

# BB208-02; BB208-03

Low voltage variable capacitance diode

Rev. 01 — 7 April 2004

Product data sheet

## 1. Product profile

### 1.1 General description

The BB208-02 is a planar technology variable capacitance diode in a SOD523 (SC-79) ultra small SMD plastic package.

The BB208-03 is a planar technology variable capacitance diode in a SOD323 (SC-76) very small SMD plastic package.

### 1.2 Features

- Very small SMD plastic packages
- Very low series resistance
- Excellent CV linearity
- $C_{d(1V)}$ : 21.5 pF;  $C_{d(7.5V)}$ : 4.9 pF
- High ratio.

### 1.3 Applications

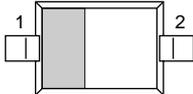
- Voltage Controlled Oscillators (VCO)
- Voltage Controlled Crystal Oscillators/Temperature Controlled Crystal Oscillators (VCXO/TCXO).

## 2. Pinning information

Table 1: Discrete pinning: SOD523

Pin	Description	Simplified outline	Symbol
1	cathode	 <p>Top view</p>	 <p>sym008</p>
2	anode		

Table 2: Discrete pinning: SOD323

Pin	Description	Simplified outline	Symbol
1	cathode	 <p>Top view</p>	 <p>sym008</p>
2	anode		

# PHILIPS

### 3. Ordering information

Table 3: Ordering information

Type number	Package		Version
	Name	Description	
BB208-02	-	plastic surface mounted package; 2 leads	SOD523
BB208-03	-	plastic surface mounted package; 2 leads	SOD323

### 4. Marking

Table 4: Marking

Type number	Marking code
BB208-02	A1
BB208-03	A2

### 5. Limiting values

Table 5: Limiting values

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

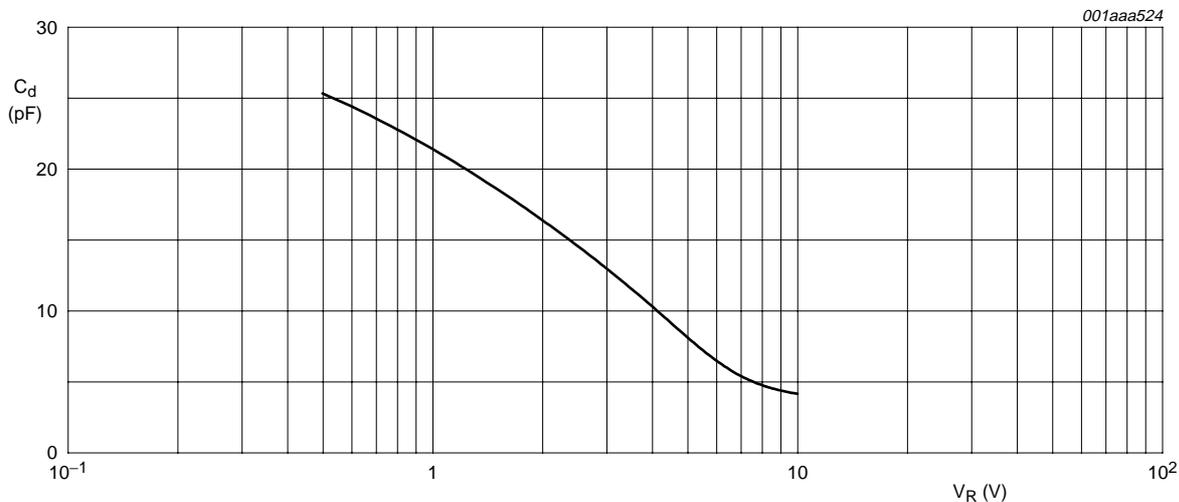
Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	continuous reverse voltage		-	10	V
$I_F$	continuous forward current		-	20	mA
$T_{stg}$	storage temperature		-55	+150	°C
$T_j$	operating junction temperature		-55	+125	°C

### 6. Characteristics

Table 6: Electrical characteristics

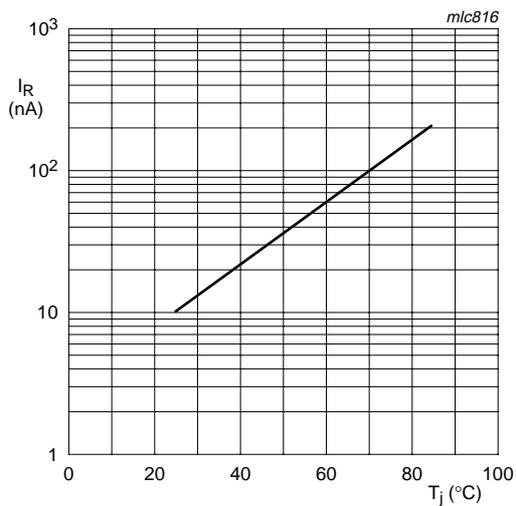
$T_j = 25\text{ °C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_R$	reverse current	$V_R = 10\text{ V}$ ; see <a href="#">Figure 2</a>	-	-	10	nA
		$V_R = 10\text{ V}$ ; $T_j = 85\text{ °C}$ ; see <a href="#">Figure 2</a>	-	-	200	nA
$r_s$	diode series resistance	$f = 100\text{ MHz}$ ; $V_R = 3\text{ V}$	-	0.35	0.5	$\Omega$
$C_d$	diode capacitance	$f = 1\text{ MHz}$ ; see <a href="#">Figure 1</a> and <a href="#">Figure 3</a>				
		$V_R = 1\text{ V}$	19.9	-	23.2	pF
		$V_R = 4\text{ V}$	-	10.1	-	pF
		$V_R = 7.5\text{ V}$	4.5	-	5.4	pF
$\frac{C_{d(1V)}}{C_{d(4V)}}$	capacitance ratio	$f = 1\text{ MHz}$	2.0	-	-	
$\frac{C_{d(1V)}}{C_{d(7.5V)}}$	capacitance ratio	$f = 1\text{ MHz}$	3.7	-	5.2	

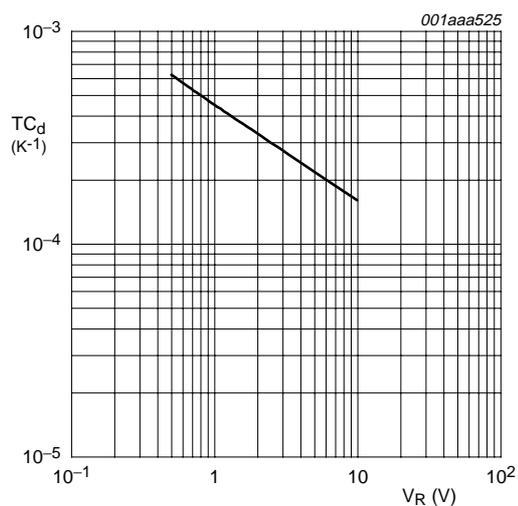


$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

**Fig 1. Diode capacitance as a function of reverse voltage; typical values.**



**Fig 2. Reverse current as a function of junction temperature; typical values.**



**Fig 3. Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.**

**7. Package outline**

Plastic surface mounted package; 2 leads

SOD523

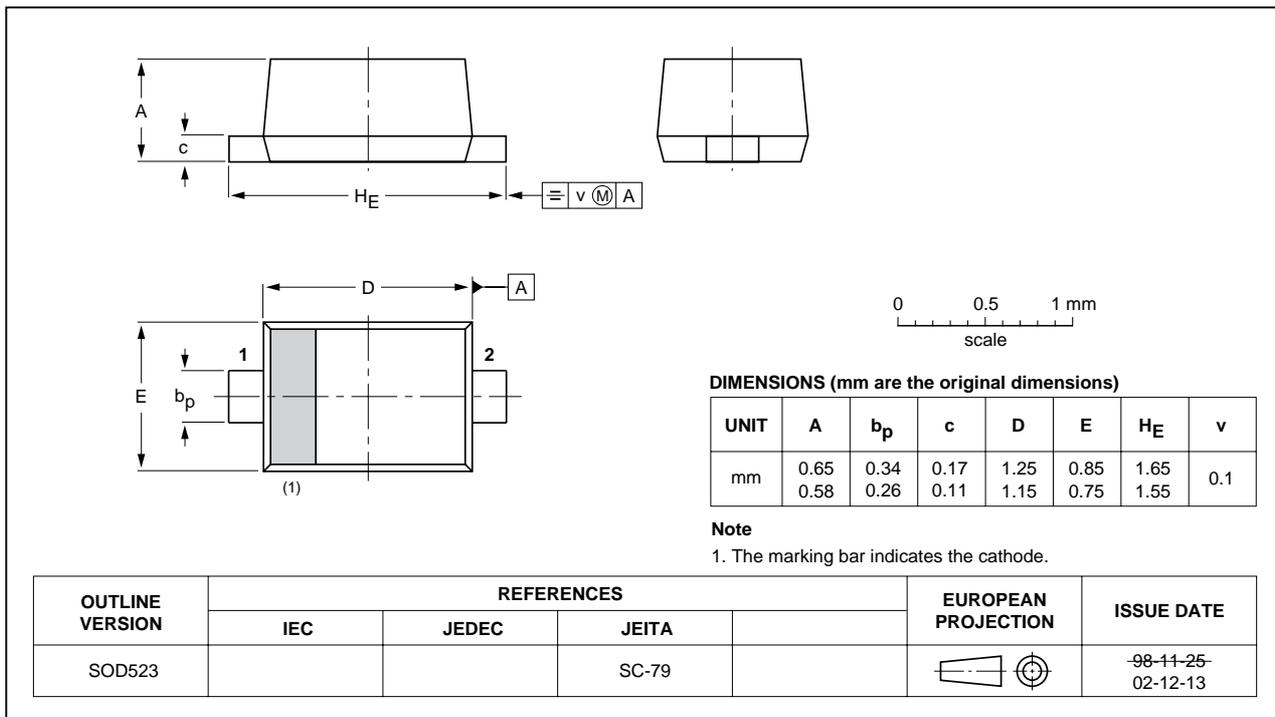


Fig 4. Package outline (BB208-02).

Plastic surface mounted package; 2 leads

SOD323

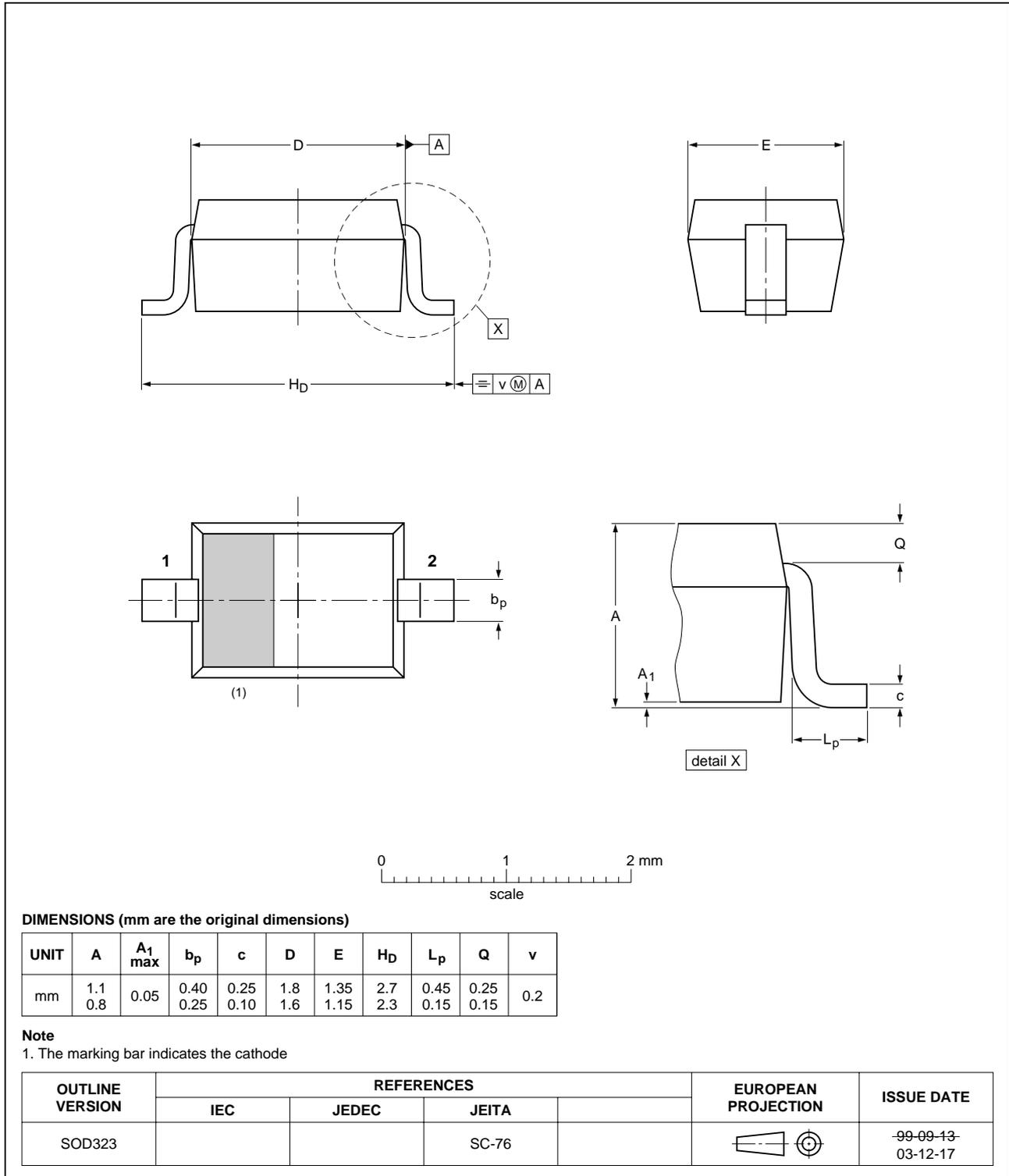


Fig 5. Package outline (BB208-03).

## 8. Revision history

**Table 7: Revision history**

Document ID	Release date	Data sheet status	Change notice	Order number	Supersedes
BB208-02_BB208-03_1	20040407	Product data	-	9397 750 12696	-

## 9. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2]</sup> <sup>[3]</sup>	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

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

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

## 10. Definitions

**Short-form specification** — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

**Application information** — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

## 11. Disclaimers

**Life support** — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

**Right to make changes** — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status 'Production'), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

## 12. Contact information

For additional information, please visit: <http://www.semiconductors.philips.com>

For sales office addresses, send an email to: [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com)

## 13. Contents

<b>1</b>	<b>Product profile</b> .....	<b>1</b>
1.1	General description .....	1
1.2	Features .....	1
1.3	Applications .....	1
<b>2</b>	<b>Pinning information</b> .....	<b>1</b>
<b>3</b>	<b>Ordering information</b> .....	<b>2</b>
<b>4</b>	<b>Marking</b> .....	<b>2</b>
<b>5</b>	<b>Limiting values</b> .....	<b>2</b>
<b>6</b>	<b>Characteristics</b> .....	<b>2</b>
<b>7</b>	<b>Package outline</b> .....	<b>4</b>
<b>8</b>	<b>Revision history</b> .....	<b>6</b>
<b>9</b>	<b>Data sheet status</b> .....	<b>7</b>
<b>10</b>	<b>Definitions</b> .....	<b>7</b>
<b>11</b>	<b>Disclaimers</b> .....	<b>7</b>
<b>12</b>	<b>Contact information</b> .....	<b>7</b>



© Koninklijke Philips Electronics N.V. 2004

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: 7 April 2004  
Document order number: 9397 750 12696

Published in The Netherlands