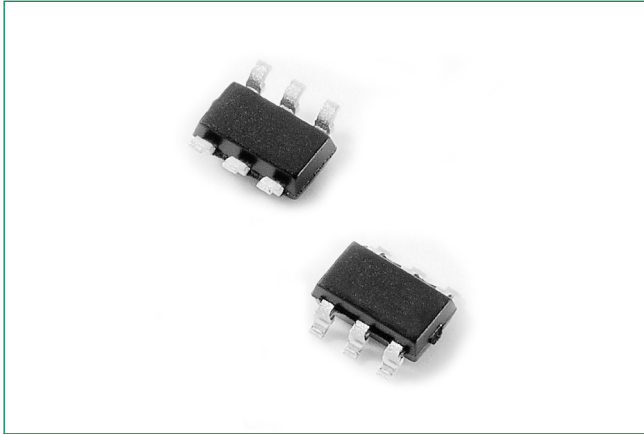
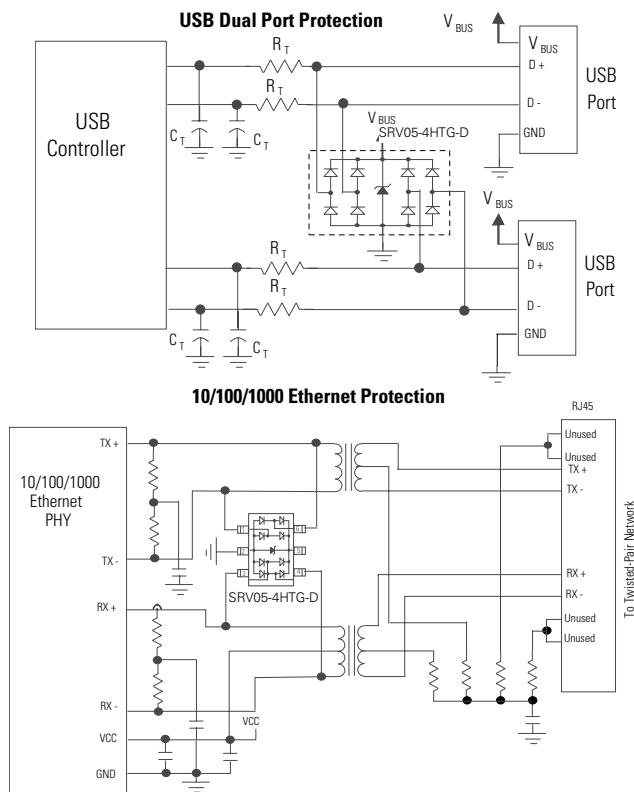


# SRV05-4HTG-D

## 6V 10A TVS Diode Array



### Application Examples



### Description

The SRV05-4HTG-D integrates low capacitance rail-to-rail diodes with an additional zener diode to protect each I/O pin against ESD and high surge events. This robust device can safely absorb 10A surge current per IEC 61000-4-5, 2nd Edition ( $t_P=8/20\mu s$ ) without performance degradation and a minimum  $\pm 30kV$  ESD per IEC 61000-4-2. Their very low loading capacitance also makes them ideal for protecting high speed signal pins.

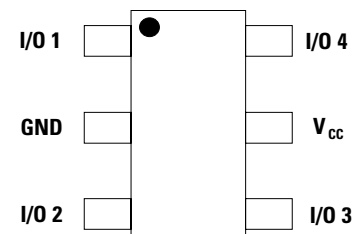
### Features and Benefits

- ESD, IEC 61000-4-2,  $\pm 30kV$  contact,  $\pm 30kV$  air
- EFT, IEC61000-4-4, 40A (5/50ns)
- Lightning, IEC 61000-4-5 2nd Edition, 10A (8/20 $\mu s$ )
- Low capacitance of 1pF (TYP) per I/O
- Low leakage current of 0.5 $\mu A$  (MAX) at 5V
- Small SOT23-6 (JEDEC MO-178) packaging
- Halogen free, lead free and RoHS compliant
- Moisture Sensitivity Level (MSL -1)

### Applications

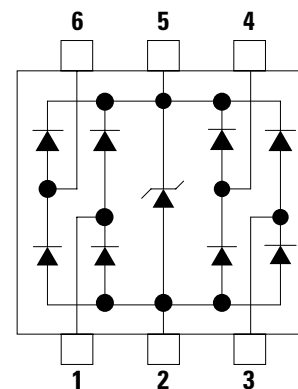
- LCD/PDP TVs
- Monitors
- Notebooks
- 10/100/1000 Ethernet
- Firewire
- Set Top Boxes
- Flat Panel Displays
- Portable Medical

### Pinout



### Top View

### Functional Block Diagram



Life Support Note:

**Not Intended for Use in Life Support or Life Saving Applications**

The products shown herein are not designed for use in life sustaining or life saving applications unless otherwise expressly indicated.

# SRV05-4HTG-D

## 6V 10A TVS Diode Array

### Absolute Maximum Ratings

| Symbol     | Parameter                            | Value      | Units |
|------------|--------------------------------------|------------|-------|
| $I_{PP}$   | Peak Current ( $t_p=8/20\mu s$ )     | 10         | A     |
| $P_{PK}$   | Peak Pulse Power ( $t_p=8/20\mu s$ ) | 150        | W     |
| $T_{OP}$   | Operating Temperature                | -40 to 125 | °C    |
| $T_{STOR}$ | Storage Temperature                  | -55 to 150 | °C    |

**Caution:** Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the component. This is a stress only rating and operation of the component at these or any other conditions above those indicated in the operational sections of this specification is not implied.

### Electrical Characteristics ( $T_{OP}=25^{\circ}C$ )

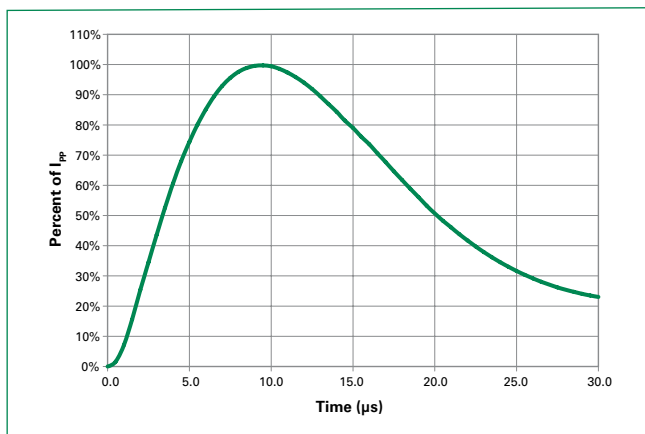
| Parameter                          | Symbol        | Test Conditions                             | Min      | Typ  | Max | Units    |
|------------------------------------|---------------|---------------------------------------------|----------|------|-----|----------|
| Reverse Standoff Voltage           | $V_{RWM}$     | -                                           |          |      | 6   | V        |
| Breakdown Voltage                  | $V_{BR}$      | $I_R = 1mA$ , I/O to GND                    | 6        | 8.5  |     | V        |
| Reverse Leakage Current            | $I_{LEAK}$    | $V_R=5V$ , I/O to GND                       |          | 0.1  | 0.5 | $\mu A$  |
| Clamp Voltage <sup>1</sup>         | $V_C$         | $I_{PP}=5A$ , $t_p=8/20\mu s$ , I/O to GND  |          | 11.7 | 13  | V        |
|                                    |               | $I_{PP}=8A$ , $t_p=8/20\mu s$ , I/O to GND  |          | 12.5 | 14  | V        |
|                                    |               | $I_{PP}=10A$ , $t_p=8/20\mu s$ , I/O to GND |          | 13.2 | 15  | V        |
| Dynamic Resistance <sup>2</sup>    | $R_{DYN}$     | TLP, $t_p=100ns$ , I/O to GND               |          | 0.28 |     | $\Omega$ |
| ESD Withstand Voltage <sup>1</sup> | $V_{ESD}$     | IEC 61000-4-2 (Contact Discharge)           | $\pm 30$ |      |     | kV       |
|                                    |               | IEC 61000-4-2 (Air Discharge)               | $\pm 30$ |      |     | kV       |
| Diode Capacitance <sup>1</sup>     | $C_{I/O-GND}$ | Reverse Bias=0V, $f=1MHz$ , I/O to GND      |          | 1    | 3   | pF       |
|                                    | $C_{I/O-I/O}$ | Reverse Bias=0V, $f=1MHz$ , I/O to I/O      |          | 0.5  |     | pF       |

**Notes:**

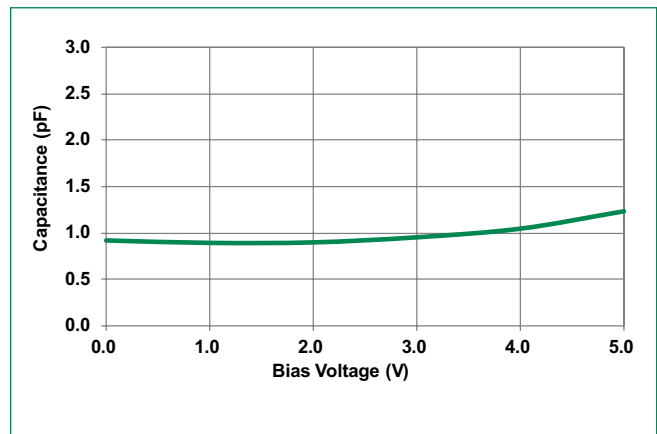
1. Parameter is guaranteed by design and/or component characterization.

2. Transmission Line Pulse (TLP) test setting : Std.TDR(50 $\Omega$ ),  $t_p=100ns$ ,  $tr=0.2ns$  ITLP and VTLP averaging window: start  $t_1=70ns$  to end  $t_2=80ns$

### 8/20 $\mu s$ Pulse Waveform



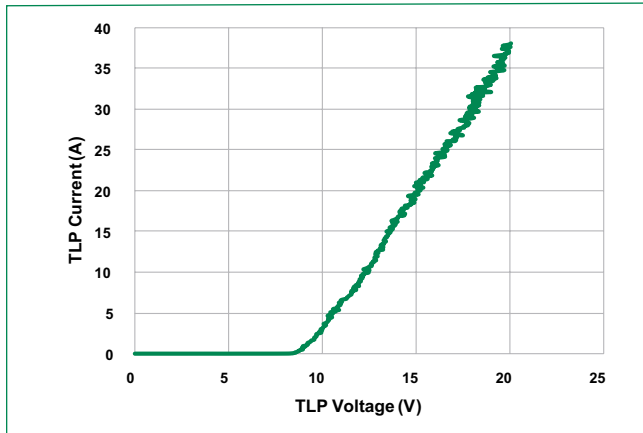
### Capacitance vs. Reverse Bias



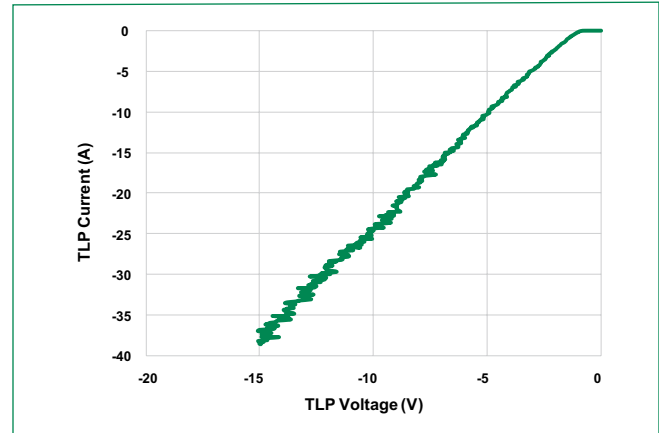
# SRV05-4HTG-D

## 6V 10A TVS Diode Array

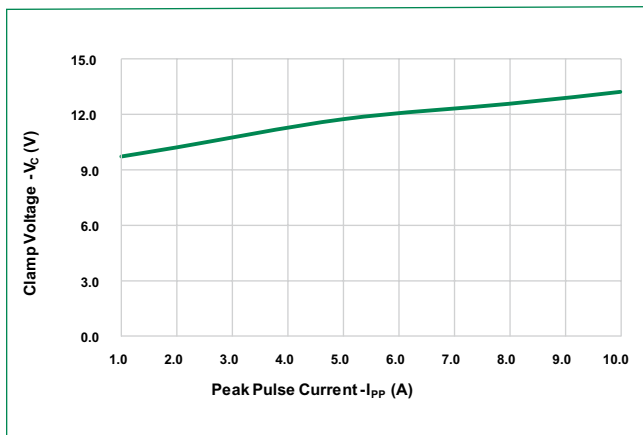
Positive Transmission Line Pulsing (TLP) Plot



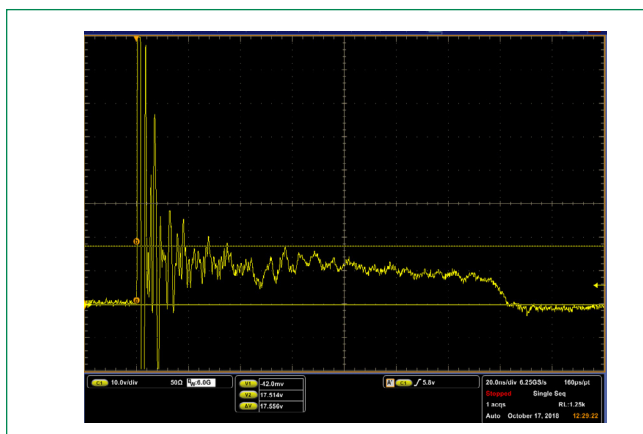
Negative Transmission Line Pulsing (TLP) Plot



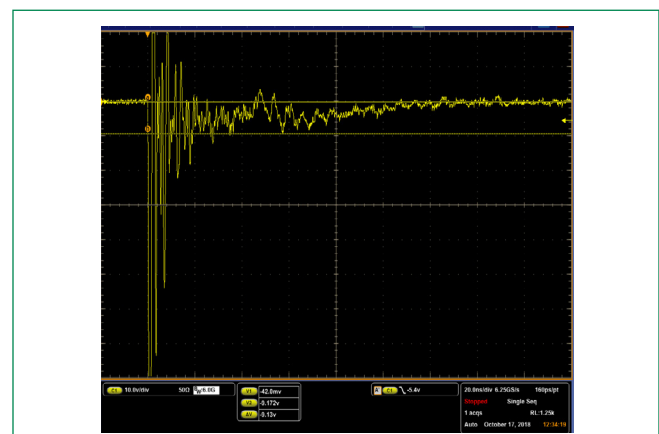
Clamping Voltage vs. Peak Pulse Current



IEC 61000-4-2 +8 kV Contact ESD Clamping Voltage



IEC 61000-4-2 -8 kV Contact ESD Clamping Voltage

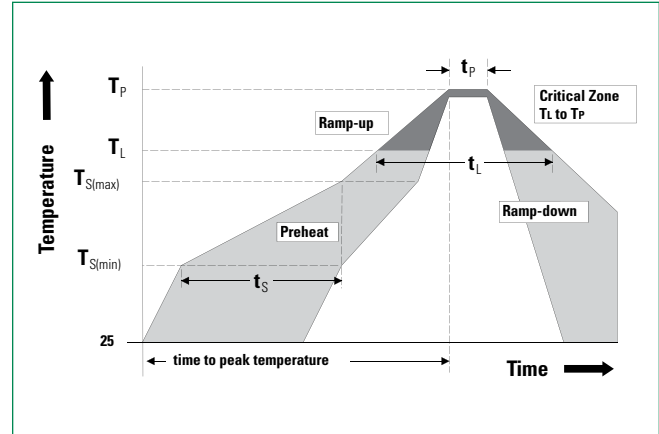


# SRV05-4HTG-D

## 6V 10A TVS Diode Array

### Soldering Parameters

|                                                                        |                                    |                         |
|------------------------------------------------------------------------|------------------------------------|-------------------------|
| <b>Reflow Condition</b>                                                |                                    | Pb – Free assembly      |
| <b>Pre Heat</b>                                                        | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                                        | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                                        | - Time (min to max) ( $t_s$ )      | 60 – 120 secs           |
| <b>Average ramp up rate (Liquidus) Temp (<math>T_L</math>) to peak</b> |                                    | 3°C/second max          |
| <b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>      |                                    | 3°C/second max          |
| <b>Reflow</b>                                                          | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                                        | - Temperature ( $t_L$ )            | 60 – 150 seconds        |
| <b>Peak Temperature (<math>T_p</math>)</b>                             |                                    | 260 <sup>+0/-5</sup> °C |
| <b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>   |                                    | 30 seconds              |
| <b>Ramp-down Rate</b>                                                  |                                    | 6°C/second max          |
| <b>Time 25°C to peak Temperature (<math>T_p</math>)</b>                |                                    | 8 minutes Max.          |
| <b>Do not exceed</b>                                                   |                                    | 260°C                   |



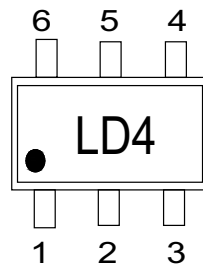
### Ordering Information

| Part Number  | Package | Min. Order Qty. |
|--------------|---------|-----------------|
| SRV05-4HTG-D | SOT23-6 | 3000            |

### Product Characteristics

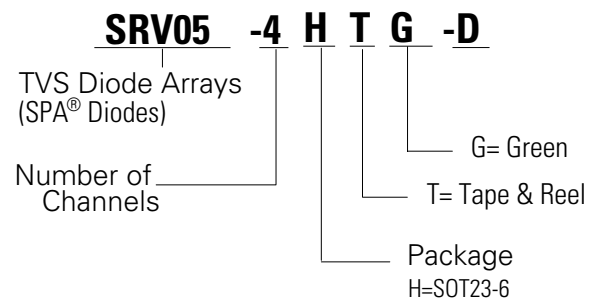
|                           |                                                        |
|---------------------------|--------------------------------------------------------|
| <b>Lead Plating</b>       | Matte Tin                                              |
| <b>Lead Material</b>      | Copper Alloy                                           |
| <b>Lead Coplanarity</b>   | 0.004 inches(0.102mm)                                  |
| <b>Substrate Material</b> | Silicon                                                |
| <b>Body Material</b>      | Molded Compound                                        |
| <b>Flammability</b>       | UL Recognized compound meeting flammability rating V-0 |

### Part Marking System



L : Part code  
D : Assembly code  
4 : Number of channel

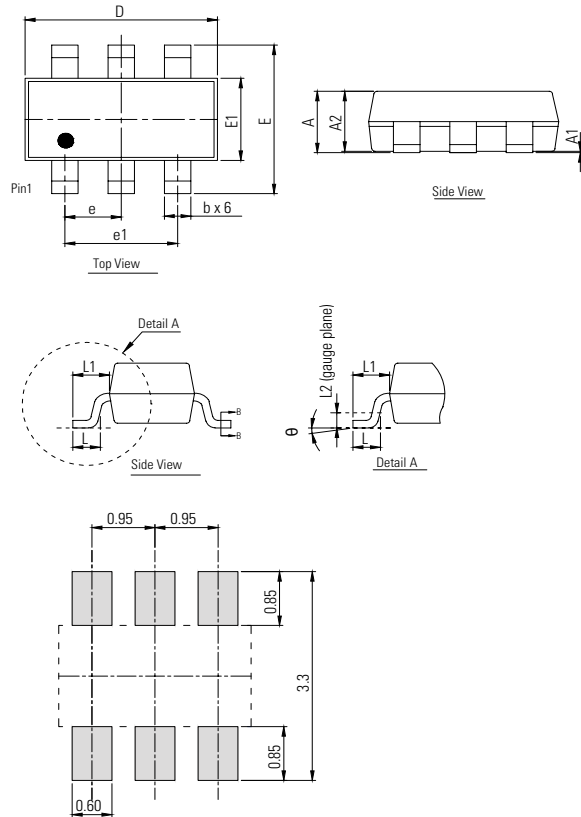
### Part Numbering System



# SRV05-4HTG-D

## 6V 10A TVS Diode Array

### Package Dimensions - SOT23-6

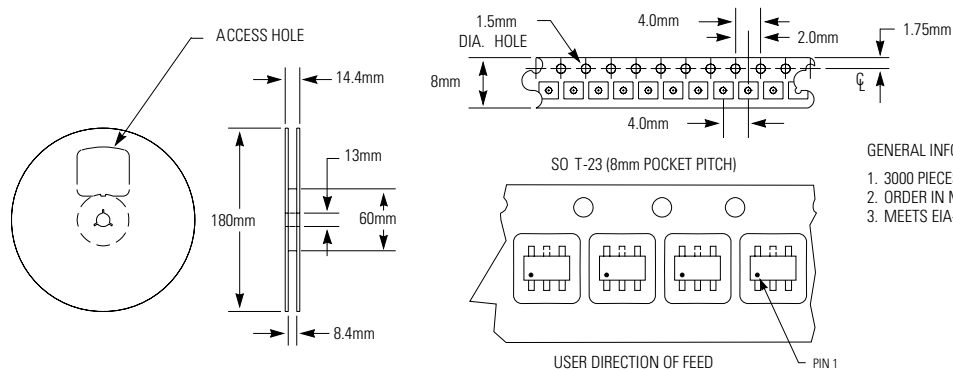


Recommended soldering pad layout (unit :mm)

| Symbol    | Millimeters |      |      | Inches    |       |       |
|-----------|-------------|------|------|-----------|-------|-------|
|           | Min         | Nom  | Max  | Min       | Nom   | Max   |
| <b>A</b>  | -           | -    | 1.45 | -         | -     | 0.057 |
| <b>A1</b> | 0.00        | -    | 0.15 | 0.000     | -     | 0.006 |
| <b>A2</b> | 0.90        | 1.15 | 1.30 | 0.035     | 0.045 | 0.051 |
| <b>b</b>  | 0.30        | -    | 0.50 | 0.012     | -     | 0.020 |
| <b>D</b>  | 2.70        | 2.90 | 3.05 | 0.106     | 0.114 | 0.120 |
| <b>E</b>  | 2.60        | 2.80 | 3.00 | 0.102     | 0.110 | 0.118 |
| <b>E1</b> | 1.45        | 1.60 | 1.75 | 0.057     | 0.063 | 0.069 |
| <b>e</b>  | 0.95 BSC    |      |      | 0.037 BSC |       |       |
| <b>e1</b> | 1.90 BSC    |      |      | 0.075 BSC |       |       |
| <b>L</b>  | 0.30        | 0.50 | 0.60 | 0.012     | 0.020 | 0.024 |
| <b>L1</b> | 0.60 REF    |      |      | 0.024 REF |       |       |
| <b>L2</b> | 0.25 BSC    |      |      | 0.010 BSC |       |       |
| <b>Θ</b>  | 0°          | 4°   | 8°   | 0°        | 4°    | 8°    |

### Embossed Carrier Tape & Reel Specification — SOT23-6

#### 8mm TAPE AND REEL



#### GENERAL INFORMATION

1. 3000 PIECES PER REEL.
2. ORDER IN MULTIPLES OF FULL REELS ONLY.
3. MEETS EIA-481 REVISION "A" SPECIFICATIONS.

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