

4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY
Product Summary

| V _{BR} (Min) | I _{PP} (Max) | C _T (Typ) |
|-----------------------|-----------------------|----------------------|
| 5V | 5.5A | 0.55pF |

Description

The DT1240A-04LP is a high-performance device suitable for protecting four high-speed I/Os. These devices are assembled in U-DFN2510-10 and U-DFN2510-10 (Type CJ) packages and have high ESD surge capability and low capacitance.

Applications

Typically used at high-speed ports such as USB2.0, USB3.0, USB3.1, IEEE1394 (Firewire[®]), iLink, Serial ATA, DVI[™], HDMI[™]1.4, HDMI[™]2.0 and PCI[™].

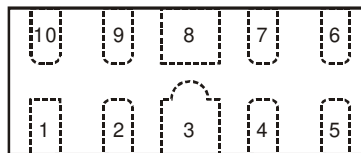
Features

- Clamping Voltage: 7.5V at 10A 100ns, TLP 8.2V at 5.5A (8μs/20μs)
- IEC 61000-4-2 (ESD): Air – ±16kV, Contact – ±14kV
- IEC 61000-4-5 (Lighting): 5.5A (8/20μs)
- 4 Channels of ESD Protection
- Low Channel Input Capacitance of 0.55pF Typical
- TLP Dynamic Resistance: 0.2Ω
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

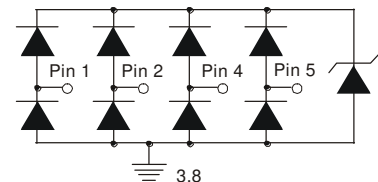
Mechanical Data

- Case: U-DFN2510-10
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Schematic
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208 **e4**
- Weight: 0.038 grams (Approximate)

| Pin # | Description |
|-------------|-----------------|
| 1, 2, 4, 5 | I/O |
| 6, 7, 9, 10 | No Connection |
| 3, 8 | V _{SS} |



Pin Description (Top View)



Device Schematic

Ordering Information (Note 4)

| Part Number | Compliance | Marking Code | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|----------------|------------|--------------|--------------------|-----------------|-------------------|
| DT1240A-04LP-7 | Standard | QE5 | 7 | 8 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

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Marking Information



QE5 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: 1 = 2021)
 M = Month (ex: 9 = September)



QE5 = Product Type Marking Code
 YWX = Date Code Marking
 Y = Year (ex: 1 = 2021)
 W = Week
 (ex: a = Week 27; z Represents Week 52 and 53)
 X = Internal Code (ex: U = Monday)

Date Code Key for YM

| | | | | | | | | | | | | |
|--------------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Year | 2016 | ... | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
| Code | D | ... | I | J | K | L | M | N | O | P | R | S |
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

Date Code Key for YWX

| | | | | | | | | | | | | |
|----------------------|------|-----|------|------|-------|------|------|------|------|------|------|------|
| Year | 2016 | ... | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
| Code | 6 | ... | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |
| Week | 1-26 | | | | 27-52 | | | | 53 | | | |
| Code | A-Z | | | | a-z | | | | z | | | |
| Internal Code | Sun | Mon | Tue | Wed | Thu | Fri | Sat | | | | | |
| Code | T | U | V | W | X | Y | Z | | | | | |

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit | Condition |
|---|--------------------------|-------------|------|---------------------------------|
| Peak Pulse Current, per IEC 61000-4-5 | I _{PP} | 5.5 | A | I/O to V _{SS} , 8/20μs |
| Peak Pulse Power, per IEC 61000-4-5 | P _{PP} | 52 | W | I/O to V _{SS} , 8/20μs |
| Operating Voltage (DC) | V _{DC} | 3.6 | V | I/O to V _{SS} |
| ESD Protection – Contact Discharge, per IEC 61000-4-2 | V _{ESD_CONTACT} | ±14 | kV | I/O to V _{SS} |
| ESD Protection – Air Discharge, per IEC 61000-4-2 | V _{ESD_AIR} | ±16 | kV | I/O to V _{SS} |
| Operating Temperature | T _{OP} | -55 to +85 | °C | — |
| Storage Temperature | T _{STG} | -55 to +150 | °C | — |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|------------------|-------|------|
| Power Dissipation Typical (Note 5) | P _D | 350 | mW |
| Thermal Resistance, Junction to Ambient Typical (Note 5) | R _{θJA} | 360 | °C/W |

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|-----------------------------------|--|------|-------|------|------|--|
| Reverse Working Voltage | V _{RWM} | — | — | 3.3 | V | — |
| Reverse Current | I _R | — | — | 1.0 | μA | V _R = 3.3V, I/O to V _{SS} |
| Reverse Breakdown Voltage | V _{BR} | 5 | — | — | V | I _R = 1mA, I/O to V _{SS} |
| Forward Clamping Voltage | V _F | -1.0 | -0.85 | — | V | I _F = -15mA, I/O to V _{SS} |
| Reverse Clamping Voltage (Note 6) | V _C | — | 8.2 | 9.5 | V | I _{PP} = 5.5A, I/O to V _{SS} , 8/20μs |
| ESD Clamping Voltage | V _{ESD} | — | 7.5 | — | V | TLP, 10A, t _P = 100ns, I/O to V _{SS} |
| Dynamic Reverse Resistance | R _{DIF-R} | — | 0.2 | — | Ω | TLP, 10A, t _P = 100ns, I/O to V _{SS} |
| Dynamic Forward Resistance | R _{DIF-F} | — | 0.2 | — | Ω | TLP, 10A, t _P = 100ns, V _{SS} to I/O |
| Channel Input Capacitance | C _{I/O} | — | 0.55 | 0.65 | pF | V _{I/O} = 2.5V, V _{SS} = 0V, f = 1MHz |
| Delta C _{I/O} | C _{I/OMAX} -C _{I/OMIN} | — | 0.04 | — | pF | C _{I/OMAX} -C _{I/OMIN} |

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's website at <http://www.diodes.com/package-outlines.html>.
 6. Clamping voltage value is based on an 8μs x20μs peak pulse current (I_{PP}) waveform.

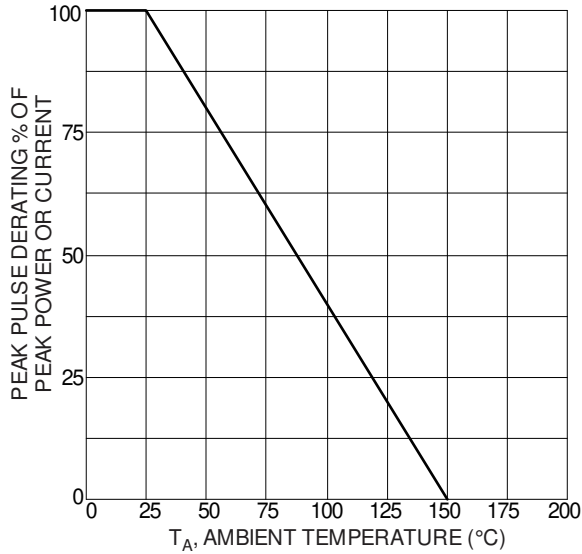


Figure 1 Pulse Derating Curve

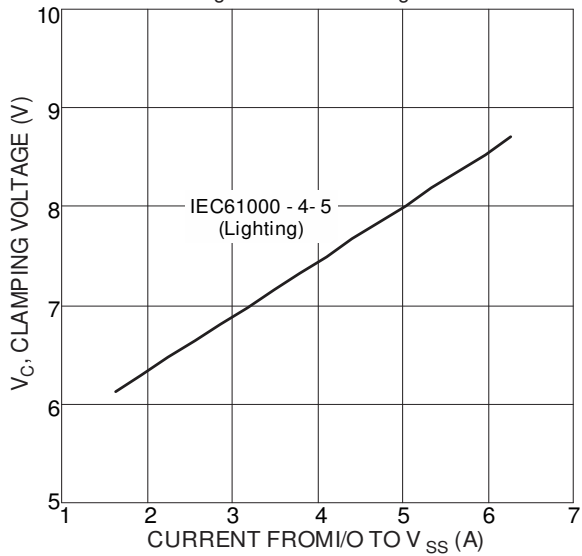


Figure 3 Clamping Voltage Characteristic

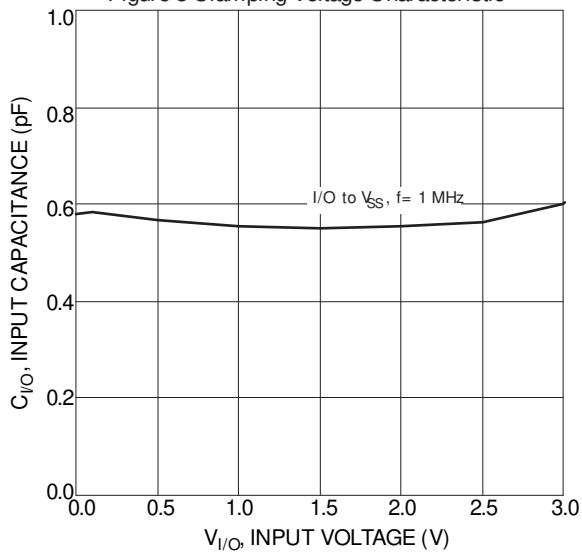


Figure 5 Input Capacitance vs. Input Voltage

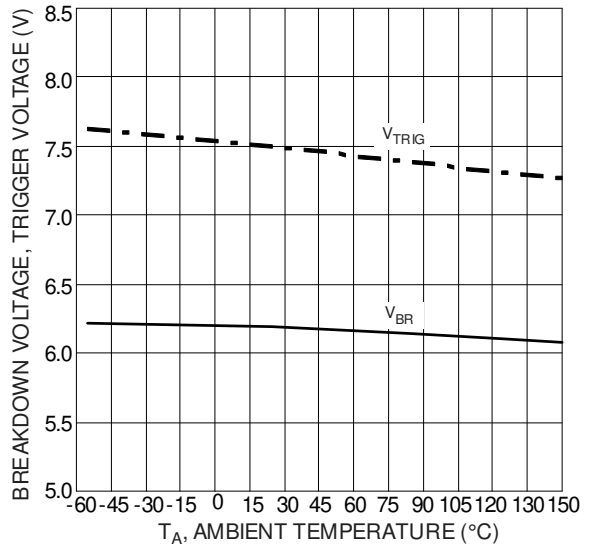


Figure 2 V_{BR} , Trigger Voltage vs. Ambient Temperature

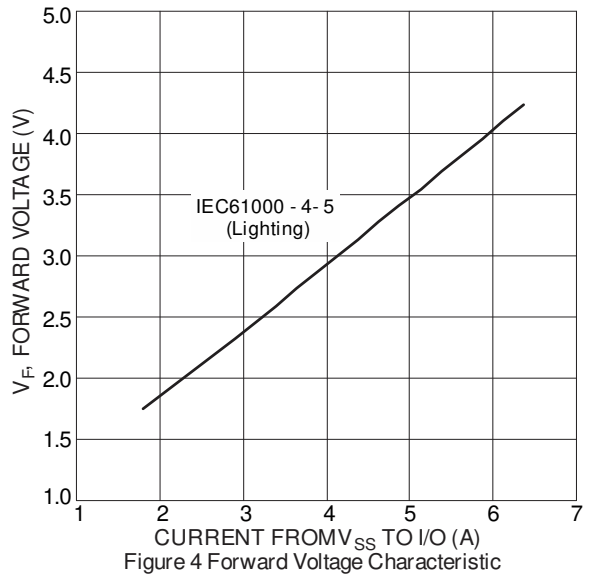


Figure 4 Forward Voltage Characteristic

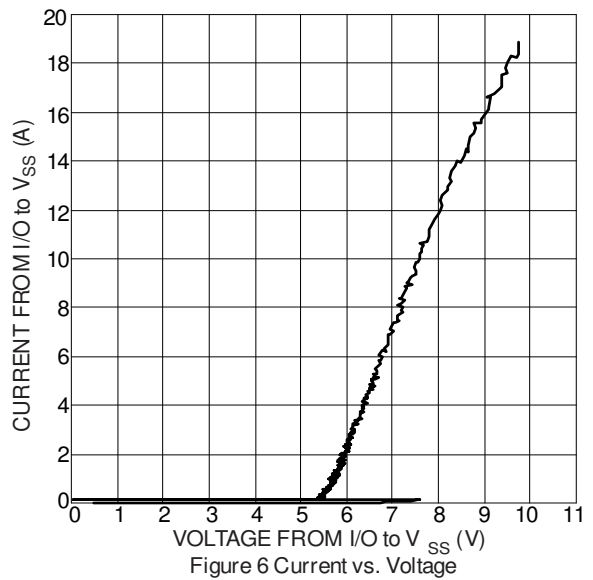
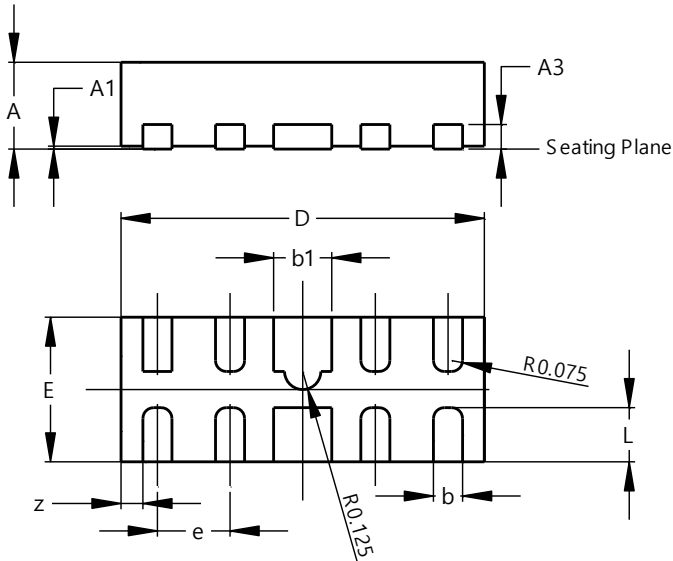


Figure 6 Current vs. Voltage

Package Outline Dimensions

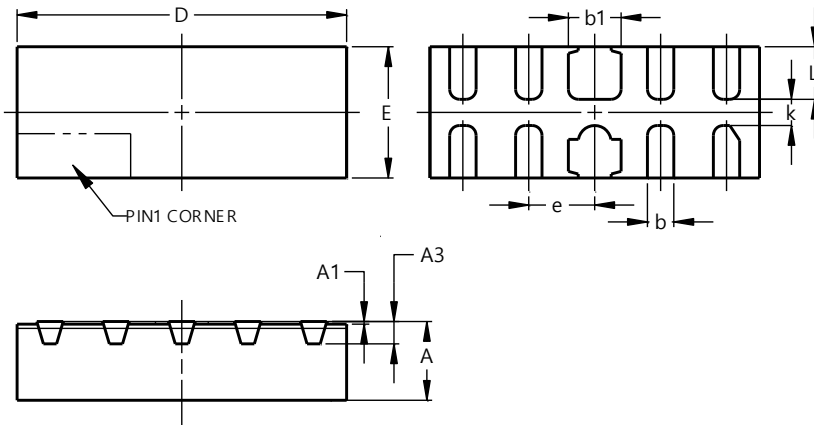
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

U-DFN2510-10



| U-DFN2510-10 | | | |
|-----------------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.545 | 0.605 | 0.575 |
| A1 | 0.00 | 0.05 | 0.03 |
| A3 | – | – | 0.13 |
| b | 0.15 | 0.25 | 0.20 |
| b1 | 0.35 | 0.45 | 0.40 |
| D | 2.450 | 2.575 | 2.500 |
| e | – | – | 0.50 |
| E | 0.950 | 1.075 | 1.000 |
| L | 0.325 | 0.425 | 0.375 |
| z | – | – | 0.150 |
| All Dimensions in mm | | | |

U-DFN2510-10 (Type CJ)

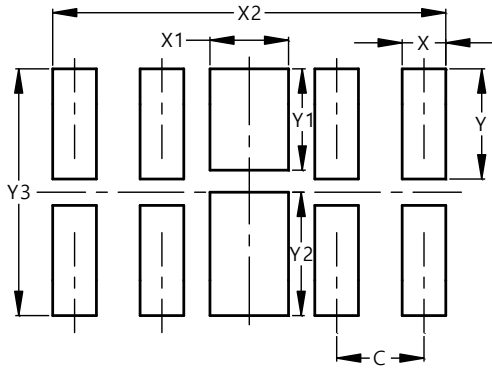


| U-DFN2510-10 (Type CJ) | | | |
|-----------------------------|----------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.545 | 0.605 | -- |
| A1 | 0.00 | 0.05 | -- |
| A3 | 0.152REF | | |
| b | 0.150 | 0.250 | -- |
| b1 | 0.350 | 0.450 | -- |
| D | 2.450 | 2.575 | -- |
| E | 0.950 | 1.075 | -- |
| e | -- | -- | 0.500 |
| E | 0.950 | 1.075 | 1.000 |
| L | 0.350 | 0.450 | -- |
| k | 0.200REF | | |
| All Dimensions in mm | | | |

Suggested Pad Layout

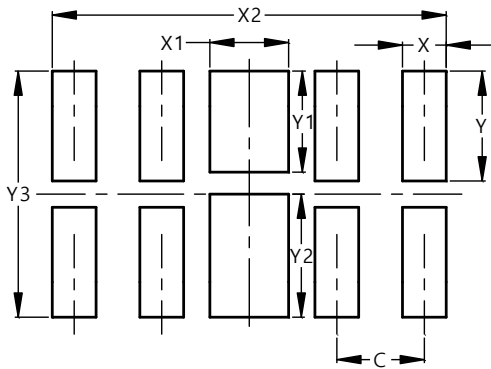
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

U-DFN2510-10



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.500 |
| X | 0.250 |
| X1 | 0.450 |
| X2 | 2.250 |
| Y | 0.625 |
| Y1 | 0.575 |
| Y2 | 0.700 |
| Y3 | 1.400 |

U-DFN2510-10 (Type CJ)



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.500 |
| X | 0.250 |
| X1 | 0.450 |
| X2 | 2.250 |
| Y | 0.625 |
| Y1 | 0.575 |
| Y2 | 0.700 |
| Y3 | 1.400 |

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