

## Product Summary

<b>V<sub>BR</sub> (Min)</b>	<b>IPP (Max)</b>	<b>C<sub>I/O</sub> (Typ)</b>
5.5V	3	0.45pF

## Description

The D3V3X8U9LP3810 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, low ESD clamping voltage and ultra-low capacitance.

## Applications

Typically used at high-speed ports such as USB 3.0, USB 3.1, Serial ATA, Display port.

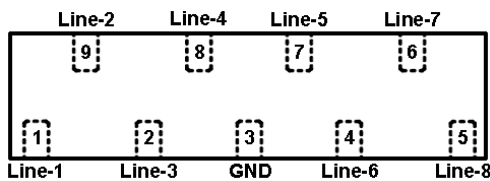
## Features

- Clamping Voltage: 7V at 16A TLP
- IEC 61000-4-2 (ESD): Air — ±10kV, Contact — ±8kV
- IEC 61000-4-5 (Lightning): 3A (8/20μs)
- 8 Channels of ESD Protection
- Ultra-Low Channel Input Capacitance of 0.45pF Typical
- TLP Dynamic Resistance: 0.3Ω
- **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/>

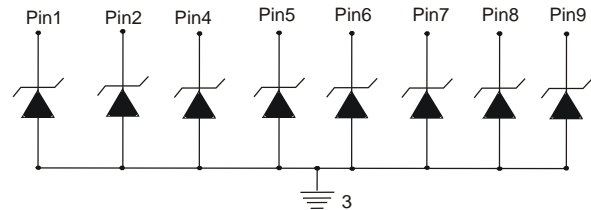
## Mechanical Data

- Case: U-DFN3810-9
- 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 @4
- Weight: 0.005 grams (Approximate)

U-DFN3810-9 (Type B)



Pin Description (Top View)



Device Schematic

## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity
D3V3X8U9LP3810-7	Standard	MW6	7	8	5,000/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/>.

## Marking Information

U-DFN3810-9 (Type B)



MW6 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2017	...	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Code	E	...	H	I	J	K	L	M	N	O	P	R

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>	3	A	I/O to V <sub>SS</sub> , 8/20μs
Peak Pulse Power, per IEC 61000-4-5	P <sub>PP</sub>	20	W	I/O to V <sub>SS</sub> , 8/20μs
ESD Protection – Contact Discharge, per IEC 61000-4-2	V <sub>ESD_CONTACT</sub>	±8	kV	I/O to V <sub>SS</sub>
ESD Protection – Air Discharge, per IEC 61000-4-2	V <sub>ESD_AIR</sub>	±10	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>	5.5	7.0	—	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>
Holding Reverse Voltage	V <sub>HOLD</sub>	—	1.19	—	V	I/O to V <sub>SS</sub>
Holding Reverse Current	I <sub>HOLD</sub>	—	90	—	mA	I/O to V <sub>SS</sub>
Clamping Voltage (Note 6)	V <sub>C</sub>	—	7	—	V	TLP, 16A, t <sub>p</sub> = 100ns, I/O to V <sub>SS</sub>
Clamping Voltage (Note 6)	V <sub>C</sub>	—	7	—	V	TLP, -16A, t <sub>p</sub> = 100ns, I/O to V <sub>SS</sub>
Dynamic Reverse Resistance	R <sub>DIF-R</sub>	—	0.3	—	Ω	TLP, 10A, t <sub>p</sub> = 100ns, I/O to V <sub>SS</sub>
Dynamic Forward Resistance	R <sub>DIF-F</sub>	—	0.25	—	Ω	TLP, 10A, t <sub>p</sub> = 100ns, V <sub>SS</sub> to I/O
Channel Input Capacitance	C <sub>I/O</sub>	—	0.45	—	pF	V <sub>I/O</sub> = 0V, V <sub>SS</sub> = 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 a TLP model. TLP conditions: Z<sub>0</sub>=50Ω, t<sub>p</sub> = 100ns, averaging window; t<sub>1</sub>=70ns to t<sub>2</sub>=90ns.

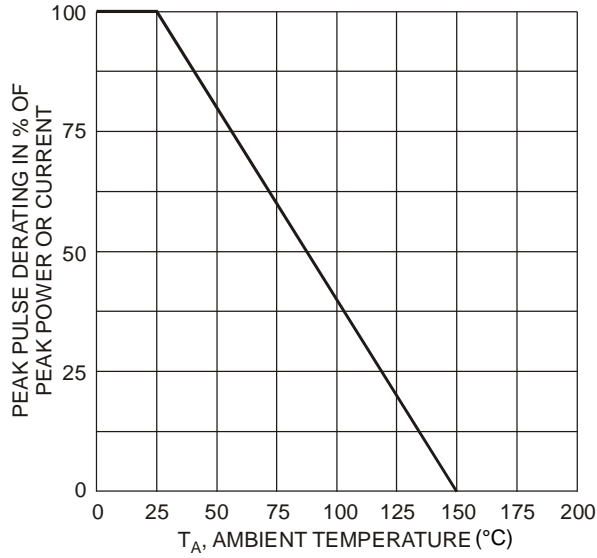


Figure 1 Pulse Derating Curve

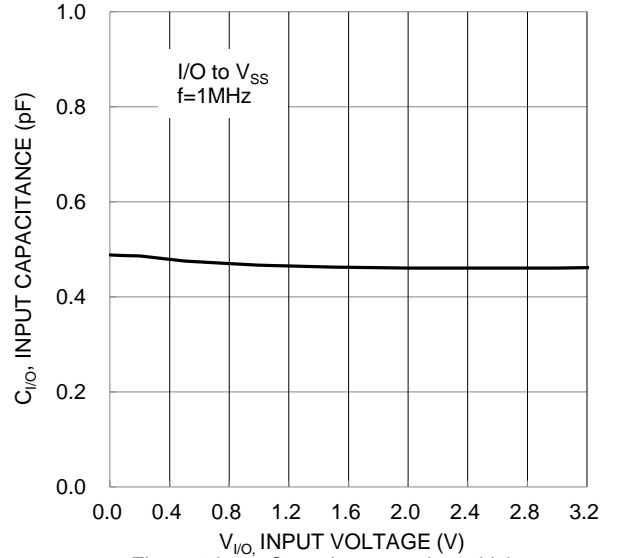


Figure 2 Input Capacitance vs. Input Voltage

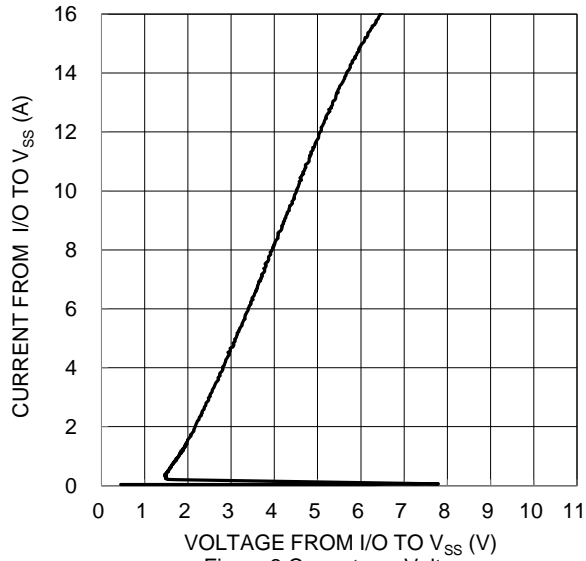
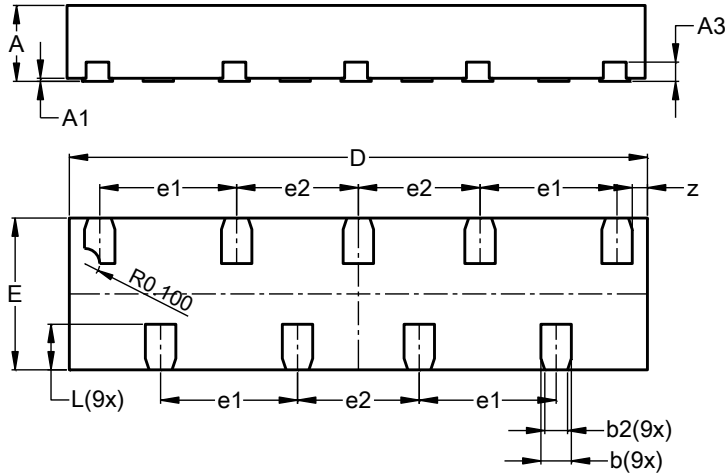


Figure 3 Current vs. Voltage

**Package Outline Dimensions**

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

**U-DFN3810-9 (Type B)**

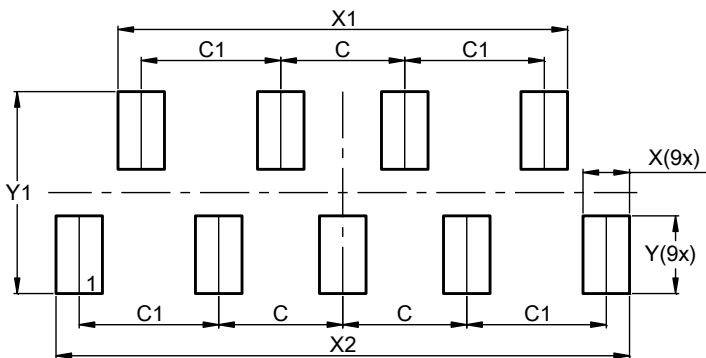


U-DFN3810-9 (Type B)			
Dim	Min	Max	Typ
A	0.45	0.55	0.50
A1	0.00	0.05	0.02
A3	--	--	0.127
b	0.15	0.25	0.20
b2	0.10	0.20	0.15
D	3.75	3.85	3.80
E	0.95	1.05	1.00
e1	--	--	0.90
e2	--	--	0.80
L	0.25	0.35	0.30
z	--	--	0.10
All Dimensions in mm			

**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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