



**THE DATASHEET OF
CDSOT23-T12C**





Features

- RoHS compliant*
- Protects one or two lines
- Unidirectional and bidirectional configurations
- ESD protection 30 kV max.

Applications

- RS-232, RS-422 and RS-423 data lines
- Portable electronics
- Wireless bus protection
- Control and monitoring systems

CDSOT23-T03~T36C - TVS Diode Array Series

General Information

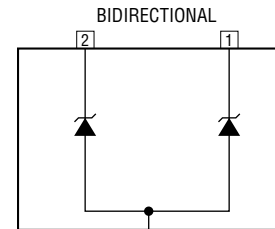
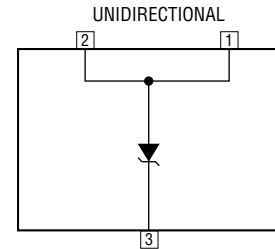
Portable communications, computing and video equipment manufacturers are challenging the semiconductor industry to develop increasingly smaller electronic components.

Bourns offers Transient Voltage Suppressor Array diodes for surge and ESD protection applications, in compact chip package SOT23 size format. The Transient Voltage Suppressor Array series offers a choice of voltage types ranging from 3 V to 36 V. 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 meet IEC 61000-4-2 (ESD), IEC 61000-4-4 (EFT) and IEC 61000-4-5 (Surge) requirements.

Thermal Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

| Parameter | Symbol | Value | Unit |
|-----------------------|------------------|-------------|------|
| Operating Temperature | T _J | -55 to +150 | °C |
| Storage Temperature | T _{STG} | -55 to +150 | °C |



Electrical Characteristics (@ T_A = 25 °C Unless Otherwise Noted)

| Parameter | Symbol | CDSOT23- | | | | | | | | | | | | | | Unit | |
|--|--------------------|------------------|------|------------------|------|------------------|------|------------------|------|------------------|------|------------------|------|-----------------|------|-------------------------|----|
| | | Uni- | Bi- | Uni- | Bi- | Uni- | Bi- | Uni- | Bi- | Uni- | Bi- | Uni- | Bi- | Uni- | Bi- | | |
| | | T03 | T03C | T05 | T05C | T08 | T08C | T12 | T12C | T15 | T15C | T24 | T24C | T36 | T36C | | |
| Breakdown Voltage @ 1 mA | V _{BR} | 4.0 | | 6.0 | | 8.5 | | 13.3 | | 16.7 | | 26.7 | | 40.0 | | V | |
| Working Peak Voltage | V _{WM} | 3.3 | | 5.0 | | 8.0 | | 12.0 | | 15.0 | | 24.0 | | 36.0 | | V | |
| Maximum Clamping Voltage V _C @ I _P = 1 A (1) | V _F | 7.0 | | 9.8 | | 13.4 | | 19.0 | | 24.0 | | 43.0 | | 51.0 | | V | |
| Maximum Clamping Voltage @ 8/20 μs V _C = I _{PP} (1) | V _F | 10.9 V @ 43 A | | 13.5 V @ 42 A | | 16.9 V @ 34 A | | 25.9 V @ 21 A | | 30.0 V @ 17 A | | 49.0 V @ 12 A | | 76.8 V @ 9 A | | V | |
| Maximum Leakage Current @ V _{WM} | I _D | 125 | | 20 | | 10 | | 2 | | 1 | | 1 | | 1 | | μA | |
| Typical Capacitance - Unidirectional @ 0 V, 1 MHz | C _{J(SD)} | 500 | | 350 | | 250 | | 150 | | 100 | | 88 | | 80 | | pF | |
| Typical Capacitance - Bidirectional @ 0 V, 1 MHz | C _{J(SD)} | 300 | | 210 | | 150 | | 90 | | 60 | | 63 | | 60 | | pF | |
| ESD Protection (per IEC 61000-4-2) Contact - Min. Contact - Max. Air - Min. Air - Max. | ESD | | | | | | | | | | | | | | | ±8 ±30 ±15 ±30 | kV |
| Peak Pulse Power (t _p @ 8/20 μs) (2) | P _{PP} | | | | | | | | | | | | | | | 500 | W |
| Forward Voltage @ 100 mA, 300 μs - Square Wave (3) | V _F | | | | | | | | | | | | | | | 1.5 | V |

- Notes: 1. See Pulse Wave Form. 2. See Peak Pulse Power vs. Pulse Time. 3. Only applies to unidirectional devices. 4. Part numbers with a "C" suffix are bidirectional devices, i.e., CDSOT23-T03C.



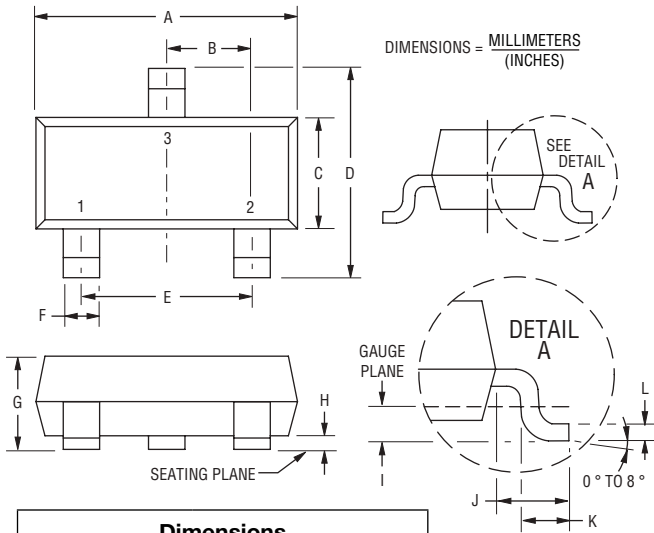
*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011. Specifications are subject to change without notice. Users should verify actual device performance in their specific applications. The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.

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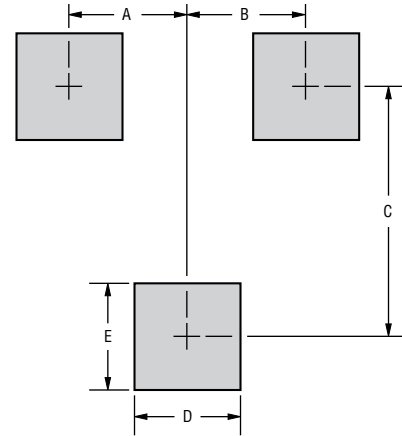
Product Dimensions

This is a molded JEDEC SOT-323 package with 100 % Matte Sn plating on the lead frame. It weighs approximately 0.6 g and has a flammability rating of UL 94V-0.



| Dimensions | |
|------------|--|
| A | $\frac{2.80 - 3.00}{(0.110 - 0.118)}$ |
| B | $\frac{0.95}{(0.037)}$ BSC |
| C | $\frac{1.20 - 1.40}{(0.047 - 0.055)}$ |
| D | $\frac{2.10 - 2.49}{(0.083 - 0.098)}$ |
| E | $\frac{1.90}{(0.075)}$ BSC |
| F | $\frac{0.30 - 0.50}{(0.012 - 0.019)}$ |
| G | $\frac{0.89 - 1.17}{(0.035 - 0.046)}$ |
| H | $\frac{0.05 - 0.015}{(0.002 - 0.006)}$ |
| I | $\frac{0.25}{(0.010)}$ BSC |
| J | $\frac{0.46 - 0.64}{(0.018 - 0.025)}$ |
| K | $\frac{0.40 - 0.58}{(0.016 - 0.023)}$ |
| L | $\frac{0.08 - 0.20}{(0.003 - 0.008)}$ |

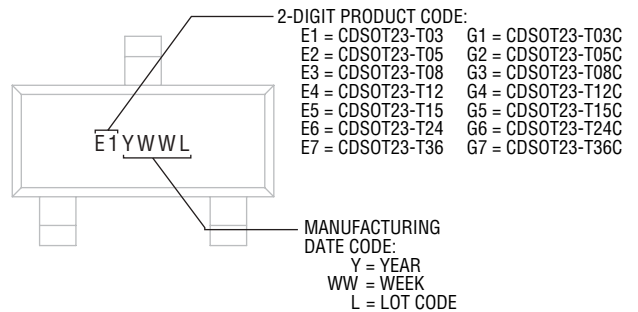
Recommended Footprint



DIMENSIONS = MILLIMETERS (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 | $\frac{0.85}{(0.033)}$ |

Typical Part Marking



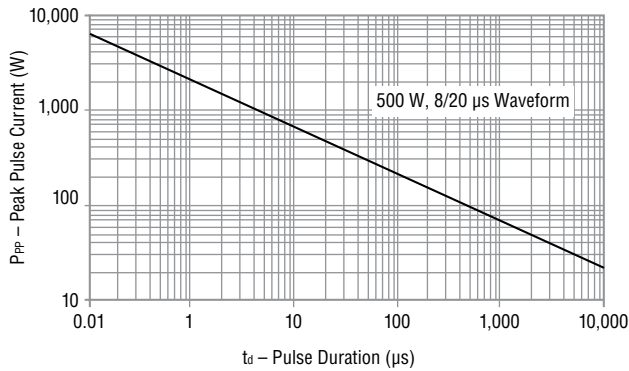
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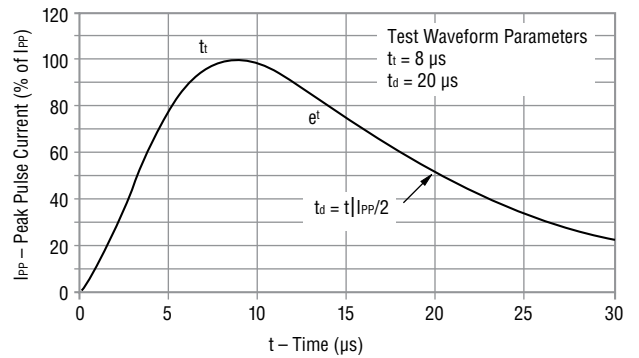
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Performance Graphs

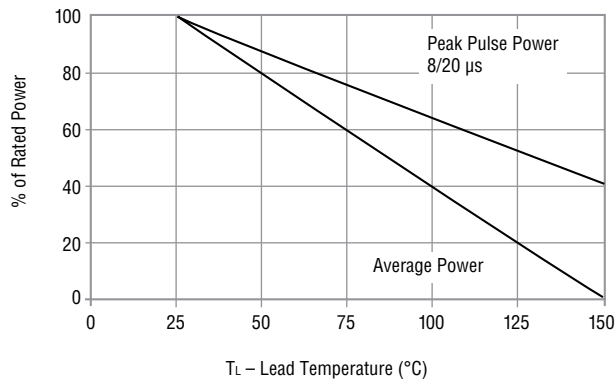
Peak Pulse Power vs. Pulse Time



Pulse Waveform

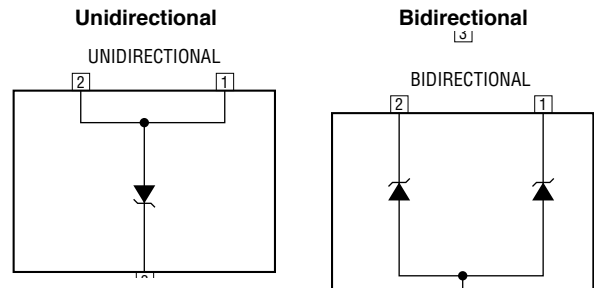


Power Derating Curve



Block Diagram

The device block diagrams below include the pin names and basic electrical connections associated with each channel.



How to Order

CD SOT23 - T 03 C

- Common Code _____
- Chip Diode _____
- Package _____
 • SOT23 = SOT23 Package
- Model _____
 T = Transient Voltage Suppressor
- Working Peak Voltage _____
 3 = 3 V_{RWM} (Volts)
- Suffix _____
 C = Bidirectional Diode

Environmental Specifications

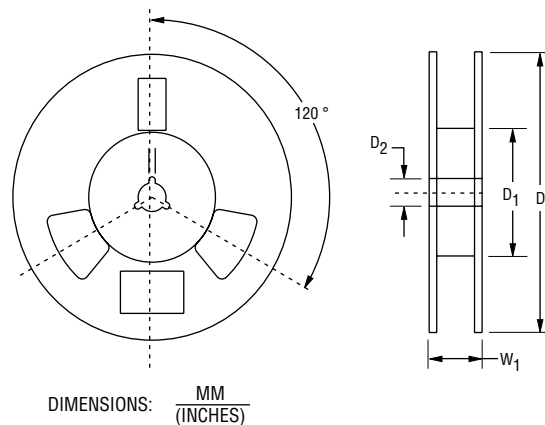
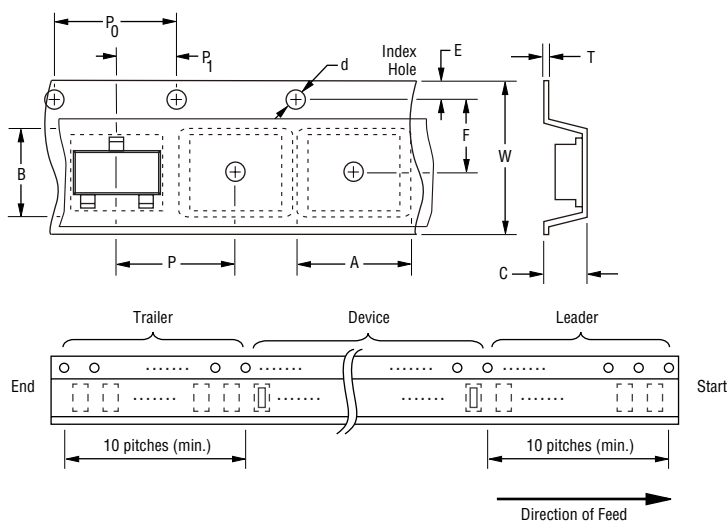
- Moisture Sensitivity Level1
- ESD Classification (HBM)..... 3B

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BOURNS®

Packaging Information

The surface mount product is packaged in an 12 mm x 8 mm tape and reel format per EIA-481 standard.



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

| Item | Symbol | SOT23 |
|------------------------|----------------|---|
| Carrier Width | A | $\frac{2.25 \pm 0.10}{(0.088 \pm 0.004)}$ |
| Carrier Length | B | $\frac{2.34 \pm 0.10}{(0.092 \pm 0.004)}$ |
| Carrier Depth | C | $\frac{1.22 \pm 0.10}{(0.048 \pm 0.004)}$ |
| 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 ₁ | $\frac{50.0}{(1.969)}$ MIN. |
| Feed Hole Diameter | D ₂ | $\frac{13.0 \pm 0.20}{(0.512 \pm 0.008)}$ |
| 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 ₀ | $\frac{4.00 \pm 0.10}{(0.157 \pm 0.004)}$ |
| Embossment Center | P ₁ | $\frac{2.00 \pm 0.05}{(0.079 \pm 0.002)}$ |
| 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 ₁ | $\frac{14.4}{(0.567)}$ MAX. |
| Quantity per Reel | -- | 3,000 |

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REV. 06/19

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