

# SMAJ Transient Voltage Suppressor Diode Series

**BOURNS®**

## Electrical Characteristics (@ T<sub>A</sub> = 25 °C Unless Otherwise Noted)

| Unidirectional Device |         | Bidirectional Device |         | Breakdown Voltage V <sub>BR</sub> (Volts) |      |                       | Working Peak Reverse Voltage | Maximum Reverse Leakage @ V <sub>RWM</sub> | Maximum Clamping Voltage @ I <sub>pp</sub> (10/1000 μs) | Maximum Peak Pulse Current (10/1000 μs) | Maximum Clamping Voltage @ I <sub>pp</sub> (8/20 μs) | Maximum Peak Pulse Current (8/20 μs) |
|-----------------------|---------|----------------------|---------|-------------------------------------------|------|-----------------------|------------------------------|--------------------------------------------|---------------------------------------------------------|-----------------------------------------|------------------------------------------------------|--------------------------------------|
| Part No.              | Marking | Part No.             | Marking | Min.                                      | Max. | @ I <sub>T</sub> (mA) | V <sub>RWM</sub> (V)         | I <sub>R</sub> (μA)                        | V <sub>C</sub> (V)                                      | I <sub>pp</sub> (A)                     | V <sub>C</sub> (V)                                   | I <sub>pp</sub> (A)                  |
| SMAJ5.0A              | HE      | SMAJ5.0CA            | TE      | 6.40                                      | 7.00 | 10                    | 5.0                          | 800                                        | 9.2                                                     | 43.5                                    | 12.0                                                 | 217.5                                |
| SMAJ6.0A              | HG      | SMAJ6.0CA            | TG      | 6.67                                      | 7.37 | 10                    | 6.0                          | 800                                        | 10.3                                                    | 38.8                                    | 13.4                                                 | 194.0                                |
| SMAJ6.5A              | HK      | SMAJ6.5CA            | TK      | 7.22                                      | 7.98 | 10                    | 6.5                          | 500                                        | 11.2                                                    | 35.7                                    | 14.6                                                 | 178.5                                |
| SMAJ7.0A              | HM      | SMAJ7.0CA            | TM      | 7.78                                      | 8.60 | 10                    | 7.0                          | 200                                        | 12.0                                                    | 33.3                                    | 15.6                                                 | 166.5                                |
| SMAJ7.5A              | HP      | SMAJ7.5CA            | TP      | 8.33                                      | 9.21 | 1.0                   | 7.5                          | 100                                        | 12.9                                                    | 31.0                                    | 16.8                                                 | 155.0                                |
| SMAJ8.0A              | HR      | SMAJ8.0CA            | TR      | 8.89                                      | 9.83 | 1.0                   | 8.0                          | 50                                         | 13.6                                                    | 29.4                                    | 17.7                                                 | 147.0                                |
| SMAJ8.5A              | HT      | SMAJ8.5CA            | TT      | 9.44                                      | 10.4 | 1.0                   | 8.5                          | 20                                         | 14.4                                                    | 27.8                                    | 18.7                                                 | 139.0                                |
| SMAJ9.0A              | HV      | SMAJ9.0CA            | TV      | 10.0                                      | 11.1 | 1.0                   | 9.0                          | 10                                         | 15.4                                                    | 26.0                                    | 20.0                                                 | 130.0                                |
| SMAJ10A               | HX      | SMAJ10CA             | TX      | 11.1                                      | 12.3 | 1.0                   | 10                           | 5                                          | 17.0                                                    | 23.5                                    | 22.1                                                 | 117.5                                |
| SMAJ11A               | HZ      | SMAJ11CA             | TZ      | 12.2                                      | 13.5 | 1.0                   | 11                           | 1.0                                        | 18.2                                                    | 22.0                                    | 23.7                                                 | 110.0                                |
| SMAJ12A               | IE      | SMAJ12CA             | UE      | 13.3                                      | 14.7 | 1.0                   | 12                           | 1.0                                        | 19.9                                                    | 20.1                                    | 25.9                                                 | 100.5                                |
| SMAJ13A               | IG      | SMAJ13CA             | UG      | 14.4                                      | 15.9 | 1.0                   | 13                           | 1.0                                        | 21.5                                                    | 18.6                                    | 28.0                                                 | 93.0                                 |
| SMAJ14A               | IK      | SMAJ14CA             | UK      | 15.6                                      | 17.2 | 1.0                   | 14                           | 1.0                                        | 23.2                                                    | 17.2                                    | 30.2                                                 | 86.0                                 |
| SMAJ15A               | IM      | SMAJ15CA             | UM      | 16.7                                      | 18.5 | 1.0                   | 15                           | 1.0                                        | 24.4                                                    | 16.4                                    | 31.7                                                 | 82.0                                 |
| SMAJ16A               | IP      | SMAJ16CA             | UP      | 17.8                                      | 19.7 | 1.0                   | 16                           | 1.0                                        | 26.0                                                    | 15.4                                    | 33.8                                                 | 77.0                                 |
| SMAJ17A               | IR      | SMAJ17CA             | UR      | 18.9                                      | 20.9 | 1.0                   | 17                           | 1.0                                        | 27.6                                                    | 14.5                                    | 35.9                                                 | 72.5                                 |
| SMAJ18A               | IT      | SMAJ18CA             | UT      | 20.0                                      | 22.1 | 1.0                   | 18                           | 1.0                                        | 29.2                                                    | 13.7                                    | 38.0                                                 | 68.5                                 |
| SMAJ20A               | IV      | SMAJ20CA             | UV      | 22.2                                      | 24.5 | 1.0                   | 20                           | 1.0                                        | 32.4                                                    | 12.3                                    | 42.1                                                 | 61.5                                 |
| SMAJ22A               | IX      | SMAJ22CA             | UX      | 24.4                                      | 26.9 | 1.0                   | 22                           | 1.0                                        | 35.5                                                    | 11.3                                    | 46.2                                                 | 56.5                                 |
| SMAJ24A               | IZ      | SMAJ24CA             | UZ      | 26.7                                      | 29.5 | 1.0                   | 24                           | 1.0                                        | 38.9                                                    | 10.3                                    | 50.6                                                 | 51.5                                 |
| SMAJ26A               | JE      | SMAJ26CA             | VE      | 28.9                                      | 31.9 | 1.0                   | 26                           | 1.0                                        | 42.1                                                    | 9.5                                     | 54.7                                                 | 47.5                                 |
| SMAJ28A               | JG      | SMAJ28CA             | VG      | 31.1                                      | 34.4 | 1.0                   | 28                           | 1.0                                        | 45.4                                                    | 8.8                                     | 59.0                                                 | 44.0                                 |
| SMAJ30A               | JK      | SMAJ30CA             | VK      | 33.3                                      | 36.8 | 1.0                   | 30                           | 1.0                                        | 48.4                                                    | 8.3                                     | 62.9                                                 | 41.5                                 |
| SMAJ33A               | JM      | SMAJ33CA             | VM      | 36.7                                      | 40.6 | 1.0                   | 33                           | 1.0                                        | 53.3                                                    | 7.5                                     | 69.3                                                 | 37.5                                 |
| SMAJ36A               | JP      | SMAJ36CA             | VP      | 40                                        | 44.2 | 1.0                   | 36                           | 1.0                                        | 58.1                                                    | 6.9                                     | 75.5                                                 | 34.5                                 |
| SMAJ40A               | JR      | SMAJ40CA             | VR      | 44.4                                      | 49.1 | 1.0                   | 40                           | 1.0                                        | 64.5                                                    | 6.2                                     | 83.9                                                 | 31.0                                 |
| SMAJ43A               | JT      | SMAJ43CA             | VT      | 47.8                                      | 52.8 | 1.0                   | 43                           | 1.0                                        | 69.4                                                    | 5.8                                     | 90.2                                                 | 29.0                                 |
| SMAJ45A               | JV      | SMAJ45CA             | VV      | 50                                        | 55.3 | 1.0                   | 45                           | 1.0                                        | 72.7                                                    | 5.5                                     | 94.5                                                 | 27.5                                 |
| SMAJ48A               | JX      | SMAJ48CA             | VX      | 53.3                                      | 58.9 | 1.0                   | 48                           | 1.0                                        | 77.4                                                    | 5.2                                     | 100.6                                                | 26.0                                 |
| SMAJ51A               | JZ      | SMAJ51CA             | VZ      | 56.7                                      | 62.7 | 1.0                   | 51                           | 1.0                                        | 82.4                                                    | 4.9                                     | 107.1                                                | 24.5                                 |
| SMAJ54A               | RE      | SMAJ54CA             | WE      | 60                                        | 66.3 | 1.0                   | 54                           | 1.0                                        | 87.1                                                    | 4.6                                     | 113.2                                                | 23.0                                 |
| SMAJ58A               | RG      | SMAJ58CA             | WG      | 64.4                                      | 71.2 | 1.0                   | 58                           | 1.0                                        | 93.6                                                    | 4.3                                     | 121.7                                                | 21.5                                 |
| SMAJ60A               | RK      | SMAJ60CA             | WK      | 66.7                                      | 73.7 | 1.0                   | 60                           | 1.0                                        | 96.8                                                    | 4.1                                     | 125.8                                                | 20.5                                 |
| SMAJ64A               | RM      | SMAJ64CA             | WM      | 71.1                                      | 78.6 | 1.0                   | 64                           | 1.0                                        | 103                                                     | 3.9                                     | 133.9                                                | 19.5                                 |
| SMAJ70A               | RP      | SMAJ70CA             | WP      | 77.8                                      | 86.0 | 1.0                   | 70                           | 1.0                                        | 113                                                     | 3.5                                     | 146.9                                                | 17.5                                 |
| SMAJ75A               | RR      | SMAJ75CA             | WR      | 83.3                                      | 92.1 | 1.0                   | 75                           | 1.0                                        | 121                                                     | 3.3                                     | 157.3                                                | 16.5                                 |
| SMAJ78A               | RT      | SMAJ78CA             | WT      | 86.7                                      | 95.8 | 1.0                   | 78                           | 1.0                                        | 126                                                     | 3.2                                     | 163.8                                                | 16.0                                 |
| SMAJ85A               | RV      | SMAJ85CA             | WV      | 94.4                                      | 104  | 1.0                   | 85                           | 1.0                                        | 137                                                     | 2.9                                     | 178.1                                                | 14.5                                 |
| SMAJ90A               | RX      | SMAJ90CA             | WX      | 100                                       | 111  | 1.0                   | 90                           | 1.0                                        | 146                                                     | 2.7                                     | 189.8                                                | 13.5                                 |
| SMAJ100A              | RZ      | SMAJ100CA            | WZ      | 111                                       | 123  | 1.0                   | 100                          | 1.0                                        | 162                                                     | 2.5                                     | 210.6                                                | 12.5                                 |
| SMAJ110A              | SE      | SMAJ110CA            | XE      | 122                                       | 135  | 1.0                   | 110                          | 1.0                                        | 177                                                     | 2.3                                     | 230.1                                                | 11.5                                 |
| SMAJ120A              | SG      | SMAJ120CA            | XG      | 133                                       | 147  | 1.0                   | 120                          | 1.0                                        | 193                                                     | 2.1                                     | 250.9                                                | 10.5                                 |
| SMAJ130A              | SK      | SMAJ130CA            | XK      | 144                                       | 159  | 1.0                   | 130                          | 1.0                                        | 209                                                     | 1.9                                     | 271.7                                                | 9.5                                  |
| SMAJ150A              | SM      | SMAJ150CA            | XM      | 167                                       | 185  | 1.0                   | 150                          | 1.0                                        | 243                                                     | 1.6                                     | 315.9                                                | 8.0                                  |
| SMAJ160A              | SP      | SMAJ160CA            | XP      | 178                                       | 197  | 1.0                   | 160                          | 1.0                                        | 259                                                     | 1.5                                     | 336.7                                                | 7.5                                  |
| SMAJ170A              | SR      | SMAJ170CA            | XR      | 189                                       | 209  | 1.0                   | 170                          | 1.0                                        | 275                                                     | 1.5                                     | 357.5                                                | 7.5                                  |
| SMAJ180A              | ST      | SMAJ180CA            | XT      | 201                                       | 222  | 1.0                   | 180                          | 1.0                                        | 292                                                     | 1.4                                     | 379.6                                                | 7.0                                  |
| SMAJ200A              | SV      | SMAJ200CA            | XV      | 224                                       | 247  | 1.0                   | 200                          | 1.0                                        | 324                                                     | 1.2                                     | 421.2                                                | 6.0                                  |
| SMAJ220A              | SX      | SMAJ220CA            | XX      | 246                                       | 272  | 1.0                   | 220                          | 1.0                                        | 356                                                     | 1.1                                     | 462.8                                                | 5.5                                  |
| SMAJ250A              | SZ      | SMAJ250CA            | XZ      | 279                                       | 309  | 1.0                   | 250                          | 1.0                                        | 405                                                     | 1.0                                     | 526.5                                                | 5.0                                  |
| SMAJ300A              | FE      | SMAJ300CA            | GE      | 335                                       | 371  | 1.0                   | 300                          | 1.0                                        | 486                                                     | 0.8                                     | 631.8                                                | 4.0                                  |
| SMAJ350A              | FG      | SMAJ350CA            | GG      | 391                                       | 432  | 1.0                   | 350                          | 1.0                                        | 567                                                     | 0.7                                     | 737.1                                                | 3.5                                  |
| SMAJ400A              | FK      | SMAJ400CA            | GK      | 447                                       | 494  | 1.0                   | 400                          | 1.0                                        | 648                                                     | 0.6                                     | 842.4                                                | 3.0                                  |
| SMAJ434A              | 434U    | SMAJ434CA            | 434D    | 485                                       | 535  | 1.0                   | 434                          | 1.0                                        | 698                                                     | 0.6                                     | 907.4                                                | 2.9                                  |
| SMAJ440A              | FM      | SMAJ440CA            | GM      | 492                                       | 543  | 1.0                   | 440                          | 1.0                                        | 713                                                     | 0.6                                     | 926.9                                                | 3.0                                  |
| SMAJ495A              | 495U    | SMAJ495CA            | 495D    | 522                                       | 578  | 1.0                   | 495                          | 1.0                                        | 760                                                     | 0.5                                     | 988.0                                                | 2.6                                  |

Notes: 1. Suffix 'A' denotes a 5 % tolerance unidirectional device. 3. For bidirectional devices with a V<sub>R</sub> of 10 volts or less, the I<sub>R</sub> limit is double.  
2. Suffix 'CA' denotes a 5 % tolerance bidirectional device.

Specifications are subject to change without notice.

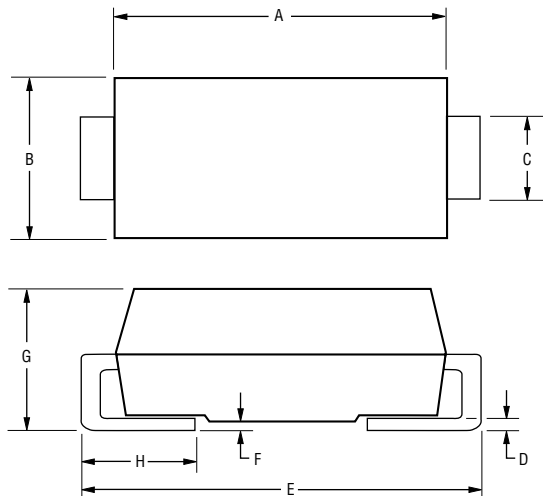
Users should verify actual device performance in their specific applications.

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# SMAJ Transient Voltage Suppressor Diode Series

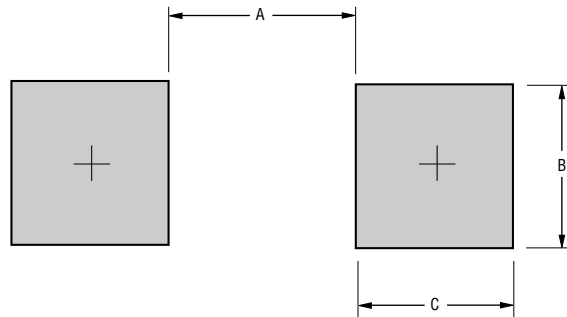
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## Product Dimensions



| Dimension | SMA (DO-214AC)                        |
|-----------|---------------------------------------|
| A         | $\frac{3.99 - 4.50}{(0.157 - 0.177)}$ |
| B         | $\frac{2.54 - 2.79}{(0.100 - 0.110)}$ |
| C         | $\frac{1.25 - 1.65}{(0.049 - 0.065)}$ |
| D         | $\frac{0.15 - 0.31}{(0.006 - 0.012)}$ |
| E         | $\frac{4.93 - 5.28}{(0.194 - 0.208)}$ |
| F         | $\frac{0.203}{(0.008)}$ MAX.          |
| G         | $\frac{1.98 - 2.29}{(0.078 - 0.090)}$ |
| H         | $\frac{0.76 - 1.52}{(0.030 - 0.060)}$ |

## Recommended Footprint



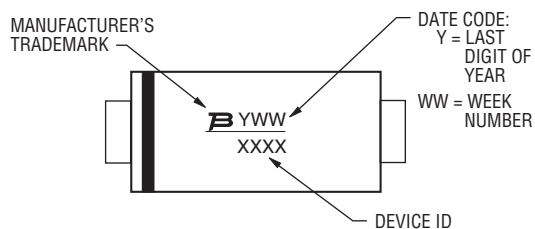
| Dimension | SMA (DO-214AC)         |
|-----------|------------------------|
| A (Max.)  | $\frac{2.70}{(0.106)}$ |
| B (Min.)  | $\frac{2.10}{(0.083)}$ |
| C (Min.)  | $\frac{1.27}{(0.050)}$ |

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

## Physical Specifications

Case .....Molded plastic per UL Class 94V-0  
 Polarity..... Cathode band indicates unidirectional device  
 No cathode band indicates bidirectional device  
 Weight .....0.064 grams

## Typical Part Marking



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Users should verify actual device performance in their specific applications.

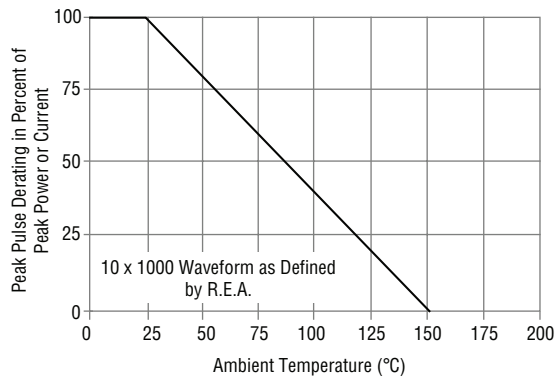
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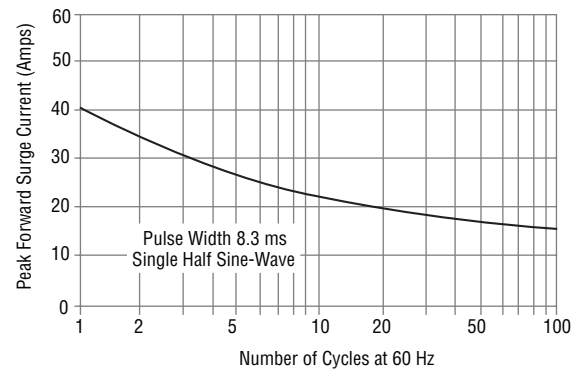
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## Rating & Characteristic Curves

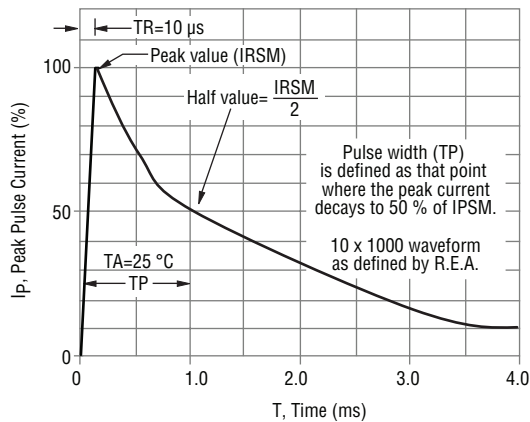
### Pulse Derating Curve



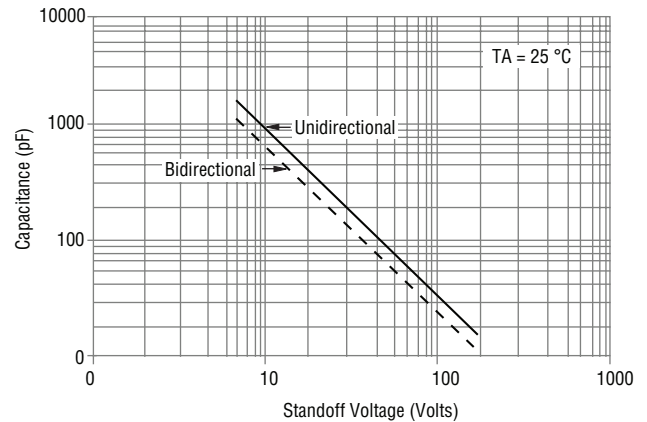
### Maximum Non-Repetitive Surge Current



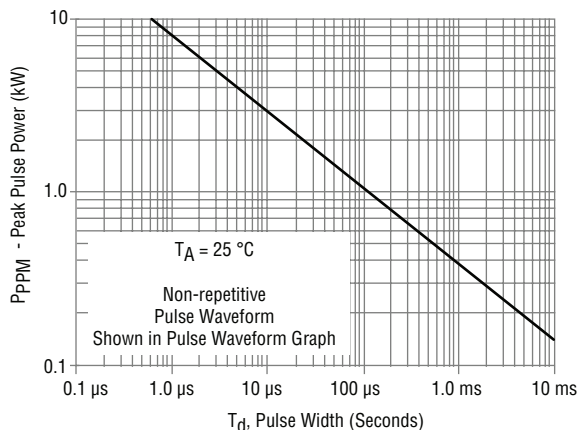
### Pulse Waveform



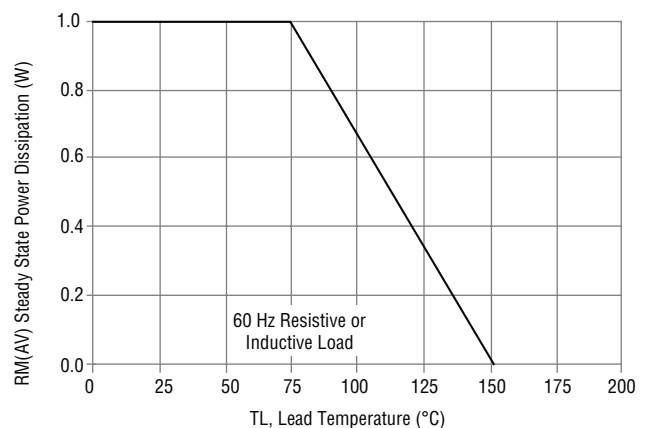
### Typical Junction Capacitance



### Pulse Rating Curve



### Steady State Power Derating Curve



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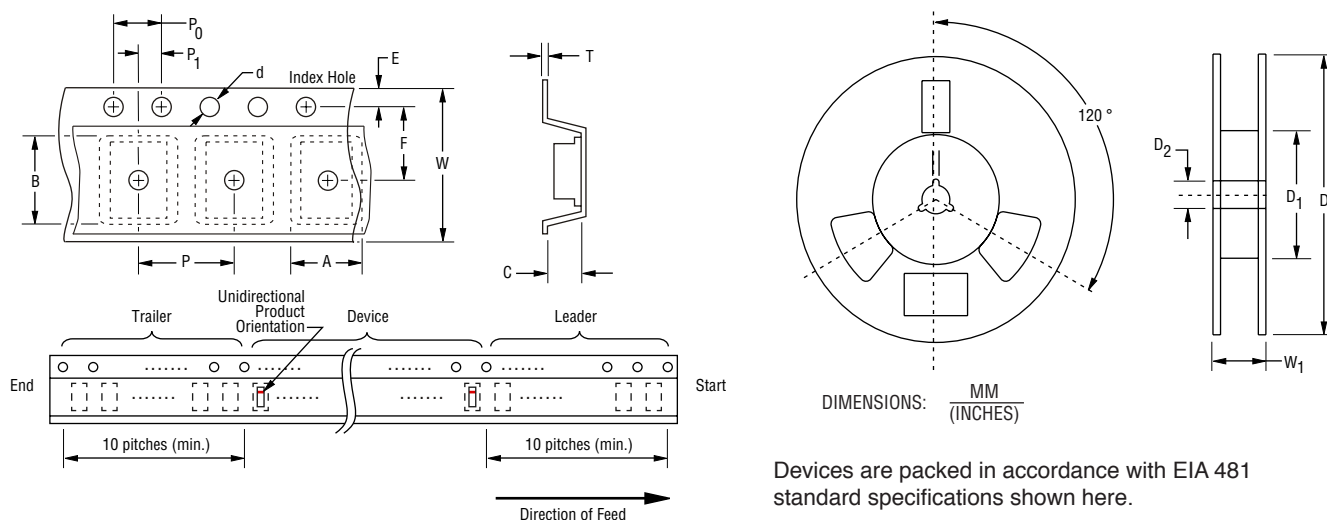
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# SMAJ Transient Voltage Suppressor Diode Series

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## Packaging Information

The product will be dispensed in tape and reel format (see diagram below).



| Item                   | Symbol         | SMA (DO-214AC)                      |                        |
|------------------------|----------------|-------------------------------------|------------------------|
|                        |                | 7 Inch Reel                         | 13 Inch Reel           |
| Carrier Width          | A              | $2.90 \pm 0.20$<br>(0.114 ± 0.008)  |                        |
| Carrier Length         | B              | $5.50 \pm 0.20$<br>(0.217 ± 0.008)  |                        |
| Carrier Depth          | C              | $2.26 \pm 0.20$<br>(0.089 ± 0.008)  |                        |
| Sprocket Hole          | d              | $1.50 \pm 0.10$<br>(0.061 ± 0.004)  |                        |
| Reel Outside Diameter  | D              | $\frac{178}{(7.008)}$               | $\frac{330}{(12.992)}$ |
| Reel Inner Diameter    | D <sub>1</sub> | $\frac{50.0}{(1.969)}$ MIN.         |                        |
| Feed Hole Diameter     | D <sub>2</sub> | $13.0 \pm 0.20$<br>(0.512 ± 0.008)  |                        |
| Sprocket Hole Position | E              | $1.75 \pm 0.10$<br>(0.069 ± 0.004)  |                        |
| Punch Hole Position    | F              | $5.50 \pm 0.05$<br>(0.217 ± 0.002)  |                        |
| Punch Hole Pitch       | P              | $4.00 \pm 0.10$<br>(0.157 ± 0.004)  |                        |
| Sprocket Hole Pitch    | P <sub>0</sub> | $4.00 \pm 0.10$<br>(0.157 ± 0.004)  |                        |
| Embossment Center      | P <sub>1</sub> | $2.00 \pm 0.05$<br>(0.079 ± 0.002)  |                        |
| Overall Tape Thickness | T              | $0.30 \pm 0.10$<br>(0.012 ± 0.004)  |                        |
| Tape Width             | W              | $12.00 \pm 0.30$<br>(0.472 ± 0.012) |                        |
| Reel Width             | W <sub>1</sub> | $\frac{18.4}{(0.724)}$ MAX.         |                        |
| Quantity per Reel      | --             | 1,000                               | 5,000                  |

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