

BZB100A

Bidirectional Zener diode

Rev. 02 — 24 June 2008

Product data sheet

1. Product profile

1.1 General description

Bidirectional Zener diode in a SOD323 (SC-76) very small Surface-Mounted Device (SMD) plastic package.

1.2 Features

- Non-repetitive peak reverse power dissipation: $P_{ZSM} \leq 30 \text{ W}$
- Bidirectional configuration
- Small plastic package suitable for surface-mounted design
- AEC-Q101 qualified

1.3 Applications

- General regulation functions
- Overvoltage protection for ElectroLuminescent (EL) driver circuits

1.4 Quick reference data

Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-------------------|-------------------------------------|----------------------|-----|-----|------|------|
| Per device | | | | | | |
| V_Z | working voltage | $I_Z = 1 \text{ mA}$ | 95 | - | 105 | V |
| I_{ZSM} | non-repetitive peak reverse current | | [1] | - | 0.23 | A |

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

2. Pinning information

Table 2. Pinning

| Pin | Description | Simplified outline | Graphic symbol |
|-----|-------------------|--------------------|----------------|
| 1 | cathode (diode 1) | | |
| 2 | cathode (diode 2) | | |

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BZB100A | SC-76 | plastic surface-mounted package; 2 leads | SOD323 |

4. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BZB100A | AT |

5. Limiting values

Table 5. Limiting values

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-------------------|---|-----------------------------|-------|------|------|
| Per device | | | | | |
| I_{ZSM} | non-repetitive peak reverse current | | [1] - | 0.23 | A |
| P_{ZSM} | non-repetitive peak reverse power dissipation | | [1] - | 30 | W |
| | | | [2] - | 75 | W |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | [3] - | 300 | mW |
| | | | [4] - | 540 | mW |
| | | | [5] - | 830 | mW |
| T_j | junction temperature | | - | 150 | °C |
| T_{amb} | ambient temperature | | -55 | +150 | °C |
| T_{stg} | storage temperature | | -65 | +150 | °C |

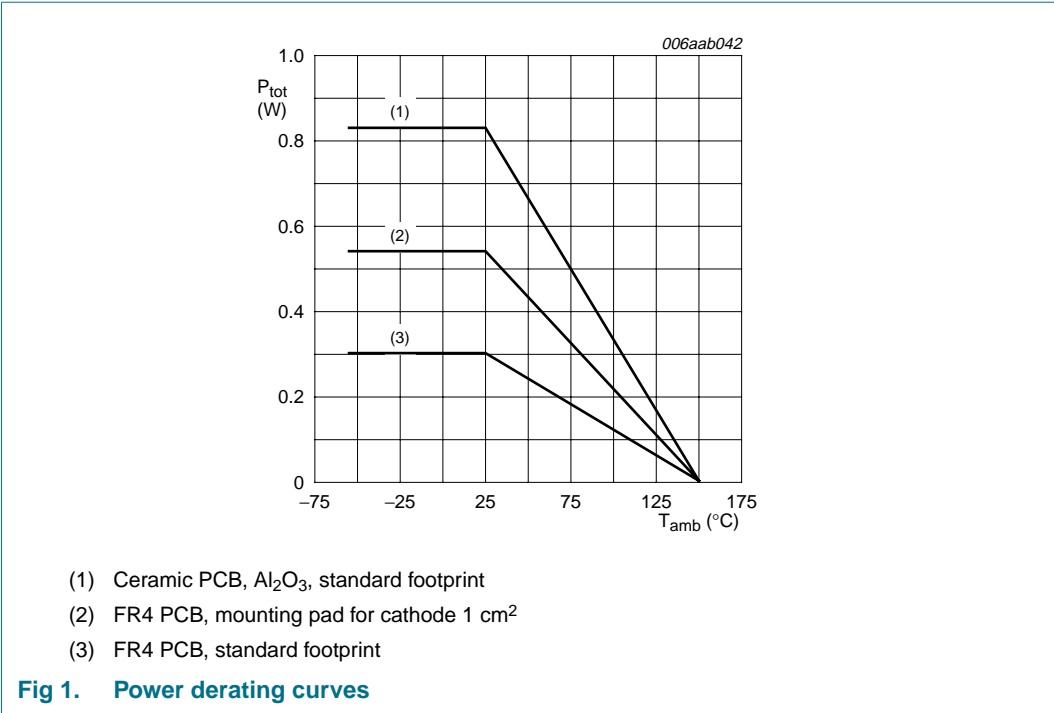
[1] $t_p = 100\text{ }\mu\text{s}$; square wave; $T_j = 25\text{ °C}$ prior to surge

[2] $t_p = 10\text{ }\mu\text{s}$; square wave; $T_j = 25\text{ °C}$ 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 .

[5] Device mounted on a ceramic PCB, Al_2O_3 , standard footprint.



6. Thermal characteristics

Table 6. Thermal characteristics

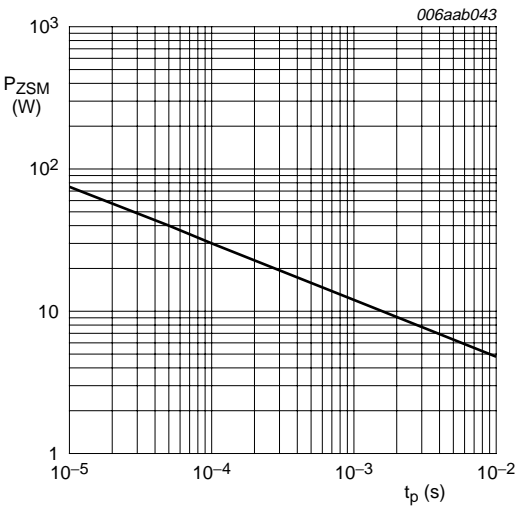
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------|--|-------------|-----|-----|-----|---------|
| Per device | | | | | | |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | - | 415 K/W |
| | | | [2] | - | - | 230 K/W |
| | | | [3] | - | - | 150 K/W |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | | [4] | - | - | 90 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 cm².
[3] Device mounted on a ceramic PCB, Al₂O₃, standard footprint.
[4] Soldering point of cathode tab.

7. Characteristics

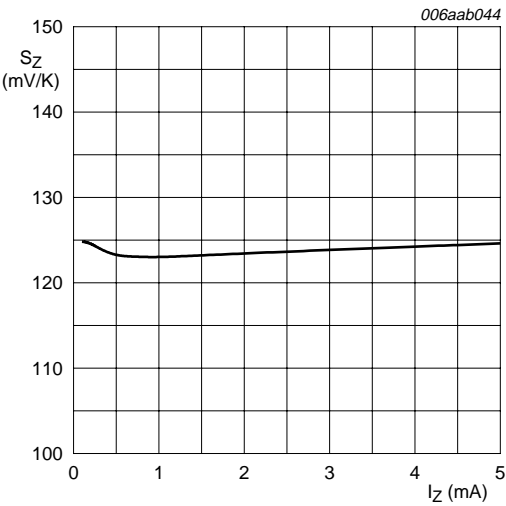
Table 7. Characteristics
T_j = 25 °C unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|------------------|-------------------------|------------------------------------|-----|-----|------|------|
| Per device | | | | | | |
| V _Z | working voltage | I _Z = 1 mA | 95 | - | 105 | V |
| r _{dif} | differential resistance | I _Z = 1 mA | - | - | 700 | Ω |
| I _R | reverse current | V _R = 76 V | - | - | 0.05 | μA |
| S _Z | temperature coefficient | I _Z = 1 mA | - | 123 | - | mV/K |
| C _d | diode capacitance | f = 1 MHz; V _R = 0 V | - | - | 10 | pF |



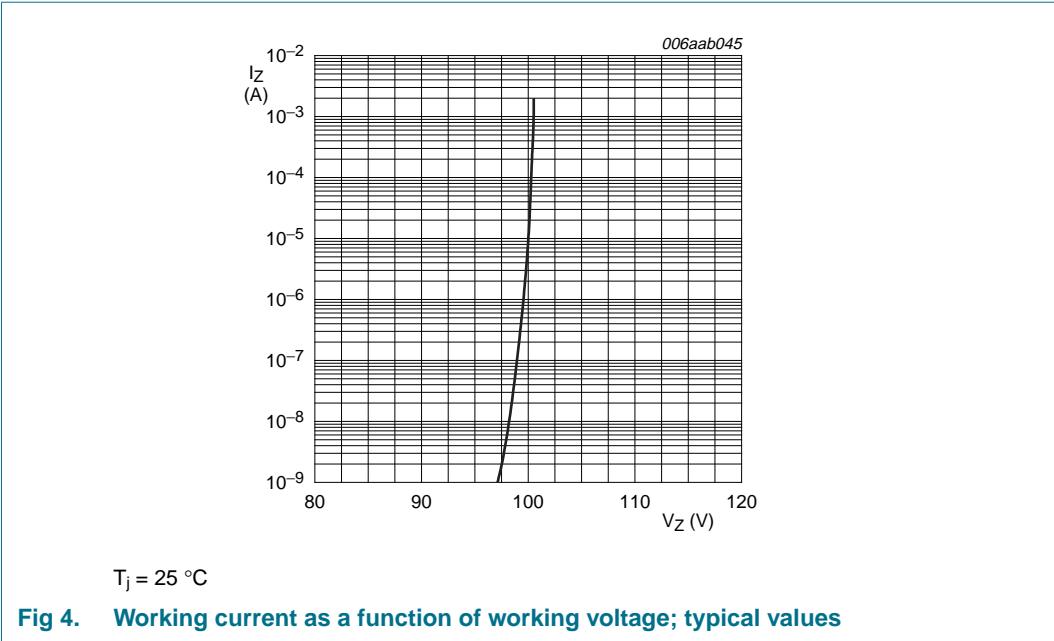
T_j = 25 °C (prior to surge)

Fig 2. Non-repetitive peak reverse power dissipation as a function of pulse duration; maximum values



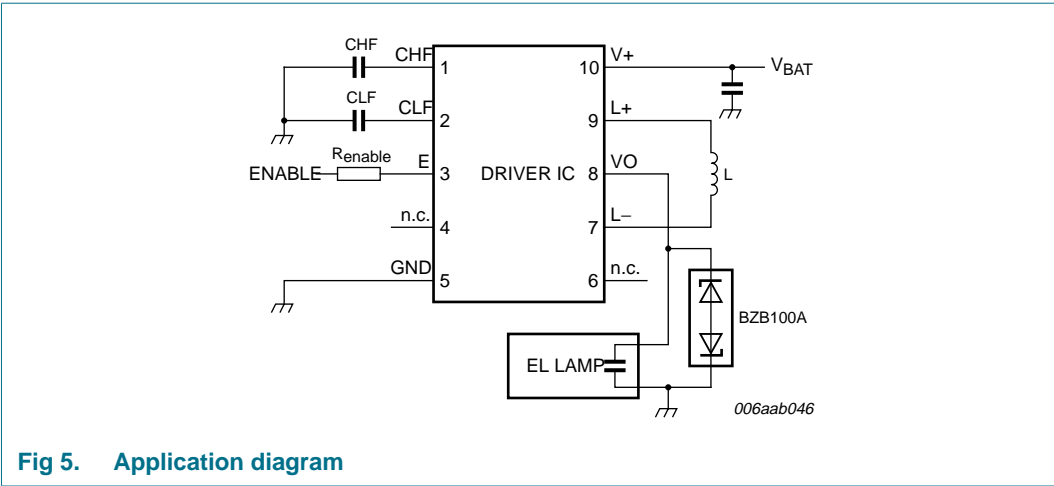
T_j = 25 °C to 150 °C

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



8. Application information

High-voltage Zener diodes can be used as overvoltage protection diodes for Integrated Circuits (IC) due to their ability to cut off the applied voltage at a well-defined value. One important application is the protection of EL driver circuits where a driver IC is connected to an EL foil. Since both the foil as well as the IC are sensitive against voltage overstress, it is necessary to install an additional protection device in the circuit. Commonly, a peak-to-peak voltage of 220 V should not be exceeded, such that two 100 V diodes in bidirectional configuration are used.

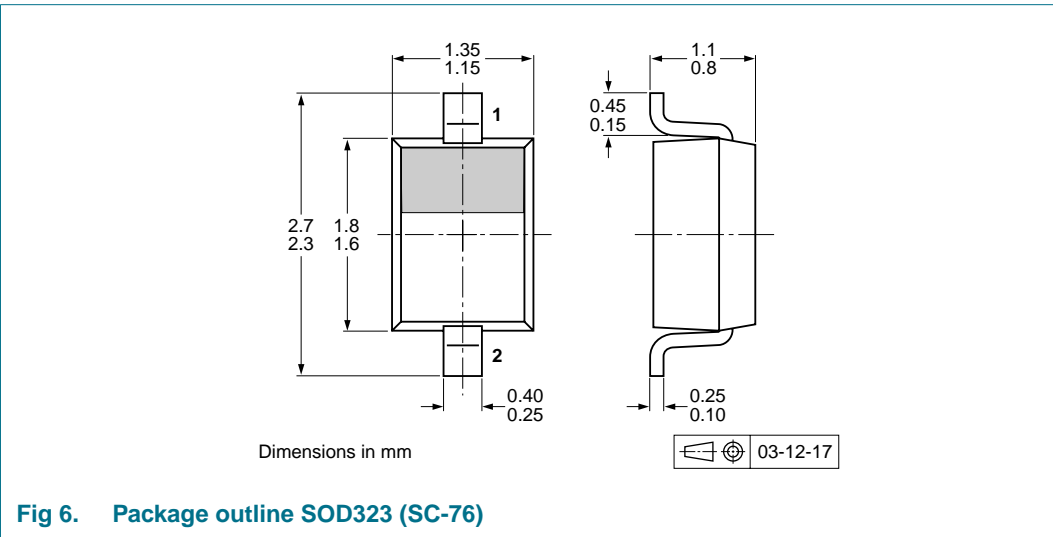


9. Test information

9.1 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.

10. Package outline



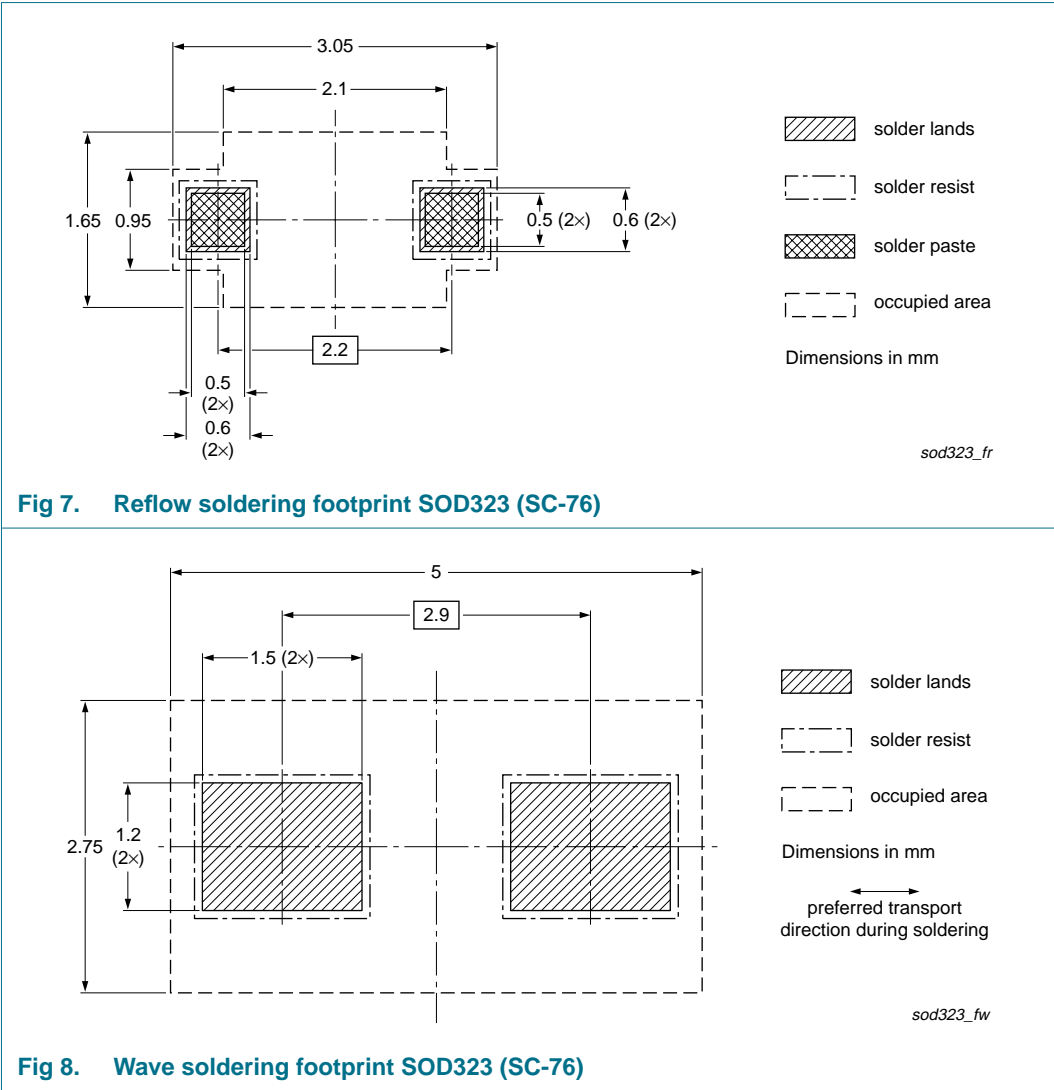
11. Packing information

Table 8. Packing methods
The indicated -xxx are the last three digits of the 12NC ordering code.^[1]

| Type number | Package | Description | Packing quantity | |
|-------------|---------|--------------------------------|------------------|-------|
| | | | 3000 | 10000 |
| BZB100A | SOD323 | 4 mm pitch, 8 mm tape and reel | -115 | -135 |

[1] For further information and the availability of packing methods, see [Section 15](#).

12. Soldering



13. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--|--------------------|---------------|------------|
| BZB100A_2 | 20080624 | Product data sheet | - | BZB100A_1 |
| Modifications: | <ul style="list-style-type: none">• Section 1.1 "General description": adapted• Section 1.2 "Features": adapted• Table 2 "Pinning": graphic symbol amended• Table 6 "Thermal characteristics": updated• Section 8 "Application information": adapted• Section 12 "Soldering": updated• Section 14 "Legal information": updated | | | |
| BZB100A_1 | 20080128 | Product data sheet | - | - |

14. Legal information

14.1 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. |

[1] Please consult the most recently issued document before initiating or completing a design.

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

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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