



# BB179

## UHF variable capacitance diode

Rev. 3 — 5 September 2011

Product data sheet

## 1. Product profile

### 1.1 General description

The BB179 is a planar technology variable capacitance diode, in a SOD523 (SC-79) ultra small plastic SMD package. The excellent matching performance is achieved by gliding matching and a Direct Matching Assembly (DMA) procedure.

### 1.2 Features and benefits

- Excellent linearity
- Excellent matching to 2 % DMA
- Ultra small plastic SMD package
- $C_{d(28V)}$ : 2.1 pF;  $C_{d(1V)}$  to  $C_{d(28V)}$  ratio: 9
- Low series resistance.

### 1.3 Applications

- Electronic tuning in UHF television tuners
- Voltage Controlled Oscillators (VCO).

## 2. Pinning information

Table 1. Pinning

| Pin | Description | Simplified outline <sup>[1]</sup>                                                     | 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 |
| BB179       | SC-79   | plastic surface mounted package; 2 leads | SOD523  |



## 4. Marking

Table 3. Marking

| Type number | Marking code |
|-------------|--------------|
| BB179       | 9            |

## 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    |
| $V_{RM}$  | peak reverse voltage | 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   |

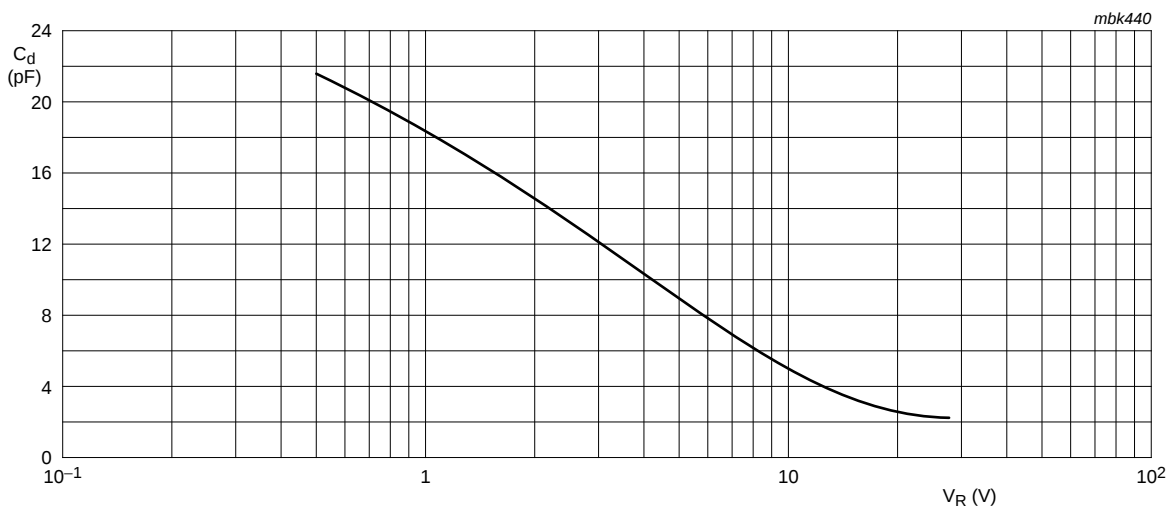
## 6. Characteristics

Table 5. Characteristics

$T_j = 25^\circ\text{C}$  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 | $f = 470\text{ MHz}$                                                      | [1]   | 0.6  | 0.75  | $\Omega$ |
| $C_d$                           | diode capacitance       | $f = 1\text{ MHz}$ ; see <a href="#">Figure 1</a> and <a href="#">3</a>   |       |      |       |          |
|                                 |                         | $V_R = 1\text{ V}$                                                        | 18.22 | -    | 21.26 | pF       |
|                                 |                         | $V_R = 28\text{ V}$                                                       | 1.951 | 2.1  | 2.225 | pF       |
| $\frac{C_{d(1V)}}{C_{d(2V)}}$   | capacitance ratio       | $f = 1\text{ MHz}$                                                        | -     | 1.27 | -     |          |
| $\frac{C_{d(1V)}}{C_{d(28V)}}$  | capacitance ratio       | $f = 1\text{ MHz}$                                                        | 8.45  | 9    | 10.9  |          |
| $\frac{C_{d(25V)}}{C_{d(28V)}}$ | capacitance ratio       | $f = 1\text{ MHz}$                                                        | -     | 1.05 | -     |          |
| $\frac{\Delta C_d}{C_d}$        | capacitance matching    | $V_R = 1\text{ V to } 28\text{ V}$ ; in a sequence of 10 diodes (gliding) | -     | -    | 2     | %        |

[1]  $V_R$  is the value at which  $C_d = 9\text{ pF}$



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

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

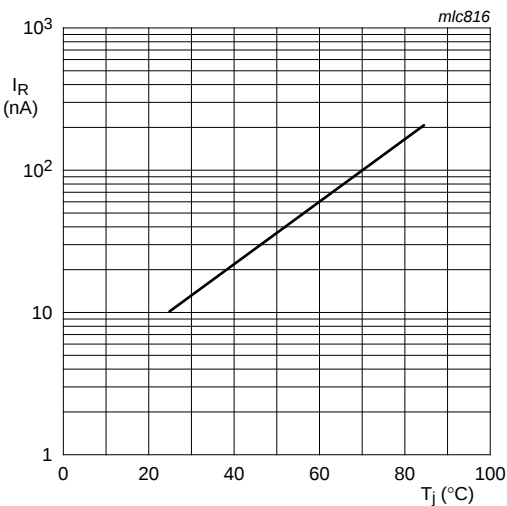
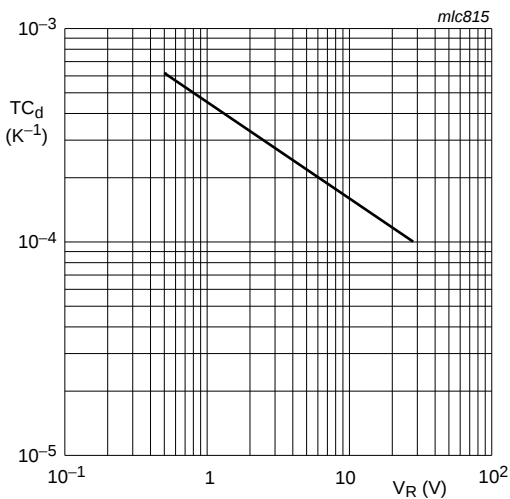


Fig 2. Reverse current as a function of junction temperature; maximum values.



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

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

7. Package outline

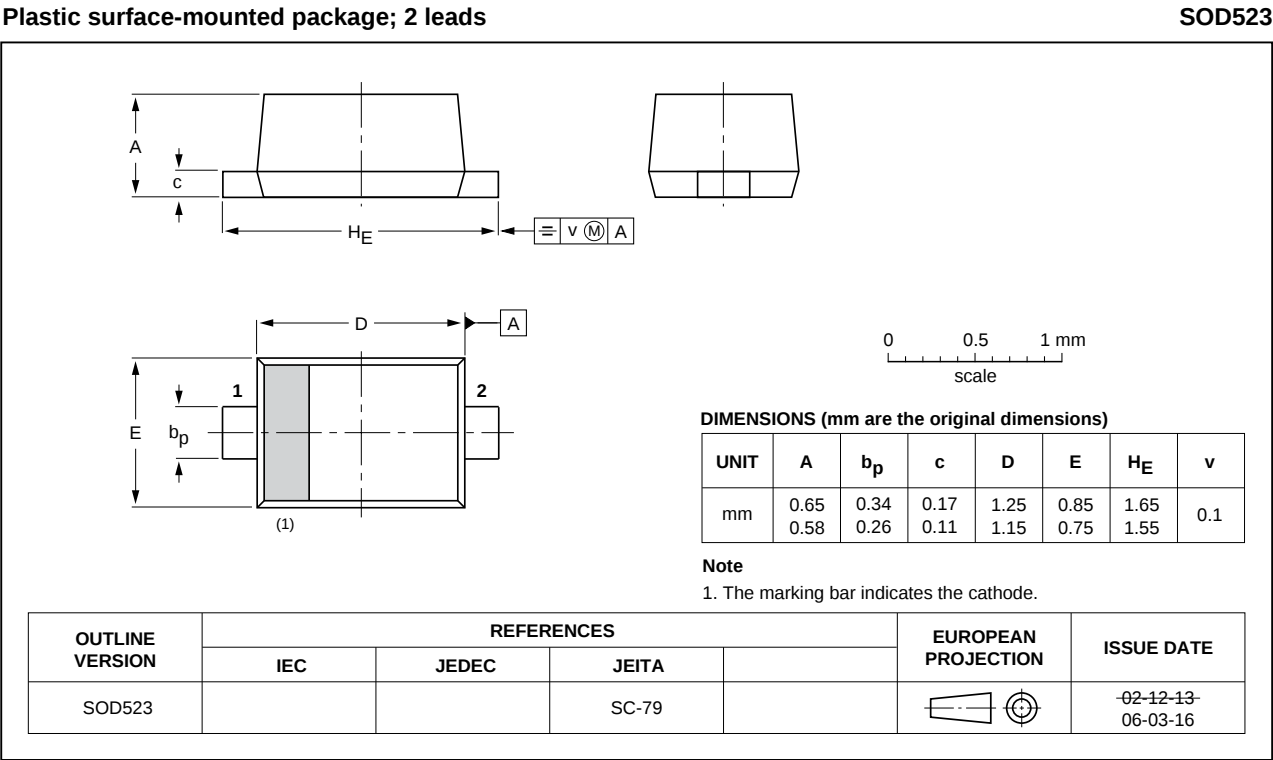


Fig 4. Package outline SOD523 (SC-79).

## 8. Revision history

Table 6. Revision history

| Document ID                   | Release date                                                                                                                                                                                                                                                                                                                         | Data sheet status     | Change notice | Supersedes |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------|------------|
| BB179 v.3                     | 20110905                                                                                                                                                                                                                                                                                                                             | Product data sheet    | -             | BB179 v.2  |
| Modifications:                | <ul style="list-style-type: none"><li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li><li>• Package outline drawings have been updated to the latest version.</li></ul> |                       |               |            |
| BB179 v.2<br>(9397 750 13832) | 20041005                                                                                                                                                                                                                                                                                                                             | Product data sheet    | -             | BB179 v.1  |
| BB179 v.1<br>(9397 750 02985) | 19971113                                                                                                                                                                                                                                                                                                                             | Product specification | -             | -          |

## 9. Legal information

### 9.1 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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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