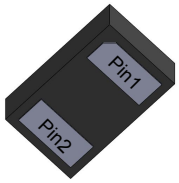
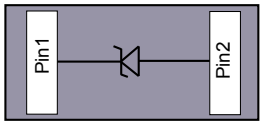
# ESDA8P30-1T2

Datasheet

## Small transient voltage suppressor




SOD882T package




Pin configuration

## Features

- Low clamping voltage
- Peak pulse power:
  - 300 W (8/20 µs)
- Stand-off voltage 6.3 V
- Unidirectional diode
- Low leakage current:
  - 0.3 µA at 25 °C
- Complies with the following standards: IEC 61000-4-2 level 4
  - ± 30 kV (air discharge)
  - ± 30 kV (contact discharge)

## Application

Where transient over voltage protection in ESD sensitive equipment is required, such as:

- Smartphones, mobile phones, tablets, portable multimedia
- USB $V_{bus}$ protection
- Power supply protection
- Battery protection

| Product status link |
| --- |
| ESDA8P30-1T2 |

## Description

The ESDA8P30-1T2 is a unidirectional single line TVS diode designed to protect the power line against EOS and ESD transients.

The device is ideal for applications where high power TVS and board space saving are required.

# 1 Characteristics

**Table 1. Absolute maximum ratings ($T_{amb}$ = 25 °C)**

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{pp}$ | Peak pulse voltage | IEC 61000-4-2 contact discharge<br>IEC 61000-4-2 air discharge | >30<br>>30 | kV |
| $P_{pp}$ | Peak pulse power (8/20 µs) | | 300 | W |
| $I_{pp}$ | Peak pulse current (8/20 µs) | | 30 | A |
| $T_{op}$ | Operating junction temperature range | | -55 to 150 | °C |
| $T_{stg}$ | Storage junction temperature range | | -55 to 150 | °C |

**Figure 1. Electrical characteristics (definitions)**

| Symbol | | Parameter |
|---|---|---|
| $V_{BR}$ | = | Breakdown voltage |
| $V_{CL}$ | = | Clamping voltage |
| $I_{RM}$ | = | Leakage current @$V_{RM}$ |
| $V_{RM}$ | = | Stand-off voltage |
| $I_{PP}$ | = | Peak pulse current |
| $R_D$ | = | Dynamic resistance |
| $I_R$ | = | Breakdown current |

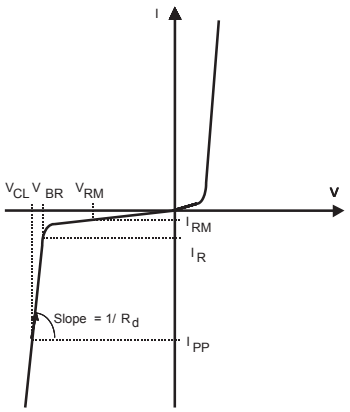



**Table 2. Electrical characteristics (values) ($T_{amb}$ = 25° C)**

| Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| $V_{BR}$ | $I_R$ = 1 mA | 6.9 | 7.3 | 7.8 | V |
| $I_{RM}$ | $V_{RM}$ = 6.3 V | | | 300 | nA |
| $V_{CL}$ | $I_{PP}$ = 20 A 8/20µs | | | 11 | V |
| | $I_{PP}$ = 30 A 8/20µs | | | 12 | |
| $R_D$ | 8/20µs | | 0.12 | | Ω |
| $C_{LINE}$ | $V_{LINE}$ = 0 V, F = 1 MHz, $V_{OSC}$ = 30 mV | | 170 | | pF |

## 1.1 Characteristics (curves)

**Figure 2. Peak pulse power dissipation versus initial junction temperature (typical value)**

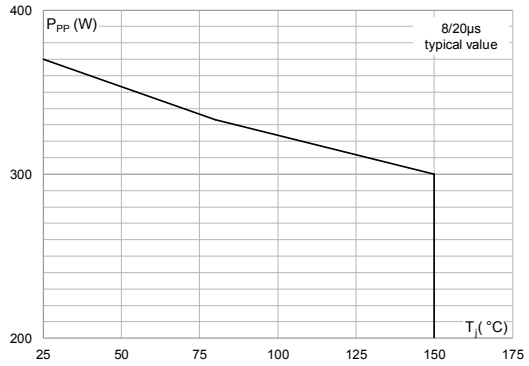



**Figure 3. Peak pulse power versus exponential pulse duration (maximum values)**

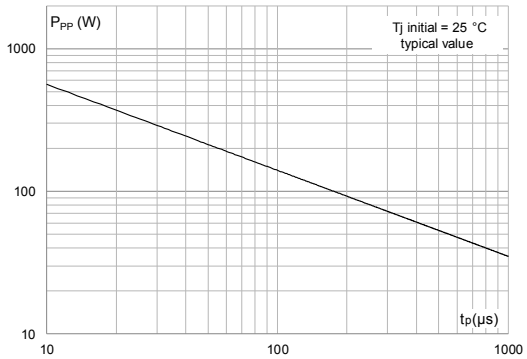



**Figure 4. Peak power dissipation versus initial temperature (typical value)**

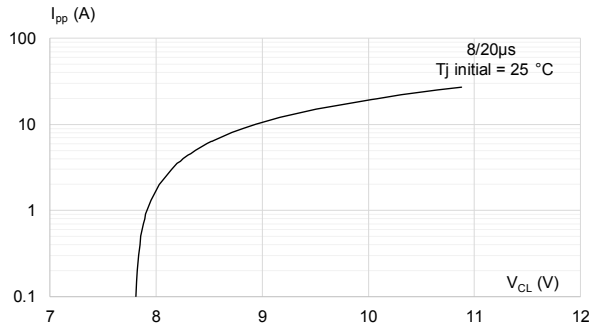



**Figure 5. Leakage current versus junction temperature (typical value)**

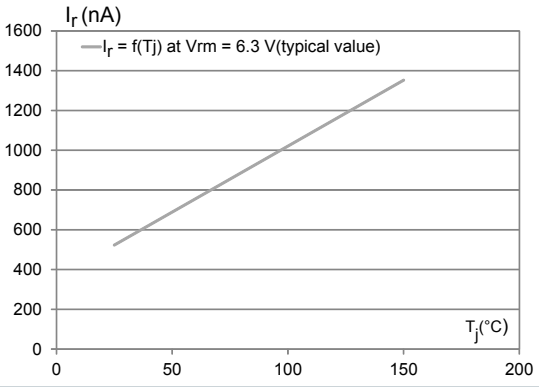



**Figure 6. ESD response to IEC 61000-4-2 (+8kV contact discharge)**

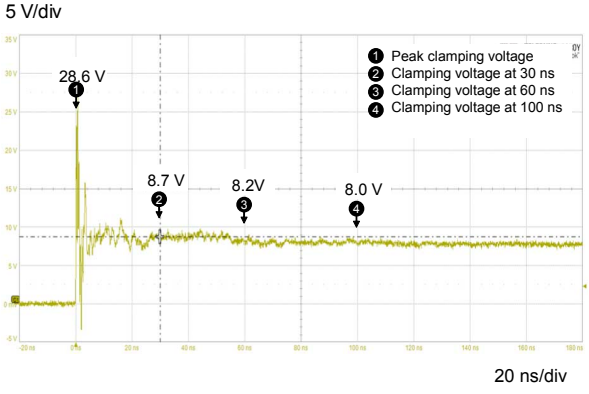
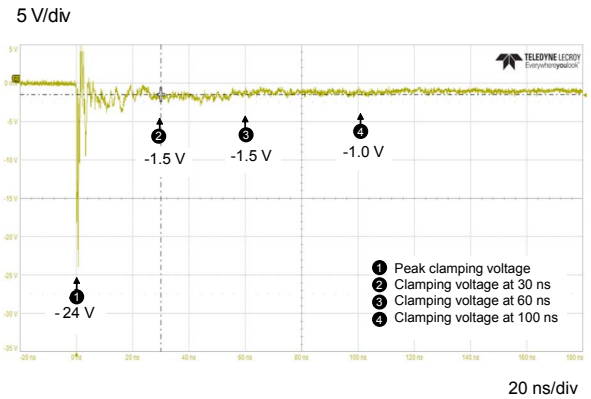



**Figure 7. ESD response to IEC 61000-4-2 (-8kV contact discharge)**



# 2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

## 2.1 SOD882T package information

**Figure 8. SOD882T package outline**

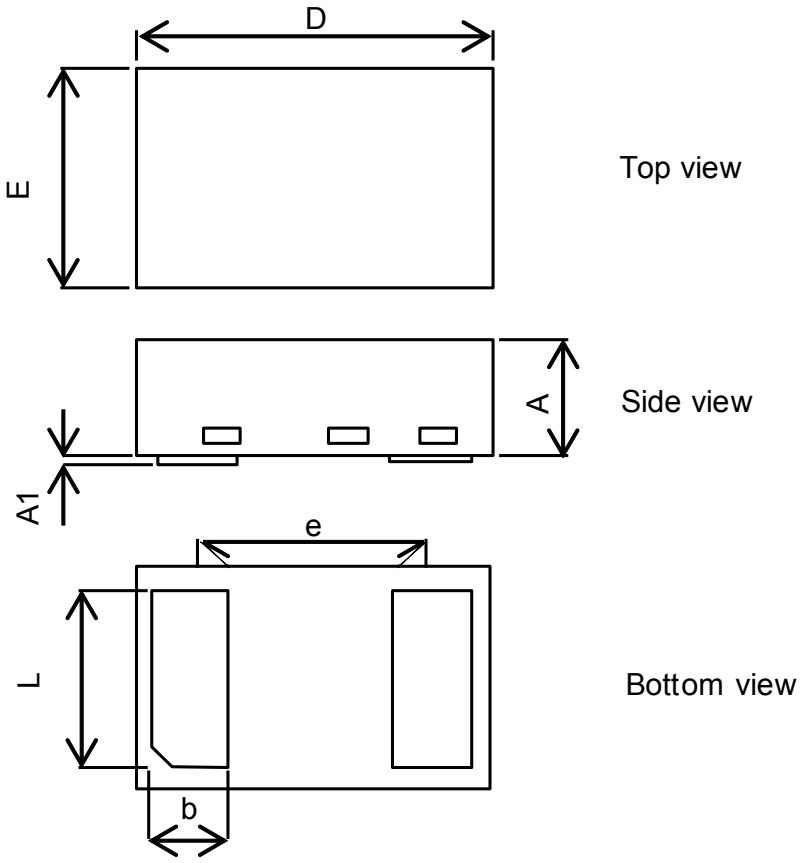


Table 3. **SOD882T package mechanical data**

| Ref. | Dimensions | | |
|---|---|---|---|
| | Millimeters | | |
| | Min. | Typ. | Max. |
| A | 0.30 | | 0.40 |
| A1 | 0.00 | 0.02 | 0.05 |
| L | 0.45 | 0.50 | 0.55 |
| D | | 1.00 | |
| E | | 0.60 | |
| e | | 0.65 | |
| b | 0.20 | 0.25 | 0.30 |

Figure 9. **SOD882T recommended footprint**

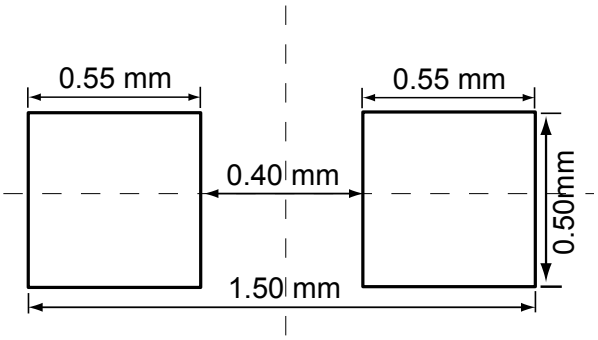
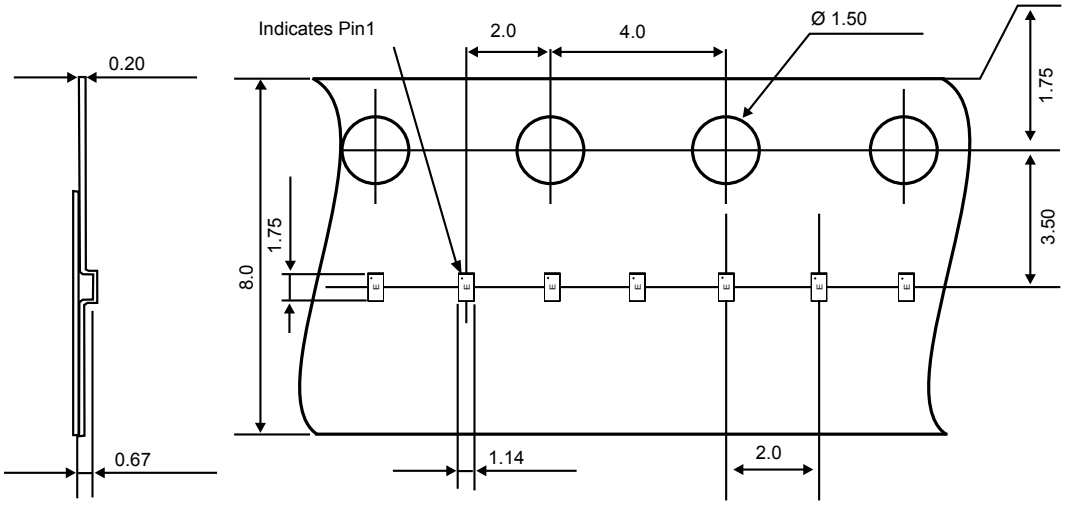



Figure 10. **Marking**

**Figure 11. Tape and reel specification**

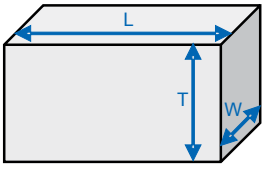


# 3 Recommendation on PCB assembly

## 3.1 Stencil opening design

1. General recommendation on stencil opening design
   a. Stencil opening dimensions: L (Length), W (Width), T (Thickness).

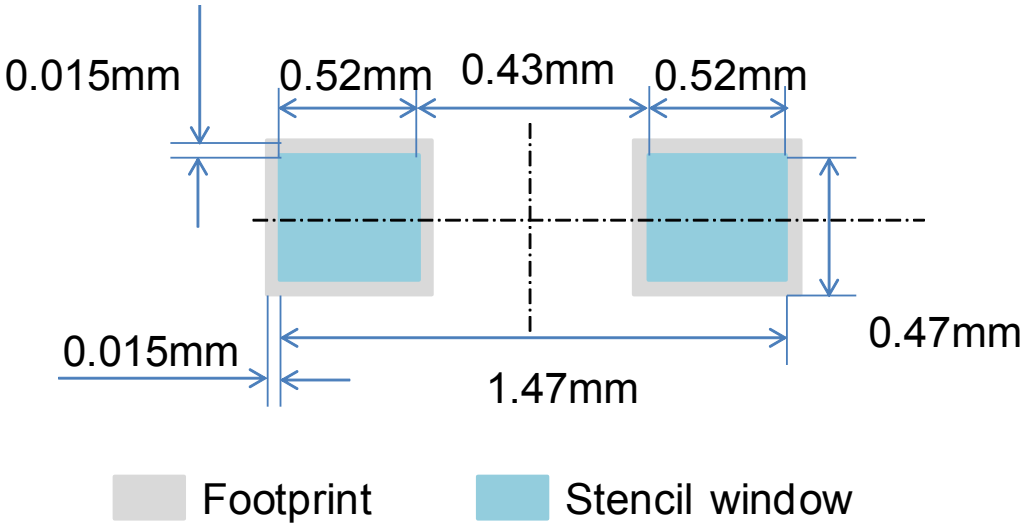
**Figure 12. Stencil opening recommendation**




   b. General design rule
      - Stencil thickness (T) = 75 ~ 125 µm
      - $\frac{W}{T} \geq 1.5$
      - $\frac{L \times W}{2T(L+W)} \geq 0.66$

1. Reference design
   a. Stencil opening thickness: 100 µm
   b. Stencil opening for leads: Opening to footprint ratio is 90%

**Figure 13. Recommended stencil window position in mm**



## 3.2 Solder paste

1. Halide-free flux qualification ROL0 according to ANSI/J-STD-004.
2. “No clean” solder paste is recommended.
3. Offers a high tack force to resist component movement during high speed.
4. Use solder paste with fine particles: powder particle size 20-45 µm.

## 3.3 Placement

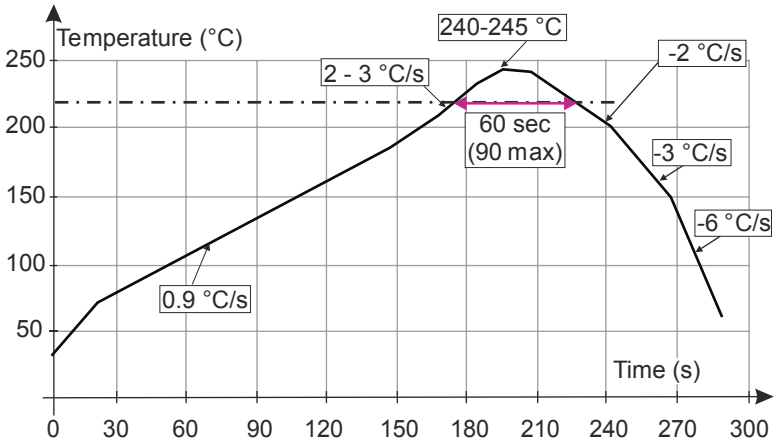
1. Manual positioning is not recommended.
2. It is recommended to use the lead recognition capabilities of the placement system, not the outline centering
3. Standard tolerance of ±0.05 mm is recommended.
4. 3.5 N placement force is recommended. Too much placement force can lead to squeezed out solder paste and cause solder joints to short. Too low placement force can lead to insufficient contact between package and solder paste that could cause open solder joints or badly centered packages.
5. To improve the package placement accuracy, a bottom side optical control should be performed with a high resolution tool.
6. For assembly, a perfect supporting of the PCB (all the more on flexible PCB) is recommended during solder paste printing, pick and place and reflow soldering by using optimized tools.

## 3.4 PCB design preference

1. To control the solder paste amount, the closed via is recommended instead of open vias.
2. The position of tracks and open vias in the solder area should be well balanced. A symmetrical layout is recommended, to avoid any tilt phenomena caused by asymmetrical solder paste due to solder flow away.

## 3.5 Reflow profile

**Figure 14. ST ECOPACK® recommended soldering reflow profile for PCB mounting**




*Note: Minimize air convection currents in the reflow oven to avoid component movement.*

# 4 Ordering information

**Figure 15. Ordering information scheme**

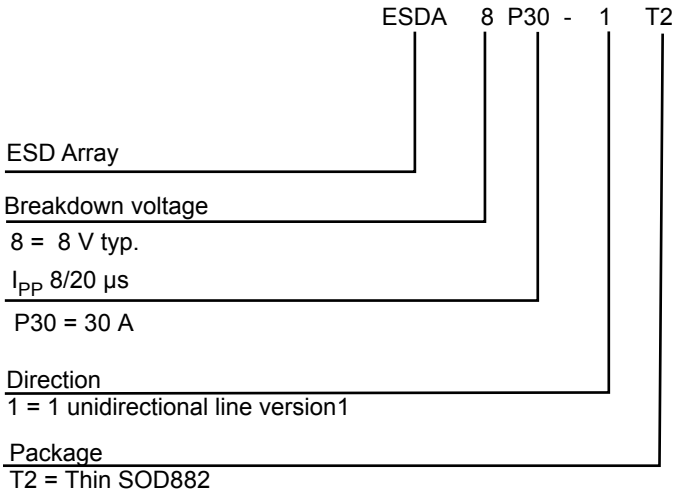



**Table 4. Ordering information**

| Order code | Marking | Weight | Base qty. | Delivery mode |
|---|---|---|---|---|
| ESDA8P30-1T2 | E | 0.76 mg | 12000 | Tape and reel |

1. *The marking can be rotated by multiples of 90° to differentiate assembly location.*

## Revision history

Table 5. **Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 03-Apr-2018 | 1 | First issue. |
| 24-Aug-2018 | 2 | Updated Table 2. |
| 18-Oct-2018 | 8 | Updated Figure 10. Marking. |