

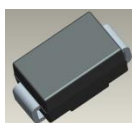
## Features

- 400W Peak Pulse Power Dissipation
- Glass Passivated Die Construction
- Unidirectional and Bidirectional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An Automotive- Compliant Part is Available Under Separate Datasheet ([SMAJ5.0\(C\)AQ-SMAJ200\(C\)AQ](#))**

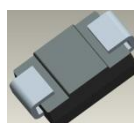
## Mechanical Data

- Case: SMA
- 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)**
- Polarity Indicator: Cathode Band (Bi-Directional Devices do not Have a Polarity Indicator)
- Weight: 0.064 grams (Approximate)

### SMA



Top View



Bottom View

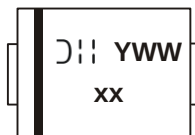
## Ordering Information (Note 4)

| Part Number      | Compliance | Case | Packaging        |
|------------------|------------|------|------------------|
| SMAJXXX(C)A-13-F | Standard   | SMA  | 5000/Tape & Reel |

\*x = Device Voltage, Example: SMAJ170A-13-F

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> 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



xx = Product Type Marking Code  
(See Electrical Characteristics Table)  
DII = Manufacturers' Code Marking  
YWW = Date Code Marking  
Y = Last Digit of Year (ex: 9 for 2019)  
WW = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic                                                                                               | Symbol             | Value | Unit |
|--------------------------------------------------------------------------------------------------------------|--------------------|-------|------|
| Peak Pulse Power Dissipation<br>(Non-Repetitive Current Pulse Derated above T <sub>A</sub> = +25°C) (Note 5) | P <sub>PK</sub>    | 400   | W    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Superimposed<br>on Rated Load (Notes 5, 6 and 7)     | I <sub>FSM</sub>   | 40    | A    |
| Steady State Power Dissipation @ T <sub>L</sub> = +75°C                                                      | PM <sub>(AV)</sub> | 1.0   | W    |
| Instantaneous Forward Voltage @ I <sub>FP</sub> = 35A (Notes 5, 6, and 7)                                    | V <sub>F</sub>     | 3.5   | V    |

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.

**Thermal Characteristics**

| Characteristic              | Symbol           | Value       | Unit |
|-----------------------------|------------------|-------------|------|
| Operating Temperature Range | T <sub>J</sub>   | -55 to +150 | °C   |
| Storage Temperature Range   | T <sub>STG</sub> | -55 to +175 | °C   |

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

| Part Number<br>Add C For<br>Bidirectional<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 |      |
|-------------------------------------------------------|--------------------------------|-------------------------------------------------------------------|---------|---------------------|---------------------------------------------------------|--------------------------------------------|-----------------------------------------------|--------------|------|
|                                                       | 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- |
| SMAJ5.0(C)A                                           | 5.0                            | 6.40                                                              | 7.25    | 10                  | 800                                                     | 9.2                                        | 43.5                                          | TE           | HE   |
| SMAJ6.0(C)A                                           | 6.0                            | 6.67                                                              | 7.37    | 10                  | 800                                                     | 10.3                                       | 38.8                                          | TG           | HG   |
| SMAJ6.5(C)A                                           | 6.5                            | 7.22                                                              | 7.98    | 10                  | 500                                                     | 11.2                                       | 35.7                                          | TK           | HK   |
| SMAJ7.0(C)A                                           | 7.0                            | 7.78                                                              | 8.60    | 10                  | 200                                                     | 12.0                                       | 33.3                                          | TM           | HM   |
| SMAJ7.5(C)A                                           | 7.5                            | 8.33                                                              | 9.21    | 1.0                 | 100                                                     | 12.9                                       | 31.0                                          | TP           | HP   |
| SMAJ8.0(C)A                                           | 8.0                            | 8.89                                                              | 9.83    | 1.0                 | 50                                                      | 13.6                                       | 29.4                                          | TR           | HR   |
| SMAJ8.5(C)A                                           | 8.5                            | 9.44                                                              | 10.4    | 1.0                 | 10                                                      | 14.4                                       | 27.7                                          | TT           | HT   |
| SMAJ9.0(C)A                                           | 9.0                            | 10.0                                                              | 11.1    | 1.0                 | 5.0                                                     | 15.4                                       | 26.0                                          | TV           | HV   |
| SMAJ10(C)A                                            | 10                             | 11.1                                                              | 12.3    | 1.0                 | 5.0                                                     | 17.0                                       | 23.5                                          | TX           | HX   |
| SMAJ11(C)A                                            | 11                             | 12.2                                                              | 13.5    | 1.0                 | 5.0                                                     | 18.2                                       | 22.0                                          | TZ           | HZ   |
| SMAJ12(C)A                                            | 12                             | 13.3                                                              | 14.7    | 1.0                 | 5.0                                                     | 19.9                                       | 20.1                                          | UE           | IE   |
| SMAJ13(C)A                                            | 13                             | 14.4                                                              | 15.9    | 1.0                 | 5.0                                                     | 21.5                                       | 18.6                                          | UG           | IG   |
| SMAJ14(C)A                                            | 14                             | 15.6                                                              | 17.2    | 1.0                 | 5.0                                                     | 23.2                                       | 17.2                                          | UK           | IK   |
| SMAJ15(C)A                                            | 15                             | 16.7                                                              | 18.5    | 1.0                 | 5.0                                                     | 24.4                                       | 16.4                                          | UM           | IM   |
| SMAJ16(C)A                                            | 16                             | 17.8                                                              | 19.7    | 1.0                 | 5.0                                                     | 26.0                                       | 15.3                                          | UP           | IP   |
| SMAJ17(C)A                                            | 17                             | 18.9                                                              | 20.9    | 1.0                 | 5.0                                                     | 27.6                                       | 14.5                                          | UR           | IR   |
| SMAJ18(C)A                                            | 18                             | 20.0                                                              | 22.1    | 1.0                 | 5.0                                                     | 29.2                                       | 13.7                                          | UT           | IT   |
| SMAJ20(C)A                                            | 20                             | 22.2                                                              | 24.5    | 1.0                 | 5.0                                                     | 32.4                                       | 12.3                                          | UV           | IV   |
| SMAJ22(C)A                                            | 22                             | 24.4                                                              | 26.9    | 1.0                 | 5.0                                                     | 35.5                                       | 11.2                                          | UX           | IX   |
| SMAJ24(C)A                                            | 24                             | 26.7                                                              | 29.5    | 1.0                 | 5.0                                                     | 38.9                                       | 10.3                                          | UZ           | IZ   |
| SMAJ26(C)A                                            | 26                             | 28.9                                                              | 31.9    | 1.0                 | 5.0                                                     | 42.1                                       | 9.5                                           | VE           | JE   |
| SMAJ28(C)A                                            | 28                             | 31.1                                                              | 34.4    | 1.0                 | 5.0                                                     | 45.4                                       | 8.8                                           | VG           | JG   |
| SMAJ30(C)A                                            | 30                             | 33.3                                                              | 36.8    | 1.0                 | 5.0                                                     | 48.4                                       | 8.3                                           | VK           | JK   |
| SMAJ33(C)A                                            | 33                             | 36.7                                                              | 40.6    | 1.0                 | 5.0                                                     | 53.3                                       | 7.5                                           | VM           | JM   |
| SMAJ36(C)A                                            | 36                             | 40.0                                                              | 44.2    | 1.0                 | 5.0                                                     | 58.1                                       | 6.9                                           | VP           | JP   |
| SMAJ40(C)A                                            | 40                             | 44.4                                                              | 49.1    | 1.0                 | 5.0                                                     | 64.5                                       | 6.2                                           | VR           | JR   |
| SMAJ43(C)A                                            | 43                             | 47.8                                                              | 52.8    | 1.0                 | 5.0                                                     | 69.4                                       | 5.7                                           | VT           | JT   |
| SMAJ45(C)A                                            | 45                             | 50.0                                                              | 55.3    | 1.0                 | 5.0                                                     | 72.7                                       | 5.5                                           | VV           | JV   |
| SMAJ48(C)A                                            | 48                             | 53.3                                                              | 58.9    | 1.0                 | 5.0                                                     | 77.4                                       | 5.2                                           | VX           | JX   |
| SMAJ51(C)A                                            | 51                             | 56.7                                                              | 62.7    | 1.0                 | 5.0                                                     | 82.4                                       | 4.9                                           | VZ           | JZ   |
| SMAJ54(C)A                                            | 54                             | 60.0                                                              | 66.3    | 1.0                 | 5.0                                                     | 87.1                                       | 4.6                                           | WE           | RE   |
| SMAJ58(C)A                                            | 58                             | 64.4                                                              | 71.2    | 1.0                 | 5.0                                                     | 93.6                                       | 4.3                                           | WG           | RG   |
| SMAJ60(C)A                                            | 60                             | 66.7                                                              | 73.7    | 1.0                 | 5.0                                                     | 96.8                                       | 4.1                                           | WK           | RK   |
| SMAJ64(C)A                                            | 64                             | 71.1                                                              | 78.6    | 1.0                 | 5.0                                                     | 103                                        | 3.9                                           | WM           | RM   |
| SMAJ70(C)A                                            | 70                             | 77.8                                                              | 86.0    | 1.0                 | 5.0                                                     | 113                                        | 3.5                                           | WP           | RP   |
| SMAJ75(C)A                                            | 75                             | 83.3                                                              | 92.1    | 1.0                 | 5.0                                                     | 121                                        | 3.3                                           | WR           | RR   |
| SMAJ78(C)A                                            | 78                             | 86.7                                                              | 95.8    | 1.0                 | 5.0                                                     | 126                                        | 3.2                                           | WT           | RT   |
| SMAJ85(C)A                                            | 85                             | 94.4                                                              | 104     | 1.0                 | 5.0                                                     | 137                                        | 2.9                                           | WV           | RV   |
| SMAJ90(C)A                                            | 90                             | 100                                                               | 111     | 1.0                 | 5.0                                                     | 146                                        | 2.7                                           | WX           | RX   |
| SMAJ100(C)A                                           | 100                            | 111                                                               | 123     | 1.0                 | 5.0                                                     | 162                                        | 2.5                                           | WZ           | RZ   |
| SMAJ110(C)A                                           | 110                            | 122                                                               | 135     | 1.0                 | 5.0                                                     | 177                                        | 2.3                                           | XE           | SE   |
| SMAJ120(C)A                                           | 120                            | 133                                                               | 147     | 1.0                 | 5.0                                                     | 193                                        | 2.0                                           | XG           | SG   |
| SMAJ130(C)A                                           | 130                            | 144                                                               | 159     | 1.0                 | 5.0                                                     | 209                                        | 1.9                                           | XK           | SK   |
| SMAJ150(C)A                                           | 150                            | 167                                                               | 185     | 1.0                 | 5.0                                                     | 243                                        | 1.6                                           | XM           | SM   |
| SMAJ160(C)A                                           | 160                            | 178                                                               | 197     | 1.0                 | 5.0                                                     | 259                                        | 1.5                                           | XP           | SP   |
| SMAJ170(C)A                                           | 170                            | 189                                                               | 209     | 1.0                 | 5.0                                                     | 275                                        | 1.4                                           | XR           | SR   |
| SMAJ200(C)A                                           | 200                            | 224                                                               | 248     | 1.0                 | 1.0                                                     | 324                                        | 1.2                                           | YT           | ST   |

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

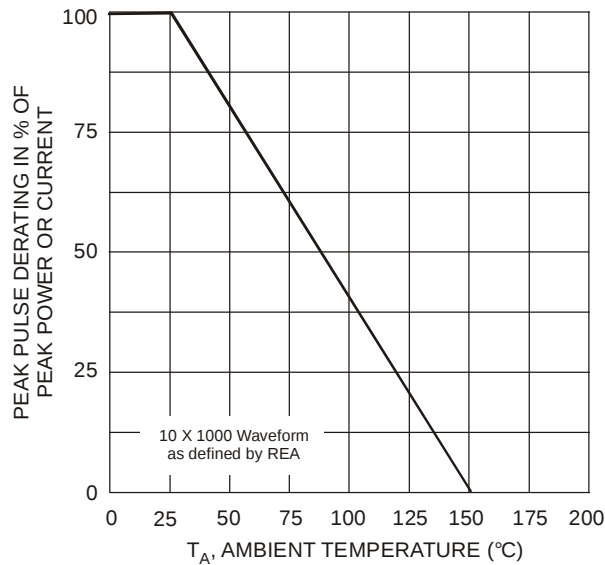


Fig. 1 Pulse Derating Curve

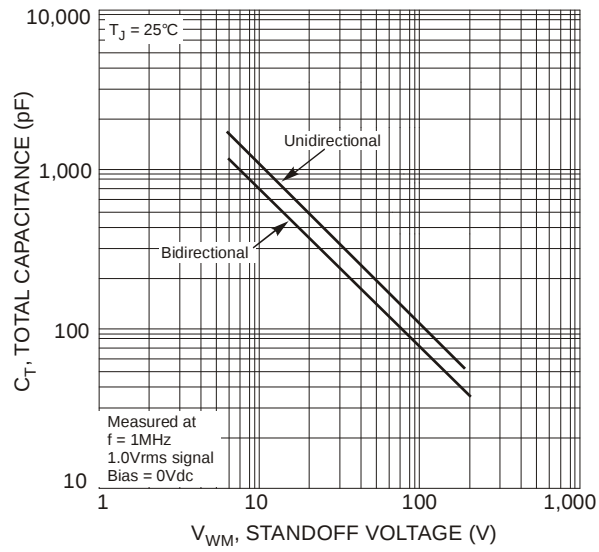


Fig. 2 Typical Total Capacitance

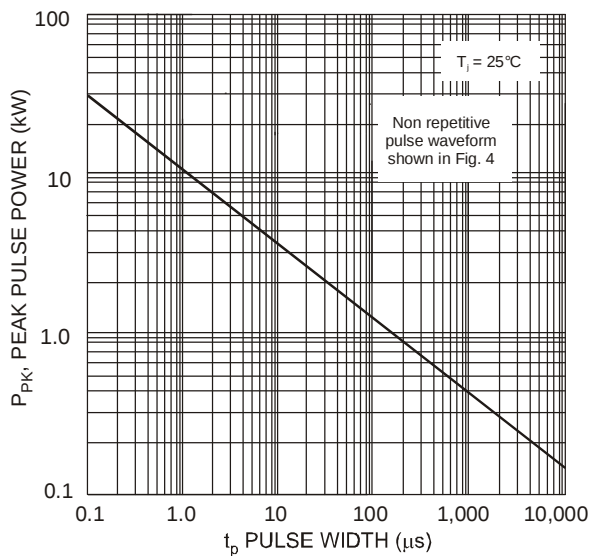


Fig. 3 Pulse Rating Curve

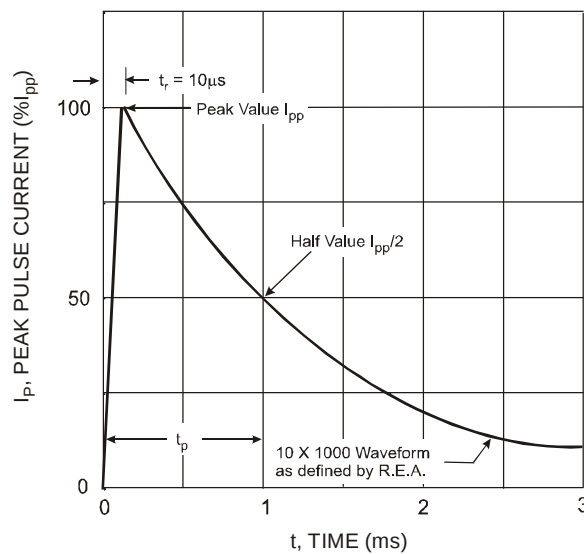


Fig. 4 Pulse Waveform

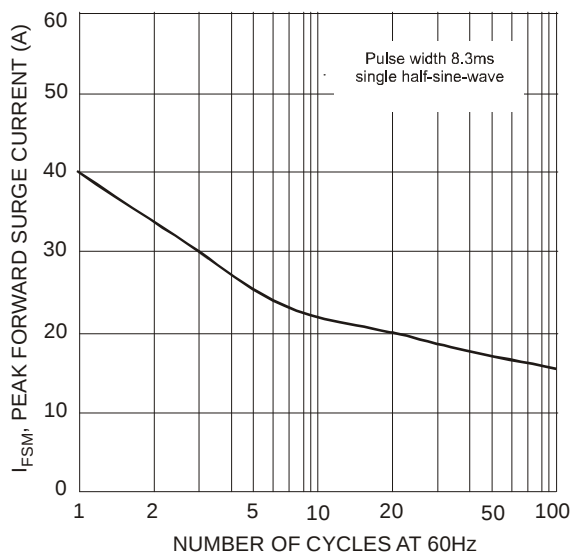


Fig. 5 Maximum Non-Repetitive Surge Current

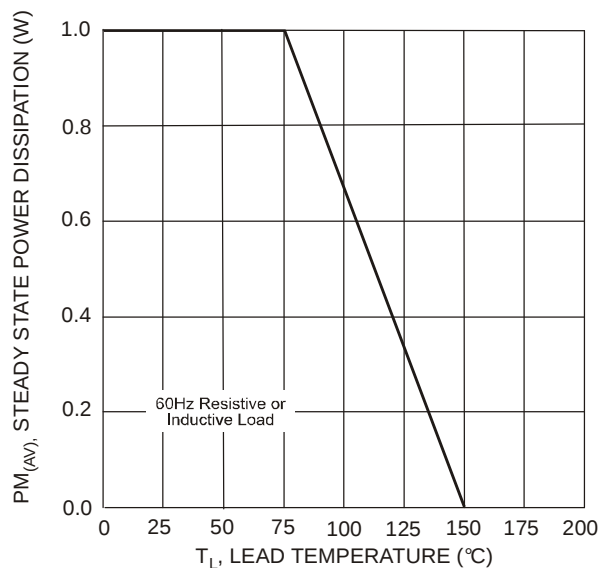
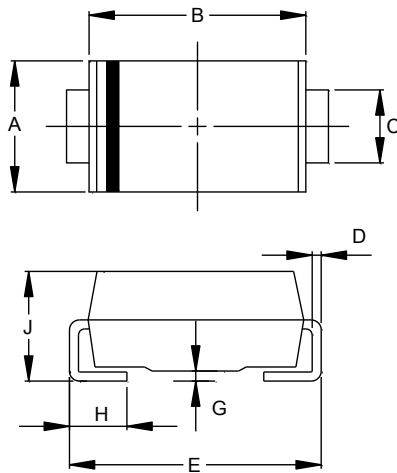


Fig. 6 Steady State Power Derating Curve

## Package Outline Dimensions

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

### SMA

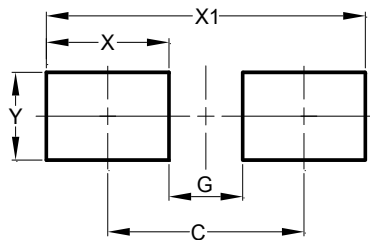


| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 1.96 | 2.40 |
| All Dimensions in mm |      |      |

## Suggested Pad Layout

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

### SMA



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 4.00          |
| G          | 1.50          |
| X          | 2.50          |
| X1         | 6.50          |
| Y          | 1.70          |

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2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

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