

## Features

- RoHS compliant\*
- Halogen free\*\*
- ESD protection
- Protects two lines
- Low leakage current
- Low capacitance

## Applications

- Ethernet - 10//100/1000 Base T
- Firewire and USB
- Portable electronics
- Video/graphic cards

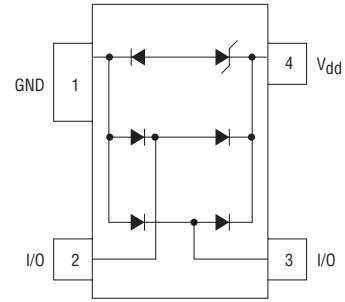
# CD143A-SR2.8~3.3 - Steering/TVS Diode Array Series

## General Information

The Model CD143A-SR2.8 and CD143A-SR3.3 devices provide ESD protection for the external ports of portable electronic devices such as cell phones, handheld electronics and personal computers.

The ESD protection provided by the component enables a data port to withstand a minimum  $\pm 8$  kV Contact /  $\pm 15$  kV Air Discharge per the ESD test method specified in IEC 61000-4-2. The device measures 2.80 mm x 1.20 mm and is available in a SOT-143 package intended to be mounted directly onto an FR4 printed circuit board.

The Bourns® device will meet IEC 61000-4-2 (ESD) to 30 kV, IEC 61000-4-4 (EFT) to 40 A and IEC 61000-4-5 (Surge) to 12 A.



## Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

| Parameter  | Symbol    | Value                                       | Unit             |
|--|-----------|---|------------------|
| Peak Pulse Power ( $t_p = 8/20 \mu\text{s}$ ) <sup>1</sup> | $P_{PP}$  | 200   | W                |
| Peak Pulse Current ( $t_p = 8/20 \mu\text{s}$ )            | $I_{PP}$  | 12  | A                |
| Operating Supply Voltage ( $V_{DD} - \text{Gnd}$ )         | $V_{dc}$  | 3.8   | V                |
| ESD Protection per IEC 61000-4-2 (Air, Contact)            | $V_{esd}$ | $\pm 30$                                    | kV               |
| DC Voltage at any I/O Pin                                  | $V_{io}$  | (Gnd -0.5) to ( $V_{DD} + 0.5$ )            | V                |
| Operating Temperature                                      | $T_J$     | $-55^\circ\text{C}$ to $+125^\circ\text{C}$ | $^\circ\text{C}$ |
| Storage Temperature  | $T_{STG}$ | $-55^\circ\text{C}$ to $+150^\circ\text{C}$ | $^\circ\text{C}$ |

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

| Parameter   | Symbol   | CD143A-SR2.8 | CD143A-SR3.3 | Unit          |
|---|----------|--------------|--------------|---------------|
| Breakdown Voltage Minimum @ 1 mA <sup>2</sup>                 | $V_{BR}$ | 4.5          |              | V             |
| Working Peak Voltage <sup>2</sup>                             | $V_{WM}$ | 2.8          | 3.3          | V             |
| Clamping Voltage Maximum @ $I_P = 1 \text{ A}$ <sup>2,3</sup> | $V_C$    | 5.0          | 7.0          | V             |
| Clamping Voltage Maximum @ $I_P$ <sup>2,3</sup>               | $V_C$    | 8.5 @ 5 A    | 8.2 @ 10 A   | V             |
| Reverse Leakage Current Maximum @ $V_{WM}$ <sup>2</sup>       | $I_L$    | 5.0          |              | $\mu\text{A}$ |
| Forward Voltage Maximum @ 15 mA <sup>4</sup>                  | $V_f$    | 1.0          |              | V             |
| Leakage Current @ $V_{WM}$ <sup>5</sup>                       | $I_D$    | 1.0          |              | $\mu\text{A}$ |
| Capacitance Typical @ 0 V, 1 MHz <sup>5</sup>                 | $C_J$    | 4.5          |              | pF            |

Notes:

1. See Peak Pulse Power vs. Pulse Time.
2. From Pin 4 to Pin 1.
3. See Pulse Wave Form.
4. From Pin 1 to Pin 4.
5. From Pin 1 to Pin 3, Pin 1 to Pin 2.



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

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

\*\*Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

Specifications are subject to change without notice.

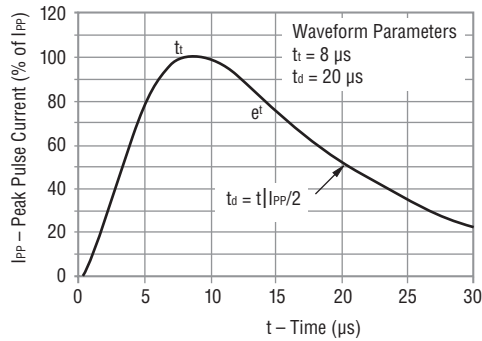
Users should verify actual device performance in their specific applications.

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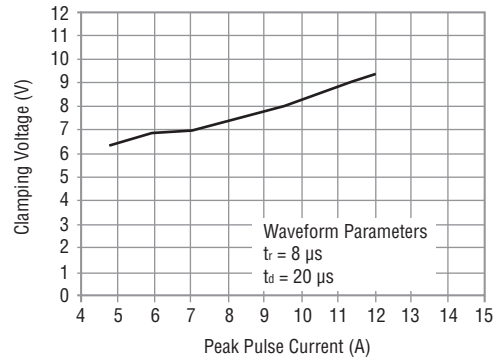
# CD143A-SR2.8~3.3 - Steering/TVS Diode Array Series

## Typical Characteristics

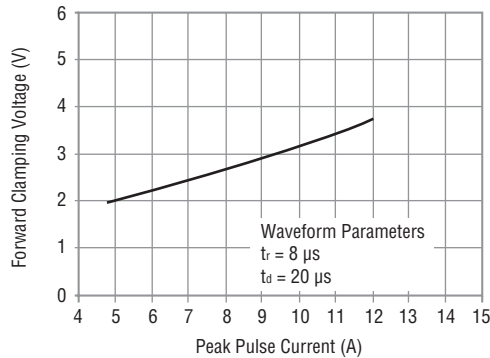
### Pulse Wave Form



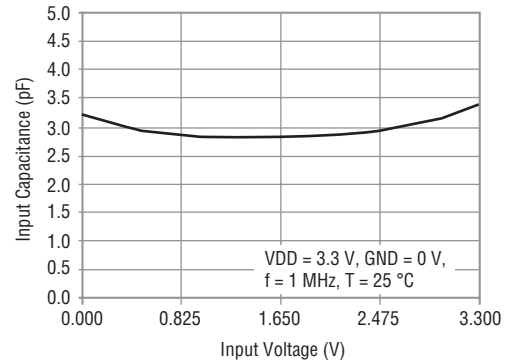
### Clamping Voltage vs. Peak Pulse Current



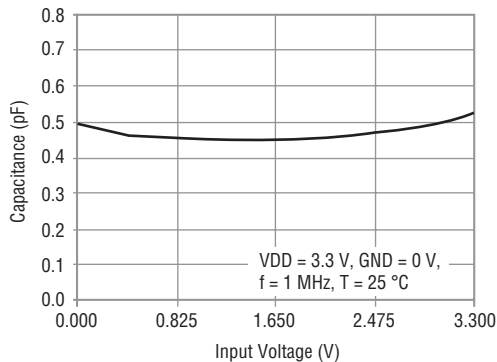
### Forward Clamping Voltage vs. Peak Pulse Current



### Typical Variation of C\_IN vs. V\_IN



### Typical Variation of C\_I/O-to-I/O vs. V\_IN



### How to Order

**CD 143A - SR 3.3 C**

Common Code \_\_\_\_\_  
 Chip Diode \_\_\_\_\_  
 Package \_\_\_\_\_  
 143A = SOT-143 \_\_\_\_\_  
 Model \_\_\_\_\_  
 SR = Steering Diode Array \_\_\_\_\_  
 Repetitive Peak Reverse Voltage \_\_\_\_\_  
 3.3 = 3.3 V<sub>RWM</sub> (Volts) \_\_\_\_\_  
 Customer Specific Requirements \_\_\_\_\_

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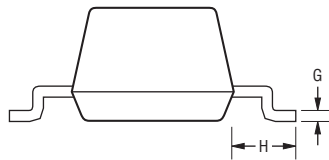
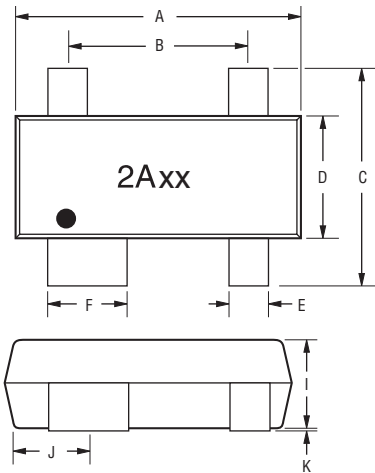
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## Product Dimensions

This is a molded device. It weighs approximately 35 mg and has a flammability rating of UL 94V-0. The dimensions for the packaged device are shown below.

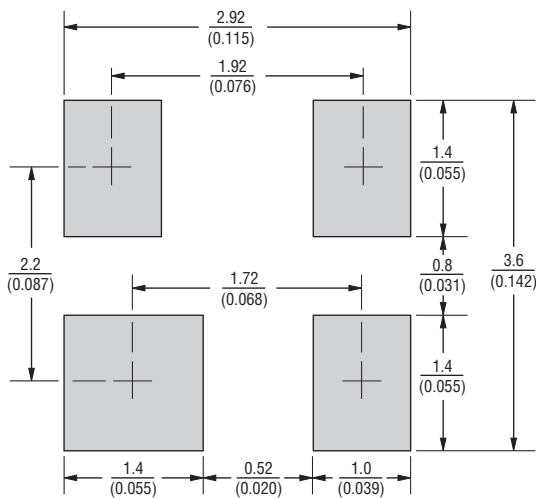


DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

| Dimensions |                                       |
|------------|---------------------------------------|
| A          | $\frac{2.80 - 3.04}{(0.110 - 0.12)}$  |
| B          | $\frac{1.80 - 2.02}{(0.071 - 0.080)}$ |
| C          | $\frac{2.25 - 2.55}{(0.089 - 0.100)}$ |
| D          | $\frac{1.2 - 1.4}{(0.047 - 0.055)}$   |
| E          | $\frac{0.35 - 0.50}{(0.014 - 0.020)}$ |
| F          | $\frac{0.76 - 0.89}{(0.030 - 0.035)}$ |
| G          | $\frac{0.09 - 0.18}{(0.035 - 0.007)}$ |
| H          | $\frac{0.46 - 0.60}{(0.018 - 0.024)}$ |
| I          | $\frac{0.9 - 1.1}{(0.035 - 0.043)}$   |
| J          | $\frac{0.72 - 0.83}{(0.028 - 0.033)}$ |
| K          | $\frac{0.05 - 0.1}{(0.002 - 0.004)}$  |

## Recommended Pad Layout

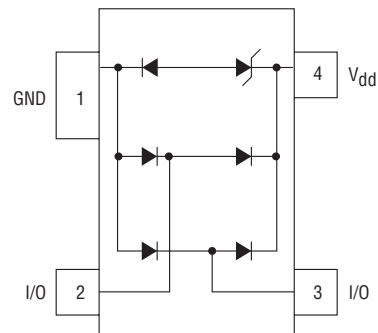
This is the footprint recommended for this SOT-143 device.



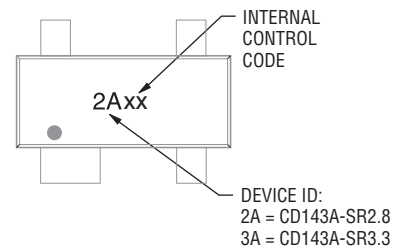
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Block Diagram

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



## Typical Part Marking



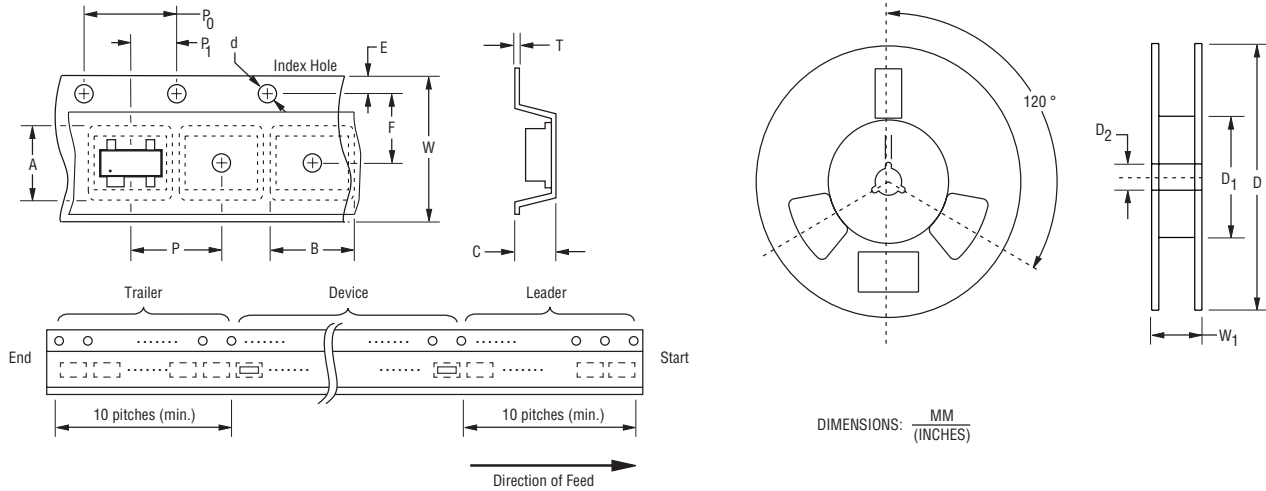
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# CD143A-SR2.8~3.3 - Steering/TVS Diode Array Series

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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.



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

| Item                   | Symbol         | SOT-143  |
|------------------------|----------------|--|
| Carrier Width          | A              | $\frac{3.19 \pm 0.10}{(0.126 \pm 0.004)}$      |
| Carrier Length         | B              | $\frac{2.8 \pm 0.10}{(0.110 \pm 0.004)}$       |
| Carrier Depth          | C              | $\frac{1.31 \pm 0.10}{(0.052 \pm 0.004)}$      |
| Sprocket Hole          | d              | $\frac{1.5 +0.1/-0}{(0.059 +0.004/-0)}$        |
| Reel Outside Diameter  | D              | $\frac{180 \pm 3}{(7.087 \pm 0.012)}$          |
| Reel Inner Diameter    | D <sub>1</sub> | $\frac{50.0}{(1.969)} \text{ MIN.}$            |
| Feed Hole Diameter     | D <sub>2</sub> | $\frac{13.0 +0.5/-0.2}{(0.512 +0.020/-0.008)}$ |
| 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              | $\frac{0.6}{(0.024)} \text{ MAX.}$             |
| Tape Width             | W              | $\frac{8.3}{(0.327)} \text{ MAX.}$             |
| Reel Width             | W <sub>1</sub> | $\frac{14.4}{(0.567)} \text{ MAX.}$            |
| Quantity per Reel      | --             | 3,000  |

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