



# BB175

## VHF variable capacitance diode

Rev. 1 — 25 March 2013

Product data sheet

## 1. Product profile

### 1.1 General description

The BB175 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD523 (SC-79) ultra small SMD plastic package.

### 1.2 Features and benefits

- High linearity
- Ultra small SMD plastic package
- $C_{d(28V)} = 2.7 \text{ pF}$ ;  $C_{d(1V)}$  to  $C_{d(28V)}$  ratio = 22
- Low series resistance

### 1.3 Applications

- Voltage Controlled Oscillators (VCO)

## 2. Pinning information

Table 1. Pinning

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

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 2. Ordering information

| Type number | Package |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | Name    | Description                              | Version |
| BB175       | SC-79   | plastic surface-mounted package; 2 leads | SOD523  |



## 4. Marking

**Table 3. Marking**

| Type number | Marking code |
|-------------|--------------|
| BB175       | CH           |

## 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      |                                                    | -   | 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

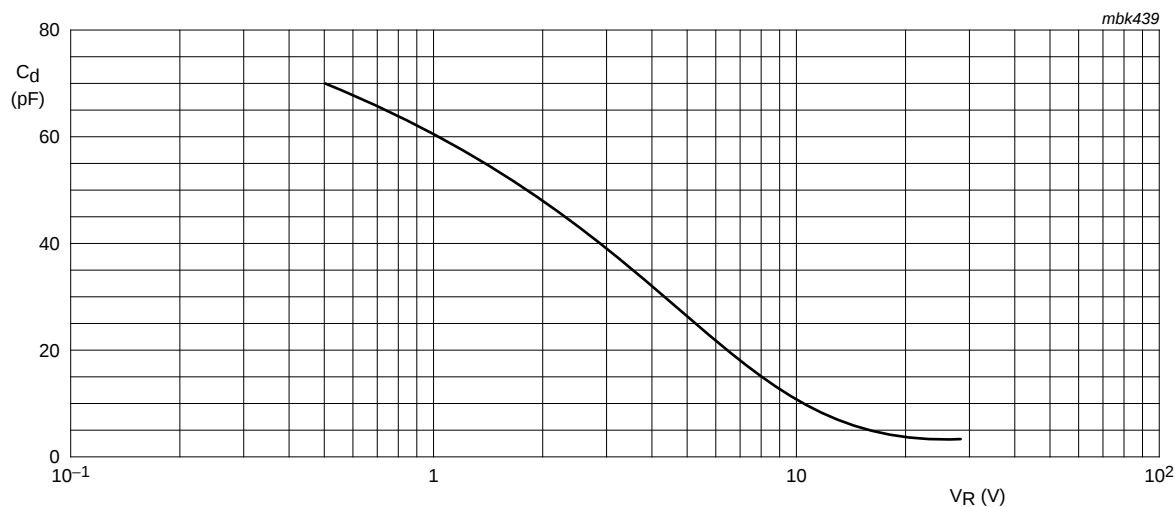
**Table 5. Characteristics**

*$T_j = 25\text{ °C}$  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                | $f = 100\text{ MHz}; C_d = 30\text{ pF}$ | -     | 1.0  | 1.2  | $\Omega$ |
| $C_d$                   | diode capacitance                      | $f = 1\text{ MHz}$                       | [2]   |      |      |          |
|                         |                                        | $V_R = 1\text{ V}$                       | 52    | -    | 62   | pF       |
|                         |                                        | $V_R = 28\text{ V}$                      | 2.48  | 2.7  | 2.89 | pF       |
| $C_{d(1V)}/C_{d(2V)}$   | diode capacitance ratio (1 V to 2 V)   | $f = 1\text{ MHz}$                       | -     | 1.31 | -    |          |
| $C_{d(1V)}/C_{d(28V)}$  | diode capacitance ratio (1 V to 28 V)  | $f = 1\text{ MHz}$                       | 20.6  | 22   | -    |          |
| $C_{d(25V)}/C_{d(28V)}$ | diode capacitance ratio (25 V to 28 V) | $f = 1\text{ MHz}$                       | -     | 1.05 | -    |          |

[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.

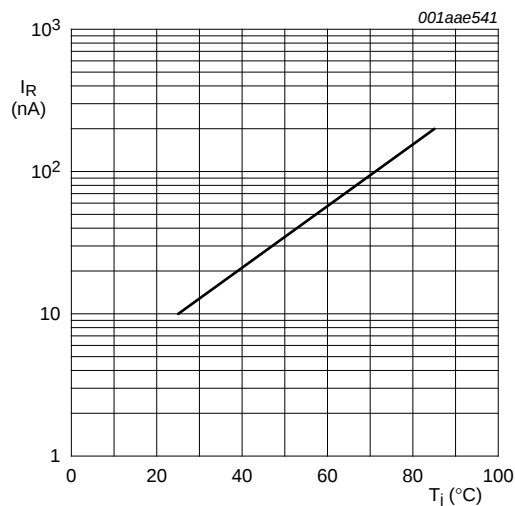
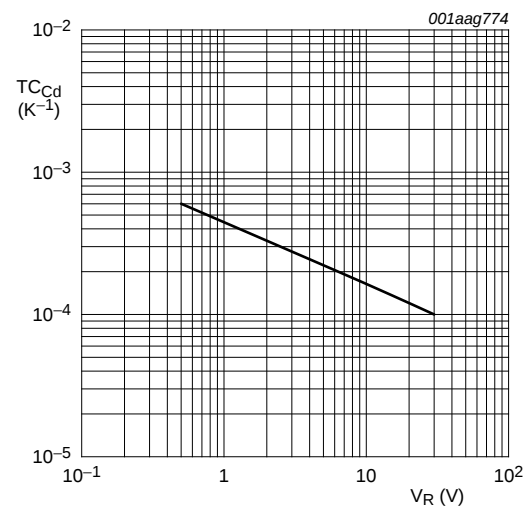


Fig 2. Reverse current as a function of junction temperature; maximum values.



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

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

7. Package outline

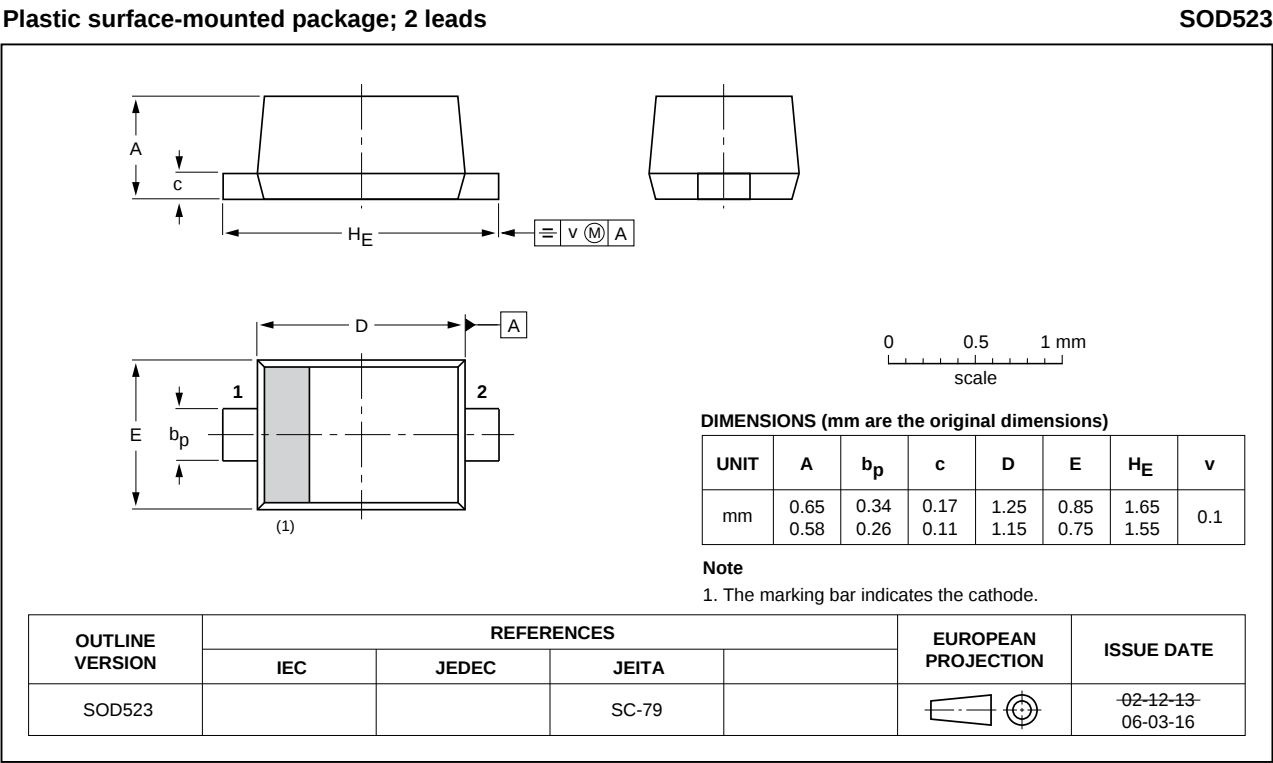


Fig 4. Package outline SOD523 (SC-79)

## 8. Abbreviations

Table 6. Abbreviations

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

## 9. Revision history

Table 7. Revision history

| Document ID | Release date | Data sheet status  | Change notice | Supersedes |
|-------------|--------------|--------------------|---------------|------------|
| BB175 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. |
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| Product [short] data sheet        | Production                    | This document contains the product specification.                                     |

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