

## Product Summary

|                           |                           |                           |
|---------------------------|---------------------------|---------------------------|
| <b>V<sub>BR</sub> Min</b> | <b>I<sub>pp</sub> Max</b> | <b>C<sub>IN</sub> Typ</b> |
| 3.8V                      | 12A                       | 28pF                      |

## 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 use in portable applications such as cellular phones, digital cameras and MP3 players.

## Applications

- Cellular Handsets
- Portable Electronics
- Computers and Peripheral

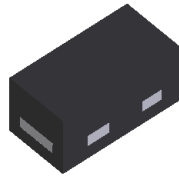
## Features

- Provides ESD Protection per IEC 61000-4-2 Standard: Air  $\pm 30\text{kV}$ , Contact  $\pm 30\text{kV}$
- 1 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/>**

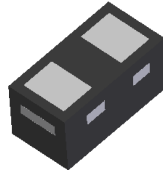
## Mechanical Data

- Case: X3-DFN0603-2
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin over Copper Leadframe, per MIL-STD-202, Method 208 (G3)
- Weight: 0.0002 grams (Approximate)

X3-DFN0603-2



Top View



Bottom View



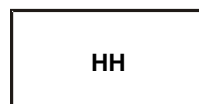
Device Schematic

## Ordering Information (Note 4)

| Part Number   | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel  |
|---------------|------------|---------|--------------------|-----------------|--------------------|
| D3V3L1B2LP3-7 | Standard   | HH      | 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



HH = Product Type Marking Code

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

| Characteristic                     | Symbol                   | Value | Unit | Conditions             |
|------------------------------------|--------------------------|-------|------|------------------------|
| Peak Pulse Power Dissipation       | P <sub>PP</sub>          | 96    | W    | 8/20μs, Per Figure 3   |
| Peak Pulse Current                 | I <sub>PP</sub>          | 12    | A    | 8/20μs, Per Figure 3   |
| ESD Protection – Contact Discharge | V <sub>ESD_CONTACT</sub> | ±30   | kV   | IEC 61000-4-2 Standard |
| ESD Protection – Air Discharge     | V <sub>ESD_AIR</sub>     | ±30   | kV   | IEC 61000-4-2 Standard |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Package Power Dissipation (Note 5)               | P <sub>D</sub>                    | 250         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 500         | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -65 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> | —   | —   | 3.3 | V    | —   |
| Channel Leakage Current (Note 6)               | I <sub>RM</sub>  | —   | —   | 200 | nA   | V <sub>RWM</sub> = 3.3V   |
| Breakdown Voltage                              | V <sub>BR</sub>  | 3.8 | —   | —   | V    | I <sub>R</sub> = 1mA  |
| Clamping Voltage, Positive Transients (Note 7) | V <sub>CL</sub>  | —   | —   | 6   | V    | I <sub>PP</sub> = 1A, t <sub>P</sub> = 8/20μs                     |
|  |                  | —   | —   | 8   | V    | I <sub>PP</sub> = 12A, t <sub>P</sub> = 8/20μs                    |
| ESD Clamping Voltage (Note 8)                  | V <sub>C</sub>   | —   | 8   | —   | V    | I <sub>TLP</sub> = 10A, t <sub>P</sub> = 100ns                    |
| Dynamic Resistance                             | R <sub>DYN</sub> | —   | 0.2 | —   | Ω    | I <sub>TLP</sub> = 10A to 20A, t <sub>P</sub> = 100ns, I/O to GND |
| Channel Input Capacitance                      | C <sub>IN</sub>  | —   | 28  | —   | pF   | V <sub>R</sub> = 0V, f = 1MHz                                     |

- Notes:
5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on our website at <http://www.diodes.com/package-outlines.html>.
  6. Short duration pulse test used to minimize self-heating effect.
  7. Clamping voltage value is based on an 8x20μs peak pulse current (I<sub>PP</sub>) waveform.
  8. Transmission Line Pulse Test (TLP) settings: t<sub>P</sub>=100ns, t<sub>R</sub>=1ns, I<sub>TLP</sub> and V<sub>TLP</sub> averaging window is from 70ns to 90ns.

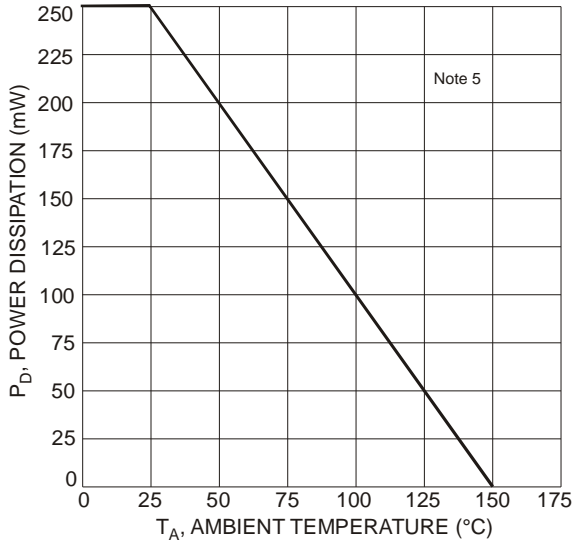


Figure 1 Power Derating Curve

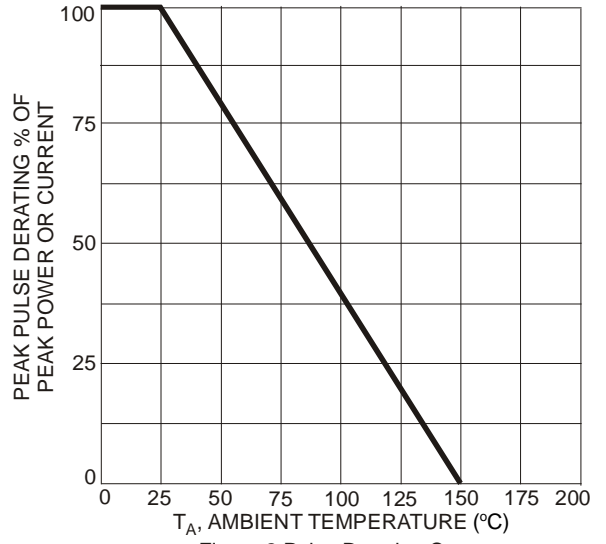


Figure 2 Pulse Derating Curve

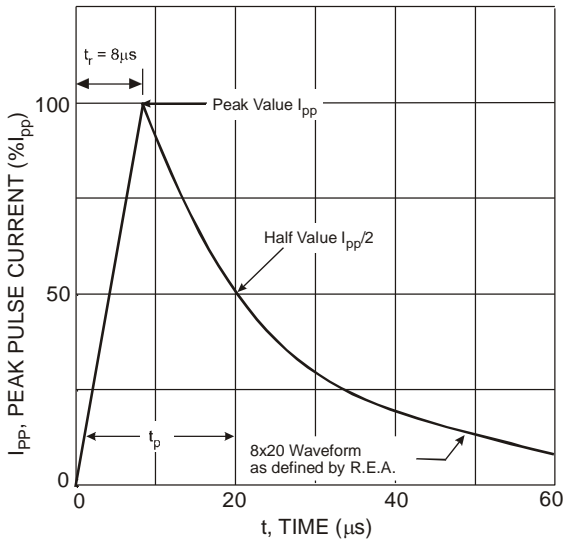


Figure 3 Pulse Waveform

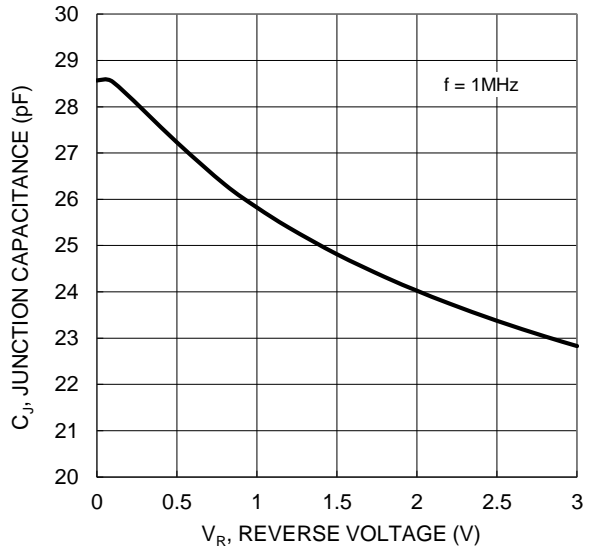


Figure 4 Typical Junction Capacitance

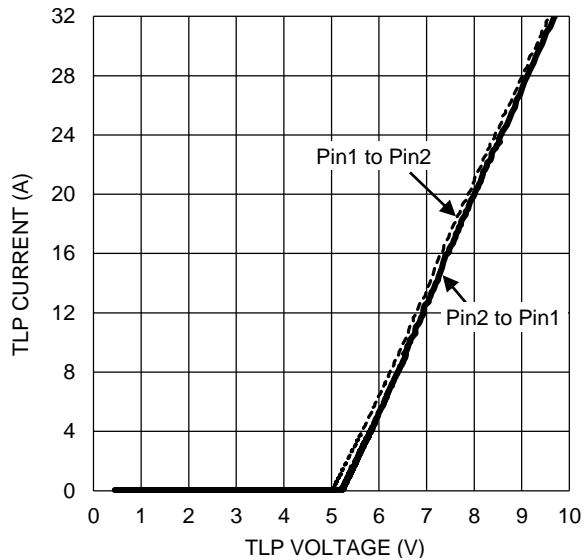
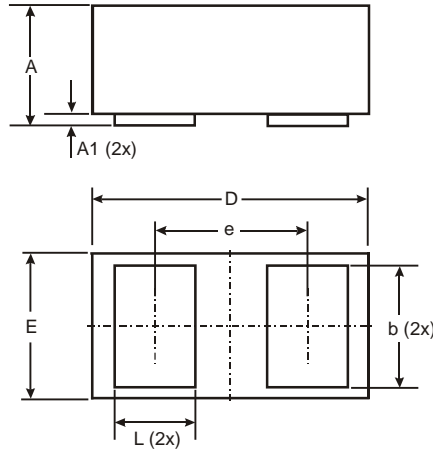


Figure 5 TLP Curve (t<sub>p</sub>=100ns)

**Package Outline Dimensions**

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

**X3-DFN0603-2**

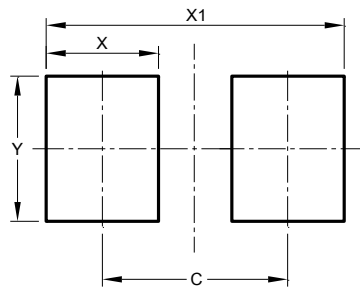


| X3-DFN0603-2         |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.27  | 0.35  | 0.30  |
| A1                   | 0.00  | 0.03  | 0.02  |
| b                    | 0.19  | 0.29  | 0.24  |
| D                    | 0.595 | 0.645 | 0.62  |
| E                    | 0.295 | 0.345 | 0.32  |
| e                    | -     | -     | 0.355 |
| L                    | 0.14  | 0.24  | 0.19  |
| All Dimensions in mm |       |       |       |

**Suggested Pad Layout**

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

**X3-DFN0603-2**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.380         |
| X          | 0.230         |
| X1         | 0.610         |
| Y          | 0.300         |

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