

BB199

Variable capacitance diode for VCO and VCXO

Rev. 1 — 1 December 2010

Product data sheet

1. Product profile

1.1 General description

The BB199 is a low voltage variable capacitance diode for the Voltage Controlled Oscillator (VCO) and Voltage Controlled Crystal Oscillator (VCXO) applications.

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

1.2 Features and benefits

- Small plastic SMD package
- Very low operating voltage (1 V to 4 V)
- Large capacitance ratio ($C_{d(0V5)}/C_{d(2V)} = 2.8$ minimum)
- Good capacitor-voltage (C-V) linearity
- Very low series resistance allowing high Q performance.

1.3 Applications

- Communication equipment
- Voltage Controlled Oscillators

2. Pinning information

Table 1. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode	[1]	
2	anode		 sym008

[1] The marking bar indicates the cathode.

3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BB199	SC-79	plastic surface-mounted package; 2 leads	SOD523

4. Marking

Table 3. Marking codes

Type number	Marking code
BB199	K9

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		-	20	V
I_F	forward current		-	100	mA
P_{tot}	total power dissipation	$T_{sp} = 90\text{ °C}$	-	300	mW
T_{stg}	storage temperature		-65	+150	°C
T_j	junction temperature		-65	+150	°C

6. Thermal characteristics

Table 5. Thermal characteristics

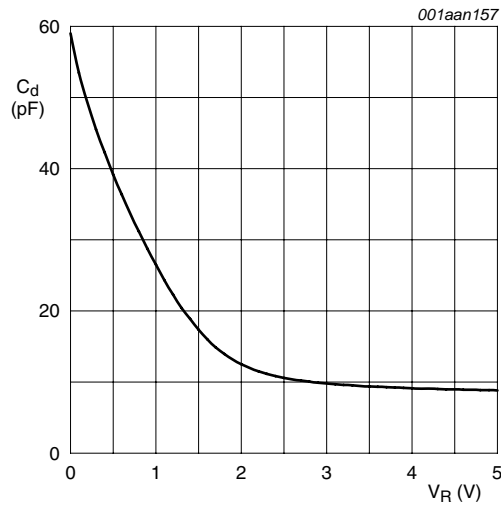
Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point		200	K/W

7. Characteristics

Table 6. Characteristics

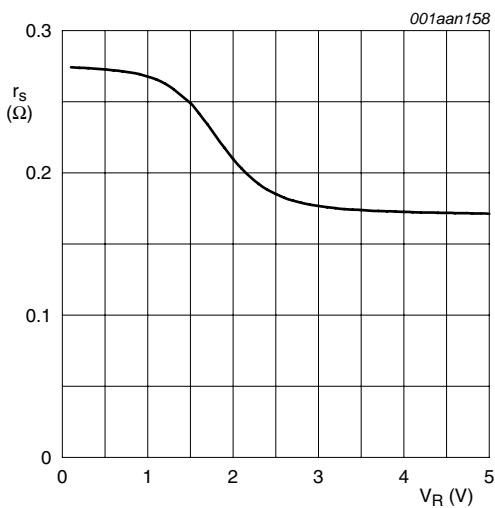
$T_j = 25\text{ °C}$ unless otherwise specified

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_R	reverse current	$V_R = 20\text{ V}$	-	-	1000	nA
		$V_R = 16\text{ V}$	-	-	5	nA
C_d	diode capacitance	$f = 1\text{ MHz}$				
		$V_R = 0.5\text{ V}$	36.5	-	42.5	pF
		$V_R = 2\text{ V}$	11.8	-	13.8	pF
r_s	diode series resistance	$V_R = 1.5\text{ V}; f = 100\text{ MHz}$	-	0.25	0.5	Ω
$C_{d(0V5)}/C_{d(2V)}$	diode capacitance ratio (0.5 V to 2 V)	$f = 1\text{ MHz}$	2.8	-	-	



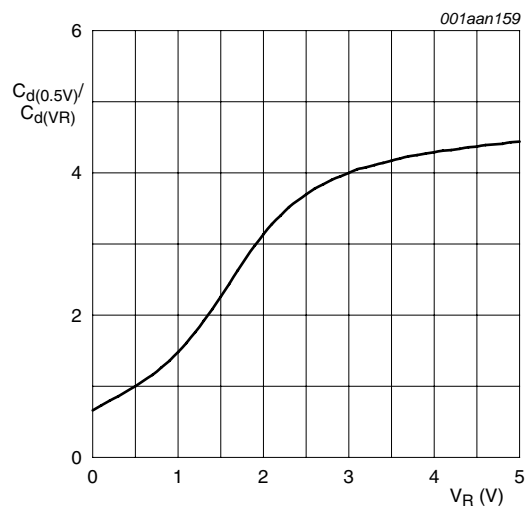
$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



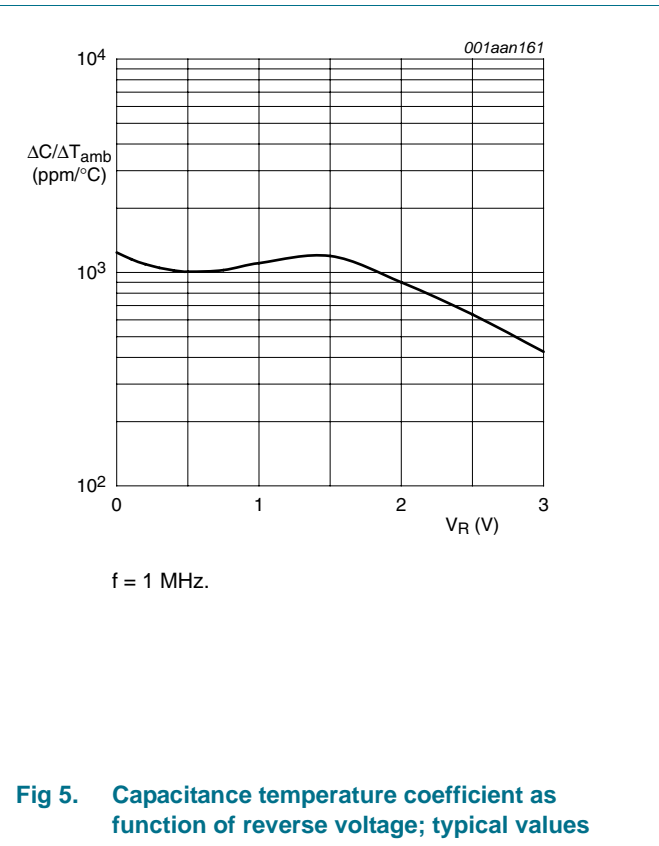
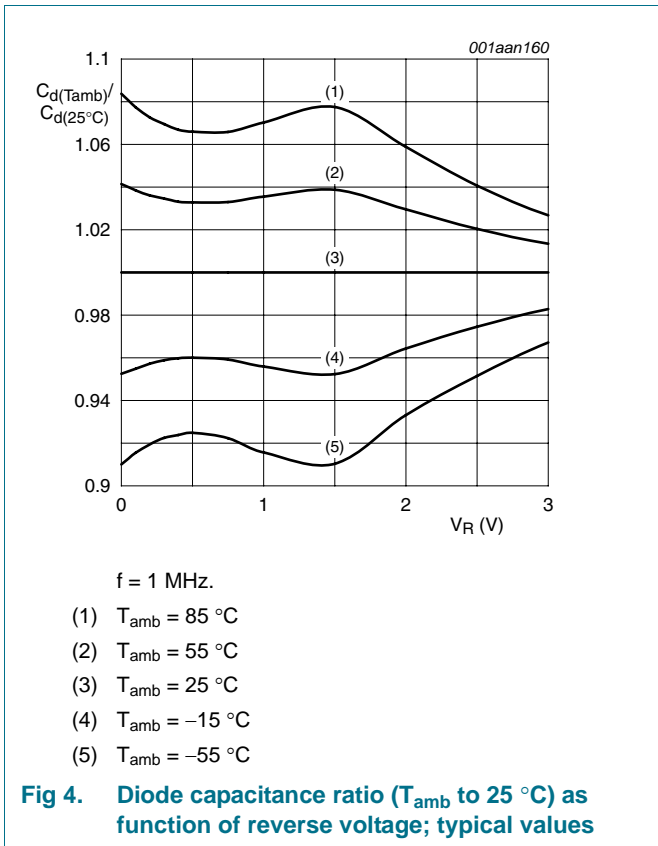
$f = 100 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

Fig 2. Diode reverse resistance as function of reverse voltage; typical values



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

Fig 3. Diode capacitance ratio (0.5 V to V_R) as function of reverse voltage; typical values



8. Package outline

Plastic surface-mounted package; 2 leads

SOD523

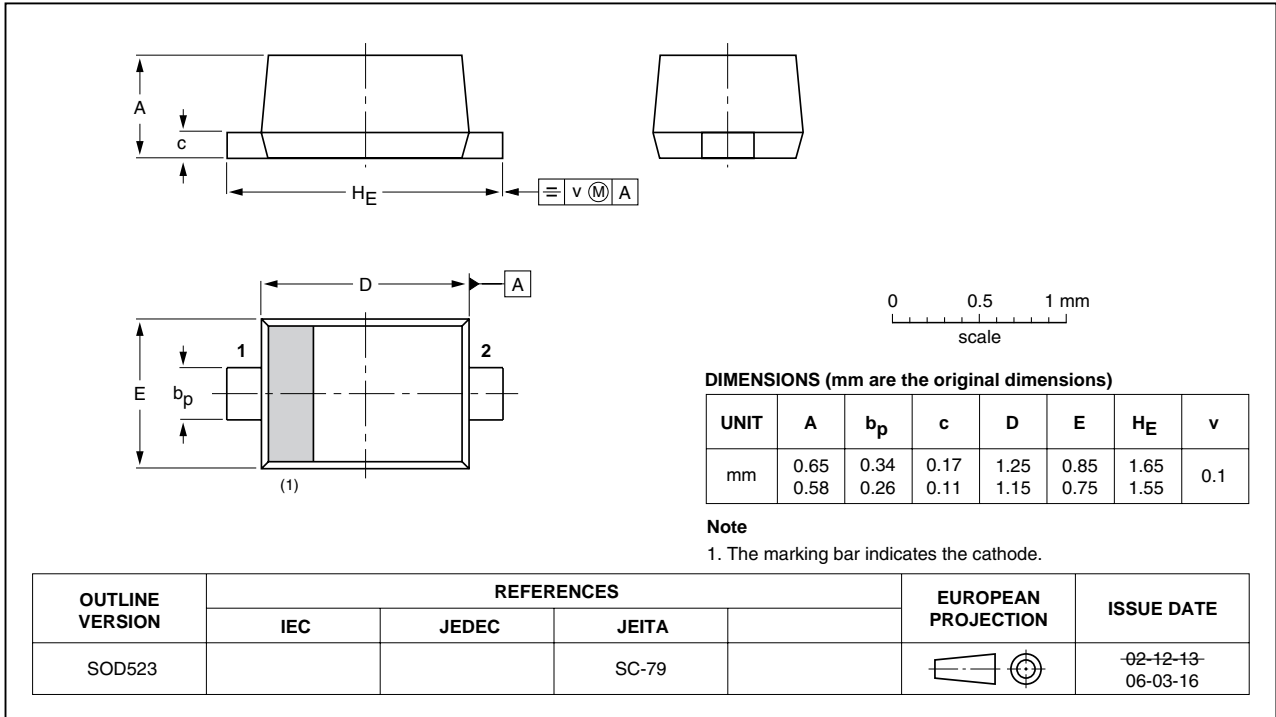


Fig 6. Package outline SOD523 (SC-79)

9. Abbreviations

Table 7. Abbreviations

Acronym	Description
Q	Quality factor
SMD	Surface Mounted Device

10. Revision history

Table 8. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BB199 v.1	20101201	Product data sheet	-	-

11. Legal information

11.1 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".

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Date of release: 1 December 2010

Document identifier: BB199

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