



PZUxBL series

Single Zener diodes in a SOD882 package

Rev. 2 — 11 November 2019

Product data sheet

1. Product profile

1.1. General description

General-purpose Zener diodes in a SOD882 leadless ultra small Surface-Mounted Device (SMD) plastic package.

1.2. Features

- Non-repetitive peak reverse power dissipation: $P_{ZSM} \leq 40 \text{ W}$
- Total power dissipation: $P_{tot} \leq 250 \text{ mW}$
- Tolerance series: B: approximately $\pm 5 \%$; B2: approximately $\pm 2 \%$
- Wide working voltage range: nominal 2.4 V to 36 V (E24 range)
- Low reverse current I_R range
- Small plastic package suitable for surface-mounted design
- AEC-Q101 qualified

1.3. Applications

- General regulation functions

1.4. Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------|---|--|-------|-----|-----|------|
| V_F | forward voltage | $I_F = 100 \text{ mA}$ | [1] - | - | 1.1 | V |
| P_{ZSM} | non-repetitive peak reverse power dissipation | | [2] - | - | 40 | W |
| P_{tot} | total power dissipation | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [3] - | - | 250 | mW |
| | | | [4] - | - | 550 | mW |

[1] Pulse test: $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$

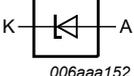
[2] $t_p = 100 \text{ } \mu\text{s}$; square wave; $T_j = 25 \text{ }^\circ\text{C}$ prior to surge

[3] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[4] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

2. Pinning information

Table 2. Pinning

| Pin | Description | | Simplified outline | Symbol |
|-----|-------------|-----|--|--|
| 1 | cathode | [1] |  Transparent top view |  006aaa152 |
| 2 | anode | | | |

[1] The marking bar indicates the cathode

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|------------------------------|-----------|--|---------|
| | Name | Description | Version |
| PZU2.4BL to PZU36BL [1] | DFN1006-2 | leadless ultra small plastic package; 2 terminals | SOD882 |
| PZU2.7B2L to PZU24B2L [2] | | | |

[1] The series consists of 29 types with nominal working voltages from 2.4 V to 36 V.

[2] The series consists of 25 types with nominal working voltages from 2.7 V to 24 V.

4. Marking

Table 4. Marking codes

| Type number | Marking code | Type number | Marking code |
|-------------|--------------|-------------|--------------|
| PZU2.4BL | H2 | PZU2.7B2L | HZ |
| PZU2.7BL | H3 | PZU3.0B2L | K1 |
| PZU3.0BL | H4 | PZU3.3B2L | K2 |
| PZU3.3BL | H5 | PZU3.6B2L | K3 |
| PZU3.6BL | H6 | PZU3.9B2L | K4 |
| PZU3.9BL | H7 | PZU4.3B2L | K5 |
| PZU4.3BL | H8 | PZU4.7B2L | K6 |
| PZU4.7BL | H9 | PZU5.1B2L | K7 |
| PZU5.1BL | HA | PZU5.6B2L | K8 |
| PZU5.6BL | HB | PZU6.2B2L | H1 |
| PZU6.2BL | HC | PZU6.8B2L | K9 |
| PZU6.8BL | HD | PZU7.5B2L | KA |
| PZU7.5BL | HE | PZU8.2B2L | KB |
| PZU8.2BL | HF | PZU9.1B2L | KC |
| PZU9.1BL | HG | PZU10B2L | KD |
| PZU10BL | HH | PZU11B2L | KE |
| PZU11BL | HK | PZU12B2L | KF |
| PZU12BL | HL | PZU13B2L | KG |
| PZU13BL | HM | PZU14B2L | KH |
| PZU15BL | HN | PZU15B2L | KK |
| PZU16BL | HP | PZU16B2L | KL |
| PZU18BL | HR | PZU18B2L | KM |
| PZU20BL | HS | PZU20B2L | KN |
| PZU22BL | HT | PZU22B2L | KP |
| PZU24BL | HU | PZU24B2L | KR |
| PZU27BL | HV | - | - |
| PZU30BL | HW | - | - |
| PZU33BL | HX | - | - |
| PZU36BL | HY | - | - |

5. Limiting values

Table 5. Limiting values

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|---|-----------------------------|-------|--------------|------|
| I_F | forward current | | - | 200 | mA |
| I_{ZSM} | non-repetitive peak reverse current | | [1] - | see: Table 8 | |
| P_{ZSM} | non-repetitive peak reverse power dissipation | | [1] - | 40 | W |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | [2] - | 250 | mW |
| | | | [3] - | 500 | mW |
| T_j | junction temperature | | - | 150 | °C |
| T_{amb} | ambient temperature | | -55 | +150 | °C |
| T_{stg} | storage temperature | | -65 | +150 | °C |

[1] $t_p = 100\text{ }\mu\text{s}$; square wave; $T_j = 25\text{ °C}$ prior to surge

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

6. Thermal characteristics

Table 6. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------|--|-------------|-------|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] - | - | 500 | K/W |
| | | | [2] - | - | 250 | K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | [3] - | - | 55 | K/W |

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .

[3] Soldering point of cathode tab.

7. Characteristics

Table 7. Characteristics

$T_j = 25\text{ °C}$ unless otherwise specified

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|-----------------------|-------|-----|-----|------|
| V_F | forward voltage | $I_F = 10\text{ mA}$ | [1] - | - | 0.9 | V |
| | | $I_F = 100\text{ mA}$ | [1] - | - | 1.1 | V |

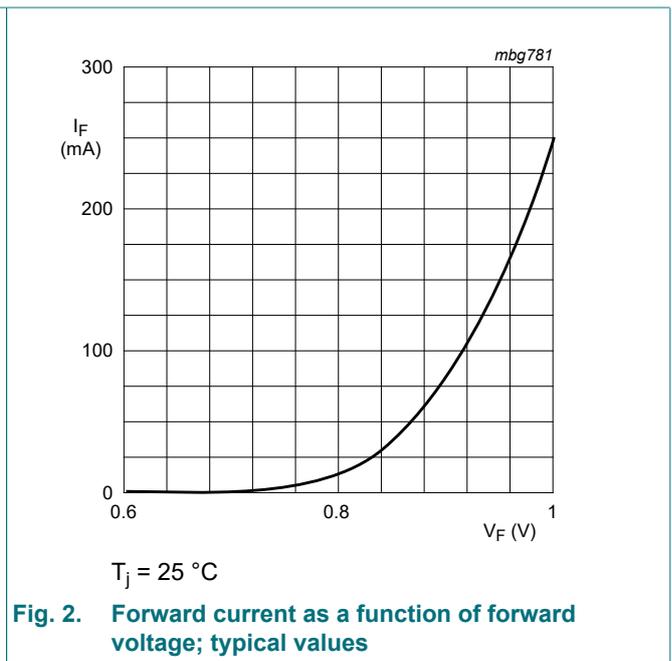
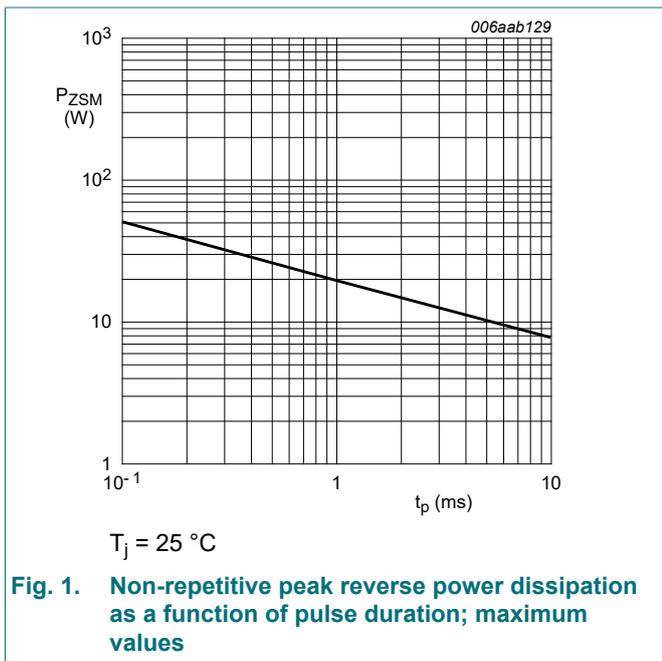
[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$

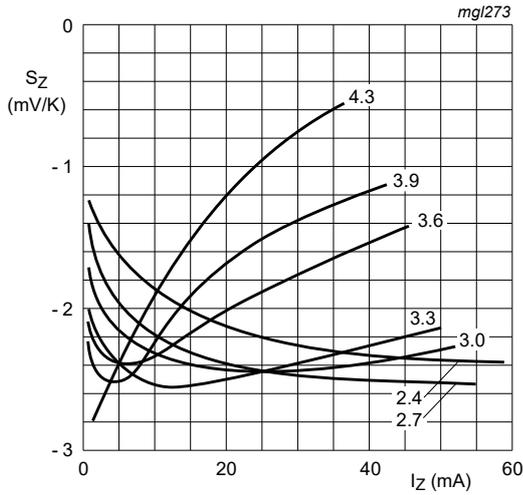
Table 8. Characteristics per type; PZU2.4BL to PZU36BL

 $T_j = 25\text{ °C}$ unless otherwise specified

| PZU xBL | Sel | Working voltage V_Z (V); | | Maximum differential resistance r_{dif} (Ω) | | Reverse current I_R (μ A) | | Temperature coefficient S_Z (mV/K); | Diode capacitance C_d (pF) ; $V_R = 0$ V | Non-repetitive peak reverse current I_{ZSM} (A) |
|------------|-----|----------------------------------|-------|--|--------------|--|-----------|---|---|--|
| | | $I_Z = 5$ mA | | $I_Z = 0.5$ mA | $I_Z = 5$ mA | Max | V_R (V) | Typ | Max | Max |
| | | Min | Max | Max | Max | | | | | |
| 2.4 | B | 2.3 | 2.6 | 1000 | 100 | 50 | 1 | -1.6 | 450 | 8 |
| 2.7 | B | 2.5 | 2.9 | 1000 | 100 | 20 | 1 | -2.0 | 440 | 8 |
| | B2 | 2.65 | 2.9 | | | | | | | |
| 3.0 | B | 2.80 | 3.20 | 1000 | 95 | 10 | 1 | -2.1 | 425 | 8 |
| | B2 | 2.95 | 3.20 | | | | | | | |
| 3.3 | B | 3.10 | 3.50 | 1000 | 95 | 5 | 1 | -2.4 | 410 | 8 |
| | B2 | 3.25 | 3.50 | | | | | | | |
| 3.6 | B | 3.40 | 3.80 | 1000 | 90 | 5 | 1 | -2.4 | 390 | 8 |
| | B2 | 3.55 | 3.80 | | | | | | | |
| 3.9 | B | 3.70 | 4.10 | 1000 | 90 | 3 | 1 | -2.5 | 370 | 8 |
| | B2 | 3.87 | 4.10 | | | | | | | |
| 4.3 | B | 4.01 | 4.48 | 1000 | 90 | 3 | 1 | -2.5 | 350 | 8 |
| | B2 | 4.15 | 4.34 | | | | | | | |
| 4.7 | B | 4.42 | 4.90 | 800 | 80 | 2 | 1 | -1.4 | 325 | 8 |
| | B2 | 4.55 | 4.75 | | | | | | | |
| 5.1 | B | 4.84 | 5.37 | 250 | 60 | 2 | 1.5 | 0.3 | 300 | 5.5 |
| | B2 | 4.98 | 5.20 | | | | | | | |
| 5.6 | B | 5.31 | 5.92 | 100 | 40 | 1 | 2.5 | 1.9 | 275 | 5.5 |
| | B2 | 5.49 | 5.73 | | | | | | | |
| 6.2 | B | 5.86 | 6.53 | 80 | 30 | 0.5 | 3 | 2.7 | 250 | 5.5 |
| | B2 | 6.06 | 6.33 | | | | | | | |
| 6.8 | B | 6.47 | 7.14 | 60 | 20 | 0.5 | 3.5 | 3.4 | 215 | 5.5 |
| | B2 | 6.65 | 6.93 | | | | | | | |
| 7.5 | B | 7.06 | 7.84 | 60 | 10 | 0.5 | 4 | 4.0 | 170 | 3.5 |
| | B2 | 7.28 | 7.60 | | | | | | | |
| 8.2 | B | 7.76 | 8.64 | 60 | 10 | 0.5 | 5 | 4.6 | 150 | 3.5 |
| | B2 | 8.02 | 8.36 | | | | | | | |
| 9.1 | B | 8.56 | 9.55 | 60 | 10 | 0.5 | 6 | 5.5 | 120 | 3.5 |
| | B2 | 8.85 | 9.23 | | | | | | | |
| 10 | B | 9.45 | 10.55 | 60 | 10 | 0.1 | 7 | 6.4 | 110 | 3.5 |
| | B2 | 9.77 | 10.21 | | | | | | | |
| 11 | B | 10.44 | 11.56 | 60 | 10 | 0.1 | 8 | 7.4 | 108 | 3 |
| | B2 | 10.76 | 11.22 | | | | | | | |
| 12 | B | 11.42 | 12.60 | 80 | 10 | 0.1 | 9 | 8.4 | 105 | 3 |
| | B2 | 11.74 | 12.24 | | | | | | | |

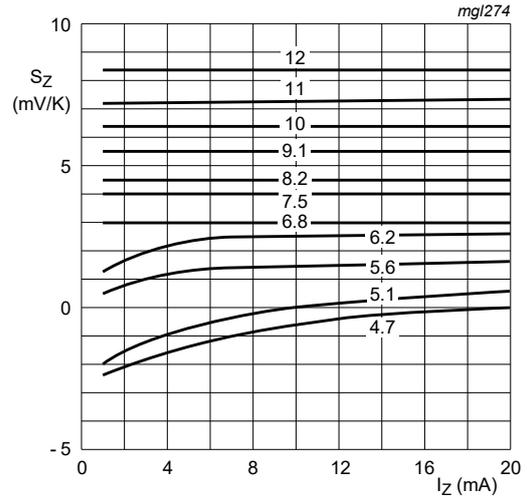
| PZU xBL | Sel | Working voltage V_Z (V); | | Maximum differential resistance r_{dif} (Ω) | | Reverse current I_R (μA) | | Temperature coefficient S_Z (mV/K); | Diode capacitance C_d (pF); $V_R = 0$ V | Non-repetitive peak reverse current I_{ZSM} (A) $t_p = 100 \mu s$; square wave; $T_j = 25^\circ C$; prior to surge |
|---------|-----|----------------------------|-------|--|--------------|-----------------------------------|-----------|---------------------------------------|---|---|
| | | $I_Z = 5$ mA | | $I_Z = 0.5$ mA | $I_Z = 5$ mA | Max | V_R (V) | Typ | Max | |
| | | Min | Max | Max | Max | | | | | |
| 13 | B | 12.47 | 13.96 | 80 | 10 | 0.1 | 10 | 9.4 | 103 | 2.5 |
| | B2 | 12.91 | 13.49 | | | | | | | |
| 14 | B2 | 13.70 | 14.30 | 80 | 10 | 0.1 | 11 | 10.4 | 101 | 2 |
| 15 | B | 13.84 | 15.52 | 80 | 15 | 0.05 | 11 | 11.4 | 99 | 2 |
| | B2 | 14.34 | 14.98 | | | | | | | |
| 16 | B | 15.37 | 17.09 | 80 | 20 | 0.05 | 12 | 12.4 | 97 | 1.5 |
| | B2 | 15.85 | 16.51 | | | | | | | |
| 18 | B | 16.94 | 19.03 | 80 | 20 | 0.05 | 13 | 14.4 | 93 | 1.5 |
| | B2 | 17.56 | 18.35 | | | | | | | |
| 20 | B | 18.86 | 21.08 | 100 | 20 | 0.05 | 15 | 16.4 | 88 | 1.5 |
| | B2 | 19.52 | 20.39 | | | | | | | |
| 22 | B | 20.88 | 23.17 | 100 | 25 | 0.05 | 17 | 18.4 | 84 | 1.3 |
| | B2 | 21.54 | 22.47 | | | | | | | |
| 24 | B | 22.93 | 25.57 | 120 | 30 | 0.05 | 19 | 20.4 | 80 | 1.3 |
| | B2 | 23.72 | 24.78 | | | | | | | |
| 27 | B | 25.1 | 28.9 | 150 | 40 | 0.05 | 21 | 23.4 | 73 | 1 |
| 30 | B | 28 | 32 | 200 | 40 | 0.05 | 23 | 26.6 | 66 | 1 |
| 33 | B | 31 | 35 | 250 | 40 | 0.05 | 25 | 29.7 | 60 | 0.9 |
| 36 | B | 34 | 38 | 300 | 60 | 0.05 | 27 | 33.0 | 59 | 0.8 |





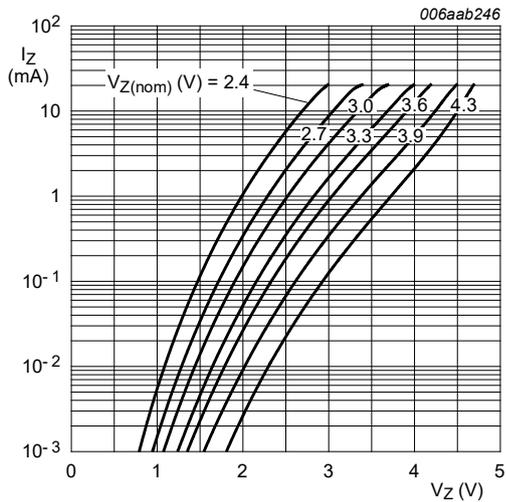
PZU2.4BL to PZU4.3B2L
 $T_j = 25\text{ }^\circ\text{C}$ to $150\text{ }^\circ\text{C}$

Fig. 3. Temperature coefficient as a function of working current; typical values



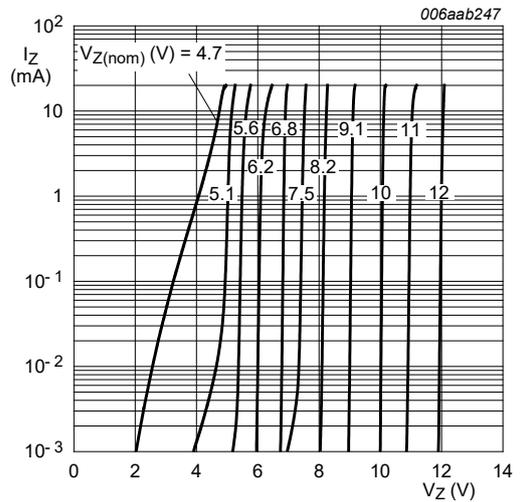
PZU4.7BL to PZU12B2L
 $T_j = 25\text{ }^\circ\text{C}$ to $150\text{ }^\circ\text{C}$

Fig. 4. Temperature coefficient as a function of working current; typical values



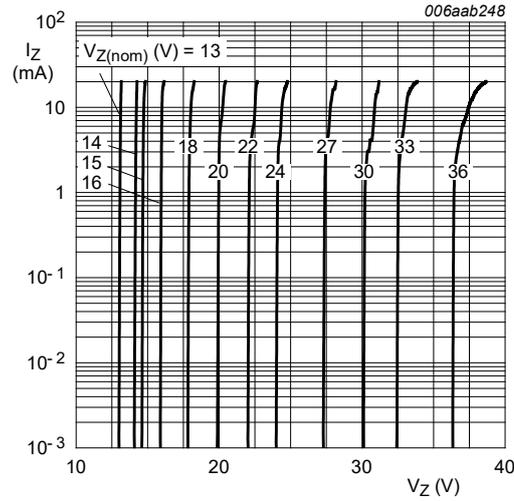
PZU2.4BL to PZU4.3B2L
 $T_j = 25\text{ }^\circ\text{C}$

Fig. 5. Working current as a function of working voltage; typical values



PZU4.7BL to PZU12B2L
 $T_j = 25\text{ }^\circ\text{C}$

Fig. 6. Working current as a function of working voltage; typical values



PZU13BL to PZU36BL
 $T_j = 25\text{ }^\circ\text{C}$

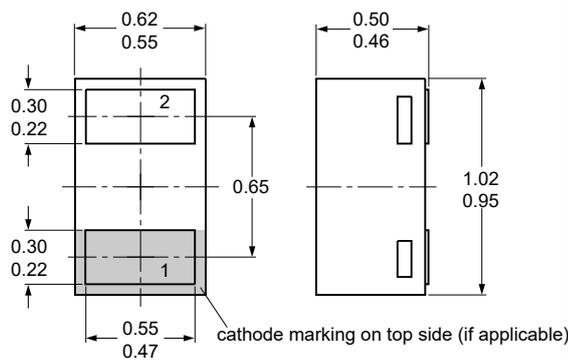
Fig. 7. Working current as a function of working voltage; typical values

8. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

9. Package outline

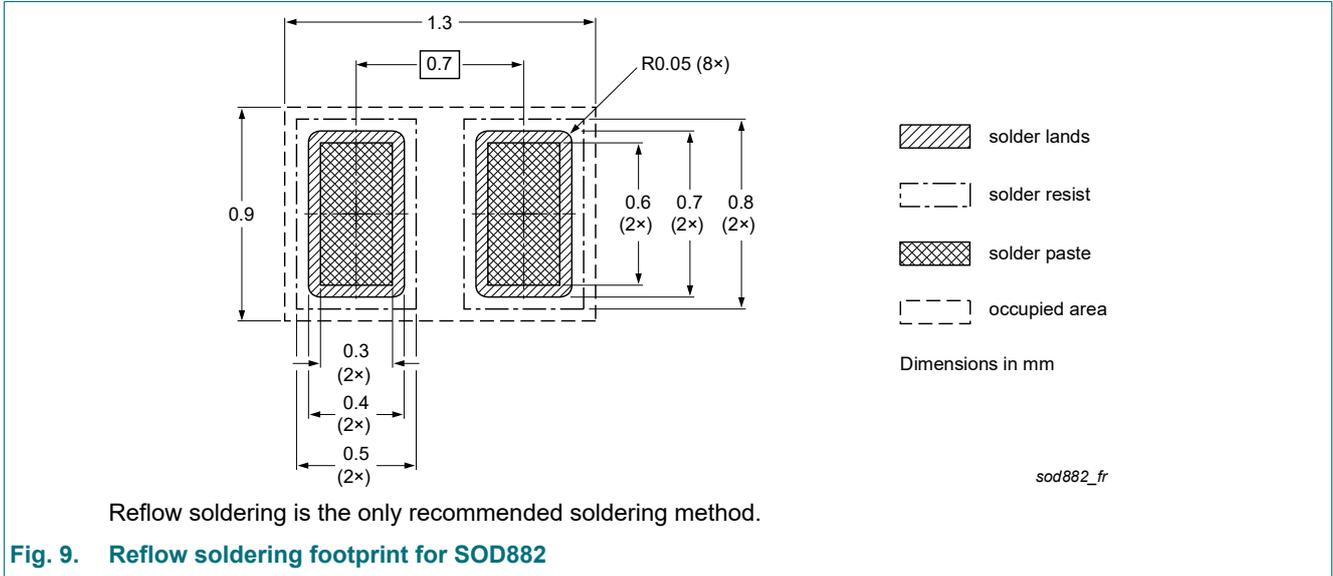


Dimensions in mm



Fig. 8. Package outline SOD882

10. Soldering



11. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-----------------|--|--------------------|---------------|-----------------|
| PZUXBL_SER v. 2 | 20191111 | Product data sheet | - | PZUXBL_SER v. 1 |
| Modifications: | <ul style="list-style-type: none">The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.Legal texts have been adapted to the new company name where appropriate. | | | |
| PZUXBL_SER v. 1 | 20080506 | Product data sheet | - | - |

12. 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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Date of release: 11 November 2019

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