



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 | [1] | <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 | | Version |
|-------------|---------|--|---------|
| | Name | Description | |
| 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 Ω resistor | - | 35 | V |
| I_F | forward current | | - | 20 | mA |
| T_{stg} | storage temperature | | -55 | +150 | $^{\circ}\text{C}$ |
| T_j | junction temperature | | -55 | +125 | $^{\circ}\text{C}$ |

6. Characteristics

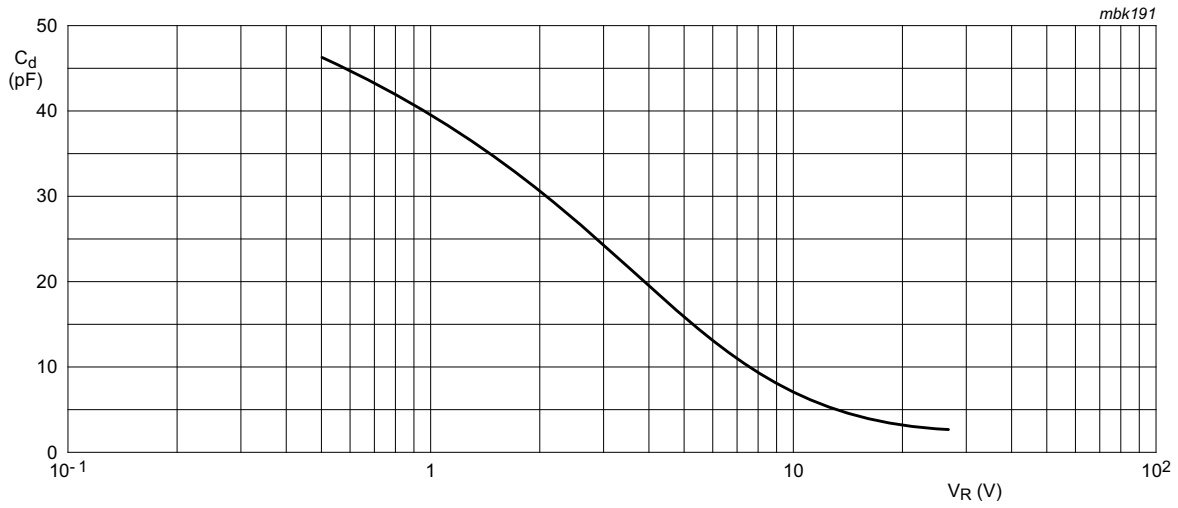
Table 6. Characteristics

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit | |
|-------------------------|--|---|------|-------|-----|----------|----|
| I_R | reverse current | $V_R = 30\text{ V}$ | [1] | - | - | 10 | nA |
| | | $V_R = 30\text{ V}; T_j = 85\text{ }^{\circ}\text{C}$ | [1] | - | - | 200 | nA |
| r_s | diode series resistance | $f = 100\text{ MHz}; C_d = 30\text{ pF}$ | - | 0.65 | 0.8 | Ω | |
| 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](#).



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

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

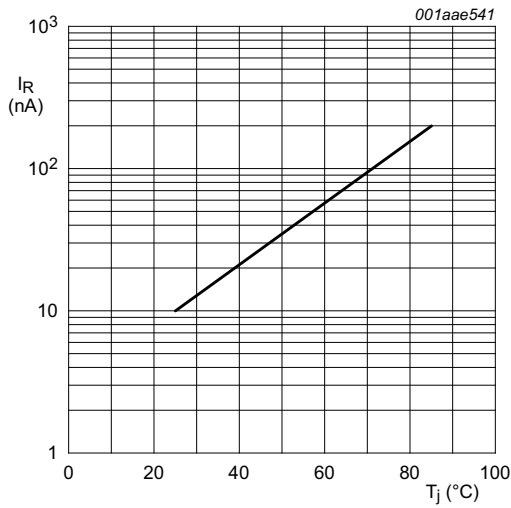
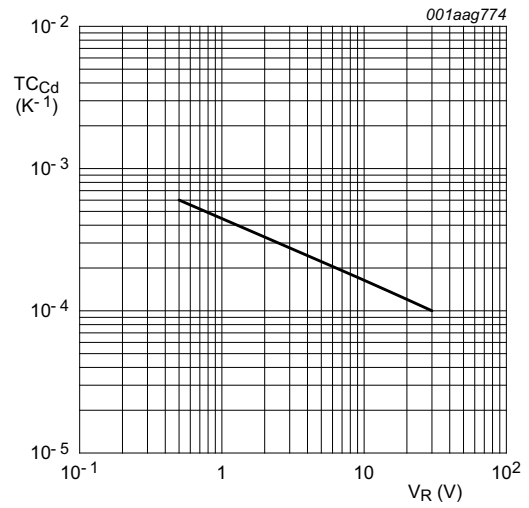


Fig 2. Reverse current as a function of junction temperature; maximum values.



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

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

7. Package outline

Plastic surface-mounted package; 2 leads

SOD323

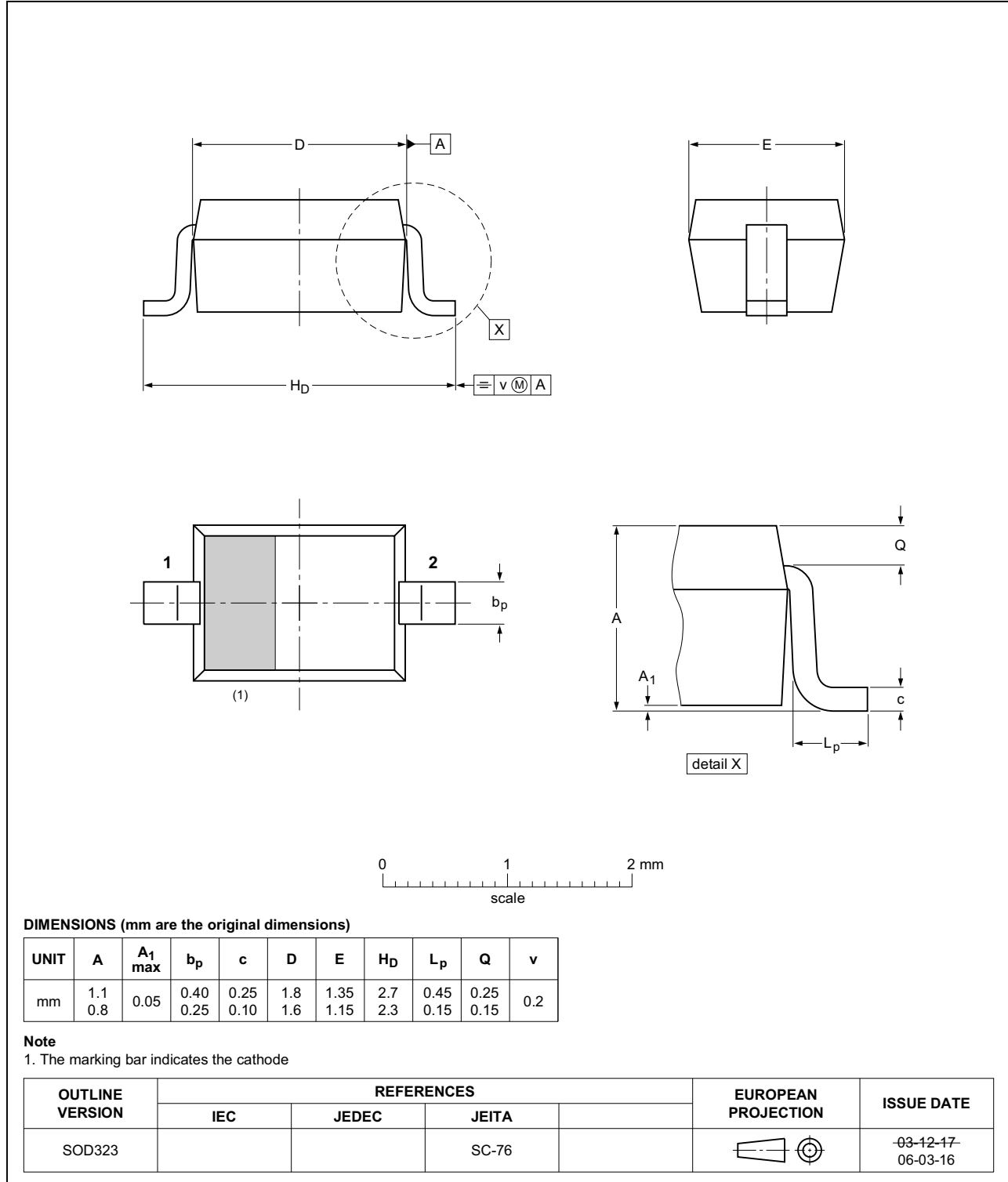


Fig 4. Package outline SOD323 (SC-76)

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 | • Section 3 on page 1 : additional ordering information has been added | | | |
| BB172 v.1 | 20130325 | Product data sheet | - | - |

10. Legal information

10.1 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. |

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[2] The term 'short data sheet' is explained in section "Definitions".

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