

## 400W Transient Voltage Suppressor (TVS) protection device

### Main product characteristics

|                             |              |
|-----------------------------|--------------|
| $V_{WM}$                    | 5.0V – 440V  |
| $V_{BR(min)} - V_{BR(max)}$ | 6.40V – 543V |
| $I_{PP}$                    | 41.7A – 0.6A |
| $V_{CL(MAX)}$               | 9.6V – 713V  |
| $P_{PP}$                    | 400W         |



### Description and applications

This device has the ability to clamp dangerous high voltage, short term transients such as produced by directed or radiated electrostatic discharge phenomena before entering sensitive component regions of a circuit design. Response time of clamping action is virtually instantaneous. As a result, they may also be used effectively for protection from ESD or EFT per IEC61000-4-2 and IEC61000-4-4 or for inductive switching environments and induced RF. They can also be used for protecting other sensitive components from secondary lightning effects per IEC61000-4-5 and class levels defined herein. Microsemi also offers numerous other TVS products to meet higher and lower power demands and special applications.

- RoHS compliant (2002/95/EC), MSL level 1 (J-STD-020)
- Qualified to automotive grade – AEC Q101
- Bi-directional devices are denoted by the suffixes C or CA, electrical characteristics apply in both directions.

### Maximum ratings and characteristics<sup>(1)</sup>

| Symbol          | Parameter                                                                                                  | Value          | Unit               |
|-----------------|------------------------------------------------------------------------------------------------------------|----------------|--------------------|
| $P_{PPM}$       | Peak power dissipation with a 10/1000 $\mu$ s waveform <sup>(2)(3)</sup> (fig.1)                           | 400            | W                  |
| $I_{PPM}$       | Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(2)</sup> (fig. 3)                                 | See next table | A                  |
| $P_{M(AV)}$     | Steady state power dissipation at $T_L = 75^\circ\text{C}$ , lead lengths 0.375" (9.5mm) <sup>(3)</sup>    | 1.0            | W                  |
| $I_{FSM}$       | Non repetitive peak forward surge current (8.3ms single half sine wave) unidirectional only <sup>(4)</sup> | 40             | A                  |
| $V_F$           | Maximum instantaneous forward voltage at 25A for unidirectional only <sup>(5)</sup>                        | 3.5 / 5.0      | V                  |
| $R_{\theta JL}$ | Typical thermal resistance junction to lead                                                                | 30             | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ | Typical thermal resistance junction to ambient                                                             | 120            | $^\circ\text{C/W}$ |
| $T_{STG}$       | Storage temperature                                                                                        | -55 to +150    | $^\circ\text{C}$   |
| $T_J$           | Junction temperature                                                                                       | -55 to +150    | $^\circ\text{C}$   |

(1) All ratings at 25 $^\circ\text{C}$  unless specified otherwise

(2) Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per Fig. 2. rating is 300W above 78V.

(3) Mounted on copper pad area of 0.2" x 0.2" (5.0mm x 5.0mm)

(4) Mounted on minimum recommended pad layout

(5)  $V_F=3.5\text{V}$  for devices of  $V_{BR} < 220\text{V}$  and  $V_F=5.0\text{V}$  maximum for devices of  $V_{BR} > 220\text{V}$

## 400W Transient Voltage Suppressor (TVS) protection device

### Electrical characteristics<sup>(1)</sup>

| DEVICE                                  | Device marking code |     | BREAKDOWN VOLTAGE <sup>(2)</sup> , V <sub>BR</sub><br>V <sub>BR</sub> (V) @ I <sub>T</sub> (mA) |      | TEST CURRENT I <sub>T</sub><br>(mA) | STAND-OFF VOLTAGE V <sub>WM</sub><br>(V) | MAXIMUM STANDBY CURRENT <sup>(4)</sup> I <sub>D</sub><br>(μA) @ V <sub>WM</sub> | MAXIMUM PEAK PULSE CURRENT <sup>(3)</sup> I <sub>PP</sub><br>(A) | MAXIMUM CLAMPING VOLTAGE V <sub>C</sub> (V)<br>@ I <sub>PP</sub> |
|-----------------------------------------|---------------------|-----|-------------------------------------------------------------------------------------------------|------|-------------------------------------|------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|
|                                         | UNI                 | BI  | Min                                                                                             | Max  |                                     |                                          |                                                                                 |                                                                  |                                                                  |
| SMAJ5.0e3 / SMAJ5.0Ce3                  | MAD                 | MWD | 6.40                                                                                            | 7.82 | 10                                  | 5.0                                      | 800                                                                             | 41.7                                                             | 9.6                                                              |
| SMAJ5.0Ae3 / SMAJ5.0CAe3 <sup>(5)</sup> | MAE                 | MWE | 6.40                                                                                            | 7.07 | 10                                  | 5.0                                      | 800                                                                             | 43.5                                                             | 9.2                                                              |
| SMAJ6.0e3 / SMAJ6.0Ce3                  | MAF                 | MWF | 6.67                                                                                            | 8.15 | 10                                  | 6.0                                      | 800                                                                             | 35.1                                                             | 11.4                                                             |
| SMAJ6.0Ae3 / SMAJ6.0CAe3                | MAG                 | MWG | 6.67                                                                                            | 7.37 | 10                                  | 6.0                                      | 800                                                                             | 38.8                                                             | 10.3                                                             |
| SMAJ6.5e3 / SMAJ6.5Ce3                  | MAH                 | MWH | 7.22                                                                                            | 8.82 | 10                                  | 6.5                                      | 500                                                                             | 32.5                                                             | 12.3                                                             |
| SMAJ6.5Ae3 / SMAJ6.5CAe3                | MAK                 | MWK | 7.22                                                                                            | 7.98 | 10                                  | 6.5                                      | 500                                                                             | 35.7                                                             | 11.2                                                             |
| SMAJ7.0e3 / SMAJ7.0Ce3                  | MAL                 | MWL | 7.78                                                                                            | 9.51 | 10                                  | 7.0                                      | 200                                                                             | 30.1                                                             | 13.3                                                             |
| SMAJ7.0Ae3 / SMAJ7.0CAe3                | MAM                 | MWM | 7.78                                                                                            | 8.60 | 10                                  | 7.0                                      | 200                                                                             | 33.3                                                             | 12.0                                                             |
| SMAJ7.5e3 / SMAJ7.5Ce3                  | MAN                 | MWN | 8.33                                                                                            | 10.2 | 1.0                                 | 7.5                                      | 100                                                                             | 28.0                                                             | 14.3                                                             |
| SMAJ7.5Ae3 / SMAJ7.5CAe3                | MAP                 | MWP | 8.33                                                                                            | 9.21 | 1.0                                 | 7.5                                      | 100                                                                             | 31.0                                                             | 12.9                                                             |
| SMAJ8.0e3 / SMAJ8.0Ce3                  | MAQ                 | MWQ | 8.89                                                                                            | 10.9 | 1.0                                 | 8.0                                      | 50                                                                              | 26.7                                                             | 15.0                                                             |
| SMAJ8.0Ae3 / SMAJ8.0CAe3                | MAR                 | MWR | 8.89                                                                                            | 9.83 | 1.0                                 | 8.0                                      | 50                                                                              | 29.4                                                             | 13.6                                                             |
| SMAJ8.5e3 / SMAJ8.5Ce3                  | MAS                 | MWS | 9.44                                                                                            | 11.5 | 1.0                                 | 8.5                                      | 10                                                                              | 25.2                                                             | 15.9                                                             |
| SMAJ8.5Ae3 / SMAJ8.5CAe3                | MAT                 | MWT | 9.44                                                                                            | 10.4 | 1.0                                 | 8.5                                      | 10                                                                              | 27.8                                                             | 14.4                                                             |
| SMAJ9.0e3 / SMAJ9.0Ce3                  | MAU                 | MWU | 10.0                                                                                            | 12.2 | 1.0                                 | 9.0                                      | 5.0                                                                             | 23.7                                                             | 16.9                                                             |
| SMAJ9.0Ae3 / SMAJ9.0CAe3                | MAV                 | MWV | 10.0                                                                                            | 11.1 | 1.0                                 | 9.0                                      | 5.0                                                                             | 26.0                                                             | 15.4                                                             |
| SMAJ10e3 / SMAJ10Ce3                    | MAW                 | MWW | 11.1                                                                                            | 13.6 | 1.0                                 | 10                                       | 1.0                                                                             | 21.3                                                             | 18.8                                                             |
| SMAJ10Ae3 / SMAJ10CAe3                  | MAX                 | MWX | 11.1                                                                                            | 12.3 | 1.0                                 | 10                                       | 1.0                                                                             | 23.5                                                             | 17.0                                                             |
| SMAJ11e3 / SMAJ11Ce3                    | MAY                 | MWY | 12.2                                                                                            | 14.9 | 1.0                                 | 11                                       | 1.0                                                                             | 19.9                                                             | 20.1                                                             |
| SMAJ11Ae3 / SMAJ11CAe3                  | MAZ                 | MWZ | 12.2                                                                                            | 13.5 | 1.0                                 | 11                                       | 1.0                                                                             | 22.0                                                             | 18.2                                                             |
| SMAJ12e3 / SMAJ12Ce3                    | MBD                 | MXD | 13.3                                                                                            | 16.3 | 1.0                                 | 12                                       | 1.0                                                                             | 18.2                                                             | 22.0                                                             |
| SMAJ12Ae3 / SMAJ12CAe3                  | MBE                 | MXE | 13.3                                                                                            | 14.7 | 1.0                                 | 12                                       | 1.0                                                                             | 20.1                                                             | 19.9                                                             |
| SMAJ13e3 / SMAJ13Ce3                    | MBF                 | MXF | 14.4                                                                                            | 17.6 | 1.0                                 | 13                                       | 1.0                                                                             | 16.8                                                             | 23.8                                                             |
| SMAJ13Ae3 / SMAJ13CAe3                  | MBG                 | MXG | 14.4                                                                                            | 15.9 | 1.0                                 | 13                                       | 1.0                                                                             | 18.6                                                             | 21.5                                                             |
| SMAJ14e3 / SMAJ14Ce3                    | MBH                 | MXH | 15.6                                                                                            | 19.1 | 1.0                                 | 14                                       | 1.0                                                                             | 15.5                                                             | 25.8                                                             |
| SMAJ14Ae3 / SMAJ14CAe3                  | MBK                 | MXK | 15.6                                                                                            | 17.2 | 1.0                                 | 14                                       | 1.0                                                                             | 17.2                                                             | 23.2                                                             |
| SMAJ15e3 / SMAJ15Ce3                    | MBL                 | MXL | 16.7                                                                                            | 20.4 | 1.0                                 | 15                                       | 1.0                                                                             | 14.9                                                             | 26.9                                                             |
| SMAJ15Ae3 / SMAJ15CAe3                  | MBM                 | MXM | 16.7                                                                                            | 18.5 | 1.0                                 | 15                                       | 1.0                                                                             | 16.4                                                             | 24.4                                                             |
| SMAJ16e3 / SMAJ16Ce3                    | MBN                 | MXN | 17.8                                                                                            | 21.8 | 1.0                                 | 16                                       | 1.0                                                                             | 13.9                                                             | 28.8                                                             |
| SMAJ16Ae3 / SMAJ16CAe3                  | MBP                 | MXP | 17.8                                                                                            | 19.7 | 1.0                                 | 16                                       | 1.0                                                                             | 15.4                                                             | 26.0                                                             |
| SMAJ17e3 / SMAJ17Ce3                    | MBQ                 | MXQ | 18.9                                                                                            | 23.1 | 1.0                                 | 17                                       | 1.0                                                                             | 13.1                                                             | 30.5                                                             |
| SMAJ17Ae3 / SMAJ17CAe3                  | MBR                 | MXR | 18.9                                                                                            | 20.9 | 1.0                                 | 17                                       | 1.0                                                                             | 14.5                                                             | 27.6                                                             |
| SMAJ18e3 / SMAJ18Ce3                    | MBS                 | MXS | 20.0                                                                                            | 24.4 | 1.0                                 | 18                                       | 1.0                                                                             | 12.4                                                             | 32.2                                                             |
| SMAJ18Ae3 / SMAJ18CAe3                  | MBT                 | MXT | 20.0                                                                                            | 22.1 | 1.0                                 | 18                                       | 1.0                                                                             | 13.7                                                             | 29.2                                                             |
| SMAJ20e3 / SMAJ20Ce3                    | MBU                 | MXU | 22.2                                                                                            | 27.1 | 1.0                                 | 20                                       | 1.0                                                                             | 11.2                                                             | 35.8                                                             |
| SMAJ20Ae3 / SMAJ20CAe3                  | MBV                 | MXV | 22.2                                                                                            | 24.5 | 1.0                                 | 20                                       | 1.0                                                                             | 12.3                                                             | 32.4                                                             |
| SMAJ22e3 / SMAJ22Ce3                    | MBW                 | MXW | 24.4                                                                                            | 29.8 | 1.0                                 | 22                                       | 1.0                                                                             | 10.2                                                             | 39.4                                                             |
| SMAJ22Ae3 / SMAJ22CAe3                  | MBX                 | MXX | 24.4                                                                                            | 26.9 | 1.0                                 | 22                                       | 1.0                                                                             | 11.3                                                             | 35.5                                                             |

(1) All ratings at 25°C unless specified otherwise

(2) V<sub>BR</sub> measured after I<sub>T</sub> applied for 300μs, I<sub>T</sub>=square wave pulse or equivalent

(3) Surge current waveform per Fig.3 and derated per Fig.2

(4) For bidirectional types with V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled

(5) For the bidirectional SMAJ5.0CA, the maximum V<sub>BR</sub> is 7.25V

## 400W Transient Voltage Suppressor (TVS) protection device

### Electrical characteristics (cont.)<sup>(1)</sup>

| DEVICE                 | Device marking code |     | BREAKDOWN VOLTAGE <sup>(2)</sup> , V <sub>BR</sub><br>V <sub>BR</sub> (V) @ I <sub>T</sub> (mA) |      | TEST CURRENT I <sub>T</sub><br>(mA) | STAND-OFF VOLTAGE V <sub>WM</sub><br>(V) | MAXIMUM STANDBY CURRENT <sup>(4)</sup> I <sub>D</sub><br>(μA) @ V <sub>WM</sub> | MAXIMUM PEAK PULSE CURRENT <sup>(3)</sup> I <sub>PP</sub><br>(A) | MAXIMUM CLAMPING VOLTAGE V <sub>C</sub> (V)<br>@ I <sub>PP</sub> |
|------------------------|---------------------|-----|-------------------------------------------------------------------------------------------------|------|-------------------------------------|------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|
|                        | UNI                 | BI  | Min                                                                                             | Max  |                                     |                                          |                                                                                 |                                                                  |                                                                  |
| SMAJ24e3 / SMAJ24Ce3   | MBY                 | MXY | 26.7                                                                                            | 32.6 | 1.0                                 | 24                                       | 1.0                                                                             | 9.3                                                              | 43.0                                                             |
| SMAJ24Ae3 / SMAJ24CAe3 | MBZ                 | MXZ | 26.7                                                                                            | 29.5 | 1.0                                 | 24                                       | 1.0                                                                             | 10.3                                                             | 38.9                                                             |
| SMAJ26e3 / SMAJ26Ce3   | MCD                 | MYD | 28.9                                                                                            | 35.3 | 1.0                                 | 26                                       | 1.0                                                                             | 8.6                                                              | 46.6                                                             |
| SMAJ26Ae3 / SMAJ26CAe3 | MCE                 | MYE | 28.9                                                                                            | 31.9 | 1.0                                 | 26                                       | 1.0                                                                             | 9.5                                                              | 42.1                                                             |
| SMAJ28e3 / SMAJ28Ce3   | MCF                 | MYF | 31.1                                                                                            | 38.0 | 1.0                                 | 28                                       | 1.0                                                                             | 8.0                                                              | 50.0                                                             |
| SMAJ28Ae3 / SMAJ28CAe3 | MCG                 | MYG | 31.1                                                                                            | 34.4 | 1.0                                 | 28                                       | 1.0                                                                             | 8.8                                                              | 45.4                                                             |
| SMAJ30e3 / SMAJ30Ce3   | MCH                 | MYH | 33.3                                                                                            | 40.7 | 1.0                                 | 30                                       | 1.0                                                                             | 7.5                                                              | 53.5                                                             |
| SMAJ30Ae3 / SMAJ30CAe3 | MCK                 | MYK | 33.3                                                                                            | 36.8 | 1.0                                 | 30                                       | 1.0                                                                             | 8.3                                                              | 48.4                                                             |
| SMAJ33e3 / SMAJ33Ce3   | MCL                 | MYL | 36.7                                                                                            | 44.9 | 1.0                                 | 33                                       | 1.0                                                                             | 6.8                                                              | 59.0                                                             |
| SMAJ33Ae3 / SMAJ33CAe3 | MCM                 | MYM | 36.7                                                                                            | 40.6 | 1.0                                 | 33                                       | 1.0                                                                             | 7.5                                                              | 53.3                                                             |
| SMAJ36e3 / SMAJ36Ce3   | MCN                 | MYN | 40.0                                                                                            | 48.9 | 1.0                                 | 36                                       | 1.0                                                                             | 6.2                                                              | 64.3                                                             |
| SMAJ36Ae3 / SMAJ36CAe3 | MCP                 | MYP | 40.0                                                                                            | 44.2 | 1.0                                 | 36                                       | 1.0                                                                             | 6.9                                                              | 58.1                                                             |
| SMAJ40e3 / SMAJ40Ce3   | MCQ                 | MYQ | 44.4                                                                                            | 54.3 | 1.0                                 | 40                                       | 1.0                                                                             | 5.6                                                              | 71.4                                                             |
| SMAJ40Ae3 / SMAJ40CAe3 | MCR                 | MYR | 44.4                                                                                            | 49.1 | 1.0                                 | 40                                       | 1.0                                                                             | 6.2                                                              | 64.5                                                             |
| SMAJ43e3 / SMAJ43Ce3   | MCS                 | MYS | 47.8                                                                                            | 58.4 | 1.0                                 | 43                                       | 1.0                                                                             | 5.2                                                              | 76.7                                                             |
| SMAJ43Ae3 / SMAJ43CAe3 | MCT                 | MYT | 47.8                                                                                            | 52.8 | 1.0                                 | 43                                       | 1.0                                                                             | 5.8                                                              | 69.4                                                             |
| SMAJ45e3 / SMAJ45Ce3   | MCU                 | MYU | 50.0                                                                                            | 61.1 | 1.0                                 | 45                                       | 1.0                                                                             | 5.0                                                              | 80.3                                                             |
| SMAJ45Ae3 / SMAJ45CAe3 | MCV                 | MYV | 50.0                                                                                            | 55.3 | 1.0                                 | 45                                       | 1.0                                                                             | 5.5                                                              | 72.7                                                             |
| SMAJ48e3 / SMAJ48Ce3   | MCW                 | MYW | 53.3                                                                                            | 65.1 | 1.0                                 | 48                                       | 1.0                                                                             | 4.7                                                              | 85.5                                                             |
| SMAJ48Ae3 / SMAJ48CAe3 | MCX                 | MYX | 53.3                                                                                            | 58.9 | 1.0                                 | 48                                       | 1.0                                                                             | 5.2                                                              | 77.4                                                             |
| SMAJ51e3 / SMAJ51Ce3   | MCY                 | MYY | 56.7                                                                                            | 69.3 | 1.0                                 | 51                                       | 1.0                                                                             | 4.4                                                              | 91.1                                                             |
| SMAJ51Ae3 / SMAJ51CAe3 | MCZ                 | MYZ | 56.7                                                                                            | 62.7 | 1.0                                 | 51                                       | 1.0                                                                             | 4.9                                                              | 82.4                                                             |
| SMAJ54e3 / SMAJ54Ce3   | MRD                 | MZD | 60.0                                                                                            | 73.3 | 1.0                                 | 54                                       | 1.0                                                                             | 4.2                                                              | 96.3                                                             |
| SMAJ54Ae3 / SMAJ54CAe3 | MRE                 | MZE | 60.0                                                                                            | 66.3 | 1.0                                 | 54                                       | 1.0                                                                             | 4.6                                                              | 87.1                                                             |
| SMAJ58e3 / SMAJ58Ce3   | MRF                 | MZF | 64.4                                                                                            | 78.7 | 1.0                                 | 58                                       | 1.0                                                                             | 3.9                                                              | 103                                                              |
| SMAJ58Ae3 / SMAJ58CAe3 | MRG                 | MZG | 64.4                                                                                            | 71.2 | 1.0                                 | 58                                       | 1.0                                                                             | 4.3                                                              | 93.6                                                             |
| SMAJ60e3 / SMAJ60Ce3   | MRH                 | MZH | 66.7                                                                                            | 81.5 | 1.0                                 | 60                                       | 1.0                                                                             | 3.7                                                              | 107                                                              |
| SMAJ60Ae3 / SMAJ60CAe3 | MRK                 | MZK | 66.7                                                                                            | 73.7 | 1.0                                 | 60                                       | 1.0                                                                             | 4.1                                                              | 96.8                                                             |
| SMAJ64e3 / SMAJ64Ce3   | MRL                 | MZL | 71.1                                                                                            | 86.9 | 1.0                                 | 64                                       | 1.0                                                                             | 3.5                                                              | 114                                                              |
| SMAJ64Ae3 / SMAJ64CAe3 | MRM                 | MZM | 71.1                                                                                            | 78.6 | 1.0                                 | 64                                       | 1.0                                                                             | 3.9                                                              | 103                                                              |
| SMAJ70e3 / SMAJ70Ce3   | MRN                 | MZN | 77.8                                                                                            | 95.1 | 1.0                                 | 70                                       | 1.0                                                                             | 3.2                                                              | 125                                                              |
| SMAJ70Ae3 / SMAJ70CAe3 | MRP                 | MZP | 77.8                                                                                            | 86.0 | 1.0                                 | 70                                       | 1.0                                                                             | 3.5                                                              | 113                                                              |
| SMAJ75e3 / SMAJ75Ce3   | MRQ                 | MZQ | 83.3                                                                                            | 102  | 1.0                                 | 75                                       | 1.0                                                                             | 3.0                                                              | 134                                                              |
| SMAJ75Ae3 / SMAJ75CAe3 | MRR                 | MZR | 83.3                                                                                            | 92.1 | 1.0                                 | 75                                       | 1.0                                                                             | 3.3                                                              | 121                                                              |
| SMAJ78e3 / SMAJ78Ce3   | MRS                 | MZS | 86.7                                                                                            | 106  | 1.0                                 | 78                                       | 1.0                                                                             | 2.9                                                              | 139                                                              |
| SMAJ78Ae3 / SMAJ78CAe3 | MRT                 | MZT | 86.7                                                                                            | 95.8 | 1.0                                 | 78                                       | 1.0                                                                             | 3.2                                                              | 126                                                              |
| SMAJ85e3 / SMAJ85Ce3   | MRU                 | MZU | 94.4                                                                                            | 115  | 1.0                                 | 85                                       | 1.0                                                                             | 2.0                                                              | 151                                                              |
| SMAJ85Ae3 / SMAJ85CAe3 | MRV                 | MZV | 94.4                                                                                            | 104  | 1.0                                 | 85                                       | 1.0                                                                             | 2.2                                                              | 137                                                              |

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(3) Surge current waveform per Fig.3 and derated per Fig.2

(4) For bidirectional types with V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled

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### Electrical characteristics (cont.)<sup>(1)</sup>

| DEVICE                   | Device marking code |     | BREAKDOWN VOLTAGE <sup>(2)</sup> , V <sub>BR</sub><br>V <sub>BR</sub> (V) @ I <sub>T</sub> (mA) |     | TEST CURRENT I <sub>T</sub><br>(mA) | STAND-OFF VOLTAGE V <sub>WM</sub><br>(V) | MAXIMUM STANDBY CURRENT <sup>(4)</sup> I <sub>D</sub><br>(μA) @ V <sub>WM</sub> | MAXIMUM PEAK PULSE CURRENT <sup>(3)</sup> I <sub>PP</sub><br>(A) | MAXIMUM CLAMPING VOLTAGE V <sub>C</sub> (V)<br>@ I <sub>PP</sub> |
|--------------------------|---------------------|-----|-------------------------------------------------------------------------------------------------|-----|-------------------------------------|------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|
|                          | UNI                 | BI  | Min                                                                                             | Max |                                     |                                          |                                                                                 |                                                                  |                                                                  |
| SMAJ90e3 / SMAJ90Ce3     | MRW                 | MZW | 100                                                                                             | 122 | 1.0                                 | 90                                       | 1.0                                                                             | 1.9                                                              | 160                                                              |
| SMAJ90Ae3 / SMAJ90CAe3   | MRX                 | MZX | 100                                                                                             | 111 | 1.0                                 | 90                                       | 1.0                                                                             | 2.1                                                              | 146                                                              |
| SMAJ100e3 / SMAJ100Ce3   | MRY                 | MZY | 111                                                                                             | 136 | 1.0                                 | 100                                      | 1.0                                                                             | 1.7                                                              | 179                                                              |
| SMAJ100Ae3 / SMAJ100CAe3 | MRZ                 | MZZ | 111                                                                                             | 123 | 1.0                                 | 100                                      | 1.0                                                                             | 1.9                                                              | 162                                                              |
| SMAJ110e3 / SMAJ110Ce3   | MSD                 | MVD | 122                                                                                             | 149 | 1.0                                 | 110                                      | 1.0                                                                             | 1.5                                                              | 196                                                              |
| SMAJ110Ae3 / SMAJ110CAe3 | MSE                 | MVE | 122                                                                                             | 135 | 1.0                                 | 110                                      | 1.0                                                                             | 1.7                                                              | 177                                                              |
| SMAJ120e3 / SMAJ120Ce3   | MSF                 | MVF | 133                                                                                             | 163 | 1.0                                 | 120                                      | 1.0                                                                             | 1.4                                                              | 214                                                              |
| SMAJ120Ae3 / SMAJ120CAe3 | MSG                 | MVG | 133                                                                                             | 147 | 1.0                                 | 120                                      | 1.0                                                                             | 1.6                                                              | 193                                                              |
| SMAJ130e3 / SMAJ130Ce3   | MSH                 | MVH | 144                                                                                             | 176 | 1.0                                 | 130                                      | 1.0                                                                             | 1.3                                                              | 231                                                              |
| SMAJ130Ae3 / SMAJ130CAe3 | MSK                 | MVK | 144                                                                                             | 159 | 1.0                                 | 130                                      | 1.0                                                                             | 1.4                                                              | 209                                                              |
| SMAJ150e3 / SMAJ150Ce3   | MSL                 | MVL | 167                                                                                             | 204 | 1.0                                 | 150                                      | 1.0                                                                             | 1.1                                                              | 268                                                              |
| SMAJ150Ae3 / SMAJ150CAe3 | MSM                 | MVM | 167                                                                                             | 185 | 1.0                                 | 150                                      | 1.0                                                                             | 1.2                                                              | 243                                                              |
| SMAJ160e3 / SMAJ160Ce3   | MSN                 | MVN | 178                                                                                             | 218 | 1.0                                 | 160                                      | 1.0                                                                             | 1.0                                                              | 287                                                              |
| SMAJ160Ae3 / SMAJ160CAe3 | MSP                 | MVP | 178                                                                                             | 197 | 1.0                                 | 160                                      | 1.0                                                                             | 1.2                                                              | 259                                                              |
| SMAJ170e3 / SMAJ170Ce3   | MSQ                 | MVQ | 189                                                                                             | 231 | 1.0                                 | 170                                      | 1.0                                                                             | 0.99                                                             | 304                                                              |
| SMAJ170Ae3 / SMAJ170CAe3 | MSR                 | MVR | 189                                                                                             | 209 | 1.0                                 | 170                                      | 1.0                                                                             | 1.09                                                             | 275                                                              |
| SMAJ180Ae3 / SMAJ180CAe3 | MST                 | MVT | 201                                                                                             | 222 | 1.0                                 | 180                                      | 1.0                                                                             | 1.4                                                              | 292                                                              |
| SMAJ200Ae3 / SMAJ200CAe3 | MSV                 | MVV | 224                                                                                             | 247 | 1.0                                 | 200                                      | 1.0                                                                             | 1.2                                                              | 324                                                              |
| SMAJ220Ae3 / SMAJ220CAe3 | MSX                 | MVX | 246                                                                                             | 272 | 1.0                                 | 220                                      | 1.0                                                                             | 1.1                                                              | 356                                                              |
| SMAJ250Ae3 / SMAJ250CAe3 | MSZ                 | MVZ | 279                                                                                             | 309 | 1.0                                 | 250                                      | 1.0                                                                             | 1.0                                                              | 405                                                              |
| SMAJ300Ae3 / SMAJ300CAe3 | MTE                 | MUE | 335                                                                                             | 371 | 1.0                                 | 300                                      | 1.0                                                                             | 0.8                                                              | 486                                                              |
| SMAJ350Ae3 / SMAJ350CAe3 | MTG                 | MUG | 391                                                                                             | 432 | 1.0                                 | 350                                      | 1.0                                                                             | 0.7                                                              | 567                                                              |
| SMAJ400Ae3 / SMAJ400CAe3 | MTK                 | MUK | 447                                                                                             | 494 | 1.0                                 | 400                                      | 1.0                                                                             | 0.6                                                              | 648                                                              |
| SMAJ440Ae3 / SMAJ440CAe3 | MTM                 | MUM | 492                                                                                             | 543 | 1.0                                 | 440                                      | 1.0                                                                             | 0.6                                                              | 713                                                              |

(1) All ratings at 25°C unless specified otherwise

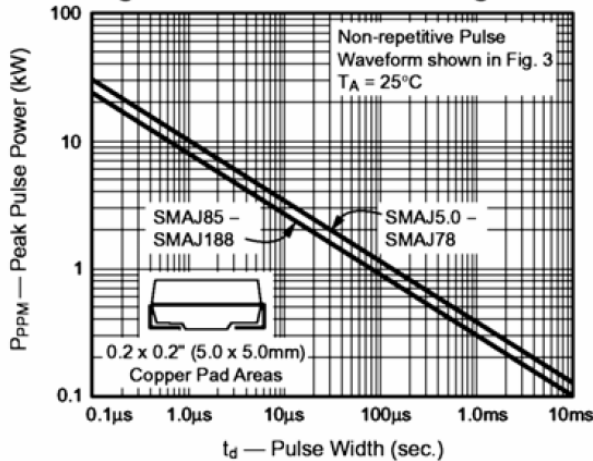
(2) V<sub>BR</sub> measured after I<sub>T</sub> applied for 300μs, I<sub>T</sub>=square wave pulse or equivalent

(3) Surge current waveform per Fig.3 and derated per Fig.2

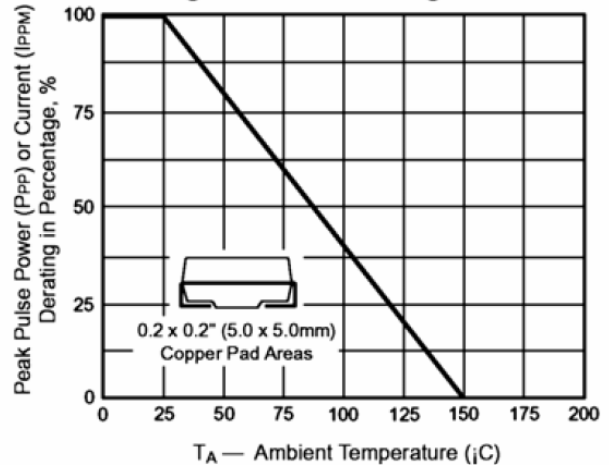
(4) For bidirectional types with V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled

## 400W Transient Voltage Suppressor (TVS) protection device

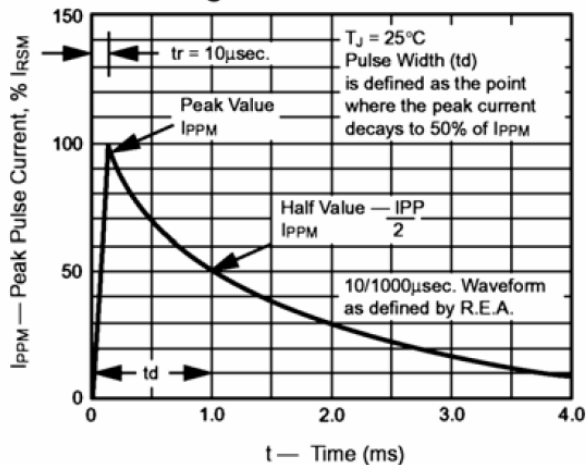
**Fig. 1 – Peak Pulse Power Rating Curve**



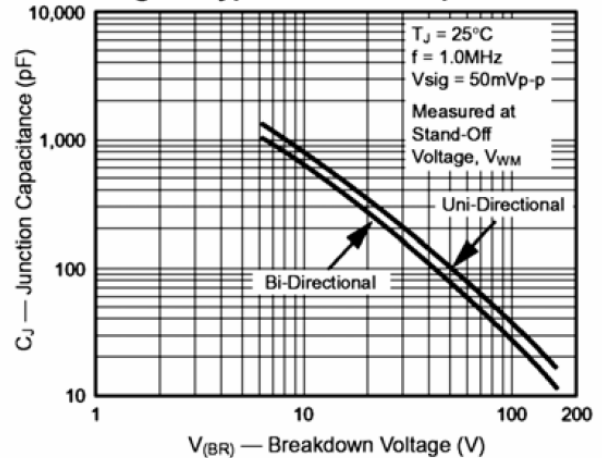
**Fig. 2 – Pulse Derating Curve**



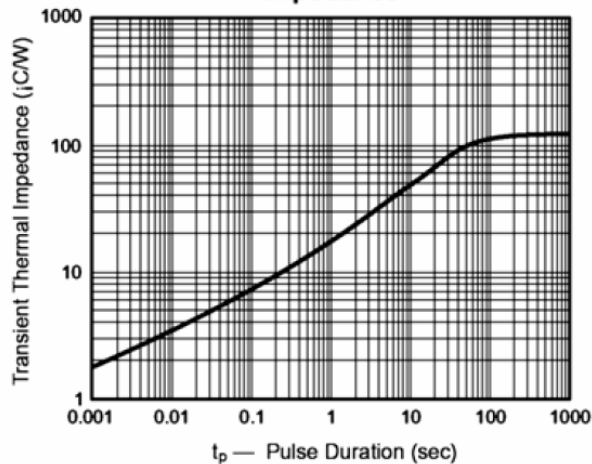
**Fig. 3 – Pulse Waveform**



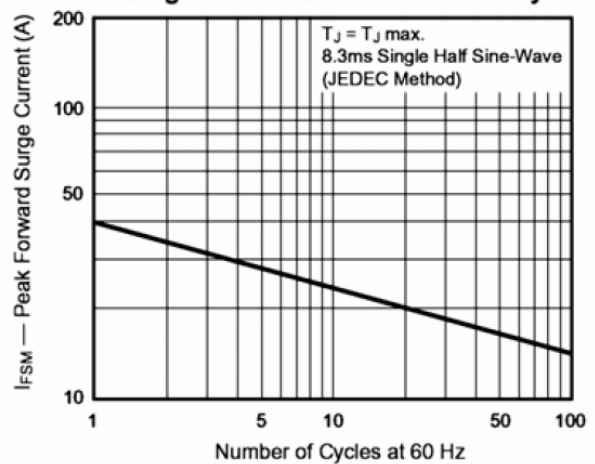
**Fig. 4 – Typical Junction Capacitance**



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

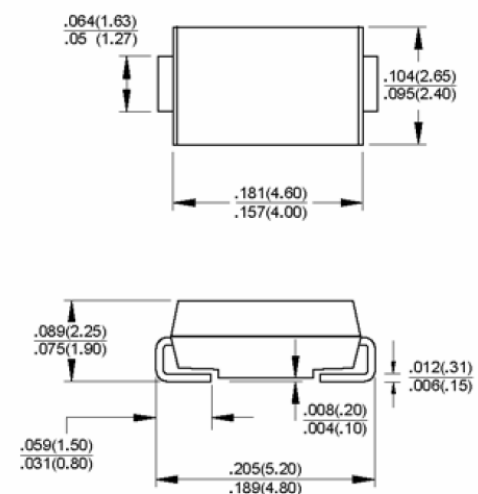
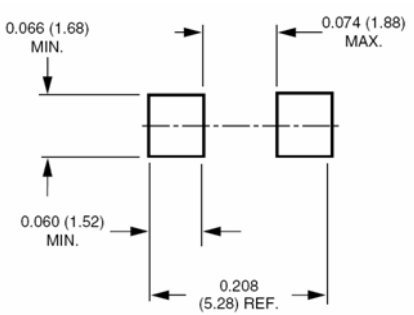


**Fig. 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only**



## 400W Transient Voltage Suppressor (TVS) protection device

### Mechanical Characteristics

| Physical dimensions                                                                                                                    | Footprint dimensions                                                                | Package materials & information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p><b>Dimensions in inches and (millimeters)</b></p> |  | <p><b>Case :</b> Epoxy meets UL94V-0</p> <p><b>Electrode finish :</b><br/>Matte Sn plating - fully RoHS compliant</p> <p><b>Terminals :</b> solderable per MIL-STD-750, Method 2026</p> <p><b>Marking code :</b> See electrical characteristics table and example below:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <div style="display: flex; justify-content: space-between; width: 100%;"> <div style="width: 20%;"></div> <div style="text-align: center; width: 60%;"> <p>XXX</p> <p>D/C</p> </div> <div style="width: 20%;"></div> </div> </div> |

**POLARITY :** For unidirectional types the color band denotes the cathode, which is positive with respect to the anode under normal TVS operation.

### Ordering information

| Product order code                                                                   | Package        | Weight             | Base qty | Delivery mode           |
|--------------------------------------------------------------------------------------|----------------|--------------------|----------|-------------------------|
| <b>SMAJxxxxe3/TR13</b><br><br>For example :<br>SMAJ18CAe3/TR13 or<br>SMAJ6.8Ae3/TR13 | DO-214AC (SMA) | 0.002oz.<br>0.064g | 5000     | Tape and reel (13 inch) |

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[SMAJ43Ce3/TR13](#) [SMAJ90CAe3/TR13](#) [SMAJ40CAe3/TR13](#) [SMAJ7.0Ce3/TR13](#) [SMAJ75e3/TR13](#)  
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