



## TVS Diode SMAJ12CA Ideal for the Protection of I/O Interfaces, Bi-directional Transient Voltage Suppressor

Our Product Introduction

### Basic Information

- Place of Origin: Shenzhen, Guangdong, China
- Brand Name: SOCAY
- Certification: UL, REACH, RoHS, ISO
- Model Number: SMAJ12CA
- Minimum Order Quantity: 5000PCS
- Price: Negotiable
- Delivery Time: 5-8 work days



### Product Specification

- SMAJ12CA Name: TVS Diodes
- Package Type: DO-214AC/SMA
- SMAJ12CA V<sub>rw</sub>: 12.0V
- V<sub>br</sub>@I<sub>t</sub> (Min.): 13.3V
- SMAJ12CA V<sub>br</sub>@I<sub>t</sub> (Max.): 14.7V
- I<sub>t</sub>: 1mA
- V<sub>c</sub>@I<sub>pp</sub>: 19.9V
- SMAJ12CA I<sub>pp</sub>: 20.10A
- I<sub>r</sub>@V<sub>rw</sub>: 5μA

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## Product Description

**TVS Diode SMAJ12CA Ideal for the Protection of I/O Interfaces, Bi-directional Transient Voltage Suppressor**

**TVS Diode SMAJ12CA DATASHEET: [SMAJ\\_v2207.1.pdf](#)**

### TVS Diode SMAJ12CA Description:

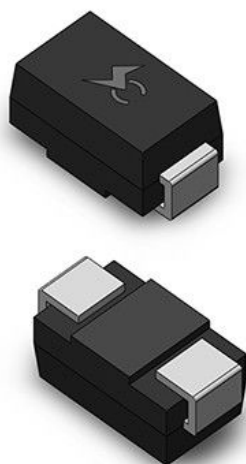
series TVS transient suppression diode products adopt standard surface mount SMA packaging and have a peak rated power of 400W. The product has extremely fast response time (sub-nanosecond) and very high stability. Designed specifically for the protection of various interfaces in electronic circuit applications from transient voltages caused by lightning strikes and other transient voltage events.

| SMAJ12CA Part Number |          | SMAJ12CA Marking |    | Reverse Stand-Off Voltage VRWM(V) | Breakdown Voltage VBR (V) @IT |       | Test Current IT (mA) | Maximum Clamping Voltage VC @IPP (V) | Maximum Peak Pulse Current IPP (A) | Maximum Reverse Leakage IR @VRWM (μA) |
|----------------------|----------|------------------|----|-----------------------------------|-------------------------------|-------|----------------------|--------------------------------------|------------------------------------|---------------------------------------|
| Uni                  | Bi       | Uni              | Bi |                                   | MIN                           | MAX   |                      |                                      |                                    |                                       |
| SMAJ12A              | SMAJ12CA | BE               | XE | 12.0                              | 13.30                         | 14.70 | 1                    | 19.9                                 | 20.10                              | 5                                     |

### Product Features

- Low profile package
- Ideal for automated placement
- 400 Watt peak pulse power capability with a 10/1000μs waveform
- For surface mounted applications to optimize board space
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance

- Power supply protection
- Automotive application
- Industrial application
- Power management



## Description

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

## Features

- ◆ For surface mounted applications in order to optimize board space
- ◆ Low leakage
- ◆ Uni and Bidirectional unit
- ◆ Glass passivated junction
- ◆ Low inductance
- ◆ Excellent clamping capability
- ◆ 400W Peak power capability at  $10 \times 1000\mu\text{s}$  waveform Repetition rate (duty cycle):0.01%
- ◆ Fast response time: typically less than 1.0ps from 0 Volts to  $V_{BR}$  min
- ◆ Typical  $I_R$  less than 5 $\mu\text{A}$  above 12V
- ◆ High Temperature soldering: 260°C/40 seconds at terminals
- ◆ Typical maximum temperature coefficient  $\Delta V_{BR} = 0.1\% \times V_{BR}@25^\circ\text{C} \times \Delta T$
- ◆ Plastic package has Underwriters Laboratory Flammability 94V-0
- ◆ Matte tin lead-free Plated
- ◆ Halogen free and RoHS compliant
- ◆ Typical failure mode is short from over-specified voltage or current
- ◆ Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- ◆ 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 IEC 61000-4-4 (IEC801-4)

## Functional Diagram

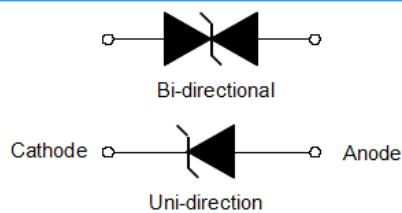


Figure 1 - Peak Pulse Power Rating Curve

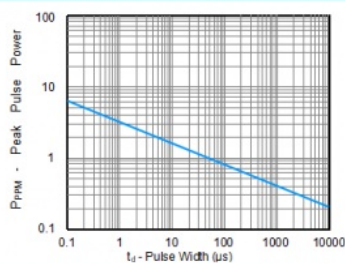


Figure 2 - Pulse Derating Curve

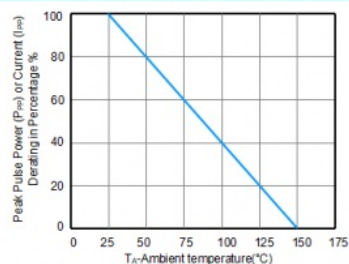


Figure 3 - Pulse Waveform

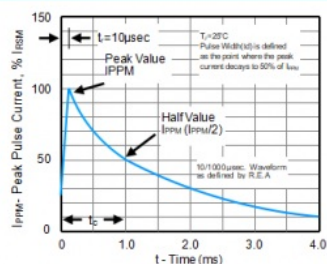


Figure 4 - Typical Junction Capacitance

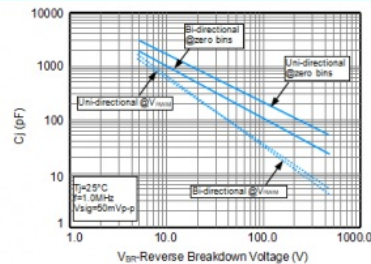


Figure 5 - Steady State Power Derating Curve

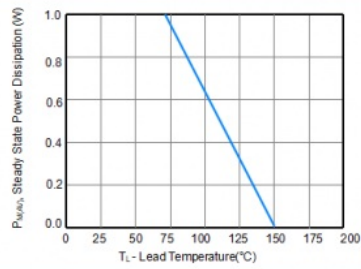
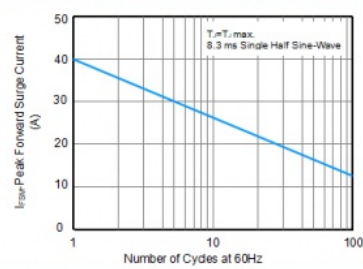
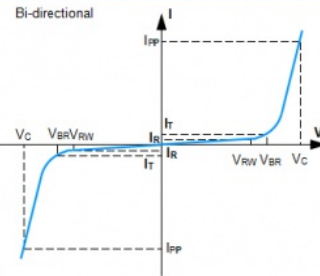
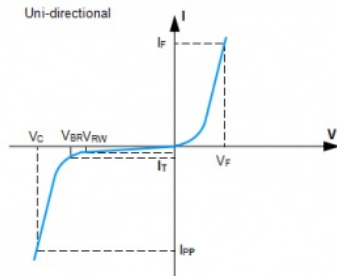


Figure 6 - Maximum Non-Repetitive Surge Current



## I-V Curve Characteristics



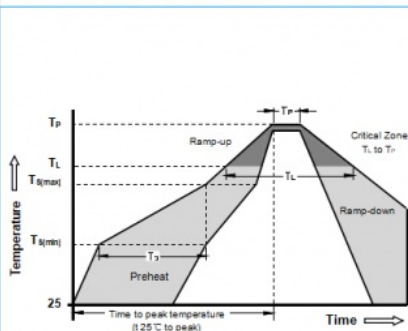
## Physical Specifications

|          |                                                              |
|----------|--------------------------------------------------------------|
| Weight   | 0.002 ounce, 0.061 gram                                      |
| Case     | JEDEC DO-214AC Molded Plastic over glass passivated junction |
| Polarity | Color band denotes cathode except Bipolar                    |
| Terminal | Matte Tin-plated leads, Solderable per JESD22-B102D          |

## Environmental Specifications

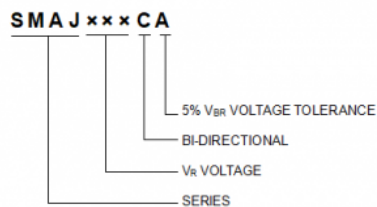
|                    |             |
|--------------------|-------------|
| Temperature Cycle  | JESD22-A104 |
| Pressure Cooker    | JESD22-A102 |
| High Temp. Storage | JESD22-A103 |
| HTRB               | JESD22-A108 |
| Thermal Shock      | JESD22-A106 |

## Soldering Parameters

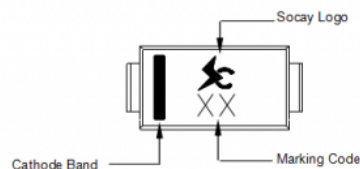


| Reflow Condition                                     |                                    | Lead-free assembly |
|------------------------------------------------------|------------------------------------|--------------------|
| Pre Heat                                             | -Temperature Min ( $T_{s(min)}$ )  | 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              |

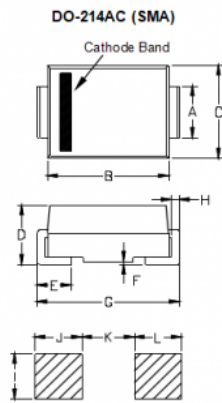
## Part Numbering



## Part Marking



## Dimensions

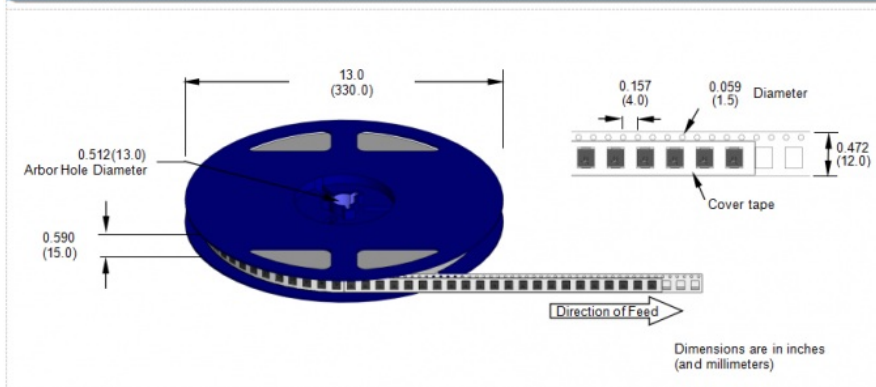


| Dimensions | Inches |       | Millimeters |       |
|------------|--------|-------|-------------|-------|
|            | Min    | Max   | Min         | Max   |
| A          | 0.049  | 0.065 | 1.25        | 1.65  |
| B          | 0.156  | 0.183 | 3.95        | 4.65  |
| C          | 0.093  | 0.112 | 2.35        | 2.85  |
| D          | 0.078  | 0.095 | 1.98        | 2.41  |
| E          | 0.030  | 0.060 | 0.76        | 1.52  |
| F          | -      | 0.008 | -           | 0.203 |
| G          | 0.185  | 0.209 | 4.70        | 5.30  |
| H          | 0.006  | 0.012 | 0.15        | 0.31  |
| I          | 0.067  | -     | 1.70        | -     |
| J          | 0.082  | -     | 2.10        | -     |
| K          | -      | 0.090 | -           | 2.30  |
| L          | 0.082  | -     | 2.10        | -     |

## Packaging

| Part Number | Component Package | Reel (pcs) | Per Carton (pcs) | Packaging Option          | Reel Diameters (mm) |
|-------------|-------------------|------------|------------------|---------------------------|---------------------|
| SMA.JXXXXX  | DO-214AC (SMA)    | 5000       | 80000            | Tape & Reel -15mm/13"tape | 330.0               |

## 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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