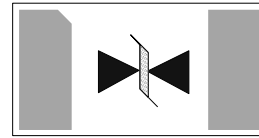
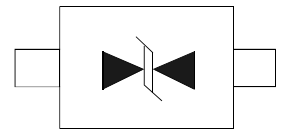


## Description

Low capacitance ElectroStatic Discharge (ESD) protection diodes in ultra small SMD plastic packages designed to protect one signal line from the damage caused by ESD and other transients.



SOD-882



SOD-323/523

## Features

- Bidirectional ESD protection of one line
- Max. peak pulse power:  $P_{PP} = 130 \text{ W}$
- Low clamping voltage:  $V_{(CL)R} = 14 \text{ V}$
- Ultra low leakage current:  $I_{RM} = 5 \text{ nA}$
- ESD protection > 30 kV
- IEC 61000-4-2, level 4 (ESD)
- IEC 61000-4-5 (surge);  $I_{PP} = 12 \text{ A}$
- Ultra small SMD plastic packages

## Applications

- Cellular handsets and accessories
- Portable electronics
- Computers and peripherals
- Communication systems
- Audio and video equipment

## Quick reference data

### Quick reference data

| Symbol    | Parameter                 | Conditions                                  | Min | Typ | Max | Unit |
|-----------|---------------------------|---|-----|-----|-----|------|
| $V_{RWM}$ | reverse stand-off voltage |   | -   | -   | 5   | V    |
| $C_d$     | diode capacitance         | $V_R = 0 \text{ V};$<br>$f = 1 \text{ MHz}$ | -   | 35  | 45  | pF   |

## Limiting values

### Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol           | Parameter            | Conditions |        | Min | Max  | Unit |
|------------------|----------------------|------------|--------|-----|------|------|
| <b>Per diode</b> |                      |            |        |     |      |      |
| P <sub>PP</sub>  | peak pulse power     | 8/20 μs    | [1][2] | -   | 130  | W    |
| I <sub>PP</sub>  | peak pulse current   | 8/20 μs    | [1][2] | -   | 12   | A    |
| T <sub>j</sub>   | junction temperature |            |        | -   | 150  | °C   |
| T <sub>amb</sub> | ambient temperature  |            |        | -65 | +150 | °C   |
| T <sub>stg</sub> | storage temperature  |            |        | -65 | +150 | °C   |

[1] Non-repetitive current pulse 8/20 μs exponentially decaying waveform according to IEC61000-4-5; see [Figure 1](#).

[2] Measured from pin 1 to pin 2.

### ESD maximum ratings

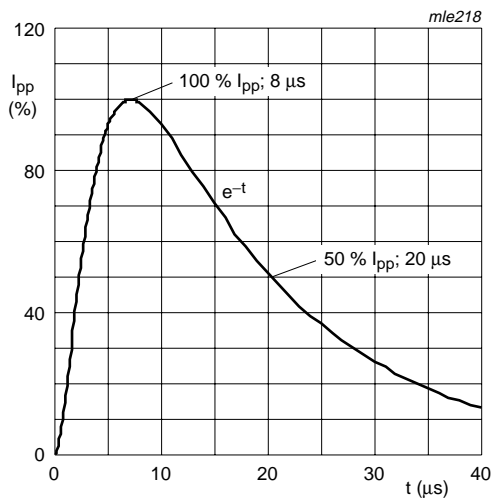
| Symbol | Parameter                          | Conditions                        |        | Min | Max | Unit |
|--------|------------------------------------|-----------------------------------|--------|-----|-----|------|
| ESD    | electrostatic discharge capability | IEC 61000-4-2 (contact discharge) | [1][2] | -   | 30  | kV   |
|        |                                    | HBM MIL-Std 883                   |        | -   | 10  | kV   |

[1] Measured from pin 1 to pin 2.

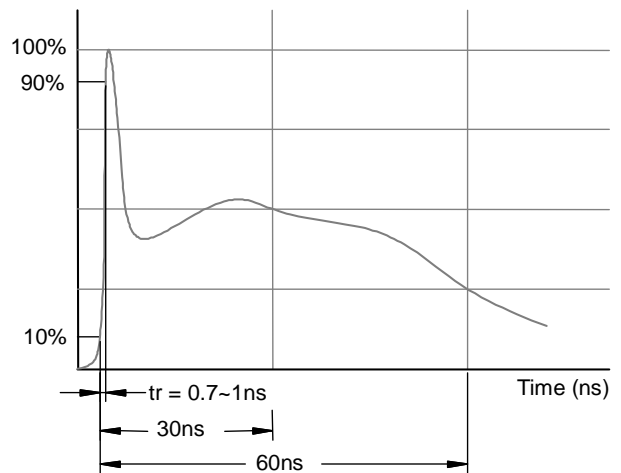
[2] Device stressed with ten non-repetitive ElectroStatic Discharge (ESD) pulses; see [Figure 2](#).

### ESD standards compliance

| Standard   | Conditions                      |
|--|---------------------------------|
| IEC 61000-4-2, level 4 (ESD); <a href="#">Figure 2</a> | > 15 kV (air); > 8 kV (contact) |
| HBM MIL-STD 883; class 3                               | > 4 kV                          |



**Fig 1.** 8/20 μs pulse waveform according to IEC 61000-4-5



**Fig 2.** ElectroStatic Discharge (ESD) pulse waveform according to IEC 61000-4-2

## Characteristics

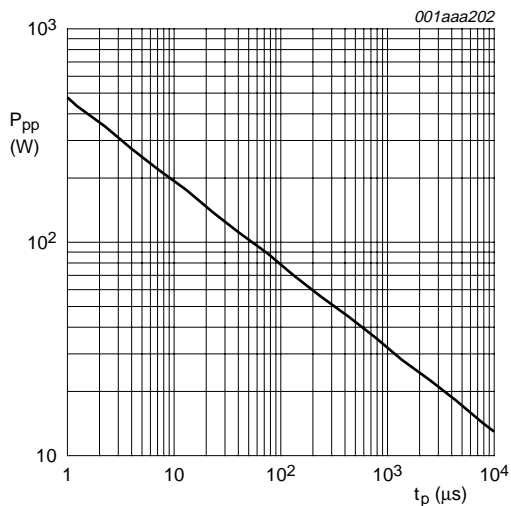
### Characteristics

$T_{amb} = 25^{\circ}\text{C}$  unless otherwise specified

| Symbol           | Parameter                 | Conditions  | Min    | Typ | Max | Unit     |
|------------------|---------------------------|---|--------|-----|-----|----------|
| <b>Per diode</b> |                           |   |        |     |     |          |
| $V_{RWM}$        | reverse stand-off voltage |   | -      | -   | 5   | V        |
| $I_{RM}$         | reverse leakage current   | $V_{RWM} = 5\text{ V}$ ;<br>see <a href="#">Figure 6</a>                  | -      | 5   | 100 | nA       |
| $V_{(CL)R}$      | clamping voltage          | $I_{PP} = 1\text{ A}$   | [1][2] | -   | 10  | V        |
|                  |                           | $I_{PP} = 12\text{ A}$  | [1][2] | -   | 14  | V        |
| $V_{(BR)}$       | breakdown voltage         | $I_R = 1\text{ mA}$   | 5.5    | -   | 9.5 | V        |
| $r_{dif}$        | differential resistance   | $I_R = 1\text{ mA}$   | -      | -   | 50  | $\Omega$ |
| $C_d$            | diode capacitance         | $V_R = 0\text{ V}$ ; $f = 1\text{ MHz}$ ;<br>see <a href="#">Figure 5</a> | -      | 35  | 45  | pF       |

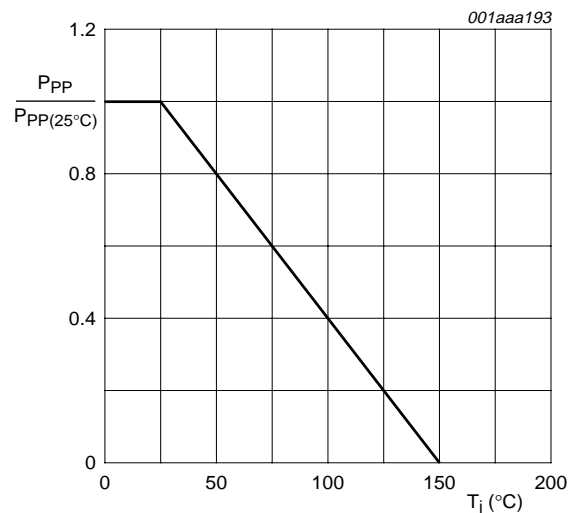
[1] Non-repetitive current pulse 8/20  $\mu\text{s}$  exponentially decaying waveform according to IEC61000-4-5; see [Figure 1](#).

[2] Measures from pin 1 to pin 2.

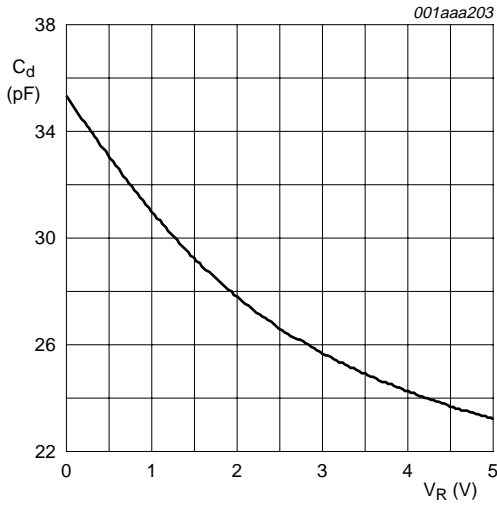


$T_{amb} = 25^{\circ}\text{C}$

**Fig 3. Peak pulse power dissipation as a function of exponential time duration  $t_p$ ; typical values**

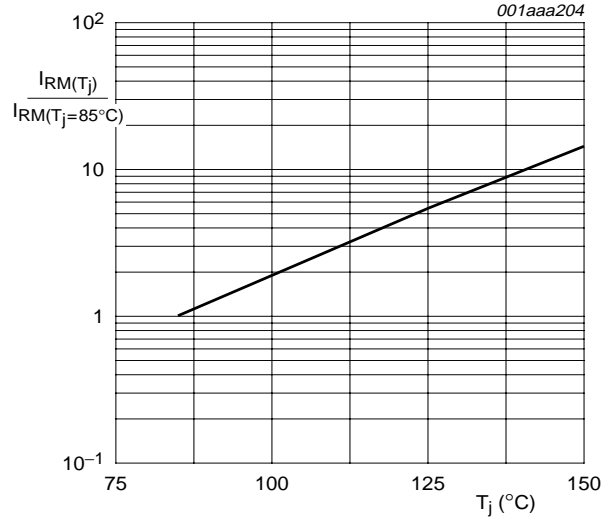


**Fig 4. Relative variation of peak pulse power as a function of junction temperature; typical values**

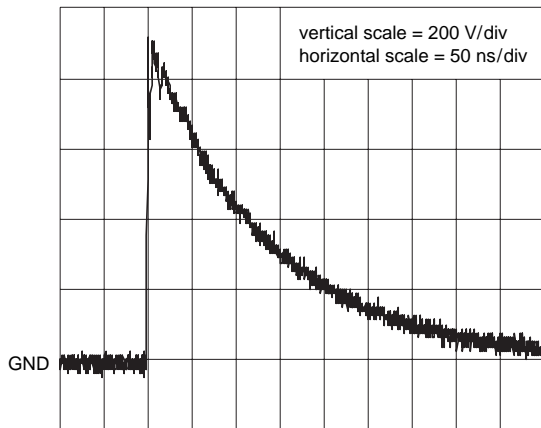


$T_{amb} = 25\text{ }^\circ\text{C}$ ;  $f = 1\text{ MHz}$

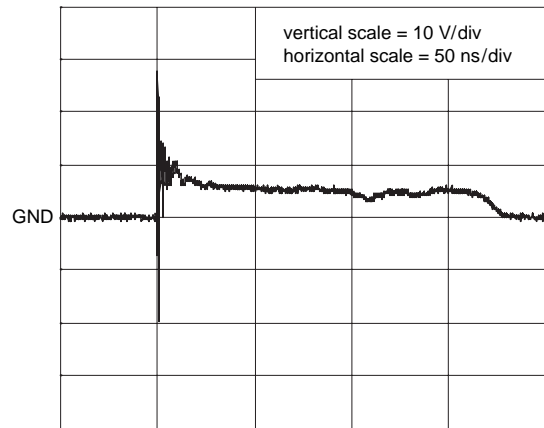
**Fig 5. Diode capacitance as a function of reverse voltage; typical values**



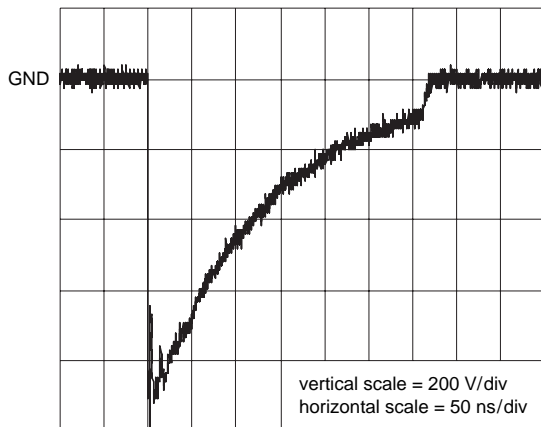
**Fig 6. Relative variation of reverse leakage current as a function of junction temperature; typical**



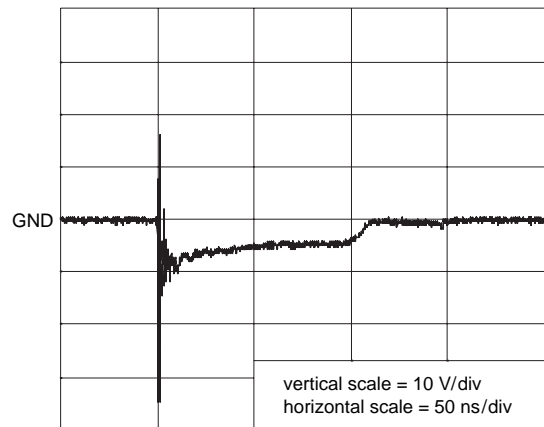
unclamped +1 kV ESD voltage waveform  
(IEC61000-4-2 network)



clamped +1 kV ESD voltage waveform  
(IEC61000-4-2 network)



unclamped -1 kV ESD voltage waveform  
(IEC61000-4-2 network)

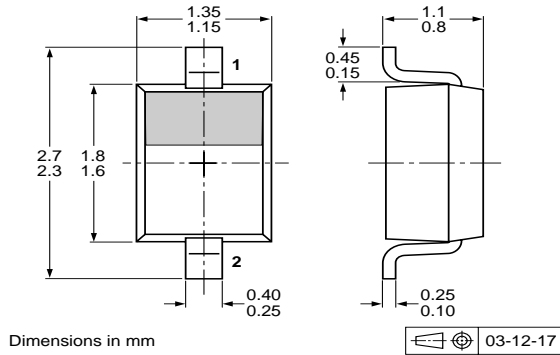


clamped -1 kV ESD voltage waveform  
(IEC61000-4-2 network)

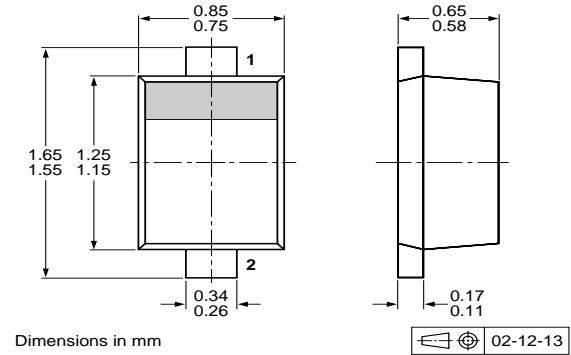
006aaa056

**Fig 7. ESD clamping test setup and waveforms**

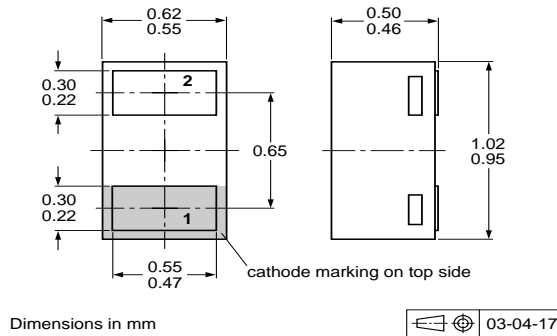
**SOD-323/SOD-523/SOD-882 PACKAGE OUTLINE DIMENSIONS**



PESD5V0S1BA(SOD-323)

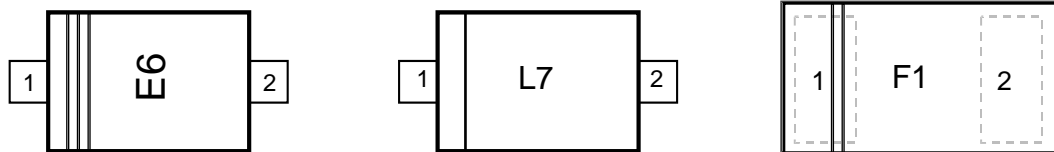


PESD5V0S1BB(SOD-523)



PESD5V0S1BL(SOD-882)

**Marking**



**Ordering information**

| Order code  | Marking code | package | Baseqty | Delivermode   |
|-------------|--------------|---------|---------|---------------|
| PESD5V0S1BA | E6           | SOD-323 | 3000    | Tape and reel |
| PESD5V0S1BB | L7           | SOD-523 | 3000    | Tape and reel |
| PESD5V0S1BL | F1           | SOD-882 | 10000   | Tape and reel |