

## Features

- Lead free as standard
- RoHS compliant\*
- Low clamping voltage
- Bidirectional ESD protection
- Protects 2 lines

## Applications

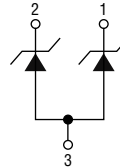
- Personal Digital Assistants (PDAs)
- Mobile phones & accessories
- Portable electronics
- Power lines and low speed data lines

# CDSOT23-0502U - Surface Mount TVS Diode

## General Information

The CDSOT23-0502U device provides ESD, EFT and Surge protection for high speed data ports meeting IEC 61000-4-2 (ESD), IEC 61000-4-4 (EFT) and IEC 61000-4-5 (Surge) requirements. The Transient Voltage Suppressor array offers a Working Peak Reverse Voltage of 5 V and Minimum Breakdown Voltage of 6 V.

The SOT23-3 packaged device will mount directly onto the industry standard SOT23-3 footprint. Bourns® Chip Diodes are easy to handle with standard pick and place equipment and their flat configuration minimizes roll away.



## Additional Information

Click these links for more information:



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

| Parameter   | Symbol             | Value      | Unit |
|---|--------------------|------------|------|
| Peak Pulse Current (t <sub>p</sub> = 8/20μs)                      | I <sub>PPM</sub>   | 16         | A    |
| Storage Temperature   | T <sub>STG</sub>   | -55 to 125 | °C   |
| Operating Temperature   | T <sub>OPR</sub>   | -55 to 150 | °C   |
| Minimum Breakdown Voltage @ 1 mA                                  | V <sub>BR</sub>    | 6.0        | V    |
| Reverse Standoff Voltage  | V <sub>M</sub>     | 5          | V    |
| Maximum Leakage Current @ V <sub>WM</sub>                         | I <sub>L</sub>     | 2.5        | μA   |
| Maximum Forward Voltage   | V <sub>F</sub>     | 1          | V    |
| Maximum Surge Clamping Voltage1 @ I <sub>PP</sub> =5 A (NOTE 1,2) | V <sub>CS1</sub>   | 7          | V    |
| Maximum Surge Clamping Voltage2 @ I <sub>PP</sub> =5 A (NOTE 3)   | V <sub>CS2</sub>   | 8          | V    |
| Typical ESD Clamping Voltage1 @ I <sub>PP</sub> =17 A (NOTE 1,2)  | V <sub>ESD1</sub>  | 9          | V    |
| Typical ESD Clamping Voltage2 @ I <sub>PP</sub> =17 A (NOTE 3)    | V <sub>ESD2</sub>  | 11         | V    |
| Max Channel Input Capacitance @ 0 V, 1 MHz (NOTE 1,2)             | C <sub>N</sub>     | 65         | pF   |
| Max Channel to Channel Capacitance @ 0 V, 1 MHz (NOTE 3)          | C <sub>CROSS</sub> | 32.5       | pF   |

Notes:

1. Test between Pins 1 to 3.
2. Test between Pins 2 to 3.
3. Test between Pins 1 to 2.



**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

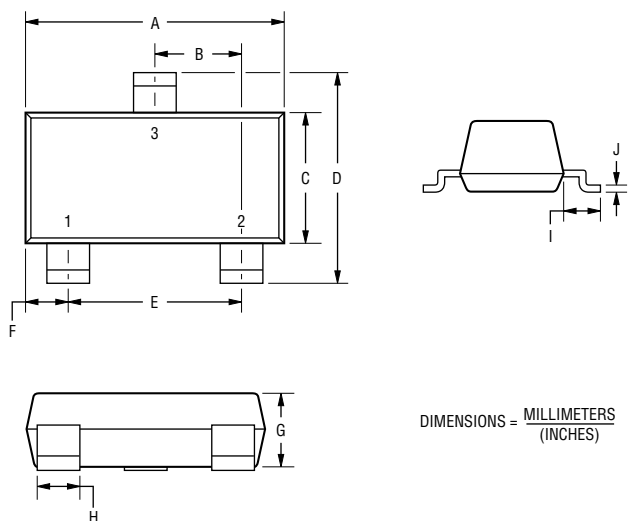
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# CDSOT23-0502U - Surface Mount TVS Diode

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## Product Dimensions

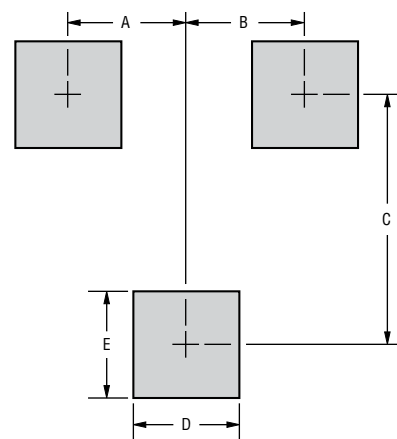
This is a molded SOT23-3L package with lead free 100 % Matte Sn on the lead frame. It weighs approximately 8 mg and has a flammability rating of UL 94V-0.



DIMENSIONS =  $\frac{\text{MILLIMETERS}}{(\text{INCHES})}$

| Dimensions |                                       |
|------------|---------------------------------------|
| A          | $\frac{2.82 - 3.02}{(0.111 - 0.119)}$ |
| B          | $\frac{0.95}{(0.037)}$ TYP.           |
| C          | $\frac{1.20 - 1.40}{(0.047 - 0.055)}$ |
| D          | $\frac{2.25 - 2.55}{(0.089 - 0.100)}$ |
| E          | $\frac{1.80 - 2.00}{(0.071 - 0.079)}$ |
| F          | $\frac{0.45 - 0.60}{(0.018 - 0.024)}$ |
| G          | $\frac{0.90 - 1.05}{(0.035 - 0.041)}$ |
| H          | $\frac{0.30 - 0.40}{(0.012 - 0.016)}$ |
| I          | $\frac{0.55}{(0.022)}$ REF.           |
| J          | $\frac{0.08 - 0.15}{(0.003 - 0.006)}$ |

## Recommended Footprint



DIMENSIONS =  $\frac{\text{MILLIMETERS}}{(\text{INCHES})}$

| Dimensions |                        |
|------------|------------------------|
| A          | $\frac{0.95}{(0.037)}$ |
| B          | $\frac{0.95}{(0.037)}$ |
| C          | $\frac{2.00}{(0.079)}$ |
| D          | $\frac{0.85}{(0.033)}$ |
| E          | $\frac{0.85}{(0.033)}$ |

## How to Order

**CD SOT23 - 05 02 U**

Common Code \_\_\_\_\_  
 Chip Diode \_\_\_\_\_  
 Package \_\_\_\_\_  
 • SOT23 = SOT-23-3L Package  
 Working Peak Voltage \_\_\_\_\_  
 05 = 5 V  
 Lines \_\_\_\_\_  
 02 = 2 Lines  
 Suffix \_\_\_\_\_  
 U = Unidirectional Diode

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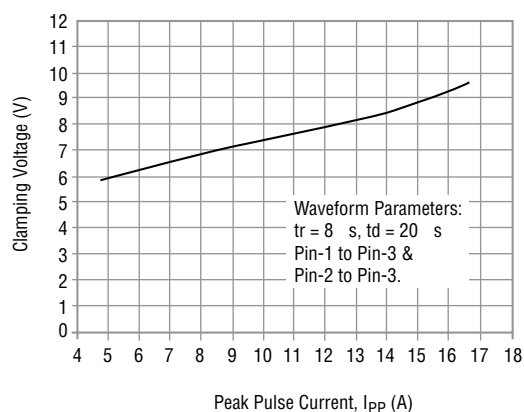
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# CDSOT23-0502U - Surface Mount TVS Diode

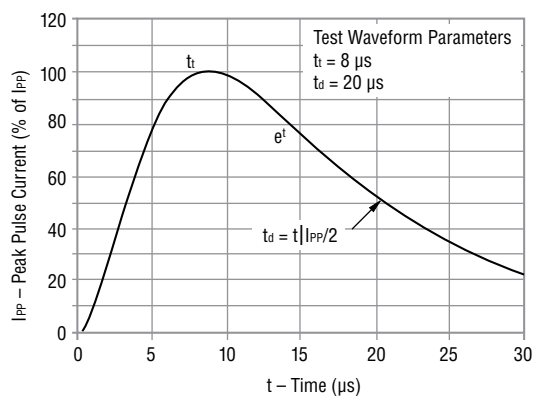
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## Rating & Characteristic Curves

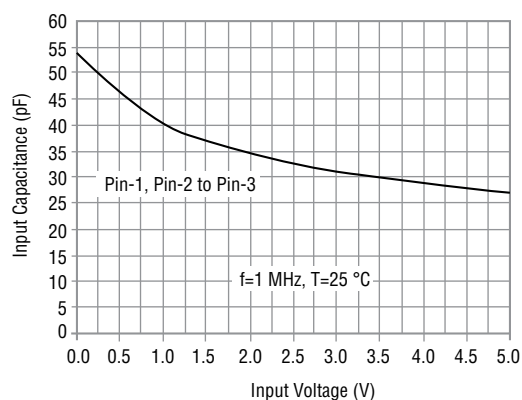
### Reverse Clamping Voltage vs Peak Pulse Current



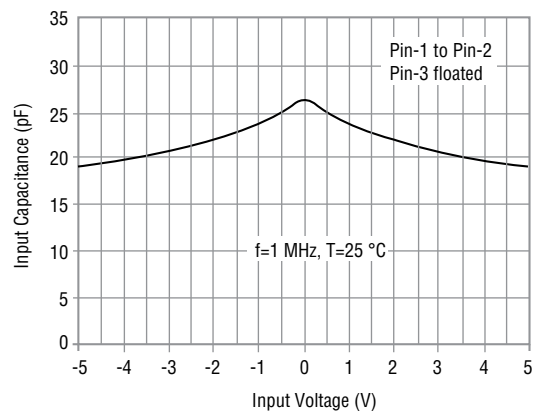
### Pulse Waveform



### Typical variation of $C_{IN}$ vs. $V_{IN}$ (1)



### Typical variation of $C_{IN}$ vs. $V_{IN}$ (1)



### Typical Part Marking

CDSOT23-0502U .....52U

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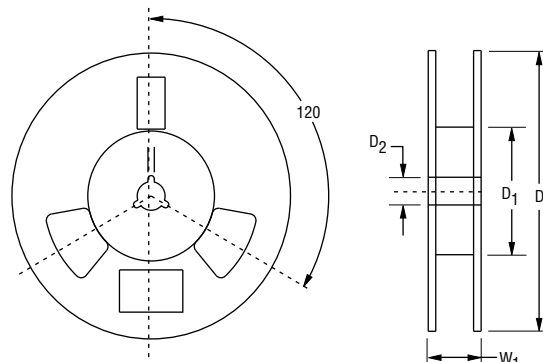
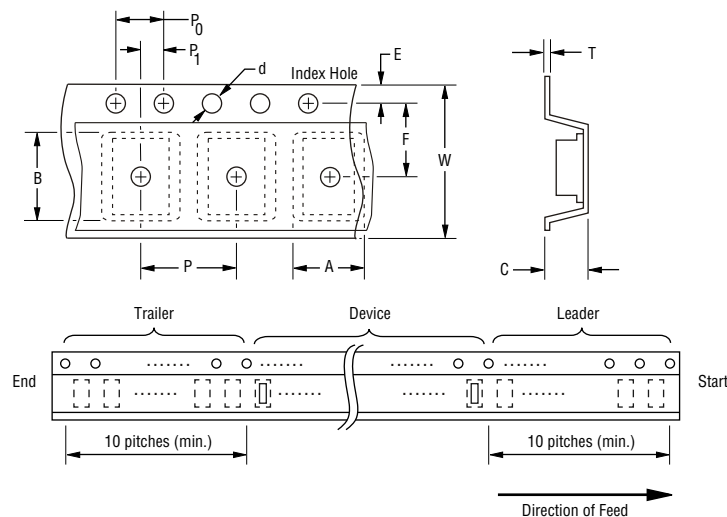
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# CDSOT23-0502U - Surface Mount TVS Diode

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## Packaging Information

The product is dispensed in tape and reel format (see diagram below).



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

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

| Item                   | Symbol         | SOT-23                                    |
|------------------------|----------------|---|
| Carrier Width          | A              | $\frac{2.25 \pm 0.10}{(0.088 - 0.004)}$   |
| Carrier Length         | B              | $\frac{2.34 \pm 0.10}{(0.092 - 0.004)}$   |
| Carrier Depth          | C              | $\frac{1.22 \pm 0.10}{(0.048 - 0.004)}$   |
| 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> | $\frac{50.0}{(1.969)} \text{ Min.}$       |
| 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              | $\frac{4.00 \pm 0.10}{(0.157 - 0.004)}$   |
| 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> | $\frac{14.4}{(0.567)} \text{ Max.}$       |
| Quantity per Reel      | --             | 3,000                                     |

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