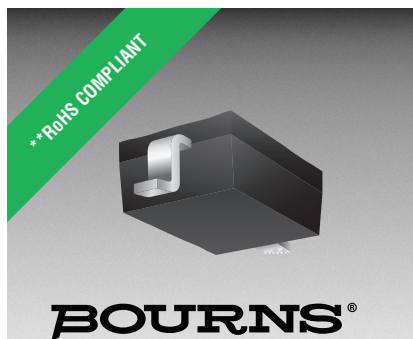




## Features

- Lead free as standard\*
- ESD protection 30 kV max.
- Low capacitance ~ 1.0 pF
- Protects 1 line
- Uni/bidirectional configuration

## Applications

- HDMI 1.4
- Digital Visual Interface (DVI)
- USB 3.0 / USB OTG
- Memory protection
- SIM card ports

# CDSOD323-TxxLC - TVS Diode Series

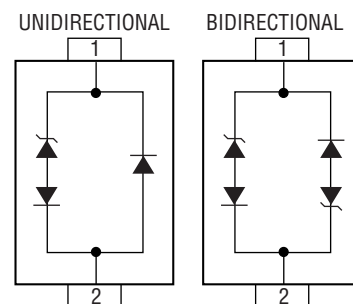
## General Information

Portable communications, computing and video equipment manufacturers 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 Diode series offers a choice of voltage types ranging from 5 V to 24 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 will assist compliance with IEC 61000-4-2 (ESD), IEC 61000-4-4 (EFT) and IEC 61000-4-5 (Surge) requirements.

Note: For 12 V and 24 V VDSL applications, the CDSOD323-TxxC-DSL family of devices is recommended.



## Electrical & Thermal Characteristics (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

| Parameter                                                                                          | Symbol    | Value                                       | Unit             |
|----------------------------------------------------------------------------------------------------|-----------|---------------------------------------------|------------------|
| Unidirectional Peak Pulse Power ( $t_p = 8/20 \mu\text{s}$ )                                       | $P_{PP}$  | 350                                         | W                |
| Bidirectional Peak Pulse Power ( $t_p = 8/20 \mu\text{s}$ )                                        | $P_{PP}$  | 250                                         | W                |
| Operating Temperature                                                                              | $T_L$     | -55 to +150                                 | $^\circ\text{C}$ |
| Storage Temperature                                                                                | $T_{STG}$ | -55 to +150                                 | $^\circ\text{C}$ |
| ESD Protection (per IEC 61000-4-2)<br>Contact - Min.<br>Contact - Max.<br>Air - Min.<br>Air - Max. | ESD       | $\pm 8$<br>$\pm 30$<br>$\pm 15$<br>$\pm 30$ | kV               |

| Parameter                                                | Symbol   | CDSOD323-     |               |               |               |               |               | Unit          |
|----------------------------------------------------------|----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                                                          |          | Uni-T05L      | Bi-T05LC      | Uni-T08L      | Bi-T08LC      | Uni-T12L      | Bi-T12LC      |               |
| Min. Breakdown Voltage @ 1 mA                            | $V_{BR}$ | 6.0           | 6.0           | 8.5           | 8.5           | 13.3          | 13.3          | V             |
| Working Peak Voltage                                     | $V_M$    | 5.0           | 5.0           | 8.0           | 8.0           | 12.0          | 12.0          | V             |
| Maximum Clamping Voltage @ $I_P = 1 \text{ A}$           | $V_C$    | 9.8           | 9.8           | 13.4          | 13.4          | 19.0          | 19.0          | V             |
| Typical Clamping Voltage @ $8/20 \mu\text{s}$ @ $I_{PP}$ | $V_C$    | 18.3 V @ 15 A | 18.3 V @ 15 A | 18.3 V @ 15 A | 18.3 V @ 15 A | 28.6 V @ 11 A | 28.6 V @ 11 A | V             |
| Maximum Leakage Current @ $V_{WM}$                       | $I_D$    | 5             | 5             | 2             | 2             | 1             | 1             | $\mu\text{A}$ |
| Typical Capacitance @ 0 V, 1 MHz                         | $C_p$    | 1.0           |               |               |               |               |               | pF            |

Notes:

1. Part numbers with suffix "C" indicate bidirectional device, i.e. CDSOD323-T05LC.
2. For bidirectional devices only, the electrical specifications apply in both directions.
3. Unidirectional only: Positive potential is applied from pin 1 to 2.

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

\*\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# CDSOD323-TxxLC - TVS Diode Series

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## Electrical & Thermal Characteristics (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

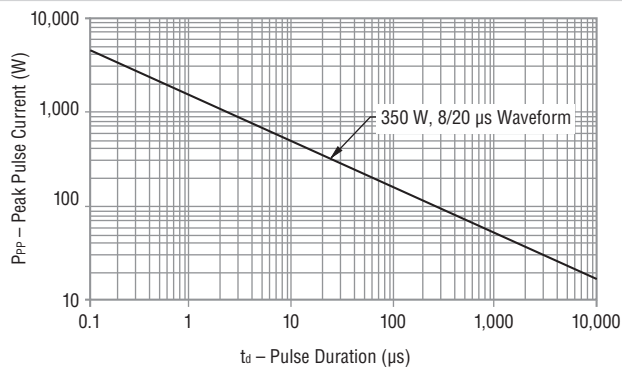
| Parameter                                                       | Symbol   | CDSOD323-     |               |              |              |              |              | Unit          |
|-----------------------------------------------------------------|----------|---------------|---------------|--------------|--------------|--------------|--------------|---------------|
|                                                                 |          | Uni-T15L      | Bi-T15LC      | Uni-T18L     | Bi-T18LC     | Uni-T24L     | Bi-T24LC     |               |
| Min. Breakdown Voltage @ 1 mA                                   | $V_{BR}$ | 16.7          | 16.7          | 20.0         | 20.0         | 26.7         | 26.7         | V             |
| Working Peak Voltage                                            | $V_M$    | 15.0          | 15.0          | 18.0         | 18.0         | 24.0         | 24.0         | V             |
| Maximum Clamping Voltage @ $I_P = 1\text{ A}$                   | $V_C$    | 24.0          | 24.0          | 29.0         | 29.0         | 43.0         | 43.0         | V             |
| Typical Clamping Voltage @ $8/20\text{ }\mu\text{s}$ @ $I_{PP}$ | $V_C$    | 31.8 V @ 10 A | 31.8 V @ 10 A | 45.0 V @ 8 A | 45.0 V @ 8 A | 56.0 V @ 6 A | 56.0 V @ 6 A | V             |
| Maximum Leakage Current @ $V_{WM}$                              | $I_D$    | 1             |               |              |              |              |              | $\mu\text{A}$ |
| Typical Capacitance @ 0 V, 1 MHz                                | $C_J$    | 1.0           |               |              |              |              |              | pF            |

### Notes:

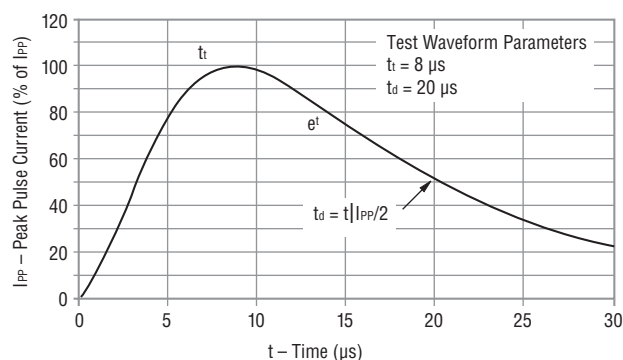
1. Part numbers with suffix "C" indicate bidirectional device, i.e. CDSOD323-T05LC.
2. For bidirectional devices only, the electrical specifications apply in both directions.
3. Unidirectional only: Positive potential is applied from pin 1 to 2.

## Performance Graphs

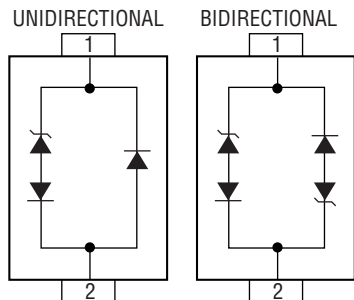
### Peak Pulse Power vs. Pulse Time



### Pulse Waveform



## Block Diagram



## How to Order

**CD SOD323 - T 05 LC**

Common Code \_\_\_\_\_  
 Chip Diode \_\_\_\_\_  
 Package \_\_\_\_\_  
 • SOD323 = SOD-323 Package  
 Model \_\_\_\_\_  
 T = Transient Voltage Suppressor  
 Working Peak Reverse Voltage \_\_\_\_\_  
 05 = 5  $V_{RWM}$  (Volts)  
 Suffix \_\_\_\_\_  
 L = Ultralow Capacitance Unidirectional Diode  
 LC = Ultralow Capacitance Bidirectional Diode

Specifications are subject to change without notice.

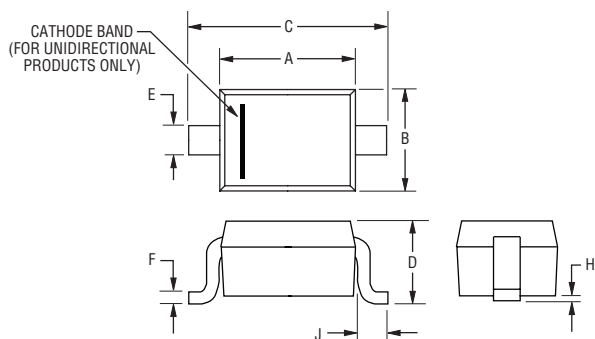
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# CDSOD323-TxxLC - TVS Diode Series

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## Product Dimensions

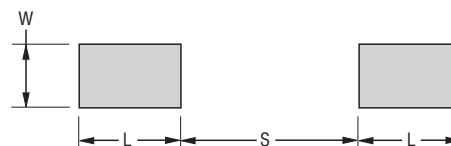
This is a molded JEDEC SOD-323 package with lead free 100 % Sn plating on the terminations. It weighs approximately 30 mg and has a flammability rating of UL 94V-0.



| 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          | $\frac{0.92 - 1.14}{(0.036 - 0.045)}$ |
| E          | $\frac{0.25 - 0.40}{(0.010 - 0.016)}$ |
| F          | $\frac{0.08 - 0.20}{(0.003 - 0.008)}$ |
| H          | $\frac{0.13}{(0.005)}$ MAX.           |
| J          | $\frac{0.30 - 0.45}{(0.012 - 0.018)}$ |

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

## Recommended Footprint



| Dimensions (Nominal) |                        |
|----------------------|------------------------|
| L                    | $\frac{0.80}{(0.031)}$ |
| S                    | $\frac{1.40}{(0.055)}$ |
| W                    | $\frac{0.50}{(0.020)}$ |

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-T05L .....  | T5  |
| CDSOD323-T05LC ..... | S5  |
| CDSOD323-T08L .....  | T8  |
| CDSOD323-T08LC ..... | S8  |
| CDSOD323-T12L .....  | T12 |
| CDSOD323-T12LC ..... | S12 |
| CDSOD323-T15L .....  | T15 |
| CDSOD323-T15LC ..... | S15 |
| CDSOD323-T18L .....  | T18 |
| CDSOD323-T18LC ..... | S18 |
| CDSOD323-T24L .....  | T24 |
| CDSOD323-T24LC ..... | S24 |

## Environmental Specifications

|                                  |    |
|----------------------------------|----|
| Moisture Sensitivity Level ..... | 1  |
| ESD Classification (HBM) .....   | 3B |

Specifications are subject to change without notice.

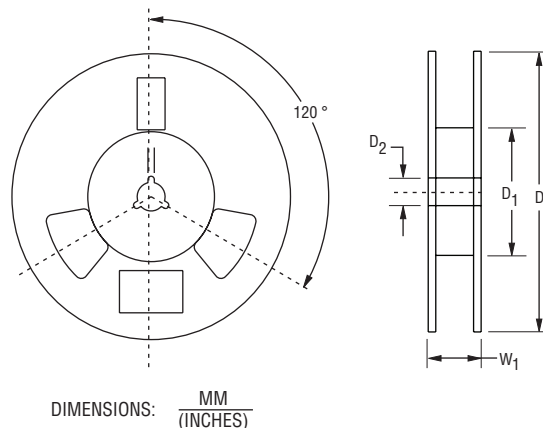
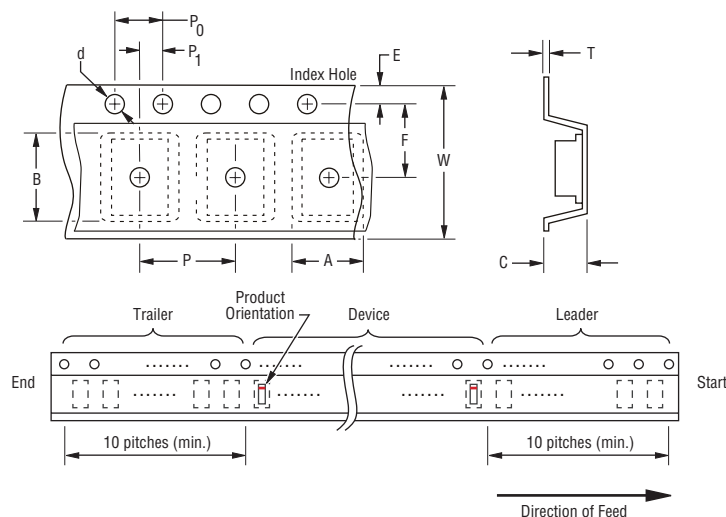
The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

# CDSOD323-TxxLC - 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         | SOD323                                    |
|------------------------|----------------|-------------------------------------------|
| Carrier Width          | A              | $\frac{1.55 \pm 0.10}{(0.061 \pm 0.004)}$ |
| Carrier Length         | B              | $\frac{2.90 \pm 0.10}{(0.114 \pm 0.004)}$ |
| Carrier Depth          | C              | $\frac{1.35 \pm 0.10}{(0.053 \pm 0.004)}$ |
| Sprocket Hole          | d              | $\frac{1.55 \pm 0.05}{(0.061 \pm 0.002)}$ |
| Reel Outside Diameter  | D              | $\frac{178}{(7.008)}$                     |
| Reel Inner Diameter    | D <sub>1</sub> | $\frac{80.0}{(3.150)} \text{ Min.}$       |
| 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              | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ |
| 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              | $\frac{8.00 \pm 0.20}{(0.315 \pm 0.008)}$ |
| Reel Width             | W <sub>1</sub> | $\frac{13.5}{(0.531)} \text{ Max.}$       |
| Quantity per Reel      | --             | 3,000                                     |

**BOURNS®**

### Asia-Pacific:

Tel: +886-2 2562-4117

Email: asiacus@bourns.com

### Europe:

Tel: +36 88 520 390

Email: eurocus@bourns.com

### The Americas:

Tel: +1-951 781-5500

Email: americus@bourns.com

**www.bourns.com**

REV. 01/18

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