

# SMAJ SERIES

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### STAND-OFF VOLTAGE - 5.0 TO 170 Volts

### 400 Watt Peak Pulse Power

| SMAJ<br>PART NUMBER |           | DEVICE<br>MARKING<br>CODE |    | REVERSE<br>STAND-<br>OFF<br>VOLTAGE<br>$V_{RWM}(V)$ | BREAKDOWN VOLTAGE<br>$V_{BR}(V)$<br>MIN.@ $I_T$ | BREAKDOWN VOLTAGE<br>$V_{BR}(V)$<br>MAX.@ $I_T$ | TEST<br>CURRENT<br>$I_T$ (mA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@ $I_{pp}$ $V_c(V)$ | PEAK<br>PULSE<br>CURRENT<br>$I_{pp}$ (A) | REVERSE<br>LEAKAGE<br>@ $V_{RWM}$ $I_R$<br>( $\mu A$ ) |
|---------------------|-----------|---------------------------|----|-----------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------|-------------------------------------------------------|------------------------------------------|--------------------------------------------------------|
| UNI-POLAR           | BI-POLAR  | UNI                       | BI |                                                     |                                                 |                                                 |                               |                                                       |                                          |                                                        |
| SMAJ5.0A            | SMAJ5.0CA | AE                        | WE | 5.0                                                 | 6.40                                            | 7.00                                            | 10                            | 9.2                                                   | 43.5                                     | 800                                                    |
| SMAJ6.0A            | SMAJ6.0CA | AG                        | WG | 6.0                                                 | 6.67                                            | 7.37                                            | 10                            | 10.3                                                  | 38.8                                     | 800                                                    |
| SMAJ6.5A            | SMAJ6.5CA | AK                        | WK | 6.5                                                 | 7.22                                            | 7.98                                            | 10                            | 11.2                                                  | 35.7                                     | 500                                                    |
| SMAJ7.0A            | SMAJ7.0CA | AM                        | WM | 7.0                                                 | 7.78                                            | 8.60                                            | 10                            | 12.0                                                  | 33.3                                     | 200                                                    |
| SMAJ7.5A            | SMAJ7.5CA | AP                        | WP | 7.5                                                 | 8.33                                            | 9.21                                            | 1                             | 12.9                                                  | 31.0                                     | 100                                                    |
| SMAJ8.0A            | SMAJ8.0CA | AR                        | WR | 8.0                                                 | 8.89                                            | 9.83                                            | 1                             | 13.6                                                  | 29.4                                     | 50                                                     |
| SMAJ8.5A            | SMAJ8.5CA | AT                        | WT | 8.5                                                 | 9.44                                            | 10.40                                           | 1                             | 14.4                                                  | 27.8                                     | 20                                                     |
| SMAJ9.0A            | SMAJ9.0CA | AV                        | WV | 9.0                                                 | 10.00                                           | 11.10                                           | 1                             | 15.4                                                  | 26.0                                     | 10                                                     |
| SMAJ10A             | SMAJ10CA  | AX                        | WX | 10.0                                                | 11.10                                           | 12.30                                           | 1                             | 17.0                                                  | 23.5                                     | 5                                                      |
| SMAJ11A             | SMAJ11CA  | AZ                        | WZ | 11.0                                                | 12.20                                           | 13.50                                           | 1                             | 18.2                                                  | 22.0                                     | 5                                                      |
| SMAJ12A             | SMAJ12CA  | BE                        | XE | 12.0                                                | 13.30                                           | 14.70                                           | 1                             | 19.9                                                  | 20.1                                     | 5                                                      |
| SMAJ13A             | SMAJ13CA  | BG                        | XG | 13.0                                                | 14.40                                           | 15.90                                           | 1                             | 21.5                                                  | 18.6                                     | 5                                                      |
| SMAJ14A             | SMAJ14CA  | BK                        | XK | 14.0                                                | 15.60                                           | 17.20                                           | 1                             | 23.2                                                  | 17.2                                     | 5                                                      |
| SMAJ15A             | SMAJ15CA  | BM                        | XM | 15.0                                                | 16.70                                           | 18.50                                           | 1                             | 24.4                                                  | 16.4                                     | 5                                                      |
| SMAJ16A             | SMAJ16CA  | BP                        | XP | 16.0                                                | 17.80                                           | 19.70                                           | 1                             | 26.0                                                  | 15.4                                     | 5                                                      |
| SMAJ17A             | SMAJ17CA  | BR                        | XR | 17.0                                                | 18.90                                           | 20.90                                           | 1                             | 27.6                                                  | 14.5                                     | 5                                                      |
| SMAJ18A             | SMAJ18CA  | BT                        | XT | 18.0                                                | 20.00                                           | 22.10                                           | 1                             | 29.2                                                  | 13.7                                     | 5                                                      |
| SMAJ20A             | SMAJ20CA  | BV                        | XV | 20.0                                                | 22.20                                           | 24.50                                           | 1                             | 32.4                                                  | 12.3                                     | 5                                                      |
| SMAJ22A             | SMAJ22CA  | BX                        | XY | 22.0                                                | 24.40                                           | 26.90                                           | 1                             | 35.5                                                  | 11.3                                     | 5                                                      |
| SMAJ24A             | SMAJ24CA  | BZ                        | XZ | 24.0                                                | 26.70                                           | 29.50                                           | 1                             | 38.9                                                  | 10.3                                     | 5                                                      |
| SMAJ26A             | SMAJ26CA  | CE                        | YE | 26.0                                                | 28.90                                           | 31.90                                           | 1                             | 42.1                                                  | 9.5                                      | 5                                                      |
| SMAJ28A             | SMAJ28CA  | CG                        | YG | 28.0                                                | 31.10                                           | 34.40                                           | 1                             | 45.4                                                  | 8.8                                      | 5                                                      |
| SMAJ30A             | SMAJ30CA  | CK                        | YK | 30.0                                                | 33.30                                           | 36.80                                           | 1                             | 48.4                                                  | 8.3                                      | 5                                                      |
| SMAJ33A             | SMAJ33CA  | CM                        | YM | 33.0                                                | 36.70                                           | 40.60                                           | 1                             | 53.3                                                  | 7.5                                      | 5                                                      |
| SMAJ36A             | SMAJ36CA  | CP                        | YP | 36.0                                                | 40.00                                           | 44.20                                           | 1                             | 58.1                                                  | 6.9                                      | 5                                                      |
| SMAJ40A             | SMAJ40CA  | CR                        | YR | 40.0                                                | 44.40                                           | 49.10                                           | 1                             | 64.5                                                  | 6.2                                      | 5                                                      |
| SMAJ43A             | SMAJ43CA  | CT                        | YT | 43.0                                                | 47.80                                           | 52.80                                           | 1                             | 69.4                                                  | 5.8                                      | 5                                                      |
| SMAJ45A             | SMAJ45CA  | CV                        | YV | 45.0                                                | 50.00                                           | 55.30                                           | 1                             | 72.7                                                  | 5.5                                      | 5                                                      |
| SMAJ48A             | SMAJ48CA  | CX                        | YX | 48.0                                                | 53.30                                           | 58.90                                           | 1                             | 77.4                                                  | 5.2                                      | 5                                                      |
| SMAJ51A             | SMAJ51CA  | CZ                        | YZ | 51.0                                                | 56.70                                           | 62.70                                           | 1                             | 82.4                                                  | 4.9                                      | 5                                                      |
| SMAJ54A             | SMAJ54CA  | RE                        | ZE | 54.0                                                | 60.00                                           | 66.30                                           | 1                             | 87.1                                                  | 4.6                                      | 5                                                      |
| SMAJ58A             | SMAJ58CA  | RG                        | ZG | 58.0                                                | 64.40                                           | 71.20                                           | 1                             | 93.6                                                  | 4.3                                      | 5                                                      |
| SMAJ60A             | SMAJ60CA  | RK                        | ZK | 60.0                                                | 66.70                                           | 73.70                                           | 1                             | 96.8                                                  | 4.1                                      | 5                                                      |
| SMAJ64A             | SMAJ64CA  | RM                        | ZM | 64.0                                                | 71.10                                           | 78.60                                           | 1                             | 103.0                                                 | 3.9                                      | 5                                                      |
| SMAJ70A             | SMAJ70CA  | RP                        | ZP | 70.0                                                | 77.80                                           | 86.00                                           | 1                             | 113.0                                                 | 3.5                                      | 5                                                      |
| SMAJ75A             | SMAJ75CA  | RR                        | ZR | 75.0                                                | 83.30                                           | 92.10                                           | 1                             | 121.0                                                 | 3.3                                      | 5                                                      |
| SMAJ78A             | SMAJ78CA  | RT                        | ZT | 78.0                                                | 86.70                                           | 95.80                                           | 1                             | 126.0                                                 | 3.2                                      | 5                                                      |
| SMAJ85A             | SMAJ85CA  | RV                        | ZV | 85.0                                                | 94.40                                           | 104.00                                          | 1                             | 137.0                                                 | 2.9                                      | 5                                                      |
| SMAJ90A             | SMAJ90CA  | RX                        | ZX | 90.0                                                | 100.00                                          | 111.00                                          | 1                             | 146.0                                                 | 2.7                                      | 5                                                      |
| SMAJ100A            | SMAJ100CA | RZ                        | ZZ | 100.0                                               | 111.00                                          | 123.00                                          | 1                             | 162.0                                                 | 2.5                                      | 5                                                      |
| SMAJ110A            | SMAJ110CA | SE                        | VE | 110.0                                               | 122.00                                          | 135.00                                          | 1                             | 177.0                                                 | 2.3                                      | 5                                                      |
| SMAJ120A            | SMAJ120CA | SG                        | VG | 120.0                                               | 133.00                                          | 147.00                                          | 1                             | 193.0                                                 | 2.1                                      | 5                                                      |
| SMAJ130A            | SMAJ130CA | SK                        | VK | 130.0                                               | 144.00                                          | 159.00                                          | 1                             | 209.0                                                 | 1.9                                      | 5                                                      |
| SMAJ150A            | SMAJ150CA | SM                        | VM | 150.0                                               | 167.00                                          | 185.00                                          | 1                             | 243.0                                                 | 1.6                                      | 5                                                      |
| SMAJ160A            | SMAJ160CA | SP                        | VP | 160.0                                               | 178.00                                          | 197.00                                          | 1                             | 259.0                                                 | 1.5                                      | 5                                                      |
| SMAJ170A            | SMAJ170CA | SR                        | VR | 170.0                                               | 189.00                                          | 209.00                                          | 1                             | 275.0                                                 | 1.5                                      | 5                                                      |

For bidirectional type having  $V_{rwm}$  of 10 volts and less, the  $I_R$  limit is double.

For parts without A , the  $V_{BR}$  is  $\pm 10\%$

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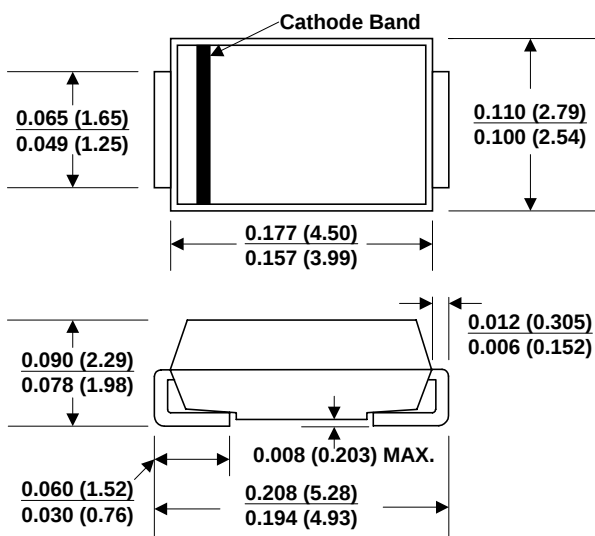
## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

STAND-OFF VOLTAGE - 5.0 TO 170 Volts

400 Watt Peak Pulse Power

### FEATURES

#### DO-214AC (SMA)



Dimensions in inches and (millimeters)

board space  
 Low profile package  
 Built-in strain relief  
 Glass passivated junction  
 Low inductance  
 Excellent clamping capability  
 Repetition Rate (duty cycle):0.01%  
 Fast response time: typically less than 1.0ps from 0 Volts to V(BR) for unidirectional types  
 Typical IR less than 1mA above 10V  
 High Temperature soldering: 250°C/10 seconds at terminals  
 Plastic package has Underwriters Laboratory Flammability 94V-O

### MECHANICAL DATA

**Case:** JEDEC DO214AC. Molded plastic over glass passivated junction

**Terminal:** Solder plated, solderable per MIL-STD-750, Method 2026

**Polarity:** Color band denoted positive end (cathode) except Bidirectional

**Standard Packaging:** 12mm tape (EIA STD RS-481)

**Weight:** 0.002 ounce, 0.061 gram

### DEVICES FOR BIPOLAR APPLICATION

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

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25 ambient temperature unless otherwise specified.

| RATING                                                                                                     | SYMBOL         | VALUE       | UNITS |
|------------------------------------------------------------------------------------------------------------|----------------|-------------|-------|
| Peak Pulse Power Dissipation on 10/1000 $\mu$ s waveform (Note 1,2, FIG.1)                                 | $P_{PPM}$      | Minimum 400 | Watts |
| Peak Pulse Current of on 10/1000 $\mu$ s waveform (Note 1,FIG.3)                                           | $I_{PPM}$      | SEE TABLE 1 | Amps  |
| Peak Forward Surge Current,8.3ms Single Half Sine-Wave Superimposed on Rated Load,(JEDEC Method) (Note2,3) | $I_{FSM}$      | 40          | Amps  |
| Operating junction and Storage Temperature Range                                                           | $T_J, T_{STG}$ | -55 to +150 |       |

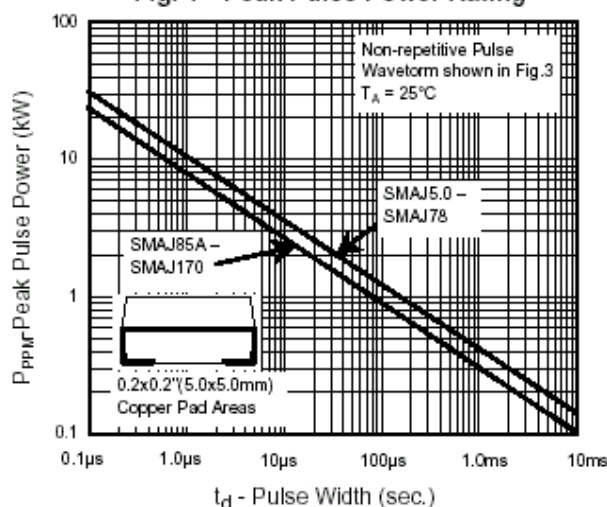
- Notes :
- 1.Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25$  per Fig. 2.
  - 2.Mounted on 5.0mm<sup>2</sup> (0.03mm thick) Copper Pads to each terminal
  - 3.8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

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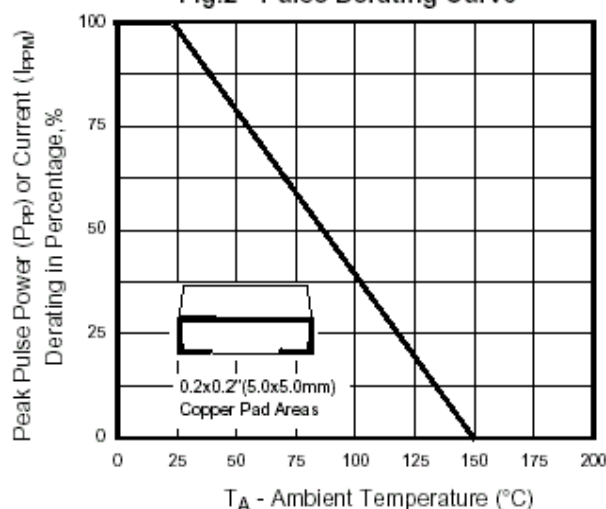
## RATINGS AND CHARACTERISTIC CURVES

**Ratings and Characteristic Curves** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

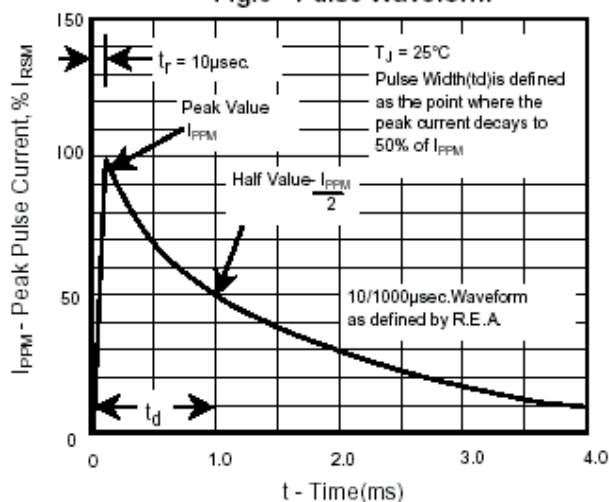
**Fig. 1 - Peak Pulse Power Rating**



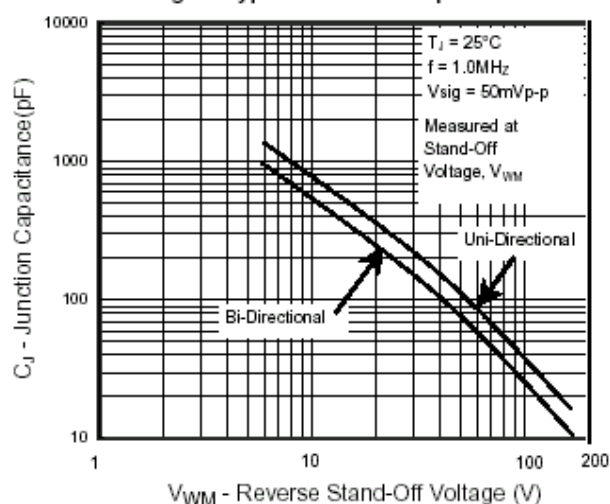
**Fig.2 - Pulse Derating Curve**



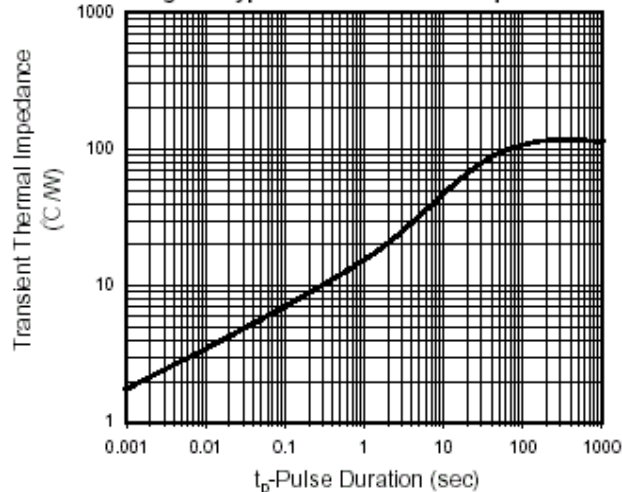
**Fig.3 - Pulse Waveform**



**Fig.4 - Typical Junction Capacitance**



**Fig. 5 - Typ. Transient Thermal Impedance**



**Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only**

