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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_Z$</td>
<td>working voltage</td>
<td>$I_Z = 1 \text{ mA}$</td>
<td>95</td>
<td>-</td>
<td>105</td>
<td>V</td>
</tr>
<tr>
<td>$I_{ZSM}$</td>
<td>non-repetitive peak reverse current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[1] $I_P = 100 \mu\text{s}; \text{square wave}; T_J = 25 \degree \text{C prior to surge}$

2. Pinning information

Table 2. Pinning

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>cathode (diode 1)</td>
<td><img src="image" alt="Simplified outline" /></td>
<td><img src="image" alt="Graphic symbol" /></td>
</tr>
<tr>
<td>2</td>
<td>cathode (diode 2)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Ordering information

Table 3. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>BZB100A</td>
<td>SC-76</td>
<td>plastic surface-mounted package; 2 leads</td>
<td>SOD323</td>
</tr>
</tbody>
</table>

4. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
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<tbody>
<tr>
<td>BZB100A</td>
<td>AT</td>
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</tbody>
</table>

5. Limiting values

Table 5. Limiting values

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>I_ZSM</td>
<td>non-repetitive peak reverse current</td>
<td>U</td>
<td>-</td>
<td>0.23</td>
<td>A</td>
</tr>
<tr>
<td>P_ZSM</td>
<td>non-repetitive peak reverse power dissipation</td>
<td>U</td>
<td>-</td>
<td>30</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2]</td>
<td>-</td>
<td>75</td>
<td>W</td>
</tr>
<tr>
<td>P_tot</td>
<td>total power dissipation</td>
<td>T_amb ≤ 25 °C</td>
<td>[3]</td>
<td>-</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[4]</td>
<td>-</td>
<td>540</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[5]</td>
<td>-</td>
<td>830</td>
</tr>
<tr>
<td>T_J</td>
<td>junction temperature</td>
<td>-</td>
<td>-</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>T_amb</td>
<td>ambient temperature</td>
<td>-55</td>
<td>+150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>T_stg</td>
<td>storage temperature</td>
<td>-65</td>
<td>+150</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

[1] \( t_p = 100 \mu s; \) square wave; \( T_J = 25 °C \) prior to surge

[2] \( t_p = 10 \mu s; \) square wave; \( T_J = 25 °C \) prior to surge


6. Thermal characteristics

Table 6. Thermal characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per device</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R_{th(j-a)}$</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1]</td>
<td>-</td>
<td>415</td>
<td>K/W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[3]</td>
<td>-</td>
<td>150</td>
<td>K/W</td>
</tr>
<tr>
<td>$R_{th(j-sp)}$</td>
<td>thermal resistance from junction to solder point</td>
<td>[4]</td>
<td>-</td>
<td>-</td>
<td>90</td>
<td>K/W</td>
</tr>
</tbody>
</table>

7. Characteristics

Table 7. Characteristics
T<sub>j</sub> = 25 °C unless otherwise specified.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V&lt;sub&gt;Z&lt;/sub&gt;</td>
<td>working voltage</td>
<td>I&lt;sub&gt;Z&lt;/sub&gt; = 1 mA</td>
<td>95</td>
<td>-</td>
<td>105</td>
<td>V</td>
</tr>
<tr>
<td>r&lt;sub&gt;dif&lt;/sub&gt;</td>
<td>differential resistance</td>
<td>I&lt;sub&gt;Z&lt;/sub&gt; = 1 mA</td>
<td>-</td>
<td>-</td>
<td>700</td>
<td>Ω</td>
</tr>
<tr>
<td>I&lt;sub&gt;R&lt;/sub&gt;</td>
<td>reverse current</td>
<td>V&lt;sub&gt;R&lt;/sub&gt; = 76 V</td>
<td>-</td>
<td>-</td>
<td>0.05</td>
<td>µA</td>
</tr>
<tr>
<td>S&lt;sub&gt;Z&lt;/sub&gt;</td>
<td>temperature coefficient</td>
<td>I&lt;sub&gt;Z&lt;/sub&gt; = 1 mA</td>
<td>-</td>
<td>123</td>
<td>-</td>
<td>mV/K</td>
</tr>
<tr>
<td>C&lt;sub&gt;d&lt;/sub&gt;</td>
<td>diode capacitance</td>
<td>f = 1 MHz; V&lt;sub&gt;R&lt;/sub&gt; = 0 V</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>pF</td>
</tr>
</tbody>
</table>

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

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

![Fig 6. Package outline SOD323 (SC-76)]

11. Packing information

Please refer to packing information on [www.nexperia.com](http://www.nexperia.com).
12. Soldering

**Fig 7.** Reflow soldering footprint SOD323 (SC-76)

**Fig 8.** Wave soldering footprint SOD323 (SC-76)
## 13. Revision history

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<th>Data sheet status</th>
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<th>Supersedes</th>
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<td>20080624</td>
<td>Product data sheet</td>
<td>-</td>
<td>BZB100A_1</td>
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<tr>
<td>BZB100A_1</td>
<td>20080128</td>
<td>Product data sheet</td>
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**Modifications:**
- [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
14. Legal information

14.1 Data sheet status

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<th>Definition</th>
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<tr>
<td>Objective [short] data sheet</td>
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<td>This document contains data from the objective specification for product development.</td>
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<tr>
<td>Preliminary [short] data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
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<td>Product [short] data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
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</table>

[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.nexperia.com.

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