

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

# SMAJ5.0 THRU SMAJ170CA

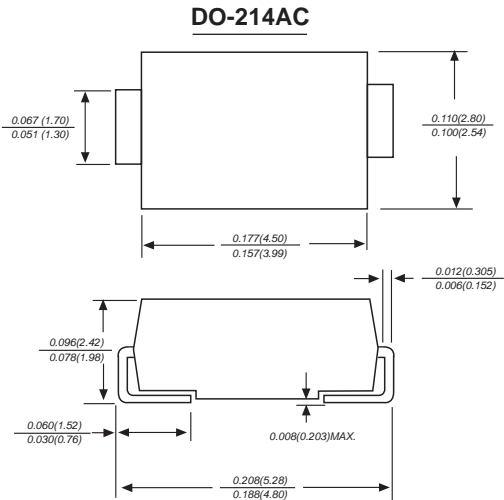
*Stand-off Voltage: 5.0-170 Volts  
Peak pulse power: 400 Watts*

### FEATURE

- Optimized for LAN protection applications
- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Glass passivated junction
- 400w peak pulse power capability
- Excellent clamping capability
- Low incremental surge resistance
- Fast response time: typically less than 1.0ps from 0v to  $V_{(BR)}$  min
- High temperature soldering guaranteed: 260°C/10S at terminals

### MECHANICAL DATA

- Case :JEDEC DO-214AC molded plastic body over passivated chip
- Terminals : Solder plated , solderable per MIL-STD 750, method 2026
- Polarity : Color band denotes cathode except for bidirectional types
- Mounting Position : Any
- Weight : 0.002 ounce, 0.07 grams



*Dimensions in inches and (millimeters)*

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

- For bidirectional use suffix C or CA for types SMAJ5.0 thru SMAJ170 (e.g. SMAJ5.0C, SMAJ170CA)
- Electrical characteristics apply in both directions.

### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

- Ratings at 25 C ambient temperature unless otherwise specified.

|  | <i>SYMBOLS</i>                    | <i>VALUE</i> | <i>UNITS</i> |
|--|-----------------------------------|--------------|--------------|
| Peak pulse power dissipation with a 10/1000μs wavetorm(NOTE 1,2,4,FIG.1) | P <sub>PPM</sub>                  | Minimum 400  | Watts        |
| Peak forward surge current (Note 3)                                      | I <sub>FSM</sub>                  | 40.0         | Amps         |
| Peak pulse current with a 10/1000μs waveform(NOTE 1)                     | I <sub>PPM</sub>                  | See Table 1  | Amps         |
| Operating junction and storage temperature range                         | T <sub>STG</sub> , T <sub>J</sub> | -55 to + 150 | °C           |

- Notes:**
1. Non-repetitive current pulse, per Fig.3 and derated above  $T_A=25^\circ\text{C}$  per Fig.2
  2. Mounted on 5.0mm<sup>2</sup> copper pads to each terminal
  3. Measured on 8.3ms single half sine-wave. For uni-directional devices only.
  4. Peak pulse power waveform is 10/1000μs



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*Stand-off Voltage:5.0-170 Volts  
Peak pulse power:400 Watts*

| Device   | Working Peak Reverse Voltage V <sub>WM</sub> (Volts) | Breakdown Voltage V <sub>(BR)</sub> (Volts) at I <sub>T</sub> |      | Test Current I <sub>T</sub> (mA) | Maximum Clamping Voltage at I <sub>PPM</sub> V <sub>C</sub> (Volts)(NOTE5) | Maximum Peak Pulse Reverse Current I <sub>PPM</sub> (NOTE5) (Amps) | Maximum Reverse Leakage a V <sub>WM</sub> I <sub>D</sub> (μA) |
|----------|--|---|------|----------------------------------|--|--|---|
|          |  | MIN   | MAX  |                                  |  |  |   |
| SMAJ5.0  | 5.0  | 6.40  | 7.81 | 10                               | 9.6  | 41.7   | 800   |
| SMAJ5.0A | 5.0  | 6.40  | 7.08 | 10                               | 9.2  | 43.5   | 800   |
| SMAJ6.0  | 6.0  | 6.67  | 8.15 | 10                               | 11.4   | 35.1   | 800   |
| SMAJ6.0A | 6.0  | 6.67  | 7.37 | 10                               | 10.3   | 38.8   | 800   |
| SMAJ6.5  | 6.5  | 7.22  | 8.82 | 10                               | 12.3   | 32.5   | 500   |
| SMAJ6.5A | 6.5  | 7.22  | 7.98 | 10                               | 11.2   | 35.7   | 500   |
| SMAJ7.0  | 7.0  | 7.78  | 9.51 | 10                               | 13.3   | 30.1   | 200   |
| SMAJ7.0A | 7.0  | 7.78  | 8.60 | 10                               | 12.0   | 33.3   | 200   |
| SMAJ7.5  | 7.5  | 8.33  | 10.3 | 1.0                              | 14.3   | 28.0   | 100   |
| SMAJ7.5A | 7.5  | 8.33  | 9.21 | 1.0                              | 12.9   | 31.0   | 100   |
| SMAJ8.0  | 8.0  | 8.89  | 10.9 | 1.0                              | 15.0   | 26.7   | 50.0  |
| SMAJ8.0A | 8.0  | 8.89  | 9.83 | 1.0                              | 13.6   | 29.4   | 50.0  |
| SMAJ8.5  | 8.5  | 9.44  | 11.5 | 1.0                              | 15.9   | 25.2   | 10.0  |
| SMAJ8.5A | 8.5  | 9.44  | 10.4 | 1.0                              | 14.4   | 27.8   | 10.0  |
| SMAJ9.0  | 9.0  | 10.0  | 12.2 | 1.0                              | 16.9   | 23.7   | 5.0   |
| SMAJ9.0A | 9.0  | 10.0  | 11.1 | 1.0                              | 15.4   | 26.0   | 5.0   |
| SMAJ10   | 10.00  | 11.1  | 13.6 | 1.0                              | 18.8   | 21.3   | 5.0   |
| SMAJ10A  | 10.00  | 11.1  | 12.3 | 1.0                              | 17.0   | 23.5   | 5.0   |
| SMAJ11   | 11.00  | 12.2  | 14.9 | 1.0                              | 20.1   | 19.9   | 5.0   |
| SMAJ11A  | 11.00  | 12.2  | 13.5 | 1.0                              | 18.2   | 22.0   | 5.0   |
| SMAJ12   | 12.00  | 13.3  | 16.3 | 1.0                              | 22.0   | 18.2   | 5.0   |
| SMAJ12A  | 12.00  | 13.3  | 14.7 | 1.0                              | 19.9   | 20.1   | 5.0   |
| SMAJ13   | 13.00  | 14.4  | 17.6 | 1.0                              | 23.8   | 16.8   | 5.0   |
| SMAJ13A  | 13.00  | 14.4  | 15.9 | 1.0                              | 21.5   | 18.6   | 5.0   |
| SMAJ14   | 14.00  | 15.6  | 19.1 | 1.0                              | 25.8   | 15.5   | 5.0   |
| SMAJ14A  | 14.00  | 15.6  | 17.2 | 1.0                              | 23.2   | 17.2   | 5.0   |
| SMAJ15   | 15.00  | 16.7  | 20.4 | 1.0                              | 26.9   | 14.9   | 5.0   |
| SMAJ15A  | 15.00  | 16.7  | 18.5 | 1.0                              | 24.4   | 16.4   | 5.0   |
| SMAJ16   | 16.00  | 17.8  | 21.8 | 1.0                              | 28.8   | 13.9   | 5.0   |
| SMAJ16A  | 16.00  | 17.8  | 19.7 | 1.0                              | 26.0   | 15.4   | 5.0   |
| SMAJ17   | 17.00  | 18.9  | 23.1 | 1.0                              | 30.5   | 13.1   | 5.0   |
| SMAJ17A  | 17.00  | 18.9  | 20.9 | 1.0                              | 27.6   | 14.5   | 5.0   |
| SMAJ18   | 18.00  | 20.0  | 24.4 | 1.0                              | 32.2   | 12.4   | 5.0   |
| SMAJ18A  | 18.00  | 20.0  | 22.1 | 1.0                              | 29.2   | 13.7   | 5.0   |
| SMAJ20   | 20.00  | 22.2  | 27.1 | 1.0                              | 35.8   | 11.2   | 5.0   |
| SMAJ20A  | 20.00  | 22.2  | 24.5 | 1.0                              | 32.4   | 12.3   | 5.0   |
| SMAJ22   | 22.00  | 24.4  | 29.8 | 1.0                              | 39.4   | 10.2   | 5.0   |
| SMAJ22A  | 22.00  | 24.4  | 26.9 | 1.0                              | 35.5   | 11.3   | 5.0   |
| SMAJ24   | 24.00  | 26.7  | 32.6 | 1.0                              | 43.0   | 9.3  | 5.0   |
| SMAJ24A  | 24.00  | 26.7  | 29.5 | 1.0                              | 38.9   | 10.3   | 5.0   |
| SMAJ26   | 26.00  | 28.9  | 35.3 | 1.0                              | 46.6   | 8.6  | 5.0   |
| SMAJ26A  | 26.00  | 28.9  | 31.9 | 1.0                              | 42.1   | 9.5  | 5.0   |
| SMAJ28   | 28.00  | 31.1  | 38.0 | 1.0                              | 50.0   | 8.0  | 5.0   |
| SMAJ28A  | 28.00  | 31.1  | 34.4 | 1.0                              | 45.4   | 8.8  | 5.0   |
| SMAJ30   | 30.00  | 33.3  | 40.7 | 1.0                              | 53.5   | 7.5  | 5.0   |
| SMAJ30A  | 30.00  | 33.3  | 36.8 | 1.0                              | 48.4   | 8.3  | 5.0   |



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| Device   | Working Peak Reverse Voltage<br>V <sub>WM</sub> (Volts) | Breakdown Voltage<br>V <sub>(BR)</sub><br>(Volts) at I <sub>T</sub> |      | Test Current<br>I <sub>T</sub> (mA) | Maximum Clamping Voltage at<br>I <sub>PPM</sub> V <sub>C</sub><br>(Volts)(NOTE5) | Maximum Peak Pulse Reverse Current<br>I <sub>PPM</sub> (NOTE5)<br>(Amps) | Maximum Reverse Leakage<br>a V <sub>WM</sub><br>I <sub>D</sub> ( $\mu$ A) |
|----------|---|---|------|-------------------------------------|--|--|---|
|          |   | MIN   | MAX  |                                     |  |  |   |
| SMAJ33   | 33.00   | 36.7  | 44.9 | 1.0                                 | 59.0   | 5.1  | 5.0   |
| SMAJ33A  | 33.00   | 36.7  | 40.6 | 1.0                                 | 53.3   | 5.6  | 5.0   |
| SMAJ36   | 36.00   | 40.0  | 48.9 | 1.0                                 | 64.3   | 4.7  | 5.0   |
| SMAJ36A  | 36.00   | 40.0  | 44.2 | 1.0                                 | 58.1   | 5.2  | 5.0   |
| SMAJ40   | 40.00   | 44.4  | 54.3 | 1.0                                 | 71.4   | 4.2  | 5.0   |
| SMAJ40A  | 40.00   | 44.4  | 49.1 | 1.0                                 | 64.5   | 4.7  | 5.0   |
| SMAJ43   | 43.00   | 47.8  | 58.4 | 1.0                                 | 76.7   | 3.9  | 5.0   |
| SMAJ43A  | 43.00   | 47.8  | 52.8 | 1.0                                 | 69.4   | 4.3  | 5.0   |
| SMAJ45   | 45.00   | 50.0  | 61.1 | 1.0                                 | 80.3   | 3.7  | 5.0   |
| SMAJ45A  | 45.00   | 50.0  | 55.3 | 1.0                                 | 72.7   | 4.1  | 5.0   |
| SMAJ48   | 48.00   | 53.3  | 65.1 | 1.0                                 | 85.5   | 3.5  | 5.0   |
| SMAJ48A  | 48.00   | 53.3  | 58.9 | 1.0                                 | 77.4   | 3.9  | 5.0   |
| SMAJ51   | 51.00   | 56.7  | 69.3 | 1.0                                 | 91.1   | 3.3  | 5.0   |
| SMAJ51A  | 51.00   | 56.7  | 62.7 | 1.0                                 | 82.4   | 3.6  | 5.0   |
| SMAJ54   | 54.00   | 60.0  | 73.3 | 1.0                                 | 96.3   | 3.1  | 5.0   |
| SMAJ54A  | 54.00   | 60.0  | 66.3 | 1.0                                 | 87.1   | 3.4  | 5.0   |
| SMAJ58   | 58.00   | 64.4  | 78.7 | 1.0                                 | 103.0  | 2.9  | 5.0   |
| SMAJ58A  | 58.00   | 64.4  | 71.2 | 1.0                                 | 93.6   | 3.2  | 5.0   |
| SMAJ60   | 60.00   | 66.7  | 81.5 | 1.0                                 | 107.0  | 2.8  | 5.0   |
| SMAJ60A  | 60.00   | 66.7  | 73.7 | 1.0                                 | 96.8   | 3.1  | 5.0   |
| SMAJ64   | 64.00   | 71.1  | 86.4 | 1.0                                 | 114.0  | 2.6  | 5.0   |
| SMAJ64A  | 64.00   | 71.1  | 78.6 | 1.0                                 | 103.0  | 2.9  | 5.0   |
| SMAJ70   | 70.00   | 77.8  | 95.1 | 1.0                                 | 125  | 2.4  | 5.0   |
| SMAJ70A  | 70.00   | 77.8  | 86.0 | 1.0                                 | 113  | 2.7  | 5.0   |
| SMAJ75   | 75.00   | 83.3  | 102  | 1.0                                 | 134  | 2.2  | 5.0   |
| SMAJ75A  | 75.00   | 83.3  | 92.1 | 1.0                                 | 121  | 2.5  | 5.0   |
| SMAJ78   | 78.00   | 86.7  | 106  | 1.0                                 | 139  | 2.2  | 5.0   |
| SMAJ78A  | 78.00   | 86.7  | 95.8 | 1.0                                 | 126  | 2.4  | 5.0   |
| SMAJ85   | 85.00   | 94.4  | 115  | 1.0                                 | 151  | 2.0  | 5.0   |
| SMAJ85A  | 85.00   | 94.4  | 104  | 1.0                                 | 137  | 2.2  | 5.0   |
| SMAJ90   | 90.00   | 100   | 122  | 1.0                                 | 160  | 1.9  | 5.0   |
| SMAJ90A  | 90.00   | 100   | 111  | 1.0                                 | 146  | 2.1  | 5.0   |
| SMAJ100  | 100.00  | 111   | 136  | 1.0                                 | 179  | 1.7  | 5.0   |
| SMAJ100A | 100.00  | 111   | 123  | 1.0                                 | 162  | 1.9  | 5.0   |
| SMAJ110  | 110.00  | 122   | 149  | 1.0                                 | 196  | 1.5  | 5.0   |
| SMAJ110A | 110.00  | 122   | 135  | 1.0                                 | 177  | 1.7  | 5.0   |
| SMAJ120  | 120.00  | 133   | 163  | 1.0                                 | 214  | 1.4  | 5.0   |
| SMAJ120A | 120.00  | 133   | 147  | 1.0                                 | 193  | 1.6  | 5.0   |
| SMAJ130  | 130.00  | 144   | 176  | 1.0                                 | 231  | 1.3  | 5.0   |
| SMAJ130A | 130.00  | 144   | 159  | 1.0                                 | 209  | 1.4  | 5.0   |
| SMAJ150  | 150.00  | 167   | 204  | 1.0                                 | 268  | 1.1  | 5.0   |
| SMAJ150A | 150.00  | 167   | 185  | 1.0                                 | 243  | 1.2  | 5.0   |
| SMAJ160  | 160.00  | 178   | 218  | 1.0                                 | 287  | 1.0  | 5.0   |
| SMAJ160A | 160.00  | 178   | 197  | 1.0                                 | 259  | 1.2  | 5.0   |
| SMAJ170  | 170.00  | 189   | 231  | 1.0                                 | 304  | 0.99   | 5.0   |
| SMAJ170A | 170.00  | 189   | 209  | 1.0                                 | 275  | 1.09   | 5.0   |

**NOTES:**

1. V<sub>(BR)</sub> measured after I<sub>T</sub> applied for 300 $\mu$ s, I<sub>T</sub>=square wave pulse or equivalent
2. Surge current waveform per Fig.3 and derated per Fig.2
3. For bidirectional types having V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled
4. All items and symbols are consistent with ANSI/IEEE C62.35
5. Peak pulse power waveform is 10/1000 $\mu$ s

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SMAJ5.0 THRU SMAJ170CA

Stand-off Voltage: 5.0-170 Volts  
Peak pulse power: 400 Watts

FIG.1 – PEAK PULSE POWER RATING CURVE

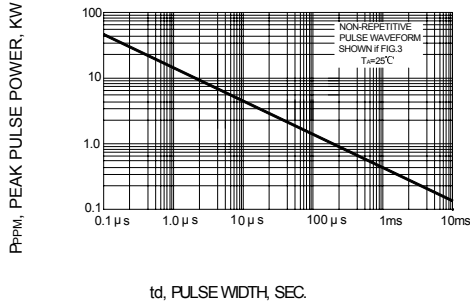


FIG.2 – PULSE DERATING CURVE

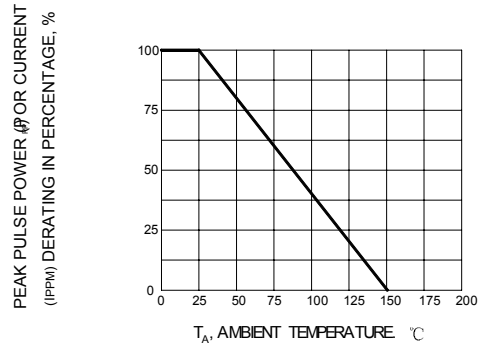


FIG.3 – PULSE WAVEFORM

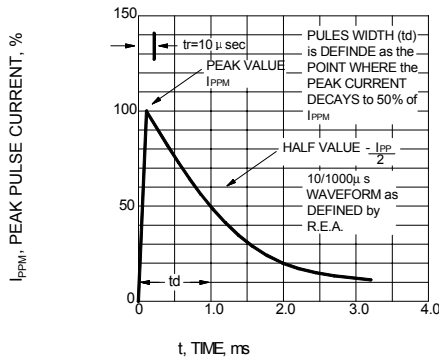


FIG.4 – TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL

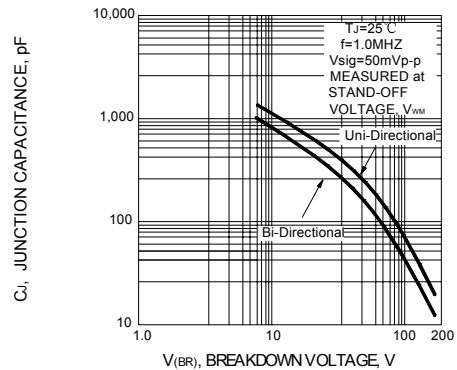


FIG.5 – TYPICAL TRANSIENT THERMAL IMPEDANCE

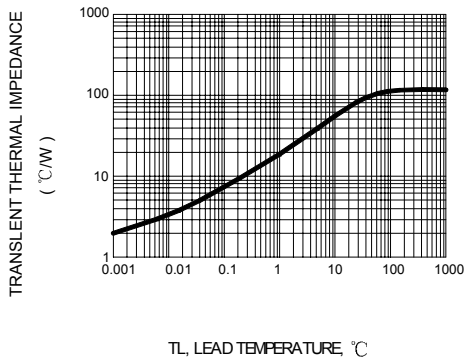


FIG.6 – MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

