

## Features

- Lead free as standard\*
- ESD protection >30 kV
- Surge protection >24 A
- Protects 1 line
- Uni/bidirectional configuration

## Applications

- Computer notebooks
- Cellular phones
- Personal Digital Assistants (PDAs)
- Digital cameras

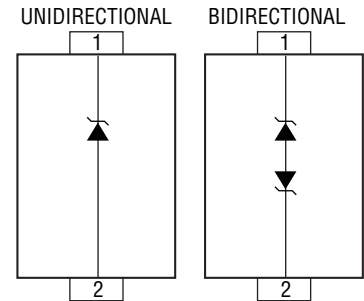
# CDSOD323-TxxSC - TVS Diode Series

## General Information

The markets of portable communications, computing and video equipment are challenging the semiconductor industry to develop increasingly smaller electronic components.

Bourns offers Transient Voltage Suppressor Diodes for surge and ESD protection applications in SOD323 package size format. The Transient Voltage Suppressor series offers a choice of voltage types ranging from 3 V to 36 V in a unidirectional or bidirectional configuration.

Bourns® Chip Diodes conform to JEDEC standards, are easy to handle on standard pick and place equipment and their flat configuration minimizes roll away. The Bourns® device meets IEC 61000-4-2 (ESD), IEC 61000-4-4 (EFT) and IEC 61000-4-5 (Surge) requirements.



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

| Parameter  | Symbol           | Value       | Unit |
|--|------------------|-------------|------|
| Unidirectional Peak Pulse Power (t <sub>p</sub> = 8/20 μs) | P <sub>PP</sub>  | 500         | W    |
| Bidirectional Peak Pulse Power (t <sub>p</sub> = 8/20 μs)  | P <sub>PP</sub>  | 400         | W    |
| Operating Temperature                                      | T <sub>L</sub>   | -55 to +150 | °C   |
| Storage Temperature  | T <sub>STG</sub> | -55 to +150 | °C   |
| Minimum ESD Protection (per IEC 61000-4-2)                 |                  |             |      |
| Contact Discharge  | ESD              | ±8          | kV   |
| Air Discharge  | ESD              | ±15         | kV   |

| Parameter  | Symbol          | CDSOD323-     |               |               |               |               |               |               |               | Unit |
|--|-----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|------|
|  |                 | Uni-T03S      | Bi-T03SC      | Uni-T05S      | Bi-T05SC      | Uni-T08S      | Bi-T08SC      | Uni-T12S      | Bi-T12SC      |      |
| Min. Breakdown Voltage @ 1 mA                        | V <sub>BR</sub> | 4.0           | 4.0           | 6.0           | 6.0           | 8.5           | 8.5           | 13.3          | 13.3          | V    |
| Working Peak Voltage                                 | V <sub>M</sub>  | 3.3           | 3.3           | 5.0           | 5.0           | 8.0           | 8.0           | 12.0          | 12.0          | V    |
| Maximum Clamping Voltage @ I <sub>p</sub> = 1 A      | V <sub>F</sub>  | 7.0           | 8.0           | 9.8           | 9.8           | 13.4          | 13.4          | 19.0          | 19.0          | V    |
| Typical Clamping Voltage @ 8/20 μs @ I <sub>pp</sub> | V <sub>C</sub>  | 10.9 V @ 43 A | 10.9 V @ 43 A | 13.5 V @ 42 A | 14.5 V @ 28 A | 16.9 V @ 34 A | 18.5 V @ 17 A | 25.9 V @ 21 A | 29.5 V @ 14 A | V    |
| Maximum Leakage Current @ V <sub>WM</sub>            | I <sub>D</sub>  | 125           | 125           | 10            | 10            | 10            | 10            | 1             | 1             | μA   |
| Typical Capacitance @ 0 V, 1 MHz                     | C <sub>p</sub>  | 500           | 200           | 350           | 175           | 250           | 150           | 150           | 50            | pF   |

### Notes:

1. Part numbers with suffix "C" indicate bidirectional device, i.e. CDSOD323-T05SC.
2. For bidirectional devices only, the electrical specifications apply in both directions.



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\*No lead detected in standard tests of homogeneous materials.

\*\*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

# CDSOD323-TxxSC - TVS Diode Series



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

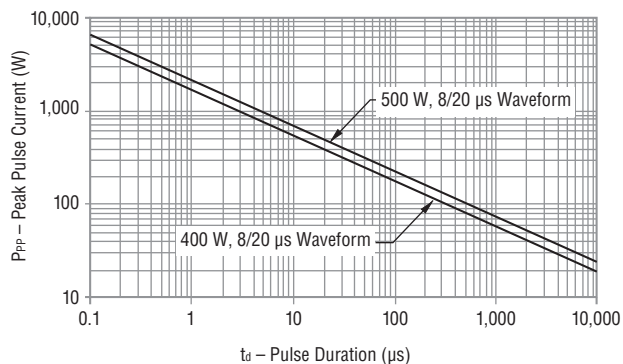
| Parameter  | Symbol          | CDSOD323-     |               |              |              |               |              |              |              | Unit |
|--|-----------------|---------------|---------------|--------------|--------------|---------------|--------------|--------------|--------------|------|
|  |                 | Uni-T15S      | Bi-T15SC      | Uni-T18S     | Bi-T18SC     | Uni-T24S      | Bi-T24SC     | Uni-T36S     | Bi-T36SC     |      |
| Min. Breakdown Voltage @ 1 mA                        | V <sub>BR</sub> | 16.7          | 16.7          | 20.0         | 20.0         | 26.7          | 26.7         | 40.0         | 40.0         | V    |
| Working Peak Voltage                                 | V <sub>M</sub>  | 15.0          | 15.0          | 18.0         | 18.0         | 24.0          | 24.0         | 36.0         | 36.0         | V    |
| Maximum Clamping Voltage @ I <sub>P</sub> = 1 A      | V <sub>F</sub>  | 24.0          | 24.0          | 29.0         | 29.0         | 43.0          | 43.0         | 60.0         | 60.0         | V    |
| Typical Clamping Voltage @ 8/20 μs @ I <sub>PP</sub> | V <sub>C</sub>  | 30.0 V @ 17 A | 33.0 V @ 12 A | 40.0 V @ 9 A | 40.0 V @ 9 A | 49.0 V @ 12 A | 46.2 V @ 9 A | 75.0 V @ 5 A | 75.0 V @ 5 A | V    |
| Maximum Leakage Current @ V <sub>WM</sub>            | I <sub>D</sub>  | 1             |               |              |              |               |              |              |              | μA   |
| Typical Capacitance @ 0 V, 1 MHz                     | C <sub>P</sub>  | 100           | 40            | 90           | 40           | 88            | 40           | 75           | 35           | pF   |

### Notes:

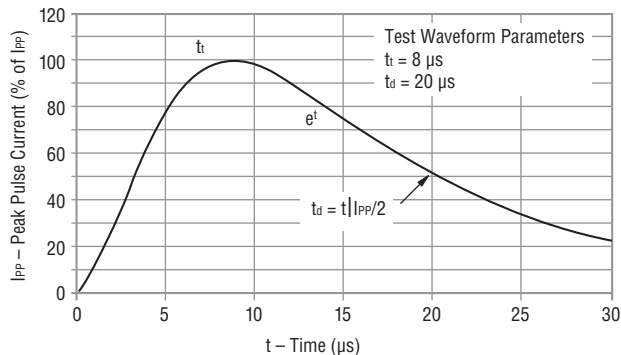
- Part numbers with suffix "C" indicate bidirectional device, i.e. CDSOD323-T05SC.
- For bidirectional devices only, the electrical specifications apply in both directions.

## Performance Graphs

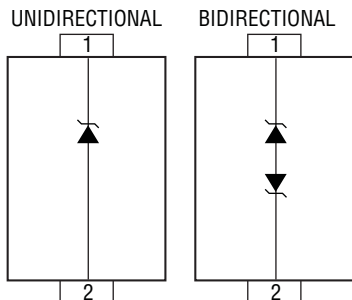
### Peak Pulse Power vs. Pulse Time



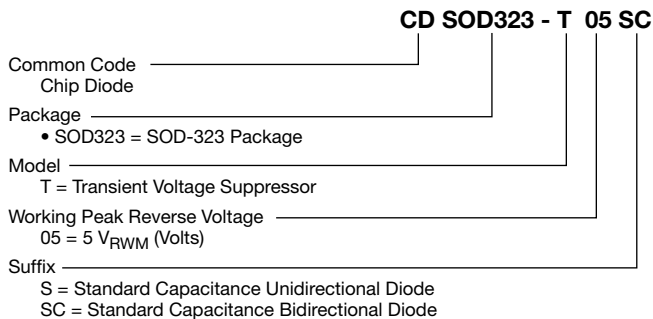
### Pulse Waveform



### Block Diagram



### How to Order



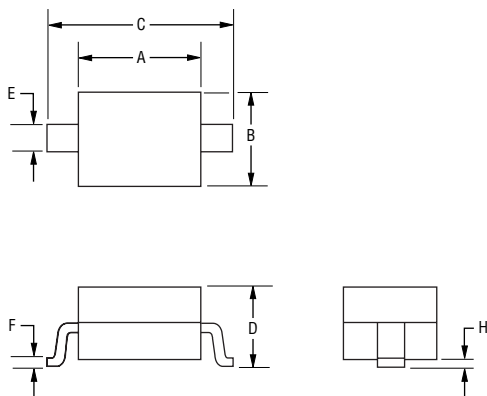
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# CDSOD323-TxxSC - TVS Diode Series

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## Product Dimensions

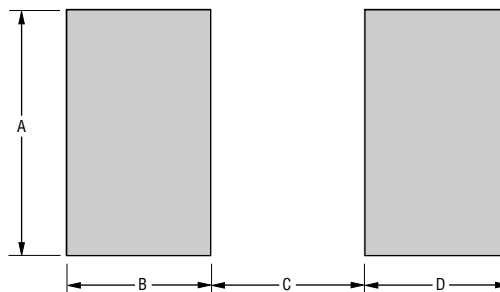
This is a molded JEDEC SOD-323 package with lead free 100 % Sn plating on the terminations. It weighs approximately 30 mg and has a flammability rating of UL 94V-0.



| Dimensions |                                       |
|------------|---------------------------------------|
| A          | $\frac{1.60 - 1.90}{(0.063 - 0.075)}$ |
| B          | $\frac{1.15 - 1.45}{(0.045 - 0.057)}$ |
| C          | $\frac{2.39 - 2.70}{(0.094 - 0.106)}$ |
| D          | $\frac{0.92 - 1.10}{(0.036 - 0.043)}$ |
| E          | $\frac{0.25 - 0.40}{(0.010 - 0.016)}$ |
| F          | $\frac{0.10 - 0.20}{(0.004 - 0.008)}$ |
| H          | $\frac{0.10}{(0.004)}$ MAX.           |

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

## Recommended Footprint



| Dimensions (Nominal) |                        |
|----------------------|------------------------|
| A                    | $\frac{0.80}{(0.031)}$ |
| B                    | $\frac{0.80}{(0.031)}$ |
| C                    | $\frac{1.40}{(0.055)}$ |
| D                    | $\frac{0.80}{(0.031)}$ |

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

## Typical Part Marking

Each device has device marking outlined below and the unidirectional devices have an additional Polarity Band indicating the cathode.

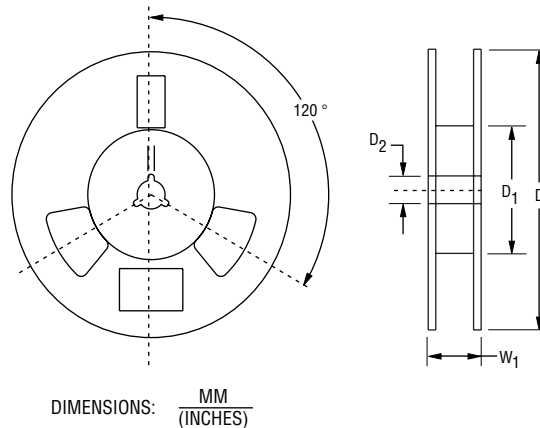
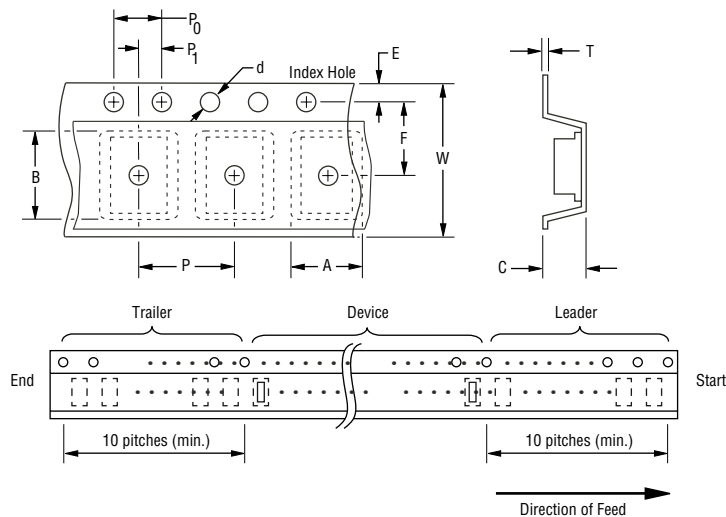
|                      |   |
|----------------------|---|
| CDSOD323-T03S .....  | A |
| CDSOD323-T03SC ..... | G |
| CDSOD323-T05S .....  | B |
| CDSOD323-T05SC ..... | H |
| CDSOD323-T08S .....  | C |
| CDSOD323-T08SC ..... | J |
| CDSOD323-T12S .....  | D |
| CDSOD323-T12SC ..... | K |
| CDSOD323-T15S .....  | E |
| CDSOD323-T15SC ..... | L |
| CDSOD323-T18S .....  | O |
| CDSOD323-T18SC ..... | N |
| CDSOD323-T24S .....  | F |
| CDSOD323-T24SC ..... | M |
| CDSOD323-T36S .....  | R |
| CDSOD323-T36SC ..... | T |

# CDSOD323-TxxSC - TVS Diode Series

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## Packaging Information

The surface mount product is packaged in an 8 mm x 4 mm tape and reel format per EIA-481 standard.



Devices are packed in accordance with EIA standard RS-481-A.

| Item                   | Symbol         | SOD-323                                   |
|------------------------|----------------|---|
| Carrier Width          | A              | $\frac{1.55 \pm 0.10}{(0.061 - 0.004)}$   |
| Carrier Length         | B              | $\frac{2.90 \pm 0.10}{(0.114 - 0.004)}$   |
| Carrier Depth          | C              | $\frac{1.35 \pm 0.10}{(0.053 - 0.004)}$   |
| Sprocket Hole          | d              | $\frac{1.55 \pm 0.05}{(0.061 - 0.002)}$   |
| Reel Outside Diameter  | D              | $\frac{178}{(7.008)}$                     |
| Reel Inner Diameter    | D <sub>1</sub> | $\frac{80.0}{(3.150)}$ Min.               |
| Feed Hole Diameter     | D <sub>2</sub> | $\frac{13.0 \pm 0.20}{(0.512 \pm 0.008)}$ |
| Sprocket Hole Position | E              | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ |
| Punch Hole Position    | F              | $\frac{3.50 \pm 0.05}{(0.138 \pm 0.002)}$ |
| Punch Hole Pitch       | P              | $\frac{4.00 \pm 0.10}{(0.157 - 0.004)}$   |
| Sprocket Hole Pitch    | P <sub>0</sub> | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ |
| Embossment Center      | P <sub>1</sub> | $\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$ |
| Overall Tape Thickness | T              | $\frac{0.20 \pm 0.10}{(0.008 \pm 0.004)}$ |
| Tape Width             | W              | $\frac{8.00 \pm 0.20}{(0.315 - 0.008)}$   |
| Reel Width             | W <sub>1</sub> | $\frac{13.5}{(0.531)}$ Max.               |
| Quantity per Reel      | --             | 3,000                                     |

REV. 03/11

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