

## Product Summary

|                             |                             |                            |
|-----------------------------|-----------------------------|----------------------------|
| <b>V<sub>BR</sub> (Min)</b> | <b>I<sub>PP</sub> (Max)</b> | <b>C<sub>T</sub> (Typ)</b> |
| 6.2V                        | 40A                         | 210pF                      |

## Description and Applications

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 Automotive Infotainment applications including,

- USB Modules
- HDMI Inputs
- Infotainment Console

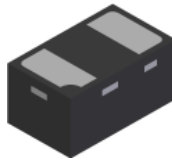
## Features

- Low Profile Package (0.53mm Max) and Ultra-Small PCB Footprint Area (1.08mm \* 0.68mm Max) Suitable for Compact Portable Electronics
- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: X1-DFN1006-2
- 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 (e4)
- Weight: 0.001 grams (Approximate)

X1-DFN1006-2



Bottom View



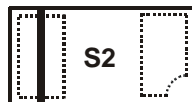
Device Schematic

## Ordering Information (Note 4)

| Part Number   | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity Per Reel  |
|---------------|------------|---------|--------------------|-----------------|--------------------|
| D5V0S1U2LP-7B | Standard   | S2      | 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



S2 = Product Type Marking Code  
Bar Denotes Pin 1 or Cathode Side

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

| Characteristic                     | Symbol                   | Value | Unit | Conditions             |
|------------------------------------|--------------------------|-------|------|------------------------|
| Peak Pulse Power Dissipation       | P <sub>PP</sub>          | 500   | W    | 8/20μs, per Figure 3   |
| Peak Pulse Current                 | I <sub>PP</sub>          | 40    | 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 6) | 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 Working Voltage   | V <sub>RWM</sub> | —   | —   | 5.5  | V    | —  |
| Reverse Current (Note 6)  | I <sub>R</sub>   | —   | 0.1 | 1.0  | μA   | V <sub>R</sub> = V <sub>RWM</sub> = 5.0V       |
| Reverse Breakdown Voltage | V <sub>BR</sub>  | 6.2 | —   | 7.4  | V    | I <sub>R</sub> = 1mA                           |
| Reverse Clamping Voltage  | V <sub>CL</sub>  | —   | —   | 8.0  | V    | I <sub>PP</sub> = 5A, t <sub>p</sub> = 8/20μs  |
|                           |                  | —   | —   | 11.5 |      | I <sub>PP</sub> = 30A, t <sub>p</sub> = 8/20μs |
|                           |                  | —   | —   | 13.0 |      | I <sub>PP</sub> = 40A, t <sub>p</sub> = 8/20μs |
| Capacitance               | C <sub>T</sub>   | —   | 210 | —    | pF   | V <sub>R</sub> = 0V, f = 1MHz                  |

- Notes:
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown in Diodes Incorporated's package outline PDFs, 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.

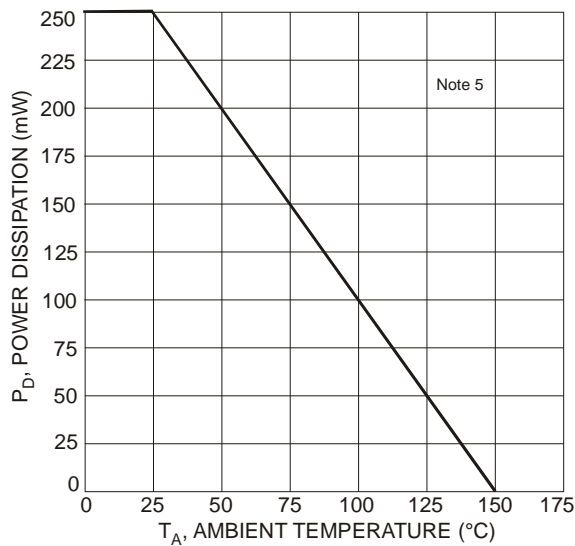


Figure 1 Power Derating Curve

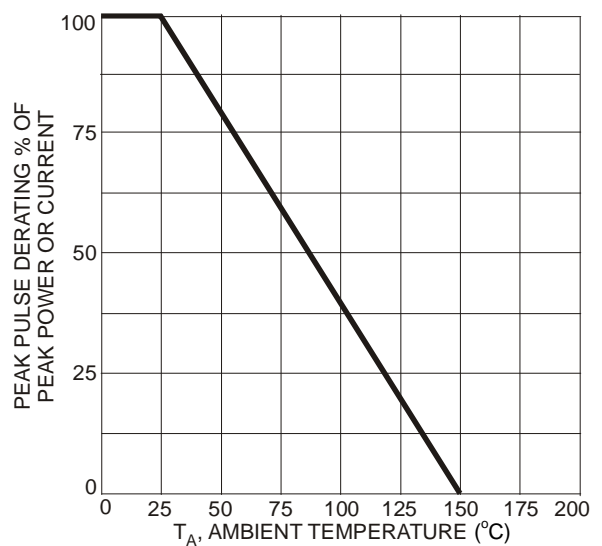


Figure 2 Pulse Derating Curve

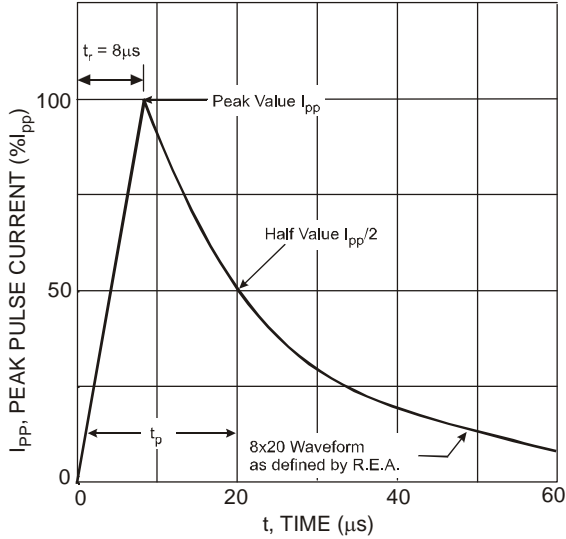


Figure 3 Typical 8 x 20 $\mu$ s Pulse Waveform

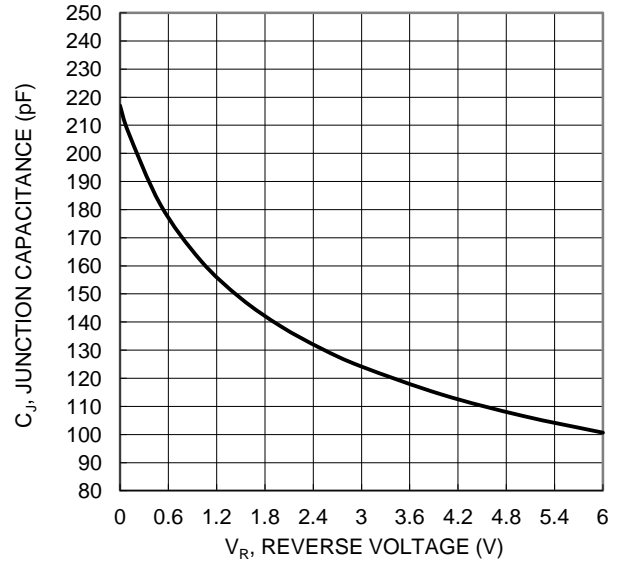


Figure 4 Typical Junction Capacitance

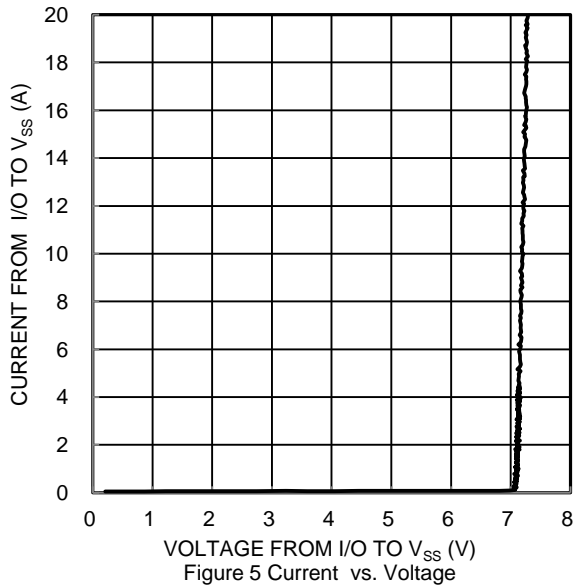


Figure 5 Current vs. Voltage

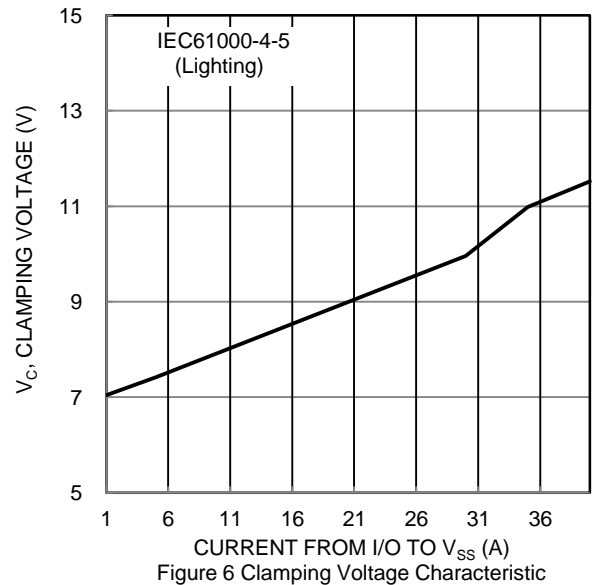
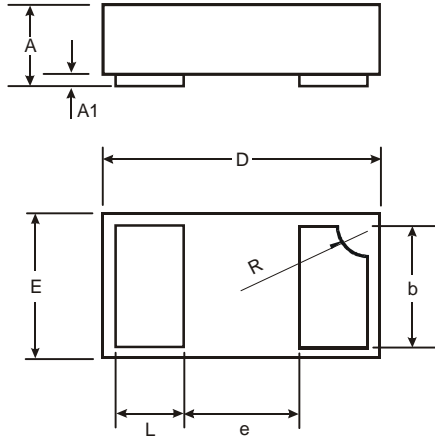


Figure 6 Clamping Voltage Characteristic

**Package Outline Dimensions**

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

**X1-DFN1006-2**

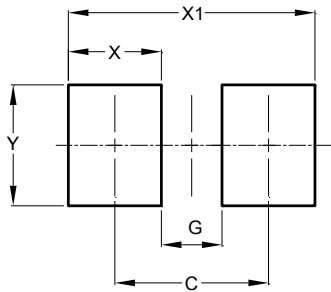


| X1-DFN1006-2         |      |       |      |
|----------------------|------|-------|------|
| Dim                  | Min  | Max   | Typ  |
| A                    | 0.47 | 0.53  | 0.50 |
| A1                   | 0    | 0.05  | 0.03 |
| b                    | 0.45 | 0.55  | 0.50 |
| D                    | 0.95 | 1.075 | 1.00 |
| E                    | 0.55 | 0.675 | 0.60 |
| e                    | -    | -     | 0.40 |
| L                    | 0.20 | 0.30  | 0.25 |
| R                    | 0.05 | 0.15  | 0.10 |
| All Dimensions in mm |      |       |      |

**Suggested Pad Layout**

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

**X1-DFN1006-2**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.70          |
| G          | 0.30          |
| X          | 0.40          |
| X1         | 1.10          |
| Y          | 0.70          |

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