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**PESD3V3S1UL****Unidirectional ESD protection diode****1. General description**

Unidirectional ElectroStatic Discharge (ESD) protection diode in a SOD882 leadless ultra small Surface Mounted Device (SMD) plastic package designed to protect one signal line from the damage caused by ESD and other transients.

**2. Features and benefits**

- Ultra small SMD plastic package
- ESD protection of one line
- Max. peak pulse power:  $P_{PPM} = 150 \text{ W}$
- Low clamping voltage:  $V_{CL} = 20 \text{ V}$
- Ultra low leakage current:  $I_{RM} < 700 \text{ nA}$
- ESD protection up to 30 kV
- IEC 61000-4-2; level 4 (ESD)
- IEC 61000-4-5; (surge);  $I_{PPM} = 15 \text{ A}$
- AEC-Q101 qualified

**3. Applications**

- Computers and peripherals
- Audio and video equipment
- Parallel ports
- Communication systems

**4. Quick reference data****Table 1. Quick reference data**

| Symbol    | Parameter                | Conditions                                                                    | Min | Typ | Max | Unit |
|-----------|--------------------------|-------------------------------------------------------------------------------|-----|-----|-----|------|
| $V_{RWM}$ | reverse standoff voltage | $T_{amb} = 25 \text{ }^{\circ}\text{C}$                                       | -   | -   | 3.3 | V    |
| $C_d$     | diode capacitance        | $f = 1 \text{ MHz}; V_R = 0 \text{ V}; T_{amb} = 25 \text{ }^{\circ}\text{C}$ | -   | 207 | 300 | pF   |

**5. Pinning information****Table 2. Pinning information**

| Pin | Symbol | Description            | Simplified outline                                 | Graphic symbol                                              |
|-----|--------|------------------------|----------------------------------------------------|-------------------------------------------------------------|
| 1   | K      | cathode <sup>[1]</sup> | <p>Transparent top view<br/>DFN1006-2 (SOD882)</p> | <p>1 <math>\overleftarrow{\text{K}}</math> 2<br/>sym035</p> |
| 2   | A      | anode                  |                                                    |                                                             |

[1] The marking bar indicates the cathode.

**6. Ordering information****Table 3. Ordering information**

| Type number | Package   |                                                                                                 | Version |
|-------------|-----------|-------------------------------------------------------------------------------------------------|---------|
|             | Name      | Description                                                                                     |         |
| PESD3V3S1UL | DFN1006-2 | plastic, leadless ultra small package; 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.48 mm body | SOD882  |

**7. Marking****Table 4. Marking codes**

| Type number | Marking code |
|-------------|--------------|
| PESD3V3S1UL | G1           |

**8. Limiting values****Table 5. Limiting values**

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

| Symbol                     | Parameter                       | Conditions                        | Min | Max | Unit               |
|----------------------------|---------------------------------|-----------------------------------|-----|-----|--------------------|
| $P_{PPM}$                  | rated peak pulse power          | $t_p = 8/20 \text{ } \mu\text{s}$ | [1] | 150 | W                  |
| $I_{PPM}$                  | rated peak pulse current        |                                   | [1] | 15  | A                  |
| $T_j$                      | junction temperature            |                                   | -   | 150 | $^{\circ}\text{C}$ |
| $T_{amb}$                  | ambient temperature             |                                   | -55 | 150 | $^{\circ}\text{C}$ |
| $T_{stg}$                  | storage temperature             |                                   | -65 | 150 | $^{\circ}\text{C}$ |
| <b>ESD maximum ratings</b> |                                 |                                   |     |     |                    |
| $V_{ESD}$                  | electrostatic discharge voltage | IEC 61000-4-2 (contact discharge) | [2] | 30  | kV                 |
|                            |                                 | MIL-STD-883 (human body model)    | [2] | 10  | kV                 |

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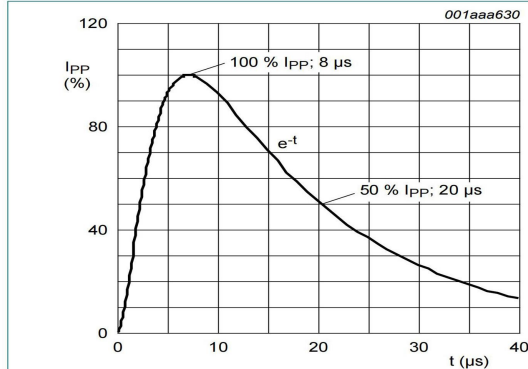


Fig. 1. 8/20  $\mu$ s pulse waveform according to IEC 61000-4-5

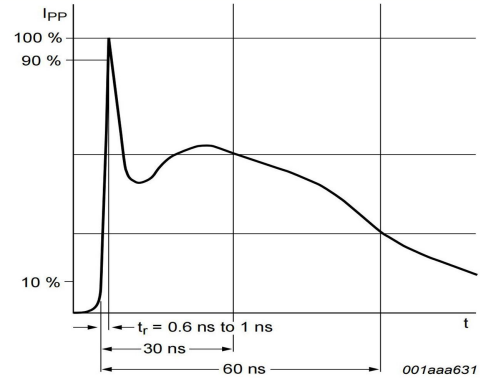


Fig. 2. ESD pulse waveform according to IEC 61000-4-2

## 9. Characteristics

Table 6. Characteristics

| Symbol    | Parameter                | Conditions                                                                 | Min     | Typ | Max | Unit          |
|-----------|--------------------------|----------------------------------------------------------------------------|---------|-----|-----|---------------|
| $V_{RWM}$ | reverse standoff voltage | $T_{amb} = 25\text{ }^{\circ}\text{C}$                                     | -       | -   | 3.3 | V             |
| $V_{BR}$  | breakdown voltage        | $I_R = 5\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$                  | [1] 5.2 | 5.6 | 6   | V             |
| $I_{RM}$  | reverse leakage current  | $V_{RWM} = 3.3\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}$             | -       | 0.7 | 2   | $\mu\text{A}$ |
| $C_d$     | diode capacitance        | $f = 1\text{ MHz}; V_R = 0\text{ V}; T_{amb} = 25\text{ }^{\circ}\text{C}$ | -       | 207 | 300 | pF            |
| $V_{CL}$  | clamping voltage         | $I_{PP} = 1\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$                | [2] -   | -   | 8   | V             |
|           |                          | $I_{PPM} = 15\text{ A}; T_{amb} = 25\text{ }^{\circ}\text{C}$              | [2] -   | -   | 20  | V             |
| $r_{dif}$ | differential resistance  | $I_R = 1\text{ mA}; T_{amb} = 25\text{ }^{\circ}\text{C}$                  | -       | -   | 400 | $\Omega$      |

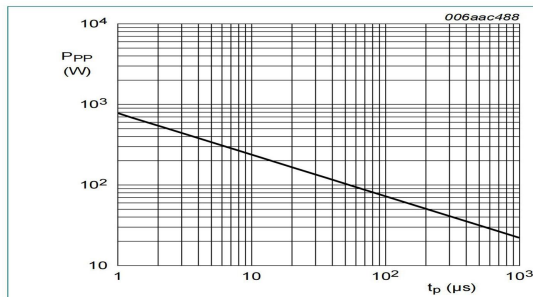


Fig. 3. Peak pulse power as a function of exponential pulse duration; typical values

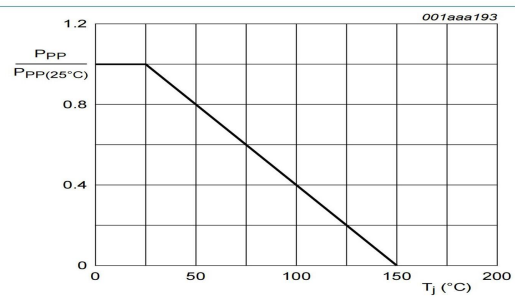


Fig. 4. Relative variation of peak pulse power as a function of junction temperature; typical values

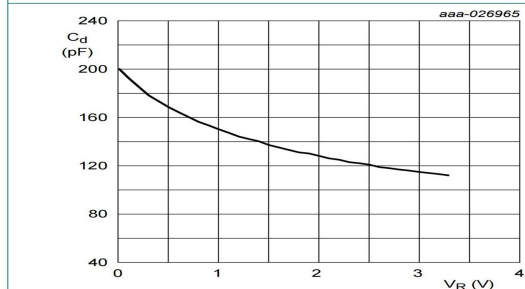


Fig. 5. Diode capacitance as a function of reverse voltage; typical values

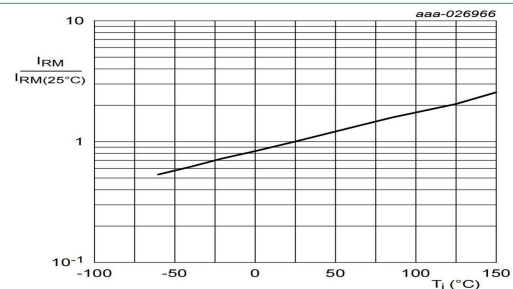


Fig. 6. Relative variation of reverse leakage current as a function of junction temperature; typical values

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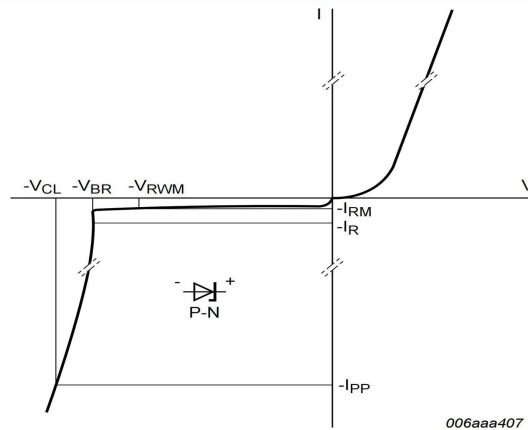


Fig. 7. V-I characteristics for a unidirectional ESD protection diode

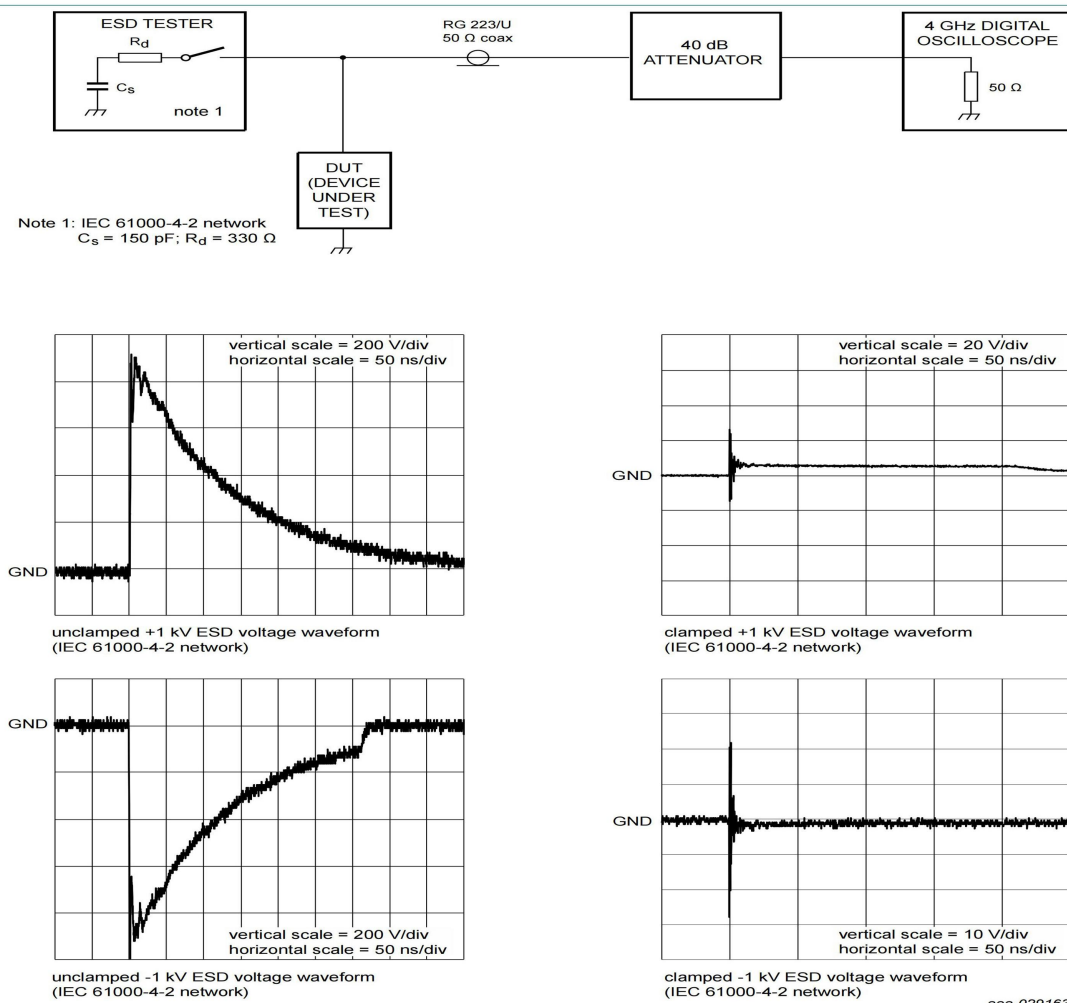


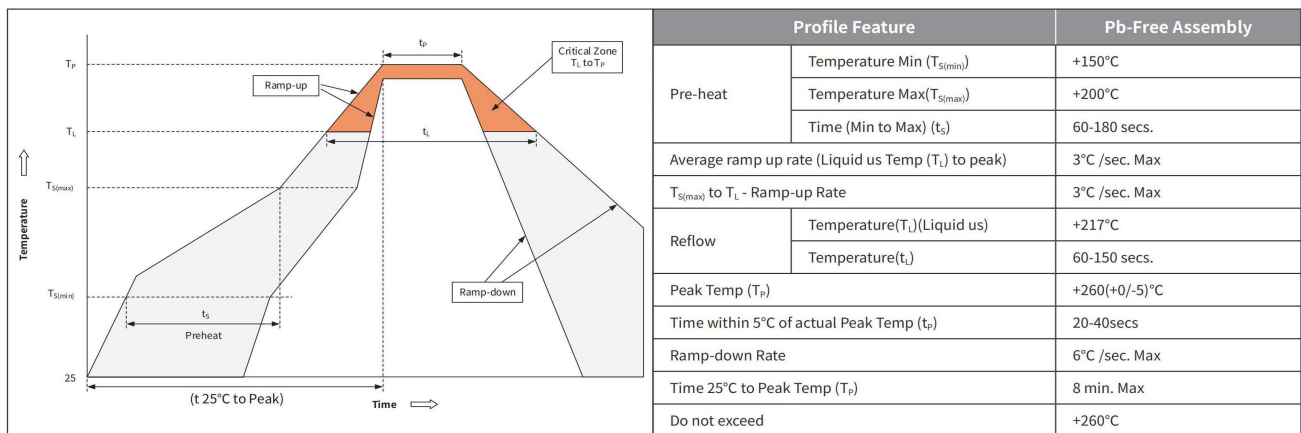
Fig. 8. ESD clamping test setup and waveforms

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## Ordering Information

| PREFERRED P/N | PACKAGE    | SIZE(mm)       | DELIVERY MODE | MPQ(PCS) |
|---------------|------------|----------------|---------------|----------|
|               | DFN1006-2L | 1.00×0.60×0.37 | 7" REEL       | 10,000   |

## Recommended Soldering Conditions



## Package Outline Dimensions (DFN1006-2L)

| Symbol         | Dimensions  |       |        |       |
|----------------|-------------|-------|--------|-------|
|                | Millimeters |       | Inches |       |
|                | Min         | Max   | Min    | Max   |
| A              | 0.950       | 1.050 | 0.037  | 0.041 |
| B              | 0.550       | 0.650 | 0.022  | 0.026 |
| C              | 0.350       | 0.450 | 0.014  | 0.018 |
| D              | 0.550       | 0.650 | 0.022  | 0.026 |
| D <sub>1</sub> | 0.280       | 0.380 | 0.011  | 0.015 |
| E              | 0.450       | 0.550 | 0.018  | 0.022 |
| L              | 0.000       | 0.100 | 0.000  | 0.004 |

## Suggested Pad Layout

| Symbol | Dimensions  |      |        |       |
|--------|-------------|------|--------|-------|
|        | Millimeters |      | Inches |       |
|        | Min         | Max  | Min    | Max   |
| J      | 0.50        | 0.60 | 0.020  | 0.024 |
| K      | 0.25        | 0.35 | 0.010  | 0.014 |
| M      | 0.55        | 0.65 | 0.022  | 0.026 |