

## Features & Applications

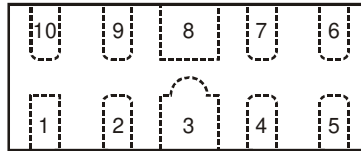
- Clamping Voltage: 9V at 10A 100ns, TLP 9.4V at 5.5A 8µs/20µs
- IEC 61000-4-2 (ESD): Air — ±16kV, Contact — ±14kV
- IEC 61000-4-4 (EFT): Level 4
- IEC 61000-4-5 (Lightning): ±5.5A (8/20µs)
- 4 Channels of ESD Protection
- Low Channel Input Capacitance of 0.55pF Typical
- TLP Dynamic Resistance: 0.25Ω
- Typically Used for High Speed Ports such as USB 2.0, USB 3.0 DVI™, HDMI™ 2.0, Ethernet Port, IEEE, MDDI, PCI Express®, SATA/ eSATA
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. “Green” Device (Note 3)**
- An automotive-compliant part is available under separate datasheet ([DT1240-04LPQ](#))**

## Mechanical Data

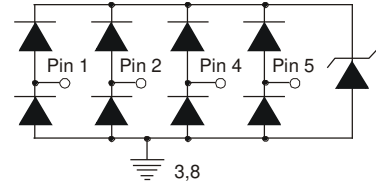
- Package: U-DFN2510-10
- Package Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals:
  - Sites 1 and 2: NiPdAu over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 **(e4)**
  - Site 3: Matte Tin over Copper Leadframe. Solderable per MIL-STD-202, Method 208 **(e3)**
- Weight: 0.038 grams (Approximate)

Sites 1 and 2: U-DFN2510-10  
Site 3: U-DFN2510-10 (Type CJ)

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
DT1240-04LP-7	U-DFN2510-10	BC7	7	8	3,000	Tape & Reel
DT1240-04LP-7	U-DFN2510-10 (Type CJ)	BC7	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

Sites 1 and 3

Site 2



BC7 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: K = 2023)  
 M = Month (ex: 9 = September)



BC7 = 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)

Date Code Key for YM

<b>Year</b>	2013	...	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<b>Code</b>	A	...	K	L	M	N	O	P	R	S	T	U
<b>Month</b>	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Code</b>	1	2	3	4	5	6	7	8	9	O	N	D

Date Code Key for YWX

<b>Year</b>	2013	...	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
<b>Code</b>	3	...	3	4	5	6	7	8	9	0	1	2
<b>Week</b>	1-26			27-52			53					
<b>Code</b>	A-Z			a-z			z					
<b>Internal Code</b>	Sun	Mon	Tue	Wed	Thu	Fri	Sat					
<b>Code</b>	T	U	V	W	X	Y	Z					

## 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>	5.5	A	I/O to V <sub>SS</sub> , 8/20μs
Peak Pulse Power, per IEC 61000-4-5	P <sub>PP</sub>	60	W	I/O to V <sub>SS</sub> , 8/20μs
Operating Voltage (DC)	V <sub>DC</sub>	6	V	I/O to V <sub>SS</sub>
ESD Protection – Contact Discharge, per IEC 61000-4-2	V <sub>ESD_CONTACT</sub>	±14	kV	I/O to V <sub>SS</sub>
ESD Protection – Air Discharge, per IEC 61000-4-2	V <sub>ESD_AIR</sub>	±16	kV	I/O to V <sub>SS</sub>
Operating and Storage Temperature Range	T <sub>J</sub> , 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

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 Conditions
Reverse Working Voltage	V <sub>RWM</sub>	—	—	5.5	V	—
Reverse Current	I <sub>R</sub>	—	—	0.5	μA	V <sub>R</sub> = 5V, I/O to V <sub>SS</sub>
Reverse Breakdown Voltage	V <sub>BR</sub>	6	—	—	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 Voltage	V <sub>H</sub>	5.5	—	—	V	—
Reverse Clamping Voltage (Note 6)	V <sub>C</sub>	—	9.4	11	V	I <sub>PP</sub> = 5.5A, I/O to V <sub>SS</sub> , 8/20μs
Trigger Voltage	V <sub>TRIG</sub>	—	—	9.5	V	—
ESD Clamping Voltage	V <sub>ESD</sub>	—	9	—	V	TLP, 10A, 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>	—	0.25	—	Ω	TLP, 10A, t <sub>P</sub> = 100ns, V <sub>SS</sub> to I/O
Channel Input Capacitance (Note 7)	C <sub>I/O</sub>	—	0.55	0.65	pF	V <sub>I/O</sub> = 2.5V, V <sub>SS</sub> = 0V, f = 1MHz
Delta C <sub>I/O</sub>	C <sub>I/OMAX</sub> -C <sub>I/OMIN</sub>	—	0.04	—	pF	C <sub>I/OMAX</sub> -C <sub>I/OMIN</sub>

- Notes: 6. Clamping voltage value is based on an 8x20μs peak pulse current (I<sub>pp</sub>) waveform.  
 7. C<sub>I/O1</sub>=C<sub>PIN1</sub>+C<sub>PIN10</sub>, C<sub>I/O2</sub>=C<sub>PIN2</sub>+C<sub>PIN9</sub>, C<sub>I/O3</sub>=C<sub>PIN4</sub>+C<sub>PIN7</sub>, C<sub>I/O4</sub>=C<sub>PIN5</sub>+C<sub>PIN6</sub>

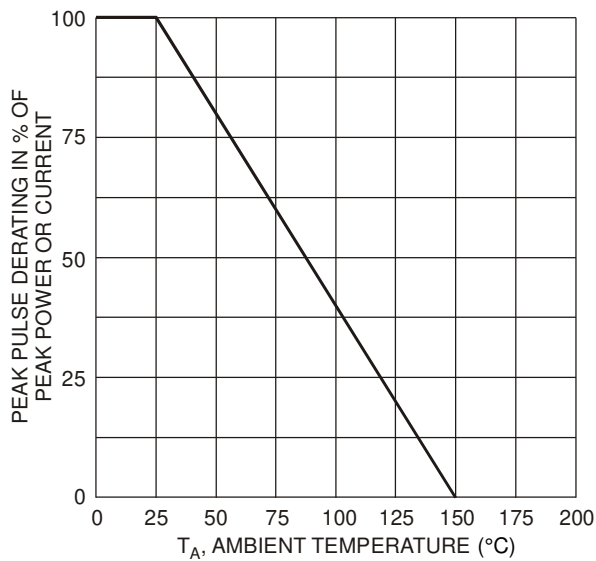


Figure 1 Pulse Derating Curve

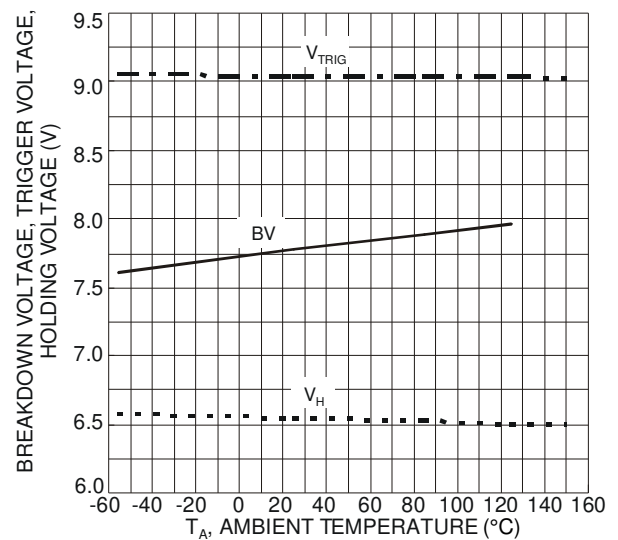


Figure 2 BV, Trigger Voltage, Holding Voltage vs. Ambient Temperature

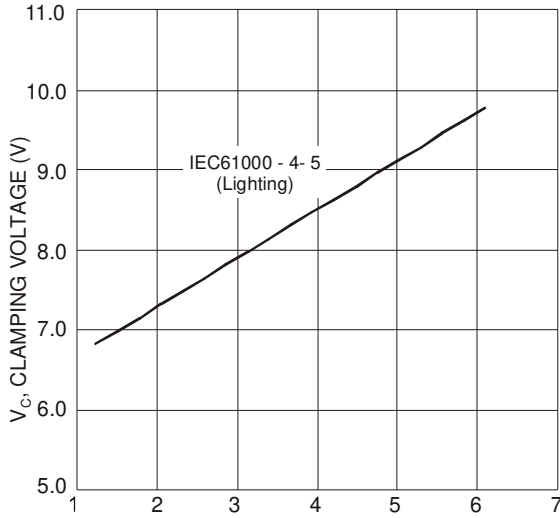


Figure 3 Clamping Voltage Characteristic

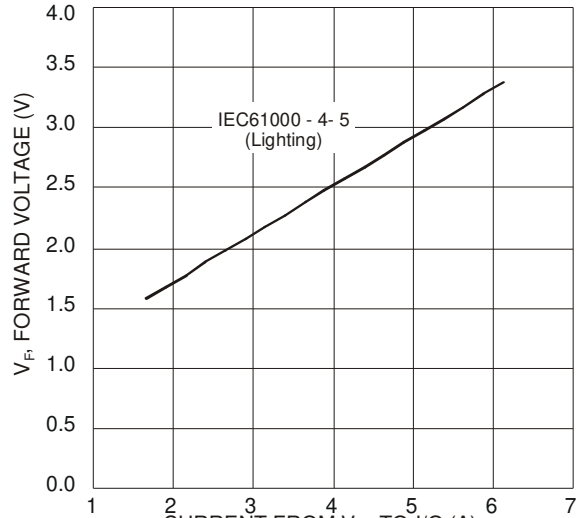


Figure 4 Forward Voltage Characteristic

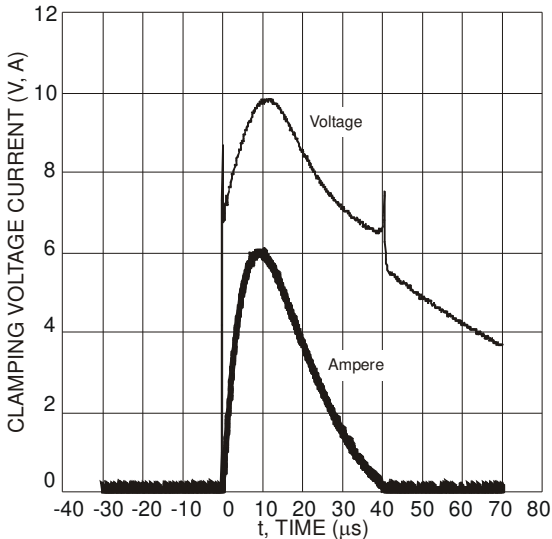


Figure 5 Waveform of Clamping Voltage, Current vs. Time (8/20μs, I/O to Vss)

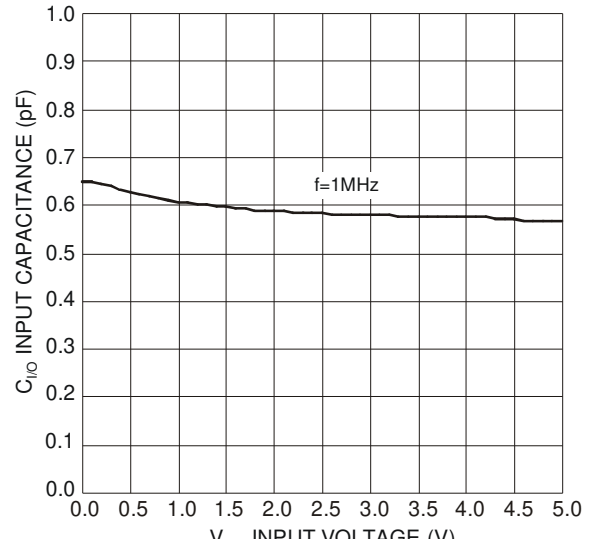


Figure 6 Input Capacitance vs. Input Voltage

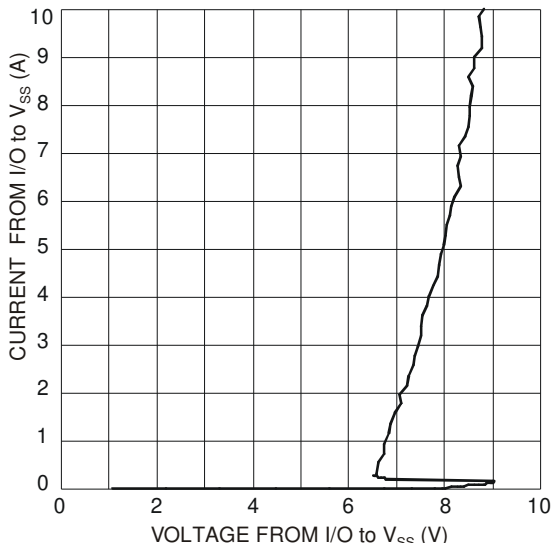
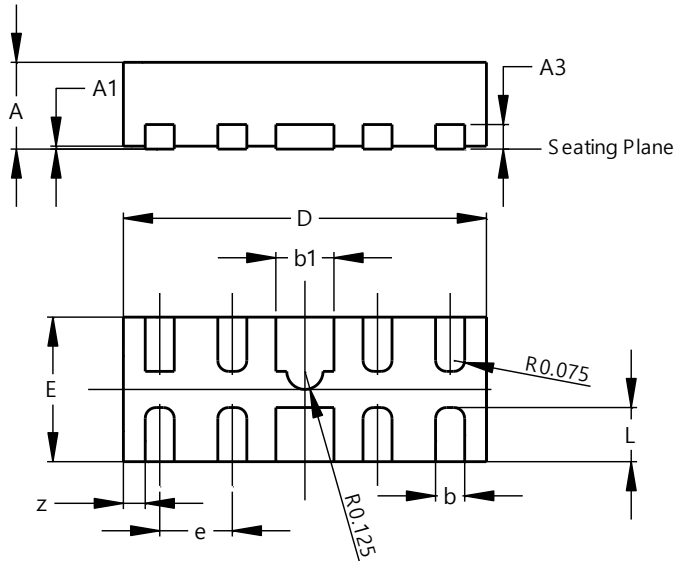


Figure 7 Current vs. Voltage

## Package Outline Dimensions

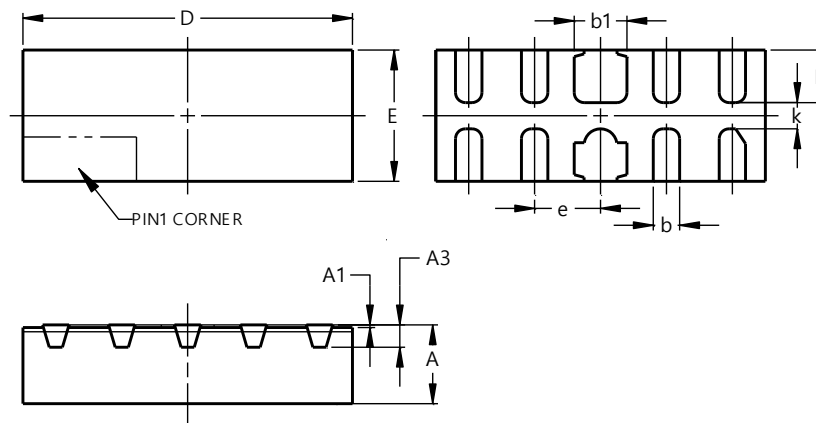
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### Sites 1 and 2: 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			

### Site 3: U-DFN2510-10 (Type CJ)

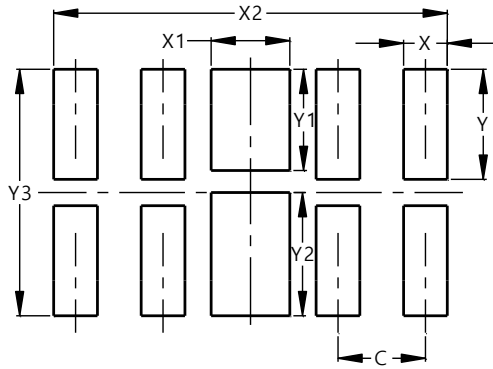


U-DFN2510-10 (Type CJ)			
Dim	Min	Max	Typ
A	0.545	0.605	--
A1	0.00	0.05	--
A3	0.152REF		
b	0.150	0.250	--
b1	0.350	0.450	--
D	2.450	2.575	--
E	0.950	1.075	--
e	--	--	0.500
E	0.950	1.075	1.000
L	0.350	0.450	--
k	0.200REF		
All Dimensions in mm			

## Suggested Pad Layout

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

All Sites: U-DFN2510-10 and U-DFN2510-10 (Type CJ)



Dimensions	Value (in mm)
<b>C</b>	0.500
<b>X</b>	0.250
<b>X1</b>	0.450
<b>X2</b>	2.250
<b>Y</b>	0.625
<b>Y1</b>	0.575
<b>Y2</b>	0.700
<b>Y3</b>	1.400

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