

# BB148

## VHF variable capacitance diode

Rev. 05 — 4 October 2004

Product data sheet

## 1. Product profile

### 1.1 General description

The BB148 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 (SC-76) very small SMD plastic package.

The excellent matching performance is achieved by gliding matching and a Direct Matching Assembly (DMA) procedure. The diodes are delivered on tape in several matched groups and are also available unmatched upon request. The unmatched type, BB158 has the same specification.

### 1.2 Features

- Excellent linearity
- Excellent matching to 1 % DMA
- Very small SMD plastic package
- $C_{d(28V)}$ : 2.6 pF;  $C_{d(1V)}$  to  $C_{d(28V)}$  ratio: 15
- Low series resistance.

### 1.3 Applications

- Electronic tuning in VHF television tuners, band B up to 460 MHz
- Voltage Controlled Oscillators (VCO).

## 2. Pinning information

Table 1: Pinning

Pin	Description	Simplified outline <a href="#">[1]</a>	Symbol
1	cathode		
2	anode		

sym008

[1] The marking bar indicates the cathode.

### 3. Ordering information

Table 2: Ordering information

Type number	Package		
	Name	Description	Version
BB148	SC-76	plastic surface mounted package; 2 leads	SOD323

### 4. Marking

Table 3: Marking

Type number	Marking code
BB148	P8

### 5. Limiting values

Table 4: Limiting values

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

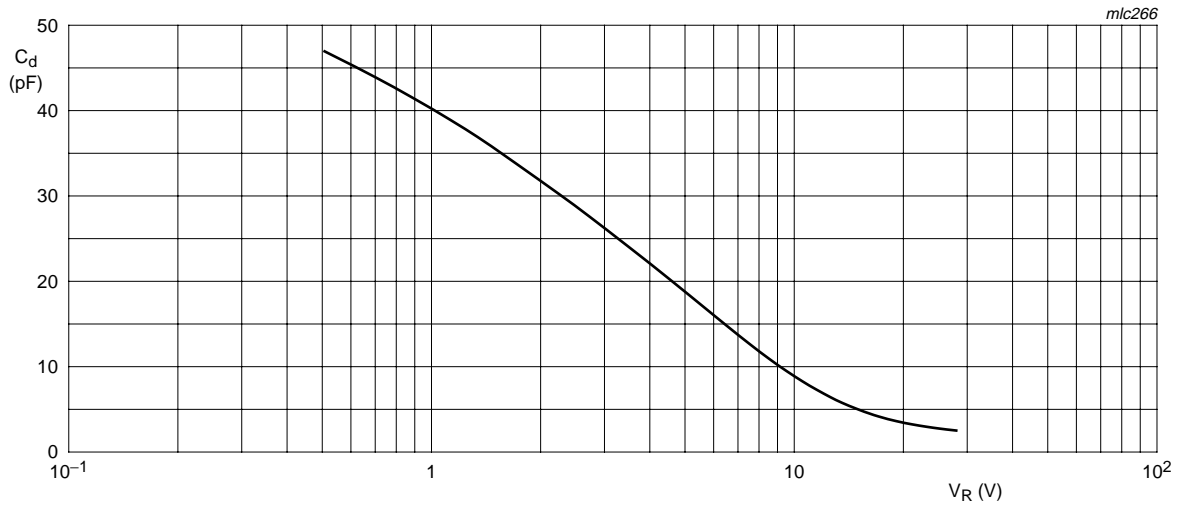
Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	reverse voltage		-	30	V
$I_F$	forward current		-	20	mA
$T_{stg}$	storage temperature		-55	+150	°C
$T_j$	junction temperature		-55	+125	°C

### 6. Characteristics

Table 5: Characteristics

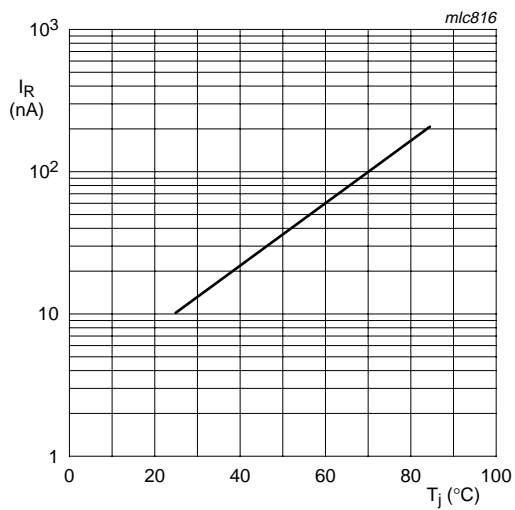
$T_j = 25^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_R$	reverse current	see <a href="#">Figure 2</a>				
		$V_R = 30\text{ V}$	-	-	10	nA
		$V_R = 30\text{ V}; T_j = 85^\circ\text{C}$	-	-	200	nA
$r_s$	diode series resistance	$f = 100\text{ MHz}; C_d = 12\text{ pF}$	-	-	0.9	$\Omega$
$C_d$	diode capacitance	$f = 1\text{ MHz};$ see <a href="#">Figure 1</a> and <a href="#">3</a>				
		$V_R = 1\text{ V}$	36.8	-	41.8	pF
		$V_R = 28\text{ V}$	2.4	2.6	2.75	pF
$\frac{C_{d(1V)}}{C_{d(28V)}}$	capacitance ratio	$f = 1\text{ MHz}$	14.5	15	-	
$\frac{\Delta C_d}{C_d}$	capacitance matching	$V_R = 0.5\text{ V to }28\text{ V};$ in a sequence of 10 diodes (gliding)	-	-	2	%

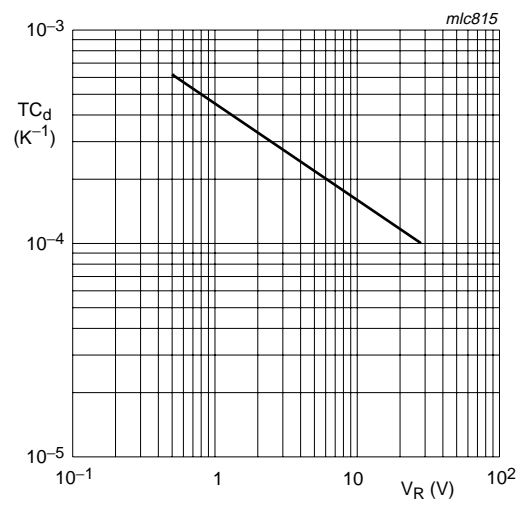


$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



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



$T_j = 0 \text{ }^\circ\text{C} \text{ to } 85 \text{ }^\circ\text{C}.$

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

7. Package outline

Plastic surface mounted package; 2 leads

SOD323

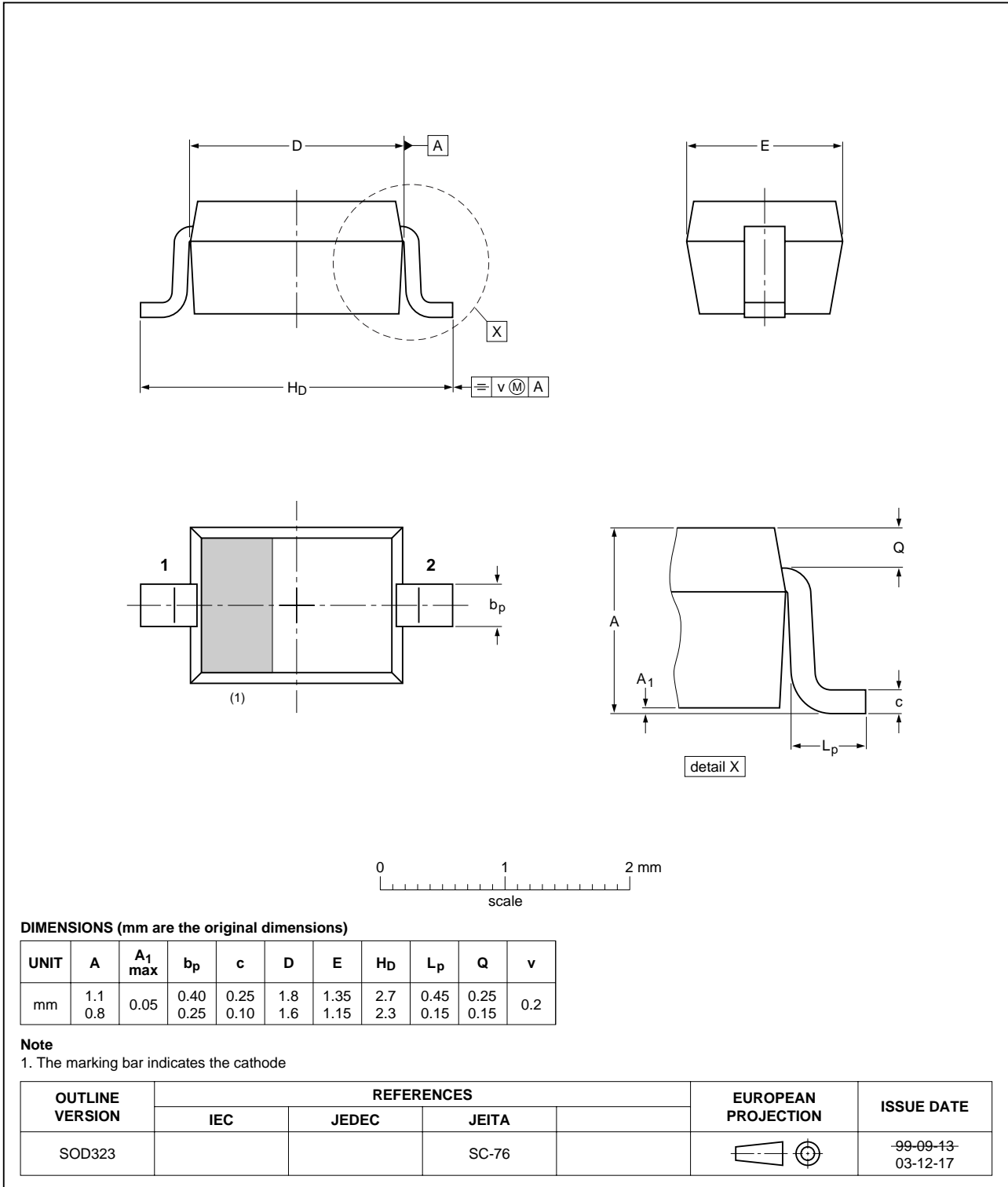


Fig 4. Package outline SOD323 (SC-76).

## 8. Revision history

**Table 6: Revision history**

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
BB148_5	20041004	Product data sheet	-	9397 750 13824	BB148_4
Modifications:	<ul style="list-style-type: none"> <li>The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors</li> <li><a href="#">Table 5 “Characteristics”</a>: <math>\Delta C_d/C_d</math> conditions changed from sequence of 20 diodes to sequence of 10 diodes</li> <li><a href="#">Table 5 “Characteristics”</a>: <math>\Delta C_d/C_d</math> in a sequence of 4 diodes removed</li> <li><a href="#">Table 5 “Characteristics”</a>: added typical value of 2.6 pF for <math>C_{d(28V)}</math></li> <li><a href="#">Table 5 “Characteristics”</a>: added typical value of 15 for <math>C_{d(1V)}</math> to <math>C_{d(28V)}</math> ratio.</li> </ul>				
BB148_4	20040301	Product specification	-	9397 750 12644	BB148_3
BB148_3	19980915	Product specification	-	9397 750 04377	BB148_2
BB148_2	19960503	n.a.	-	n.a.	BB148_1
BB148_1	19941209	n.a.	-	n.a.	-

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

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**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.

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