

## Product Summary

V <sub>BR</sub> (MIN)	I <sub>PP</sub> (MAX)	C <sub>I/O</sub> (TYP)
5.5V	5	0.5pF

## Description

The D3V3F4U10LPQ 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, 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 ports.

## Features

- Clamping Voltage: 5V at 16A IEC61000-4-2
- IEC61000-4-2 (ESD): Air — ±12kV, Contact — ±12kV
- IEC61000-4-5 (Lightning): 5A (8/20μs)
- 4 Channels of ESD Protection
- Ultra-Low Channel Input Capacitance of 0.5pF Typical
- TLP Dynamic Resistance: 0.25Ω
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- The D3V3F4U10LPQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

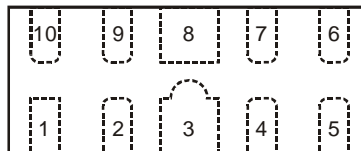
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

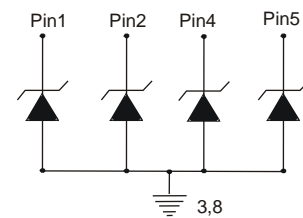
- Package: U-DFN2510-10
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 
- Weight: 0.004 grams (Approximate)

U-DFN2510-10

Pin #	Description
1, 2, 4, 5	I/O
6, 7, 9, 10	No Connection
3, 8	Vss



Pin Description (Top View)



Device Schematic

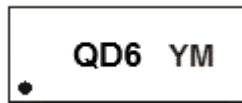
## Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
D3V3F4U10LPQ-7	U-DFN2510-10	QD6	7	8	3,000	Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  - 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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

Option A:



QD6 = Product Type Marking Code  
YM = Date Code Marking  
Y = Year (ex: K = 2023)  
M = Month (ex: 9 = September)  
Dot Denotes Cathode Side

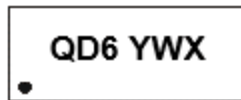
Date Code Key:

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	I	J	K	L	M	N	P	R	S	T	U	V

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

Option B:



QD6 = Product Type Marking Code  
YWX = Date Code Marking  
Y = Year (ex: 3 = 2023)  
W = Week (ex: a = Week 27; z Represents Week 52 and 53)  
X = Internal Code (ex: U = Monday)  
Dot Denotes Cathode Side

Date Code Key

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Code	1	2	3	4	5	6	7	8	9	0	1	2

Week	1-26	27-52	53
Code	A-Z	a-z	z

Internal Code	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Code	T	U	V	W	X	Y	Z

## Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Condition
Peak Pulse Current, per IEC61000-4-5	I <sub>PP</sub>	5	A	I/O to V <sub>SS</sub> , 8/20μs
Peak Pulse Power, per IEC61000-4-5	P <sub>PP</sub>	30	W	I/O to V <sub>SS</sub> , 8/20μs
ESD Protection – Contact Discharge, per IEC61000-4-2	V <sub>ESD_CONTACT</sub>	±12	kV	I/O to V <sub>SS</sub>
ESD Protection – Air Discharge, per IEC61000-4-2	V <sub>ESD_AIR</sub>	±12	kV	I/O to V <sub>SS</sub>

## Thermal Characteristics

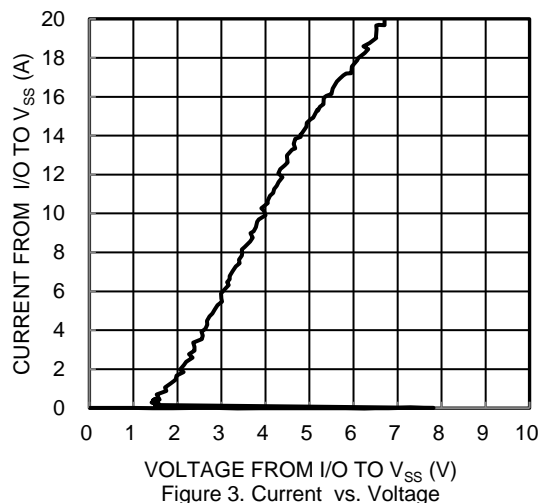
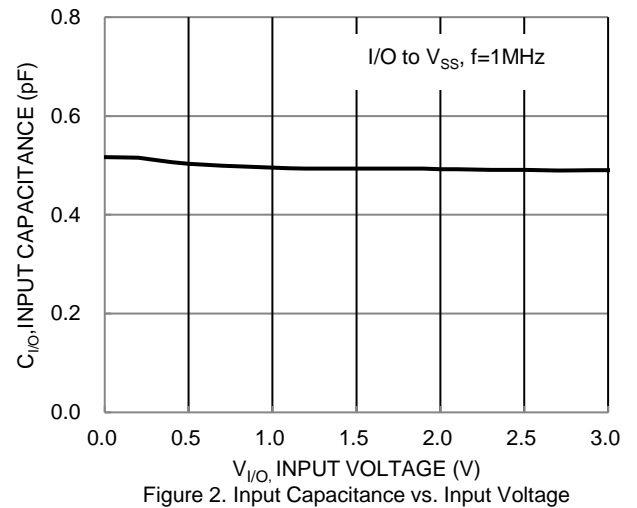
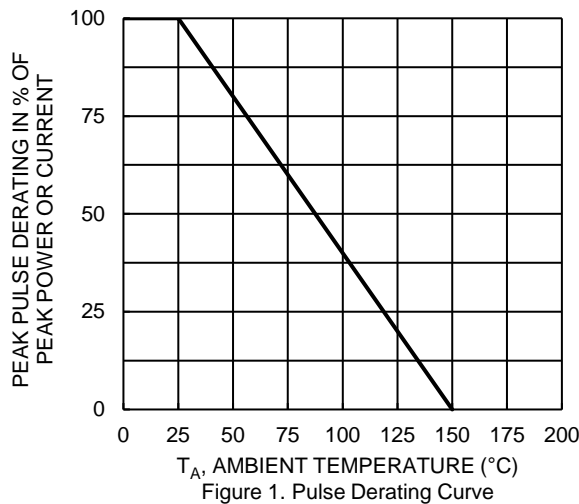
Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P <sub>D</sub>	350	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R <sub>θJA</sub>	360	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Note: 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>.

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Working Voltage	V <sub>RWM</sub>	—	—	3.3	V	—
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	6.2	—	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>	—	1.3	—	V	I/O to V <sub>SS</sub>
Reverse Clamping Voltage (Note 6)	V <sub>C</sub>	—	3.5	—	V	I <sub>PP</sub> = 5A, I/O to V <sub>SS</sub> , 8/20μs
Clamping Voltage (Note 7)	V <sub>C</sub>	—	5	—	V	TLP, 16A, t <sub>P</sub> = 100ns, I/O to V <sub>SS</sub>
Clamping Voltage (Note 7)	V <sub>C</sub>	—	5	—	V	TLP, -16A, t <sub>P</sub> = 100ns, I/O to V <sub>SS</sub>
Dynamic Reverse Resistance	R <sub>DIF-R</sub>	—	0.25	—	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>	—	0.5	—	pF	V <sub>I/O</sub> = 0V, V <sub>SS</sub> = 0V, f = 1MHz

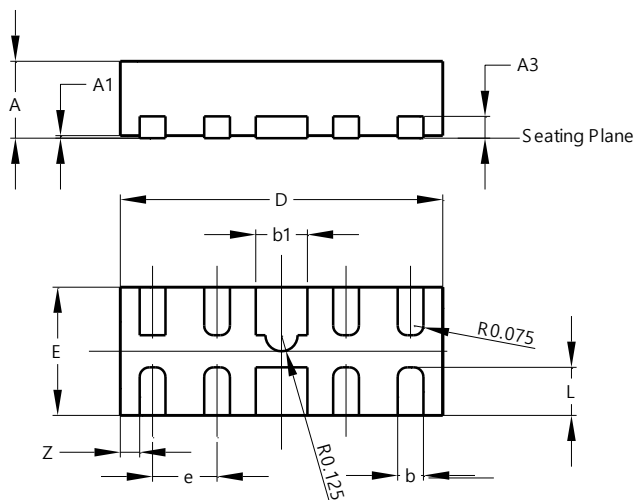
Notes: 6. Clamping voltage value is based on an 8x20μs peak pulse current (I<sub>PP</sub>) waveform.  
7. Clamping voltage value is based on a TLP model. TLP conditions: Z<sub>0</sub>=50Ω, t<sub>P</sub> = 100ns, t<sub>P</sub> = 1ns, averaging window; t<sub>1</sub>=70ns to t<sub>2</sub>=90ns.



## Package Outline Dimensions

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

### U-DFN2510-10

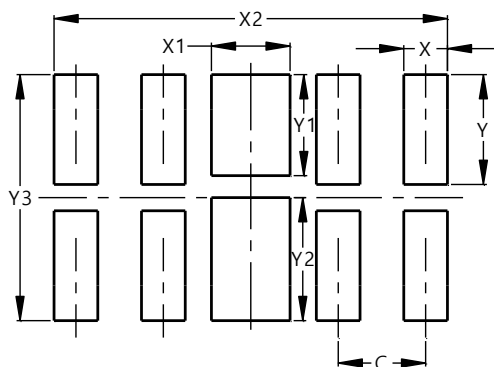


U-DFN2510-10			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.03
A3	-	-	0.13
b	0.15	0.25	0.20
b1	0.035	0.45	0.40
D	2.450	2.575	2.500
e	-	-	0.50
E	0.950	1.075	1.000
L	0.325	0.425	0.375
Z	-	-	0.150
All Dimensions in mm			

## 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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