



**THE DATASHEET OF  
PDZ15B,115**





# PDZ-B series

## Single Zener diodes

Rev. 5 — 21 December 2022

Product data sheet

## 1. General description

Low-power general purpose voltage regulator diodes in a very small SOD323 (SC-76) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Total power dissipation:  $P_{\text{tot}} \leq 400$  mW
- Small plastic package suitable for surface mounted design
- Wide variety of voltage ranges: nominal 2.4 V to 36 V (E24 range)
- Tolerance approximately  $\pm 2\%$
- PDZ5.1B - 10B: Very low dynamic impedances at low currents, very low leakage current, hard breakdown knee

## 3. Applications

- General voltage regulation

## 4. Quick reference data

Table 1. Quick reference data

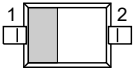
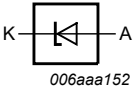
| Symbol           | Parameter               | Conditions                      | Min | Typ | Max | Unit |
|------------------|-------------------------|---------------------------------|-----|-----|-----|------|
| $V_F$            | forward voltage         | $I_F = 10$ mA [1]               | -   | -   | 0.9 | V    |
| $P_{\text{tot}}$ | total power dissipation | $T_{\text{amb}} \leq 25$ °C [2] | -   | -   | 400 | mW   |

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

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

## 5. Pinning information

Table 2. Pinning

| Pin | Symbol | Description | Simplified outline   | Graphic symbol  |
|-----|--------|-------------|--|---|
| 1   | K      | cathode[1]  |  |  |
| 2   | A      | anode       |  |   |

[1] The marking bar indicates the cathode.

## 6. Ordering information

Table 3. Ordering information

| Type number          | Package |  |         |
|----------------------|---------|--|---------|
|                      | Name    | Description                              | Version |
| PDZ2.4B to PDZ36B[1] | -       | plastic surface-mounted package; 2 leads | SOD323  |

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

## 7. Marking

Table 4. Marking Codes

| Type number | Marking Code | Type number | Marking Code | Type number | Marking Code |
|-------------|--------------|-------------|--------------|-------------|--------------|
| PDZ2.4B     | Z0           | PDZ6.2B     | ZA           | PDZ16B      | ZL           |
| PDZ2.7B     | Z1           | PDZ6.8B     | ZB           | PDZ18B      | ZM           |
| PDZ3.0B     | Z2           | PDZ7.5B     | ZC           | PDZ20B      | ZN           |
| PDZ3.3B     | Z3           | PDZ8.2B     | ZD           | PDZ22B      | ZP           |
| PDZ3.6B     | Z4           | PDZ9.1B     | ZE           | PDZ24B      | ZQ           |
| PDZ3.9B     | Z5           | PDZ10B      | ZF           | PDZ27B      | ZR           |
| PDZ4.3B     | Z6           | PDZ11B      | ZG           | PDZ30B      | ZS           |
| PDZ4.7B     | Z7           | PDZ12B      | ZH           | PDZ33B      | ZT           |
| PDZ5.1B     | Z8           | PDZ13B      | ZJ           | PDZ36B      | ZU           |
| PDZ5.6B     | Z9           | PDZ15B      | ZK           |             |              |

## 8. Limiting values

**Table 5. Limiting values**

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

| Symbol           | Parameter                           | Conditions  | Min | Max                       | Unit             |
|------------------|-------------------------------------|---|-----|---------------------------|------------------|
| $I_F$            | continuous forward current          |   | -   | 200                       | mA               |
| $I_{ZSM}$        | non-repetitive peak reverse current | $t_p = 100 \mu\text{s}$ ; square wave;<br>$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ prior to surge | -   | see characteristics table |                  |
| $P_{\text{tot}}$ | total power dissipation             | $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$ [1]  | -   | 400                       | mW               |
| $T_{\text{stg}}$ | storage temperature                 |   | -65 | +150                      | $^\circ\text{C}$ |
| $T_j$            | junction temperature                |   | -   | +150                      | $^\circ\text{C}$ |

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

## 9. Thermal characteristics

**Table 6. Thermal characteristics**

| Symbol                       | Parameter  | Conditions  | Min | Typ | Max | Unit |
|------------------------------|--|-------------|-----|-----|-----|------|
| $R_{\text{th}(j\text{-sp})}$ | thermal resistance from junction to solder point | in free air | -   | -   | 130 | K/W  |
| $R_{\text{th}(j\text{-a})}$  | thermal resistance from junction to ambient      | [1]         | -   | -   | 340 | K/W  |

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

## 10. Characteristics

**Table 7. Characteristics**

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

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

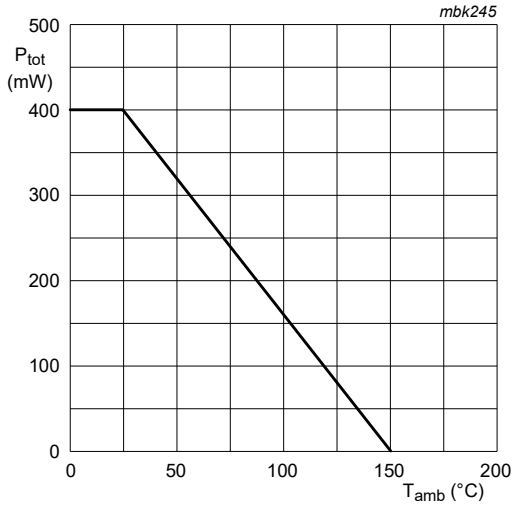
[1] Pulse test:  $t_p \leq 300 \mu\text{s}$ ;  $\delta \leq 0.02$ .

Table 8. Characteristics per type; PDZ2.4B to PDZ36B

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

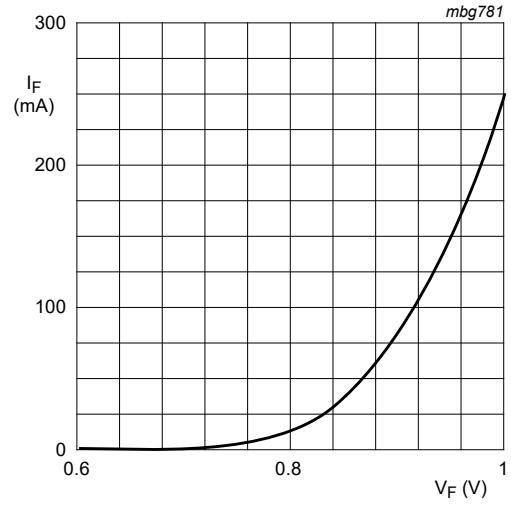
| Type    | Working voltage<br>$V_Z$ (V);<br>$I_Z = 5\text{ mA}$ |       | Maximum differential resistance<br>$r_{dif}$ ( $\Omega$ ) |                     | Reverse current<br>$I_R$ ( $\mu\text{A}$ ) |           | Temperature coefficient<br>$S_Z$ (mV/K);<br>$I_Z = 5\text{ mA}$ | Diode capacitance<br>$C_d$ (pF)[1] | Non-repetitive peak reverse current<br>$I_{ZSM}$ (A)[2] |
|---------|--|-------|---|---------------------|--|-----------|---|------------------------------------|---|
|         | Min  | Max   | $I_Z = 0.5\text{ mA}$                                     | $I_Z = 5\text{ mA}$ | Max  | $V_R$ (V) | Typ   | Max                                | Max   |
| PDZ2.4B | 2.43   | 2.63  | 1000  | 100                 | 50   | 1.0       | -1.6  | 450                                | 8.0   |
| PDZ2.7B | 2.69   | 2.91  | 1000  | 100                 | 20   | 1.0       | -2.0  | 440                                | 8.0   |
| PDZ3.0B | 2.85   | 3.07  | 1000  | 95                  | 10   | 1.0       | -2.1  | 425                                | 8.0   |
| PDZ3.3B | 3.32   | 3.53  | 1000  | 95                  | 5  | 1.0       | -2.4  | 410                                | 8.0   |
| PDZ3.6B | 3.60   | 3.85  | 500 @ 1 mA  | 90                  | 5  | 1.0       | -2.4  | 390                                | 8.0   |
| PDZ3.9B | 3.89   | 4.16  | 500 @ 1 mA  | 90                  | 3  | 1.0       | -2.5  | 370                                | 8.0   |
| PDZ4.3B | 4.17   | 4.48  | 600 @ 1 mA  | 90                  | 3  | 1.0       | -2.5  | 350                                | 8.0   |
| PDZ4.7B | 4.55   | 4.75  | 600 @ 1 mA  | 90                  | 2  | 1.0       | -1.4  | 325                                | 8.0   |
| PDZ5.1B | 4.96   | 5.20  | 250   | 60                  | 2  | 1.5       | 0.3   | 300                                | 5.5   |
| PDZ5.6B | 5.48   | 5.73  | 100   | 50                  | 1  | 2.5       | 1.9   | 275                                | 5.5   |
| PDZ6.2B | 6.06   | 6.33  | 80  | 50                  | 0.5  | 3.0       | 2.7   | 250                                | 5.5   |
| PDZ6.8B | 6.65   | 6.93  | 60  | 40                  | 0.5  | 3.5       | 3.4   | 215                                | 5.5   |
| PDZ7.5B | 7.28   | 7.60  | 60  | 10                  | 0.5  | 4.0       | 4.0   | 170                                | 3.5   |
| PDZ8.2B | 8.02   | 8.36  | 60  | 10                  | 0.5  | 5.0       | 4.6   | 150                                | 3.5   |
| PDZ9.1B | 8.85   | 9.23  | 60  | 10                  | 0.5  | 6.0       | 5.5   | 120                                | 3.5   |
| PDZ10B  | 9.77   | 10.21 | 60  | 10                  | 0.1  | 7.0       | 6.4   | 110                                | 3.5   |
| PDZ11B  | 10.78  | 11.22 | 60  | 10                  | 0.1  | 8.0       | 7.4   | 108                                | 3.0   |
| PDZ12B  | 11.74  | 12.24 | 80  | 10                  | 0.1  | 9.0       | 8.4   | 105                                | 3.0   |
| PDZ13B  | 12.91  | 13.49 | 80  | 10                  | 0.1  | 10.0      | 9.4   | 103                                | 2.5   |
| PDZ15B  | 14.34  | 14.98 | 80  | 15                  | 0.05                                       | 11.0      | 11.4  | 99                                 | 2.0   |
| PDZ16B  | 15.85  | 16.51 | 80  | 20                  | 0.05                                       | 12.0      | 12.4  | 97                                 | 1.5   |
| PDZ18B  | 17.56  | 18.35 | 80  | 20                  | 0.05                                       | 13.0      | 14.4  | 93                                 | 1.5   |
| PDZ20B  | 19.52  | 20.39 | 100   | 20                  | 0.05                                       | 15.0      | 16.4  | 88                                 | 1.5   |
| PDZ22B  | 21.54  | 22.47 | 100   | 25                  | 0.05                                       | 17.0      | 18.4  | 84                                 | 1.3   |
| PDZ24B  | 23.72  | 24.78 | 120   | 30                  | 0.05                                       | 19.0      | 20.4  | 80                                 | 1.3   |
| PDZ27B  | 26.19  | 27.53 | 150   | 40                  | 0.05                                       | 21.0      | 23.4  | 73                                 | 1.0   |
| PDZ30B  | 29.19  | 30.69 | 200   | 40                  | 0.05                                       | 23.0      | 26.6  | 66                                 | 1.0   |
| PDZ33B  | 32.15  | 33.79 | 250   | 40                  | 0.05                                       | 25.0      | 29.7  | 60                                 | 0.9   |
| PDZ36B  | 35.07  | 36.87 | 300   | 60                  | 0.05                                       | 27.0      | 33.0  | 59                                 | 0.8   |

[1]  $f = 1\text{ MHz}$ ;  $V_R = 0\text{ V}$ .[2]  $t_p = 100\text{ }\mu\text{s}$ ;  $T_{amb} = 25\text{ °C}$ .



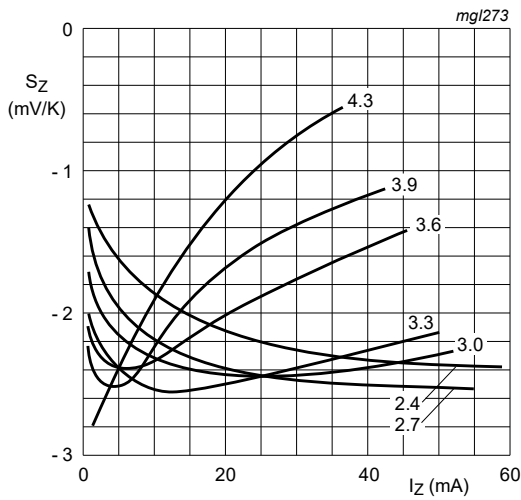
FR4 PCB, standard footprint

Fig. 1. Power derating curve



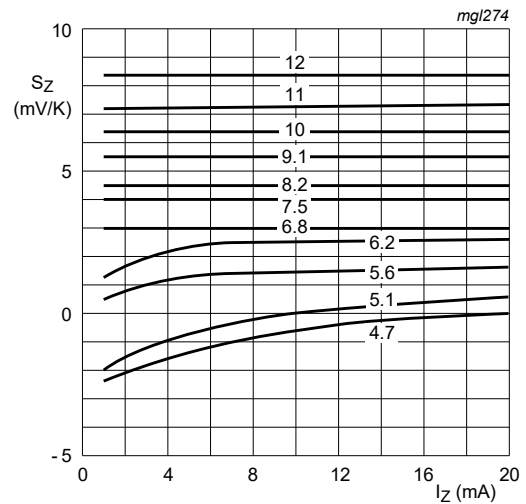
$T_j = 25\text{ °C}$

Fig. 2. Forward current as a function of forward voltage; typical values



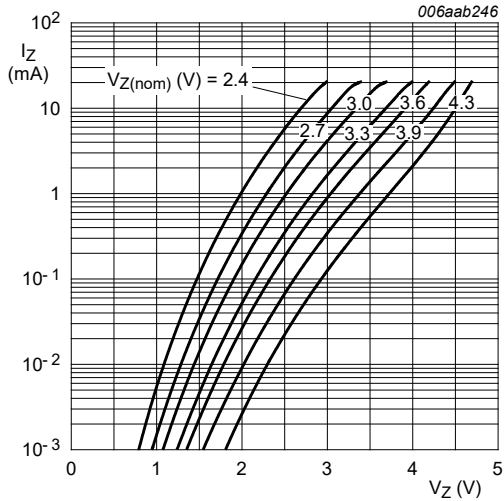
PDZ2.4B to PDZ4.3B  
 $T_j = 25\text{ °C}$  to  $150\text{ °C}$

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



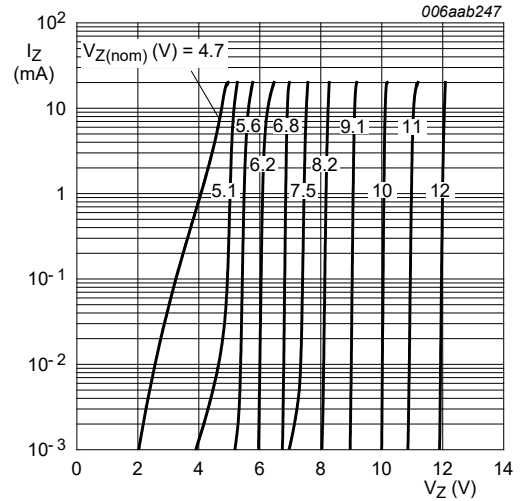
PDZ4.7B to PDZ12B  
 $T_j = 25\text{ °C}$  to  $150\text{ °C}$

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



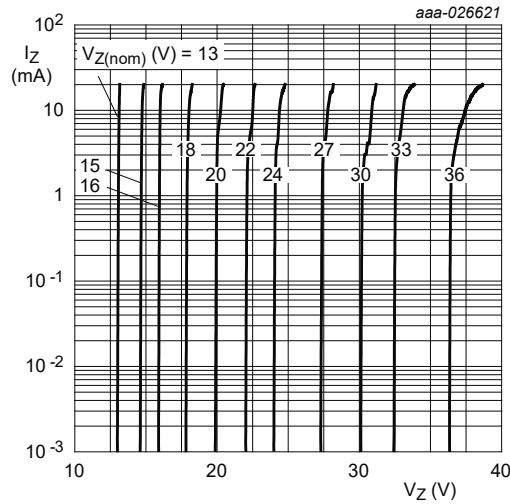
PDZ2.4B to PDZ4.3B  
 $T_j = 25\text{ }^\circ\text{C}$

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



PDZ4.7B to PDZ12B  
 $T_j = 25\text{ }^\circ\text{C}$

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



PDZ13B to PDZ36B  
 $T_j = 25\text{ }^\circ\text{C}$

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

### 11. Package outline

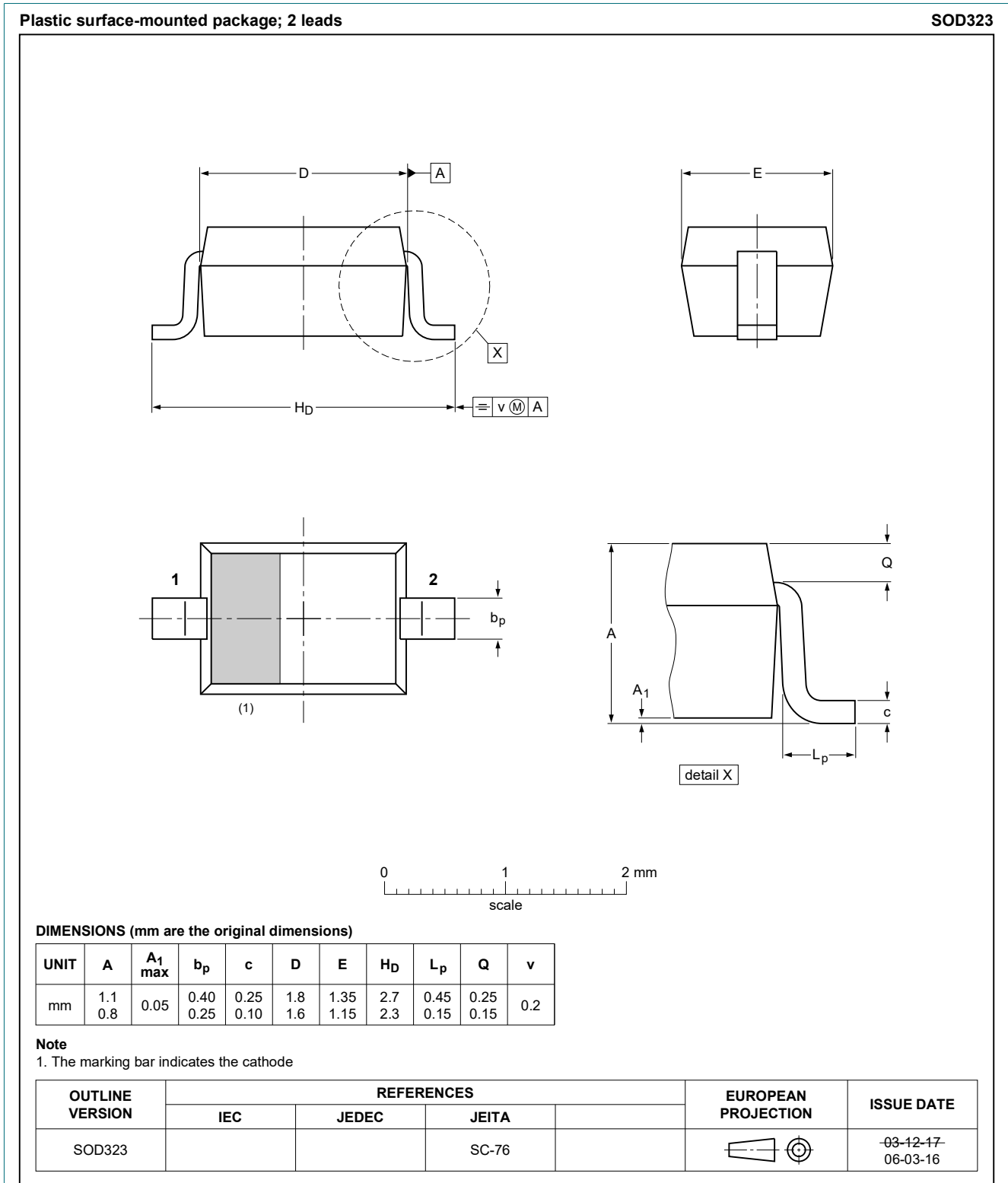


Fig. 8. Package outline SOD323



## 13. Revision history

**Table 9. Revision history**

| Document ID    | Release date                          | Data sheet status  | Change notice | Supersedes    |
|----------------|---------------------------------------|--------------------|---------------|---------------|
| PDZ-B_SER v.5  | 20221221                              | Product data sheet | -             | PDZ-B_SER v.4 |
| Modifications: | • Figure 1: Notes and title corrected |                    |               |               |
| PDZ-B_SER v.4  | 20220701                              | Product data sheet | -             | PDZ-B_SER v.3 |
| PDZ-B_SER v.3  | 20190305                              | Product data sheet | -             | PDZ-B_SER v.2 |
| PDZ-B_SER v.2  | 20040322                              | Product data sheet | -             | PDZ-B_SER v.1 |
| PDZ-B_SER v.1  | 20020218                              | Product data sheet | -             | -             |

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| Document status [1][2]         | Product status [3] | Definition  |
|--------------------------------|--------------------|---|
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| Product [short] data sheet     | Production         | This document contains the product specification.                                     |

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## Contents

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|                                 |    |
|---------------------------------|----|
| 1. General description.....     | 1  |
| 2. Features and benefits.....   | 1  |
| 3. Applications.....            | 1  |
| 4. Quick reference data.....    | 1  |
| 5. Pinning information.....     | 2  |
| 6. Ordering information.....    | 2  |
| 7. Marking.....                 | 2  |
| 8. Limiting values.....         | 3  |
| 9. Thermal characteristics..... | 3  |
| 10. Characteristics.....        | 3  |
| 11. Package outline.....        | 7  |
| 12. Soldering.....              | 8  |
| 13. Revision history.....       | 9  |
| 14. Legal information.....      | 10 |

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