

## 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 (Note 1)**
- **Green Molding Compound (No Halogen and Antimony) (Note 2)**

## 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
- Polarity Indicator: Cathode Band (Note: Bi-directional devices have no polarity indicator.)
- Weight: 0.064 grams (approximate)



Top View



Bottom View

## Ordering Information (Note 3)

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

\*x = Device Voltage, e.g., SMCJ170A-13-F. Example: SMAJ170A-13-F.

- Notes:
1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see EU Directive 2002/95/EC Annex Notes
  2. Product manufactured with Date Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
  3. For packaging details, go to our website at <http://www.diodes.com>.

## 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: 2 for 2002)  
 WW = Week code (01 to 53)

## Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic  | Symbol      | Value | Unit |
|---|-------------|-------|------|
| Peak Pulse Power Dissipation<br>(Non repetitive current pulse derated above $T_A = 25^\circ\text{C}$ ) (Note 4) | $P_{PK}$    | 400   | W    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave<br>Superimposed on Rated Load (Notes 4, 5 & 6)          | $I_{FSM}$   | 40    | A    |
| Steady State Power Dissipation @ $T_L = 75^\circ\text{C}$   | $PM_{(AV)}$ | 1.0   | W    |
| Instantaneous Forward Voltage @ $I_{PP} = 35\text{A}$<br>(Notes 4, 5, & 6)                                      | $V_F$       | 3.5   | V    |

- Notes:
4. Valid provided that terminals are kept at ambient temperature.
  5. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
  6. Unidirectional units only.

## Thermal Characteristics

| Characteristic              | Symbol    | Value       | Unit             |
|-----------------------------|-----------|-------------|------------------|
| Operating Temperature Range | $T_J$     | -55 to +150 | $^\circ\text{C}$ |
| Storage Temperature Range   | $T_{STG}$ | -55 to +175 | $^\circ\text{C}$ |

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

| Part Number<br>Add C For<br>Bidirectional<br>(Note 7) | Reverse<br>Standoff<br>Voltage<br>V <sub>RWM</sub> (V) | Breakdown<br>Voltage<br>V <sub>BR</sub> @ I <sub>T</sub> (Note 8) |         | Test<br>Current<br>I <sub>T</sub> (mA) | Max. Reverse<br>Leakage @ V <sub>RWM</sub><br>(Note 9)<br>I <sub>R</sub> (μA) | Max. Clamping<br>Voltage @ I <sub>pp</sub><br>V <sub>C</sub> (V) | Max. Peak Pulse<br>Current<br>I <sub>pp</sub><br>(A) | Marking Code |      |
|---|--|---|---------|--|---|--|--|--------------|------|
|   |  | Min (V)   | Max (V) |  |   |  |  | 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  | 2.2  | 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:
7. Suffix C denotes Bi-directional device.
  8. V<sub>BR</sub> measured with I<sub>T</sub> current pulse = 300μs
  9. For Bidirectional devices having V<sub>RWM</sub> of 10V and under, the I<sub>R</sub> is doubled.



Fig. 1 Pulse Derating Curve

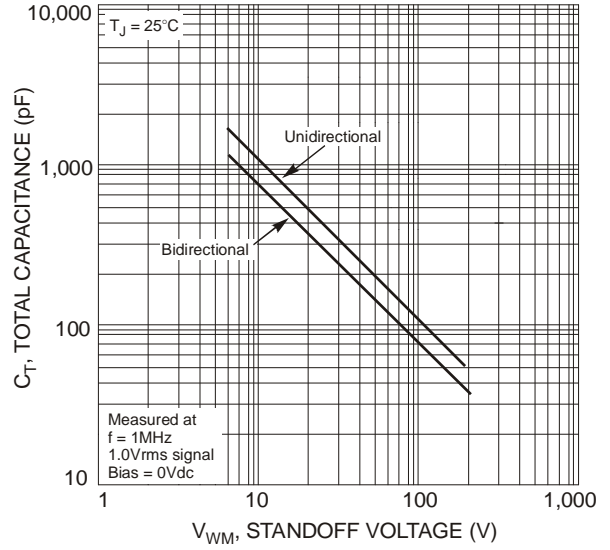


Fig. 2 Typical Total Capacitance

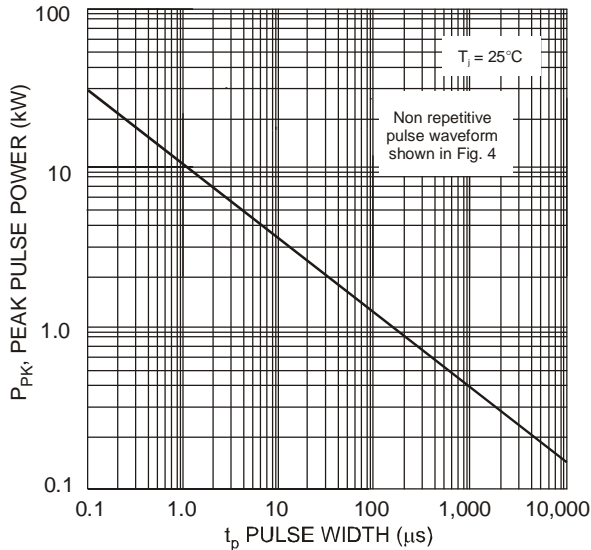


Fig. 3 Pulse Rating Curve



Fig. 4 Pulse Waveform



Fig. 5 Maximum Non-Repetitive Surge Current



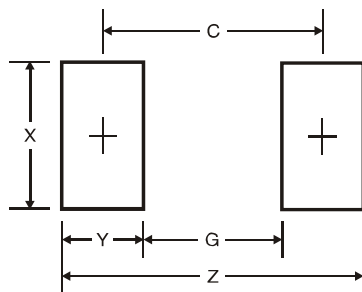
Fig. 6 Steady State Power Derating Curve

**Package Outline Dimensions**



| 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                    | 2.01 | 2.30 |
| All Dimensions in mm |      |      |

**Suggested Pad Layout**



| SMA Dimensions | Value (in mm) |
|----------------|---------------|
| Z              | 6.5           |
| G              | 1.5           |
| X              | 1.7           |
| Y              | 2.5           |
| C              | 4.0           |

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