

## 2 CHANNEL HIGH SURGE BIDIRECTIONAL TVS DIODE

### 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                      | 5A                        | 10pF                      |

### 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

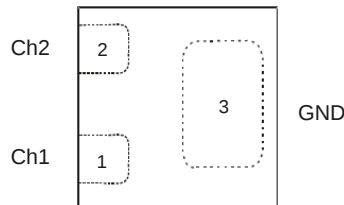
### Features

- Provides ESD Protection per IEC 61000-4-2 Standard:  
Air ±25kV, Contact ±23kV
- 2 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)**

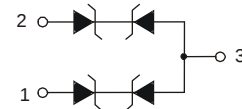
### Mechanical Data

- Case: X2-DFN1010-3
- Case 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 
- Weight: 0.001 grams (Approximate)

X2-DFN1010-3



Top View



Device Schematic

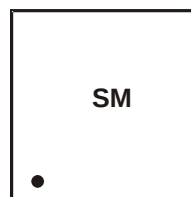
### Ordering Information (Note 4)

| Product        | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|----------------|------------|---------|--------------------|-----------------|-------------------|
| D3V3L2B3LP10-7 | Standard   | SM      | 7                  | 8               | 5,000/Tape & Reel |

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  - See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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 <http://www.diodes.com/products/packages.html>.

### Marking Information

X2-DFN1010-3



SM = 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>          | 35    | W    | 8/20μs, per Figure 1   |
| Peak Pulse Current                 | I <sub>PP</sub>          | 5     | A    | 8/20μs, per Figure 1   |
| ESD Protection – Contact Discharge | V <sub>ESD_Contact</sub> | ±23   | kV   | IEC 61000-4-2 Standard |
| ESD Protection – Air Discharge     | V <sub>ESD_Air</sub>     | ±25   | kV   | IEC 61000-4-2 Standard |

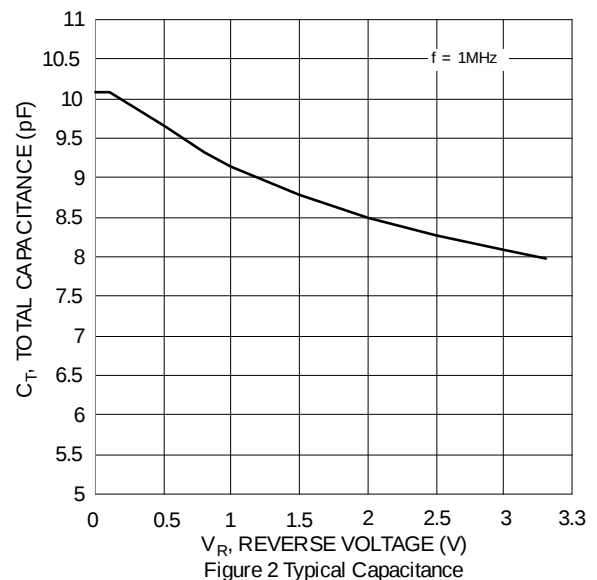
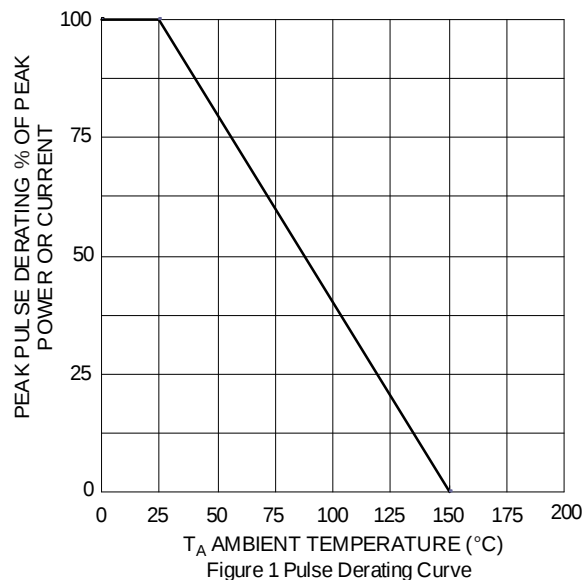
**Thermal Characteristics**

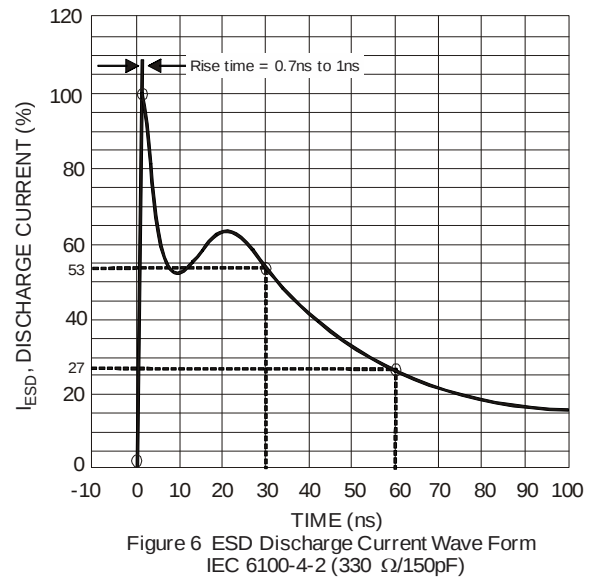
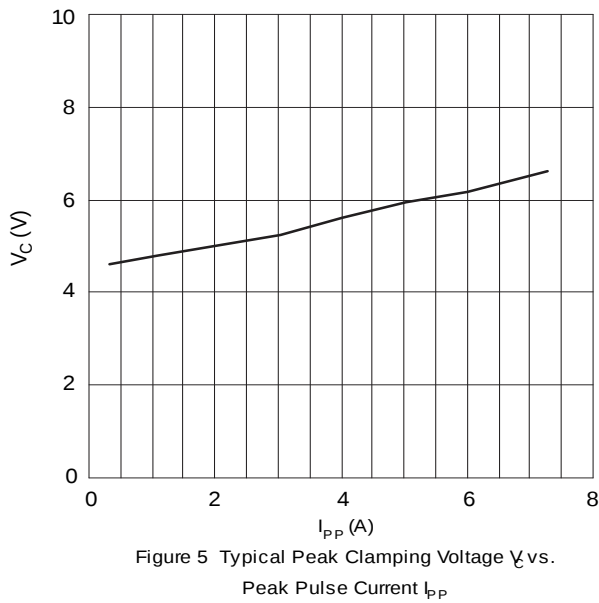
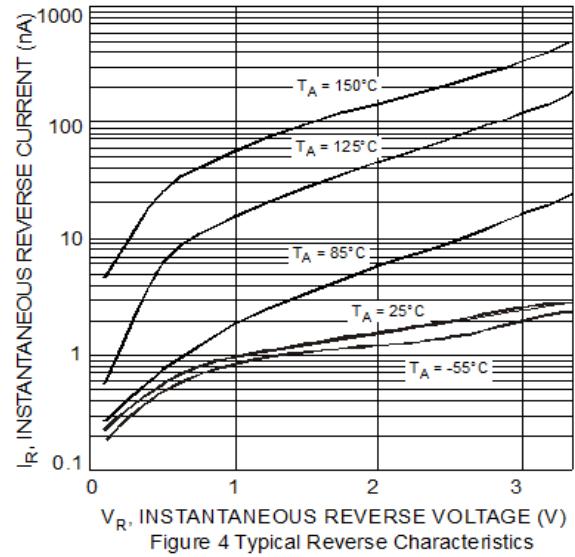
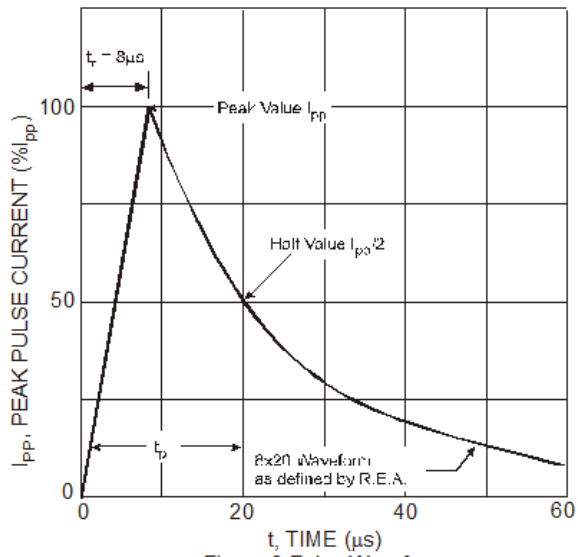
| Characteristic                                   | Symbol                            | Value       | Unit |
|--------------------------------------------------|-----------------------------------|-------------|------|
| Package Power Dissipation (Note 5)               | P <sub>D</sub>                    | 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>  | —   | 10  | 200 | nA   | V <sub>RWM</sub> = 3.3V                       |
| Clamping Voltage, Positive Transients | V <sub>CL</sub>  | —   | 4.5 | 5.4 | V    | I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μS |
|                                       |                  | —   | 5.8 | 7.0 |      | I <sub>PP</sub> = 5A, t <sub>p</sub> = 8/20μS |
| Breakdown Voltage                     | V <sub>BR</sub>  | 3.8 | —   | 6.5 | V    | I <sub>R</sub> = 1mA                          |
| Differential Resistance               | R <sub>DIF</sub> | —   | 0.3 | —   | Ω    | I <sub>R</sub> = 1A, t <sub>p</sub> = 8/20μS  |
| Channel Input Capacitance             | C <sub>IN</sub>  | —   | 10  | 13  | pF   | V <sub>R</sub> = 0V, f = 1MHz                 |

- Notes:
5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at <http://www.diodes.com>.
  6. Short duration pulse test used to minimize self-heating effect.





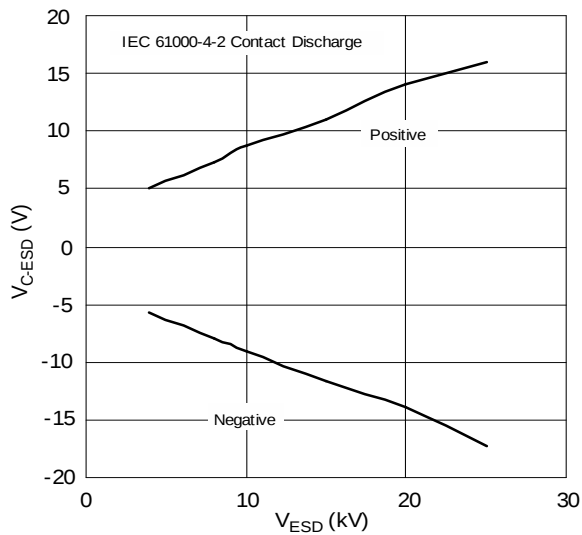


Figure 7 Typical Clamping Voltage vs.  
Contact Discharge Voltage

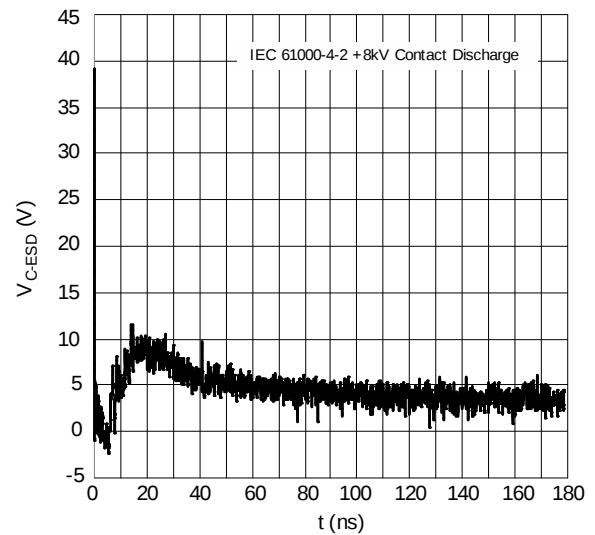


Figure 8 Typical Clamping Performance  
@ 8kV Contact Discharge

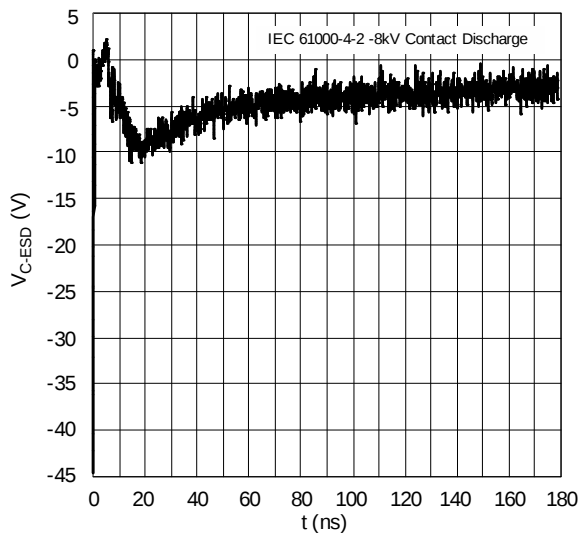
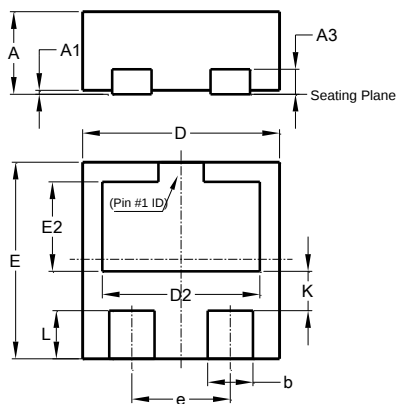


Figure 9 Typical Clamping Performance  
@ -8kV Contact Discharge

## Package Outline Dimensions

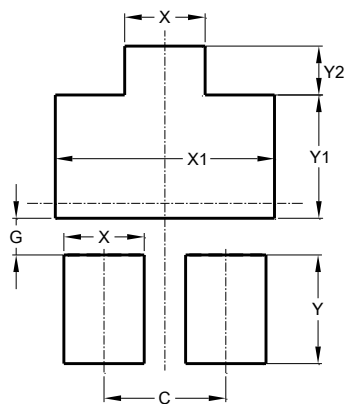
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| X2-DFN1010-3         |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | -     | 0.40  | 0.39  |
| A1                   | 0.00  | 0.05  | 0.02  |
| A3                   | -     | -     | 0.13  |
| b                    | 0.18  | 0.28  | 0.23  |
| D                    | 0.95  | 1.05  | 1.00  |
| D2                   | 0.70  | 0.90  | 0.80  |
| E                    | 0.95  | 1.05  | 1.00  |
| E2                   | 0.36  | 0.56  | 0.46  |
| e                    | -     | -     | 0.50  |
| K                    | -     | -     | 0.20  |
| L                    | 0.195 | 0.295 | 0.245 |
| All Dimensions in mm |       |       |       |

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| X2-DFN1010-3         |       |
|----------------------|-------|
| Dimensions           | Value |
| C                    | 0.500 |
| G                    | 0.150 |
| X                    | 0.330 |
| X1                   | 0.900 |
| Y                    | 0.445 |
| Y1                   | 0.505 |
| Y2                   | 0.200 |
| All Dimensions in mm |       |

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