

## Features

- Provides ESD Protection per IEC 61000-4-2 Standard:  
Air  $\pm 30\text{kV}$ , Contact  $\pm 30\text{kV}$
- 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)**
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative.**  
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

- Case: U-DFN1610-2
- Case 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 <sup>(4)</sup>
- Weight: 0.003 grams (Approximate)

U-DFN1610-2 (Type B)



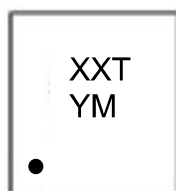
Device Schematic

## Ordering Information (Note 4)

| Part Number       | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity Per Reel  |
|-------------------|------------|---------|--------------------|-----------------|--------------------|
| D12V0S1U2LP1610-7 | Commercial | 12T     | 7                  | 8               | 10,000/Tape & Reel |
| D15V0S1U2LP1610-7 | Commercial | 15T     | 7                  | 8               | 10,000/Tape & Reel |
| D18V0S1U2LP1610-7 | Commercial | 18T     | 7                  | 8               | 10,000/Tape & Reel |
| D20V0S1U2LP1610-7 | Commercial | 20T     | 7                  | 8               | 10,000/Tape & Reel |
| D22V0S1U2LP1610-7 | Commercial | 22T     | 7                  | 8               | 10,000/Tape & Reel |
| D24V0S1U2LP1610-7 | Commercial | 24T     | 7                  | 8               | 10,000/Tape & Reel |
| D33V0S1U2LP1610-7 | Commercial | 33T     | 7                  | 8               | 10,000/Tape & Reel |
| D36V0S1U2LP1610-7 | Commercial | 36T     | 7                  | 8               | 10,000/Tape & Reel |
| D40V0S1U2LP1610-7 | Commercial | 40T     | 7                  | 8               | 10,000/Tape & Reel |
| D50V0S1U2LP1610-7 | Commercial | 50T     | 7                  | 8               | 10,000/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



XXT = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: I = 2021)  
 M = Month (ex: 9 = September)  
 Dot Denotes Cathode Side

### Date Code Key

| Year | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | G    | H    | I    | J    | K    | L    | M    | N    | O    | P    | R    | S    |

| 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                     | Symbol                   | Value | Unit | Conditions             |
|------------------------------------|--------------------------|-------|------|------------------------|
| 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 |

**Thermal Characteristics**

| Characteristic                                                 | Symbol                            | Value       | Unit |
|----------------------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)                                     | P <sub>D</sub>                    | 300         | mW   |
| Thermal Resistance, Junction to Ambient T <sub>A</sub> = +25°C | R <sub>θJA</sub>                  | 417         | °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.)

| Part Number       | Reverse Standoff Voltage | Breakdown Voltage                |         | Test Current        | Max. Reverse Leakage Current @ V <sub>RWM</sub> (Note 6) | Max. Clamping Voltage @ I <sub>pp</sub> (Note 7) | Max. Peak Pulse Current | Channel Input Capacitance (Note 8)<br>V <sub>R</sub> = 0V, f = 1MHz, Any I/O to GND | Marking Code |
|-------------------|--------------------------|----------------------------------|---------|---------------------|----------------------------------------------------------|--------------------------------------------------|-------------------------|-------------------------------------------------------------------------------------|--------------|
|                   |                          | V <sub>BR</sub> @ I <sub>T</sub> |         |                     |                                                          |                                                  |                         |                                                                                     |              |
|                   | V <sub>RWM</sub> (V)     | Min (V)                          | Max (V) | I <sub>T</sub> (mA) | I <sub>R</sub> (nA)                                      | V <sub>C</sub> (V)                               | I <sub>pp</sub> (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          |
| 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          |
| D50V0S1U2LP1610-7 | 50                       | 56                               | 63      | 1                   | 200                                                      | 88                                               | 15                      | 132                                                                                 | 50T          |

- Notes:
- 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>.
  - Short duration pulse test used to minimize self-heating effect.
  - Clamping voltage value is based on an 8x20μs peak pulse current (I<sub>pp</sub>) waveform.
  - Measured from any I/O to GND.

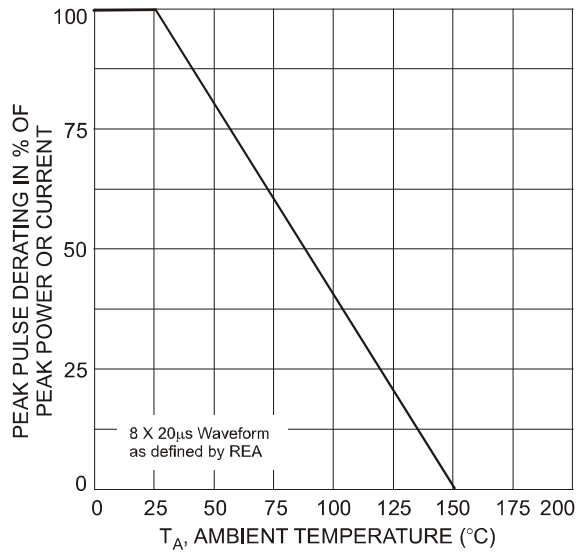


Fig. 1 Pulse Derating Curve

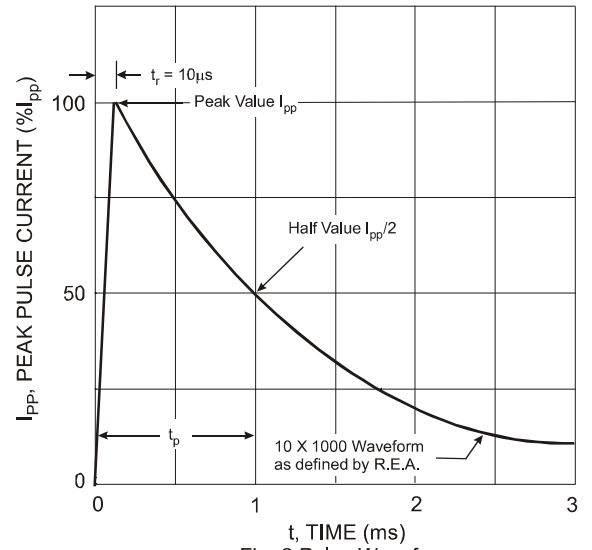


Fig. 2 Pulse Waveform

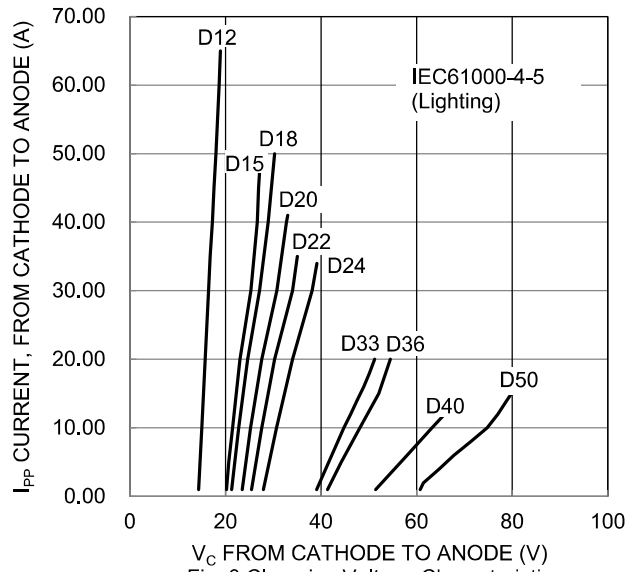
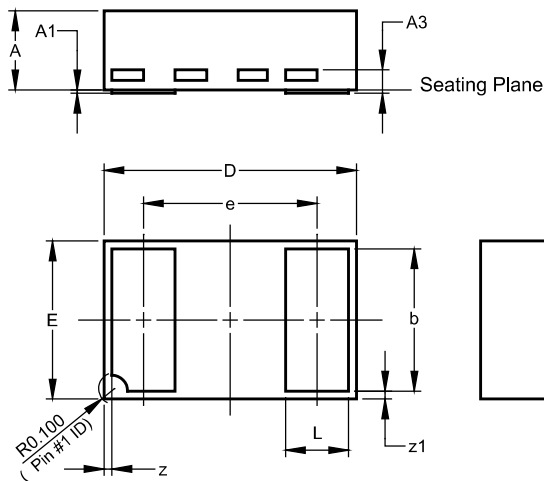


Fig. 3 Clamping Voltage Characteristic

## Package Outline Dimensions

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

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

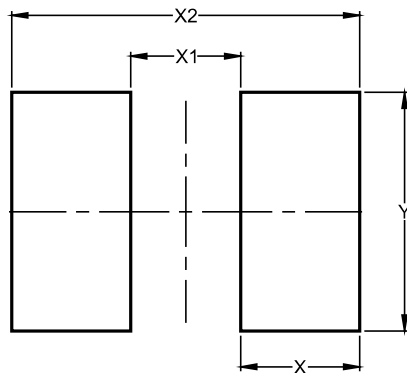


| U-DFN1610-2<br>(Type B) |           |      |       |
|-------------------------|-----------|------|-------|
| Dim                     | Min       | Max  | Typ   |
| A                       | 0.45      | 0.55 | 0.50  |
| A1                      | 0.00      | 0.05 | 0.015 |
| A3                      | -         | -    | 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<br>(in mm) |
|------------|------------------|
| X          | 0.650            |
| X1         | 0.600            |
| X2         | 1.900            |
| Y          | 1.300            |

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