

4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY

Product Summary

| | | |
|-----------------------------|-----------------------------|-----------------------------|
| V_{BR} (Min) | I_{PP} (Max) | C_{IO} (Typ) |
| 5V | 5.5A | 0.55pF |

Description

The DT1240A-04LP20 is a high-performance device suitable for protecting four high speed I/Os. These devices are assembled in X2-DFN2010-8 (Type B) package 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™, HDMI1.4™, HDMI2.0™, PCI™.

Features

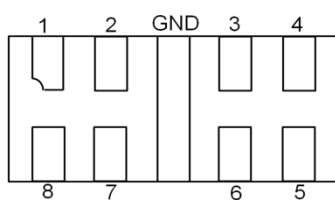
- Clamping Voltage: 7.5V at 10A 100ns, TLP 7V at 5.5A 8µs/20µs
- IEC 61000-4-2 (ESD): Air — ±16kV, Contact — ±14kV
- IEC 61000-4-5 (Lightning): 5.5A (8µs/20µs)
- 4 Channels of ESD Protection
- Low Channel Input Capacitance of 0.55pF Typical
- TLP Dynamic Resistance: 0.22Ω
- **Totally Lead-Free & Fully 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](#) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

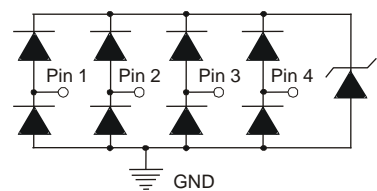
- Case: X2-DFN2010-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Schematic
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208
- Weight: 0.025 grams (Approximate)

X2-DFN2010-8 (Type B)

| Pin # | Description |
|------------|---------------|
| 1, 2, 3, 4 | I/O |
| 5, 6, 7, 8 | No Connection |



Pin Description (Bottom View)



Device Schematic

Ordering Information (Note 4)

| Part Number | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|------------------|------------|---------|--------------------|-----------------|-------------------|
| DT1240A-04LP20-7 | Standard | MU5 | 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

| |
|---------------|
| MU5 YM |
|---------------|

MU5 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: I = 2021)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2018 | ... | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code | F | ... | 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 |

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

| Characteristic | Symbol | Value | Unit | Conditions |
|---|--------------------------|-------------|------|---------------------------------|
| 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} | 38 | W | I/O to V _{SS} , 8/20μs |
| 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 | 360 | mW |
| Thermal Resistance, Junction to Ambient Typical (Note 5) | R _{θJA} | 350 | °C/W |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|-----------------------------------|--------------------|------|-------|------|------|--|
| 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 | — | 7 | 8.5 | 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} | — | 0.22 | — | Ω | TLP, 10A, t _P = 100ns, I/O to V _{SS} |
| Dynamic Forward Resistance | R _{DIF-F} | — | 0.22 | — | 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 |

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

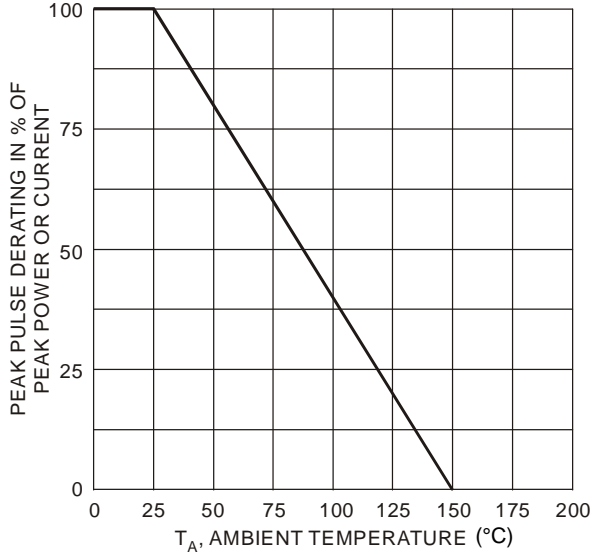


Figure 1 Pulse Derating Curve

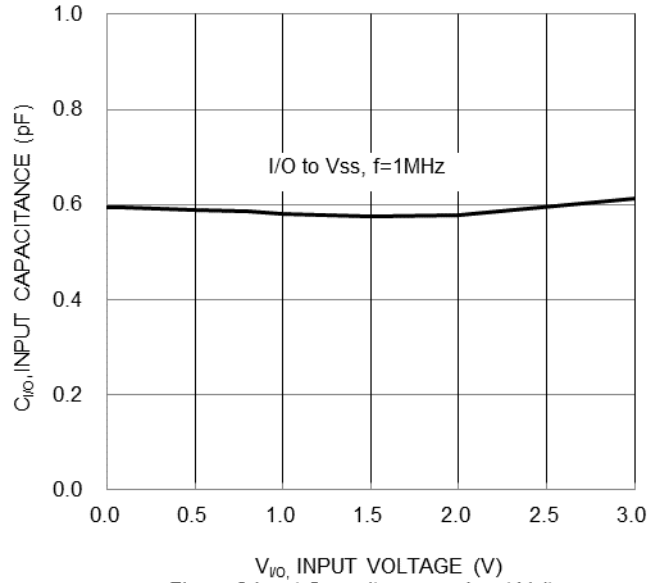


Figure 2 Input Capacitance vs. Input Voltage

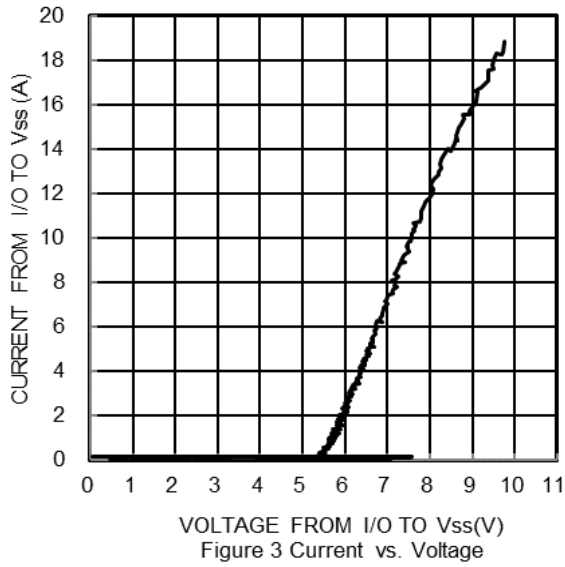
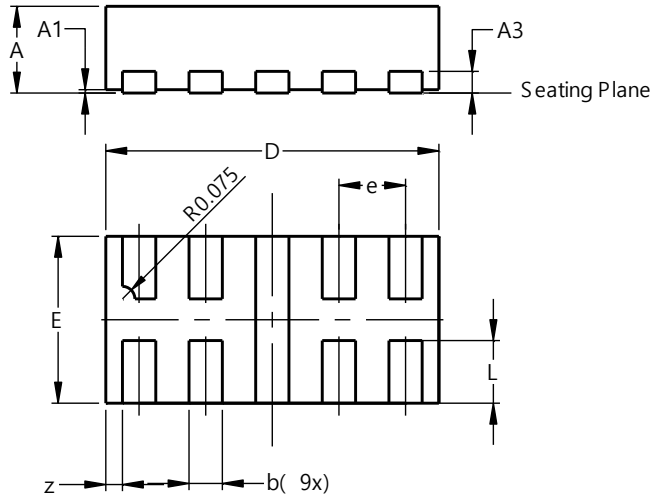


Figure 3 Current vs. Voltage

Package Outline Dimensions

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

X2-DFN2010-8 (Type B)

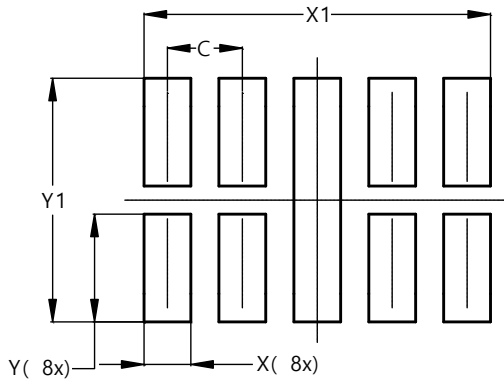


| X2-DFN2010-8 (Type B) | | | |
|--------------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | -- | 0.40 | -- |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | -- | -- | 0.13 |
| b | 0.15 | 0.25 | 0.20 |
| D | 1.950 | 2.075 | 2.000 |
| E | 0.950 | 1.075 | 1.000 |
| e | -- | -- | 0.40 |
| L | 0.325 | 0.425 | 0.375 |
| z | -- | -- | 0.10 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

X2-DFN2010-8 (Type B)



| Dimensions | Value (in mm) |
|------------|------------------|
| C | 0.400 |
| X | 0.250 |
| X1 | 1.850 |
| Y | 0.575 |
| Y1 | 1.300 |

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