

Product Summary

| VBR (MIN) | IPP (MAX) | C _{I/O} (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.**

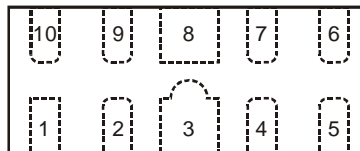
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

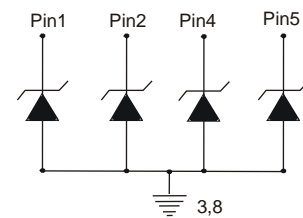
- Package: U-DFN2510-10
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 ^(e4)
- Weight: 0.004 grams (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

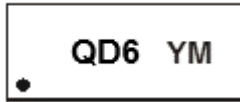
Ordering Information (Note 4)

| 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:



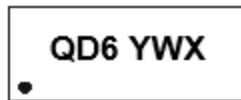
QD6 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: K = 2023)
 M = Month (ex: 9 = September)
 Dot Denotes Cathode Side

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_A = +25°C, unless otherwise specified.)

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

Thermal Characteristics

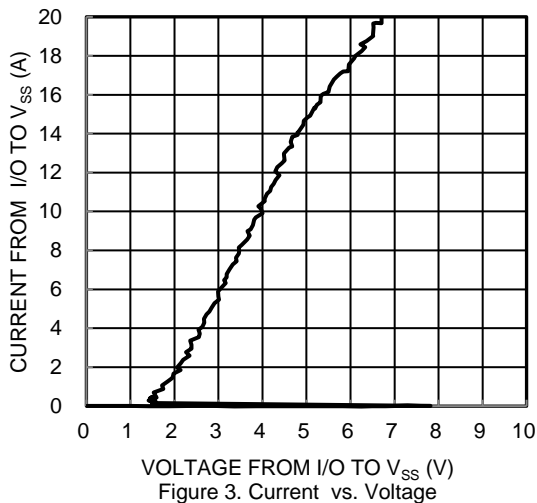
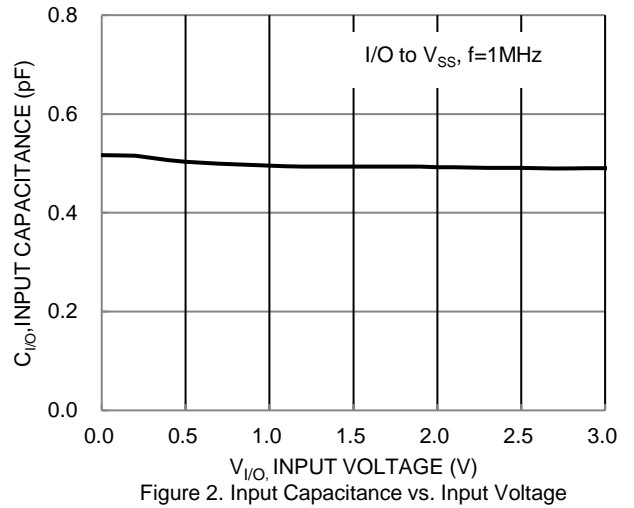
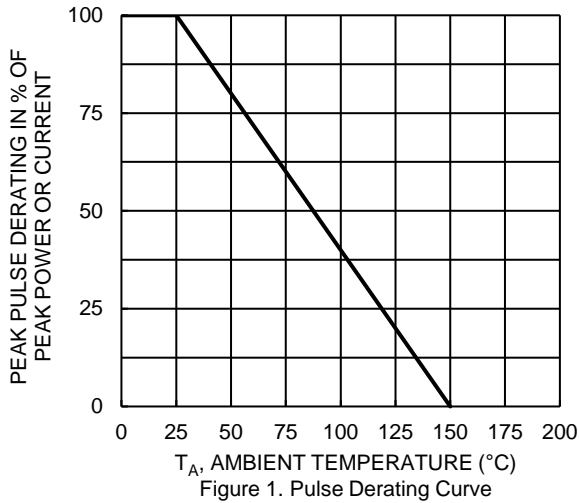
| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation Typical (Note 5) | P _D | 350 | mW |
| Thermal Resistance, Junction to Ambient Typical (Note 5) | R _{θJA} | 360 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -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_A = +25°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 = 3.3V, I/O to V _{SS} |
| Reverse Breakdown Voltage | V _{BR} | 5.5 | 6.2 | — | V | I _R = 1mA, I/O to V _{SS} |
| Forward Clamping Voltage | V _F | -1.0 | -0.85 | — | V | I _F = -15mA, I/O to V _{SS} |
| Holding Reverse Voltage | V _{HOLD} | — | 1.3 | — | V | I/O to V _{SS} |
| Reverse Clamping Voltage (Note 6) | V _C | — | 3.5 | — | V | I _{PP} = 5A, I/O to V _{SS} , 8/20μs |
| Clamping Voltage (Note 7) | V _C | — | 5 | — | V | TLP, 16A, t _P = 100ns, I/O to V _{SS} |
| Clamping Voltage (Note 7) | V _C | — | 5 | — | V | TLP, -16A, t _P = 100ns, I/O to V _{SS} |
| Dynamic Reverse Resistance | R _{DIF-R} | — | 0.25 | — | Ω | TLP, 10A, t _P = 100ns, I/O to V _{SS} |
| Dynamic Forward Resistance | R _{DIF-F} | — | 0.2 | — | Ω | TLP, 10A, t _P = 100ns, V _{SS} to I/O |
| Channel Input Capacitance | C _{I/O} | — | 0.5 | — | pF | V _{I/O} = 0V, V _{SS} = 0V, f = 1MHz |

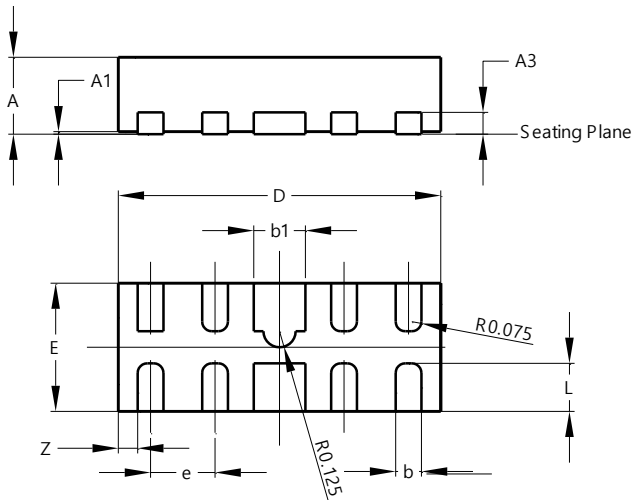
Notes: 6. Clamping voltage value is based on an 8x20μs peak pulse current (I_{PP}) waveform.
 7. Clamping voltage value is based on a TLP model. TLP conditions: Z₀=50Ω, t_P = 100ns, t_R = 1ns, averaging window; t₁=70ns to t₂=90ns.



Package Outline Dimensions

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

U-DFN2510-10

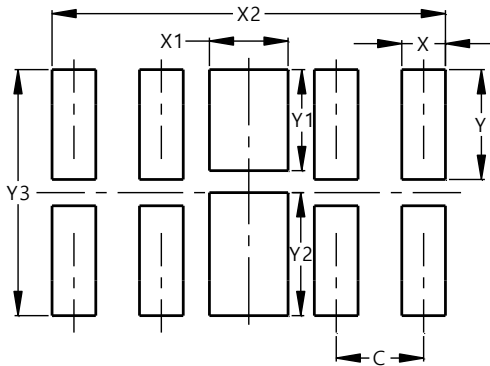


| U-DFN2510-10 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.545 | 0.605 | 0.575 |
| A1 | 0.00 | 0.05 | 0.03 |
| A3 | - | - | 0.13 |
| b | 0.15 | 0.25 | 0.20 |
| b1 | 0.35 | 0.45 | 0.40 |
| D | 2.450 | 2.575 | 2.500 |
| e | - | - | 0.50 |
| E | 0.950 | 1.075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