

# SMAJ5.0(C)A - SMAJ170(C)A

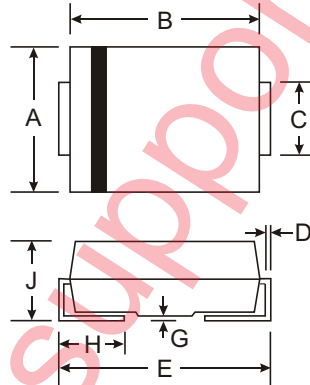
## 400W SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### Features

- 400W Peak Pulse Power Dissipation
- 5.0V - 170V Standoff Voltages
- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- Plastic Material: UL Flammability Classification Rating 94V-0

### Mechanical Data

- Case: SMA, Transfer Molded Epoxy
- Terminals: Solderable per MIL-STD-202, Method 208
- Also Available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 5, on Page 4
- Polarity Indicator: Cathode Band (Note: Bi-directional devices have no polarity indicator.)
- Marking: Date Code and Marking Code See Page 3
- Weight: 0.064 grams (approx.)
- Ordering Info: See Page 3



| 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                    | 0.10 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 2.01 | 2.62 |
| All Dimensions in mm |      |      |

### 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 1)        | $P_{PK}$    | 400         | W                |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave<br>Superimposed on Rated Load (JEDEC Method) (Notes 1, 2, & 3) | $I_{FSM}$   | 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 1, 2, & 3)   | $V_F$       | 3.5         | V                |
| Operating Temperature Range  | $T_j$       | -55 to +150 | $^\circ\text{C}$ |
| Storage Temperature Range  | $T_{STG}$   | -55 to +175 | $^\circ\text{C}$ |

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

| Part Number<br>Add C For<br>Bi-Directional<br>(Note 4) | Reverse<br>Standoff<br>Voltage<br>$V_{RWM}$ (V) | Breakdown<br>Voltage<br>$V_{BR}$ @ $I_T$ (Note 5) |         | Test<br>Current<br>$I_T$ (mA) | Max. Reverse<br>Leakage @<br>$V_{RWM}$ (Note 6)<br>$I_R$ ( $\mu$ A) | Max. Clamping<br>Voltage @ $I_{PP}$<br>$V_C$ (V) | Max. Peak Pulse<br>Current<br>$I_{PP}$<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   |

- Notes: 4. Suffix C denotes Bi-directional device.  
5.  $V_{BR}$  measured with  $I_T$  current pulse = 300 $\mu$ s  
6. For Bi-Directional devices having  $V_{RWM}$  of 10V and under, the  $I_R$  is doubled.

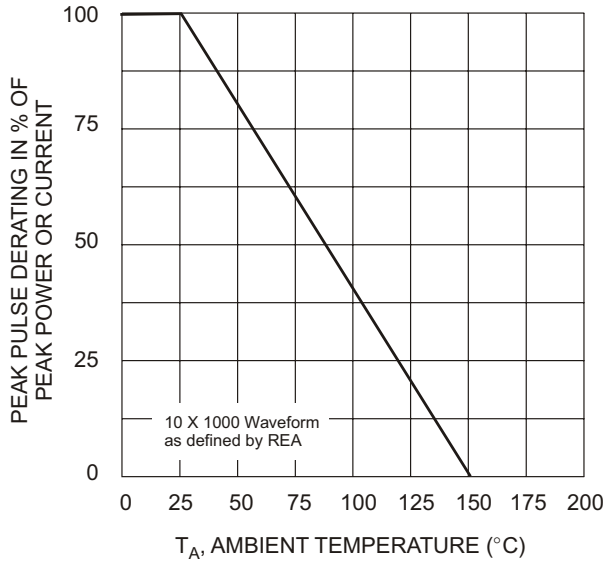


Fig. 1 Pulse Derating Curve

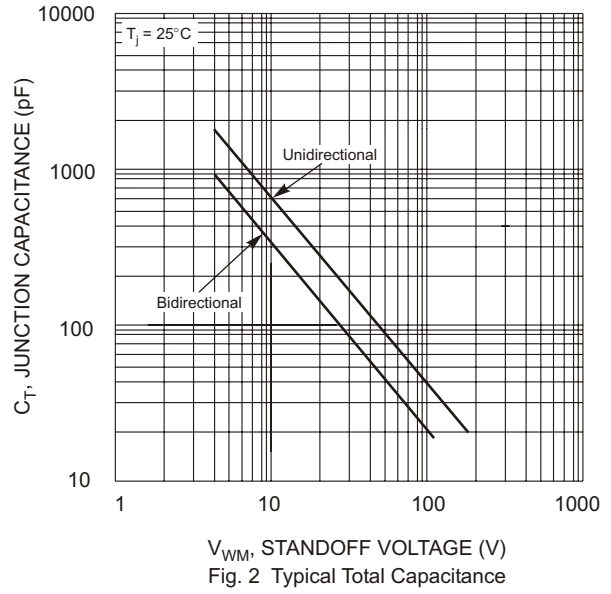


Fig. 2 Typical Total Capacitance

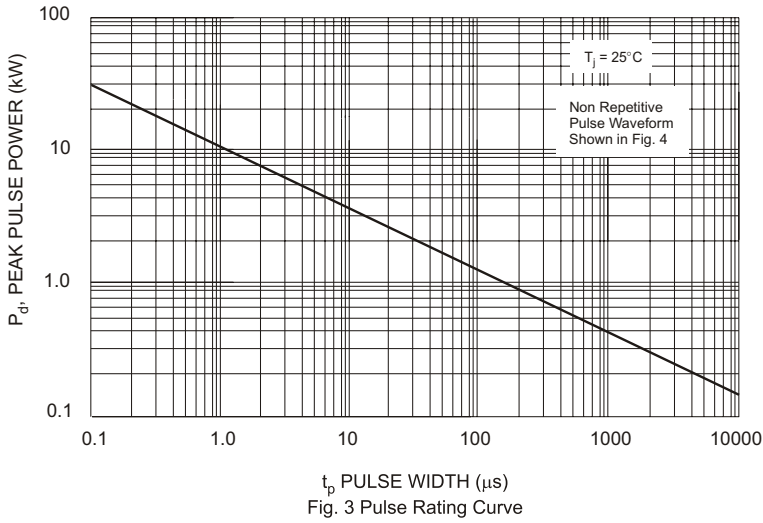


Fig. 3 Pulse Rating Curve

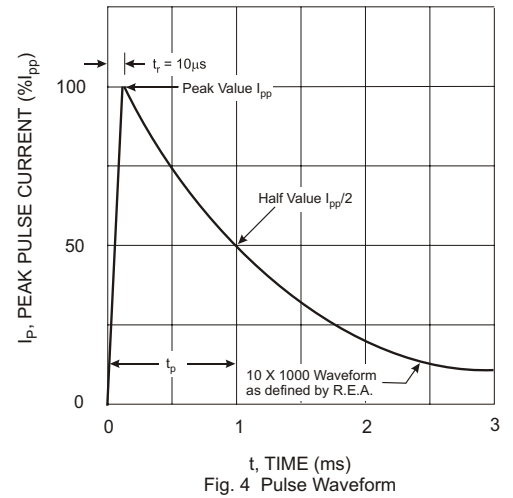


Fig. 4 Pulse Waveform

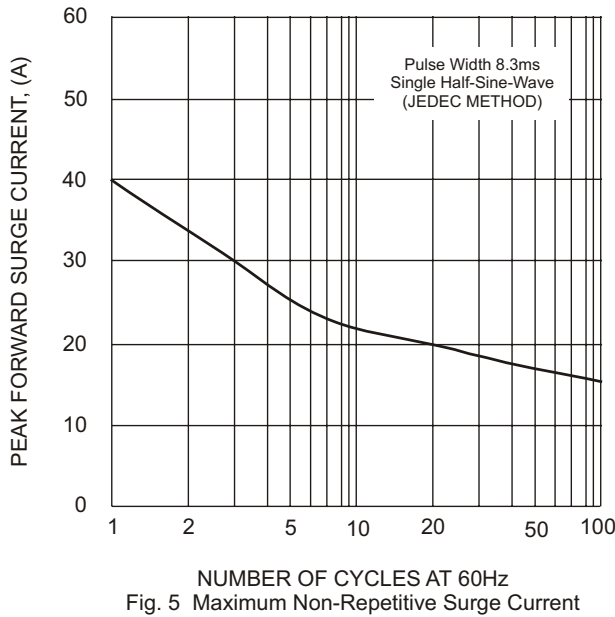


Fig. 5 Maximum Non-Repetitive Surge Current

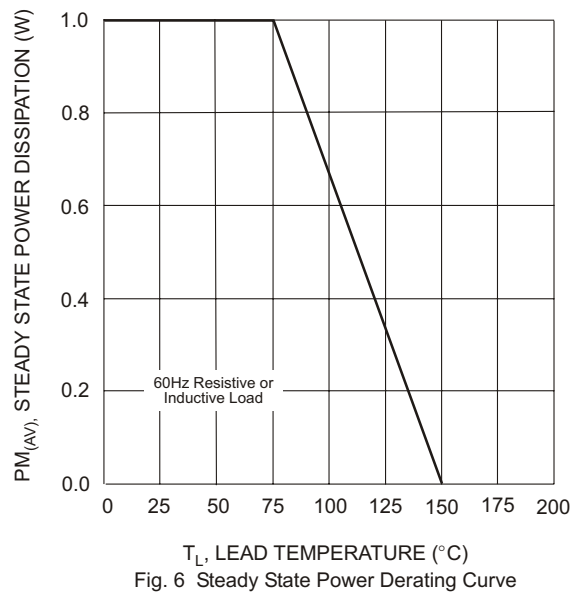
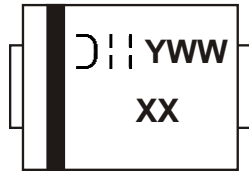


Fig. 6 Steady State Power Derating Curve

**Ordering Information** (Note 4)

| Device         | Packaging | Shipping         |
|----------------|-----------|------------------|
| SMAJXXX(C)A-13 | SMA       | 5000/Tape & Reel |

- Notes:
4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
  5. For Lead Free version (with Lead Free terminal finish) part number, please add "-F" suffix to part number above.  
Example: SMAJ170A-13-F.

**Marking Information**

XX = Product type marking code (See Page 2)  
D||| = Manufacturers' code marking  
YWW = Date code marking  
Y = Last digit of year ex: 2 for 2002  
WW = Week code 01 to 52