



# 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:  $P_{ZSM} \leq 30$  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	$I_Z = 1$ mA	95	-	105	V
$I_{ZSM}$	non-repetitive peak reverse current		[1]	-	0.23	A

[1]  $t_p = 100$   $\mu$ s; square wave;  $T_j = 25$  °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		Version
	Name	Description	
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
<b>Per device</b>					
$I_{ZSM}$	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

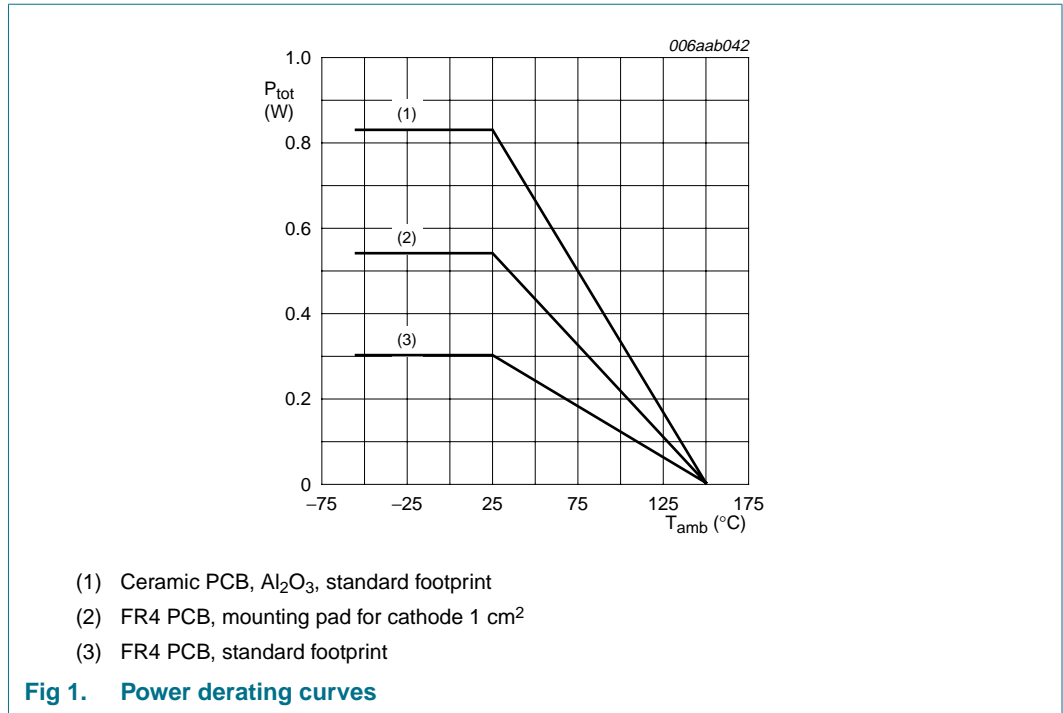
[1]  $t_p = 100\ \mu\text{s}$ ; square wave;  $T_j = 25\text{ °C}$  prior to surge

[2]  $t_p = 10\ \mu\text{s}$ ; 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  $1\text{ cm}^2$ .

[5] Device mounted on a ceramic PCB,  $\text{Al}_2\text{O}_3$ , standard footprint.



## 6. Thermal characteristics

**Table 6. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
<b>Per device</b>							
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1]	-	-	415	K/W
			[2]	-	-	230	K/W
			[3]	-	-	150	K/W
R <sub>th(j-sp)</sub>	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 cm<sup>2</sup>.

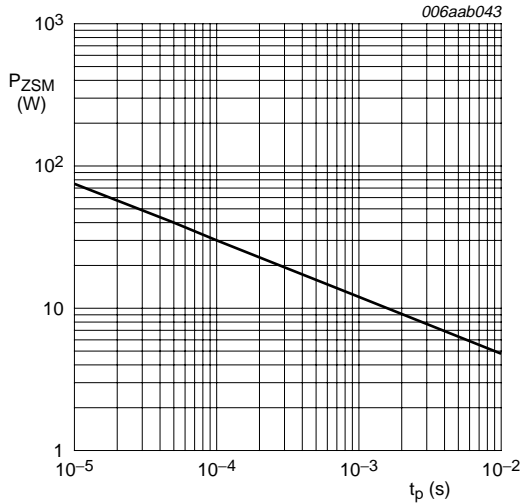
[3] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.

[4] Soldering point of cathode tab.

**7. Characteristics**

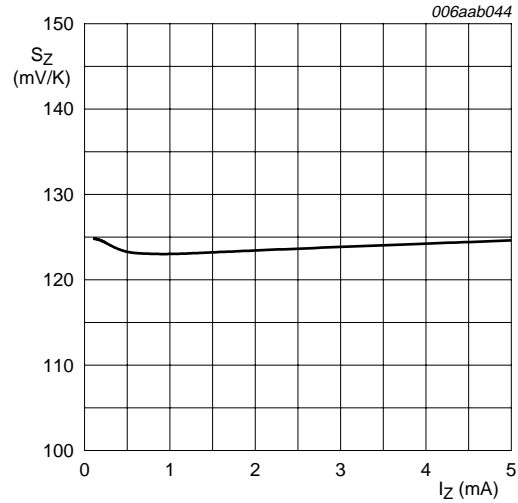
**Table 7. Characteristics**  
*T<sub>j</sub> = 25 °C unless otherwise specified.*

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



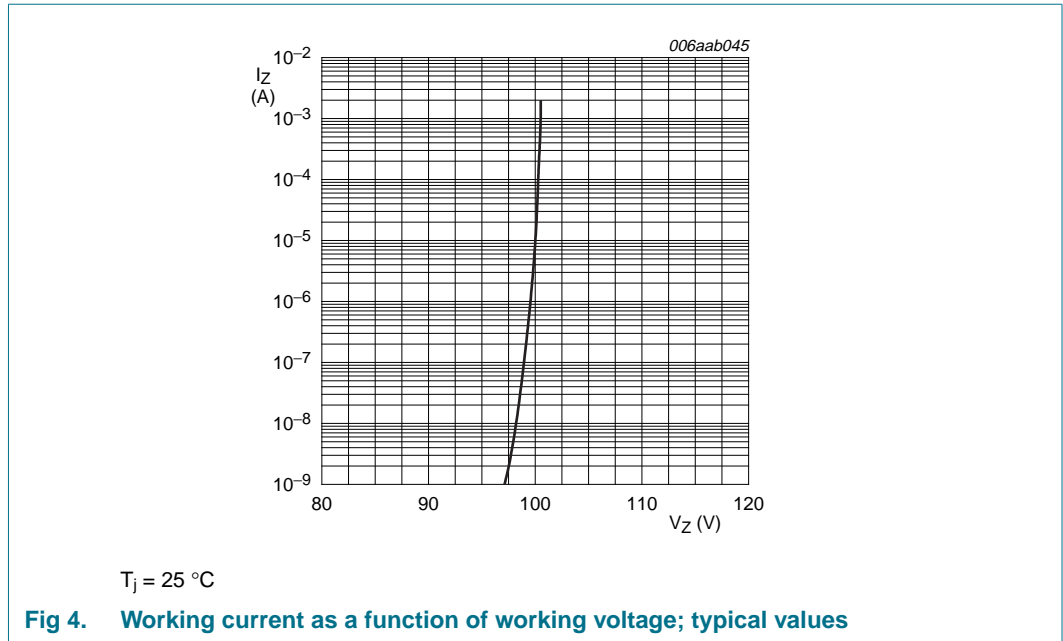
T<sub>j</sub> = 25 °C (prior to surge)

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



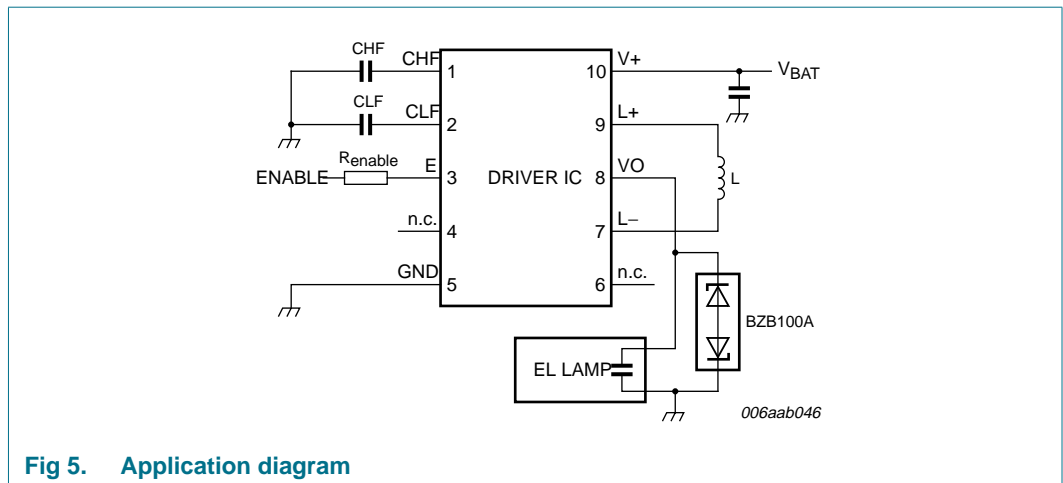
T<sub>j</sub> = 25 °C to 150 °C

**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

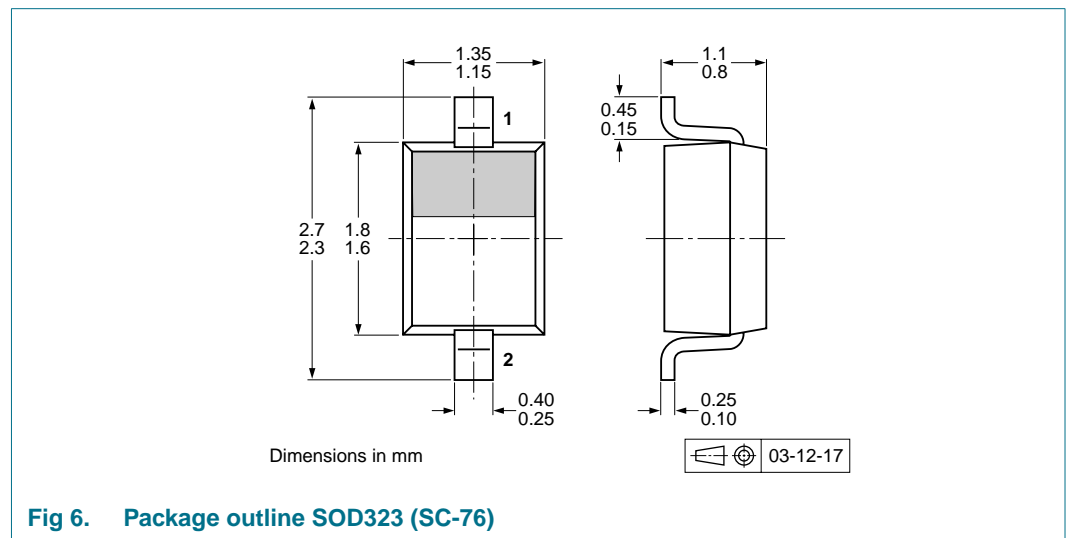


Fig 6. Package outline SOD323 (SC-76)

## 11. Packing information

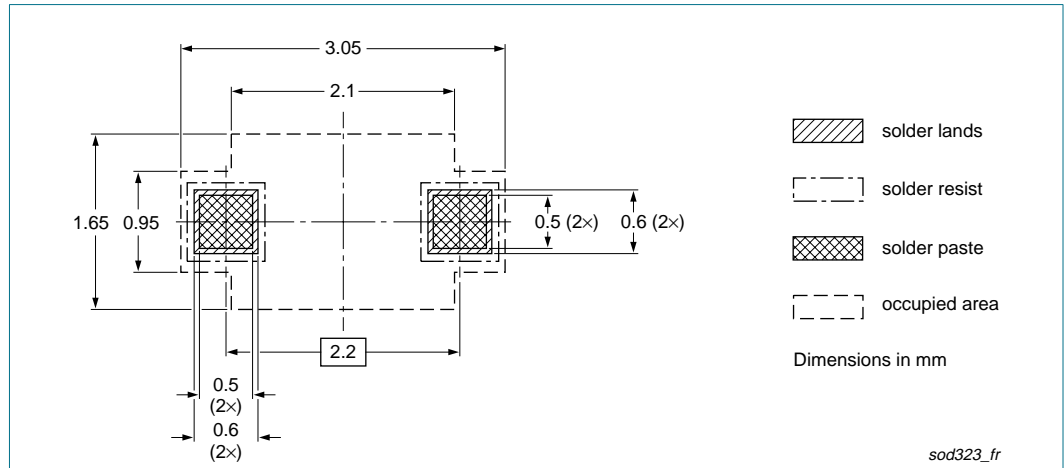
**Table 8. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

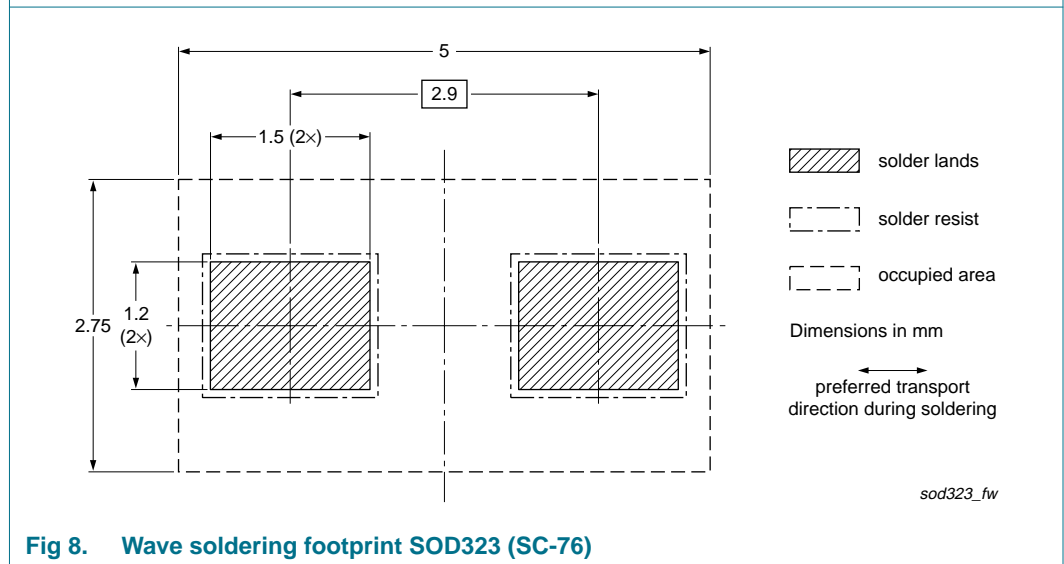
Type number	Package	Description	Packing quantity	
			3000	10000
BZB100A	SOD323	4 mm pitch, 8 mm tape and reel	-115	-135

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

**12. Soldering**



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



**Fig 8. Wave soldering footprint SOD323 (SC-76)**

## 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"><li>• <a href="#">Section 1.1 “General description”</a>: adapted</li><li>• <a href="#">Section 1.2 “Features”</a>: adapted</li><li>• <a href="#">Table 2 “Pinning”</a>: graphic symbol amended</li><li>• <a href="#">Table 6 “Thermal characteristics”</a>: updated</li><li>• <a href="#">Section 8 “Application information”</a>: adapted</li><li>• <a href="#">Section 12 “Soldering”</a>: updated</li><li>• <a href="#">Section 14 “Legal information”</a>: updated</li></ul>		
BZB100A_1	20080128	Product data sheet	-	-



## 14. Legal information

### 14.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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".

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