

## Product Summary

V <sub>BR</sub> (Min)	I <sub>PP</sub> (Max)	C <sub>T</sub> (Typ)
5.5V	90A	800pF

## Features

- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- One Channel of ESD Protection
- Low Channel Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The D4V5H1U2LP1610Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**

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

## Description

This new generation TVS is designed to protect sensitive electronics from the damage due to ESD. The combination of small size and high ESD surge capability makes it ideal for protecting one line against high surge current and other transients. These robust diodes can safely absorb repetitive ESD strikes at ±30kV without performance degradation. Additionally, it can safely dissipate 90A of 8/20µs surge current (IEC 61000-4-5) with very low clamping voltages.

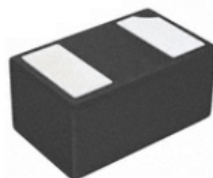
## Applications

- Power line protections
- Touch panels
- Small panel modules

## Mechanical Data

- Package: U-DFN1610-2
- 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. Solderable per MIL-STD-202, Method 208 <sup>(e4)</sup>
- Weight: 0.003 grams (Approximate)

U-DFN1610-2 (Type B)



Bottom View



Device Schematic

## Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
D4V5H1U2LP1610Q-7	U-DFN1610-2 (Type B)	MW2	7	8	10,000	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

Option A:



MW2 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: K = 2023)  
 M = Month (ex: 9 = September)

Date Code Key

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	K	L	M	N	P	R	S	T	U	V	W	X
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:



MW2 = 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

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	3	4	5	6	7	8	9	0	1	2	3	4
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	Conditions
Peak Pulse Current	I <sub>PP</sub>	90	A	8/20μs (Note 5)
ESD Protection – Contact Discharge	V <sub>ESD_CONTACT</sub>	±30	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge	V <sub>ESD_AIR</sub>	±30	kV	Standard IEC 61000-4-2
ESD Protection – 1000 Contact Discharges (Open Alliance Spec)	V <sub>ESD_CONTACT1k</sub>	±30	kV	Standard IEC 61000-4-2
ESD Protection – Contact Discharge (ISO Spec)	V <sub>ESD_CONTACT2</sub>	±30	kV	ISO 10605, 150pF, 330Ω
ESD Protection – Air Discharge (ISO Spec)	V <sub>ESD_AIR2</sub>	±30	kV	ISO 10605, 150pF, 330Ω
ESD Protection – Contact Discharge (ISO Spec)	V <sub>ESD_CONTACT3</sub>	±30	kV	ISO 10605, 330pF, 330Ω
ESD Protection – Air Discharge (ISO Spec)	V <sub>ESD_AIR3</sub>	±30	kV	IEC 10605, 330pF, 330Ω

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	500	mW
Thermal Resistance, Junction to Ambient, T <sub>A</sub> = +25°C	R <sub>θJA</sub>	250	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Standoff Voltage	V <sub>RWM</sub>	—	—	4.5	V	—
Channel Leakage Current (Note 7)	I <sub>R</sub>	—	—	1.0	μA	V <sub>R</sub> = 4.5V
Reverse Breakdown Voltage	V <sub>BR</sub>	5.5	—	8	V	I <sub>R</sub> = 1mA
Clamping Voltage, Positive Transients (Note 5)	V <sub>C</sub>	—	—	10	V	I <sub>PP</sub> = 10A, t <sub>P</sub> = 8/20μs
		—	—	11	V	I <sub>PP</sub> = 50A, t <sub>P</sub> = 8/20μs
		—	—	13	V	I <sub>PP</sub> = 90A, t <sub>P</sub> = 8/20μs
Channel Input Capacitance (Note 8)	C <sub>T</sub>	—	800	—	pF	V <sub>R</sub> = 0V, f = 1MHz, Any I/O to GND
Dynamic Resistance	R <sub>DYN</sub>	—	0.05	—	Ω	TLP, 10A, t <sub>P</sub> = 100ns

- Notes:
5. Clamping voltage value is based on an 8 x 20μs peak pulse current (I<sub>pp</sub>) waveform.
  6. 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>.
  7. Short duration pulse test used to minimize self-heating effect.
  8. Measured from any I/O to GND.

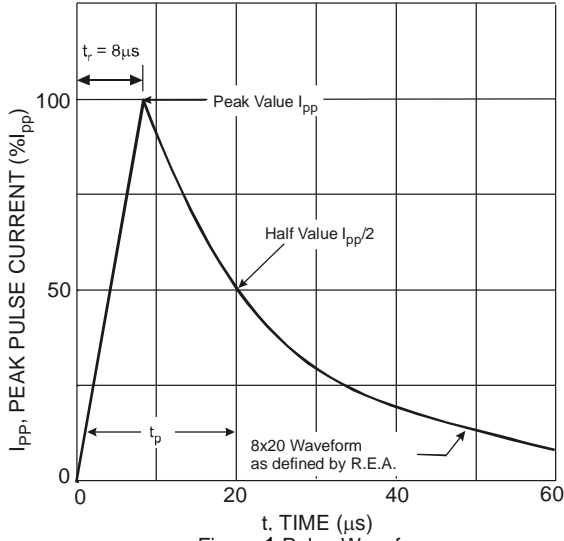


Figure 1 Pulse Waveform

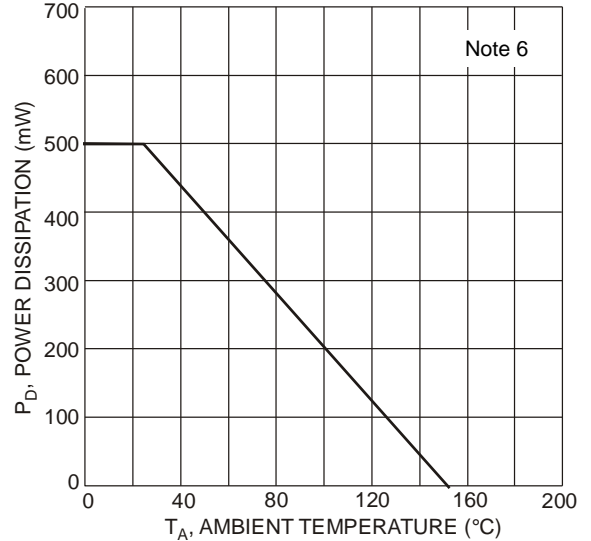


Figure 2 Power Derating Curve

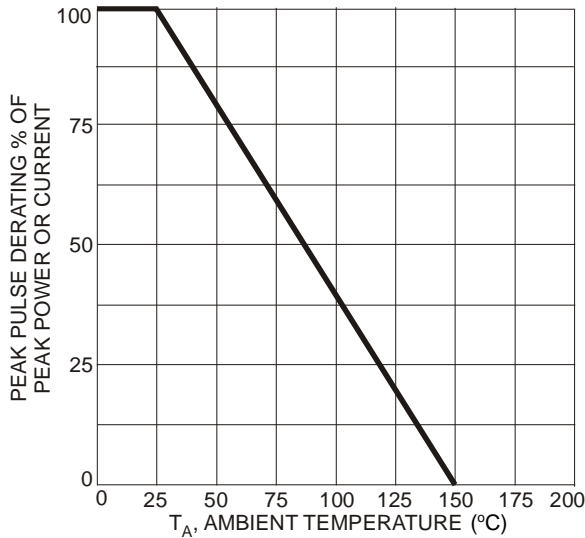


Figure 3 Power Dissipation vs. Ambient Temperature

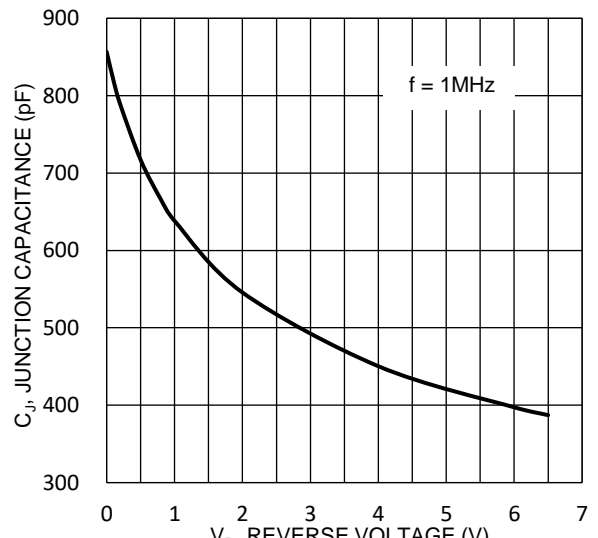


Figure 4 Typical Junction Capacitance

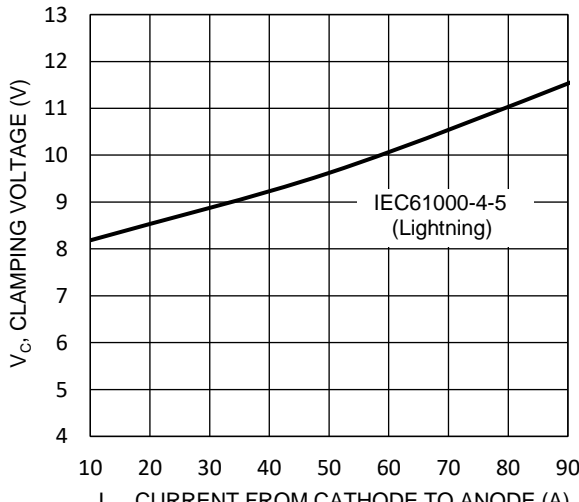


Figure 5 Clamping Voltage Characteristic

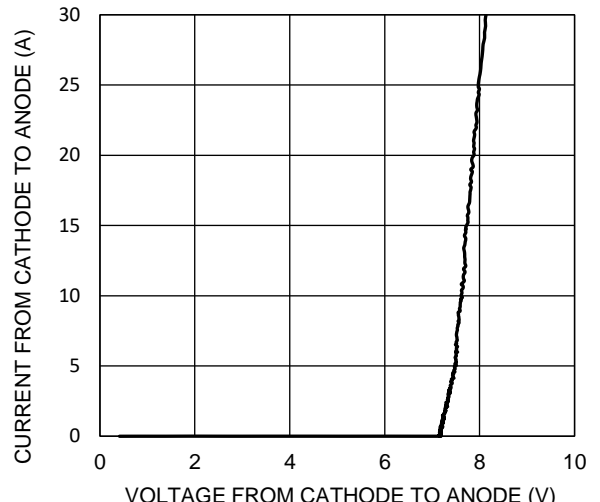
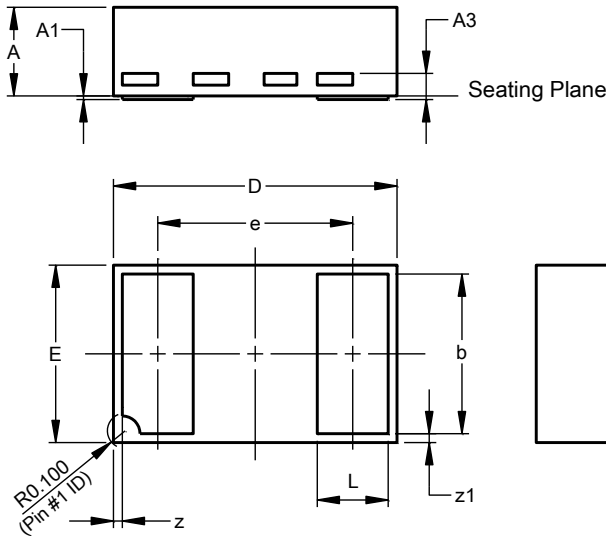


Figure 6 Current vs. Voltage (TLP, tp = 100ns)

**Package Outline Dimensions**

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

**U-DFN1610-2 (Type B)**

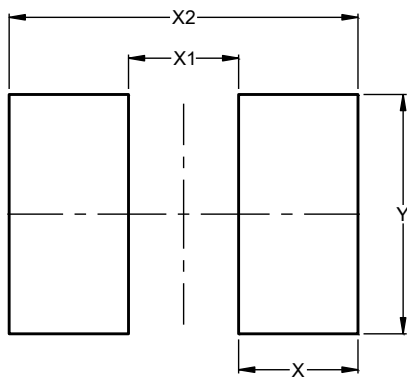


U-DFN1610-2 (Type B)			
Dim	Min	Max	Typ
A	0.45	0.55	0.50
A1	0.00	0.05	0.015
A3	-	-	0.127
b	0.85	0.95	0.90
D	1.55	1.65	1.60
E	0.95	1.05	1.00
e	-	-	1.10
L	0.35	0.45	0.40
z	0.050 REF		
z1	0.050 REF		
All Dimensions in mm			

**Suggested Pad Layout**

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

**U-DFN1610-2 (Type B)**



Dimensions	Value (in mm)
X	0.650
X1	0.600
X2	1.900
Y	1.300

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