



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: $t_p \leq 300 \text{ } \mu\text{s}$; $\delta \leq 0.02$

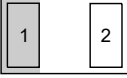
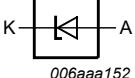
[2] $t_p = 100 \text{ } \mu\text{s}$; square wave; $T_j = 25 \text{ }^\circ\text{C}$ prior to surge

[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] |  <p>Transparent top view</p> |  <p>006aaa152</p> |
| 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 |

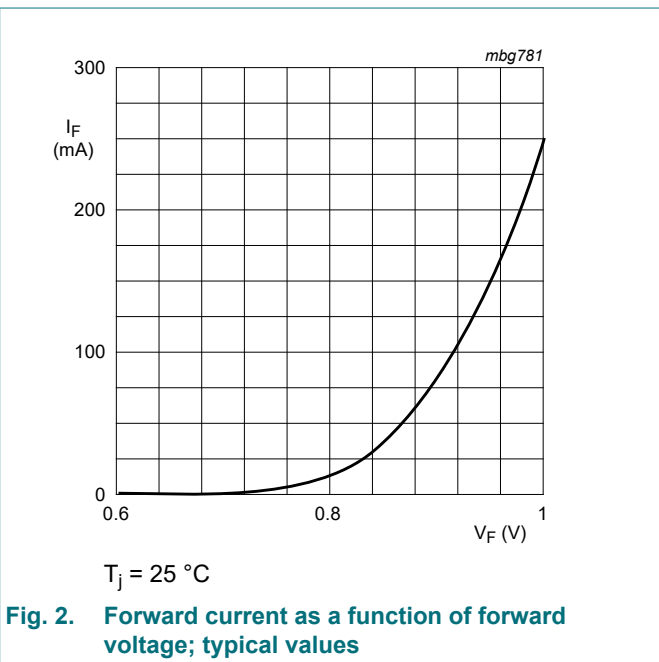
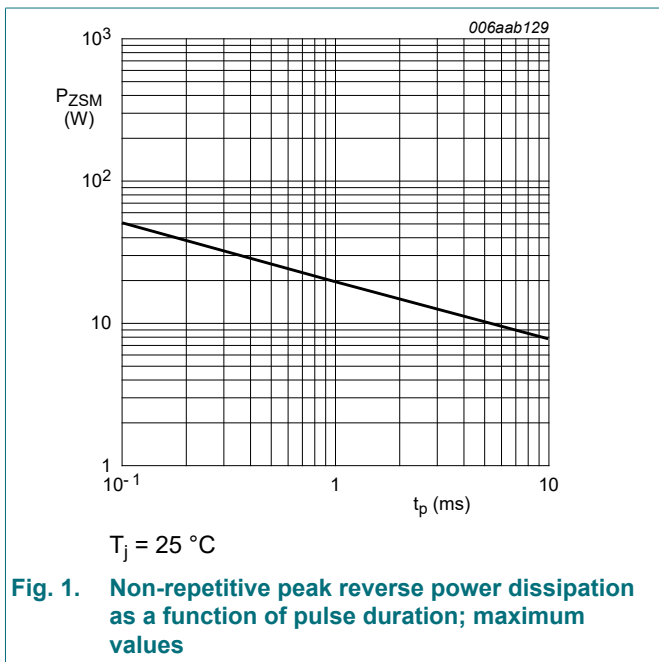
[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$

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



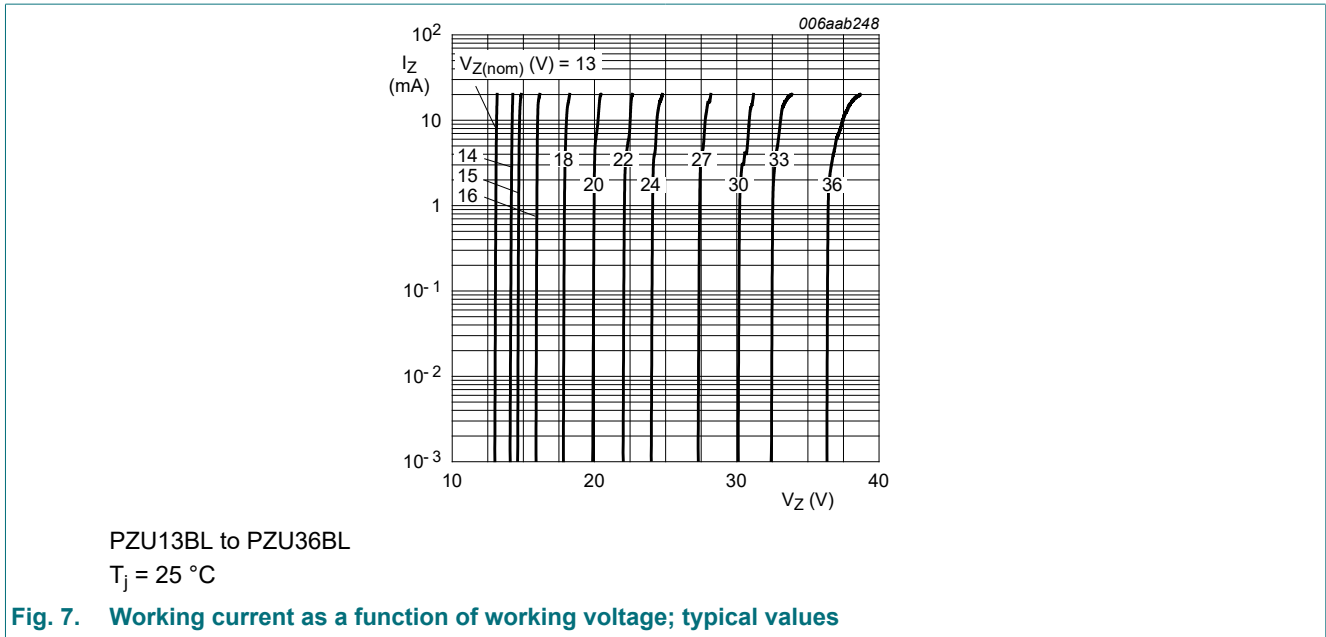
PZU2.4BL to PZU4.3B2L
 $T_j = 25\text{ }^\circ\text{C}$

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

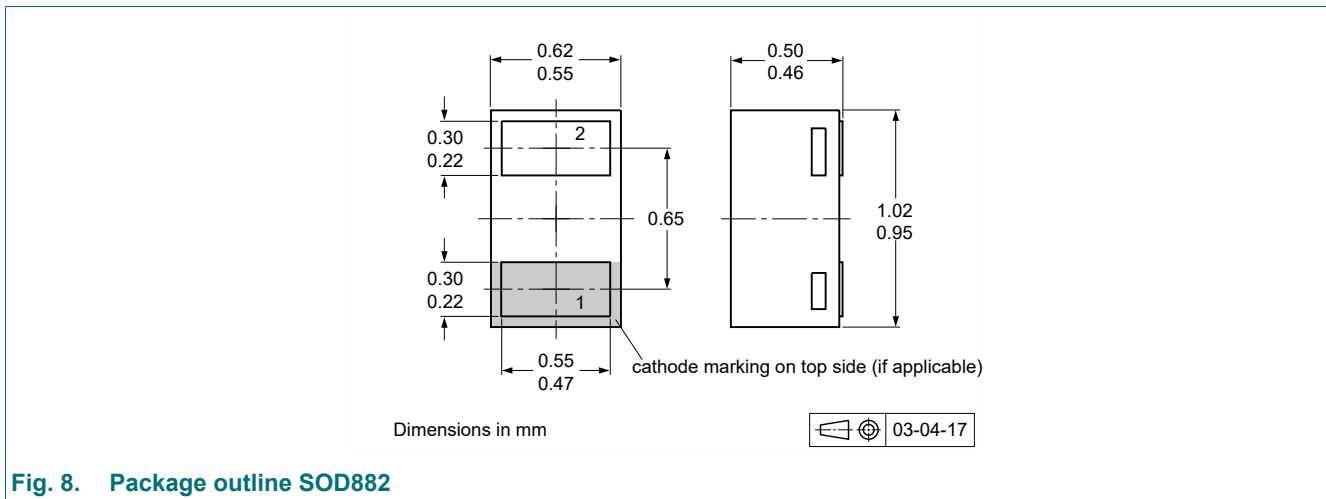


8. Test information

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



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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