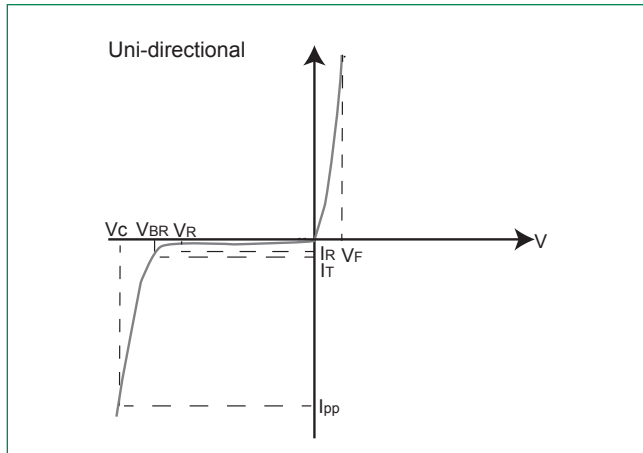


### Electrical Characteristics

| Part Number (Uni) | Marking | Reverse Stand off Voltage $V_R$ (Volts) | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ |        | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu$ A) | Agency Approval  |
|-------------------|---------|-----------------------------------------|--------------------------------------------|--------|-------------------------|-----------------------------------------------|-----------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                   |         |                                         | MIN                                        | MAX    |                         |                                               |                                         |                                                  |                                                                                                     |
| TPSMA6L5.0A       | AEA     | 5.0                                     | 6.40                                       | 7.00   | 10                      | 9.2                                           | 65.3                                    | 800                                              | X                                                                                                   |
| TPSMA6L6.0A       | AGA     | 6.0                                     | 6.67                                       | 7.37   | 10                      | 10.3                                          | 58.3                                    | 800                                              | X                                                                                                   |
| TPSMA6L6.5A       | AKA     | 6.5                                     | 7.22                                       | 7.98   | 10                      | 11.2                                          | 53.6                                    | 500                                              | X                                                                                                   |
| TPSMA6L7.0A       | AMA     | 7.0                                     | 7.78                                       | 8.60   | 10                      | 12.0                                          | 50.0                                    | 200                                              | X                                                                                                   |
| TPSMA6L7.5A       | APA     | 7.5                                     | 8.33                                       | 9.21   | 1                       | 12.9                                          | 46.6                                    | 100                                              | X                                                                                                   |
| TPSMA6L8.0A       | ARA     | 8.0                                     | 8.89                                       | 9.83   | 1                       | 13.6                                          | 44.2                                    | 50                                               | X                                                                                                   |
| TPSMA6L8.5A       | ATA     | 8.5                                     | 9.44                                       | 10.40  | 1                       | 14.4                                          | 41.7                                    | 20                                               | X                                                                                                   |
| TPSMA6L9.0A       | AVA     | 9.0                                     | 10.00                                      | 11.10  | 1                       | 15.4                                          | 39.0                                    | 10                                               | X                                                                                                   |
| TPSMA6L10A        | AXA     | 10.0                                    | 11.10                                      | 12.30  | 1                       | 17.0                                          | 35.3                                    | 5                                                | X                                                                                                   |
| TPSMA6L11A        | AZA     | 11.0                                    | 12.20                                      | 13.50  | 1                       | 18.2                                          | 33.0                                    | 1                                                | X                                                                                                   |
| TPSMA6L12A        | BEA     | 12.0                                    | 13.30                                      | 14.70  | 1                       | 19.9                                          | 30.2                                    | 1                                                | X                                                                                                   |
| TPSMA6L13A        | BGA     | 13.0                                    | 14.40                                      | 15.90  | 1                       | 21.5                                          | 28.0                                    | 1                                                | X                                                                                                   |
| TPSMA6L14A        | BKA     | 14.0                                    | 15.60                                      | 17.20  | 1                       | 23.2                                          | 25.9                                    | 1                                                | X                                                                                                   |
| TPSMA6L15A        | BMA     | 15.0                                    | 16.70                                      | 18.50  | 1                       | 24.4                                          | 24.6                                    | 1                                                | X                                                                                                   |
| TPSMA6L16A        | BPA     | 16.0                                    | 17.80                                      | 19.70  | 1                       | 26.0                                          | 23.1                                    | 1                                                | X                                                                                                   |
| TPSMA6L17A        | BRA     | 17.0                                    | 18.90                                      | 20.90  | 1                       | 27.6                                          | 21.8                                    | 1                                                | X                                                                                                   |
| TPSMA6L18A        | BT A    | 18.0                                    | 20.00                                      | 22.10  | 1                       | 29.2                                          | 20.6                                    | 1                                                | X                                                                                                   |
| TPSMA6L20A        | BVA     | 20.0                                    | 22.20                                      | 24.50  | 1                       | 32.4                                          | 18.6                                    | 1                                                | X                                                                                                   |
| TPSMA6L22A        | BXA     | 22.0                                    | 24.40                                      | 26.90  | 1                       | 35.5                                          | 16.9                                    | 1                                                | X                                                                                                   |
| TPSMA6L24A        | BZA     | 24.0                                    | 26.70                                      | 29.50  | 1                       | 38.9                                          | 15.5                                    | 1                                                | X                                                                                                   |
| TPSMA6L26A        | CEA     | 26.0                                    | 28.90                                      | 31.90  | 1                       | 42.1                                          | 14.3                                    | 1                                                | X                                                                                                   |
| TPSMA6L28A        | CGA     | 28.0                                    | 31.10                                      | 34.40  | 1                       | 45.4                                          | 13.3                                    | 1                                                | X                                                                                                   |
| TPSMA6L30A        | CKA     | 30.0                                    | 33.30                                      | 36.80  | 1                       | 48.4                                          | 12.4                                    | 1                                                | X                                                                                                   |
| TPSMA6L33A        | CMA     | 33.0                                    | 36.70                                      | 40.60  | 1                       | 53.3                                          | 11.3                                    | 1                                                | X                                                                                                   |
| TPSMA6L36A        | CPA     | 36.0                                    | 40.00                                      | 44.20  | 1                       | 58.1                                          | 10.4                                    | 1                                                | X                                                                                                   |
| TPSMA6L40A        | CRA     | 40.0                                    | 44.40                                      | 49.10  | 1                       | 64.5                                          | 9.3                                     | 1                                                | X                                                                                                   |
| TPSMA6L43A        | CTA     | 43.0                                    | 47.80                                      | 52.80  | 1                       | 69.4                                          | 8.7                                     | 1                                                | X                                                                                                   |
| TPSMA6L45A        | CVA     | 45.0                                    | 50.00                                      | 55.30  | 1                       | 72.7                                          | 8.3                                     | 1                                                | X                                                                                                   |
| TPSMA6L48A        | CXA     | 48.0                                    | 53.30                                      | 58.90  | 1                       | 77.4                                          | 7.8                                     | 1                                                | X                                                                                                   |
| TPSMA6L51A        | CZA     | 51.0                                    | 56.70                                      | 62.70  | 1                       | 82.4                                          | 7.3                                     | 1                                                | X                                                                                                   |
| TPSMA6L54A        | REA     | 54.0                                    | 60.00                                      | 66.30  | 1                       | 87.1                                          | 6.9                                     | 1                                                | X                                                                                                   |
| TPSMA6L58A        | RGA     | 58.0                                    | 64.40                                      | 71.20  | 1                       | 93.6                                          | 6.5                                     | 1                                                | X                                                                                                   |
| TPSMA6L60A        | RKA     | 60.0                                    | 66.70                                      | 73.70  | 1                       | 96.8                                          | 6.2                                     | 1                                                | X                                                                                                   |
| TPSMA6L64A        | RMA     | 64.0                                    | 71.10                                      | 78.60  | 1                       | 103.0                                         | 5.9                                     | 1                                                | X                                                                                                   |
| TPSMA6L70A        | RPA     | 70.0                                    | 77.80                                      | 86.00  | 1                       | 113.0                                         | 5.3                                     | 1                                                | X                                                                                                   |
| TPSMA6L75A        | RRA     | 75.0                                    | 83.30                                      | 92.10  | 1                       | 121.0                                         | 5.0                                     | 1                                                | X                                                                                                   |
| TPSMA6L78A        | RTA     | 78.0                                    | 86.70                                      | 95.80  | 1                       | 126.0                                         | 4.8                                     | 1                                                | X                                                                                                   |
| TPSMA6L85A        | RVA     | 85.0                                    | 94.40                                      | 104.00 | 1                       | 137.0                                         | 4.4                                     | 1                                                | X                                                                                                   |

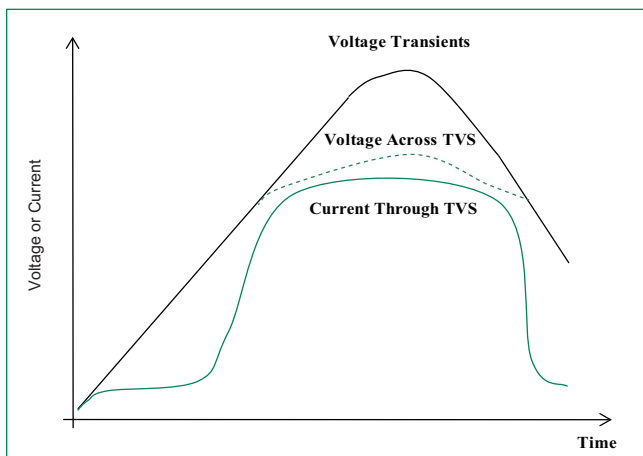
## I-V Curve Characteristics



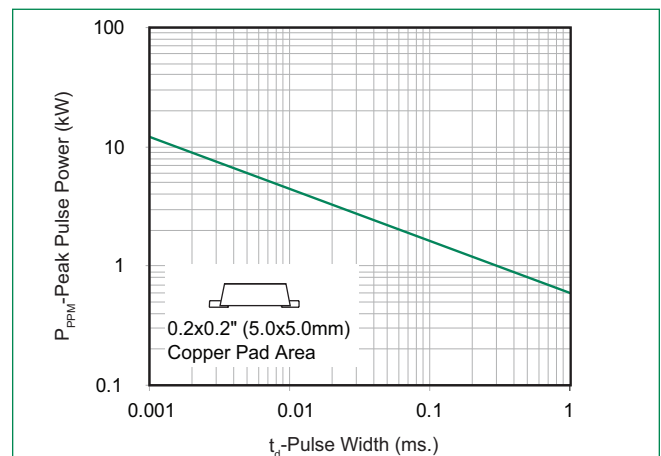
- $P_{PPM}$  Peak Pulse Power Dissipation** - Max power dissipation  
 **$V_R$  Stand-off Voltage** - Maximum voltage that can be applied to the TVS without operation  
 **$V_{BR}$  Breakdown Voltage** - Maximum voltage that flows through the TVS at a specified test current ( $I_I$ )  
 **$V_C$  Clamping Voltage** - Peak voltage measured across the suppressor at a specified  $I_{ppm}$  (peak impulse current)  
 **$I_R$  Reverse Leakage Current** - Current measured at  $V_R$   
 **$V_F$  Forward Voltage Drop for Uni-directional**

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

**Figure 1 - TVS Transients Clamping Waveform**



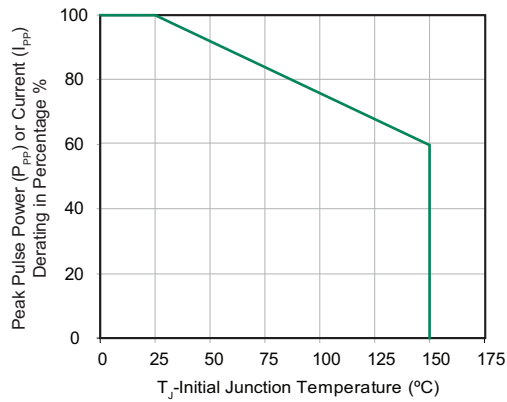
**Figure 2 - Peak Pulse Power Rating Curve**



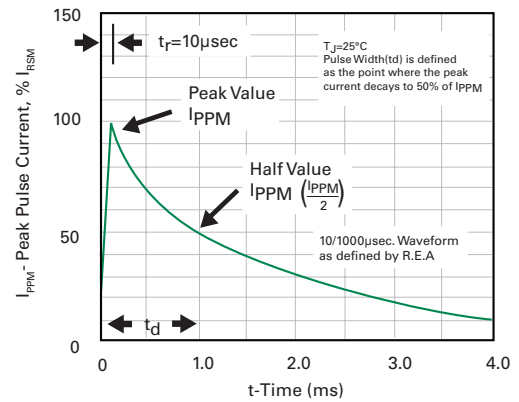
continues on next page.

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

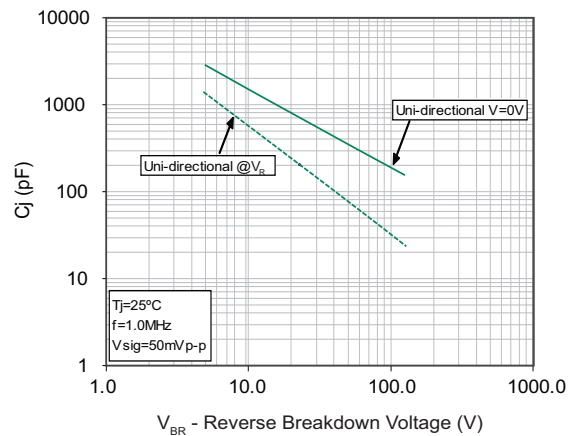
**Figure 3 - Pulse Derating Curve**



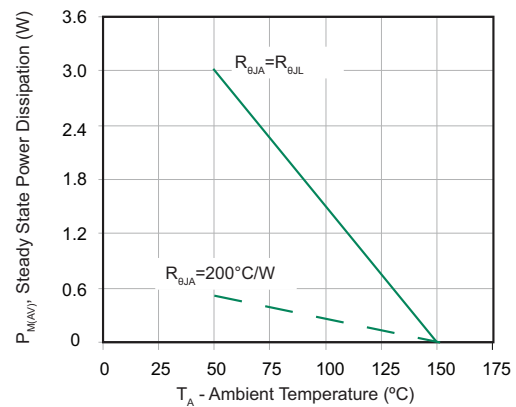
**Figure 4 - Pulse Waveform**



**Figure 5 - Typical Junction Capacitance**

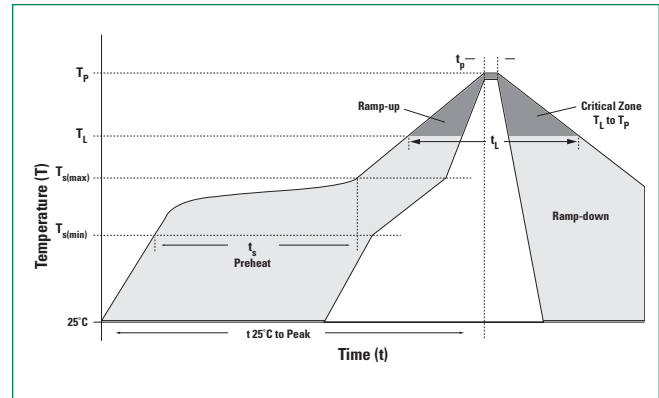


**Figure 6 - Steady State Power Dissipation Derating Curve**



## Soldering Parameters

|                                                                       |                                    |                         |
|-----------------------------------------------------------------------|------------------------------------|-------------------------|
| <b>Reflow Condition</b>                                               |                                    | Lead-free assembly      |
| <b>Pre Heat</b>                                                       | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                                       | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                                       | - Time (min to max) ( $t_p$ )      | 60 – 120 secs           |
| <b>Average ramp up rate (Liquidus Temp (<math>T_L</math>) to peak</b> |                                    | 3°C/second max          |
| <b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>     |                                    | 3°C/second max          |
| <b>Reflow</b>                                                         | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                                       | - Time (min to max) ( $t_L$ )      | 60 – 150 seconds        |
| <b>Peak Temperature (<math>T_p</math>)</b>                            |                                    | 260 <sup>+0/-5</sup> °C |
| <b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>  |                                    | 30 seconds max          |
| <b>Ramp-down Rate</b>                                                 |                                    | 6°C/second max          |
| <b>Time 25°C to peak Temperature (<math>T_p</math>)</b>               |                                    | 8 minutes max.          |
| <b>Do not exceed</b>                                                  |                                    | 280°C                   |



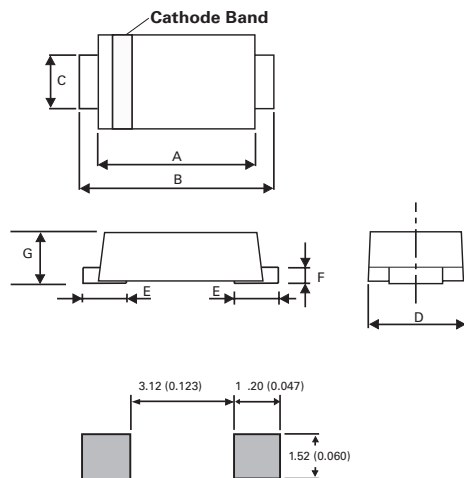
## Physical Specifications

|                 |                                                              |
|-----------------|--------------------------------------------------------------|
| <b>Weight</b>   | 0.002 ounce, 0.061 gram                                      |
| <b>Case</b>     | JEDEC DO-221AC Molded Plastic over glass passivated junction |
| <b>Polarity</b> | Color band denotes cathode except Bipolar                    |
| <b>Terminal</b> | Matte Tin-plated leads, Solderable per JESD22-B102D          |

## Environmental Specifications

|                           |             |
|---------------------------|-------------|
| <b>Temperature Cycle</b>  | JESD22-A104 |
| <b>Pressure Cooker</b>    | JESD22-A102 |
| <b>High Temp. Storage</b> | JESD22-A103 |
| <b>HTRB</b>               | JESD22-A108 |
| <b>Thermal Shock</b>      | JESD22-A106 |

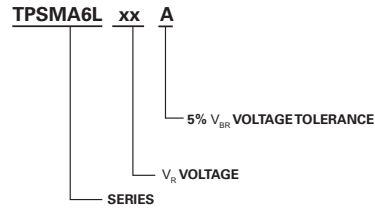
## Dimensions



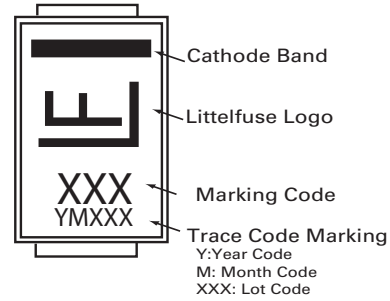
Mounting Pad Layout

| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.156  | 0.181 | 3.950       | 4.600 |
| B          | 0.189  | 0.220 | 4.800       | 5.600 |
| C          | 0.049  | 0.069 | 1.250       | 1.750 |
| D          | 0.088  | 0.116 | 2.250       | 2.950 |
| E          | 0.030  | 0.059 | 0.750       | 1.500 |
| F          | 0.005  | 0.010 | 0.125       | 0.250 |
| G          | 0.035  | 0.043 | 0.900       | 1.100 |

### Part Numbering System



### Part Marking System



### Packaging

| Part number | Component Package | Quantity | Packaging Option           | Packaging Specification |
|-------------|-------------------|----------|----------------------------|-------------------------|
| TPSMA6LxxA  | DO-221AC          | 3000     | Tape & Reel – 12mm/7" tape | EIA RS-481              |

### Tape and Reel Specification

