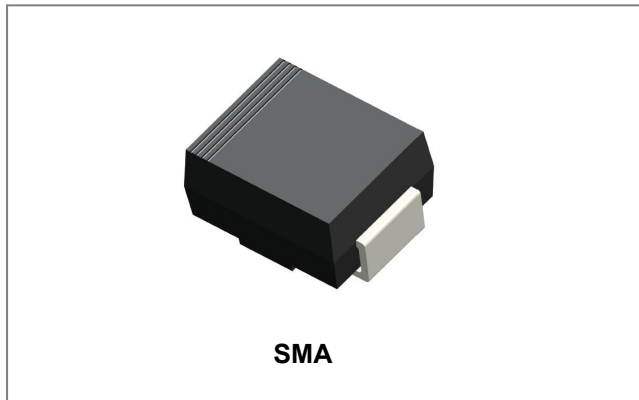


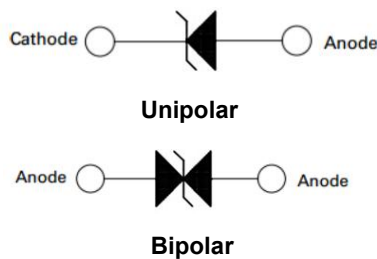
## SMAJ5.0A THRU SMAJ300CA SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR



### Features

- Glass Passivated Die Construction
- 400W Peak Pulse Power Dissipation
- 5.0V- 300V Standoff Voltage
- Uni- and Bi-Directional Versions Available
- Excellent Clamping Capability
- Fast Response Time
- Plastic Case Material has UL Flammability Classification Rating 94V-0
- ROHS Compliant
- All SMC Parts are Traceable to the Wafer Lot
- Additional testing can be offered upon request
- “-A” suffix is for Automotive qualified

### Circuit Diagram



### Mechanical Data

- Case: SMA Low Profile Molded Plastic
- Terminals: Solder Plated , Solderable per MIL-STD 750, Method 2026
- Polarity: Color band denotes cathode except Bipolar
- Mounting Position: Any
- Weight:0.064 grams(approx.)

### Maximum Ratings and Thermal Characteristics@T<sub>A</sub>=25°C unless otherwise specified

| Parameter                                                                                     | Symbol                            | Value      | Unit |
|-----------------------------------------------------------------------------------------------|-----------------------------------|------------|------|
| Peak Pulse Power Dissipation at T <sub>A</sub> =25°C by 10x1000µs Waveform (Fig.2)(Note 1, 2) | P <sub>PPM</sub>                  | 400        | W    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave ( Fig.7),(Note 3)                     | I <sub>FSM</sub>                  | 40         | A    |
| Power Dissipation on Infinite Heat Sink at T <sub>A</sub> =50°C                               | P <sub>M(AV)</sub>                | 3.3        | W    |
| Operating Junction and Storage Temperature Range                                              | T <sub>J</sub> , T <sub>STG</sub> | -55 to 150 | °C   |
| Typical Thermal Resistance Junction to Lead                                                   | R <sub>θJL</sub>                  | 30         | °C/W |
| Typical Thermal Resistance Junction to Ambient                                                | R <sub>θJA</sub>                  | 120        | °C/W |

- Notes:**
1. Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub> = 25°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 or equivalent square wavefor unidirectional device only.



**Electrical Characteristics@T<sub>A</sub>=25° C unless otherwise specified**

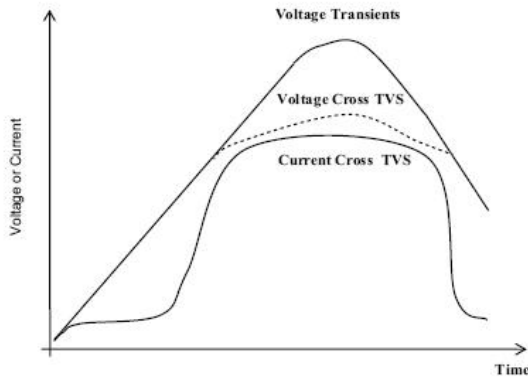
| UNI-POLAR | BI-POLAR  | DEVICE MARKING CODE |    | REVERSE STAND-OFF VOLTAGE VRWM (V) | BREAKDOWN VOLTAGE VBR (V) MIN. @IT | BREAKDOWN VOLTAGE VBR (V) MAX. @IT | TEST CURRENT IT(MA) | MAXIMUM CLAMPING VOLTAGE @IPP VC(V) | PEAK PULSE CURRENT IPP(A) | REVERSE LEAKAGE @VRWM IR(uA) |
|-----------|-----------|---------------------|----|------------------------------------|------------------------------------|------------------------------------|---------------------|-------------------------------------|---------------------------|------------------------------|
|           |           | UNI                 | BI |                                    |                                    |                                    |                     |                                     |                           |                              |
| SMAJ5.0A  | SMAJ5.0CA | HE                  | TE | 5                                  | 6.4                                | 7                                  | 10                  | 9.2                                 | 43.5                      | 800                          |
| SMAJ6.0A  | SMAJ6.0CA | HG                  | TG | 6                                  | 6.67                               | 7.37                               | 10                  | 10.3                                | 38.8                      | 800                          |
| SMAJ6.5A  | SMAJ6.5CA | HK                  | TK | 6.5                                | 7.22                               | 7.98                               | 10                  | 11.2                                | 35.7                      | 500                          |
| SMAJ7.0A  | SMAJ7.0CA | HM                  | TM | 7                                  | 7.78                               | 8.6                                | 10                  | 12                                  | 33.3                      | 200                          |
| SMAJ7.5A  | SMAJ7.5CA | HP                  | TP | 7.5                                | 8.33                               | 9.21                               | 1                   | 12.9                                | 31                        | 100                          |
| SMAJ8.0A  | SMAJ8.0CA | HR                  | TR | 8                                  | 8.89                               | 9.83                               | 1                   | 13.6                                | 29.4                      | 50                           |
| SMAJ8.5A  | SMAJ8.5CA | HT                  | TT | 8.5                                | 9.44                               | 10.4                               | 1                   | 14.4                                | 27.8                      | 20                           |
| SMAJ9.0A  | SMAJ9.0CA | HV                  | TV | 9                                  | 10                                 | 11.1                               | 1                   | 15.4                                | 26                        | 10                           |
| SMAJ10A   | SMAJ10CA  | HX                  | TX | 10                                 | 11.1                               | 12.3                               | 1                   | 17                                  | 23.5                      | 5                            |
| SMAJ11A   | SMAJ11CA  | HZ                  | TZ | 11                                 | 12.2                               | 13.5                               | 1                   | 18.2                                | 22                        | 5                            |
| SMAJ12A   | SMAJ12CA  | IE                  | UE | 12                                 | 13.3                               | 14.7                               | 1                   | 19.9                                | 20.1                      | 5                            |
| SMAJ13A   | SMAJ13CA  | IG                  | UG | 13                                 | 14.4                               | 15.9                               | 1                   | 21.5                                | 18.6                      | 5                            |
| SMAJ14A   | SMAJ14CA  | IK                  | UK | 14                                 | 15.6                               | 17.2                               | 1                   | 23.2                                | 17.2                      | 5                            |
| SMAJ15A   | SMAJ15CA  | IM                  | UM | 15                                 | 16.7                               | 18.5                               | 1                   | 24.4                                | 16.4                      | 5                            |
| SMAJ16A   | SMAJ16CA  | IP                  | UP | 16                                 | 17.8                               | 19.7                               | 1                   | 26                                  | 15.4                      | 5                            |
| SMAJ17A   | SMAJ17CA  | IR                  | UR | 17                                 | 18.9                               | 20.9                               | 1                   | 27.6                                | 14.5                      | 5                            |
| SMAJ18A   | SMAJ18CA  | IT                  | UT | 18                                 | 20                                 | 22.1                               | 1                   | 29.2                                | 13.7                      | 5                            |
| SMAJ20A   | SMAJ20CA  | IV                  | UV | 20                                 | 22.2                               | 24.5                               | 1                   | 32.4                                | 12.3                      | 5                            |
| SMAJ22A   | SMAJ22CA  | IX                  | UX | 22                                 | 24.4                               | 26.9                               | 1                   | 35.5                                | 11.3                      | 5                            |
| SMAJ24A   | SMAJ24CA  | IZ                  | UZ | 24                                 | 26.7                               | 29.5                               | 1                   | 38.9                                | 10.3                      | 5                            |
| SMAJ26A   | SMAJ26CA  | JE                  | VE | 26                                 | 28.9                               | 31.9                               | 1                   | 42.1                                | 9.5                       | 5                            |
| SMAJ28A   | SMAJ28CA  | JG                  | VG | 28                                 | 31.1                               | 34.4                               | 1                   | 45.4                                | 8.8                       | 5                            |
| SMAJ30A   | SMAJ30CA  | JK                  | VK | 30                                 | 33.3                               | 36.8                               | 1                   | 48.4                                | 8.3                       | 5                            |
| SMAJ33A   | SMAJ33CA  | JM                  | VM | 33                                 | 36.7                               | 40.6                               | 1                   | 53.3                                | 7.5                       | 5                            |
| SMAJ36A   | SMAJ36CA  | JP                  | VP | 36                                 | 40                                 | 44.2                               | 1                   | 58.1                                | 6.9                       | 5                            |
| SMAJ40A   | SMAJ40CA  | JR                  | VR | 40                                 | 44.4                               | 49.1                               | 1                   | 64.5                                | 6.2                       | 5                            |
| SMAJ43A   | SMAJ43CA  | JT                  | VT | 43                                 | 47.8                               | 52.8                               | 1                   | 69.4                                | 5.8                       | 5                            |
| SMAJ45A   | SMAJ45CA  | JV                  | VV | 45                                 | 50                                 | 55.3                               | 1                   | 72.7                                | 5.5                       | 5                            |
| SMAJ48A   | SMAJ48CA  | JX                  | VX | 48                                 | 53.3                               | 58.9                               | 1                   | 77.4                                | 5.2                       | 5                            |
| SMAJ51A   | SMAJ51CA  | JZ                  | VZ | 51                                 | 56.7                               | 62.7                               | 1                   | 82.4                                | 4.9                       | 5                            |
| SMAJ54A   | SMAJ54CA  | RE                  | WE | 54                                 | 60                                 | 66.3                               | 1                   | 87.1                                | 4.6                       | 5                            |
| SMAJ58A   | SMAJ58CA  | RG                  | WG | 58                                 | 64.4                               | 71.2                               | 1                   | 93.6                                | 4.3                       | 5                            |
| SMAJ60A   | SMAJ60CA  | RK                  | WK | 60                                 | 66.7                               | 73.7                               | 1                   | 96.8                                | 4.1                       | 5                            |
| SMAJ64A   | SMAJ64CA  | RM                  | WM | 64                                 | 71.1                               | 78.6                               | 1                   | 103                                 | 3.9                       | 5                            |
| SMAJ70A   | SMAJ70CA  | RP                  | WP | 70                                 | 77.8                               | 86                                 | 1                   | 113                                 | 3.5                       | 5                            |
| SMAJ75A   | SMAJ75CA  | RR                  | WR | 75                                 | 83.3                               | 92.1                               | 1                   | 121                                 | 3.3                       | 5                            |
| SMAJ78A   | SMAJ78CA  | RT                  | WT | 78                                 | 86.7                               | 95.8                               | 1                   | 126                                 | 3.2                       | 5                            |
| SMAJ85A   | SMAJ85CA  | RV                  | WV | 85                                 | 94.4                               | 104                                | 1                   | 137                                 | 2.9                       | 5                            |
| SMAJ90A   | SMAJ90CA  | RX                  | WX | 90                                 | 100                                | 111                                | 1                   | 146                                 | 2.7                       | 5                            |
| SMAJ100A  | SMAJ100CA | RZ                  | WZ | 100                                | 111                                | 123                                | 1                   | 162                                 | 2.5                       | 5                            |
| SMAJ110A  | SMAJ110CA | SE                  | XE | 110                                | 122                                | 135                                | 1                   | 177                                 | 2.3                       | 5                            |
| SMAJ120A  | SMAJ120CA | SG                  | XG | 120                                | 133                                | 147                                | 1                   | 193                                 | 2.1                       | 5                            |
| SMAJ130A  | SMAJ130CA | SK                  | XK | 130                                | 144                                | 159                                | 1                   | 209                                 | 1.9                       | 5                            |
| SMAJ150A  | SMAJ150CA | SM                  | XM | 150                                | 167                                | 185                                | 1                   | 243                                 | 1.6                       | 5                            |
| SMAJ160A  | SMAJ160CA | SP                  | XP | 160                                | 178                                | 197                                | 1                   | 259                                 | 1.5                       | 5                            |
| SMAJ170A  | SMAJ170CA | SR                  | XR | 170                                | 189                                | 209                                | 1                   | 275                                 | 1.5                       | 5                            |
| SMAJ180A  | SMAJ180CA | ST                  | XT | 180                                | 201                                | 222                                | 1                   | 292                                 | 1.4                       | 5                            |
| SMAJ220A  | SMAJ220CA | SX                  | XX | 220                                | 246                                | 272                                | 1                   | 356                                 | 1.1                       | 5                            |
| SMAJ300A  | SMAJ300CA | TE                  | UE | 300                                | 335                                | 371                                | 1                   | 486                                 | 0.8                       | 5                            |

**Technical Data  
Data Sheet N0223, Rev. C**

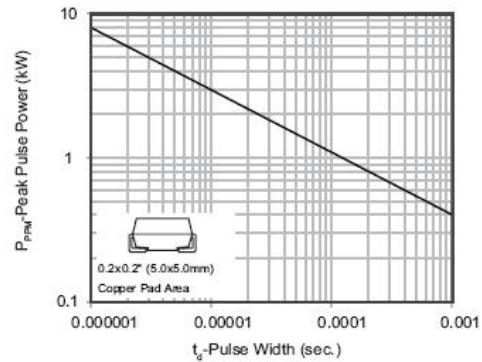
For bidirectional type having VRWM of 10 volts and less, the IR limit is double.  
For parts without A (VBR is + 10% and VC is 5% higher than with A parts).

**Ratings and Characteristics Curves**

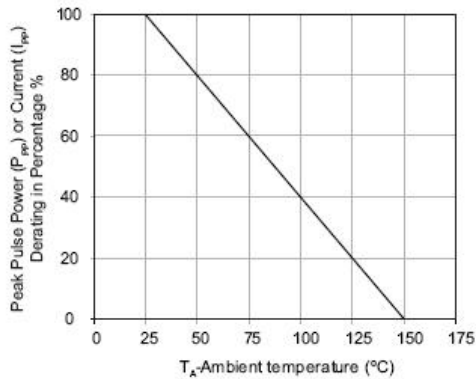
**Figure 1 - TVS Transients Clamping Waveform**



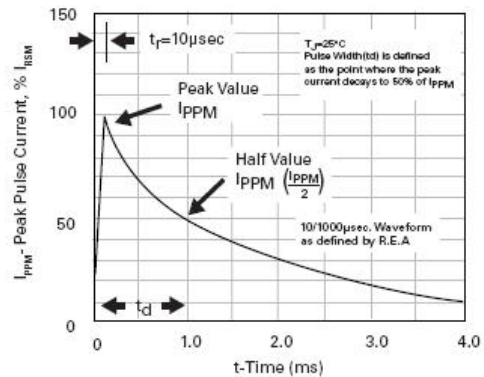
**Figure 2 - Peak Pulse Power Rating Curve**



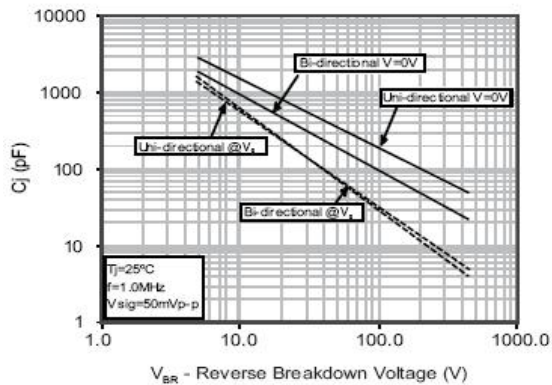
**Figure 3 - Pulse Derating Curve**



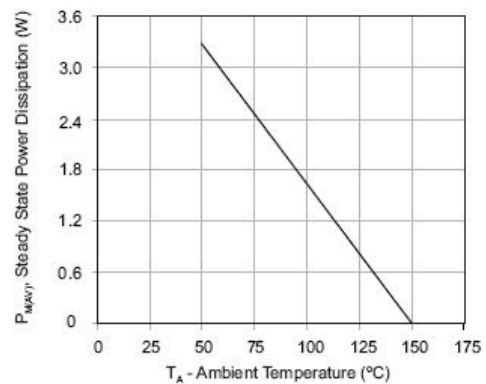
**Figure 4 - Pulse Waveform**



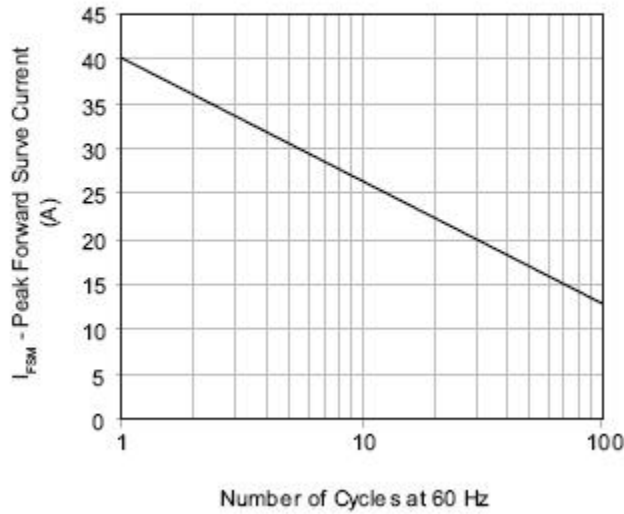
**Figure 5 - Typical Junction Capacitance**



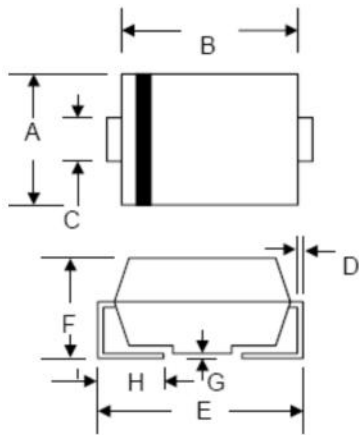
**Figure 6 - Steady State Power Dissipation Derating Curve**



**Figure 7 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**



**Mechanical Dimensions SMA**

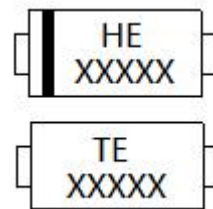


| SYMBOL | Millimeters |       | Inches |       |
|--------|-------------|-------|--------|-------|
|        | Min.        | Max.  | Min.   | Max.  |
| A      | 2.40        | 2.84  | 0.094  | 0.112 |
| B      | 3.99        | 4.75  | 0.157  | 0.187 |
| C      | 1.05        | 1.70  | 0.041  | 0.067 |
| D      | 0.15        | 0.51  | 0.006  | 0.020 |
| E      | 4.80        | 5.28  | 0.189  | 0.208 |
| F      | 2.00        | 2.44  | 0.078  | 0.098 |
| G      | 0.05        | 0.203 | 0.002  | 0.008 |
| H      | 0.76        | 1.52  | 0.030  | 0.600 |

**Ordering Information**

| Device                            | Package       | Shipping       |
|-----------------------------------|---------------|----------------|
| SMAJ5.0A<br>THRU<br>SMAJ300CA     | SMA (Pb-Free) | 5000pcs / reel |
| SMAJ5.0ATR<br>THRU<br>SMAJ300CATR | SMA (Pb-Free) | 5000pcs / reel |

**Marking Diagram**



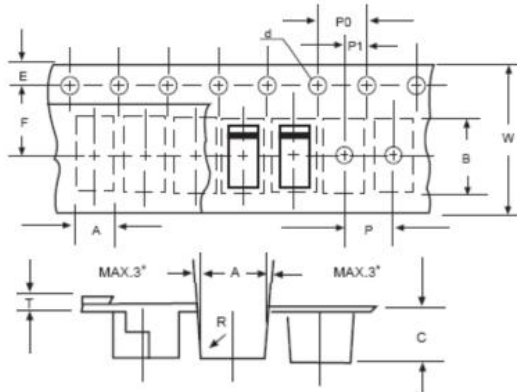
Where XXXXX is YYWWL

- HE/TE = Marking code
- YY = Year
- WW = Week
- L = Lot Number

**Cautions:** Molding resin  
Epoxy resin UL:94V-0

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

**Carrier Tape Specification SMA**



| SYMBOL | Millimeters |       |
|--------|-------------|-------|
|        | Min.        | Max.  |
| A      | 2.97        | 3.17  |
| B      | 5.70        | 5.90  |
| C      | 2.32        | 2.52  |
| d      | 1.40        | 1.60  |
| E      | 1.40        | 1.60  |
| F      | 5.60        | 5.70  |
| P      | 3.90        | 4.10  |
| P0     | 3.90        | 4.10  |
| P1     | 1.90        | 2.10  |
| T      | 0.25        | 0.35  |
| W      | 11.80       | 12.20 |

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[SMBJ33CATR](#) [SMBJ6.5A](#) [SMBJ8.0A](#) [ESD101-B1-02ELS E6327](#) [ESD112-B1-02EL E6327](#) [ESD7451N2T5G](#) [19180-510](#) [CPDT-5V0USP-](#)  
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[P4KE56CA](#) [P4KE68A](#) [P4KE91CATR](#) [P6KE120A](#) [P6KE13CA](#) [P6KE43CA](#) [P6KE6.8CA](#) [P6KE8.2](#) [P6SMBJ20CA](#)