

Product Summary

V _{BR} (MIN)	I _{PP} (MAX)	C _{IO} (TYP)
5.5V	3A	0.45pF

Description

The D3V3X4U10LPQ 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 port.

Features and Benefits

- Clamping Voltage: 6V at 16A IEC61000-4-2
- IEC61000-4-2 (ESD): Air — $\pm 8kV$, Contact — $\pm 8kV$
- IEC61000-4-5 (Lightning): 3A (8/20 μ s)
- 4 Channels of ESD Protection
- Ultra-Low Channel Input Capacitance of 0.45pF Typical
- TLP Dynamic Resistance: 0.3 Ω
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)
- The D3V3X4U10LPQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.

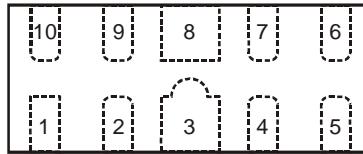
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

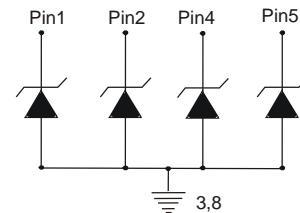
- Case: U-DFN2510-10
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 
- Weight: 0.038 grams (Approximate)

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)

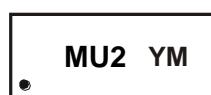
Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
D3V3X4U10LPQ-7	Automotive	MU2	7	8	3,000/Tape & Reel

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-DFN2510-10



MU2 = Product Type Marking Code

YM = Date Code Marking

Y = Year (ex: H = 2020)

M = Month (ex: 9 = September)

Date Code Key

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	H	I	J	K	L	M	N	O	P	R	S	T
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	Condition
Peak Pulse Current, per IEC61000-4-5	I_{PP}	3	A	I/O to Vss, 8/20 μs
Peak Pulse Power, per IEC61000-4-5	P_{PP}	18	W	I/O to Vss, 8/20 μs
ESD Protection – Contact Discharge, per IEC61000-4-2	$V_{ESD_CONTACT}$	± 8	kV	I/O to Vss
ESD Protection – Air Discharge, per IEC61000-4-2	V_{ESD_AIR}	± 8	kV	I/O to Vss

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	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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	—
Reverse Current	I_R	—	—	1.0	μA	$V_R = 3.3\text{V}$, I/O to Vss
Reverse Breakdown Voltage	V_{BR}	5.5	6.2	—	V	$I_R = 1\text{mA}$, I/O to Vss
Forward Clamping Voltage	V_F	-1.0	-0.85	—	V	$I_F = -15\text{mA}$, I/O to Vss
Holding Reverse Voltage	V_{HOLD}	—	1.3	—	V	I/O to Vss
Reverse Clamping Voltage (Note 6)	V_C	—	3	—	V	$I_{PP} = 3\text{A}$, I/O to Vss, 8/20 μs
Clamping Voltage (Note 7)	V_C	—	6	—	V	TLP, 16A, $t_P = 100\text{ns}$, I/O to Vss
Clamping Voltage (Note 7)	V_C	—	5	—	V	TLP, -16A, $t_P = 100\text{ns}$, I/O to Vss
Dynamic Reverse Resistance	R_{DIF-R}	—	0.3	—	Ω	TLP, 10A, $t_P = 100\text{ns}$, I/O to Vss
Dynamic Forward Resistance	R_{DIF-F}	—	0.2	—	Ω	TLP, 10A, $t_P = 100\text{ns}$, Vss to I/O
Channel Input Capacitance	$C_{I/O}$	—	0.45	—	pF	$V_{I/O} = 0\text{V}$, $V_{ss} = 0\text{V}$, $f = 1\text{MHz}$

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 an 8x20 μs peak pulse current (I_{PP}) waveform.

7. Clamping voltage value is based on a TLP model. TLP conditions: $Z_O=50\Omega$, $t_P = 100\text{ns}$, $t_P = 1\text{ns}$, averaging window; $t_1=70\text{ns}$ to $t_2=90\text{ns}$.

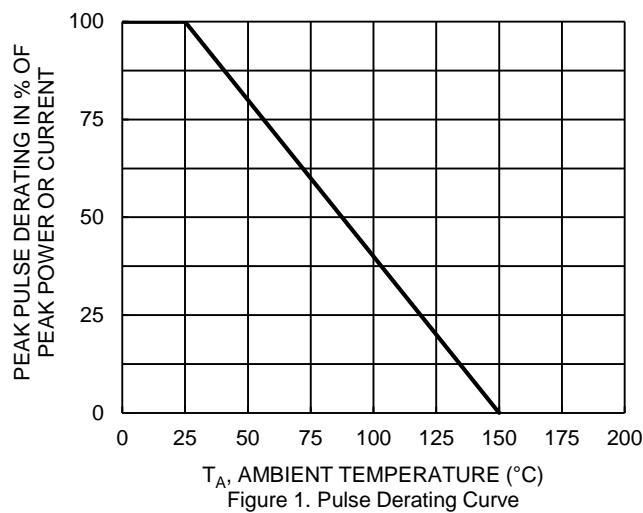


Figure 1. Pulse Derating Curve

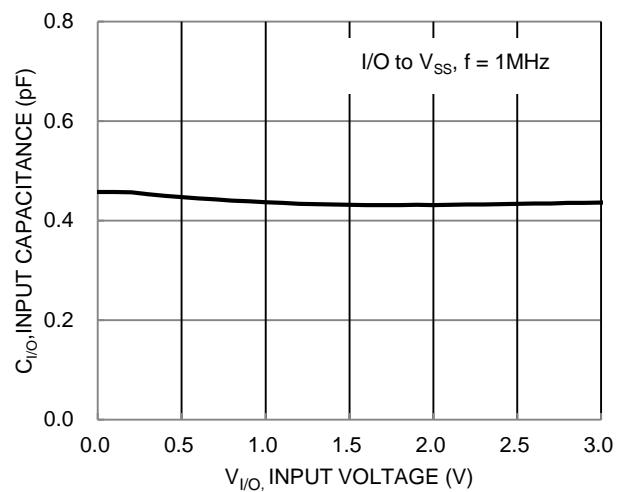


Figure 2. Input Capacitance vs. Input Voltage

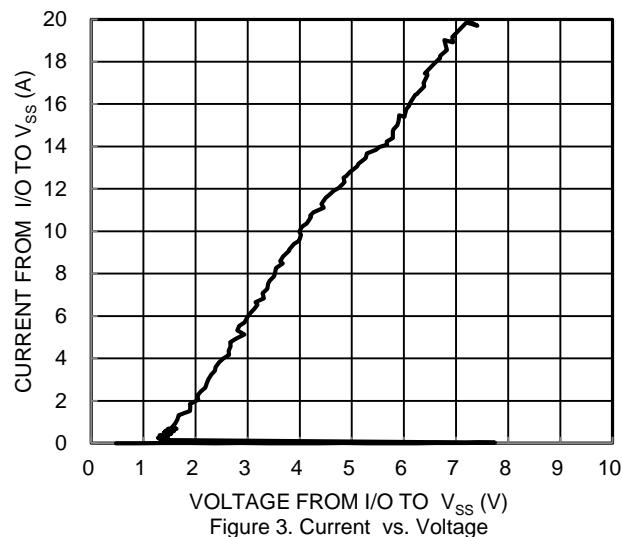
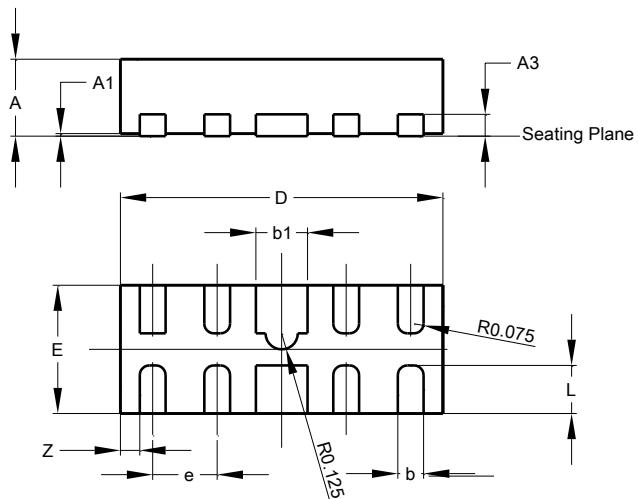


Figure 3. Current vs. Voltage

Package Outline Dimensions

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

U-DFN2510-10



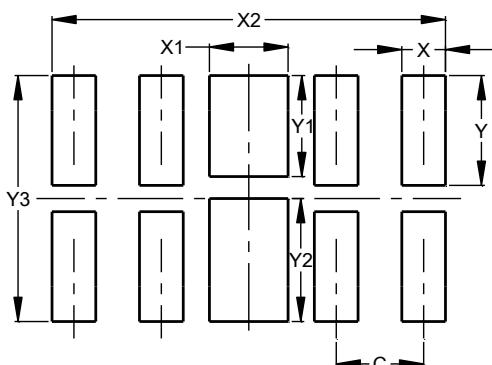
U-DFN2510-10			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0.00	0.05	0.03
A3	-	-	0.13
b	0.15	0.25	0.20
b1	0.35	0.45	0.40
D	2.450	2.575	2.500
e	-	-	0.50
E	0.950	1.075	1.000
L	0.325	0.425	0.375
Z	-	-	0.150

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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