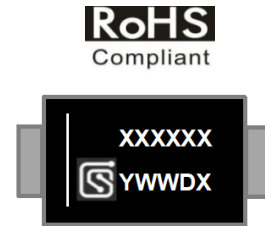


**Features**

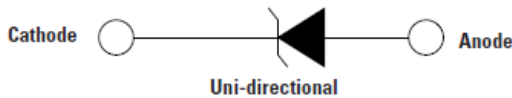
- Same power as standard SMB devices (600 W)
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- Typical failure mode is a short circuit condition for current events exceeding component rating
- ESD protection of data lines in accordance with IEC 61000-4-2
- EFT protection of data lines in accordance with IEC 61000-4-4 (IEC801-4)
- High reliability application and automotive grade AEC-Q101 qualified



**Applications**

TVS devices are ideal for the protection of I/O Interfaces, VCC bus and other vulnerable circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

**Function Diagram**




| Maximum Ratings and Thermal Characteristics (T <sub>A</sub> = 25°C unless otherwise noted) |                  |            |      |
|--|------------------|------------|------|
| Parameter  | Symbol           | Value      | Unit |
| Peak Pulse Power Dissipation at T <sub>A</sub> =25°C by 10/1000µs Waveform (Fig.3)         | P <sub>PPM</sub> | 600        | W    |
| Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =50°C                            | P <sub>D</sub>   | 3          | W    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)                           | I <sub>FSM</sub> | 60         | A    |
| Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2)               | V <sub>F</sub>   | 3.5/5      | V    |
| Operating Temperature Range  | T <sub>J</sub>   | -65 to 150 | °C   |
| Storage Temperature Range  | T <sub>STG</sub> | -65 to 150 | °C   |

| AGENCY | AGENCY FILE NUMBER |
|--------|--------------------|
|        | Pending            |

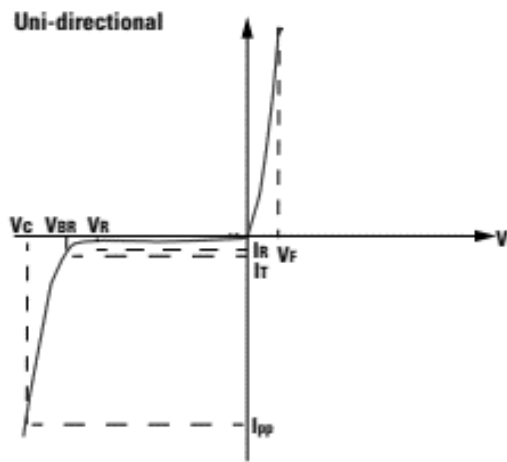
**Notes:**

2. Mounted on 5.0x5.0mm copper pad to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only

**Characteristics (T = 25°C unless otherwise noted)**

| Part Number<br>(Uni) | Marking<br>Code | Reverse Stand<br>off Voltage V <sub>R</sub><br>(Volts) | Breakdown Voltage V <sub>BR</sub><br>(Volts) @ I <sub>T</sub> |        | Test<br>Current I <sub>T</sub><br>(mA) | Maximum<br>Clamping<br>Voltage V <sub>C</sub> @ I <sub>nn</sub><br>(V) | Maximum Peak<br>Pulse Current I <sub>pp</sub><br>(A) | Maximum<br>Reverse<br>Leakage I <sub>R</sub> @<br>V <sub>R</sub><br>(μA) | Agency<br>Approval<br> |
|----------------------|-----------------|--|---|--------|--|--|--|--|---|
|                      |                 |  | MIN   | MAX    |  |  |  |  |   |
| TPSMA6L5.0A          | A6005           | 5.0  | 6.40  | 7.00   | 10                                     | 9.2  | 65.3   | 800  |   |
| TPSMA6L6.0A          | A6006           | 6.0  | 6.67  | 7.37   | 10                                     | 10.3   | 58.3   | 800  |   |
| TPSMA6L6.5A          | A606F           | 6.5  | 7.22  | 7.98   | 10                                     | 11.2   | 53.6   | 500  |   |
| TPSMA6L7.0A          | A6007           | 7.0  | 7.78  | 8.60   | 10                                     | 12.0   | 50.0   | 200  |   |
| TPSMA6L7.5A          | A607F           | 7.5  | 8.33  | 9.21   | 1                                      | 12.9   | 46.6   | 100  |   |
| TPSMA6L8.0A          | A6008           | 8.0  | 8.89  | 9.83   | 1                                      | 13.6   | 44.2   | 50   |   |
| TPSMA6L8.5A          | A608F           | 8.5  | 9.44  | 10.40  | 1                                      | 14.4   | 41.7   | 20   |   |
| TPSMA6L9.0A          | A6009           | 9.0  | 10.00   | 11.10  | 1                                      | 15.4   | 39.0   | 10   |   |
| TPSMA6L10A           | A6010           | 10.0   | 11.10   | 12.30  | 1                                      | 17.0   | 35.3   | 5  |   |
| TPSMA6L11A           | A6011           | 11.0   | 12.20   | 13.50  | 1                                      | 18.2   | 33.0   | 1  |   |
| TPSMA6L12A           | A6012           | 12.0   | 13.30   | 14.70  | 1                                      | 19.9   | 30.2   | 1  |   |
| TPSMA6L13A           | A6013           | 13.0   | 14.40   | 15.90  | 1                                      | 21.5   | 28.0   | 1  |   |
| TPSMA6L14A           | A6014           | 14.0   | 15.60   | 17.20  | 1                                      | 23.2   | 25.9   | 1  |   |
| TPSMA6L15A           | A6015           | 15.0   | 16.70   | 18.50  | 1                                      | 24.4   | 24.6   | 1  |   |
| TPSMA6L16A           | A6016           | 16.0   | 17.80   | 19.70  | 1                                      | 26.0   | 23.1   | 1  |   |
| TPSMA6L17A           | A6017           | 17.0   | 18.90   | 20.90  | 1                                      | 27.6   | 21.8   | 1  |   |
| TPSMA6L18A           | A6018           | 18.0   | 20.00   | 22.10  | 1                                      | 29.2   | 20.6   | 1  |   |
| TPSMA6L20A           | A6020           | 20.0   | 22.20   | 24.50  | 1                                      | 32.4   | 18.6   | 1  |   |
| TPSMA6L22A           | A6022           | 22.0   | 24.40   | 26.90  | 1                                      | 35.5   | 16.9   | 1  |   |
| TPSMA6L24A           | A6024           | 24.0   | 26.70   | 29.50  | 1                                      | 38.9   | 15.5   | 1  |   |
| TPSMA6L26A           | A6026           | 26.0   | 28.90   | 31.90  | 1                                      | 42.1   | 14.3   | 1  |   |
| TPSMA6L28A           | A6028           | 28.0   | 31.10   | 34.40  | 1                                      | 45.4   | 13.3   | 1  |   |
| TPSMA6L30A           | A6030           | 30.0   | 33.30   | 36.80  | 1                                      | 48.4   | 12.4   | 1  |   |
| TPSMA6L33A           | A6033           | 33.0   | 36.70   | 40.60  | 1                                      | 53.3   | 11.3   | 1  |   |
| TPSMA6L36A           | A6036           | 36.0   | 40.00   | 44.20  | 1                                      | 58.1   | 10.4   | 1  |   |
| TPSMA6L40A           | A6040           | 40.0   | 44.40   | 49.10  | 1                                      | 64.5   | 9.3  | 1  |   |
| TPSMA6L43A           | A6043           | 43.0   | 47.80   | 52.80  | 1                                      | 69.4   | 8.7  | 1  |   |
| TPSMA6L45A           | A6045           | 45.0   | 50.00   | 55.30  | 1                                      | 72.7   | 8.3  | 1  |   |
| TPSMA6L48A           | A6048           | 48.0   | 53.30   | 58.90  | 1                                      | 77.4   | 7.8  | 1  |   |
| TPSMA6L51A           | A6051           | 51.0   | 56.70   | 62.70  | 1                                      | 82.4   | 7.3  | 1  |   |
| TPSMA6L54A           | A6054           | 54.0   | 60.00   | 66.30  | 1                                      | 87.1   | 6.9  | 1  |   |
| TPSMA6L58A           | A6058           | 58.0   | 64.40   | 71.20  | 1                                      | 93.6   | 6.5  | 1  |   |
| TPSMA6L60A           | A6060           | 60.0   | 66.70   | 73.70  | 1                                      | 96.8   | 6.2  | 1  |   |
| TPSMA6L64A           | A6064           | 64.0   | 71.10   | 78.60  | 1                                      | 103.0  | 5.9  | 1  |   |
| TPSMA6L70A           | A6070           | 70.0   | 77.80   | 86.00  | 1                                      | 113.0  | 5.3  | 1  |   |
| TPSMA6L75A           | A6075           | 75.0   | 83.30   | 92.10  | 1                                      | 121.0  | 5.0  | 1  |   |
| TPSMA6L78A           | A6078           | 78.0   | 86.70   | 95.80  | 1                                      | 126.0  | 4.8  | 1  |   |
| TPSMA6L85A           | A6085           | 85.0   | 94.40   | 104.00 | 1                                      | 137.0  | 4.4  | 1  |   |

## 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

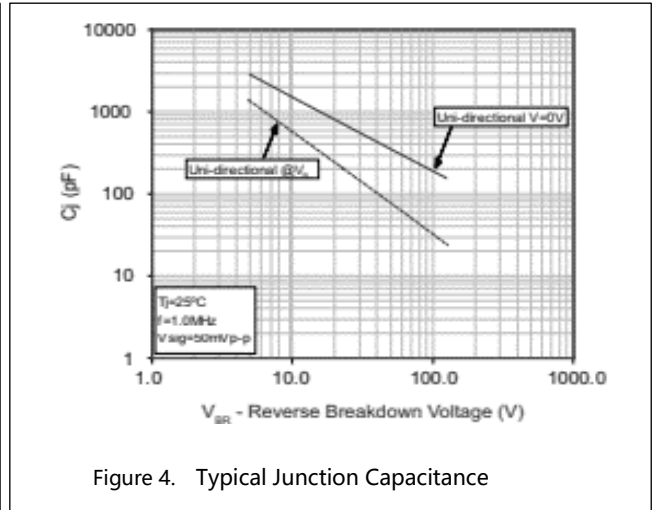
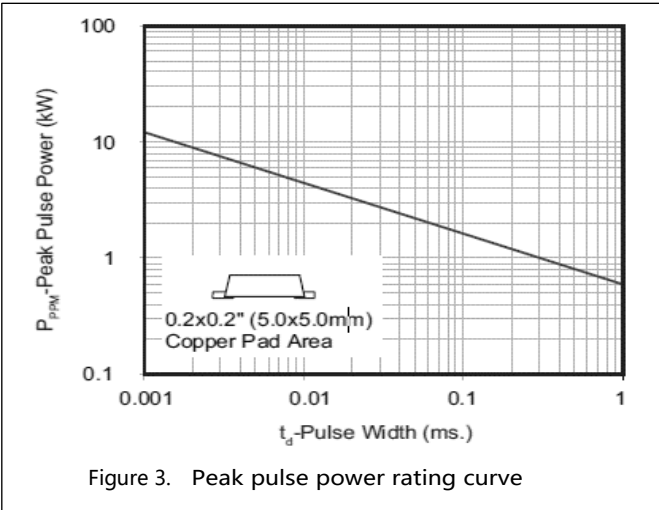
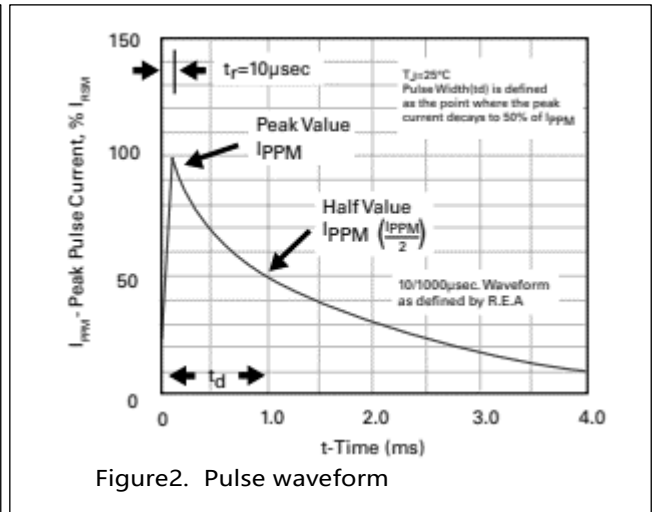
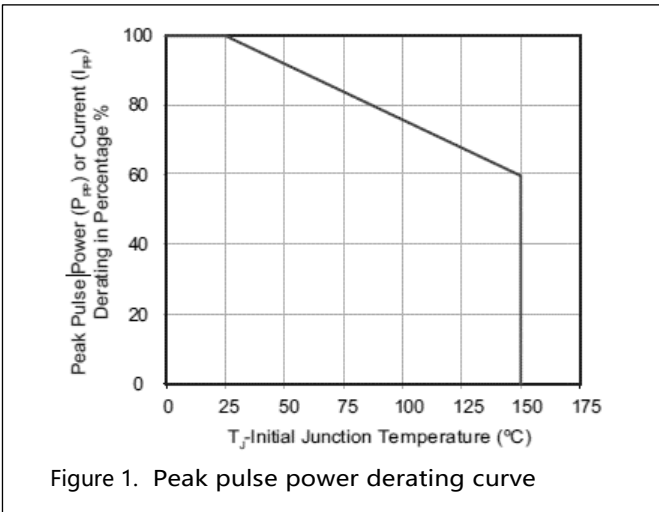
$V_{BR}$  Breakdown Voltage -- Maximum voltage that flows through the TVS at a specified test current ( $I_T$ )

$V_C$  Clamping Voltage -- Peak voltage measured across the TVS 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

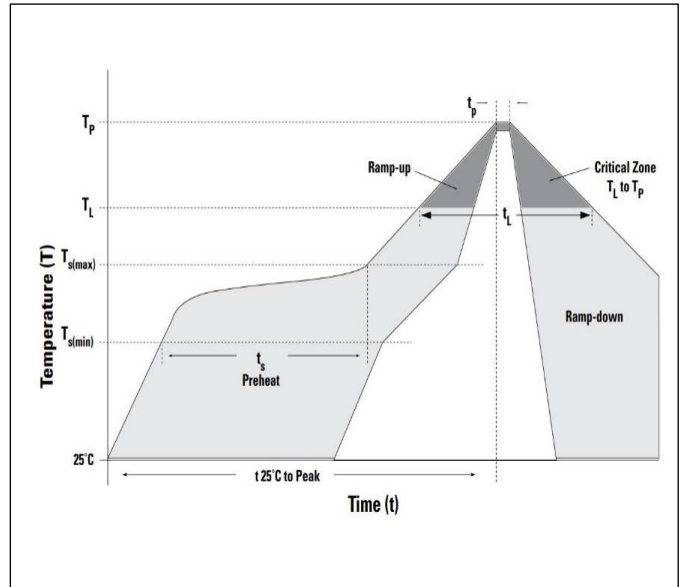
Ratings and Characteristic Curves (T = 25°C unless otherwise noted)



Soldering Parameters

Soldering profile

|  |                                    |                         |
|--|------------------------------------|-------------------------|
| Reflow Condition                                       |                                    | Lead-free assembly      |
| Pre Heat   | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|  | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|  | - Time (min to max) ( $t_s$ )      | 60 – 180 secs           |
| Average ramp up rate (Liquidus Temp ( $T_A$ ) to peak) |                                    | 3°C/second max          |
| $T_{s(max)}$ to $T_A$ - Ramp-up Rate                   |                                    | 3°C/second max          |
| Reflow   | - Temperature ( $T_A$ ) (Liquidus) | 217°C                   |
|  | - Time (min to max) ( $t_s$ )      | 60 – 150 seconds        |
| Peak Temperature ( $T_p$ )                             |                                    | 260 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                    | 30 seconds              |
| Ramp-down Rate   |                                    | 6°C/second max          |
| Time 25°C to peak Temperature ( $T_p$ )                |                                    | 8 minutes Max.          |
| Do not exceed  |                                    | 280°C                   |

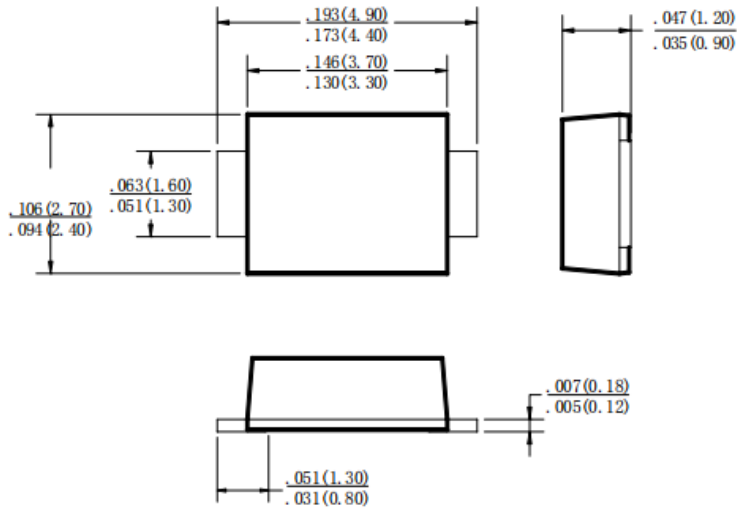


Dimensions

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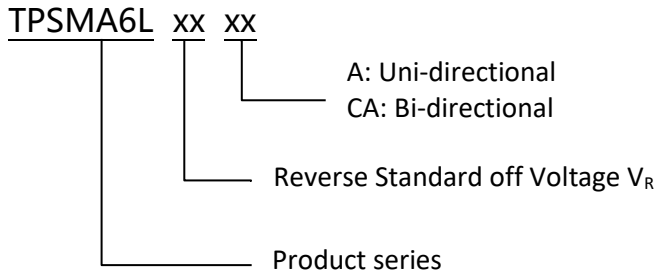
**SMAF Package Outline Dimensions**

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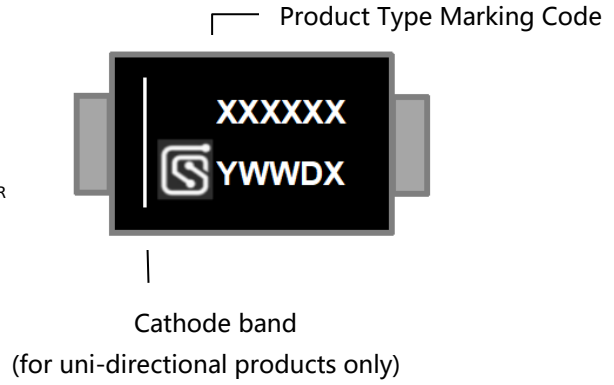


Dimensions in inches and (millimeters)

Part Numbering



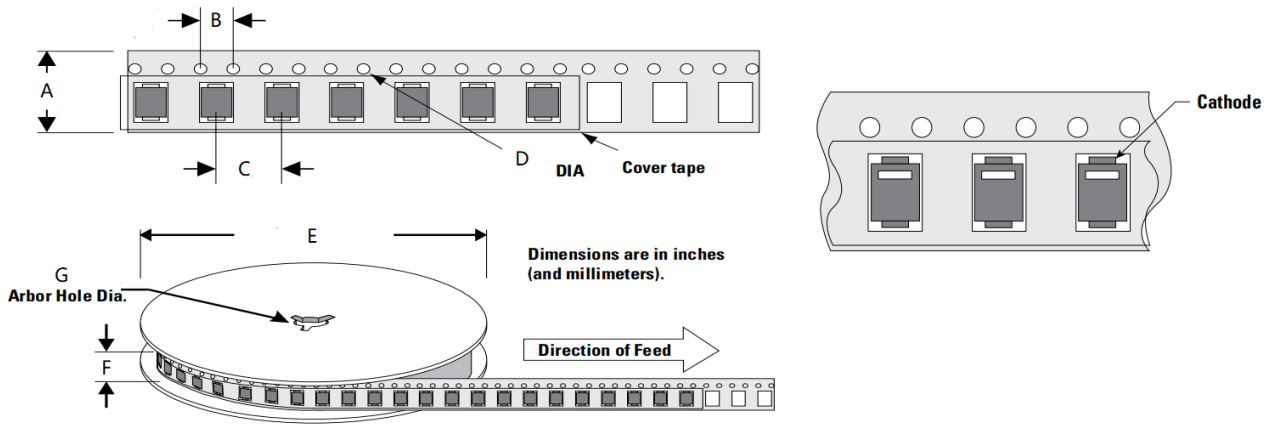
Part Marking



Packing

| Part number | Package name | Small packing quantity | Packing method |
|-------------|--------------|------------------------|----------------|
| TPSMA6LXXXX | SMAF         | 3000                   | Tape & Reel    |

Tape and Reel Specification



| Symbol | Millimeter  |
|--------|-------------|
| A      | 16.00±0.10  |
| B      | 4.00±0.10   |
| C      | 8.00±0.10   |
| D      | 1.55±0.05   |
| E      | 330.20±2.00 |
| F      | 19.70±2.00  |
| G      | 13.30±0.30  |

Revision history of Specification

| Version | Change Items    | Effective Date |
|---------|-----------------|----------------|
| 1.0     | Initial Release | 13-Aug-2021    |



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