

Product Summary

| | | |
|-----------------------------|-----------------------------|----------------------------|
| V_{BR} (Min) | I_{PP} (Max) | C_T (Typ) |
| 10V | 20A | 68pF |

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 peripherals

Features

- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- Bidirectional Configuration
- Ultra Low Channel Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DIODES™ SD09CQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: SOD323
- Package 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
- Weight: 0.004 grams (Approximate)



Top View



Device Schematic

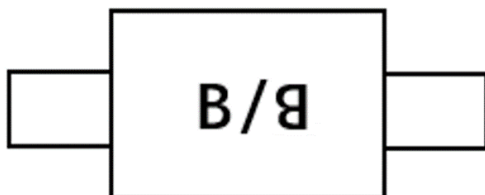
Ordering Information (Note 4)

| Part Number | Package | Marking | Reel Size (inches) | Tape Width (mm) | Packing | |
|-------------|---------|---------|--------------------|-----------------|---------|-------------|
| | | | | | Qty. | Carrier |
| SD09CQ-7 | SOD323 | B/B | 7 | 8 | 3,000 | Tape & Reel |

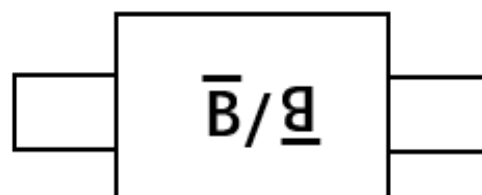
- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- 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

Option A: Made in Shanghai



Option B: Made in Chengdu



B/B = Product Type Marking Code

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

| Characteristic | Symbol | Value | Unit | Conditions |
|------------------------------------|--------------------------|-------|------|------------------------|
| Peak Pulse Power | P _{PP} | 400 | W | 8/20μs, per Figure 3 |
| Peak Pulse Current | I _{PP} | 20 | 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} | -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} | — | — | 9.0 | V | — |
| Channel Leakage Current (Note 6) | I _{RM} | — | — | 1 | μA | V _{RWM} = 9.0V |
| Breakdown Voltage | V _{BR} | 10.0 | — | — | V | I _R = 1mA |
| Clamping Voltage | V _{CL} | — | — | 14.5 | V | I _{PP} = 1A, t _p = 8/20μs |
| | | — | — | 17 | | I _{PP} = 10A, t _p = 8/20μs |
| | | — | — | 20.0 | | I _{PP} = 20A, t _p = 8/20μs |
| Clamping Voltage (Note 7) | V _{CL} | — | 17.3 | — | | I _{PP} = 16A, TLP = 10/100ns |
| | | — | 19.3 | — | | I _{PP} = 30A, TLP = 10/100ns |
| Channel Input Capacitance | C _T | — | 68 | — | pF | V _R = 0V, f = 1MHz |

- Notes:
5. 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>.
 6. Short duration pulse test used to minimize self-heating effect.
 7. Transmission Line Pulse Test (TLP) settings: t_p = 100ns, t_r = 10ns, I_{TLP} and V_{TLP} averaging window is from 70ns to 90ns.

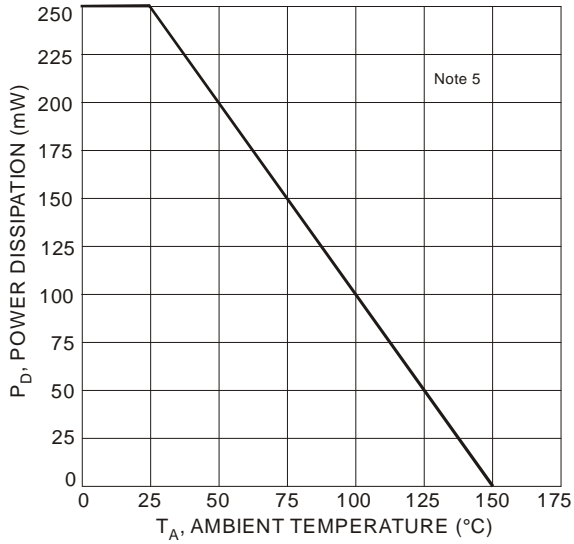


Figure 1 Power Derating Curve

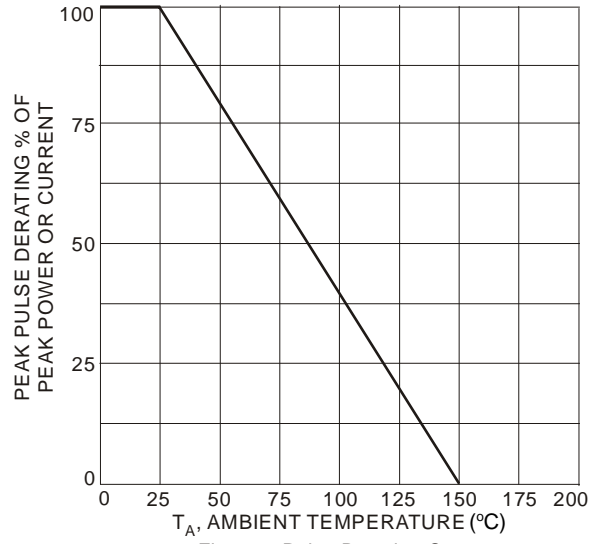


Figure 2 Pulse Derating Curve

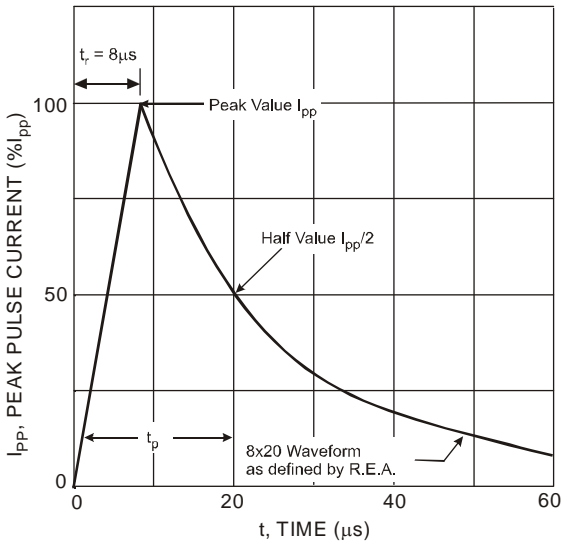


Figure 3 Typical 8 x 20µs Pulse Waveform

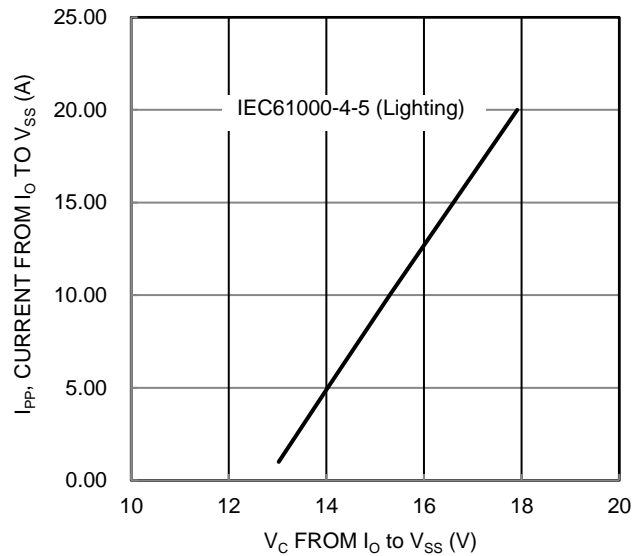


Figure 4 Clamping Voltage Characteristic

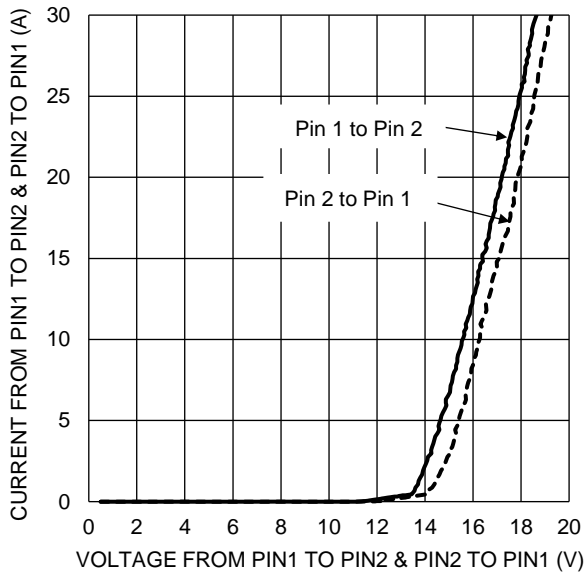
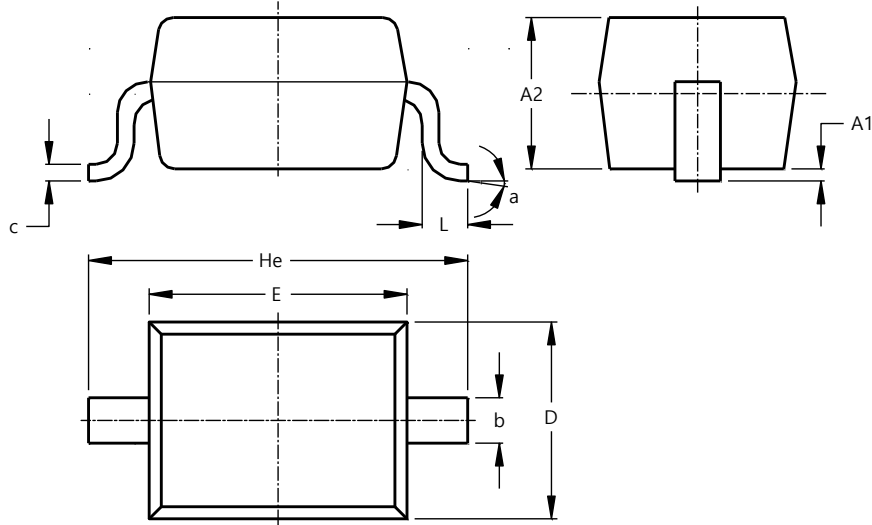


Figure 5 TLP Curve ($t_p = 100ns$)

Package Outline Dimensions

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

SOD323

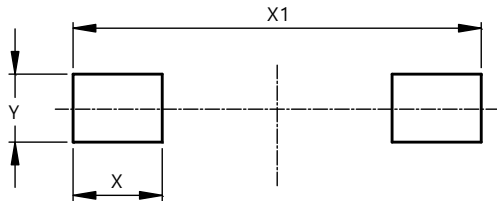


| SOD323 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A1 | -- | 0.10 | 0.05 |
| A2 | 1.00 | 1.10 | 1.05 |
| b | 0.25 | 0.35 | 0.30 |
| c | 0.10 | 0.15 | 0.11 |
| D | 1.20 | 1.40 | 1.30 |
| E | 1.60 | 1.80 | 1.70 |
| He | 2.30 | 2.70 | 2.50 |
| L | 0.20 | 0.40 | 0.30 |
| a | 0° | 8° | -- |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

SOD323



| Dimensions | Value (in mm) |
|------------|---------------|
| X | 0.590 |
| X1 | 2.700 |
| Y | 0.450 |

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