



# BB172

## VHF variable capacitance diode

Rev. 2 — 3 December 2013

Product data sheet

## 1. Product profile

### 1.1 General description

The BB172 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 (SC-76) very small SMD plastic package.

### 1.2 Features and benefits

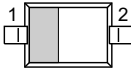
- Excellent linearity
- Very small SMD plastic package
- $C_{d(28V)} = 2.6 \text{ pF}$ ;  $C_{d(1V)}$  to  $C_{d(28V)}$  ratio = 15
- Low series resistance

### 1.3 Applications

- Voltage Controlled Oscillators (VCO)

## 2. Pinning information

Table 1. Pinning

| Pin | Description | Simplified outline                                                                    | Symbol                                                                                                 |
|-----|-------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1   | cathode     |  | <br><i>sym008</i> |
| 2   | anode       |                                                                                       |                                                                                                        |

[1] The marking bar indicates the cathode.

## 3. Ordering information

### 3.1 Package information

Table 2. Package information

| Type number | Package |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | Name    | Description                              | Version |
| BB172       | SC-76   | plastic surface-mounted package; 2 leads | SOD323  |



### 3.2 Ordering information

Table 3. Ordering options

| Type number | Orderable part number | Package | Packing method | Minimum order quantity |
|-------------|-----------------------|---------|----------------|------------------------|
| BB172       | BB172X                | SC-76   | tape and reel  | 3000                   |

## 4. Marking

Table 4. Marking

| Type number | Marking code |
|-------------|--------------|
| BB172       | 4K           |

## 5. Limiting values

Table 5. Limiting values

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

| Symbol    | Parameter            | Conditions                                         | Min | Max  | Unit |
|-----------|----------------------|----------------------------------------------------|-----|------|------|
| $V_R$     | reverse voltage      |                                                    | -   | 32   | V    |
|           |                      | peak value in series with a 10 k $\Omega$ resistor | -   | 35   | V    |
| $I_F$     | forward current      |                                                    | -   | 20   | mA   |
| $T_{stg}$ | storage temperature  |                                                    | -55 | +150 | °C   |
| $T_j$     | junction temperature |                                                    | -55 | +125 | °C   |

## 6. Characteristics

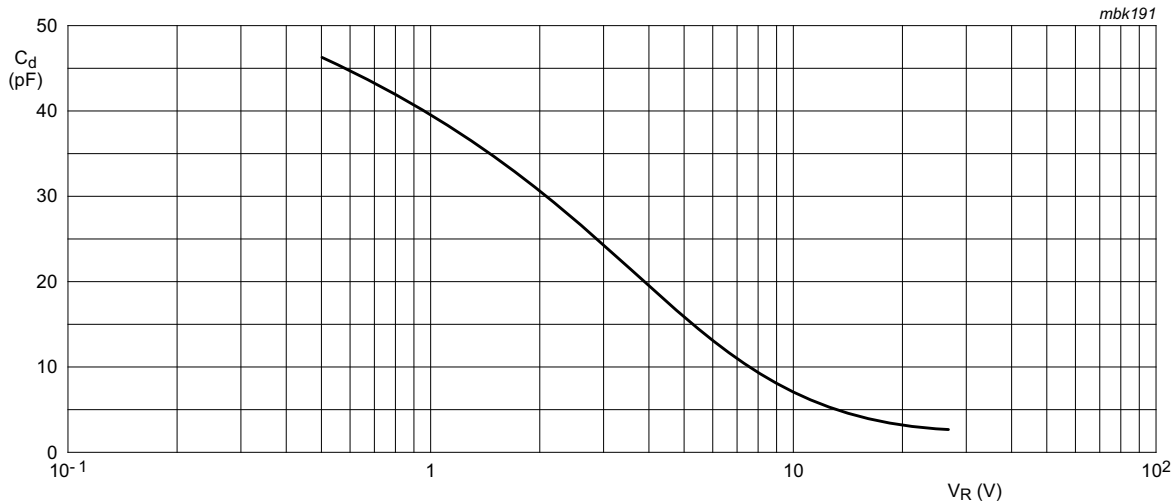
Table 6. Characteristics

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

| Symbol                  | Parameter                              | Conditions                               | Min   | Typ  | Max   | Unit     |
|-------------------------|----------------------------------------|------------------------------------------|-------|------|-------|----------|
| $I_R$                   | reverse current                        | $V_R = 30\text{ V}$                      | [1] - | -    | 10    | nA       |
|                         |                                        | $V_R = 30\text{ V}; T_j = 85\text{ °C}$  | [1] - | -    | 200   | nA       |
| $r_s$                   | diode series resistance                | $f = 100\text{ MHz}; C_d = 30\text{ pF}$ | -     | 0.65 | 0.8   | $\Omega$ |
| $C_d$                   | diode capacitance                      | $f = 1\text{ MHz}$                       | [2]   |      |       |          |
|                         |                                        | $V_R = 1\text{ V}$                       | 34.65 | -    | 42.35 | pF       |
|                         |                                        | $V_R = 28\text{ V}$                      | 2.361 | 2.6  | 2.754 | pF       |
| $C_{d(1V)}/C_{d(2V)}$   | diode capacitance ratio (1 V to 2 V)   | $f = 1\text{ MHz}$                       | -     | 1.3  | -     |          |
| $C_{d(1V)}/C_{d(28V)}$  | diode capacitance ratio (1 V to 28 V)  | $f = 1\text{ MHz}$                       | 13.5  | 15   | -     |          |
| $C_{d(25V)}/C_{d(28V)}$ | diode capacitance ratio (25 V to 28 V) | $f = 1\text{ MHz}$                       | -     | 1.08 | -     |          |

[1] See [Figure 2](#).

[2] See [Figure 1](#) and [Figure 3](#).



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

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

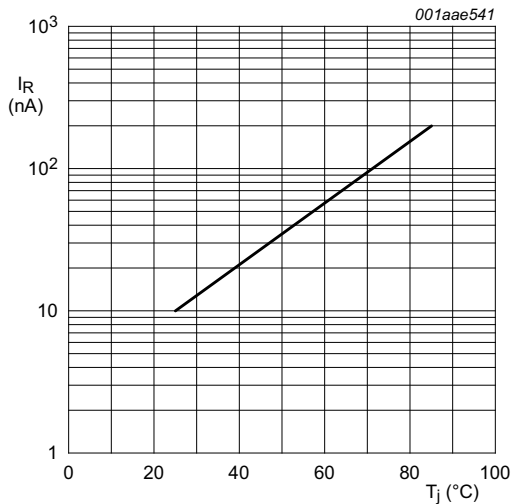
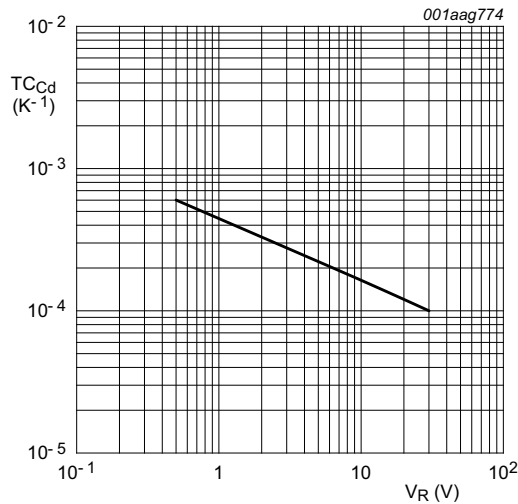


Fig 2. Reverse current as a function of junction temperature; maximum values.



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

Fig 3. Diode capacitance temperature coefficient as a function of reverse voltage; typical values.

7. Package outline

Plastic surface-mounted package; 2 leads

SOD323

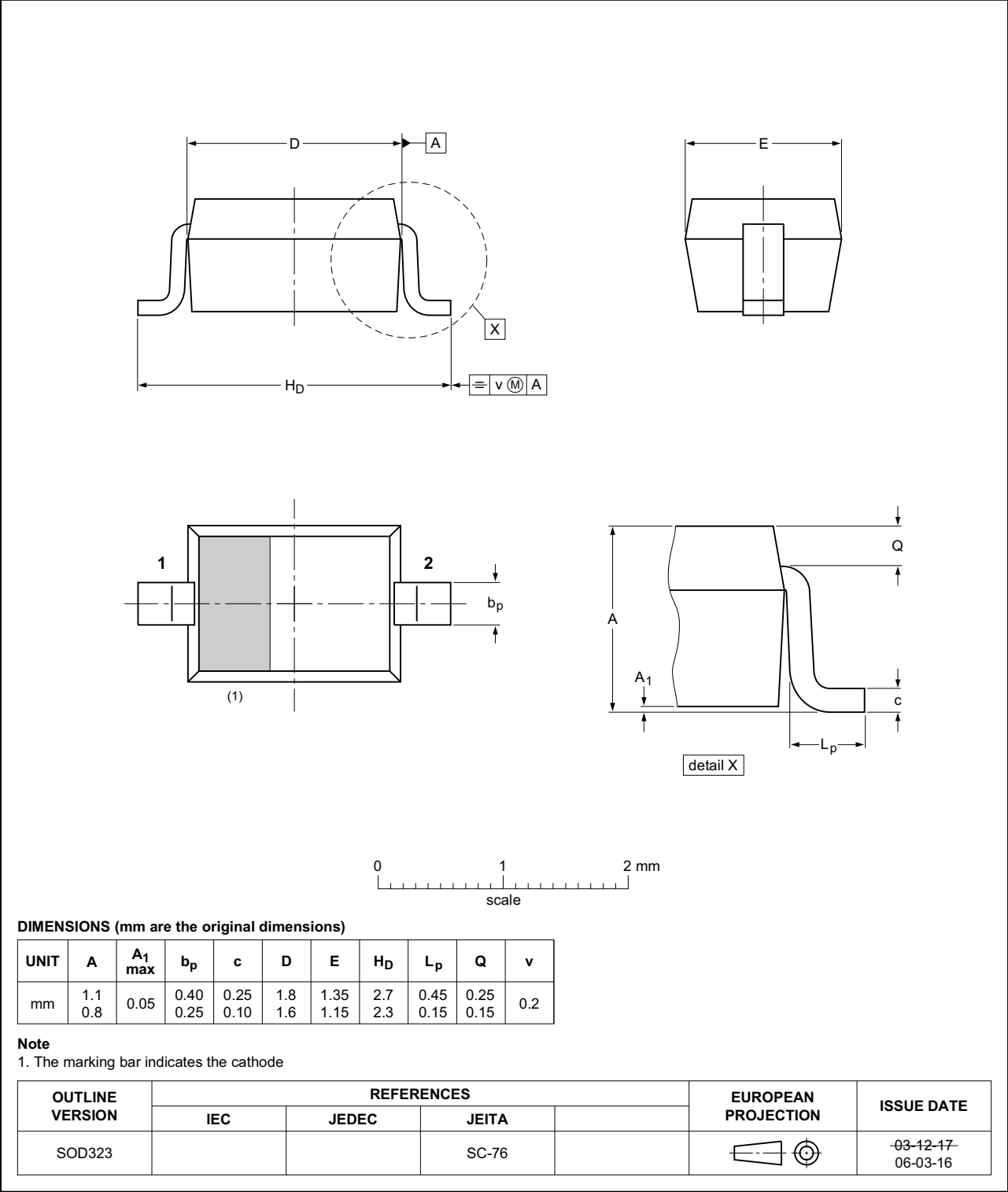


Fig 4. Package outline SOD323 (SC-76)

## 8. Abbreviations

Table 7. Abbreviations

| Acronym | Description            |
|---------|------------------------|
| SMD     | Surface Mounted Device |
| VHF     | Very High Frequency    |

## 9. Revision history

Table 8. Revision history

| Document ID   | Release date                                                                                                                          | Data sheet status  | Change notice | Supersedes |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|------------|
| BB172 v.2     | 20131203                                                                                                                              | Product data sheet | -             | BB172 v.1  |
| Modifications | <ul style="list-style-type: none"><li>• <a href="#">Section 3 on page 1</a>: additional ordering information has been added</li></ul> |                    |               |            |
| BB172 v.1     | 20130325                                                                                                                              | Product data sheet | -             | -          |

## 10. Legal information

### 10.1 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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