

## Features

- 350 Watts peak pulse power ( $t_p = 8/20\mu s$ )
- Low clamping voltage
- Working voltage:  $V_{RWM} = 3V, 5V, 8V, 12V, 15V, 18V, 24V, 36V$
- Low reverse clamping voltage
- RoHS compliant with Halogen-free

HF

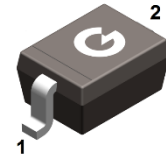


## Typical Applications

- Cell Phone Handsets and Accessories
- Microprocessor based equipment
- Portable instrumentation

## Mechanical Data

- Case: SOD-323
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



SOD-323

## Ordering Information

| Part Number | Package | Shipping Quantity     | Marking Code |
|-------------|---------|-----------------------|--------------|
| SD03        | SOD-323 | 3000pcs / Tape & Reel | 3U           |
| SD05        | SOD-323 | 3000pcs / Tape & Reel | 5U           |
| SD08        | SOD-323 | 3000pcs / Tape & Reel | 08           |
| SD12        | SOD-323 | 3000pcs / Tape & Reel | 6U           |
| SD15        | SOD-323 | 3000pcs / Tape & Reel | 15W          |
| SD18        | SOD-323 | 3000pcs / Tape & Reel | 7U           |
| SD24        | SOD-323 | 3000pcs / Tape & Reel | 8U           |
| SD36        | SOD-323 | 3000pcs / Tape & Reel | D36          |

## Maximum Ratings (@ $T_A = 25^\circ C$ unless otherwise specified)

| Parameter                              | Symbol      | Value    | Unit |
|----------------------------------------|-------------|----------|------|
| IEC 61000-4-2; ESD (Air)               | $V_{ESD-A}$ | $\pm 30$ | kV   |
| IEC 61000-4-2; ESD (Contact)           | $V_{ESD-C}$ | $\pm 30$ | kV   |
| Peak Pulse Power ( $t_p = 8/20\mu s$ ) | $P_{PP}$    | 350      | W    |

## Thermal Characteristics

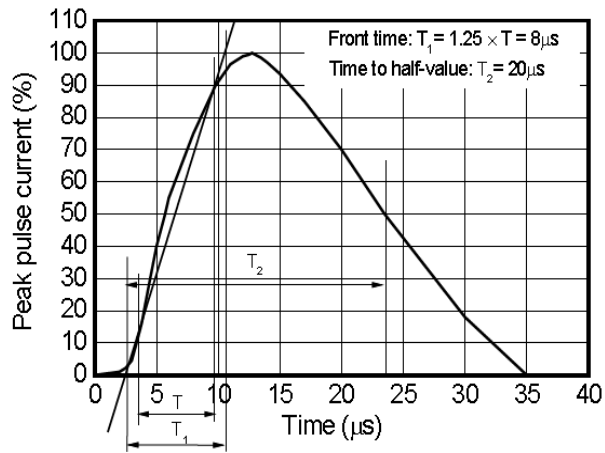
| Parameter                                     | Symbol          | Value       | Unit                 |
|-----------------------------------------------|-----------------|-------------|----------------------|
| Thermal Resistance Junction-to-Air            | $R_{\theta JA}$ | 480         | $^{\circ}\text{C/W}$ |
| Thermal Resistance Junction-to-Case           | $R_{\theta JC}$ | 250         | $^{\circ}\text{C/W}$ |
| Lead Solder Temperature (10 Seconds Duration) | $T_L$           | 260         | $^{\circ}\text{C}$   |
| Junction Temperature                          | $T_J$           | 125         | $^{\circ}\text{C}$   |
| Storage Temperature Range                     | $T_{STG}$       | -55 to +150 | $^{\circ}\text{C}$   |

## Electrical Characteristics (@ $T_A = 25^{\circ}\text{C}$ unless otherwise specified)

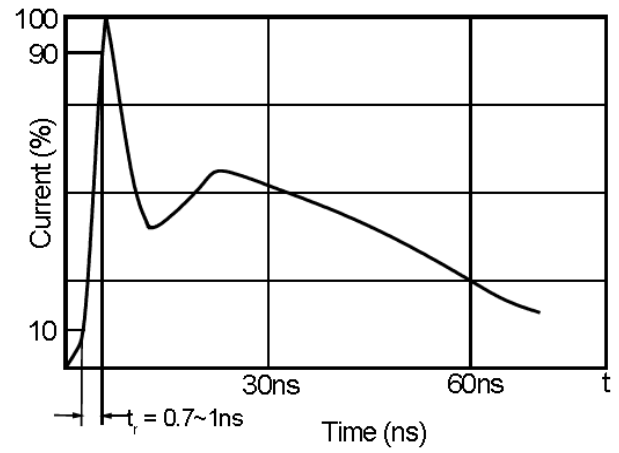
| Parameter                    | Symbol     | Test Condition                               | Min. | Typ. | Max. | Unit          |
|------------------------------|------------|----------------------------------------------|------|------|------|---------------|
| <b>SD03 TVS for 3V Lines</b> |            |                                              |      |      |      |               |
| Reverse Stand-off Voltage    | $V_{RWM}$  |                                              | -    | -    | 3    | V             |
| Reverse Breakdown Voltage    | $V_{(BR)}$ | $I_T = 1\text{mA}$                           | 4    | -    | 6.5  | V             |
| Reverse Leakage Current      | $I_R$      | $V_{RWM} = 3\text{V}$                        | -    | -    | 1    | $\mu\text{A}$ |
| Clamping Voltage             | $V_C$      | $I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$  | -    | -    | 7    | V             |
|                              |            | $I_{PP} = 25\text{A}, t_p = 8/20\mu\text{s}$ | -    | -    | 13.5 | V             |
| Junction Capacitance         | $C_J$      | $V_R = 0\text{V}, f = 1\text{MHz}$           | -    | -    | 400  | pF            |
| <b>SD05 TVS for 5V Lines</b> |            |                                              |      |      |      |               |
| Reverse Stand-off Voltage    | $V_{RWM}$  |                                              | -    | -    | 5    | V             |
| Reverse Breakdown Voltage    | $V_{(BR)}$ | $I_T = 1\text{mA}$                           | 6    | -    | -    | V             |
| Reverse Leakage Current      | $I_R$      | $V_{RWM} = 5\text{V}$                        | -    | -    | 1    | $\mu\text{A}$ |
| Clamping Voltage             | $V_C$      | $I_{PP} = 5\text{A}, t_p = 8/20\mu\text{s}$  | -    | -    | 9.8  | V             |
|                              |            | $I_{PP} = 24\text{A}, t_p = 8/20\mu\text{s}$ | -    | -    | 14.5 | V             |
| Junction Capacitance         | $C_J$      | $V_R = 0\text{V}, f = 1\text{MHz}$           | -    | -    | 350  | pF            |
| <b>SD08 TVS for 8V Lines</b> |            |                                              |      |      |      |               |
| Reverse Stand-off Voltage    | $V_{RWM}$  |                                              | -    | -    | 8    | V             |
| Reverse Breakdown Voltage    | $V_{(BR)}$ | $I_T = 1\text{mA}$                           | 8.5  | -    | -    | V             |
| Reverse Leakage Current      | $I_R$      | $V_{RWM} = 8\text{V}$                        | -    | -    | 1    | $\mu\text{A}$ |
| Clamping Voltage             | $V_C$      | $I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$  | -    | -    | 12   | V             |
|                              |            | $I_{PP} = 20\text{A}, t_p = 8/20\mu\text{s}$ | -    | -    | 18   | V             |
| Junction Capacitance         | $C_J$      | $V_R = 0\text{V}, f = 1\text{MHz}$           | -    | -    | 200  | pF            |

| Parameter                     | Symbol     | Test Condition                  | Min. | Typ. | Max. | Unit    |
|-------------------------------|------------|---------------------------------|------|------|------|---------|
| <b>SD12 TVS for 12V Lines</b> |            |                                 |      |      |      |         |
| Reverse Stand-off Voltage     | $V_{RWM}$  |                                 | -    | -    | 12   | V       |
| Reverse Breakdown Voltage     | $V_{(BR)}$ | $I_T = 1mA$                     | 13.3 | -    | -    | V       |
| Reverse Leakage Current       | $I_R$      | $V_{RWM} = 12V$                 | -    | -    | 0.5  | $\mu A$ |
| Clamping Voltage              | $V_C$      | $I_{PP} = 5A, t_p = 8/20\mu s$  | -    | -    | 19   | V       |
|                               |            | $I_{PP} = 15A, t_p = 8/20\mu s$ | -    | -    | 23   | V       |
| Junction Capacitance          | $C_J$      | $V_R = 0V, f = 1MHz$            | -    | -    | 150  | pF      |
| <b>SD15 TVS for 15V Lines</b> |            |                                 |      |      |      |         |
| Reverse Stand-off Voltage     | $V_{RWM}$  |                                 | -    | -    | 15   | V       |
| Reverse Breakdown Voltage     | $V_{(BR)}$ | $I_T = 1mA$                     | 16.7 | -    | -    | V       |
| Reverse Leakage Current       | $I_R$      | $V_{RWM} = 15V$                 | -    | -    | 0.5  | $\mu A$ |
| Clamping Voltage              | $V_C$      | $I_{PP} = 5A, t_p = 8/20\mu s$  | -    | -    | 27   | V       |
|                               |            | $I_{PP} = 10A, t_p = 8/20\mu s$ | -    | -    | 40   | V       |
| Junction Capacitance          | $C_J$      | $V_R = 0V, f = 1MHz$            | -    | -    | 100  | pF      |
| <b>SD18 TVS for 18V Lines</b> |            |                                 |      |      |      |         |
| Reverse Stand-off Voltage     | $V_{RWM}$  |                                 | -    | -    | 18   | V       |
| Reverse Breakdown Voltage     | $V_{(BR)}$ | $I_T = 1mA$                     | 20   | -    | -    | V       |
| Reverse Leakage Current       | $I_R$      | $V_{RWM} = 18V$                 | -    | -    | 0.5  | $\mu A$ |
| Clamping Voltage              | $V_C$      | $I_{PP} = 1A, t_p = 8/20\mu s$  | -    | -    | 29   | V       |
|                               |            | $I_{PP} = 9A, t_p = 8/20\mu s$  | -    | -    | 40   | V       |
| Junction Capacitance          | $C_J$      | $V_R = 0V, f = 1MHz$            | -    | -    | 80   | pF      |
| <b>SD24 TVS for 24V Lines</b> |            |                                 |      |      |      |         |
| Reverse Stand-off Voltage     | $V_{RWM}$  |                                 | -    | -    | 24   | V       |
| Reverse Breakdown Voltage     | $V_{(BR)}$ | $I_T = 1mA$                     | 26.3 | -    | 31   | V       |
| Reverse Leakage Current       | $I_R$      | $V_{RWM} = 24V$                 | -    | -    | 0.5  | $\mu A$ |
| Clamping Voltage              | $V_C$      | $I_{PP} = 1A, t_p = 8/20\mu s$  | -    | -    | 42   | V       |
|                               |            | $I_{PP} = 6A, t_p = 8/20\mu s$  | -    | -    | 56   | V       |
| Junction Capacitance          | $C_J$      | $V_R = 0V, f = 1MHz$            | -    | -    | 70   | pF      |
| <b>SD36 TVS for 36V Lines</b> |            |                                 |      |      |      |         |
| Reverse Stand-off Voltage     | $V_{RWM}$  |                                 | -    | -    | 36   | V       |
| Reverse Breakdown Voltage     | $V_{(BR)}$ | $I_T = 1mA$                     | 39   | -    | 45   | V       |
| Reverse Leakage Current       | $I_R$      | $V_{RWM} = 36V$                 | -    | -    | 200  | nA      |
| Clamping Voltage              | $V_C$      | $I_{PP} = 1A, t_p = 8/20\mu s$  | -    | -    | 55   | V       |
|                               |            | $I_{PP} = 5A, t_p = 8/20\mu s$  | -    | -    | 65   | V       |
| Junction Capacitance          | $C_J$      | $V_R = 0V, f = 1MHz$            | -    | -    | 40   | pF      |

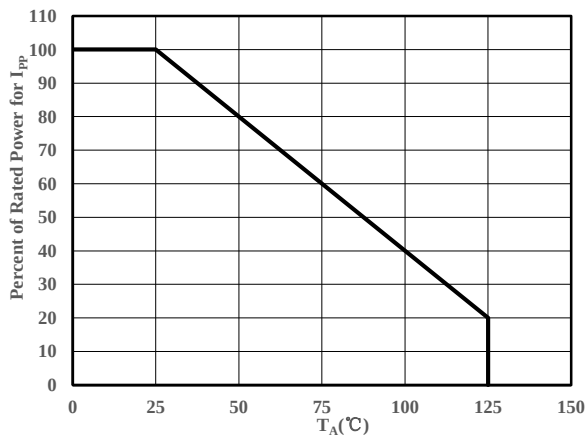
**Ratings and Characteristic Curves** (@  $T_A = 25^\circ\text{C}$  unless otherwise specified)



**Fig 1** 8/20  $\mu\text{s}$  waveform per IEC61000-4-5

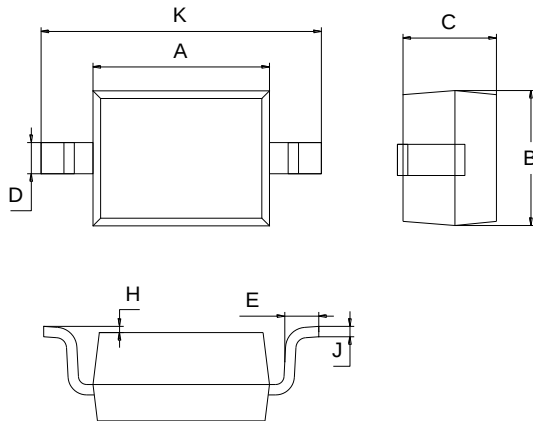


**Fig 2** ESD pulse waveform according to IEC61000-4-2



**Fig 3** Power Derating Curve

**Package Outline Dimensions** (Unit: mm)



| SOD-323   |      |      |
|-----------|------|------|
| Dimension | Min. | Max. |
| A         | 1.60 | 1.80 |
| B         | 1.20 | 1.40 |
| C         | 0.80 | 0.90 |
| D         | 0.25 | 0.35 |
| E         | 0.22 | 0.42 |
| H         | 0.02 | 0.10 |
| J         | 0.05 | 0.15 |
| K         | 2.55 | 2.75 |

**Package Outline Dimensions** (Unit: mm)

**SOD-323**

