

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 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™, HDMI1.4™, HDMI2.0™ and PCI.

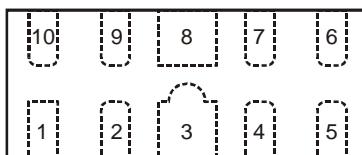
Features

- 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)

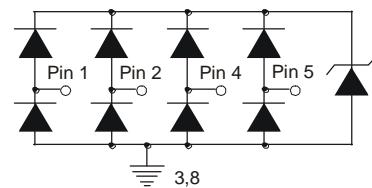
Mechanical Data

- 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 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)

Product	Compliance	Marking	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) 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



QE5 = Product Type Marking Code

YM = Date Code Marking

Y = Year (ex: D = 2016)

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

FireWire is a registered trademark of Apple Computer Inc.

DT1240A-04LP

Document number: DS38634 Rev. 4 – 2

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, 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} , 8/20 μs
Peak Pulse Power, per IEC 61000-4-5	P_{PP}	52	W	I/O to V_{SS} , 8/20 μs
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	$^\circ\text{C}$	—
Storage Temperature	T_{STG}	-55 to +150	$^\circ\text{C}$	—

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P_D	350	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	$R_{\theta JA}$	360	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V_{RWM}	—	—	3.3	V	$I_R=1\text{mA}$, I/O to V_{SS}
Reverse Current	I_R	—	—	1.0	μA	$V_R = 3.3\text{V}$, I/O to V_{SS}
Reverse Breakdown Voltage	V_{BR}	5	—	—	V	$I_R = 1\text{mA}$, I/O to V_{SS}
Forward Clamping Voltage	V_F	-1.0	-0.85	—	V	$I_F = -15\text{mA}$, I/O to V_{SS}
Reverse Clamping Voltage (Note 6)	V_C	—	8.2	9.5	V	$I_{PP} = 5.5\text{A}$, I/O to V_{SS} , 8/20 μs
ESD Clamping Voltage	V_{ESD}	—	7.5	—	V	TLP, 10A, $t_P = 100\text{ns}$, I/O to V_{SS}
Dynamic Reverse Resistance	R_{DIF-R}	—	0.2	—	Ω	TLP, 10A, $t_P = 100\text{ns}$, I/O to V_{SS}
Dynamic Forward Resistance	R_{DIF-F}	—	0.2	—	Ω	TLP, 10A, $t_P = 100\text{ns}$, V_{SS} to I/O
Channel Input Capacitance	$C_{I/O}$	—	0.55	0.65	pF	$V_{I/O} = 2.5\text{V}$, $V_{SS} = 0\text{V}$, $f = 1\text{MHz}$
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 8 μs x 20 μs peak pulse current (I_{PP}) waveform.

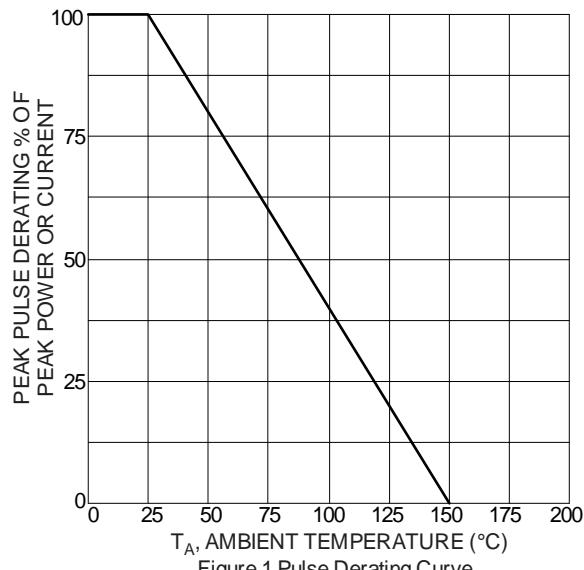


Figure 1 Pulse Derating Curve

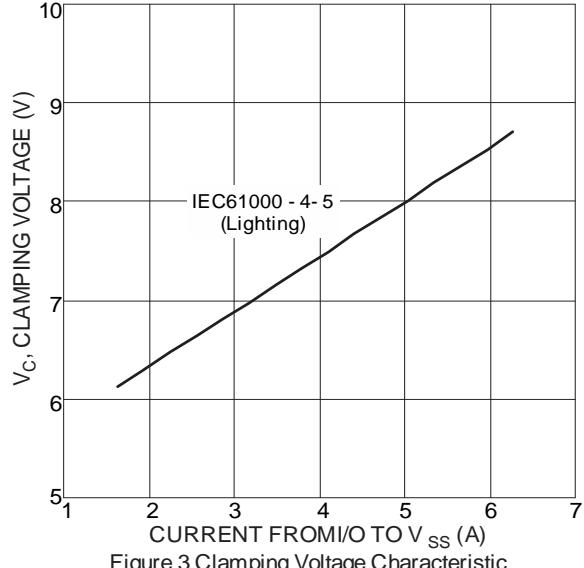


Figure 3 Clamping Voltage Characteristic

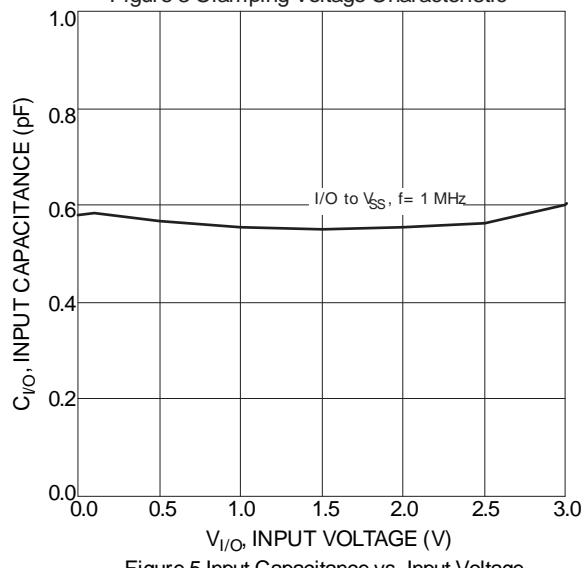


Figure 5 Input Capacitance vs. Input Voltage

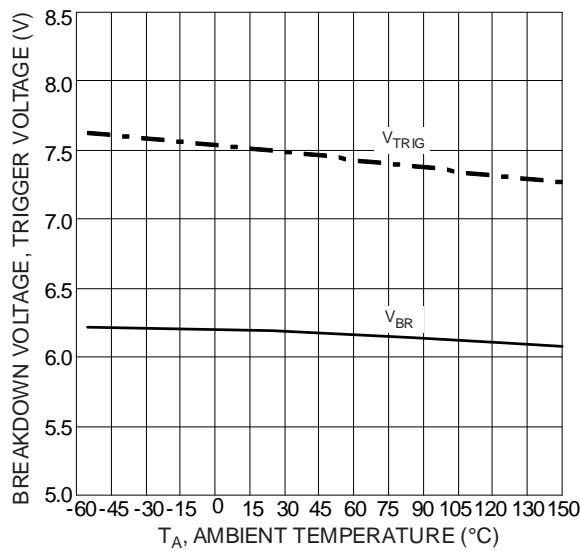


Figure 2 V_{BR}, Trigger Voltage vs. Ambient Temperature

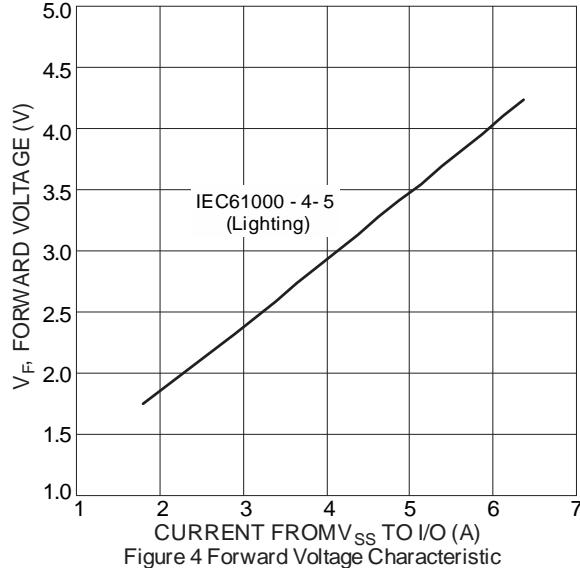


Figure 4 Forward Voltage Characteristic

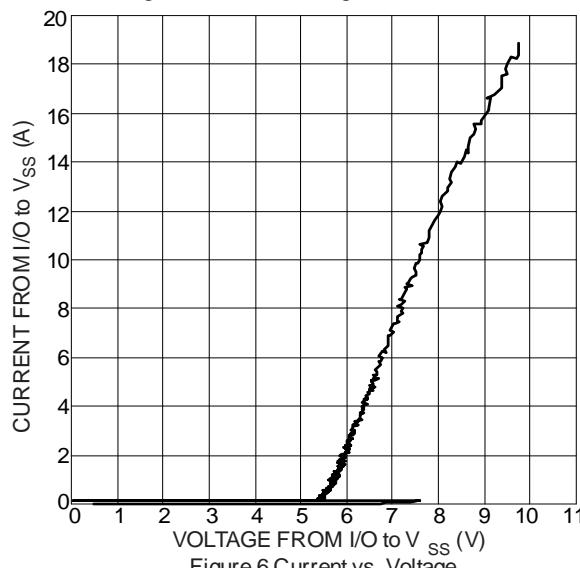
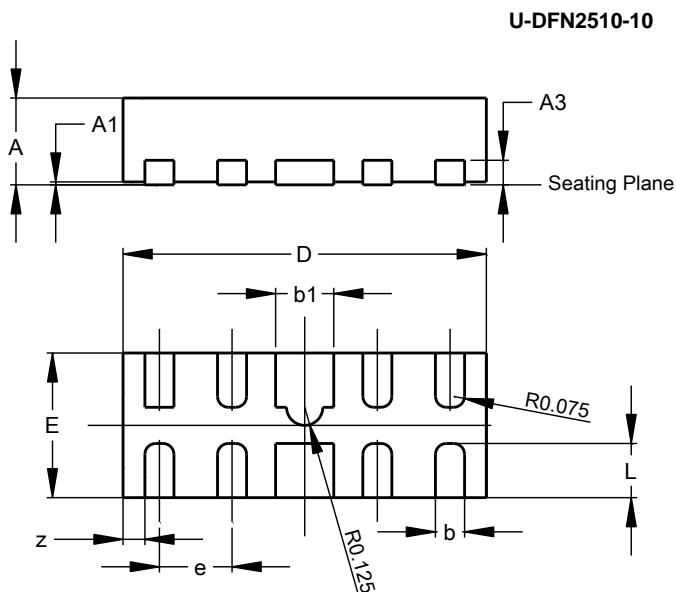


Figure 6 Current vs. Voltage

Package Outline Dimensions

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

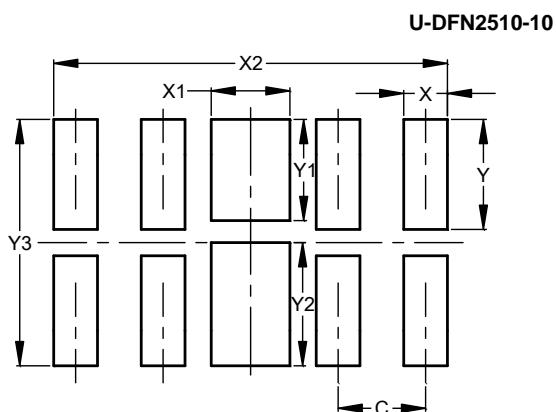


U-DFN2510-10			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.03
A3	—	—	0.13
b	0.15	0.25	0.20
b1	0.35	0.45	0.40
D	2.450	2.575	2.500
e	—	—	0.50
E	0.950	1.075	1.000
L	0.325	0.425	0.375
z	—	—	0.150

All Dimensions in mm

Suggested Pad Layout

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



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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