

## Product Summary

V <sub>BR</sub> (Min)	I <sub>PP</sub> (Max)	C <sub>io</sub> (Typ)
5V	5.5A	0.6pF

## Description

The DT1240A-08LP3810 is a high-performance device suitable for protecting four high-speed I/Os. These devices are assembled in U-DFN3810-9 (Type B) package and have high ESD surge capability and low capacitance.

## Applications

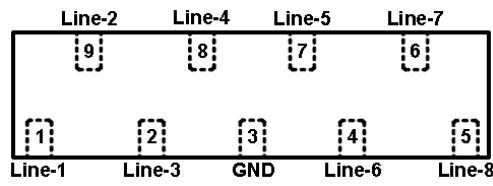
Typically used at high-speed ports such as USB2.0, USB3.0, USB3.1, IEEE1394 (Firewire®, iLink), Serial ATA, DVI™, HDMI1.4™, HDMI2.0™ and PCI™.

## Features

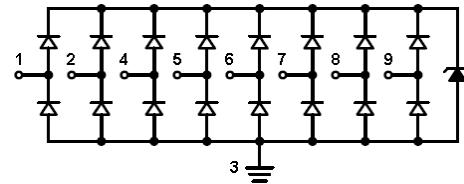
- Clamping Voltage: 8.2V at 10A 100ns, TLP; 7.5V at 5.5A (8μs/20μs)
- IEC 61000-4-2 (ESD): Air – ±16kV, Contact – ±14kV
- IEC 61000-4-5 (Lighting): 5.5A (8/20μs)
- 8 Channels of ESD Protection
- Low Channel Input Capacitance of 0.6pF Typical
- TLP Dynamic Resistance: 0.25Ω
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)

## Mechanical Data

- Case: U-DFN3810-9 (Type B)
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Schematic
- Terminals: Finish – NiPdAu, Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.005 grams (Approximate)



Pin Description (Top View)



Device Schematic

## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity
DT1240A-08LP3810-7	Standard	MW4	7	8	5,000/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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



MW4 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2017	2018	2019	2020	2021	2022
Code	E	F	G	H	I	J

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, per IEC 61000-4-5	$I_{PP}$	5.5	A	I/O to $V_{SS}$ , 8/20 $\mu\text{s}$
Peak Pulse Power, per IEC 61000-4-5	$P_{PP}$	55	W	I/O to $V_{SS}$ , 8/20 $\mu\text{s}$
ESD Protection – Contact Discharge, per IEC 61000-4-2	$V_{ESD\_CONTACT}$	$\pm 14$	kV	I/O to $V_{SS}$
ESD Protection – Air Discharge, per IEC 61000-4-2	$V_{ESD\_AIR}$	$\pm 16$	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 Conditions
Reverse Working Voltage	$V_{RWM}$	—	—	3.3	V	$I_R = 1\text{mA}$ , I/O to $V_{SS}$
Reverse Current	$I_R$	—	—	0.5	$\mu\text{A}$	$V_R = 3.3\text{V}$ , 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)	$V_C$	—	7.5	10	V	$I_{PP} = 5.5\text{A}$ , I/O to $V_{SS}$ , 8/20 $\mu\text{s}$
ESD Clamping Voltage	$V_{ESD}$	—	8.2	—	V	TLP, 10A, $t_p = 100\text{ns}$ , I/O to $V_{SS}$
Dynamic Reverse Resistance	$R_{DIF-R}$	—	0.25	—	$\Omega$	TLP, 10A, $t_p = 100\text{ns}$ , I/O to $V_{SS}$
Dynamic Forward Resistance	$R_{DIF-F}$	—	0.25	—	$\Omega$	TLP, 10A, $t_p = 100\text{ns}$ , $V_{SS}$ to I/O
Channel Input Capacitance	$C_{I/O}$	—	0.6	0.7	$\text{pF}$	$V_{I/O} = 1.65\text{V}$ , $V_{SS} = 0\text{V}$ , $f = 1\text{MHz}$
Delta $C_{I/O}$	$C_{I/OMAX} - C_{I/OMIN}$	—	0.04	—	$\text{pF}$	$C_{I/OMAX} - C_{I/OMIN}$

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 8x20 $\mu\text{s}$  peak pulse current ( $I_{PP}$ ) waveform.

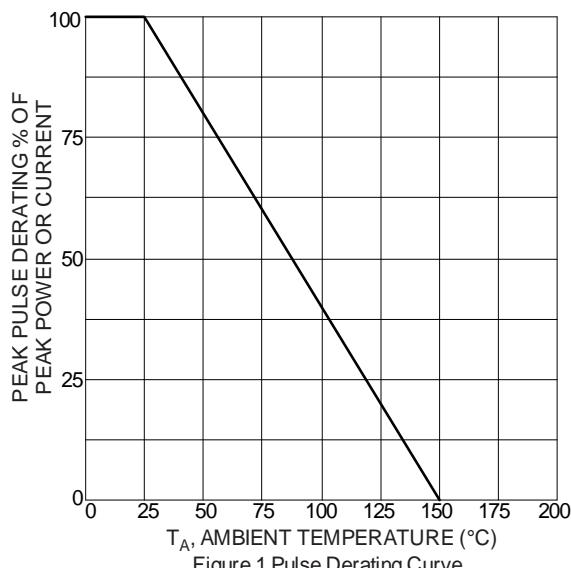


Figure 1 Pulse Derating Curve

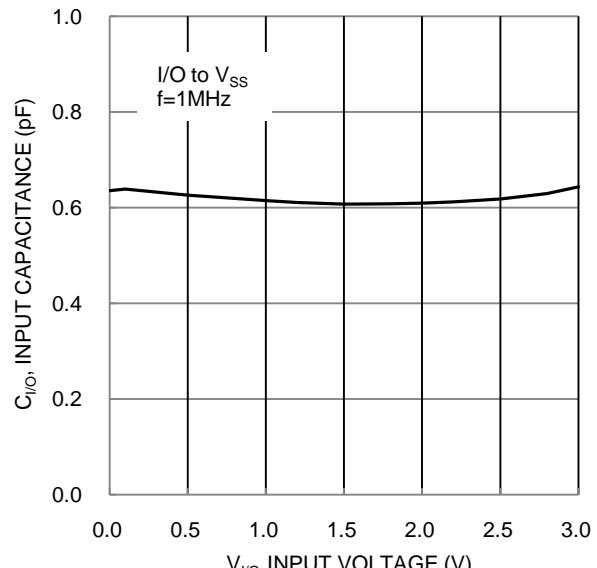


Figure 2 Input Capacitance vs. Input Voltage

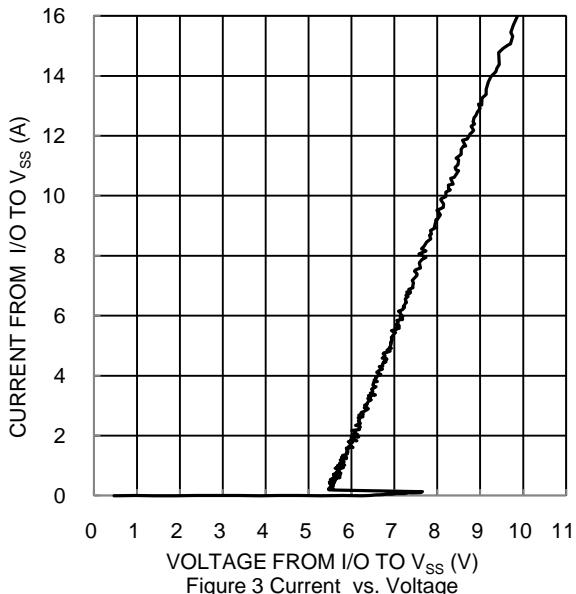
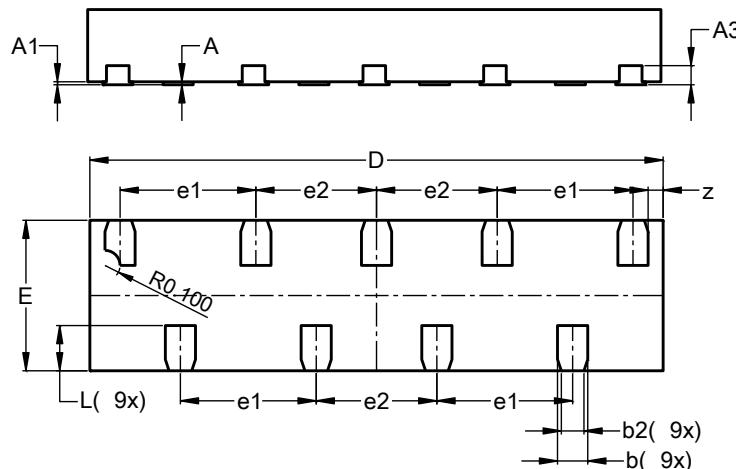


Figure 3 Current vs. Voltage

## Package Outline Dimensions

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

U-DFN3810-9 (Type B)



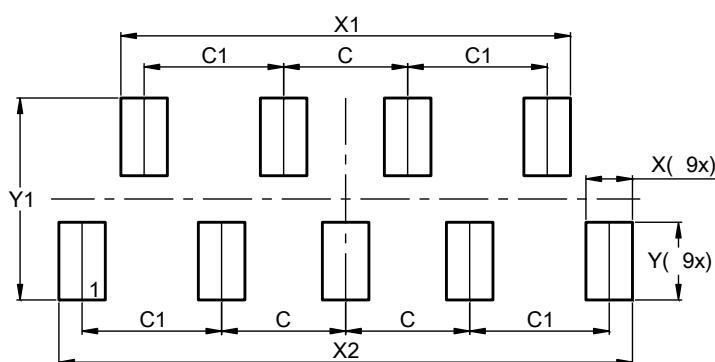
U-DFN3810-9 (Type B)			
Dim	Min	Max	Typ
A	0.45	0.55	0.50
A1	0.00	0.05	0.02
A3	--	--	0.127
b	0.15	0.25	0.20
b2	0.10	0.20	0.15
D	3.75	3.85	3.80
E	0.95	1.05	1.00
e1	--	--	0.90
e2	--	--	0.80
L	0.25	0.35	0.30
z	--	--	0.10

All Dimensions in mm

## Suggested Pad Layout

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

U-DFN3810-9 (Type B)



Dimensions	Value (in mm)
C	0.800
C1	0.900
X	0.300
X1	2.900
X2	3.700
Y	0.500
Y1	1.300

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