


# TPSMC Series

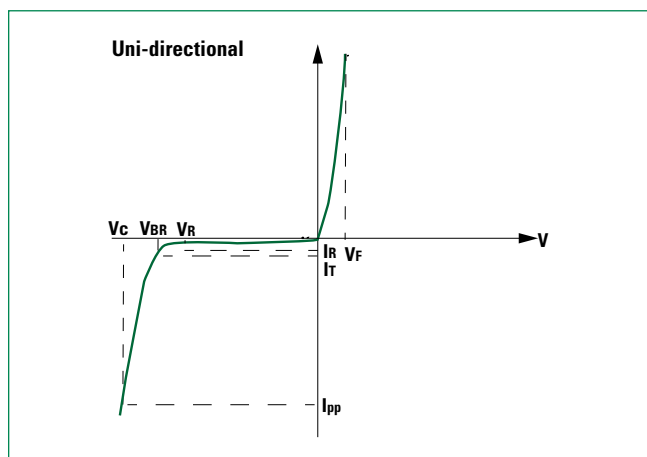
## Surface Mount - 1500W

### Electrical Characteristics

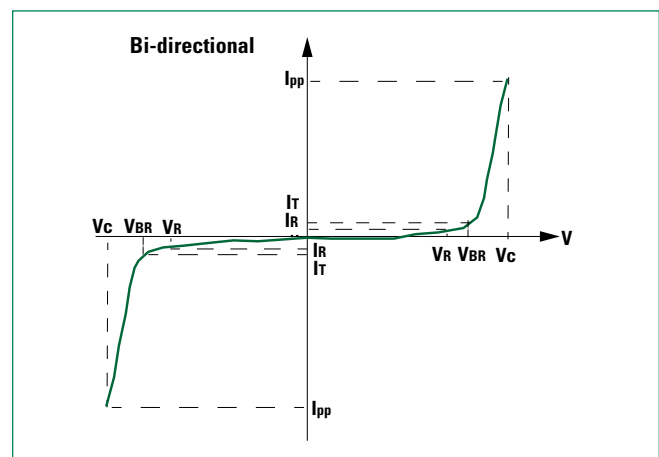
| Part Number (Uni) | Part Number (Bi) | Marking |       | Reverse Stand off Voltage $V_R$ (Volts) | Breakdown Voltage $V_{BR}$ (Volts) @ $I_T$ |        | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{pp}$ (V) | Maximum Peak Pulse Current $I_{pp}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ ( $\mu$ A) | Agency Approval  |
|-------------------|------------------|---------|-------|---|--|--------|-------------------------|---|---|--|---|
|                   |                  | UNI     | BI    |   | MIN  | MAX    |                         |   |   |  |   |
| TPSMC12A          | TPSMC12CA        | 12AA    | 12CA  | 10.20                                   | 11.40                                      | 12.60  | 1                       | 16.7  | 91.0                                    | 5  | X   |
| TPSMC13A          | TPSMC13CA        | 13AA    | 13CA  | 11.10                                   | 12.40                                      | 13.70  | 1                       | 18.2  | 83.5                                    | 1  | X   |
| TPSMC15A          | TPSMC15CA        | 15AA    | 15CA  | 12.80                                   | 14.30                                      | 15.80  | 1                       | 21.2  | 71.7                                    | 1  | X   |
| TPSMC16A          | TPSMC16CA        | 16AA    | 16CA  | 13.60                                   | 15.20                                      | 16.80  | 1                       | 22.5  | 67.6                                    | 1  | X   |
| TPSMC18A          | TPSMC18CA        | 18AA    | 18CA  | 15.30                                   | 17.10                                      | 18.90  | 1                       | 25.2  | 60.3                                    | 1  | X   |
| TPSMC20A          | TPSMC20CA        | 20AA    | 20CA  | 17.10                                   | 19.00                                      | 21.00  | 1                       | 27.7  | 54.9                                    | 1  | X   |
| TPSMC22A          | TPSMC22CA        | 22AA    | 22CA  | 18.80                                   | 20.90                                      | 23.10  | 1                       | 30.6  | 49.7                                    | 1  | X   |
| TPSMC24A          | TPSMC24CA        | 24AA    | 24CA  | 20.50                                   | 22.80                                      | 25.20  | 1                       | 33.2  | 45.8                                    | 1  | X   |
| TPSMC27A          | TPSMC27CA        | 27AA    | 27CA  | 23.10                                   | 25.70                                      | 28.40  | 1                       | 37.5  | 40.5                                    | 1  | X   |
| TPSMC30A          | TPSMC30CA        | 30AA    | 30CA  | 25.60                                   | 28.50                                      | 31.50  | 1                       | 41.4  | 36.7                                    | 1  | X   |
| TPSMC33A          | TPSMC33CA        | 33AA    | 33CA  | 28.20                                   | 31.40                                      | 34.70  | 1                       | 45.7  | 33.3                                    | 1  | X   |
| TPSMC36A          | TPSMC36CA        | 36AA    | 36CA  | 30.80                                   | 34.20                                      | 37.80  | 1                       | 49.9  | 30.5                                    | 1  | X   |
| TPSMC39A          | TPSMC39CA        | 39AA    | 39CA  | 33.30                                   | 37.10                                      | 41.00  | 1                       | 53.9  | 28.2                                    | 1  | X   |
| TPSMC43A          | TPSMC43CA        | 43AA    | 43CA  | 36.80                                   | 40.90                                      | 45.20  | 1                       | 59.3  | 25.6                                    | 1  | X   |
| TPSMC47A          | TPSMC47CA        | 47AA    | 47CA  | 40.20                                   | 44.70                                      | 49.40  | 1                       | 64.8  | 23.5                                    | 1  | X   |
| TPSMC51A          | TPSMC51CA        | 51AA    | 51CA  | 43.60                                   | 48.50                                      | 53.60  | 1                       | 70.1  | 21.7                                    | 1  | X   |
| TPSMC56A          | TPSMC56CA        | 56AA    | 56CA  | 47.80                                   | 53.20                                      | 58.80  | 1                       | 77.0  | 19.7                                    | 1  | X   |
| TPSMC62A          | TPSMC62CA        | 62AA    | 62CA  | 53.00                                   | 58.90                                      | 65.10  | 1                       | 85.0  | 17.9                                    | 1  | X   |
| TPSMC68A          | TPSMC68CA        | 68AA    | 68CA  | 58.10                                   | 64.60                                      | 71.40  | 1                       | 92.0  | 16.5                                    | 1  | X   |
| TPSMC75A          | TPSMC75CA        | 75AA    | 75CA  | 64.10                                   | 71.30                                      | 78.80  | 1                       | 103.0   | 14.8                                    | 1  | X   |
| TPSMC82A          | TPSMC82CA        | 82AA    | 82CA  | 70.10                                   | 77.90                                      | 86.10  | 1                       | 113.0   | 13.5                                    | 1  | X   |
| TPSMC91A          | TPSMC91CA        | 91AA    | 91CA  | 77.80                                   | 86.50                                      | 95.50  | 1                       | 125.0   | 12.2                                    | 1  | X   |
| TPSMC100A         | TPSMC100CA       | 100AA   | 100CA | 85.50                                   | 95.00                                      | 105.26 | 1                       | 137.0   | 11.1                                    | 1  | X   |
| TPSMC110A         | TPSMC110CA       | 110AA   | 110CA | 94.50                                   | 104.50                                     | 115.79 | 1                       | 152.0   | 10                                      | 1  | X   |
| TPSMC120A         | TPSMC120CA       | 120AA   | 120CA | 102.60                                  | 114.00                                     | 126.32 | 1                       | 165.0   | 9.2                                     | 1  | X   |
| TPSMC130A         | TPSMC130CA       | 130AA   | 130CA | 111.15                                  | 123.50                                     | 136.84 | 1                       | 179.0   | 8.5                                     | 1  | X   |
| TPSMC150A         | TPSMC150CA       | 150AA   | 150CA | 128.25                                  | 142.50                                     | 157.89 | 1                       | 207.0   | 7.3                                     | 1  | X   |
| TPSMC160A         | TPSMC160CA       | 160AA   | 160CA | 136.80                                  | 152.00                                     | 168.42 | 1                       | 219.0   | 6.9                                     | 1  | X   |
| TPSMC170A         | TPSMC170CA       | 170AA   | 170CA | 145.35                                  | 161.50                                     | 178.95 | 1                       | 234.0   | 6.5                                     | 1  | X   |
| TPSMC180A         | TPSMC180CA       | 180AA   | 180CA | 153.90                                  | 171.00                                     | 189.47 | 1                       | 246.0   | 6.2                                     | 1  | X   |
| TPSMC200A         | TPSMC200CA       | 200AA   | 200CA | 171.00                                  | 190.00                                     | 210.53 | 1                       | 274.0   | 5.5                                     | 1  | X   |
| TPSMC220A         | TPSMC220CA       | 220AA   | 220CA | 188.10                                  | 209.00                                     | 231.58 | 1                       | 328.0   | 4.6                                     | 1  | X   |
| TPSMC250A         | TPSMC250CA       | 250AA   | 250CA | 213.75                                  | 237.50                                     | 263.16 | 1                       | 344.0   | 4.4                                     | 1  | X   |

For bidirectional type having  $V_R$  of 10 volts and less, the  $I_R$  limit is double.

### 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 though 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**

# TPSMC Series

## Surface Mount - 1500W

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

Figure 1 - TVS Transients Clamping Waveform

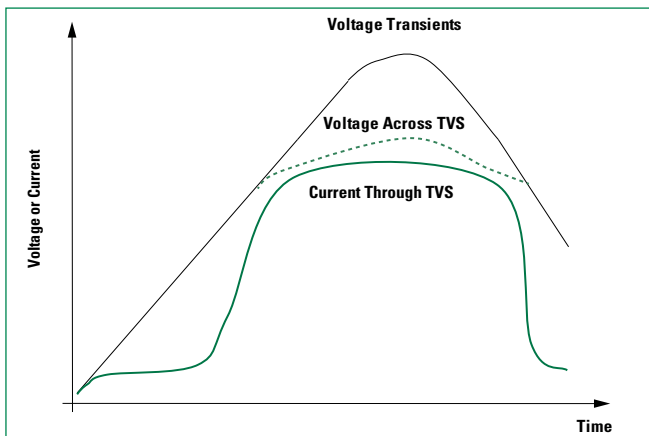


Figure 2 - Peak Pulse Power Rating

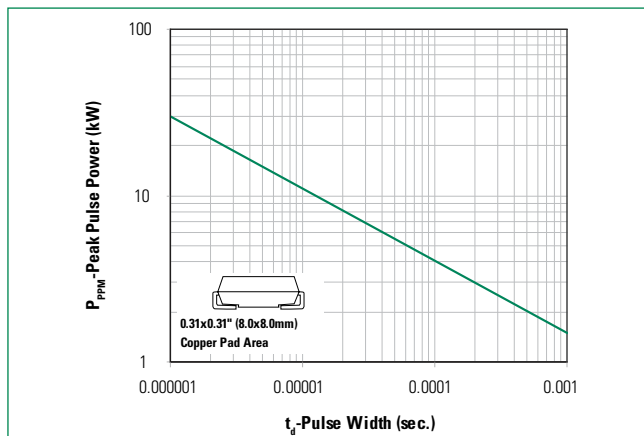


Figure 3 - Peak Pulse Power Derating Curve

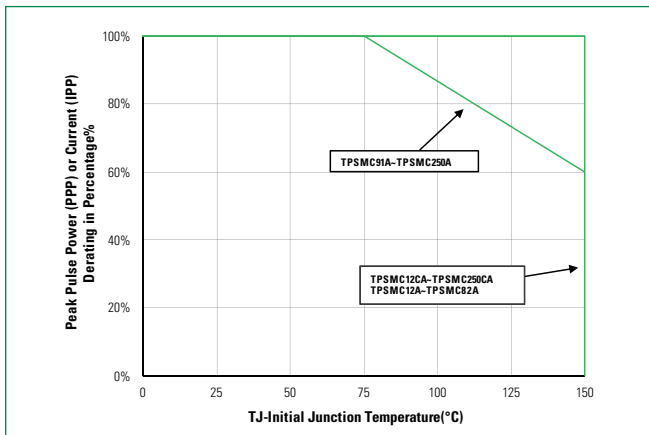


Figure 4 - Pulse Waveform

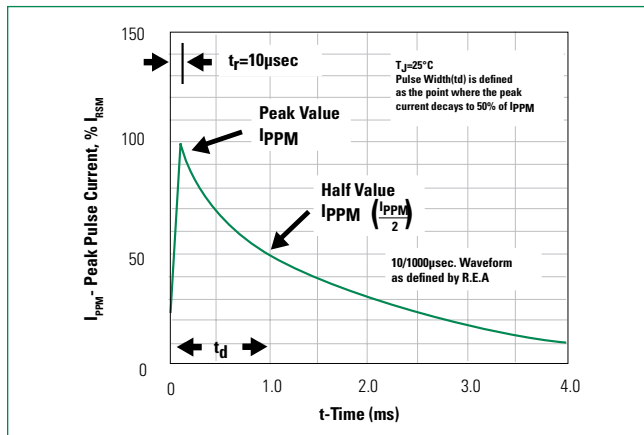


Figure 5 - Typical Junction Capacitance

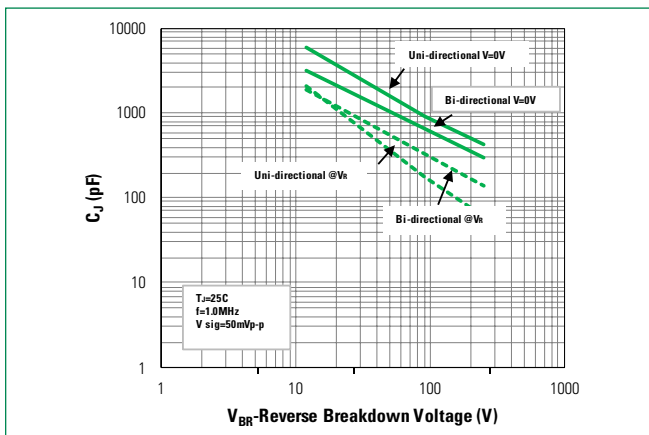
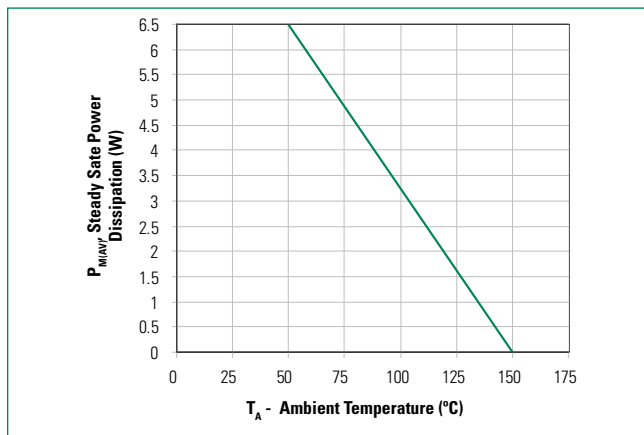


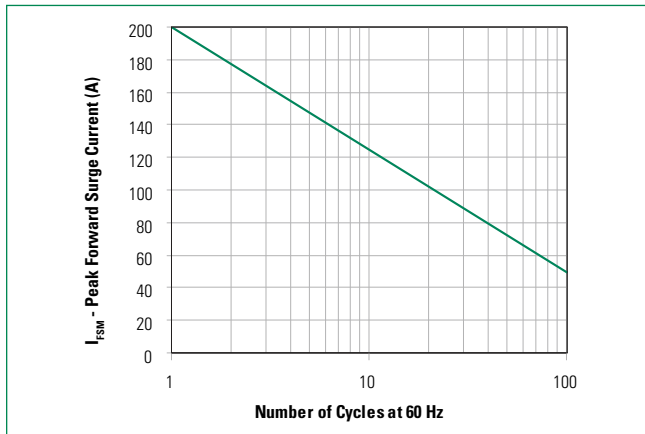
Figure 6 - Steady State Power Dissipation Derating Curve



# TPSMC Series

## Surface Mount - 1500W

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



### Physical Specifications

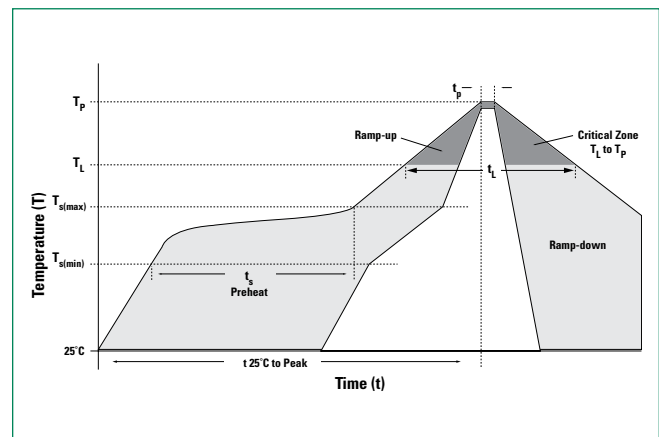
|                 |   |
|-----------------|---|
| <b>Weight</b>   | 0.007 ounce, 0.21 grams   |
| <b>Case</b>     | JEDEC DO214AB. Molded plastic body over glass passivated junction |
| <b>Polarity</b> | Color band denotes positive end (cathode) except Bidirectional.   |
| <b>Terminal</b> | Matte Tin-plated leads, Solderable per JESD22-B102                |

### Environmental Specifications

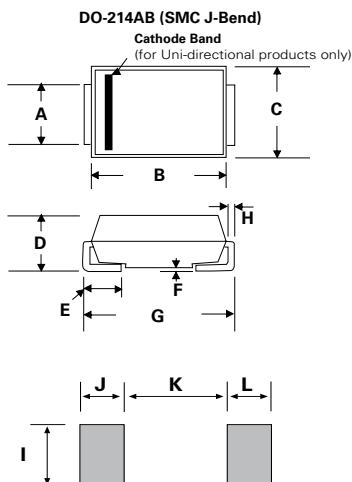
|                            |                          |
|----------------------------|--------------------------|
| <b>High Temp. Storage</b>  | JESD22-A103              |
| <b>HTRB</b>                | JESD22-A108              |
| <b>Temperature Cycling</b> | JESD22-A104              |
| <b>MSL</b>                 | JEDEC-J-STD-020, Level 1 |
| <b>H3TRB</b>               | JESD22-A101              |
| <b>RSH</b>                 | JESD22-A111              |

### 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) ( $t_s$ )      | 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) ( $t_r$ )      | 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>   | 260°C                              |                  |



### Dimensions

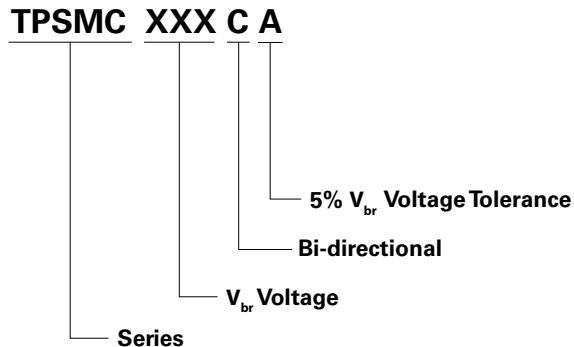


| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| <b>A</b>   | 0.114  | 0.126 | 2.900       | 3.200 |
| <b>B</b>   | 0.260  | 0.280 | 6.600       | 7.110 |
| <b>C</b>   | 0.220  | 0.245 | 5.590       | 6.220 |
| <b>D</b>   | 0.079  | 0.103 | 2.060       | 2.620 |
| <b>E</b>   | 0.030  | 0.060 | 0.760       | 1.520 |
| <b>F</b>   | -      | 0.008 | -           | 0.203 |
| <b>G</b>   | 0.305  | 0.320 | 7.750       | 8.130 |
| <b>H</b>   | 0.006  | 0.012 | 0.152       | 0.305 |
| <b>I</b>   | 0.129  | -     | 3.300       | -     |
| <b>J</b>   | 0.094  | -     | 2.400       | -     |
| <b>K</b>   | -      | 0.165 | -           | 4.200 |
| <b>L</b>   | 0.094  | -     | 2.400       | -     |

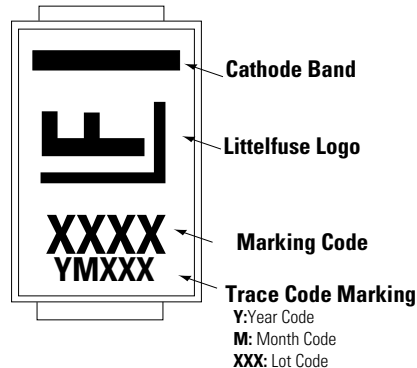
# TPSMC Series

## Surface Mount - 1500W

### Part Numbering System



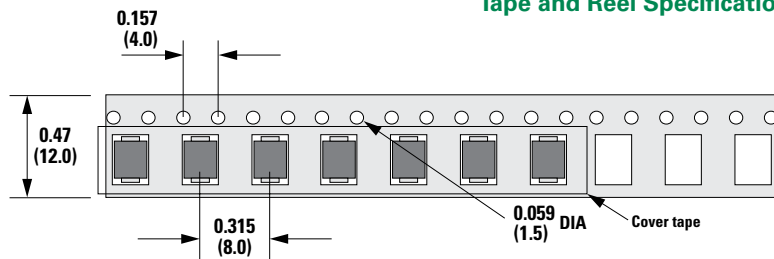
### Part Marking System



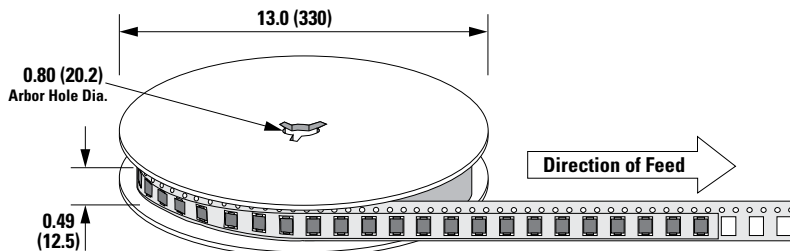
### Packaging

| Part number | Component Package | Quantity | Packaging Option                 | Packaging Specification |
|-------------|-------------------|----------|----------------------------------|-------------------------|
| TPSMCxxxXX  | DO-214AB          | 3000     | Tape & Reel - 16mm tape/13" reel | EIA STD RS-481          |

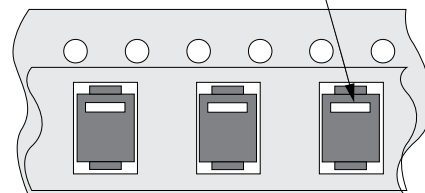
### Tape and Reel Specification



Note: Dimensions are in inches (and millimeters).



### Cathode Mark For Unidirectional Components



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[TPSMC36A](#) [TPSMC36CA](#) [TPSMC39A](#) [TPSMC51A](#) [TPSMC51CA](#) [TPSMC91A](#) [TPSMC75CA](#) [TPSMC56CA](#)  
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