



## 5000W High Power Surface Mount TVS 5.0SMDJ Series 5.0SMDJ12A 12VRWM

Our Product Introduction

### Basic Information

- Place of Origin: Shenzhen, Guangdong, China
- Brand Name: SOCAY
- Certification: UL, REACH, RoHS, ISO
- Model Number: 5.0SMDJ12A
- Minimum Order Quantity: 500PCS
- Price: Negotiable
- Delivery Time: 5-8 work days



### Product Specification

- Product Name: TVS Diodes
- Package Type: DO-214AB/SMC
- Vrwm: 12.0V
- Vbr@It (Min.): 13.30V
- Vbr@It (Max.): 14.70V
- It: 1mA
- Vc@Ipp: 19.9V
- Ipp: 253.77A
- Ir@Vrwm: 800μA
- Storage Temperature Range: -55 To +150
- Highlight: **5000W Surface Mount TVS,  
Surface Mount TVS 12VRWM**

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## Product Description

### 5000W High-power 5.0SMDJ Series TVS Diode 5.0SMDJ12A Surface Mount TVS 12VRWM

**DATASHEET:** [5.0SMDJ\\_v2107.1 .pdf](#)

#### Description:

The **5.0SMDJ** series TVS transient suppression diode product is a new type of high-efficiency circuit protection device developed by SOCA Y for the special needs of the automotive industry. It has extremely fast response time (sub-nanosecond level) and very high surge absorption capability. Designed specifically to protect sensitive electronic equipment in automotive electronics applications from voltage transients caused by lightning strikes and other transient voltage events.

| Part Number |              | Marking |      | Reverse Stand-Off Voltage $V_{RWM}$ (V) | Breakdown Voltage $V_{BR}$ (V) @ $I_T$ |       | Test Current $I_T$ (mA) | Maximum Clamping Voltage $V_C$ @ $I_{PP}$ (V) | Maximum Peak Pulse Current $I_{PP}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_{RWM}$ ( $\mu A$ ) |
|-------------|--------------|---------|------|-----------------------------------------|----------------------------------------|-------|-------------------------|-----------------------------------------------|-----------------------------------------|-------------------------------------------------------|
| Uni         | Bi           | Uni     | Bi   |                                         | MIN                                    | MAX   |                         |                                               |                                         |                                                       |
| —           | 5.0SMDJ8.0CA | —       | 5BDP | 8.0                                     | 8.89                                   | 9.83  | 1                       | 13.6                                          | 367.60                                  | 100                                                   |
| 5.0SMDJ11A  | 5.0SMDJ11CA  | 5PDX    | 5BDX | 11.0                                    | 12.20                                  | 13.50 | 1                       | 18.2                                          | 277.47                                  | 800                                                   |
| 5.0SMDJ12A  | 5.0SMDJ12CA  | 5PDZ    | 5BDZ | 12.0                                    | 13.30                                  | 14.70 | 1                       | 19.9                                          | 253.77                                  | 800                                                   |
| 5.0SMDJ13A  | 5.0SMDJ13CA  | 5PEE    | 5BEE | 13.0                                    | 14.40                                  | 15.90 | 1                       | 21.5                                          | 234.88                                  | 500                                                   |
| 5.0SMDJ14A  | 5.0SMDJ14CA  | 5PEG    | 5BEG | 14.0                                    | 15.60                                  | 17.20 | 1                       | 23.2                                          | 217.67                                  | 200                                                   |
| 5.0SMDJ15A  | 5.0SMDJ15CA  | 5PEK    | 5BEK | 15.0                                    | 16.70                                  | 18.50 | 1                       | 24.4                                          | 206.97                                  | 100                                                   |
| 5.0SMDJ16A  | 5.0SMDJ16CA  | 5PEM    | 5BEM | 16.0                                    | 17.80                                  | 19.70 | 1                       | 26.0                                          | 194.23                                  | 50                                                    |
| 5.0SMDJ17A  | 5.0SMDJ17CA  | 5PEP    | 5BEP | 17.0                                    | 18.90                                  | 20.90 | 1                       | 27.6                                          | 182.97                                  | 20                                                    |
| 5.0SMDJ18A  | 5.0SMDJ18CA  | 5PER    | 5BER | 18.0                                    | 20.00                                  | 22.10 | 1                       | 29.2                                          | 172.95                                  | 10                                                    |
| 5.0SMDJ19A  | 5.0SMDJ19CA  | 5PET    | 5BET | 19.0                                    | 21.10                                  | 23.30 | 1                       | 30.8                                          | 164.07                                  | 10                                                    |
| 5.0SMDJ20A  | 5.0SMDJ20CA  | 5PEV    | 5BEV | 20.0                                    | 22.20                                  | 24.50 | 1                       | 32.4                                          | 155.86                                  | 5                                                     |
| 5.0SMDJ22A  | 5.0SMDJ22CA  | 5PEX    | 5BEX | 22.0                                    | 24.40                                  | 26.90 | 1                       | 35.5                                          | 142.25                                  | 5                                                     |
| 5.0SMDJ24A  | 5.0SMDJ24CA  | 5PEZ    | 5BEZ | 24.0                                    | 26.70                                  | 29.50 | 1                       | 38.9                                          | 129.82                                  | 5                                                     |
| 5.0SMDJ26A  | 5.0SMDJ26CA  | 5PFE    | 5BFE | 26.0                                    | 28.90                                  | 31.90 | 1                       | 42.1                                          | 119.95                                  | 5                                                     |
| 5.0SMDJ28A  | 5.0SMDJ28CA  | 5PFG    | 5BFG | 28.0                                    | 31.10                                  | 34.40 | 1                       | 45.4                                          | 111.23                                  | 5                                                     |
| 5.0SMDJ30A  | 5.0SMDJ30CA  | 5PFK    | 5BFK | 30.0                                    | 33.30                                  | 36.80 | 1                       | 48.4                                          | 104.34                                  | 5                                                     |
| 5.0SMDJ33A  | 5.0SMDJ33CA  | 5PFM    | 5BFM | 33.0                                    | 36.70                                  | 40.60 | 1                       | 53.3                                          | 94.75                                   | 5                                                     |
| 5.0SMDJ36A  | 5.0SMDJ36CA  | 5PFP    | 5BFP | 36.0                                    | 40.00                                  | 44.20 | 1                       | 58.1                                          | 86.92                                   | 5                                                     |
| 5.0SMDJ40A  | 5.0SMDJ40CA  | 5PFR    | 5BFR | 40.0                                    | 44.40                                  | 49.10 | 1                       | 64.5                                          | 78.29                                   | 5                                                     |
| 5.0SMDJ43A  | 5.0SMDJ43CA  | 5PFT    | 5BFT | 43.0                                    | 47.80                                  | 52.80 | 1                       | 69.4                                          | 72.77                                   | 5                                                     |
| 5.0SMDJ45A  | 5.0SMDJ45CA  | 5PFV    | 5BFV | 45.0                                    | 50.00                                  | 55.30 | 1                       | 72.7                                          | 69.46                                   | 5                                                     |
| 5.0SMDJ48A  | 5.0SMDJ48CA  | 5PFX    | 5BFX | 48.0                                    | 53.30                                  | 58.90 | 1                       | 77.4                                          | 65.25                                   | 5                                                     |
| 5.0SMDJ51A  | 5.0SMDJ51CA  | 5PFZ    | 5BFZ | 51.0                                    | 56.70                                  | 62.70 | 1                       | 82.4                                          | 61.29                                   | 5                                                     |
| 5.0SMDJ54A  | 5.0SMDJ54CA  | 5PGE    | 5BGE | 54.0                                    | 60.00                                  | 66.30 | 1                       | 87.1                                          | 57.98                                   | 5                                                     |
| 5.0SMDJ58A  | 5.0SMDJ58CA  | 5PGG    | 5BGG | 58.0                                    | 64.40                                  | 71.20 | 1                       | 93.6                                          | 53.95                                   | 5                                                     |
| 5.0SMDJ60A  | 5.0SMDJ60CA  | 5PGK    | 5BGK | 60.0                                    | 66.70                                  | 73.70 | 1                       | 96.8                                          | 52.17                                   | 5                                                     |
| 5.0SMDJ64A  | 5.0SMDJ64CA  | 5PGM    | 5BGM | 64.0                                    | 71.10                                  | 78.60 | 1                       | 103.0                                         | 49.03                                   | 5                                                     |

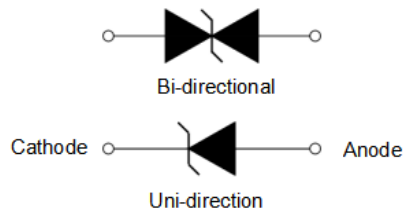
|                 |                  |          |          |       |            |            |   |       |       |   |
|-----------------|------------------|----------|----------|-------|------------|------------|---|-------|-------|---|
| 5.0SMDJ7<br>0A  | 5.0SMDJ7<br>0CA  | 5PGP     | 5BGP     | 70.0  | 77.80      | 86.00      | 1 | 113.0 | 44.69 | 5 |
| 5.0SMDJ7<br>5A  | 5.0SMDJ7<br>5CA  | 5PG<br>R | 5BG<br>R | 75.0  | 83.30      | 92.10      | 1 | 121.0 | 41.74 | 5 |
| 5.0SMDJ7<br>8A  | 5.0SMDJ7<br>8CA  | 5PGT     | 5BGT     | 78.0  | 86.70      | 95.80      | 1 | 126.0 | 40.08 | 5 |
| 5.0SMDJ8<br>0A  | 5.0SMDJ8<br>0CA  | 5PGB     | 5BGB     | 80.0  | 88.80      | 97.60      | 1 | 129.6 | 38.97 | 5 |
| 5.0SMDJ8<br>5A  | 5.0SMDJ8<br>5CA  | 5PGV     | 5BGV     | 85.0  | 94.40      | 104.0<br>0 | 1 | 137.0 | 36.86 | 5 |
| 5.0SMDJ9<br>0A  | 5.0SMDJ9<br>0CA  | 5PGX     | 5BGX     | 90.0  | 100.0<br>0 | 111.0<br>0 | 1 | 146.0 | 34.59 | 5 |
| 5.0SMDJ1<br>00A | 5.0SMDJ1<br>00CA | 5PGZ     | 5BGZ     | 100.0 | 111.0<br>0 | 123.0<br>0 | 1 | 162.0 | 31.17 | 5 |
| 5.0SMDJ1<br>10A | 5.0SMDJ1<br>10CA | 5PHE     | 5BHE     | 110.0 | 122.0<br>0 | 135.0<br>0 | 1 | 177.0 | 28.53 | 5 |
| 5.0SMDJ1<br>20A | 5.0SMDJ1<br>20CA | 5PH<br>G | 5BH<br>G | 120.0 | 133.0<br>0 | 147.0<br>0 | 1 | 193.0 | 26.17 | 5 |
| 5.0SMDJ1<br>30A | 5.0SMDJ1<br>30CA | 5PHK     | 5BHK     | 130.0 | 144.0<br>0 | 159.0<br>0 | 1 | 209.0 | 24.16 | 5 |
| 5.0SMDJ1<br>40A | 5.0SMDJ1<br>40CA | 5PHB     | 5BHB     | 140.0 | 155.0<br>0 | 171.0<br>0 | 1 | 226.8 | 22.27 | 5 |
| 5.0SMDJ1<br>50A | 5.0SMDJ1<br>50CA | 5PH<br>M | 5BH<br>M | 150.0 | 167.0<br>0 | 185.0<br>0 | 1 | 243.0 | 20.78 | 5 |
| 5.0SMDJ1<br>60A | 5.0SMDJ1<br>60CA | 5PHP     | 5BHP     | 160.0 | 178.0<br>0 | 197.0<br>0 | 1 | 259.0 | 19.50 | 5 |
| 5.0SMDJ1<br>70A | 5.0SMDJ1<br>70CA | 5PHR     | 5BHR     | 170.0 | 189.0<br>0 | 209.0<br>0 | 1 | 275.0 | 18.36 | 5 |
| 5.0SMDJ1<br>80A | 5.0SMDJ1<br>80CA | 5PHT     | 5BHT     | 180.0 | 201.0<br>0 | 220.0<br>0 | 1 | 291.6 | 17.32 | 5 |
| 5.0SMDJ1<br>90A | 5.0SMDJ1<br>90CA | 5PHV     | 5BHV     | 190.0 | 211.0<br>0 | 232.0<br>0 | 1 | 307.8 | 16.41 | 5 |
| 5.0SMDJ2<br>00A | 5.0SMDJ2<br>00CA | 5PH<br>W | 5BH<br>W | 200.0 | 224.0<br>0 | 247.0<br>0 | 1 | 324.0 | 9.26  | 5 |
| 5.0SMDJ2<br>20A | 5.0SMDJ2<br>20CA | 5PHX     | 5BHX     | 220.0 | 246.0<br>0 | 272.0<br>0 | 1 | 356.0 | 8.43  | 5 |
| 5.0SMDJ2<br>50A | 5.0SMDJ2<br>50CA | 5PHZ     | 5BHZ     | 250.0 | 279.0<br>0 | 309.0<br>0 | 1 | 405.0 | 7.41  | 5 |
| 5.0SMDJ3<br>00A | 5.0SMDJ3<br>00CA | 5PJE     | 5BJE     | 300.0 | 335.0<br>0 | 371.0<br>0 | 1 | 486.0 | 6.17  | 5 |
| 5.0SMDJ3<br>50A | 5.0SMDJ3<br>50CA | 5PJG     | 5BJG     | 350.0 | 391.0<br>0 | 432.0<br>0 | 1 | 567.0 | 5.29  | 5 |
| 5.0SMDJ4<br>00A | 5.0SMDJ4<br>00CA | 5PJK     | 5BJK     | 400.0 | 447.0<br>0 | 494.0<br>0 | 1 | 648.0 | 4.63  | 5 |
| 5.0SMDJ4<br>40A | 5.0SMDJ4<br>40CA | 5PJM     | 5BJM     | 440.0 | 492.0<br>0 | 543.0<br>0 | 1 | 713.0 | 4.21  | 5 |

#### 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 (TA=25 unless otherwise noted)                                                                                                                                                                                                                                                                                                                                                                   |                                   |                |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------|------|
| Parameter                                                                                                                                                                                                                                                                                                                                                                                                        | Symbol                            | Value          | Unit |
| Peak Pulse Power Dissipation with a 10/1000µs waveform (Fig.1)(Note 1), (Note 2)                                                                                                                                                                                                                                                                                                                                 | P <sub>PPM</sub>                  | 5000           | W    |
| Peak Pulse Current with a 10/1000µs waveform. (Note1, Fig.3)                                                                                                                                                                                                                                                                                                                                                     | I <sub>PP</sub>                   | See Next Table | A    |
| Power Dissipation on Infinite Heat Sink at T <sub>L</sub> =75                                                                                                                                                                                                                                                                                                                                                    | P <sub>M(AV)</sub>                | 6.5            | W    |
| Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 3)                                                                                                                                                                                                                                                                                                                                                 | I <sub>FSM</sub>                  | 300            | A    |
| Maximum Instantaneous Forward Voltage at 25A for Unidirectional Only (Note 4)                                                                                                                                                                                                                                                                                                                                    | V <sub>F</sub>                    | 3.5/5.0        | V    |
| Operating junction and Storage Temperature Range.                                                                                                                                                                                                                                                                                                                                                                | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150    |      |
| <b>Notes:</b><br>1. Non-repetitive current pulse, per Fig. 3 and derated above T <sub>A</sub> = 25 per Fig. 2.<br>2. Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.<br>3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.<br>4. V <sub>F</sub> < 3.5V for V <sub>BR</sub> < 200V and V <sub>F</sub> < 6.5V for V <sub>BR</sub> > 201V. |                                   |                |      |

## Functional Diagram



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

Figure 1 - Peak Pulse Power Rating Curve

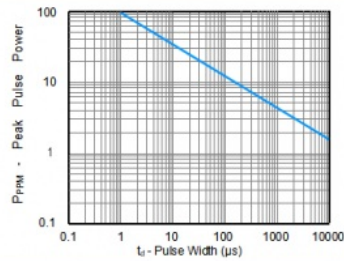


Figure 2 - Pulse Derating Curve

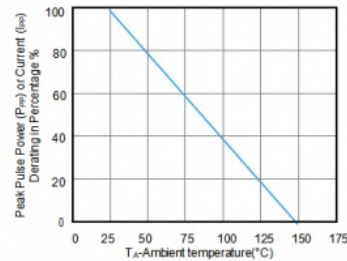


Figure 3 - Pulse Waveform

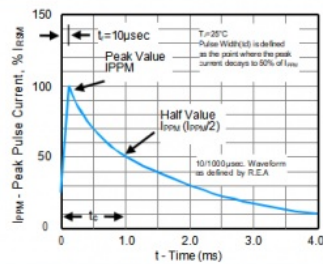


Figure 4 - Typical Junction Capacitance

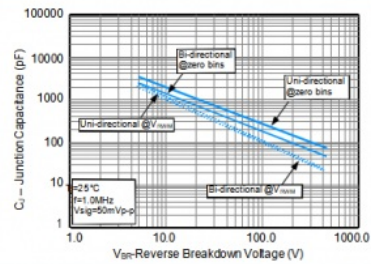


Figure 5 - Steady State Power Derating Curve

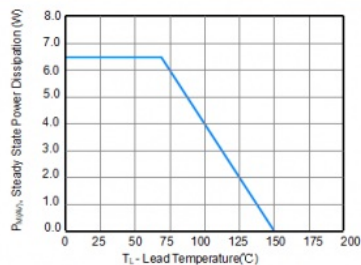
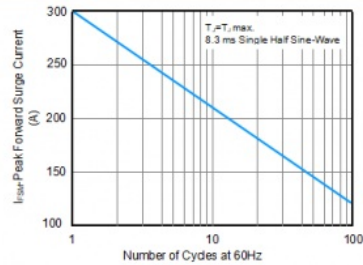
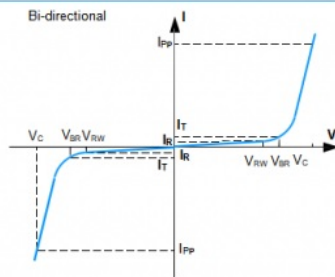
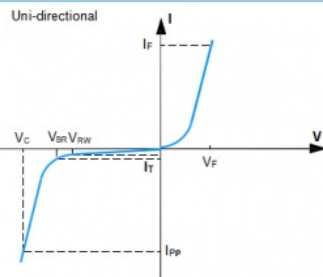


Figure 6 - Maximum Non-Repetitive Surge Current



## I-V Curve Characteristics



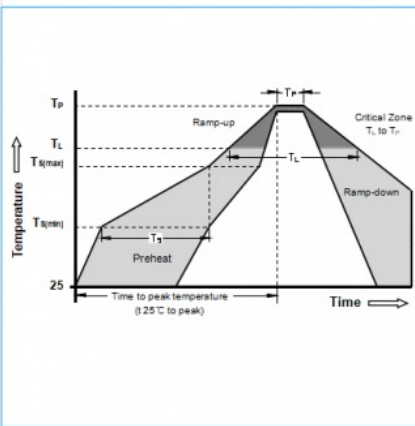
## Physical Specifications

|          |                                                              |
|----------|--------------------------------------------------------------|
| Weight   | 0.007 ounce, 0.21 gram                                       |
| Case     | JEDEC DO-214AB Molded Plastic over glass passivated junction |
| Polarity | Color band denotes cathode except Bipolar                    |
| Terminal | Matte Tin-plated leads, Solderable per JESD22-B102D          |

## Environmental Specifications

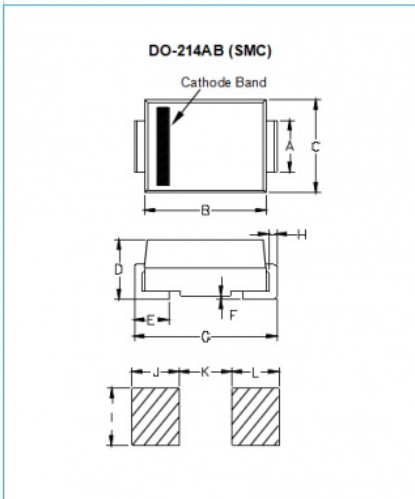
|                    |             |
|--------------------|-------------|
| Temperature Cycle  | JESD22-A104 |
| Pressure Cooker    | JESD22-A102 |
| High Temp. Storage | JESD22-A103 |
| HTRB               | JESD22-A108 |
| Thermal Shock      | JESD22-A106 |

## Soldering Parameters



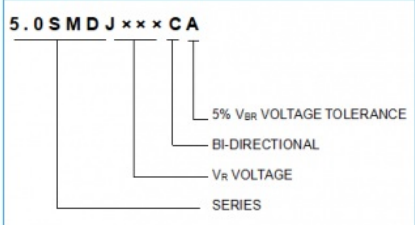
| Reflow Condition                                      |                                    | Lead-free assembly |
|-------------------------------------------------------|------------------------------------|--------------------|
| Pre Heat                                              | -Temperature Min ( $T_{s(min)}$ )  | 150°C              |
|                                                       | -Temperature Max ( $T_{s(max)}$ )  | 200°C              |
|                                                       | -Time (min to max) ( $T_s$ )       | 60 -180 Seconds    |
| Average ramp up rate (Liquidus Temp $T_L$ ) to peak   |                                    | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                    | 3°C/second max     |
| Reflow                                                | - Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|                                                       | - Time (min to max) ( $T_L$ )      | 60 -150 Seconds    |
| Peak Temperature ( $T_P$ )                            |                                    | 260 +0/-5°C        |
| Time within 5 °C of actual peak Temperature ( $T_P$ ) |                                    | 20 -40 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

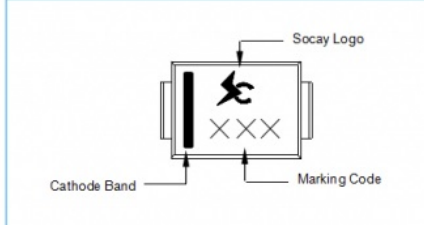


| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.108  | 0.126 | 2.750       | 3.200 |
| B          | 0.260  | 0.280 | 6.520       | 7.110 |
| C          | 0.217  | 0.244 | 5.520       | 6.220 |
| D          | 0.080  | 0.112 | 2.050       | 2.850 |
| E          | 0.030  | 0.060 | 0.750       | 1.520 |
| F          | -      | 0.008 | -           | 0.203 |
| G          | 0.305  | 0.320 | 7.640       | 8.130 |
| H          | 0.006  | 0.012 | 0.150       | 0.310 |
| I          | 0.121  | -     | 3.070       | -     |
| J          | 0.068  | -     | 1.715       | -     |
| K          | -      | 0.185 | -           | 4.690 |
| L          | 0.068  | -     | 1.715       | -     |

## Part Numbering



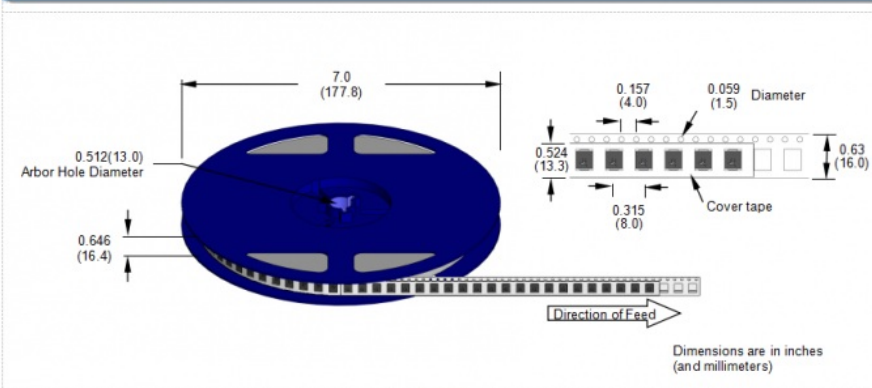
## Part Marking



## Packaging

| Part Number  | Component Package | Quantity | Packaging                | Option | Packaging Specification |
|--------------|-------------------|----------|--------------------------|--------|-------------------------|
| 5.0SMDJXXXXX | DO-214AB          | 500      | Tape & Reel -16mm/7"tape |        | EIA STD RS-481          |

## Tape and Reel Specifications



**SOCAY's main products include a full range of Ceramic Gas Discharge Tubes (GDT) Transient Suppression Diodes (TVS Diodes), ESD Suppressor, Thyristor Surge Suppressors (TSS), Spark Gap Protectors (SPG), Varistors (MOV), Chip Varistors (MLV), PTC Resettable Fuse, Negative Temperature Coefficient thermistors (NTC Thermistors), Chip Bead, Schottky Diodes, Zener Diode, etc.** From circuit design to product testing (and provide test reports), we will provide you with one-stop services in the field of circuit protection. With excellent quality and service, SOCAY has won extensive praise from customers

and respect from the industry.



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