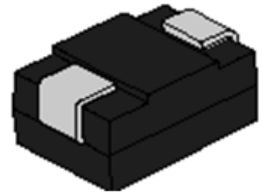


## Description

The 5.0SMDJ series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.



SMC

## Features

- ◆ 5000W peak pulsepower capability at 10 x 1000µs waveform, repetition rate (duty cycle):0.01%
- ◆ Glass Passivated chip junction
- ◆ For surface mounted applications to optimize board space
- ◆ Low profile package
- ◆ Built-in strain relief
- ◆ Low incremental surge resistance
- ◆ Excellent clamping capability
- ◆ Plastic package has UL flammability classification 94V-0
- ◆ Fast response time: typically less than 1.0ps from 0 Volts to BV min
- ◆ Typical IR less than 5uA above 22V
- ◆ High temperature soldering: 260°C/40 seconds at terminals
- ◆ IEC-61000-4-2 ESD 15KV(Air),8KV(Contact)
- ◆ ESD protection of data lines in accordance with IEC 61000-4-2(IEC801-2)
- ◆ EFT protection of data lines in accordance with IEC61000-4-4(IEC801-4)
- ◆ AEC -Q101 qualified.



Bi-directional



Uni-directional  
Symbol

## 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.



## Maximum Ratings and Electrical Characteristics

(TA=25°C unless otherwise noted)

| Parameter  | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Peak Pulse Power Dissipation at TA=25°C by 10x1000µs waveform (Fig.2)(Note 1) (Note 2) | P <sub>PPM</sub>                  | 5000        | W    |
| Power Dissipation on infinite heat sink at TA=50°C                                     | P <sub>D</sub>                    | 6.5         | W    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional only(Note 3)    | I <sub>FSM</sub>                  | 300         | A    |
| Maximum Instantaneous Forward Voltage at 100A for Unidirectional only                  | V <sub>F</sub>                    | 3.5V/5.0    | V    |
| Operating Junction and Storage Temperature Range                                       | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |
| Typical Thermal Resistance Junction to Lead  | R <sub>uJL</sub>                  | 15          | °C/W |
| Typical Thermal Resistance Junction to Ambient   | R <sub>uJA</sub>                  | 75          | °C/W |

### Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above TA=25°C per Fig. 2.
2. Mounted on copper pad area of 0.31x0.31" (8.0 x 8.0mm) to each terminal.
3. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

## Electrical Characteristics

| PART NUMBER   |              | REVERSE<br>STAND-OFF<br>VOLTAGE | BREAKDOWN<br>VOLTAGE<br>VBR(V)MAX.@I<br>T | TEST<br>CURRENT | REVERSE<br>LEAKAGE<br>@VRWM | PEAK PULSE<br>CURRENT | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@Ipp |           |
|---------------|--------------|---------------------------------|---|-----------------|-----------------------------|-----------------------|--|-----------|
| BI- POLAR     | UNI-POLAR    | VRWM<br>(V)                     | VBR<br>Min(V)                             | VBR<br>Max(V)   | IT<br>(mA)                  | IR<br>(µA)            | Ipp<br>(A)                             | Vc<br>(v) |
| 5.0SMDJ5.0CA  | 5.0SMDJ5.0A  | 5.0                             | 6.4                                       | 7.25            | 50                          | 5000                  | 554.3                                  | 9.2       |
| 5.0SMDJ6.0CA  | 5.0SMDJ6.0A  | 6.0                             | 6.67                                      | 7.67            | 50                          | 5000                  | 495.1                                  | 10.3      |
| 5.0SMDJ 6.5CA | 5.0SMDJ 6.5A | 6.5                             | 7.22                                      | 8.30            | 50                          | 2000                  | 455.4                                  | 11.2      |
| 5.0SMDJ7.0 CA | 5.0SMDJ7.0 A | 7.0                             | 7.78                                      | 8.95            | 50                          | 1000                  | 425.0                                  | 12.0      |
| 5.0SMDJ 7.5CA | 5.0SMDJ 7.5A | 7.5                             | 8.33                                      | 9.58            | 5                           | 250                   | 395.3                                  | 12.9      |
| 5.0SMDJ 8.0CA | 5.0SMDJ 8.0A | 8.0                             | 8.89                                      | 10.23           | 5                           | 150                   | 357.0                                  | 13.6      |
| 5.0SMDJ8.5 CA | 5.0SMDJ8.5 A | 8.5                             | 9.44                                      | 10.82           | 5                           | 50                    | 354.2                                  | 14.4      |
| 5.0SMDJ9.0 CA | 5.0SMDJ9.0 A | 9.0                             | 10.00                                     | 11.50           | 5                           | 20                    | 331.2                                  | 15.4      |
| 5.0SMDJ10CA   | 5.0SMDJ10A   | 10.0                            | 11.1                                      | 12.30           | 5                           | 15                    | 300.0                                  | 17.0      |
| 5.0SMDJ11CA   | 5.0SMDJ11A   | 11.0                            | 12.20                                     | 14.00           | 5                           | 2                     | 280.2                                  | 18.2      |
| 5.0SMDJ12CA   | 5.0SMDJ12A   | 12.0                            | 13.30                                     | 14.70           | 5                           | 2                     | 256.3                                  | 19.9      |
| 5.0SMDJ13CA   | 5.0SMDJ13A   | 13.0                            | 14.40                                     | 16.50           | 5                           | 2                     | 237.2                                  | 21.5      |
| 5.0SMDJ14CA   | 5.0SMDJ14A   | 14.0                            | 15.60                                     | 17.20           | 5                           | 2                     | 219.8                                  | 23.2      |
| 5.0SMDJ15CA   | 5.0SMDJ15A   | 15.0                            | 16.70                                     | 19.20           | 5                           | 2                     | 209.0                                  | 24.4      |
| 5.0SMDJ16CA   | 5.0SMDJ16A   | 16.0                            | 17.80                                     | 19.70           | 5                           | 2                     | 196.2                                  | 26.0      |
| 5.0SMDJ17CA   | 5.0SMDJ17A   | 17.0                            | 18.90                                     | 21.70           | 5                           | 2                     | 184.8                                  | 27.6      |
| 5.0SMDJ18CA   | 5.0SMDJ18A   | 18.0                            | 20.00                                     | 23.30           | 5                           | 2                     | 174.7                                  | 29.2      |
| 5.0SMDJ20CA   | 5.0SMDJ20A   | 20.0                            | 22.20                                     | 25.50           | 5                           | 2                     | 157.4                                  | 32.4      |
| 5.0SMDJ22CA   | 5.0SMDJ22A   | 22.0                            | 24.40                                     | 28.00           | 5                           | 2                     | 143.7                                  | 35.5      |
| 5.0SMDJ24CA   | 5.0SMDJ24A   | 24.0                            | 26.70                                     | 30.70           | 5                           | 2                     | 131.1                                  | 38.9      |
| 5.0SMDJ26CA   | 5.0SMDJ26A   | 26.0                            | 28.90                                     | 33.20           | 5                           | 2                     | 121.1                                  | 42.1      |
| 5.0SMDJ28CA   | 5.0SMDJ28A   | 28.0                            | 31.10                                     | 35.80           | 5                           | 2                     | 112.3                                  | 45.4      |
| 5.0SMDJ30CA   | 5.0SMDJ30A   | 30.0                            | 33.30                                     | 38.30           | 5                           | 2                     | 105.4                                  | 48.4      |
| 5.0SMDJ33CA   | 5.0SMDJ33A   | 33.0                            | 36.70                                     | 40.60           | 5                           | 2                     | 95.7                                   | 53.3      |

## Electrical Characteristics

| PART NUMBER  |             | REVERSE<br>STAND-OFF<br>VOLTAGE | N VOLTAGE<br>BREAKDOWN<br>VOLTAGE | VBR(V)/MAX.<br>@IT | CURRENT<br>TEST | LEAKAGE<br>CURRENT | CURRENT<br>PULSE<br>PEAK | MAXIMUM<br>CLAMPING<br>VOLTAGE | @Ipp |
|--------------|-------------|---------------------------------|-----------------------------------|--------------------|-----------------|--------------------|--------------------------|--------------------------------|------|
| BI- POLAR    | UNI-POLAR   | VRWM<br>(V)                     | VBR<br>Min(V)                     | VBR<br>Max(V)      | IT<br>(mA)      | IR<br>( $\mu$ A)   | Ipp (A)                  | Vc<br>(v)                      |      |
| 5.0SMDJ36CA  | 5.0SMDJ36A  | 36.0                            | 40.00                             | 46.00              | 5               | 2                  | 87.8                     | 58.1                           |      |
| 5.0SMDJ40CA  | 5.0SMDJ40A  | 40.0                            | 44.40                             | 51.10              | 5               | 2                  | 79.1                     | 64.5                           |      |
| 5.0SMDJ43CA  | 5.0SMDJ43A  | 43.0                            | 47.8                              | 52.8               | 5               | 2                  | 73.5                     | 69.4                           |      |
| 5.0SMDJ45CA  | 5.0SMDJ45A  | 45.0                            | 50.00                             | 57.50              | 5               | 2                  | 70.2                     | 72.7                           |      |
| 5.0SMDJ48CA  | 5.0SMDJ48A  | 48.0                            | 53.30                             | 58.90              | 5               | 2                  | 65.9                     | 77.4                           |      |
| 5.0SMDJ51CA  | 5.0SMDJ51A  | 51.0                            | 56.70                             | 65.20              | 5               | 2                  | 61.9                     | 82.4                           |      |
| 5.0SMDJ54CA  | 5.0SMDJ54A  | 54.0                            | 60.00                             | 69.00              | 5               | 2                  | 58.6                     | 87.1                           |      |
| 5.0SMDJ58CA  | 5.0SMDJ58A  | 58.0                            | 64.4                              | 71.2               | 5               | 2                  | 54.5                     | 93.6                           |      |
| 5.0SMDJ60CA  | 5.0SMDJ60A  | 60.0                            | 66.7                              | 73.7               | 5               | 2                  | 52.7                     | 96.8                           |      |
| 5.0SMDJ64CA  | 5.0SMDJ64A  | 64.0                            | 71.10                             | 81.80              | 5               | 2                  | 49.5                     | 103.0                          |      |
| 5.0SMDJ70CA  | 5.0SMDJ70A  | 70.0                            | 77.8                              | 95.1               | 5               | 2                  | 45.1                     | 113.0                          |      |
| 5.0SMDJ75CA  | 5.0SMDJ75A  | 75.0                            | 83.3                              | 92.1               | 5               | 2                  | 42.1                     | 121.0                          |      |
| 5.0SMDJ78CA  | 5.0SMDJ78A  | 78.0                            | 86.70                             | 99.70              | 5               | 2                  | 40.5                     | 126.0                          |      |
| 5.0SMDJ85CA  | 5.0SMDJ85A  | 85.0                            | 94.40                             | 108.20             | 5               | 2                  | 37.2                     | 137.0                          |      |
| 5.0SMDJ90CA  | 5.0SMDJ90A  | 90.0                            | 100.0                             | 111.0              | 5               | 2                  | 34.9                     | 146.0                          |      |
| 5.0SMDJ100CA | 5.0SMDJ100A | 100.0                           | 111.0                             | 123.00             | 5               | 2                  | 31.5                     | 162.0                          |      |
| 5.0SMDJ110CA | 5.0SMDJ110A | 110.0                           | 122.0                             | 135.00             | 5               | 2                  | 28.8                     | 177.0                          |      |
| 5.0SMDJ120CA | 5.0SMDJ120A | 120.0                           | 133.0                             | 147.00             | 5               | 2                  | 26.4                     | 193.0                          |      |
| 5.0SMDJ130CA | 5.0SMDJ130A | 130.0                           | 144.0                             | 159.00             | 5               | 2                  | 24.4                     | 209.0                          |      |
| 5.0SMDJ150CA | 5.0SMDJ150A | 150.0                           | 167.0                             | 185.00             | 5               | 2                  | 21.0                     | 243.0                          |      |
| 5.0SMDJ160CA | 5.0SMDJ160A | 160.0                           | 178.0                             | 197.00             | 5               | 2                  | 19.7                     | 259.0                          |      |
| 5.0SMDJ170CA | 5.0SMDJ170A | 170.0                           | 189.0                             | 209.00             | 5               | 2                  | 18.5                     | 275.0                          |      |
| 5.0SMDJ180CA | 5.0SMDJ180A | 180.0                           | 201.0                             | 222.0              | 5               | 2                  | 17.5                     | 292.0                          |      |
| 5.0SMDJ190CA | 5.0SMDJ190A | 190.0                           | 211.0                             | 233.00             | 5               | 2                  | 16.5                     | 308.0                          |      |

# Electrical Characteristics

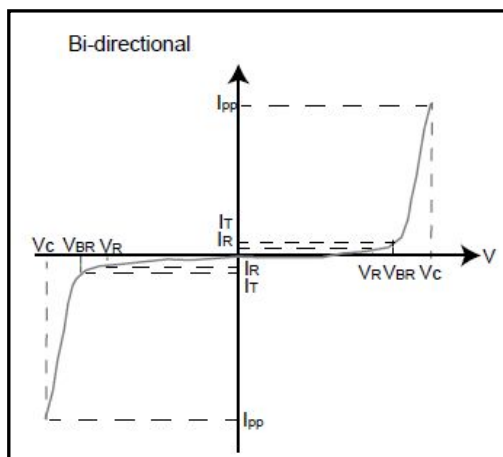
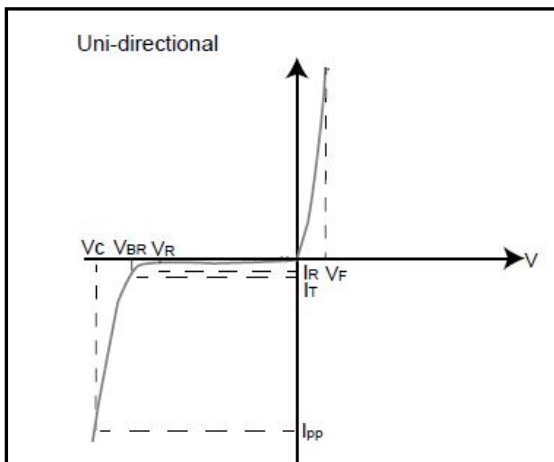
| PART NUMBER  |             | REVERSE STAND-OFF VOLTAGE | BREAKDOWN VOLTAGE VBR(V)MAX.@IT |            | TEST CURRENT | REVERSE LEAKAGE @VRWM | PEAK PULSE CURRENT | MAXIMUM CLAMPING VOLTAGE @Ipp |
|--------------|-------------|---------------------------|---------------------------------|------------|--------------|-----------------------|--------------------|-------------------------------|
| BI-POLAR     | UNI-POLAR   | VRWM (V)                  | VBR MIN(V)                      | VBR MAX(V) | IT (mA)      | IR (μA)               | Ipp (A)            | Vc (v)                        |
| 5.0SMDJ200CA | 5.0SMDJ200A | 200.0                     | 224.0                           | 247.00     | 5            | 2                     | 15.5               | 324.0                         |
| 5.0SMDJ210CA | 5.0SMDJ220A | 210.0                     | 237.00                          | 263.00     | 5            | 2                     | 14.6               | 356.0                         |
| 5.0SMDJ220CA | 5.0SMDJ220A | 220.0                     | 246.00                          | 272.00     | 5            | 2                     | 13.7               | 356.0                         |
| 5.0SMDJ250CA | 5.0SMDJ250A | 250.0                     | 279.00                          | 309.00     | 5            | 2                     | 12.0               | 405.0                         |
| 5.0SMDJ300CA | 5.0SMDJ300A | 300.0                     | 335.0                           | 371.00     | 5            | 2                     | 9.1                | 486.0                         |
| 5.0SMDJ350CA | 5.0SMDJ350A | 350.0                     | 391.00                          | 432.00     | 5            | 2                     | 7.7                | 567.0                         |
| 5.0SMDJ400CA | 5.0SMDJ400A | 400.0                     | 447.00                          | 494.00     | 5            | 2                     | 6.72               | 648.0                         |
| 5.0SMDJ440CA | 5.0SMDJ440A | 440.0                     | 492.00                          | 543.00     | 5            | 2                     | 6.16               | 713.0                         |

### Notes:

For bidirectional type having VRWM of 20 volts and less, the IR limit is double.

For parts without A (VBR is ± 10% and Vc is 5% higher than A parts

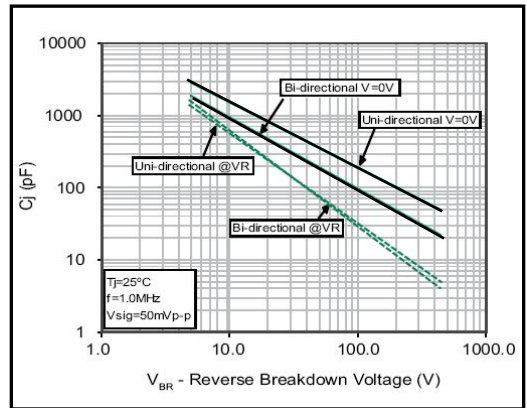
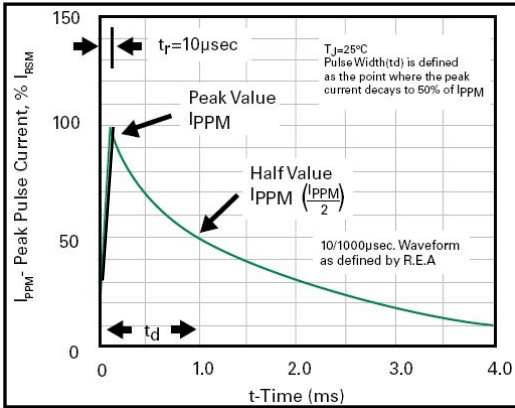
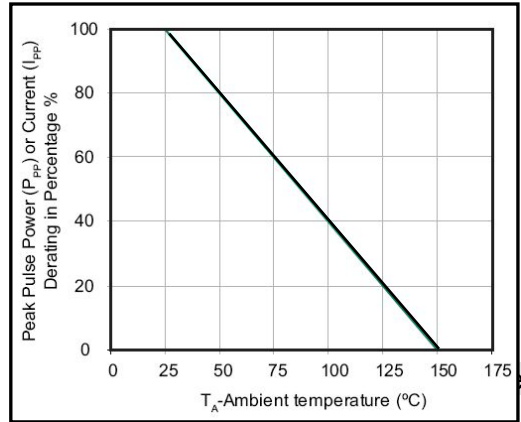
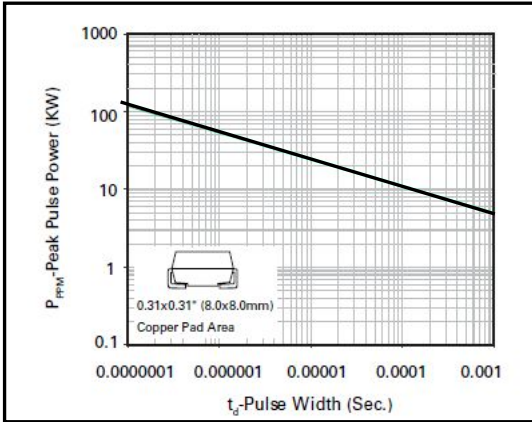
## I-V Curve Characteristics



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

Figure 1 - Peak Pulse Power Rating Curve

Figure 2 - Pulse Derating Curve



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

Figure 5 - Steady State Power Dissipation Derating Curve

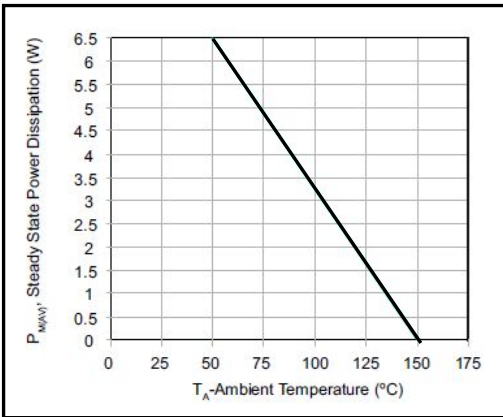
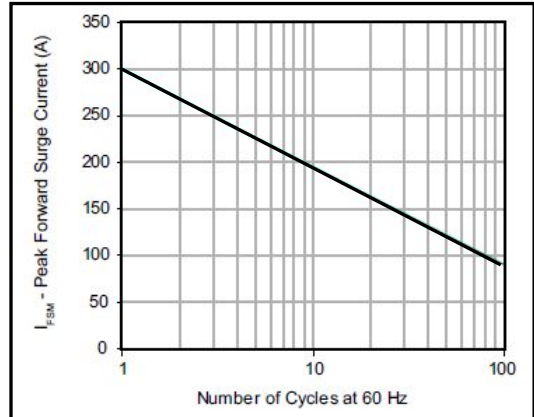


Figure 6 - Maximum Non-Repetitive Forward Surge Current Uni-Directional Only

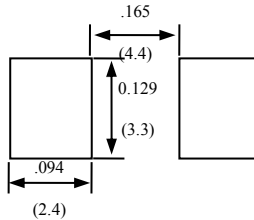
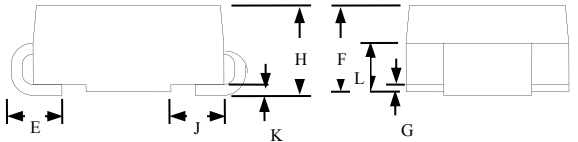
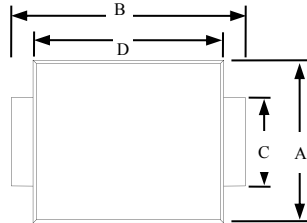


| Part           | Numbering  |          | System   |
|----------------|------------|----------|----------|
| <b>5.0SMDJ</b> | <b>XXX</b> | <b>C</b> | <b>A</b> |
| (1)            | (2)        | (3)      | (4)      |


- (1) SERIES.
- (2)  $V_R$  VOLTAGE.
- (3) BI-DIRECTIONAL.
- (4) 5% VOLTAGE TOLERANCE.

**Product Dimensions**

| Dimension | Inches |       | Millimeters |       |
|-----------|--------|-------|-------------|-------|
|           | MIN    | MAX   | MIN         | MAX   |
| A         | 0.220  | 0.245 | 5.59        | 6.22  |
| B         | 0.305  | 0.320 | 7.75        | 8.13  |
| C         | 0.114  | 0.126 | 2.90        | 3.20  |
| D         | 0.260  | 0.280 | 6.60        | 7.11  |
| E         | 0.030  | 0.060 | 0.76        | 1.52  |
| F         | 0.077  | 0.094 | 1.95        | 2.40  |
| G         | -      | 0.008 | -           | 0.203 |
| H         | 0.79   | 0.103 | 2.06        | 2.62  |
| J         | 0.030  | 0.060 | 0.76        | 1.52  |
| K         | 0.008  | 0.014 | 0.20        | 0.35  |
| L         | 0.039  | 0.049 | 0.99        | 1.24  |

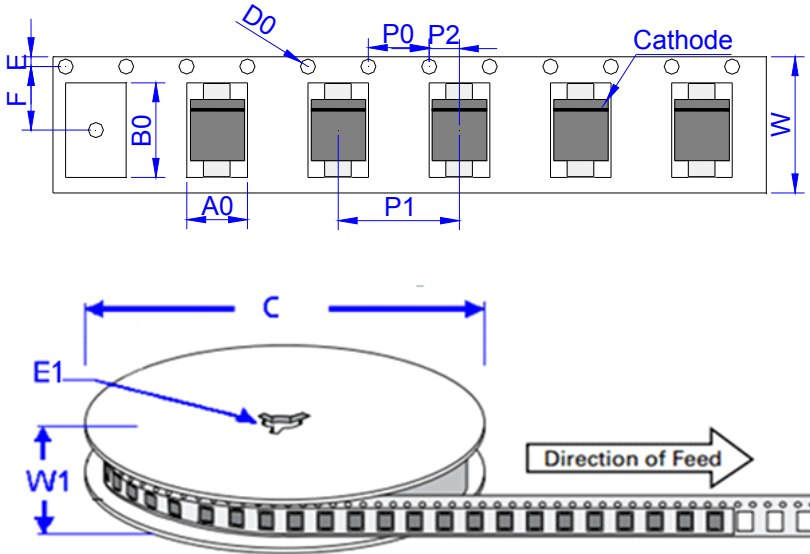


**Summary of Packing Options**

| Package Type   | Packaging Option   | Packing Quantity | Industry Standard |
|--|--------------------|------------------|-------------------|
| DO-214AB(SMC)<br> | Tape&Reel-16mm/13" | 2500PCS          | EIA STD<br>RS-481 |




## TAPE AND REEL SPECIFICATION-SMC



| Ref. | Dimensions  |                |
|------|-------------|----------------|
|      | Millimeters | Inches         |
| A0   | 6.05 ± 0.3  | 0.238 ± 0.012  |
| B0   | 8.31 ± 0.3  | 0.327 ± 0.012  |
| C    | 330.0       | 13.0           |
| D0   | 1.55 ± 0.1  | 0.061 ± 0.004  |
| E    | 1.75 ± 0.2  | 0.069 ± 0.008  |
| E1   | 13.3 ± 0.3  | 0.524 ± 0.012  |
| F    | 7.50 ± 0.2  | 0.295 ± 0.008  |
| P0   | 4.00 ± 0.2  | 0.157 ± 0.008  |
| P1   | 8.00 ± 0.2  | 0.3145 ± 0.008 |
| P2   | 2.00 ± 0.2  | 0.079 ± 0.008  |
| W    | 16.0 ± 0.2  | 0.630 ± 0.008  |
| W1   | 19.7 ± 2.0  | 0.776 ± 0.079  |

## Summary of Packing Options

| Package Type   | Packaging Option           | Packing Quantity | Industry Standard |
|--|----------------------------|------------------|-------------------|
| DO-214AB(SMC)<br> | Tape&Reel-16mm/13”<br>tape | 3000PCS          | EIA STD<br>RS-481 |