

**4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY**
**Product Summary**

V <sub>BR</sub> (Min)	I <sub>PP</sub> (Max)	C <sub>T</sub> (Typ)
5V	5A	0.55pF

**Description**

The DT1240E-04LP is a high-performance device suitable for protecting four high-speed I/Os. These devices are assembled in U-DFN2510-10 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<sup>®</sup>, iLink), Serial ATA, DVI<sup>™</sup>, HDMI1.4<sup>™</sup>, HDMI2.0<sup>™</sup> and PCI.

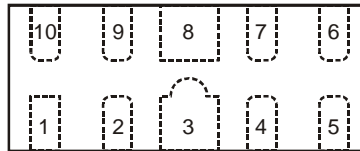
**Features**

- Clamping Voltage: 7.5V at 10A 100ns, TLP 8.2V at 5A (8μs/20μs)
- IEC 61000-4-2 (ESD): Air – ±14kV, Contact – ±12kV
- IEC 61000-4-5 (Lighting): 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)**

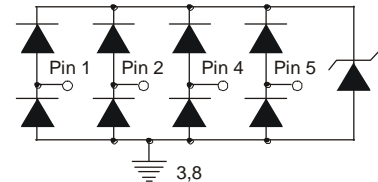
**Mechanical Data**

- Case: U-DFN2510-10
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Schematic
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208 <sup>(e4)</sup>
- Weight: 0.038 grams (Approximate)

Pin Number	Description
1, 2, 4, 5	I/O
6, 7, 9, 10	No Connection
3, 8	V <sub>SS</sub>



Pin Description (Top View)



Device Schematic

**Ordering Information** (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1240E-04LP-7	Standard	MW5	7	8	3,000/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**


MW5 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

## Date Code Key

Year	2016	2017	2018	2019	2020	2021
Code	D	E	F	G	H	I

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, per IEC 61000-4-5	I <sub>PP</sub>	5	A	I/O to V <sub>SS</sub> , 8/20μs
Peak Pulse Power, per IEC 61000-4-5	P <sub>PP</sub>	47	W	I/O to V <sub>SS</sub> , 8/20μs
ESD Protection – Contact Discharge, per IEC 61000-4-2	V <sub>ESD_CONTACT</sub>	±12	kV	I/O to V <sub>SS</sub>
ESD Protection – Air Discharge, per IEC 61000-4-2	V <sub>ESD_AIR</sub>	±14	kV	I/O to V <sub>SS</sub>
Operating Temperature	T <sub>OP</sub>	-55 to +85	°C	—
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C	—

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P <sub>D</sub>	350	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R <sub>θJA</sub>	360	°C/W

**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>	—	—	3.3	V	I <sub>R</sub> = 1mA, I/O to V <sub>SS</sub>
Reverse Current	I <sub>R</sub>	—	—	1.0	μA	V <sub>R</sub> = 3.3V, I/O to V <sub>SS</sub>
Reverse Breakdown Voltage	V <sub>BR</sub>	5	—	—	V	I <sub>R</sub> = 1mA, I/O to V <sub>SS</sub>
Forward Clamping Voltage	V <sub>F</sub>	-1.0	-0.85	—	V	I <sub>F</sub> = -15mA, I/O to V <sub>SS</sub>
Reverse Clamping Voltage (Note 6)	V <sub>C</sub>	—	8.2	9.5	V	I <sub>PP</sub> = 5A, I/O to V <sub>SS</sub> , 8/20μs
ESD Clamping Voltage	V <sub>ESD</sub>	—	7.5	—	V	TLP, 10A, t <sub>p</sub> = 100ns, I/O to V <sub>SS</sub>
Dynamic Reverse Resistance	R <sub>DIF-R</sub>	—	0.2	—	Ω	TLP, 10A, t <sub>p</sub> = 100ns, I/O to V <sub>SS</sub>
Dynamic Forward Resistance	R <sub>DIF-F</sub>	—	0.2	—	Ω	TLP, 10A, t <sub>p</sub> = 100ns, V <sub>SS</sub> to I/O
Channel Input Capacitance	C <sub>I/O</sub>	—	0.55	0.65	pF	V <sub>I/O</sub> = 2.5V, V <sub>SS</sub> = 0V, f = 1MHz
Delta C <sub>I/O</sub>	C <sub>I/OMAX</sub> -C <sub>I/OMIN</sub>	—	0.04	—	pF	C <sub>I/OMAX</sub> -C <sub>I/OMIN</sub>

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

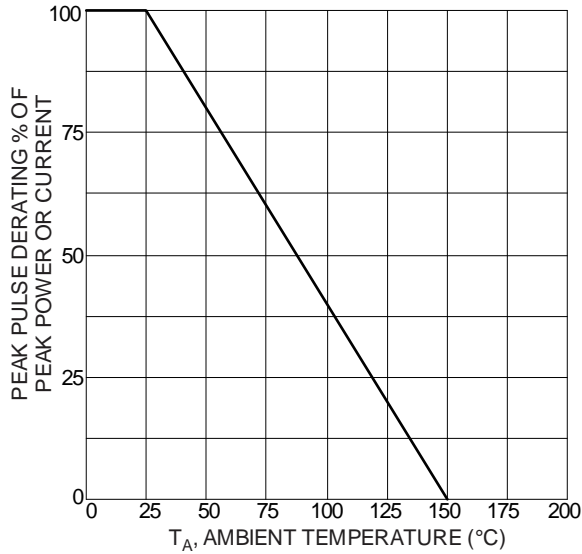


Figure 1 Pulse Derating Curve

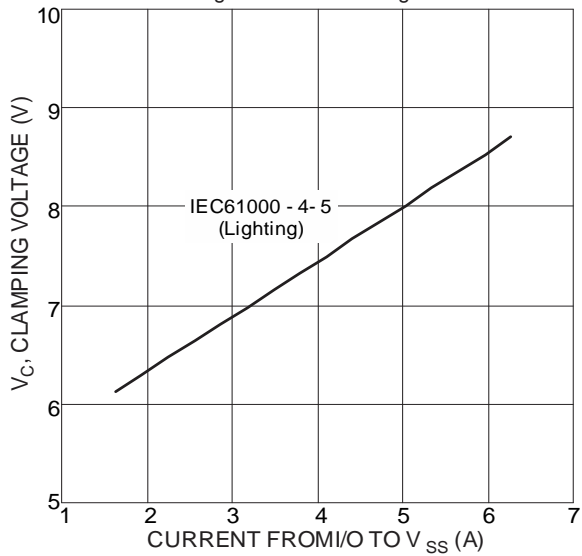


Figure 3 Clamping Voltage Characteristic

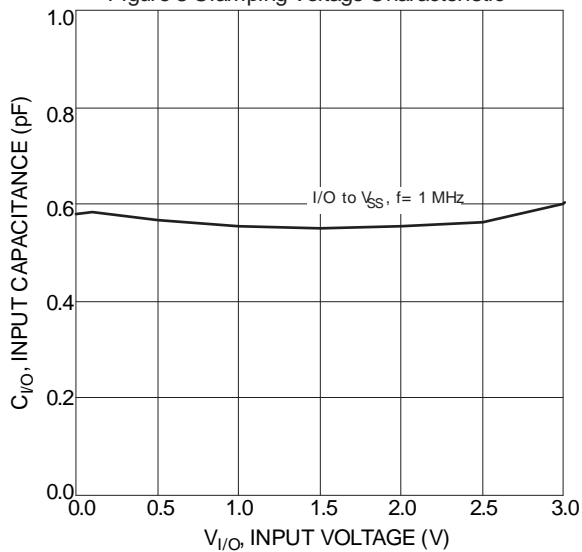


Figure 5 Input Capacitance vs. Input Voltage

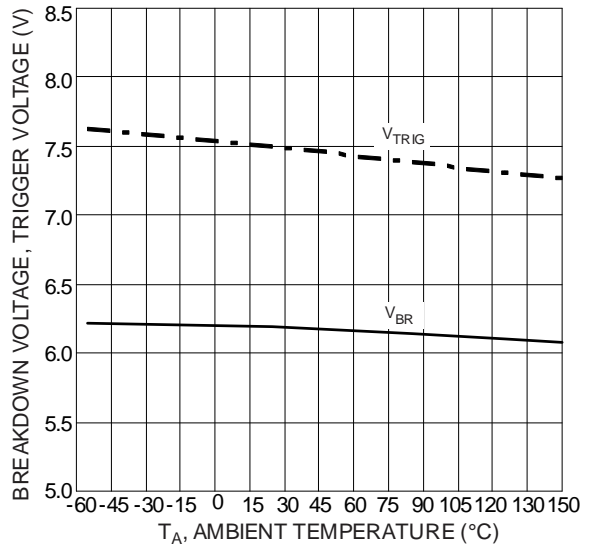


Figure 2 V<sub>BR</sub>, Trigger Voltage vs. Ambient Temperature

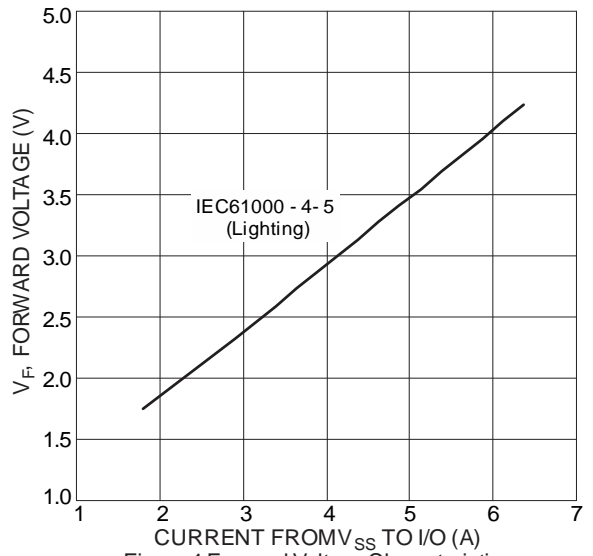


Figure 4 Forward Voltage Characteristic

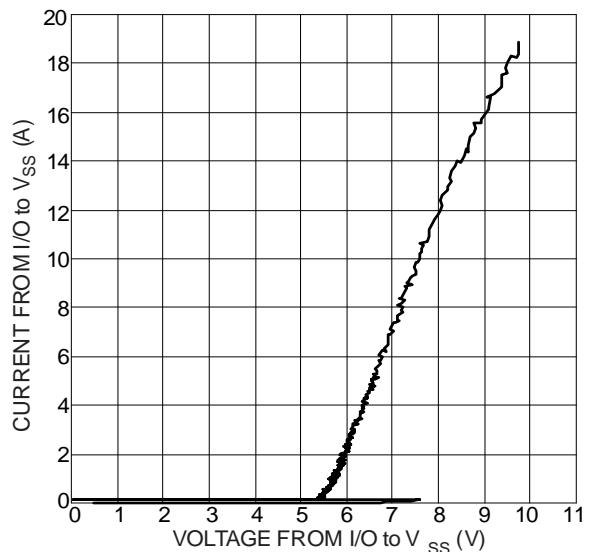
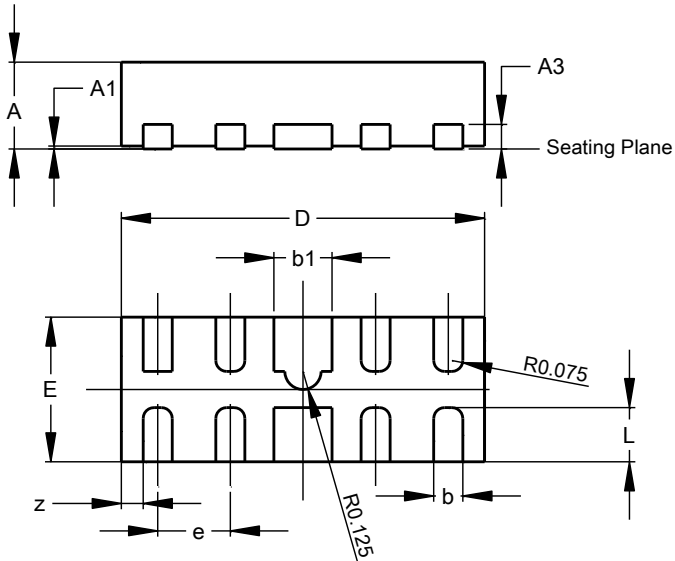


Figure 6 Current vs. Voltage

## Package Outline Dimensions

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

### U-DFN2510-10

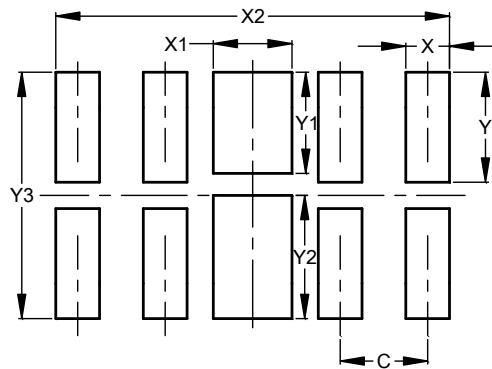


U-DFN2510-10			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.03
A3	-	-	0.13
b	0.15	0.25	0.20
b1	0.35	0.45	0.40
D	2.450	2.575	2.500
e	-	-	0.50
E	0.950	1.075	1.000
L	0.325	0.425	0.375
z	-	-	0.150
All Dimensions in mm			

## 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

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