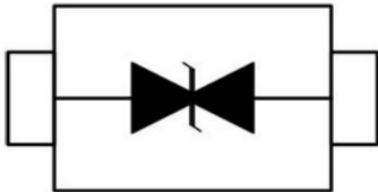


## Description

The SDxxxxD32G series is designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. These devices are ideal for situations where board space is at a premium.

This series has been specifically designed to protect sensitive components which are connected to power, data and transmission lines from overvoltage caused by ESD (electrostatic discharge), CDE (Cable Discharge Events), and EFT (electrical fast transients).

## Pinout and Functional Block Diagram



## Applications

- Networking and Telecom
- Microprocessor based equipment
- Personal Digital Assistants (PDA's)
- Notebooks, Desktops, and Servers
- Cell Phone Handsets and Accessories
- Portable Instrumentation
- Serial and Parallel Ports
- Peripherals

## Features

- IEC61000-4-2 (ESD)  $\pm 30$  kV (Air),  $\pm 30$  kV (Contact)
- IEC61000-4-4 (EFT) 40 A (5 / 50 ns)
- Peak Power Dissipation: 350 W@8 / 20  $\mu$ s
- Protects One I/O Line (Bidirectional)
- Low Clamping Voltage
- Low Leakage Current
- High Temperature to Reflow Soldering Guaranteed: 260  $^{\circ}$ C / 10 sec
- MSL1
- Flammability Rating: UL 94 V-0
- Halogen Free and RoHS Compliant

## Order Information

| Type       | Package | Marking Code       | Delivery Form | Delivery Quantity |
|------------|---------|--------------------|---------------|-------------------|
| SDxxxxD32G | SOD323  | Refer to next page | 7" T&R        | 3000 PCS          |

## Limiting Values

( $T_A = 25^{\circ}$ C, unless otherwise specified)

| Symbol    | Parameter                         | Conditions                       | Min | Max | Unit         |
|-----------|-----------------------------------|----------------------------------|-----|-----|--------------|
| $V_{ESD}$ | Electrostatic Discharge Voltage   | IEC 61000-4-2; Contact Discharge | -   | 30  | kV           |
|           |                                   | IEC 61000-4-2; Air Discharge     | -   | 30  | kV           |
| $P_{PP}$  | Peak Pulse Power (8 / 20 $\mu$ s) | -                                | -   | 350 | W            |
| $T_A$     | Operating Temperature Range       | -                                | -55 | 150 | $^{\circ}$ C |
| $T_{stg}$ | Storage Temperature Range         | -                                | -55 | 150 | $^{\circ}$ C |

# ESD Protection Diodes

Bidirectional ESD and Transient Voltage Protection

SDxxxxD32G SOD323

## Electrical Characteristics

(T<sub>A</sub> = 25 °C, unless otherwise specified)

| Part Number | Device Marking Code | V <sub>RWM</sub> | V <sub>B</sub> | I <sub>T</sub> | V <sub>C@1A</sub> | V <sub>C</sub> |      | I <sub>R</sub> | C <sub>J</sub> |
|-------------|---------------------|------------------|----------------|----------------|-------------------|----------------|------|----------------|----------------|
|             |                     | (V)              | (V)            | (mA)           | (V)               | (V)            |      | (μA)           | (pF)           |
|             |                     | (max.)           | (min.)         |                | (max.)            | (max.)         | (@A) | (max.)         | (max.)         |
| SD0320D32G  | 2A                  | 3.3              | 4.0            | 1              | 7.5               | 16.0           | 20   | 40             | 450            |
| SD0517D32G  | 2B                  | 5.0              | 6.0            | 1              | 9.8               | 18.0           | 17   | 10             | 200            |
| SD0815D32G  | 2C                  | 8.0              | 8.5            | 1              | 13.4              | 24.0           | 15   | 2              | 120            |
| SD1211D32G  | 2D                  | 12.0             | 13.3           | 1              | 19.0              | 32.0           | 11   | 1              | 75             |
| SD1510D32G  | 2J                  | 15.0             | 16.7           | 1              | 24.0              | 38.0           | 10   | 1              | 68             |
| SD1809D32G  | 2K                  | 18.0             | 20.0           | 1              | 29.0              | 45.0           | 9    | 1              | 57             |
| SD2008D32G  | 2L                  | 20.0             | 22.3           | 1              | 35.0              | 50.0           | 8    | 1              | 52             |
| SD2407D32G  | 2H                  | 24.0             | 26.7           | 1              | 43.0              | 52.0           | 7    | 1              | 50             |
| SD3605D32G  | 2N                  | 36.0             | 40.0           | 1              | 60.0              | 75.0           | 5    | 1              | 35             |

ESD TVS

ESD TVS

# ESD Protection Diodes

Bidirectional ESD and Transient Voltage Protection

SDxxxxD32G SOD323

## Performance Curve for Reference

( $T_A=25^\circ\text{C}$  unless otherwise noted)

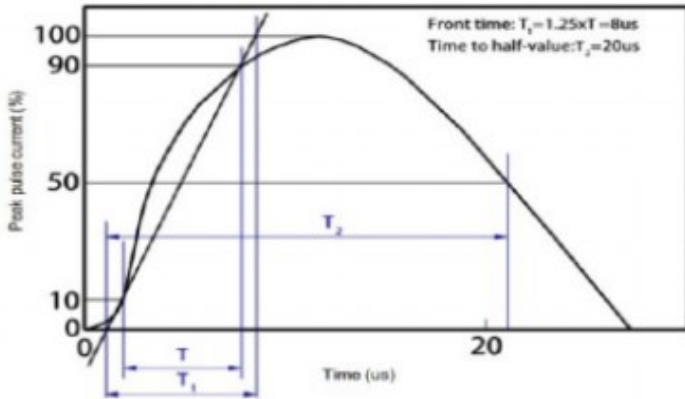


FIGURE 1

8 / 20  $\mu\text{s}$  Waveform Per IEC61000-4-5

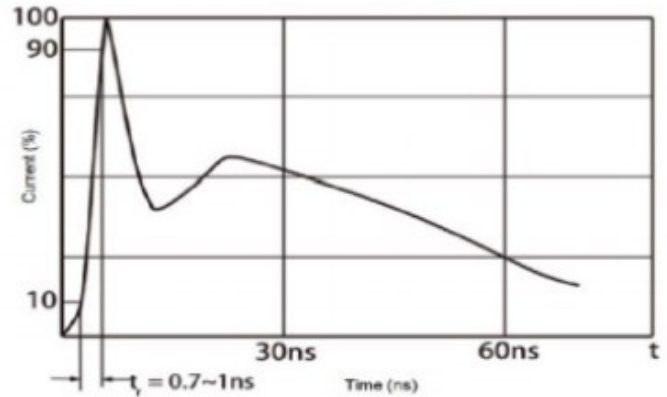


FIGURE 2

Contact Discharge Current Waveform Per IEC 61000-4-2

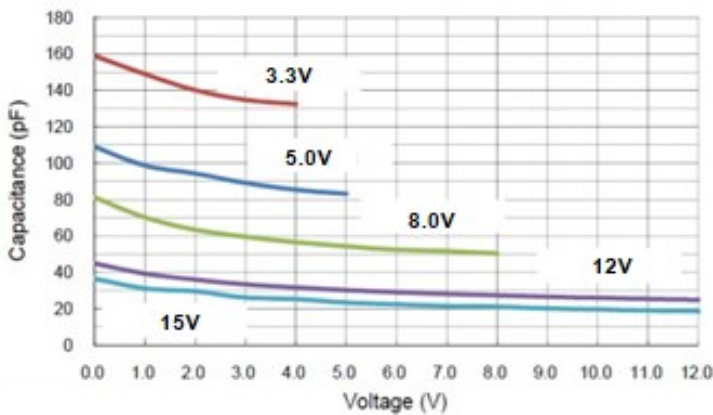


FIGURE 3

Voltage VS. Capacitance

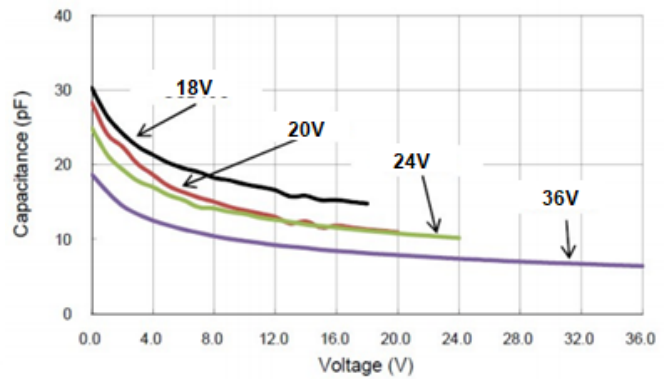


FIGURE 4

Voltage VS. Capacitance

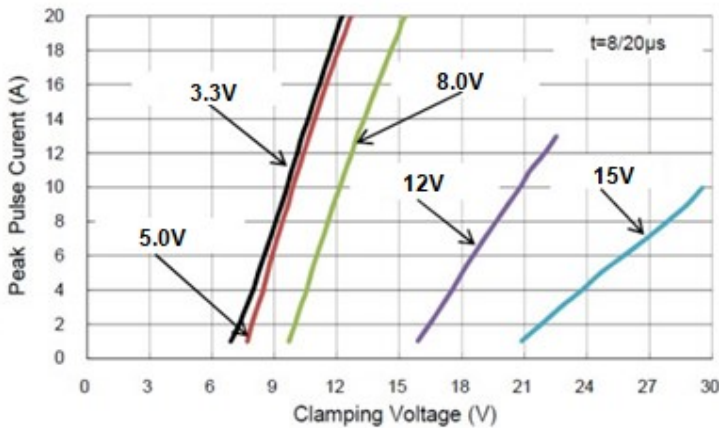


FIGURE 5

Clamping Voltage VS. Peak Pulse Current

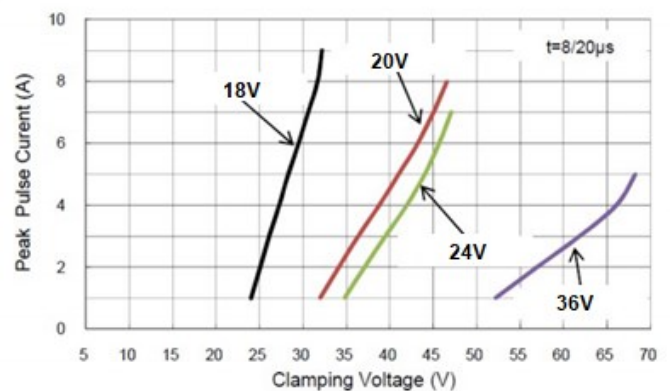


FIGURE 6

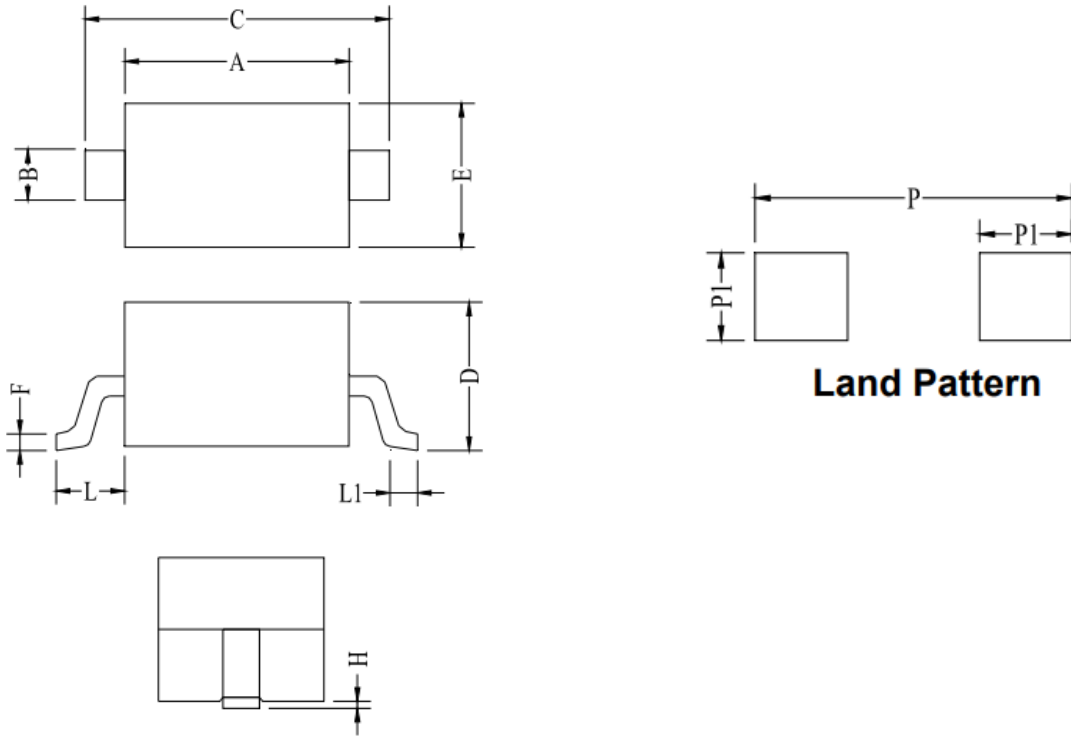
Clamping Voltage VS. Peak Pulse Current

# ESD Protection Diodes

Bidirectional ESD and Transient Voltage Protection

SDxxxxD32G SOD323

## Package Dimensions - SOD323

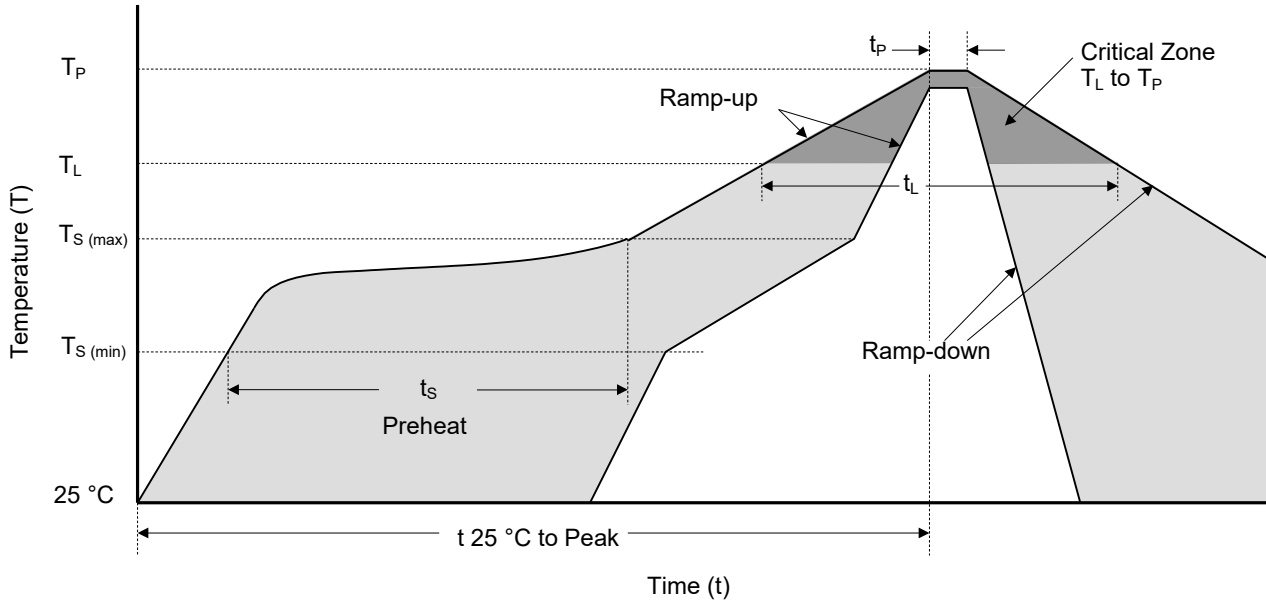


| Symbol | Millimeters |      | Inches     |       |
|--------|-------------|------|------------|-------|
|        | Min.        | Max. | Min.       | Max.  |
| A      | 1.60        | 1.80 | 0.063      | 0.071 |
| B      | 0.25        | 0.40 | 0.010      | 0.016 |
| C      | 2.30        | 2.80 | 0.091      | 0.110 |
| D      | 0.80        | 1.10 | 0.031      | 0.043 |
| E      | 1.20        | 1.40 | 0.047      | 0.055 |
| F      | 0.08        | 0.18 | 0.003      | 0.007 |
| L      | 0.475 Ref.  |      | 0.019 Ref. |       |
| L1     | 0.25        | 0.40 | 0.010      | 0.016 |
| H      | 0.00        | 0.14 | 0.000      | 0.006 |
| P      | 3.00        |      | 0.118      |       |
| P1     | 0.80        |      | 0.031      |       |

ESD TVS

ESD TVS

## Soldering Parameters



Reflowing Condition

| Reflow Soldering Parameters                              |                                   | Lead-Free Assembly      |
|--|-----------------------------------|-------------------------|
| Pre-heat   | Temperature Min ( $T_{S (min)}$ ) | 150 °C                  |
|  | Temperature Max ( $T_{S (max)}$ ) | 200 °C                  |
|  | Time (min to max) ( $t_s$ )       | 60 ~ 120 seconds        |
| Average Ramp Up Rate (Liquidus Temp ( $T_L$ ) to Peak)   |                                   | 3 °C / second max.      |
| $T_{S (max)}$ to $T_L$ Ramp-up Rate                      |                                   | 3 °C / second max.      |
| Reflow   | Temperature ( $T_L$ ) (Liquidus)  | 217 °C                  |
|  | Time (min to max) ( $t_L$ )       | 60 ~ 150 seconds        |
| Peak Temperature ( $T_P$ )                               |                                   | 260 <sup>+0/-5</sup> °C |
| Time of within 5 °C of Actual Peak Temperature ( $t_p$ ) |                                   | 20 ~ 40 seconds         |
| Ramp-down Rate   |                                   | 6 °C / second max.      |
| Time from 25 °C to Peak Temperature                      |                                   | 8 Minutes max.          |
| Do Not Exceed  |                                   | 260 °C                  |

ESD TVS

ESD TVS



# ATTENTION

## Usage

1. TVS must be operated in the specified ambient temp.
2. Do not clean the TVS with strong polar solvent such as ketone, esters, benzene and halogenated hydrocarbon, to avoid damaging the encapsulating layer.
3. Please do not apply severe vibration, shock or pressure to TVS, to avoid element cracking.

## Replacement

1. If TVS is visually damaged, please replace it.
2. TVS is a non-repairable product. For safety sake, please use equivalent TVS for replacement.

## Storage

1. Storage Temp. Range: (-55 to 150) °C.
2. Do not store the TVS at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder- ability of the lead wires. The product shall be used up within 1 year after receiving the goods.

## Environmental Conditions

1. TVS should not be exposed to the open air, nor direct sunshine.
2. TVS should avoid rain, water vapor or other condition of high temp. and high humidity.
3. TVS should avoid sand dust, salt mist, or other harmful gases.

## Max. Typical Capacitance of TVS

1. The typical capacitance of TVS is listed in the specifications. Designers may refer to it when designing TVS in High frequency circuit.

## Installation Mechanical Stress

1. Do not knock TVS when installing, to avoid mechanical damage.
2. Please do not apply severe vibration, shock or pressure to TVS, to avoid surface resin or element cracking.