# LOW CAPACITANCE BIDIRECTIONAL TVS DIODE

## Features

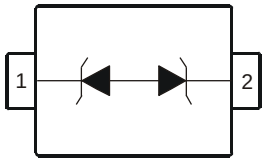
- Provides ESD Protection per IEC 61000-4-2 Standard: Contact ±10kV
- 1 Channel of ESD Protection
- High Peak Pulse Current per IEC 61000-4-5 Standard
- Low Channel Input Capacitance
- Typically used in Cellular Handsets, Portable Electronics, Communication Systems, Computers and Peripherals
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: SOD523
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.001 grams (Approximate)

SOD523

Top View




Device Schematic

## Ordering Information (Note 4)

| Product | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|---|---|---|---|---|---|
| DESD5V0U1BB-7 (Note 5) | Standard | K / ꓘ | 7 | 8 | 3,000/Tape & Reel |

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See 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.
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 http://www.diodes.com/products/packages.html.
5. Dispensed every other cavity of the carrier tape.

## Marking Information

SOD523


K / ꓘ = Product Type Marking Code

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

| Characteristic | Symbol | Value | Unit | Conditions |
|---|---|---|---|---|
| Peak Pulse Current | $I_{PP}$ | 3 | A | 8/20µs, per Figure 3 |
| ESD Protection – Contact Discharge | $V_{ESD\_Contact}$ | ±10 | kV | IEC 61000-4-2 Standard |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Package Power Dissipation (Note 6) | $P_D$ | 250 | mW |
| Thermal Resistance, Junction to Ambient (Note 6) | $R_{\theta JA}$ | 500 | °C/W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -65 to +150 | °C |

## Electrical Characteristics @$T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Reverse Standoff Voltage | $V_{RWM}$ | - | - | 5 | V | - |
| Channel Leakage Current (Note 7) | $I_{RM}$ | - | 5 | 100 | nA | $V_{RWM}$ = 5V |
| Clamping Voltage | $V_{CL}$ | - | 7.2 | - | V | $I_{PP}$ = 3A, $t_p$ = 8/20µs |
| Breakdown Voltage | $V_{BR}$ | 5.5 | 7 | 9.5 | V | $I_R$ = 5mA |
| Differential Resistance | $R_{DIF}$ | - | - | 100 | Ω | $I_R$ = 1mA |
| Dynamic Impedance | $R_{dyn}$ | - | 0.3 | - | Ω | TLP, 20A, tp = 100 ns |
| Channel Input Capacitance | $C_T$ | - | 2.9 | - | pF | $V_R$ = 0V, f = 1MHz |
| | | - | 1.9 | - | | $V_R$ = 5V, f = 1MHz |

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

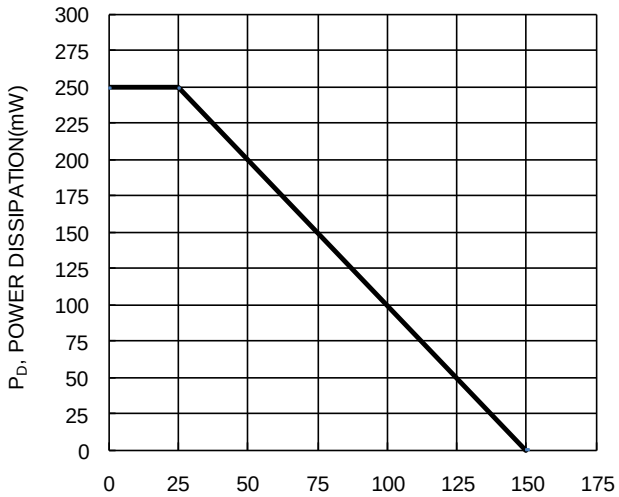


Figure 1. Power Derating Curve

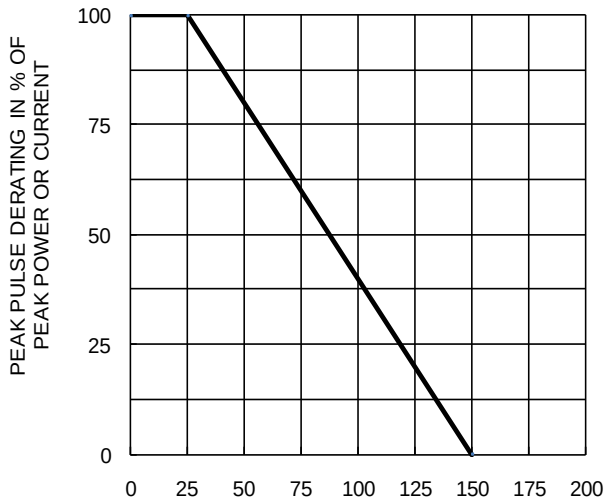


Figure 2. Pulse Derating Curve

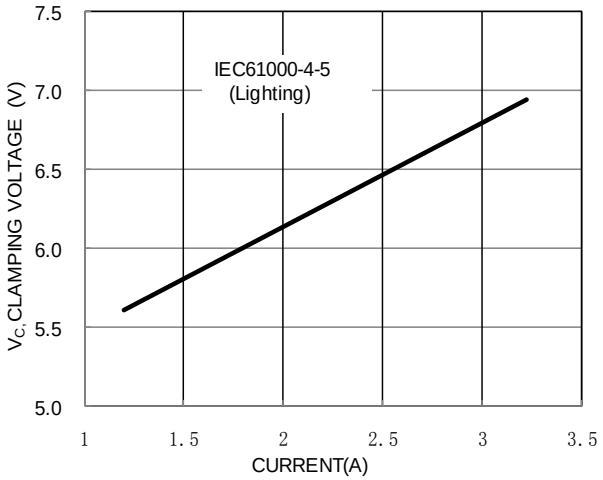



Figure 3. Clamping Voltage Characteristic

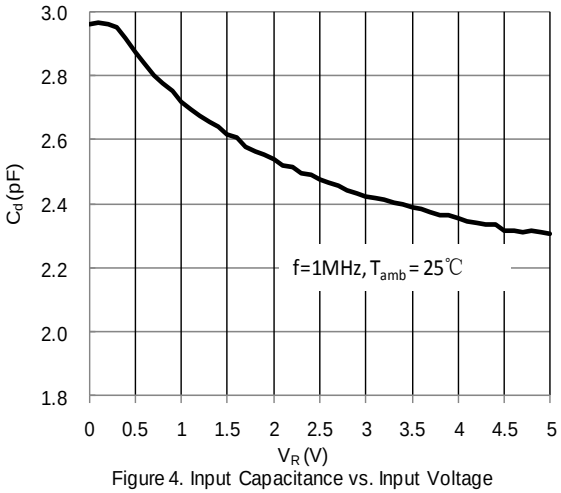



Figure 4. Input Capacitance vs. Input Voltage

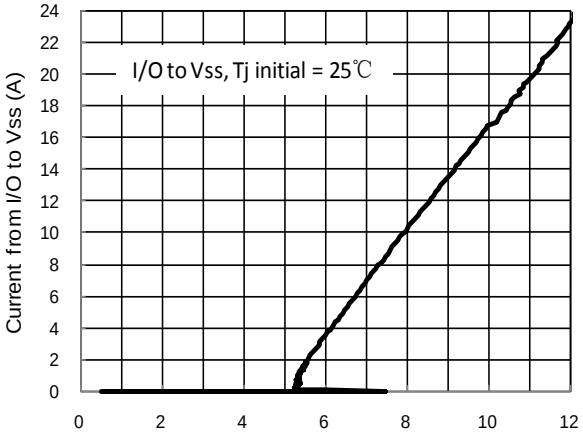



Figure 5. Current vs. Voltage

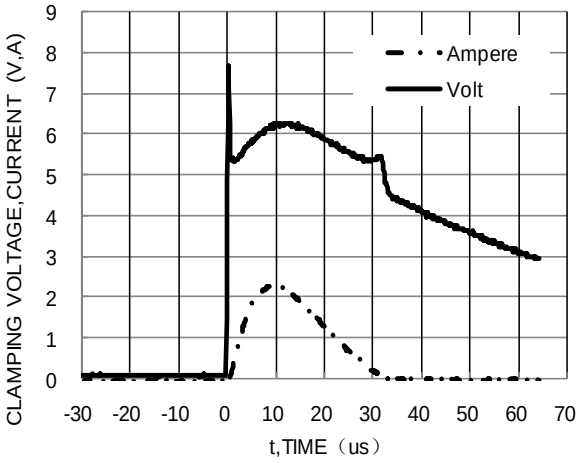



Figure 6. Waveform of Clamping Voltage,Current vs. Time(8/20us,I/O to Vss)

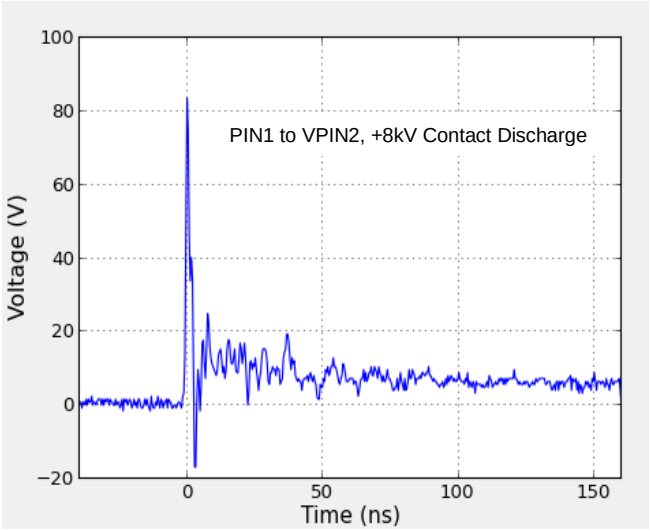



Figure 7 ESD response to IEC 61000-4-2

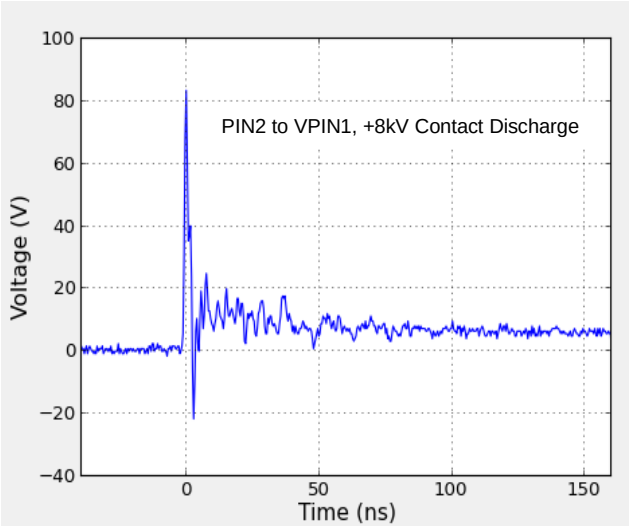
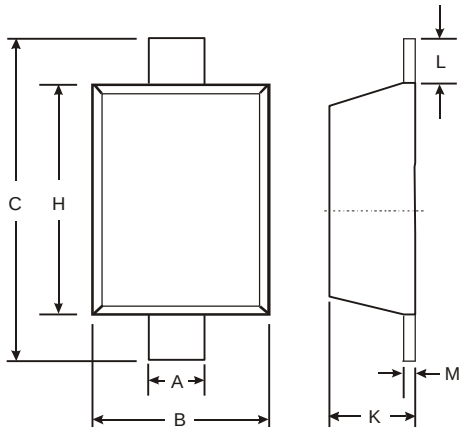



Figure 8 ESD response to IEC 61000-4-2

## Package Outline Dimensions

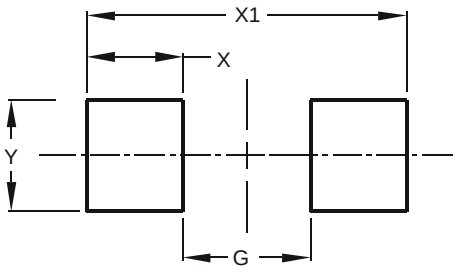
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.




| SOD523 | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 0.25 | 0.35 |
| **B** | 0.70 | 0.90 |
| **C** | 1.50 | 1.70 |
| **H** | 1.10 | 1.30 |
| **K** | 0.55 | 0.65 |
| **L** | 0.10 | 0.30 |
| **M** | 0.10 | 0.12 |
| **All Dimensions in mm** | | |

## Suggested Pad Layout

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




| Dimensions | Value (in mm) |
|---|---|
| **G** | 0.80 |
| **X** | 0.60 |
| **X1** | 2.00 |
| **Y** | 0.70 |

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