

## Product Summary

|                           |                           |                           |
|---------------------------|---------------------------|---------------------------|
| <b>V<sub>BR</sub> min</b> | <b>I<sub>pp</sub> max</b> | <b>C<sub>in typ</sub></b> |
| 6.2V                      | 9A                        | 54pF                      |

## 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 portable applications such as:

- USB Modules
- HDMI Ports
- LVDS

## Features

- Provides ESD Protection per IEC 61000-4-2 Standard:  
Air ±30kV, Contact ±30kV
- One 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**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: SOD923
- 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)

SOD923



Top View



Device Schematic

## Ordering Information (Note 5)

| Product       | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel  |
|---------------|------------|---------|--------------------|-----------------|--------------------|
| D5V0M1U2S9Q-7 | Automotive | TH      | 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information

SOD923



TH = Product Type Marking Code  
Line 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>          | 108   | W    | 8/20μs, per Figure 3   |
| Peak Pulse Current                 | I <sub>PP</sub>          | 9.0   | 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 6)               | 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 Standoff Voltage              | V <sub>RWM</sub> | —   | —   | 5.5 | V    | —                                             |
| Channel Leakage Current (Note 7)      | I <sub>RM</sub>  | —   | —   | 1.0 | μA   | V <sub>RWM</sub> = 5V                         |
| Clamping Voltage, Positive Transients | V <sub>CL</sub>  | —   | —   | 12  | V    | I <sub>PP</sub> = 9A, t <sub>p</sub> = 8/20μs |
| Breakdown Voltage                     | V <sub>BR</sub>  | 6.2 | —   | —   | V    | I <sub>R</sub> = 1mA                          |
| Channel Input Capacitance             | C <sub>IN</sub>  | —   | 54  | 64  | pF   | V <sub>R</sub> = 0V, f = 1MHz                 |

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

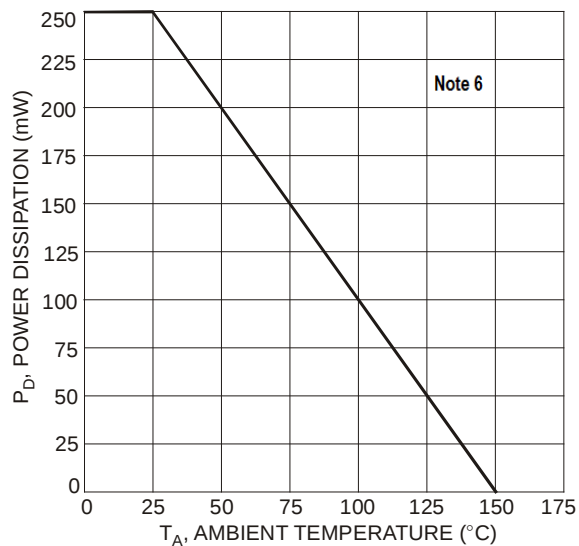


Figure 1 Power Derating Curve

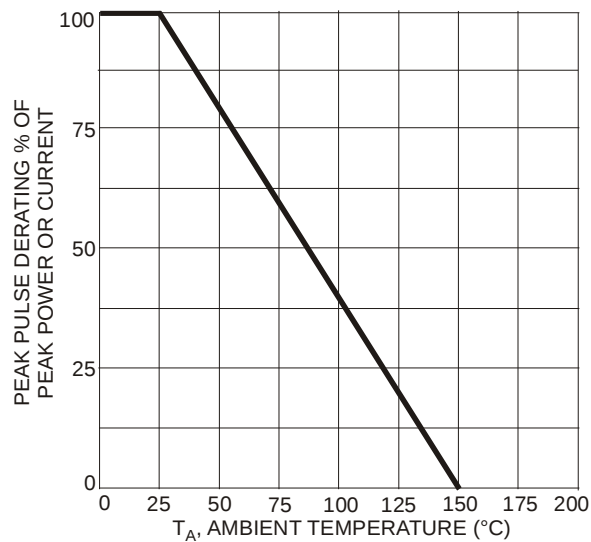


Figure 2 Pulse Derating Curve

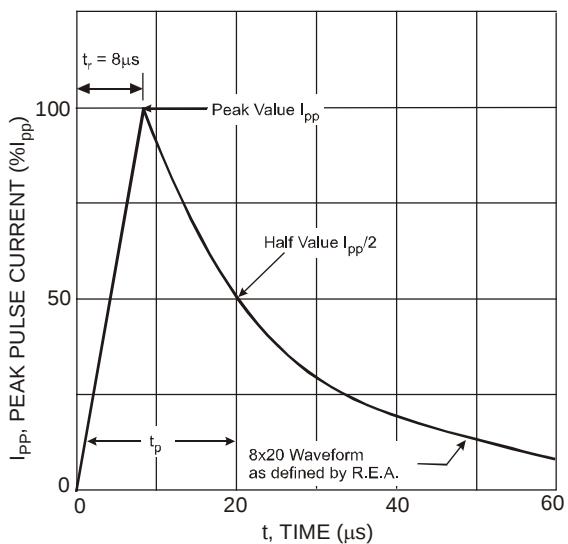


Figure 3 Pulse Waveform

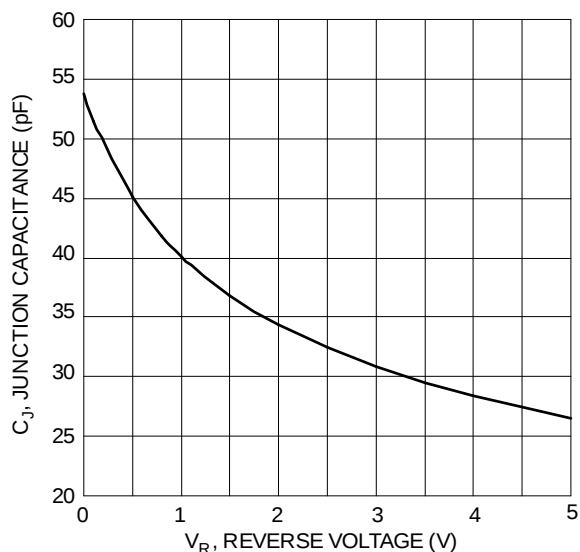
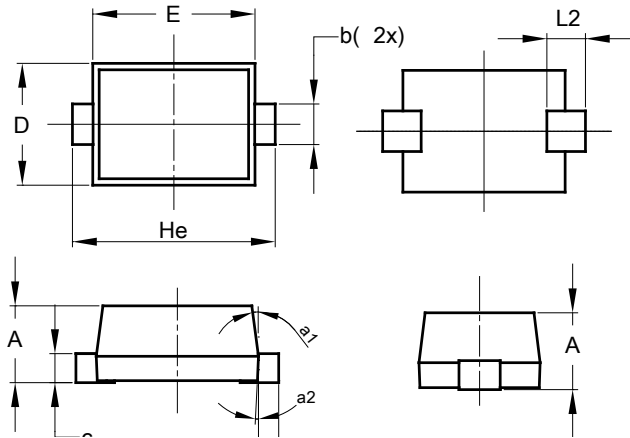


Figure 4 Typical Junction Capacitance

## Package Outline Dimensions

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

**SOD923 (0.3mm Lead Width)**

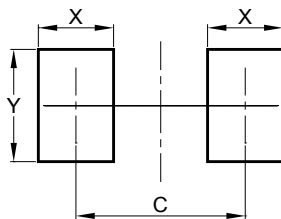


| SOD923<br>(0.3mm Lead Width) |           |      |      |
|------------------------------|-----------|------|------|
| Dim                          | Min       | Max  | Typ  |
| A                            | 0.34      | 0.40 | 0.37 |
| b                            | 0.25      | 0.35 | 0.30 |
| c                            | 0.05      | 0.15 | 0.10 |
| D                            | 0.55      | 0.65 | 0.60 |
| E                            | 0.75      | 0.85 | 0.80 |
| He                           | 0.95      | 1.05 | 1.00 |
| L                            | 0.05      | 0.15 | 0.10 |
| L2                           | 0.190 REF |      |      |
| a1                           | 0°        | 8°   | 7°   |
| a2                           | 2°        | 4°   | 3°   |
| All Dimensions in mm         |           |      |      |

## Suggested Pad Layout

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

**SOD923 (0.3mm Lead Width)**



| Dimensions | Value<br>(in mm) |
|------------|------------------|
| C          | 0.900            |
| X          | 0.400            |
| Y          | 0.600            |

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