

Product Summary

| | | |
|------------------|------------------|-----------------|
| VBR (Min) | IPP (Max) | CT (Typ) |
| 5.1V | 90A | 290pF |

Description

This new generation TVS is designed to protect sensitive electronics from the damage due to ESD and surge. 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 peripherals

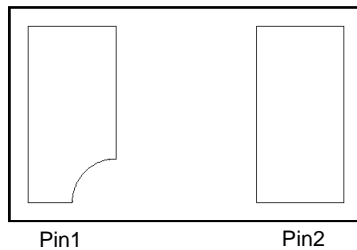
Features

- Low Profile Package (0.50mm Max) and Ultra-Small PCB Footprint Area (1.1mm x 0.7mm Max) Suitable for Compact Portable Electronics
- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- Provides Surge and Lightning Protection per IEC 61000-4-5 Standard: IPP Max 90A
- One Channel of ESD and Surge Protection
- **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-Q100/101/104/200, 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

- Package: X1-DFN1006-2
- Package 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. Solderable per MIL-STD-202, Method 208
- Weight: 0.001 grams (Approximate)

X1-DFN1006-2 (Type SA-2)



Bottom View



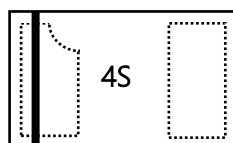
Device Schematic

Ordering Information (Note 4)

| Part Number | Package | Marking | Reel Size (inches) | Tape Width (mm) | Packing | |
|-----------------|--------------------------|---------|--------------------|-----------------|---------|-------------|
| | | | | | Qty. | Carrier |
| D5V0S1US2SLP-7B | X1-DFN1006-2 (Type SA-2) | 4S | 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



4S = Product Type Marking Code
Bar Denotes Pin1 or Cathode Side

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

| Characteristic | Symbol | Value | Unit | Conditions |
|---|--------------------------|-------|------|------------------------|
| Peak Pulse Power Dissipation (Pin1 to Pin2) | P _{PP} | 657 | W | 8/20μs, per Figure 3 |
| Peak Pulse Current (Pin1 to Pin2) | I _{PP} | 90 | A | 8/20μs, per Figure 3 |
| ESD Protection—Contact Discharge | V _{ESD_CONTACT} | ±30 | kV | IEC 61000-4-2 Standard |
| ESD Protection—Air Discharge | V _{ESD_AIR} | ±30 | kV | IEC 61000-4-2 Standard |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Package Power Dissipation (Note 5) | P _D | 250 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 500 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---------------------------|------------------|-----|------|-----|------|--|
| Reverse Working Voltage | V _{RWM} | — | — | 5.0 | V | — |
| Reverse Current (Note 6) | I _R | — | 0.01 | 2.0 | μA | V _R = V _{RWM} |
| Reverse Breakdown Voltage | V _{BR} | 5.1 | — | 7.0 | V | I _R = 1mA |
| Reverse Clamping Voltage | V _{CL} | — | 6.0 | — | V | I _{PP} = 30A, t _P = 8/20μs |
| | | — | 6.2 | 7.4 | | I _{PP} = 40A, t _P = 8/20μs |
| | | — | 6.6 | — | | I _{PP} = 60A, t _P = 8/20μs |
| | | — | 7.3 | — | | I _{PP} = 90A, t _P = 8/20μs |
| Capacitance | C _T | — | 290 | — | pF | V _R = 0V, f = 1MHz |

Notes: 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>.
6. Short duration pulse test used to minimize self-heating effect.

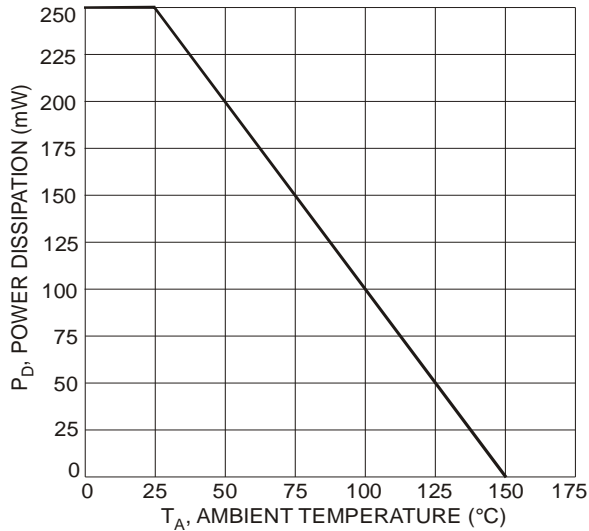


Figure 1 Power Derating Curve

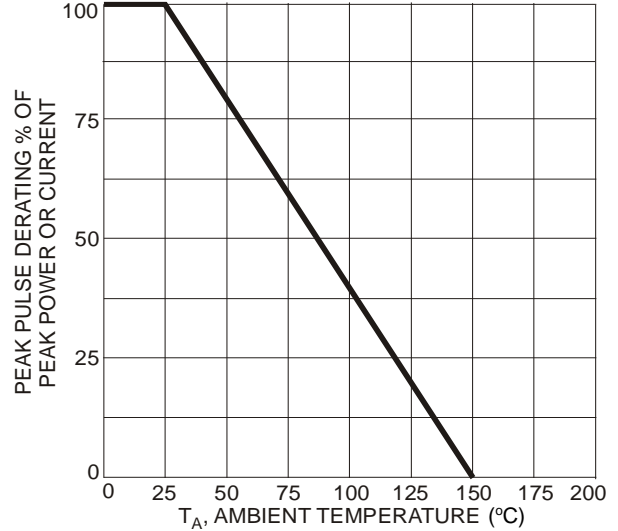


Figure 2 Pulse Derating Curve

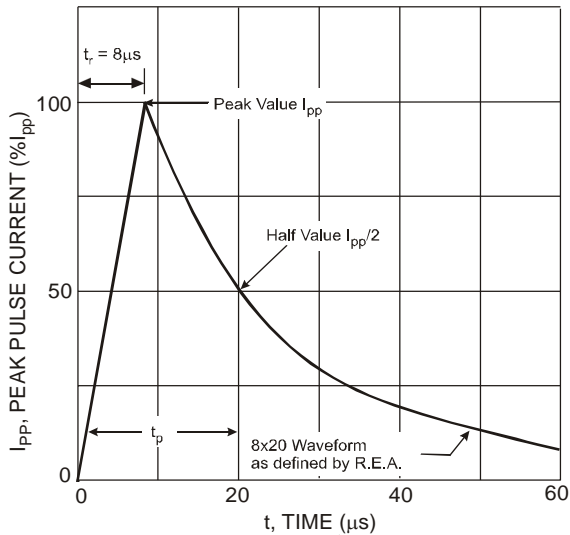


Figure 3 Typical 8 x 20µs Pulse Waveform

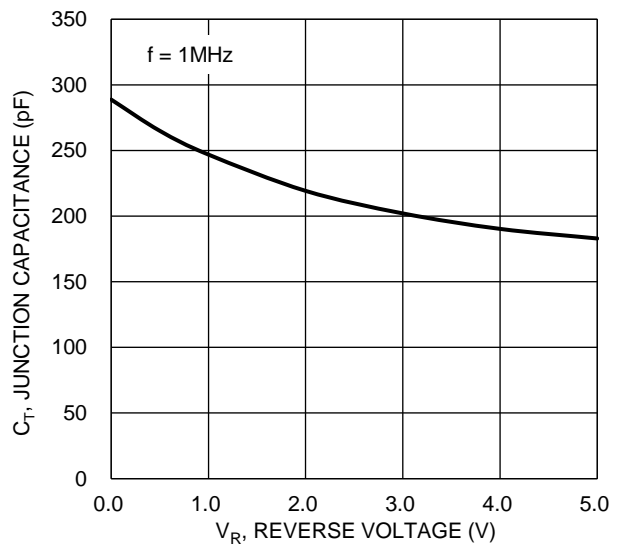


Figure 4 Typical Total Capacitance

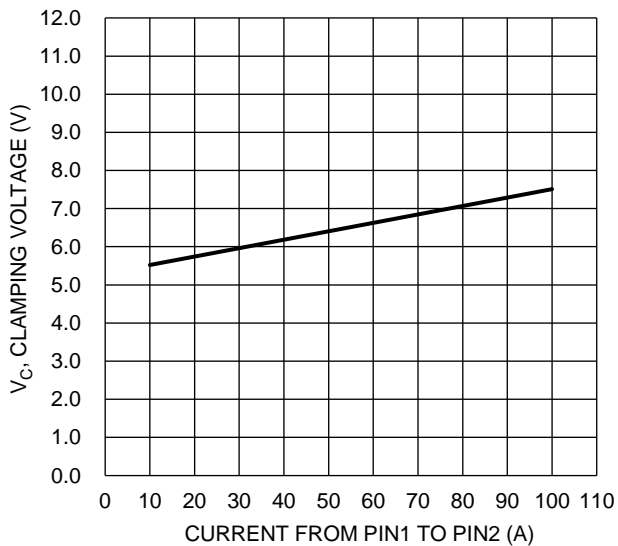


Figure 5 Clamping Voltage Characteristic ($t_p=8/20\mu s$)

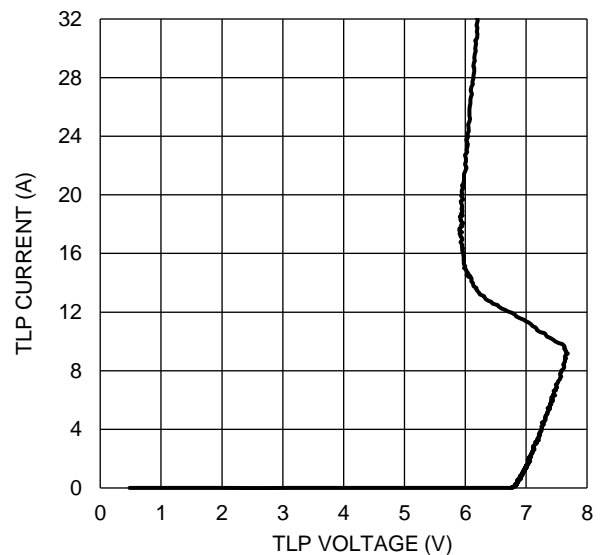
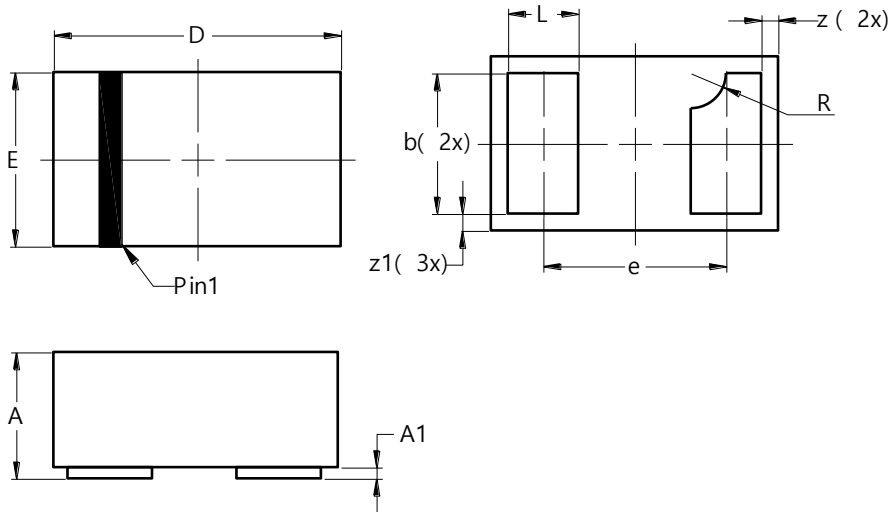


Figure 6 Positive TLP Curve ($t_p=100ns$)

Package Outline Dimensions

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

X1-DFN1006-2 (Type SA-2)

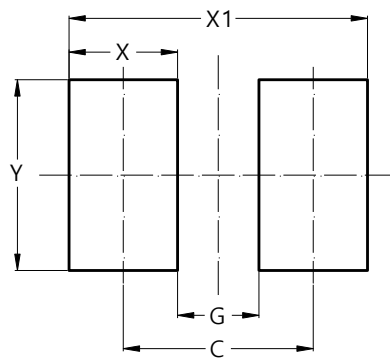


| X1-DFN1006-2 (Type SA-2) | | | |
|-----------------------------|-----------|-------|-------|
| Dim | Min | Max | Typ |
| A | 0.400 | 0.500 | -- |
| A1 | -- | 0.050 | -- |
| b | 0.450 | 0.550 | 0.500 |
| D | 0.990 | 1.050 | 1.020 |
| E | 0.590 | 0.650 | 0.620 |
| e | 0.650 BSC | | |
| L | 0.200 | 0.300 | 0.250 |
| R | 0.075 | 0.175 | 0.125 |
| z | 0.020 | 0.100 | 0.060 |
| z1 | 0.020 | 0.100 | 0.060 |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

X1-DFN1006-2 (Type SA-2)



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.700 |
| G | 0.300 |
| X | 0.400 |
| X1 | 1.100 |
| Y | 0.700 |

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