


4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY

Features

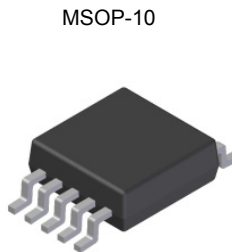
- IEC 61000-4-2 (ESD): Air – ±15kV, Contact – ±8kV
- 4 Channels of ESD protection
- Low Channel Input Capacitance of 0.5pF Typical
- Typically Used at High Speed Ports such as USB 2.0, USB 3.0, IEEE1394, Serial ATA, DVI, HDMI, PCI
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen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

Mechanical Data

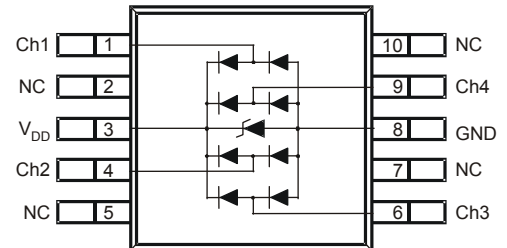
- Case: MSOP-10
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 
- Weight: 0.026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

| Pin # | Description |
|-------------|-------------------------|
| 1, 4, 6, 9 | Inputs |
| 2, 5, 7, 10 | No Connection |
| 8 | V _N , Ground |
| 3 | V _p , Power |

Pin Description



Top View



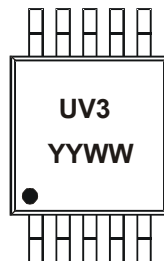
Device Schematic

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 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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | Conditions |
|------------------------------------|--------------------|----------|------|-----------------------------------|
| Peak Pulse Current | I_{PP} | 3 | A | 8/20 μs , Per Figure 3 |
| ESD Protection – Contact Discharge | $V_{ESD_Contact}$ | ± 8 | kV | Standard IEC 61000-4-2 |
| ESD Protection – Air Discharge | V_{ESD_Air} | ± 15 | kV | Standard IEC 61000-4-2 |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------|-------------|--------------------|
| Power Dissipation (Note 5) | P_D | 500 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | 250 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -65 to +150 | $^\circ\text{C}$ |

Electrical Characteristics (@ $T_A = +25^\circ\text{C}$ unless otherwise specified)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|--|-----------|-----|-----|------|----------|---|
| Reverse Working Voltage | V_{RWM} | — | — | 5.5 | V | — |
| Reverse Current (Note 6) | I_R | — | — | 200 | nA | $V_R = 5.5\text{V}$ |
| Reverse Breakdown Voltage | V_{BR} | 6.0 | — | — | V | $I_R = 1\text{mA}$ |
| Reverse Clamping Voltage, Positive Transients (Note 7) | V_{CL} | — | 10 | 12 | V | $I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$ |
| Dynamic Resistance | R_{DYN} | — | 1.0 | — | Ω | $I_R = 1\text{A}, t_p = 8/20\mu\text{s}$ |
| Capacitance (Note 8) | C_T | — | 0.4 | 0.65 | pF | $V_R = 2.5\text{V}, f = 1\text{MHz}$ |
| | | — | 0.5 | — | pF | $V_R = 0\text{V}, f = 1\text{MHz}$ |

- 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 8x20 μs peak pulse current (I_{PP}) 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.

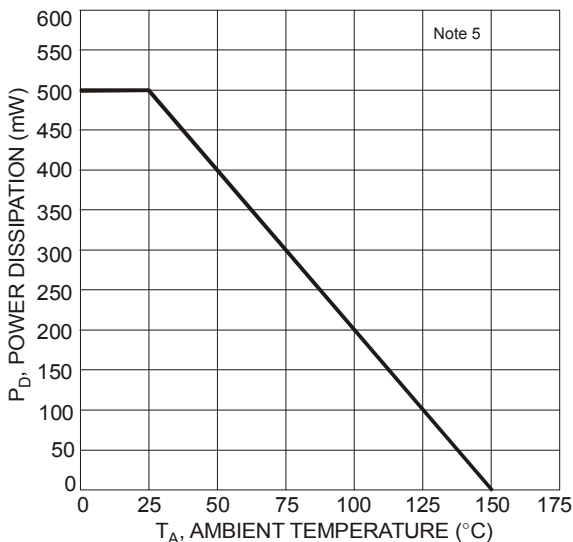


Figure 1 Power Derating Curve

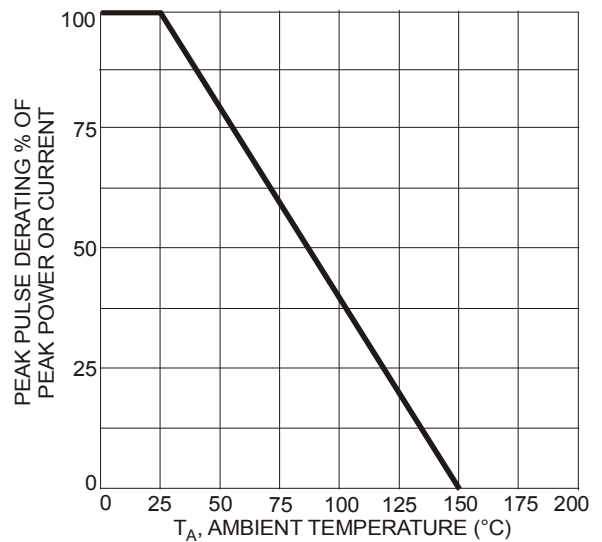


Figure 2 Pulse Derating Curve

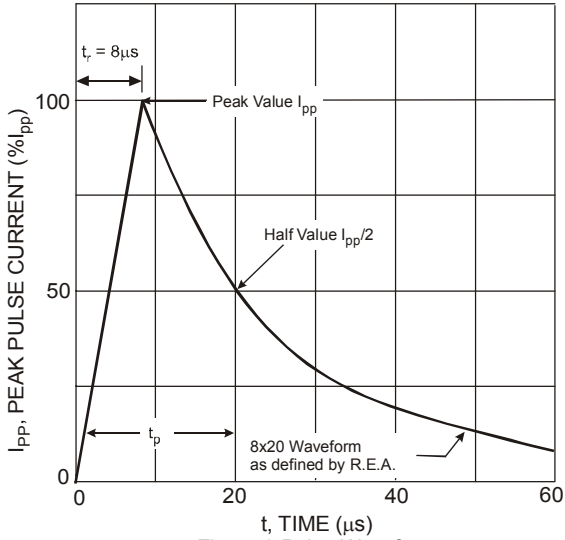


Figure 3 Pulse Waveform

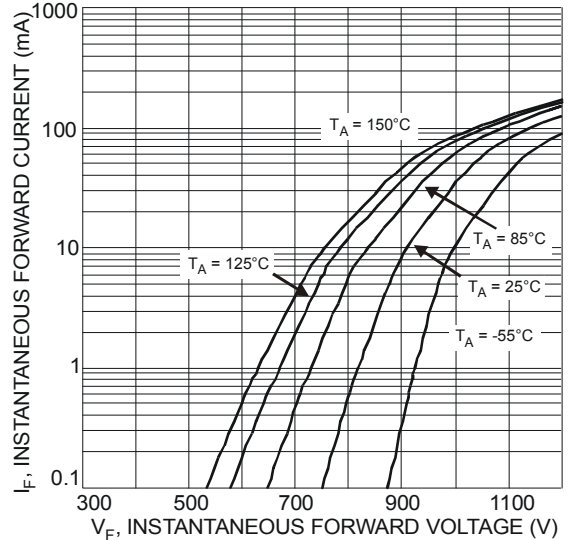


Figure 4 Typical Forward Characteristics

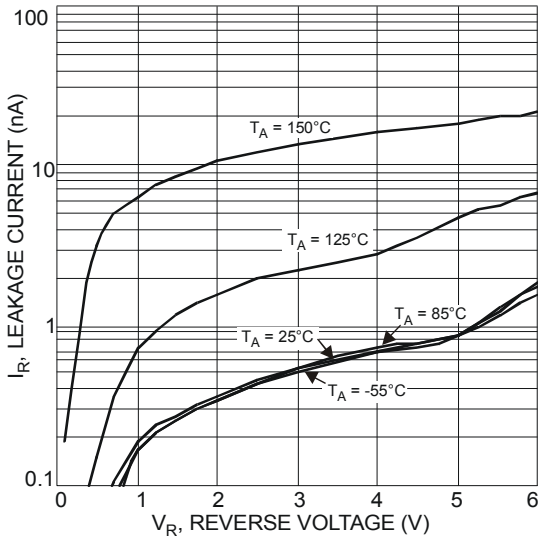


Figure 5 Typical Reverse Characteristics

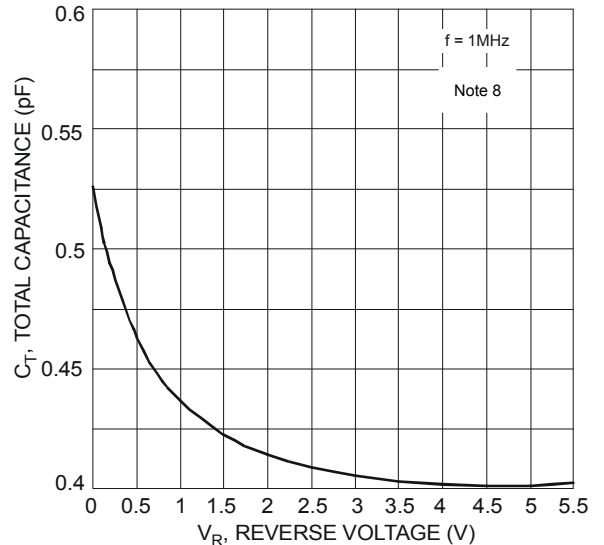
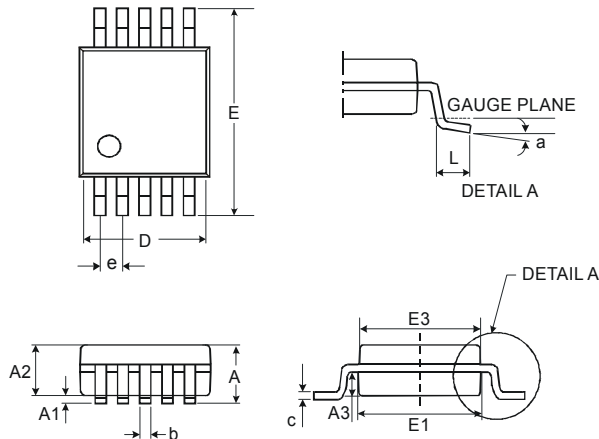


Figure 6 Total Capacitance vs. Reverse Voltage

Package Outline Dimensions

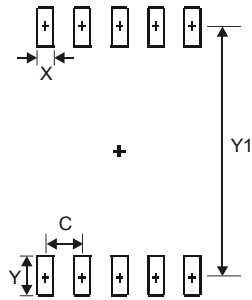
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| 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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