



# THE DATASHEET OF SMAJ9.0CA

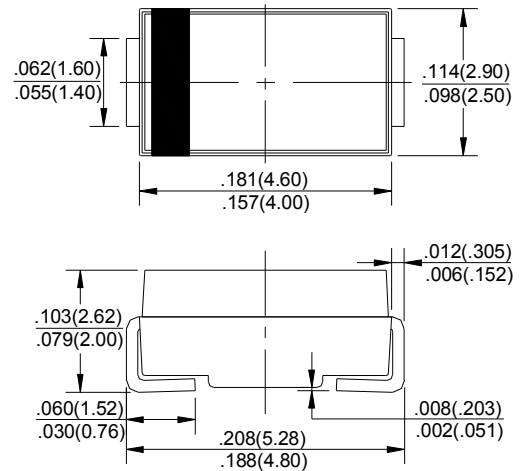


## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### FEATURES

- Glass Passivated Die Construction
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- Plastic Case Material has UL Flammability Classification Rating 94V-0

### SMA(DO-214AC)



Dimensions in inches and (millimeters)

### MECHANICAL DATA

- Case : JEDEC SMA(DO-214AC), Transfer Molded Epoxy
- Terminals : Solder Plated, Solderable per MIL-STD-750, Method 2026
- Polarity : Cathode Band Except Bi-Directional

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

| Characteristic   | Symbol         | Value       | Unit             |
|--|----------------|-------------|------------------|
| Peak Pulse Power Dissipation 10/1000 $\mu\text{s}$ Waveform (Note 1, 2) Figure 3                             | PPPM           | 400 Minimum | W                |
| Peak Pulse Current on 10/1000 $\mu\text{s}$ Waveform (Note 1) Figure 4                                       | IPPM           | See Table 1 | A                |
| Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (Note 2, 3) | IFSM           | 40          | A                |
| Operating and Storage Temperature Range  | $T_j, T_{STG}$ | -55 to +150 | $^\circ\text{C}$ |

- Note: 1. Non-repetitive current pulse per Figure 4 and derated above  $T_A = 25^\circ\text{C}$  per Figure 1.  
 2. Mounted on 5.0mm<sup>2</sup> (0.013mm thick) land area.  
 3. Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minutes maximum.



**FIG.1 – Peak Pulse Power Rating Curve**



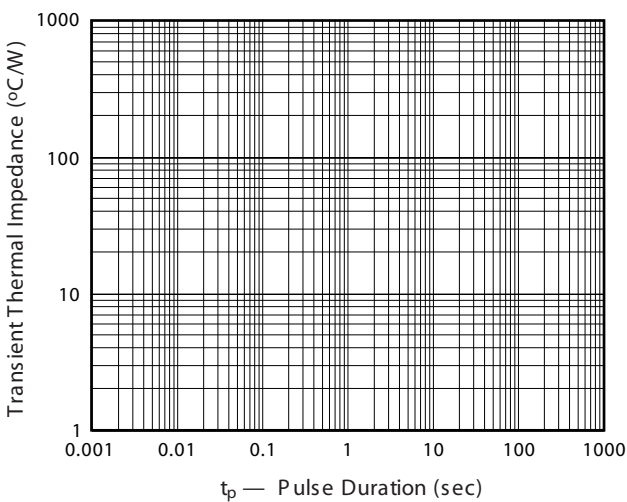
**FIG.2 – Pulse Derating Curve**



**FIG.3 – Pulse Waveform**



**FIG.4 – Typical Junction Capacitance**



**FIG.5 – Typical Transient Thermal Impedance**



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

## Electrical characteristics

| SMAJ<br>PART NUMBER |             | DEVICE<br>MARKING<br>CODE |    | REVERSE<br>STAND-<br>OFF<br>VOLTAGE<br>$V_{RWM}(V)$ | BREAK DOWN<br>VOLTAGE |                | TEST<br>CURRE<br>NT<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>$@ V_{RWM}$<br>$I_R(\mu A)(3)$ |
|---------------------|-------------|---------------------------|----|---|-----------------------|----------------|-----------------------------------|--|--|--|
| UNI- POLAR          | BI-POLAR(1) | UNI                       | BI |   | $V_{BR}(V)(1)$        | $V_{BR}(V)(2)$ |                                   |  |  |  |
|                     |             |                           |    |   | MIN. @ $I_T$          | MAX. @ $I_T$   |                                   |  |  |  |
| 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                        | XX | 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  |

NOTE: 1. Suffix C denotes Bi-direction device, Suffix A denotes the  $V_{BR}$  is  $\pm 5\%$  for parts without A, the  $V_{BR}$  is  $\pm 10\%$ .

2.  $V_{BR}$  measured with  $I_T$  Current pulse=300us.

3. For bidirectional type having  $V_{RWM}$  of 10 volts and less, the IR limit is double.

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