |
| SMAJ8.5A    | SMAJ8.5CA | AT           | WT | 1                                   | 9.44   | 10.40  | 8.5   | 14.4  | 27.8  | 20.0   |
| SMAJ9.0A    | SMAJ9.0CA | AV           | VV | 1                                   | 10.00  | 11.10  | 9.0   | 15.4  | 26.0  | 10.0   |
| SMAJ10A     | SMAJ10CA  | AX           | WX | 1                                   | 11.10  | 12.30  | 10.0  | 17.0  | 23.5  | 5.0  |
| SMAJ11A     | SMAJ11CA  | AZ           | WZ | 1                                   | 12.20  | 13.50  | 11.0  | 18.2  | 22.0  | 1.0  |
| SMAJ12A     | SMAJ12CA  | BE           | XE | 1                                   | 13.30  | 14.70  | 12.0  | 19.9  | 20.1  | 1.0  |
| SMAJ13A     | SMAJ13CA  | BG           | XG | 1                                   | 14.40  | 15.90  | 13.0  | 21.5  | 18.6  | 1.0  |
| SMAJ14A     | SMAJ14CA  | BK           | XK | 1                                   | 15.60  | 17.20  | 14.0  | 23.2  | 17.2  | 1.0  |
| SMAJ15A     | SMAJ15CA  | BM           | XM | 1                                   | 16.70  | 18.50  | 15.0  | 24.4  | 16.4  | 1.0  |
| SMAJ16A     | SMAJ16CA  | BP           | XP | 1                                   | 17.80  | 19.70  | 16.0  | 26.0  | 15.4  | 1.0  |
| SMAJ17A     | SMAJ17CA  | BR           | XR | 1                                   | 18.90  | 20.90  | 17.0  | 27.6  | 14.5  | 1.0  |
| SMAJ18A     | SMAJ18CA  | BT           | XT | 1                                   | 20.00  | 22.10  | 18.0  | 29.2  | 13.7  | 1.0  |
| SMAJ20A     | SMAJ20CA  | BV           | XV | 1                                   | 22.20  | 24.50  | 20.0  | 32.4  | 12.3  | 1.0  |
| SMAJ22A     | SMAJ22CA  | BX           | XX | 1                                   | 24.40  | 26.90  | 22.0  | 35.5  | 11.3  | 1.0  |
| SMAJ24A     | SMAJ24CA  | BZ           | XZ | 1                                   | 26.70  | 29.50  | 24.0  | 38.9  | 10.3  | 1.0  |
| SMAJ26A     | SMAJ26CA  | CE           | YE | 1                                   | 28.90  | 31.90  | 26.0  | 42.1  | 9.5   | 1.0  |
| SMAJ28A     | SMAJ28CA  | CG           | YG | 1                                   | 31.10  | 34.40  | 28.0  | 45.4  | 8.8   | 1.0  |
| SMAJ30A     | SMAJ30CA  | CK           | YK | 1                                   | 33.30  | 36.80  | 30.0  | 48.4  | 8.3   | 1.0  |
| SMAJ33A     | SMAJ33CA  | CM           | YM | 1                                   | 36.70  | 40.60  | 33.0  | 53.3  | 7.5   | 1.0  |
| SMAJ36A     | SMAJ36CA  | CP           | YP | 1                                   | 40.00  | 44.20  | 36.0  | 58.1  | 6.9   | 1.0  |
| SMAJ40A     | SMAJ40CA  | CR           | YR | 1                                   | 44.40  | 49.10  | 40.0  | 64.5  | 6.2   | 1.0  |
| SMAJ43A     | SMAJ43CA  | CT           | YT | 1                                   | 47.80  | 52.80  | 43.0  | 69.4  | 5.8   | 1.0  |
| SMAJ45A     | SMAJ45CA  | CV           | YV | 1                                   | 50.00  | 55.30  | 45.0  | 72.7  | 5.5   | 1.0  |
| SMAJ48A     | SMAJ48CA  | CX           | YX | 1                                   | 53.30  | 58.90  | 48.0  | 77.4  | 5.2   | 1.0  |
| SMAJ51A     | SMAJ51CA  | CZ           | YZ | 1                                   | 56.70  | 62.70  | 51.0  | 82.4  | 4.9   | 1.0  |
| SMAJ54A     | SMAJ54CA  | RE           | ZE | 1                                   | 60.00  | 66.30  | 54.0  | 87.1  | 4.6   | 1.0  |
| SMAJ58A     | SMAJ58CA  | RG           | ZG | 1                                   | 64.40  | 71.20  | 58.0  | 93.6  | 4.3   | 1.0  |
| SMAJ60A     | SMAJ60CA  | RK           | ZK | 1                                   | 66.70  | 73.70  | 60.0  | 96.8  | 4.1   | 1.0  |
| SMAJ64A     | SMAJ64CA  | RM           | ZM | 1                                   | 71.10  | 78.60  | 64.0  | 103.0   | 3.9   | 1.0  |
| SMAJ70A     | SMAJ70CA  | RP           | ZP | 1                                   | 77.80  | 86.00  | 70.0  | 113.0   | 3.5   | 1.0  |
| SMAJ75A     | SMAJ75CA  | RR           | ZR | 1                                   | 83.30  | 92.10  | 75.0  | 121.0   | 3.3   | 1.0  |
| SMAJ78A     | SMAJ78CA  | RT           | ZT | 1                                   | 86.70  | 95.80  | 78.0  | 126.0   | 3.2   | 1.0  |
| SMAJ85A     | SMAJ85CA  | RV           | ZV | 1                                   | 94.40  | 104.00 | 85.0  | 137.0   | 2.9   | 1.0  |
| SMAJ90A     | SMAJ90CA  | RX           | ZX | 1                                   | 100.00   | 111.00 | 90.0  | 146.0   | 2.7   | 1.0  |
| SMAJ100A    | SMAJ100CA | RZ           | ZZ | 1                                   | 111.00   | 123.00 | 100.0   | 162.0   | 2.5   | 1.0  |
| SMAJ110A    | SMAJ110CA | SE           | VE | 1                                   | 122.00   | 135.00 | 110.0   | 177.0   | 2.3   | 1.0  |
| SMAJ120A    | SMAJ120CA | SG           | VG | 1                                   | 133.00   | 147.00 | 120.0   | 193.0   | 2.1   | 1.0  |
| SMAJ130A    | SMAJ130CA | SK           | VK | 1                                   | 144.00   | 159.00 | 130.0   | 209.0   | 1.9   | 1.0  |
| SMAJ150A    | SMAJ150CA | SM           | VM | 1                                   | 167.00   | 185.00 | 150.0   | 243.0   | 1.6   | 1.0  |
| SMAJ160A    | SMAJ160CA | SP           | VP | 1                                   | 178.00   | 197.00 | 160.0   | 259.0   | 1.5   | 1.0  |
| SMAJ170A    | SMAJ170CA | SR           | VR | 1                                   | 189.00   | 209.00 | 170.0   | 275.0   | 1.5   | 1.0  |
| SMAJ180A    | SMAJ180CA | ST           | VT | 1                                   | 201.00   | 222.00 | 180.0   | 292.0   | 1.4   | 1.0  |
| SMAJ200A    | SMAJ200CA | SV           | VV | 1                                   | 224.00   | 247.00 | 200.0   | 324.0   | 1.2   | 1.0  |
| SMAJ220A    | SMAJ220CA | SX           | VX | 1                                   | 246.00   | 272.00 | 220.0   | 356.0   | 1.1   | 1.0  |
| SMAJ250A    | SMAJ250CA | SZ           | VZ | 1                                   | 279.00   | 309.00 | 250.0   | 405.0   | 1   | 1.0  |
| SMAJ300A    | SMAJ300CA | TE           | UE | 1                                   | 335.00   | 371.00 | 300.0   | 486.0   | 0.8   | 1.0  |
| SMAJ350A    | SMAJ350CA | TG           | UG | 1                                   | 391.00   | 432.00 | 350.0   | 567.0   | 0.7   | 1.0  |
| SMAJ400A    | SMAJ400CA | TK           | UK | 1                                   | 447.00   | 494.00 | 400.0   | 648.0   | 0.6   | 1.0  |
| SMAJ440A    | SMAJ440CA | TM           | UM | 1                                   | 492.00   | 543.00 | 440.0   | 713.0   | 0.6   | 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 ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

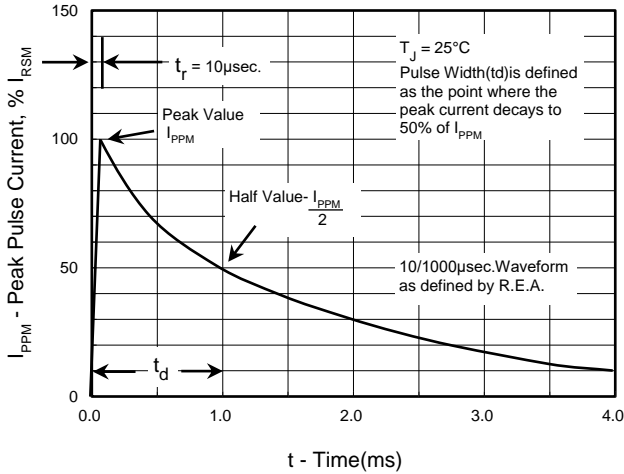
**Peak Pulse Power Rating**



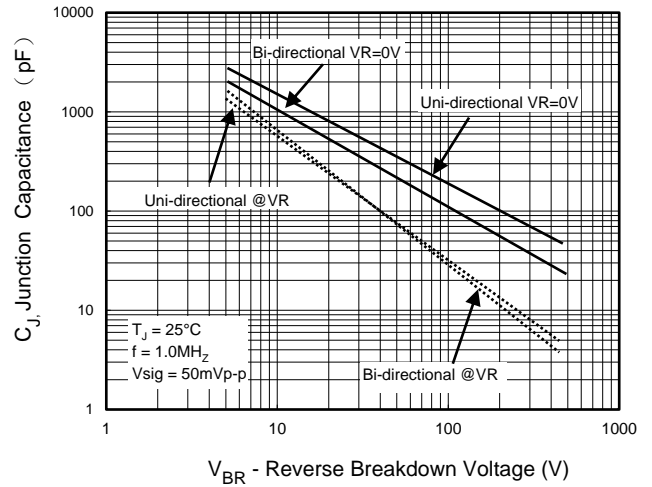
**Pulse Derating Curve**



**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 |
|-------------|----------|-----------------------------|-------------------|-----------------------|
| SMAJxxxA    | 5000     | Tape & Reel - 12mm/13" tape | DO-214AC          | 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>SMAJ 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 (XXYW)</p> <p>Date Code</p> |

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