

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 _{θJL} | 30 | °C/W |
| Typical Thermal Resistance Junction to Ambient | R _{θJA} | 120 | °C/W |

Note

- (1) Non-repetitive current pulse above T_A = 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.

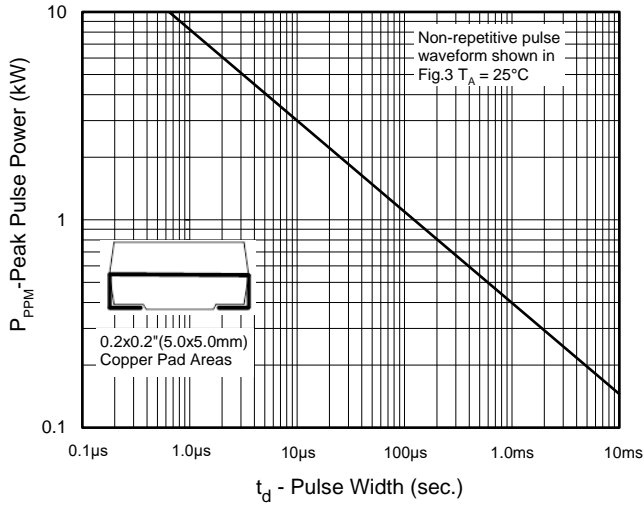
ELECTRICAL CHARACTERISTICS

| PART NUMBER | | MARKING CODE | | TEST CURRENT I _T (mA) | BREAKDOWN VOLTAGE V _{BR} (V) @I _T | | REVERSE STAND-OFF VOLTAGE V _{RWM} (V) | MAXIMUM CLAMPING VOLTAGE @I _{pp} V _c (V) | MAXIMUM PEAK PULSE CURRENT I _{pp} (A) | MAXIMUM REVERSE LEAKAGE @ V _{RWM} I _R (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 |

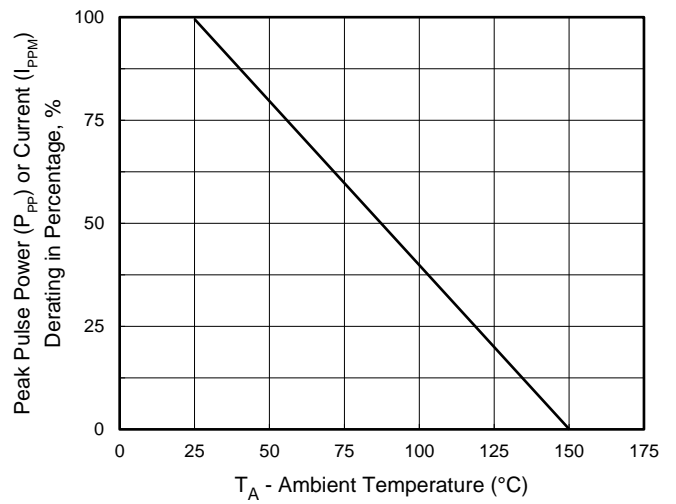
For bidirectional type having V_{rwm} of 10 volts and less, the I_R limit is double

RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

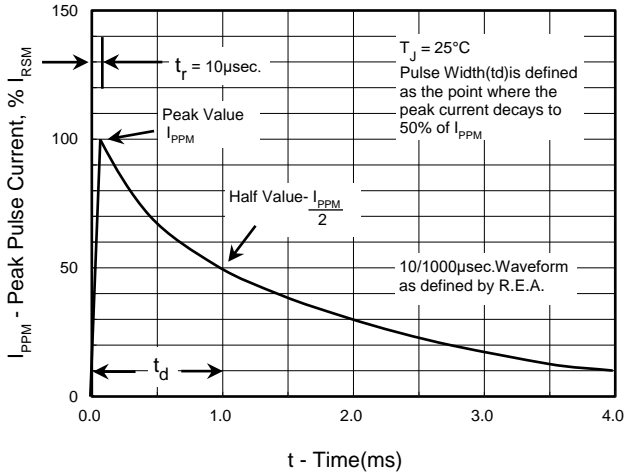
Peak Pulse Power Rating



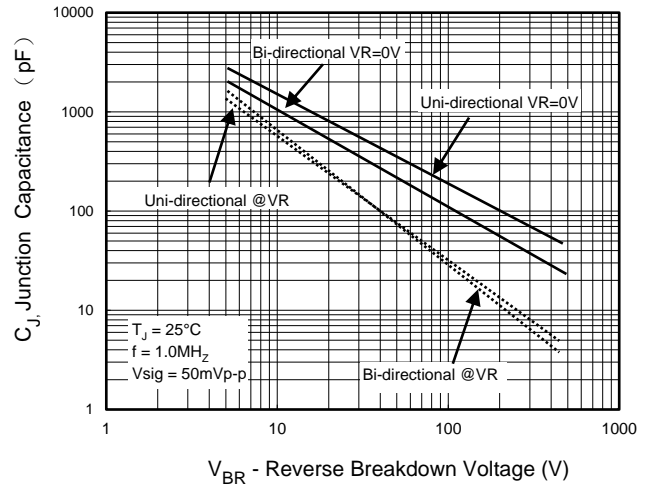
Pulse Derating Curve



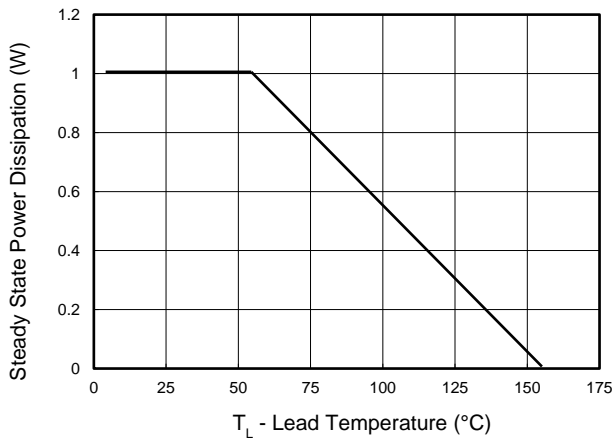
Pulse Waveform



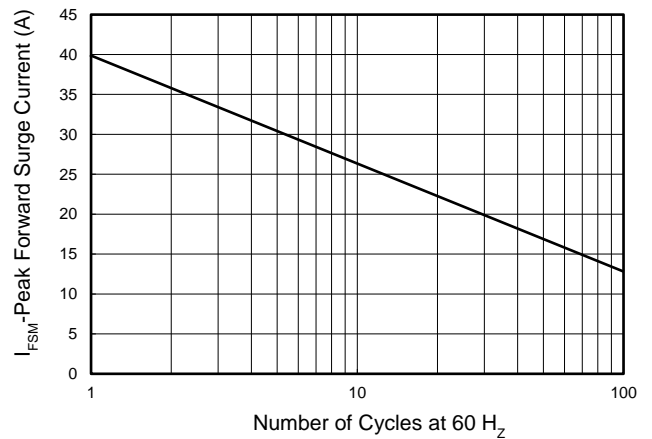
Typical Junction Capacitance



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 |



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

| Part Number | Part Marking |
|--|---|
| <p>SMAJ XXX C A</p> <ul style="list-style-type: none"> SERIES V_r VOLTAGE BI-DIRECTIONAL Narrow V_r VOLTAGE TOLERANCE | <p>Cathode Band</p> <p>Logo</p> <p>Marking Code (XXYW)</p> <p>Date Code</p> |

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