


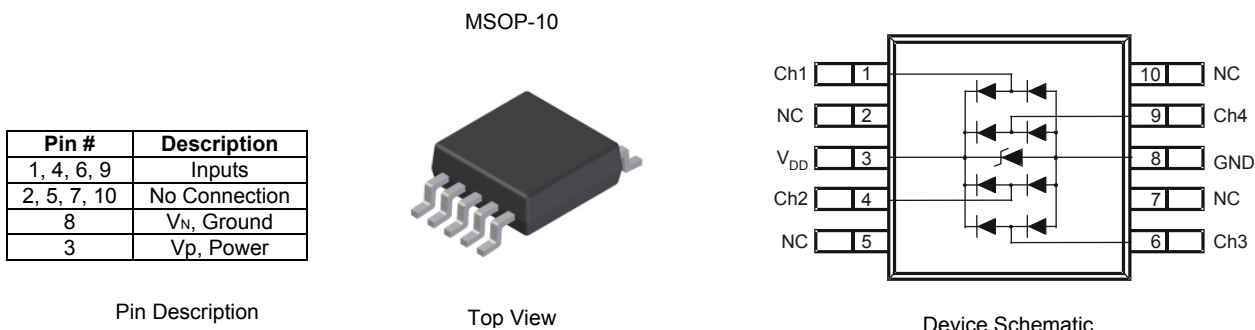
## 4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY

### Features

- IEC 61000-4-2 (ESD): Air –  $\pm 15\text{kV}$ , Contact –  $\pm 8\text{kV}$
- 4 Channels of ESD protection
- Low Channel Input Capacitance of 0.5pF Typical
- Typically Used at High Speed Ports such as USB 2.0, USB 3.0, IEEE1394, Serial ATA, DVI, HDMI, PCI
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

### Mechanical Data

- Case: MSOP-10
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 
- Weight: 0.026 grams (approximate)

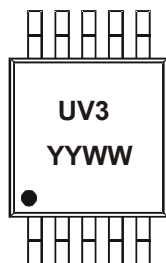


### Ordering Information (Note 4)

| Product        | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|----------------|------------|---------|--------------------|-----------------|-------------------|
| D5V0F4U10MR-13 | Standard   | UV3     | 13                 | 12              | 2,500/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

### Marking Information



UV3 = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 13 = 2013)  
 WW = Week Code (01 ~ 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                     | Symbol                   | Value | Unit | Conditions             |
|------------------------------------|--------------------------|-------|------|------------------------|
| Peak Pulse Current                 | I <sub>PP</sub>          | 3     | A    | 8/20μs, Per Figure 3   |
| ESD Protection – Contact Discharge | V <sub>ESD_Contact</sub> | ±8    | kV   | Standard IEC 61000-4-2 |
| ESD Protection – Air Discharge     | V <sub>ESD_Air</sub>     | ±15   | kV   | Standard IEC 61000-4-2 |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)                       | P <sub>D</sub>                    | 500         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 250         | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C unless otherwise specified)

| Characteristic   | Symbol           | Min | Typ | Max  | Unit | Test Conditions                               |
|--|------------------|-----|-----|------|------|---|
| Reverse Working Voltage                                | V <sub>RWM</sub> | —   | —   | 5.5  | V    | —   |
| Reverse Current (Note 6)                               | I <sub>R</sub>   | —   | —   | 200  | nA   | V <sub>R</sub> = 5.5V                         |
| Reverse Breakdown Voltage                              | V <sub>BR</sub>  | 6.0 | —   | —    | V    | I <sub>R</sub> = 1mA                          |
| Reverse Clamping Voltage, Positive Transients (Note 7) | V <sub>CL</sub>  | —   | 10  | 12   | V    | I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs |
| Dynamic Resistance                                     | R <sub>DYN</sub> | —   | 1.0 | —    | Ω    | I <sub>R</sub> = 1A, t <sub>p</sub> = 8/20μs  |
| Capacitance (Note 8)                                   | C <sub>T</sub>   | —   | 0.4 | 0.65 | pF   | V <sub>R</sub> = 2.5V, f = 1MHz               |
|  |                  | —   | 0.5 | —    | pF   | V <sub>R</sub> = 0V, f = 1MHz                 |

- Notes:
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at <http://www.diodes.com>.
  - Short duration pulse test used to minimize self-heating effect.
  - Clamping voltage value is based on an 8x20μs peak pulse current (I<sub>pp</sub>) waveform.
  - Measured from any CH to GND.
  - For information on the impact of Diodes' USB 2.0 compatible ESD protectors on signal integrity including eye diagram plots, please refer to AN77 at the following URL: [http://www.diodes.com/destdtools/appnote\\_dnote.html](http://www.diodes.com/destdtools/appnote_dnote.html).

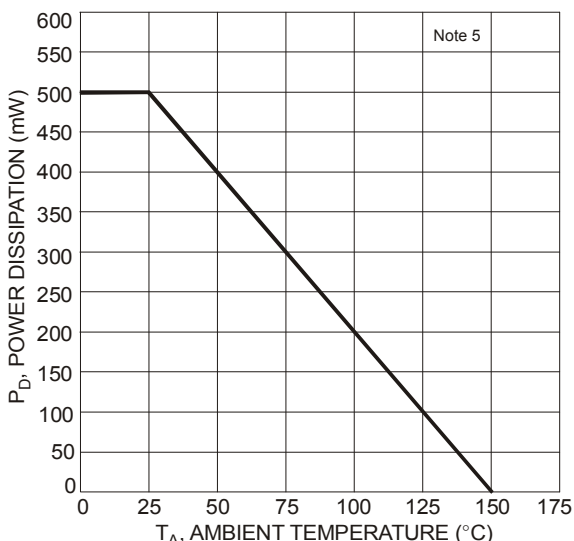


Figure 1 Power Derating Curve

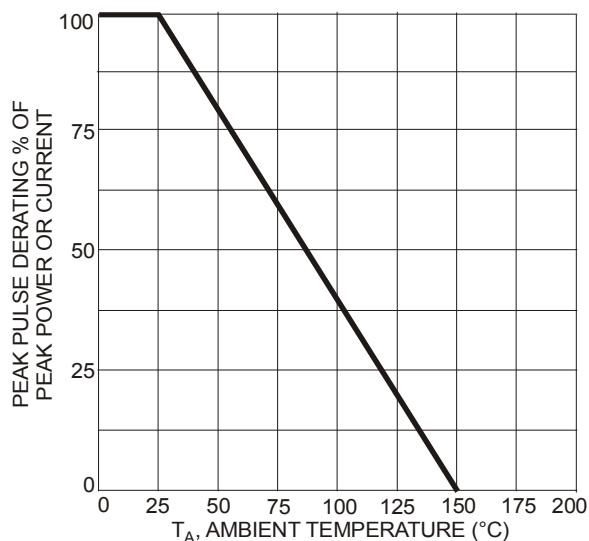


Figure 2 Pulse Derating Curve

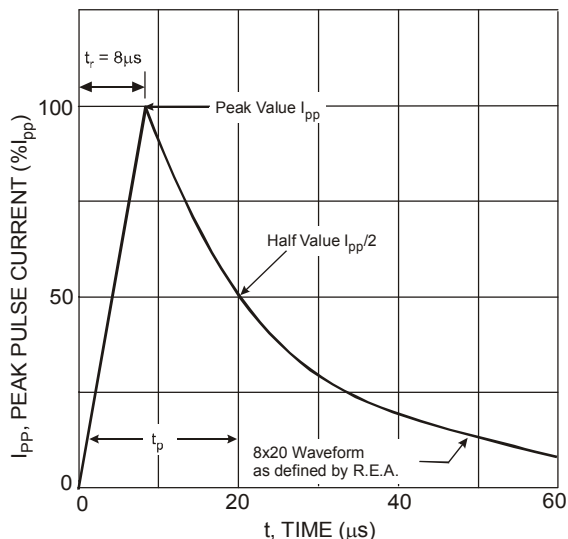


Figure 3 Pulse Waveform

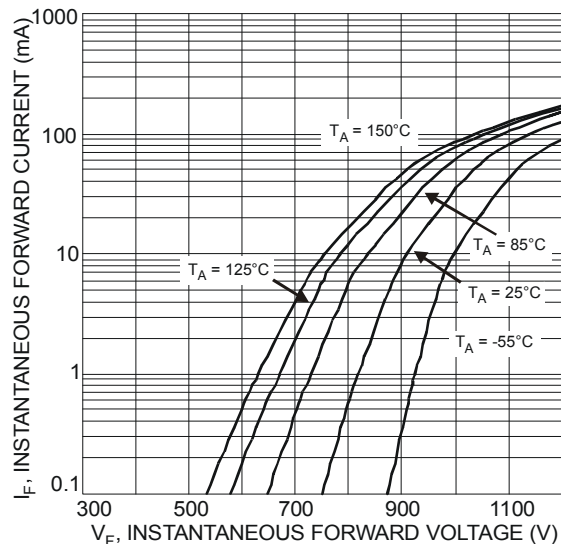


Figure 4 Typical Forward Characteristics

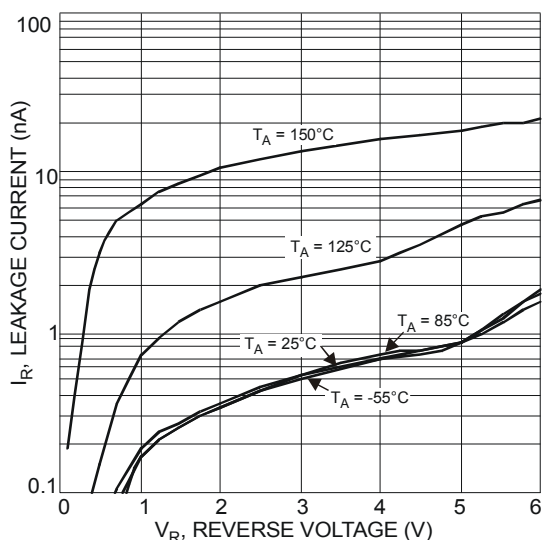


Figure 5 Typical Reverse Characteristics

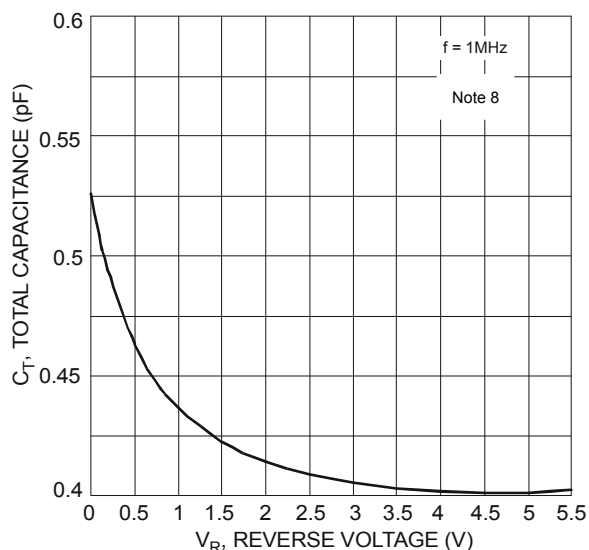
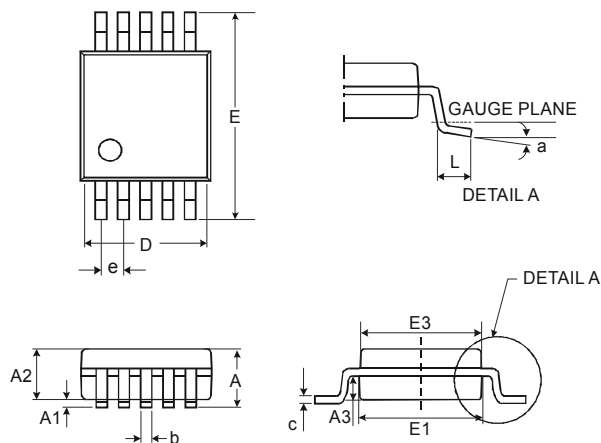


Figure 6 Total Capacitance vs. Reverse Voltage

## Package Outline Dimensions

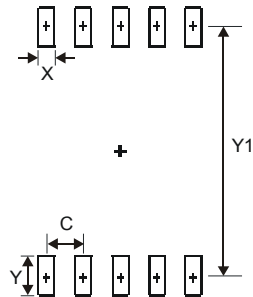
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| MSOP-10              |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| a                    | 0°   | 8°   | 4°   |
| A                    | -    | 1.10 | -    |
| A1                   | 0.05 | 0.15 | 0.10 |
| A2                   | 0.75 | 0.95 | 0.86 |
| A3                   | 0.29 | 0.49 | 0.39 |
| b                    | 0.17 | 0.33 | 0.20 |
| c                    | 0.08 | 0.23 | 0.15 |
| D                    | 2.90 | 3.10 | 3.00 |
| e                    | -    | -    | 0.50 |
| E                    | 4.70 | 5.10 | 4.90 |
| E1                   | 2.90 | 3.10 | 3.00 |
| E3                   | 2.85 | 3.05 | 2.95 |
| L                    | 0.40 | 0.80 | 0.60 |
| All Dimensions in mm |      |      |      |

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 5.300         |
| X          | 0.300         |
| Y          | 1.350         |
| Y1         | 0.500         |

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