

1. General description

400W transient voltage suppressor (TVS) in SOD123 package, designed to protect electronic circuit which induced by lightning surge or other transient voltage situation.

2. Features and benefits

- Peak pulse power 400W @ 10/1000 μ s waveform
- Excellent clamping capability
- Low incremental surge resistance
- Surface mount package for easy assembly and board space saving
- Fast response time: Typically less than 1.0ps from 0V to BV min
- IEC 61000-4-2 ESD 30kV (Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- High temperature to reflow soldering guaranteed: 260°C/10sec
- Meet UL94V-0 flammability classification which guaranteed by mold compound
- Meet MSL level1, per J-STD-020
- Lead free lead finish
- Halogen free and RoHS compliant



Bi-directional



Uni-directional

3. Applications

- Power supply protection
- Industrial application
- Power management
- I/O interface protection



4. Ordering information

| Type number | Package name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|----------------|--------------|-----------------------|----------------|------------------------|-----------------|--------------------|
| P4SODxxxXX | SOD123 | P4SODxxxXXX | Tape and reel | 3000 | SOD123J | 18-Oct-2020 |
| eg. P4SOD5.0CA | SOD123 | P4SOD5.0CAX | Tape and reel | 3000 | SOD123J | 18-Oct-2020 |

5. Absolute maximum ratings

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

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

| Symbol | Parameter | Conditions | Values | Unit |
|--------------------------------|--------------------------------|--|------------|------------------|
| Absolute maximum rating | | | | |
| P_{PPM} | peak pulse power | [1] | 400 | W |
| $P_{M(AV)}$ | steady state power dissipation | on infinite heatsink at $T_a = 50\text{ }^\circ\text{C}$ | 1 | W |
| T_{stg} | storage temperature range | | -65 to 150 | $^\circ\text{C}$ |
| T_j | operating temperature range | | -65 to 150 | $^\circ\text{C}$ |

[1] In accordance with IEC 61643-321 (10/1000 μ s current waveform).

6. Characteristics

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

| PN (Uni) | PN (Bi) | Reverse Stand off Voltage V_R (V) | Breakdown Voltage V_{BR} @ I_T (V) | | Test current I_T (mA) | Max. Clamping Voltage V_C @ I_{pp} (V) | Max. Peak Pulse Current I_{pp} (A) | Maximum Reverse Leakage I_R @ V_R (μ A) | Marking | |
|-------------|------------|---|--|------|----------------------------------|--|--|--|---------|----|
| | | | Min | Max | | | | | Uni | Bi |
| P4SOD5.0A | P4SOD5.0CA | 5 | 6.4 | 7 | 10 | 9.2 | 43.5 | 200 | 05 | 05 |
| P4SOD6.0A | P4SOD6.0CA | 6 | 6.67 | 7.37 | 10 | 10.3 | 38.8 | 200 | 06 | 06 |
| P4SOD6.5A | P4SOD6.5CA | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 35.7 | 125 | 6F | 6F |
| P4SOD7.0A | P4SOD7.0CA | 7 | 7.78 | 8.6 | 10 | 12 | 33.3 | 75 | 07 | 07 |
| P4SOD8.0A | P4SOD8.0CA | 8 | 8.89 | 9.83 | 1 | 13.6 | 29.4 | 25 | 08 | 08 |
| P4SOD9.0A | P4SOD9.0CA | 9 | 10 | 11.1 | 1 | 15.4 | 26 | 5 | 09 | 09 |
| P4SOD10A | P4SOD10CA | 10 | 11.1 | 12.3 | 1 | 17 | 23.5 | 2.5 | 10 | 10 |
| P4SOD11A | P4SOD11CA | 11 | 12.2 | 13.5 | 1 | 18.2 | 22 | 1 | 11 | 11 |
| P4SOD12A | P4SOD12CA | 12 | 13.3 | 14.7 | 1 | 19.9 | 20.1 | 1 | 12 | 12 |
| P4SOD13A | P4SOD13CA | 13 | 14.4 | 15.9 | 1 | 21.5 | 18.6 | 1 | 13 | 13 |
| P4SOD14A | P4SOD14CA | 14 | 15.6 | 17.2 | 1 | 23.2 | 17.2 | 1 | 14 | 14 |
| P4SOD15A | P4SOD15CA | 15 | 16.7 | 18.5 | 1 | 24.4 | 16.4 | 1 | 15 | 15 |
| P4SOD16A | P4SOD16CA | 16 | 17.8 | 19.7 | 1 | 26 | 15.4 | 1 | 16 | 16 |
| P4SOD17A | P4SOD17CA | 17 | 18.9 | 20.9 | 1 | 27.6 | 14.5 | 1 | 17 | 17 |
| P4SOD18A | P4SOD18CA | 18 | 20 | 22.1 | 1 | 29.2 | 13.7 | 1 | 18 | 18 |
| P4SOD20A | P4SOD20CA | 20 | 22.2 | 24.5 | 1 | 32.4 | 12.3 | 1 | 20 | 20 |
| P4SOD22A | P4SOD22CA | 22 | 24.4 | 26.9 | 1 | 35.5 | 11.3 | 1 | 22 | 22 |
| P4SOD24A | P4SOD24CA | 24 | 26.7 | 29.5 | 1 | 38.9 | 10.3 | 1 | 24 | 24 |
| P4SOD26A | P4SOD26CA | 26 | 28.9 | 31.9 | 1 | 42.1 | 9.5 | 1 | 26 | 26 |
| P4SOD28A | P4SOD28CA | 28 | 31.1 | 34.4 | 1 | 45.4 | 8.8 | 1 | 28 | 28 |
| P4SOD30A | P4SOD30CA | 30 | 33.3 | 36.8 | 1 | 48.4 | 8.3 | 1 | 30 | 30 |
| P4SOD33A | P4SOD33CA | 33 | 36.7 | 40.6 | 1 | 53.3 | 7.5 | 1 | 33 | 33 |
| P4SOD36A | P4SOD36CA | 36 | 40 | 44.2 | 1 | 58.1 | 6.9 | 1 | 36 | 36 |
| P4SOD40A | P4SOD40CA | 40 | 44.4 | 49.1 | 1 | 64.5 | 6.2 | 1 | 40 | 40 |
| P4SOD43A | P4SOD43CA | 43 | 47.8 | 52.8 | 1 | 69.4 | 5.8 | 1 | 43 | 43 |
| P4SOD45A | P4SOD45CA | 45 | 50 | 55.3 | 1 | 72.7 | 5.5 | 1 | 45 | 45 |
| P4SOD48A | P4SOD48CA | 48 | 53.3 | 58.9 | 1 | 77.4 | 5.2 | 1 | 48 | 48 |
| P4SOD51A | P4SOD51CA | 51 | 56.7 | 62.7 | 1 | 82.4 | 4.9 | 1 | 51 | 51 |
| P4SOD54A | P4SOD54CA | 54 | 60 | 66.3 | 1 | 87.1 | 4.6 | 1 | 54 | 54 |
| P4SOD58A | P4SOD58CA | 58 | 64.4 | 71.2 | 1 | 93.6 | 4.3 | 1 | 58 | 58 |
| P4SOD60A | P4SOD60CA | 60 | 66.7 | 73.7 | 1 | 96.8 | 4.1 | 1 | 60 | 60 |
| P4SOD64A | P4SOD64CA | 64 | 71.1 | 78.6 | 1 | 103 | 3.9 | 1 | 64 | 64 |
| P4SOD70A | P4SOD70CA | 70 | 77.8 | 86 | 1 | 113 | 3.5 | 1 | 70 | 70 |
| P4SOD75A | P4SOD75CA | 75 | 83.3 | 92.1 | 1 | 121 | 3.3 | 1 | 75 | 75 |
| P4SOD78A | P4SOD78CA | 78 | 86.7 | 95.8 | 1 | 126 | 3.2 | 1 | 78 | 78 |
| P4SOD85A | P4SOD85CA | 85 | 94.4 | 104 | 1 | 137 | 2.9 | 1 | 85 | 85 |

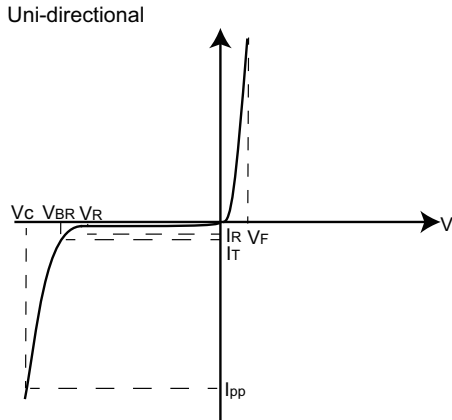


Fig. 1. I-V curve characteristics; Uni-directional

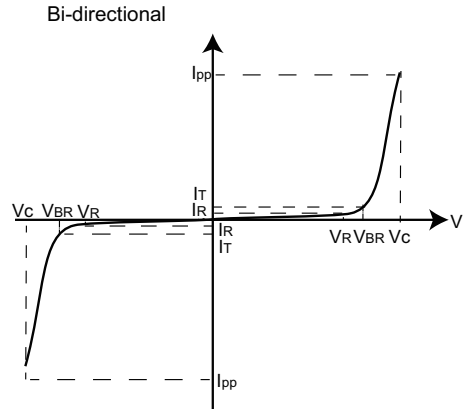


Fig. 2. I-V curve characteristics; Bi-directional

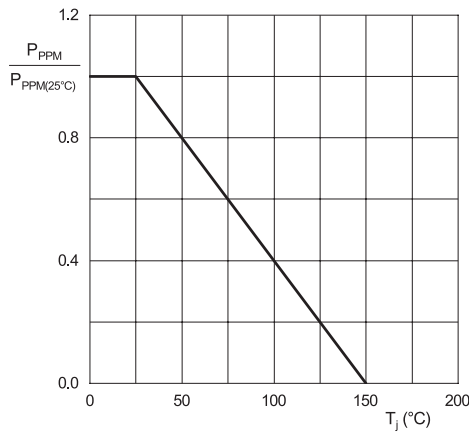


Fig. 3. Peak pulse power derating curve

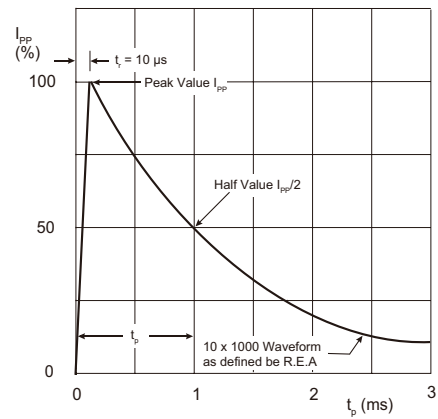


Fig. 4. Pulse waveform

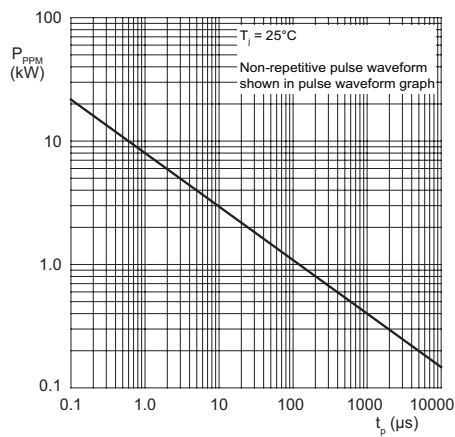


Fig. 5. Pulse rating curve

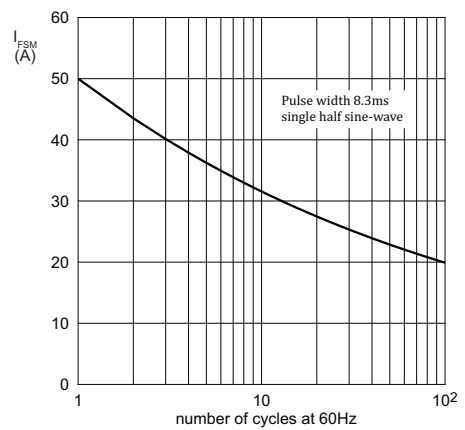


Fig. 6. Maximum non-repetitive surge current

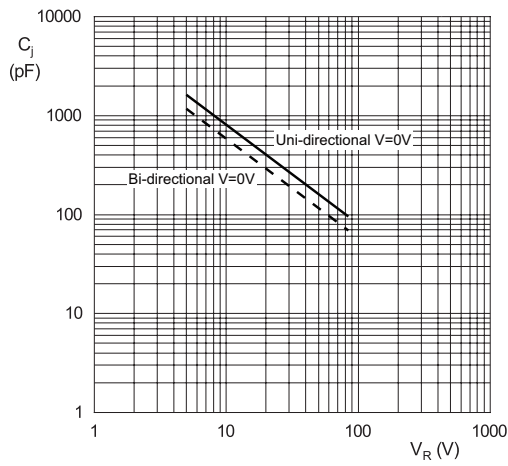


Fig. 7. Typical junction capacitance

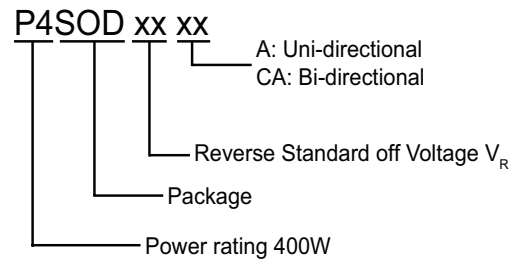


Fig. 8. Part numbering

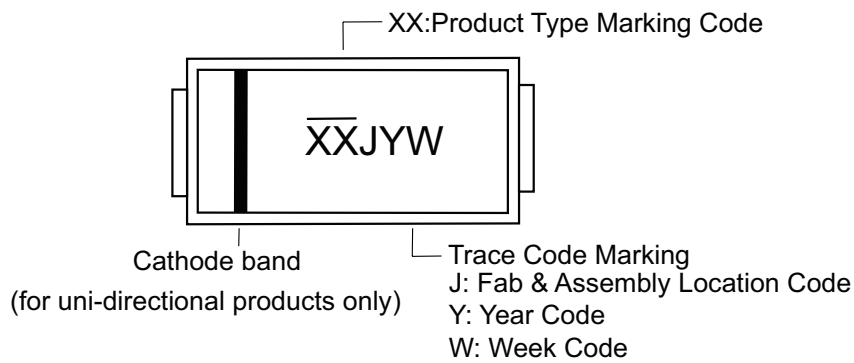
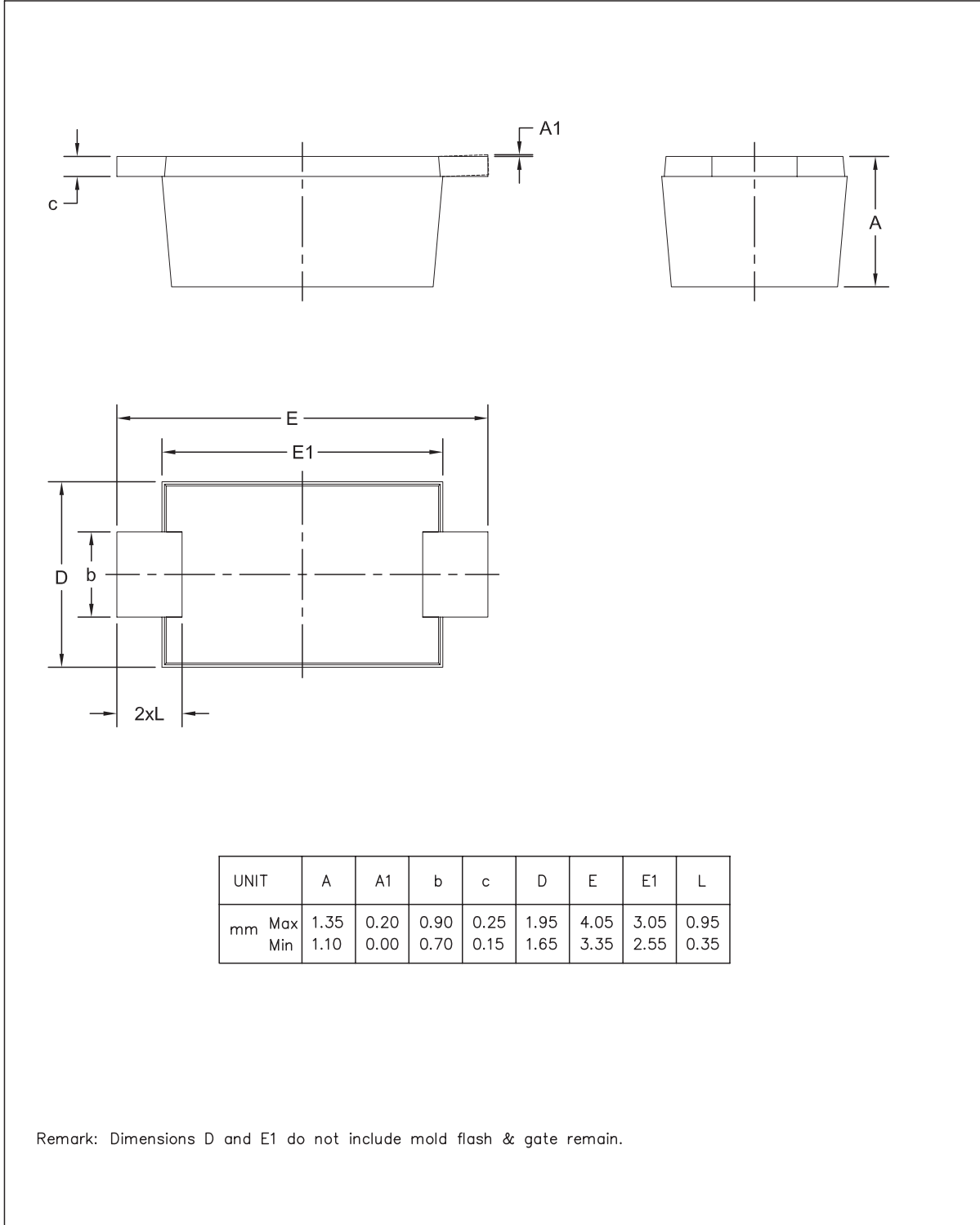


Fig. 9. Part marking

7. Package outline

SOD123



8. Legal information

Data sheet status

| Document status [1][2] | Product status [3] | Definition |
|--------------------------------|--------------------|---|
| Objective [short] data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

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- [2] The term 'short data sheet' is explained in section "Definitions".
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