D12V0S1U2LP1610 ~ D50V0S1U2LP1610

ONE CHANNEL HIGH SURGE TVS DIODE

Description

The DxxV0S1U2LP1610 series are designed to protect sensitive electronic equipment from damage caused by EOS, lightning strikes, and ESD. These devices provide the features required for board-level protection. Their high surge current capability and low clamping voltage make them ideal for use in harsh transient environments.

Applications

- Mobile handsets & accessories
- USB voltage bus
- Battery protection
- Digital lines
- Proximity sensors

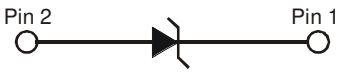
Features

- 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)**
- **Automotive-compliant parts are available under separate datasheet (D12V0S1U2LP1610Q), (D15V0S1U2LP1610Q), (D20V0S1U2LP1610Q), (D24V0S1U2LP1610Q), (D36V0S1U2LP1610Q)**

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. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.003 grams (Approximate)

U-DFN1610-2 (Type B)



Device Schematic

Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
D12V0S1U2LP1610-7	U-DFN1610-2 (Type B)	12T	7	8	10,000	Tape & Reel
D15V0S1U2LP1610-7	U-DFN1610-2 (Type B)	15T	7	8	10,000	Tape & Reel
D18V0S1U2LP1610-7	U-DFN1610-2 (Type B)	18T	7	8	10,000	Tape & Reel
D20V0S1U2LP1610-7	U-DFN1610-2 (Type B)	20T	7	8	10,000	Tape & Reel
D22V0S1U2LP1610-7	U-DFN1610-2 (Type B)	22T	7	8	10,000	Tape & Reel
D24V0S1U2LP1610-7	U-DFN1610-2 (Type B)	24T	7	8	10,000	Tape & Reel
D28V0S1U2LP1610-7	U-DFN1610-2 (Type B)	28T	7	8	10,000	Tape & Reel
D33V0S1U2LP1610-7	U-DFN1610-2 (Type B)	33T	7	8	10,000	Tape & Reel
D36V0S1U2LP1610-7	U-DFN1610-2 (Type B)	36T	7	8	10,000	Tape & Reel
D40V0S1U2LP1610-7	U-DFN1610-2 (Type B)	40T	7	8	10,000	Tape & Reel
D48V0S1U2LP1610-7	U-DFN1610-2 (Type B)	48T	7	8	10,000	Tape & Reel
D50V0S1U2LP1610-7	U-DFN1610-2 (Type B)	50T	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/.

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Marking Information



XXT = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: M = 2025)
M = Month (ex: 1 = January)
Dot Denotes Cathode Side

Date Code Key

Year	2019	-	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Code	G	-	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

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
ESD Protection – Contact Discharge	$V_{ESD_CONTACT}$	±30	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge	V_{ESD_AIR}	±30	kV	Standard IEC 61000-4-2

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Power Dissipation (Note 5)		P_D	300	mW
Thermal Resistance, Junction to Ambient	T_A = +25°C	$R_{\theta JA}$	417	°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.

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Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Orderable Part Number	Reverse Standoff Voltage	Breakdown Voltage		Test Current	Max Reverse Leakage Current @ V_{RWM} (Note 6)	Max Clamping Voltage @ I_{pp} (Note 7)	Max Peak Pulse Current	Channel Input Capacitance (Note 8) V_R = 0V, f = 1MHz, Any I/O to GND	Marking Code
		V_{BR} @ I_T							
	V_{RWM} (V)	Min (V)	Max (V)	I_T (mA)	I_R (nA)	V_C (V)	I_{pp} (A)	(pF)	
D12V0S1U2LP1610-7	12	13	17	1	200	20	65	400	12T
D15V0S1U2LP1610-7	15	17	23	1	200	30	48	270	15T
D18V0S1U2LP1610-7	18	20	23	1	200	33	45	267	18T
D20V0S1U2LP1610-7	20	22	25	1	200	36	37	242	20T
D22V0S1U2LP1610-7	22	24	28	1	200	38	32	226	22T
D24V0S1U2LP1610-7	24	26	30	1	200	42	31	210	24T
D28V0S1U2LP1610-7	28	31	36	1	200	50	25	190	28T
D33V0S1U2LP1610-7	33	36	41	1	200	55	18	165	33T
D36V0S1U2LP1610-7	36	37	44	1	200	59	18	165	36T
D40V0S1U2LP1610-7	40	45	55	1	200	73	13	143	40T
D48V0S1U2LP1610-7	48	53	59	1	200	84	15	140	48T
D50V0S1U2LP1610-7	50	56	63	1	200	88	15	132	50T

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

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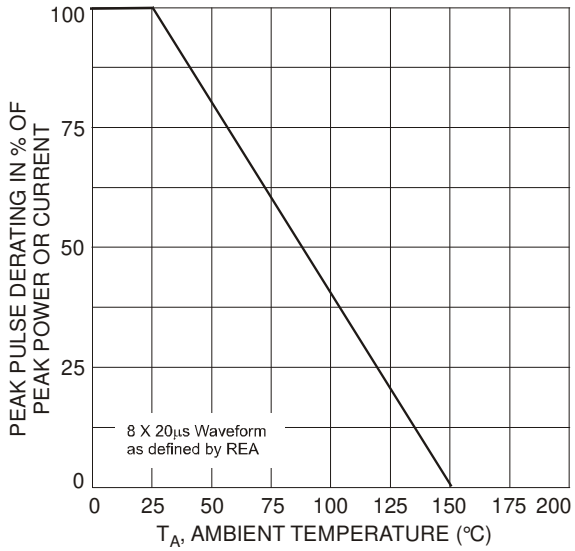


Figure 1. Pulse Derating Curve

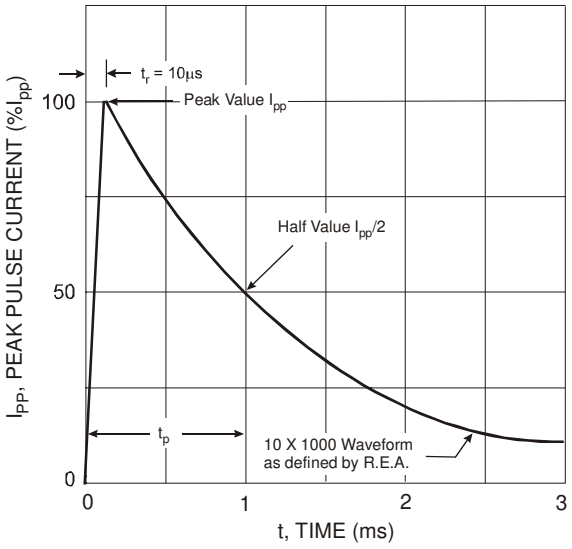


Figure 2. Pulse Waveform

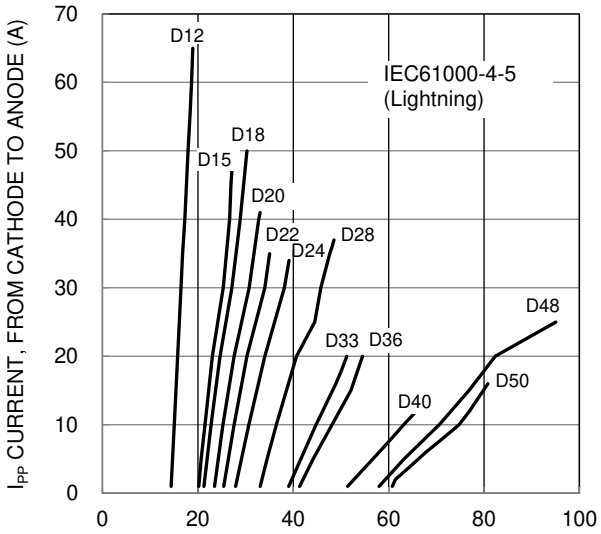


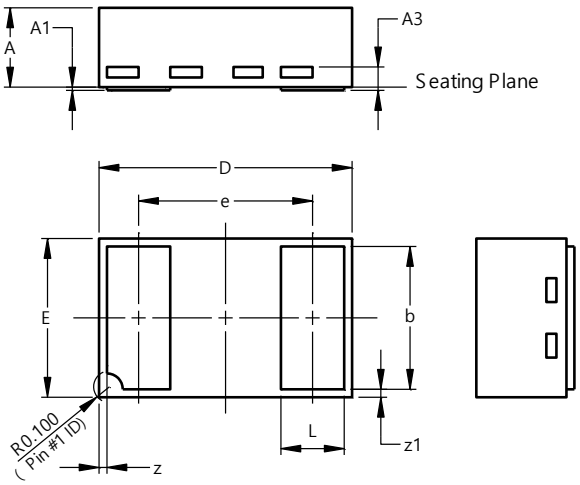
Figure 3. Clamping Voltage Characteristic

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Package Outline Dimensions

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

U-DFN1610-2 (Type B)

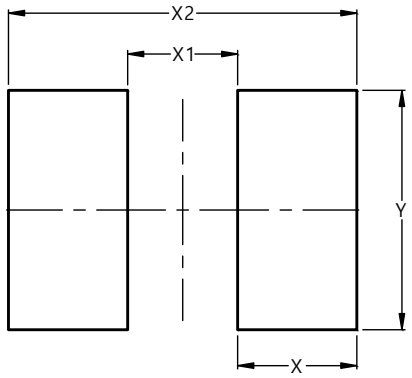


U-DFN1610-2 (Type B)			
Dim	**Min**	**Max**	**Typ**
A	0.45	0.55	0.50
A1	0.00	0.05	0.015
A3	-	-	0.127
b	0.85	0.95	0.90
D	1.55	1.65	1.60
E	0.95	1.05	1.00
e	-	-	1.10
L	0.35	0.45	0.40
z	0.050 REF		
z1	0.050 REF		
All Dimensions in mm			

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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