

## Features

- 1500W Peak Pulse Power Dissipation
- 5.0V - 170V Standoff Voltages
- 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 (Notes 3 & 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SMC
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Terminals: Lead Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208
- Polarity Indicator: Cathode Band (Note: Bidirectional devices have no polarity indicator.)
- Weight: 0.21 grams (approximate)

SMC



Top View



Bottom View

## Ordering Information (Note 5)

| Part Number      | Case | Packaging        |
|------------------|------|------------------|
| SMCJXXX(C)A-13-F | SMC  | 3000/Tape & Reel |

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

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See <http://www.diodes.com> 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. Product manufactured with Date Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
  5. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



- xxx = Product type marking code (See Page 2)
- 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 6) | $P_{PK}$    | 1500       | W    |
| Peak Forward Surge Current,<br>8.3ms Single Half Sine Wave Superimposed on Rated Load<br>(Notes 6, 7, & 8)      | $I_{FSM}$   | 200        | A    |
| Steady State Power Dissipation @ $T_L = 75^\circ\text{C}$   | $PM_{(AV)}$ | 5.0        | W    |
| Instantaneous Forward Voltage @ $I_{PP} = 100\text{A}$ (Notes 6 & 8)  | $V_F$       | See Note 9 | V    |

**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 | $^\circ\text{C}$ |

- Notes:
- 6. Valid provided that terminals are kept at ambient temperature.
  - 7. Measured with 8.3ms single half sine-wave. Duty cycle = 4 pulses per minute maximum.
  - 8. Unidirectional units only.
  - 9.  $V_F = 3.5\text{V}$  for SMCJ5.0A through SMCJ90A, and  $V_F = 5.0\text{V}$  for SMCJ100A through SMCJ170A.

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

| Part Number<br>Add C For<br>Bidirectional<br>(Note 10) | Reverse<br>Standoff<br>Voltage<br>$V_{RWM}$ (V) | Breakdown<br>Voltage<br>$V_{BR}$ @ $I_T$ (Note 11) |         | Test<br>Current<br>$I_T$ (mA) | Max. Reverse<br>Leakage @<br>$V_{RWM}$ (Note 12)<br>$I_R$ ( $\mu\text{A}$ ) | Max. Clamping<br>Voltage @ $I_{pp}$<br>$V_C$ (V) | Max. Peak Pulse<br>Current $I_{pp}$<br>(A) | Marking Code |     |
|--|---|--|---------|-------------------------------|---|--|--|--------------|-----|
|  |   | Min (V)  | Max (V) |                               |   |  |  | BI           | UNI |
| SMCJ5.0(C)A  | 5.0   | 6.40   | 7.07    | 10                            | 1000  | 9.2  | 163.0                                      | BDE          | GDE |
| SMCJ6.0(C)A  | 6.0   | 6.67   | 7.37    | 10                            | 1000  | 10.3   | 145.6                                      | BDG          | GDG |
| SMCJ6.5(C)A  | 6.5   | 7.22   | 7.98    | 10                            | 500   | 11.2   | 133.9                                      | BDK          | GDK |
| SMCJ7.0(C)A  | 7.0   | 7.78   | 8.60    | 10                            | 200   | 12.0   | 125.0                                      | BDM          | GDM |
| SMCJ7.5(C)A  | 7.5   | 8.33   | 9.21    | 1.0                           | 100   | 12.9   | 116.3                                      | BDP          | GDP |
| SMCJ8.0(C)A  | 8.0   | 8.89   | 9.83    | 1.0                           | 50  | 13.6   | 110.3                                      | BDR          | GDR |
| SMCJ8.5(C)A  | 8.5   | 9.44   | 10.4    | 1.0                           | 20  | 14.4   | 104.2                                      | BDT          | GDT |
| SMCJ9.0(C)A  | 9.0   | 10.00  | 11.1    | 1.0                           | 10  | 15.4   | 97.4                                       | BDV          | GDV |
| SMCJ10(C)A   | 10.0  | 11.10  | 12.3    | 1.0                           | 5.0   | 17.0   | 88.2                                       | BDX          | GDX |
| SMCJ11(C)A   | 11.0  | 12.20  | 13.5    | 1.0                           | 5.0   | 18.2   | 82.4                                       | BDZ          | GDZ |
| SMCJ12(C)A   | 12.0  | 13.30  | 14.7    | 1.0                           | 5.0   | 19.9   | 75.3                                       | BEE          | GEE |
| SMCJ13(C)A   | 13.0  | 14.40  | 15.9    | 1.0                           | 5.0   | 21.5   | 69.7                                       | BEG          | GEG |
| SMCJ14(C)A   | 14.0  | 15.60  | 17.2    | 1.0                           | 5.0   | 23.2   | 64.7                                       | BEK          | GEK |
| SMCJ15(C)A   | 15.0  | 16.70  | 18.5    | 1.0                           | 5.0   | 24.4   | 61.5                                       | BEM          | GEM |
| SMCJ16(C)A   | 16.0  | 17.80  | 19.7    | 1.0                           | 5.0   | 26.0   | 57.7                                       | BEP          | GEP |
| SMCJ17(C)A   | 17.0  | 18.90  | 20.9    | 1.0                           | 5.0   | 27.6   | 53.3                                       | BER          | GER |
| SMCJ18(C)A   | 18.0  | 20.00  | 22.1    | 1.0                           | 5.0   | 29.2   | 51.4                                       | BET          | GET |
| SMCJ20(C)A   | 20.0  | 22.20  | 24.5    | 1.0                           | 5.0   | 32.4   | 46.3                                       | BEV          | GEV |
| SMCJ22(C)A   | 22.0  | 24.40  | 27.0    | 1.0                           | 5.0   | 35.5   | 42.2                                       | BEX          | GEX |
| SMCJ24(C)A   | 24.0  | 26.70  | 29.5    | 1.0                           | 5.0   | 38.9   | 38.6                                       | BEZ          | GEZ |
| SMCJ26(C)A   | 26.0  | 28.90  | 31.9    | 1.0                           | 5.0   | 42.1   | 35.6                                       | BFE          | GFE |
| SMCJ28(C)A   | 28.0  | 31.10  | 34.4    | 1.0                           | 5.0   | 45.4   | 33.0                                       | BFG          | GFG |
| SMCJ30(C)A   | 30.0  | 33.30  | 36.8    | 1.0                           | 5.0   | 48.4   | 31.0                                       | BFK          | GFK |
| SMCJ33(C)A   | 33.0  | 36.70  | 40.6    | 1.0                           | 5.0   | 53.3   | 28.1                                       | BFM          | GFM |
| SMCJ36(C)A   | 36.0  | 40.00  | 44.2    | 1.0                           | 5.0   | 58.1   | 25.8                                       | BFP          | GFP |
| SMCJ40(C)A   | 40.0  | 44.40  | 49.1    | 1.0                           | 5.0   | 64.5   | 23.2                                       | BFR          | GFR |
| SMCJ43(C)A   | 43.0  | 47.80  | 52.8    | 1.0                           | 5.0   | 69.4   | 21.6                                       | BFT          | GFT |
| SMCJ45(C)A   | 45.0  | 50.00  | 55.3    | 1.0                           | 5.0   | 72.7   | 20.6                                       | BFV          | GFV |
| SMCJ48(C)A   | 48.0  | 53.30  | 58.9    | 1.0                           | 5.0   | 77.4   | 19.4                                       | BFX          | GFX |
| SMCJ51(C)A   | 51.0  | 56.70  | 62.7    | 1.0                           | 5.0   | 82.4   | 18.2                                       | BFZ          | GFZ |
| SMCJ54(C)A   | 54.0  | 60.00  | 66.3    | 1.0                           | 5.0   | 87.1   | 17.2                                       | BGE          | GGE |
| SMCJ58(C)A   | 58.0  | 64.40  | 71.2    | 1.0                           | 5.0   | 93.6   | 16.0                                       | BGG          | GGG |
| SMCJ60(C)A   | 60.0  | 66.70  | 73.7    | 1.0                           | 5.0   | 96.8   | 15.5                                       | BGK          | GGK |
| SMCJ64(C)A   | 64.0  | 71.10  | 78.6    | 1.0                           | 5.0   | 103.0  | 14.6                                       | BGM          | GGM |
| SMCJ70(C)A   | 70.0  | 77.80  | 86.0    | 1.0                           | 5.0   | 113.0  | 13.3                                       | BGP          | GGP |
| SMCJ75(C)A   | 75.0  | 83.30  | 92.1    | 1.0                           | 5.0   | 121.0  | 12.4                                       | BGR          | GGR |
| SMCJ78(C)A   | 78.0  | 86.70  | 95.8    | 1.0                           | 5.0   | 126.0  | 11.4                                       | BGT          | GGT |
| SMCJ85(C)A   | 85.0  | 94.40  | 104     | 1.0                           | 5.0   | 137.0  | 10.4                                       | BGV          | GGV |
| SMCJ90(C)A   | 90.0  | 100.00   | 111     | 1.0                           | 5.0   | 146.0  | 10.3                                       | BGX          | GGX |
| SMCJ100(C)A  | 100.0   | 111.00   | 123     | 1.0                           | 5.0   | 162.0  | 9.3  | BGZ          | GGZ |
| SMCJ110(C)A  | 110.0   | 122.00   | 135     | 1.0                           | 5.0   | 177.0  | 8.4  | BHE          | GHE |
| SMCJ120(C)A  | 120.0   | 133.00   | 147     | 1.0                           | 5.0   | 193.0  | 7.9  | BHG          | GHG |
| SMCJ130(C)A  | 130.0   | 144.00   | 159     | 1.0                           | 5.0   | 209.0  | 7.2  | BHK          | GHK |
| SMCJ150(C)A  | 150.0   | 167.00   | 185     | 1.0                           | 5.0   | 243.0  | 6.2  | BHM          | GHM |
| SMCJ160(C)A  | 160.0   | 178.00   | 197     | 1.0                           | 5.0   | 259.0  | 5.8  | BHP          | GHP |
| SMCJ170(C)A  | 170.0   | 189.00   | 209     | 1.0                           | 5.0   | 275.0  | 5.5  | BHR          | GHR |

- Notes:
- 10. Suffix C denotes Bidirectional device.
  - 11.  $V_{BR}$  measured with  $I_T$  current pulse = 300 $\mu\text{s}$ .
  - 12. For Bidirectional devices having  $V_{RWM}$  of 10V and under, the  $I_R$  is doubled.



Fig. 1 Pulse Derating Curve



Fig. 2 Typical Total Capacitance

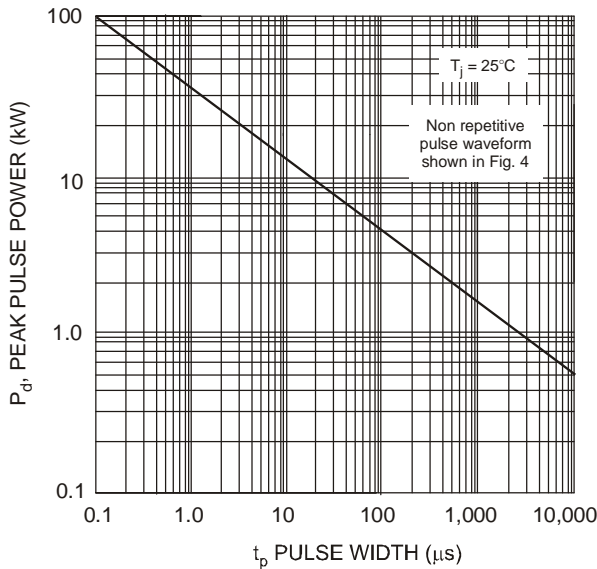


Fig. 3 Pulse Rating Curve

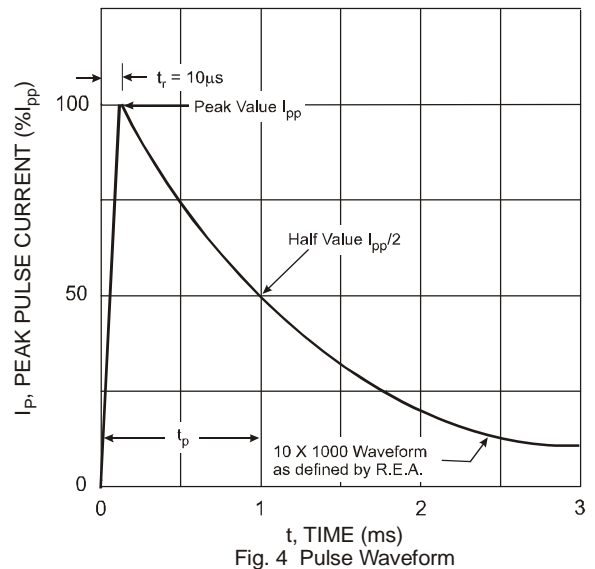


Fig. 4 Pulse Waveform



Fig. 5, Maximum Non-Repetitive Surge Current

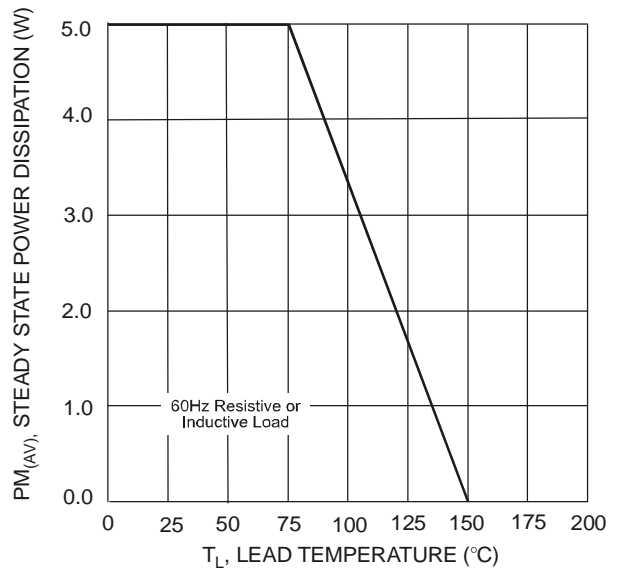


Fig. 6 Steady State Power Derating Curve

**Package Outline Dimensions**



| SMC                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 5.59 | 6.22 |
| B                    | 6.60 | 7.11 |
| C                    | 2.75 | 3.18 |
| D                    | 0.15 | 0.31 |
| E                    | 7.75 | 8.13 |
| G                    | 0.10 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 2.00 | 2.50 |
| All Dimensions in mm |      |      |

**Suggested Pad Layout**



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 9.3           |
| G          | 4.4           |
| X          | 3.3           |
| Y          | 2.5           |
| C          | 6.8           |

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