

BB152

VHF variable capacitance diode

Rev. 03 — 5 October 2004

Product data sheet

1. Product profile

1.1 General description

The BB152 is a variable capacitance diode, fabricated in planar technology and encapsulated in the SOD323 (SC-76) very small SMD plastic package.

The excellent matching performance is achieved by gliding matching and a Direct Matching Assembly (DMA) procedure.

1.2 Features



- High linearity
- Excellent matching to 2 % DMA
- Very small SMD plastic package
- $C_{d(28V)}$: 2.7 pF; $C_{d(1V)}$ to $C_{d(28V)}$ ratio: 22
- Low series resistance.

1.3 Applications

- Electronic tuning in VHF television tuners, band A up to 160 MHz
- Voltage Controlled Oscillators (VCO).

2. Pinning information

Table 1: Pinning

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

[1] The marking bar indicates the cathode.

3. Ordering information

Table 2: Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BB152 | SC-76 | plastic surface mounted package; 2 leads | SOD323 |

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4. Marking

Table 3: Marking

| Type number | Marking code |
|-------------|--------------|
| BB152 | PB |

5. Limiting values

Table 4: Limiting values

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

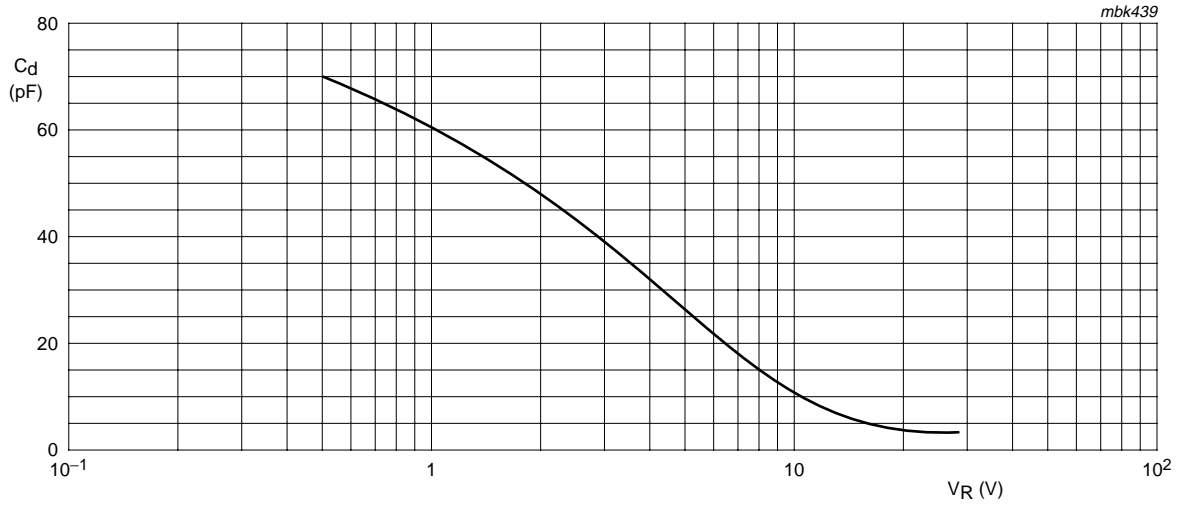
| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|----------------------|---|-----|------|--------------------|
| V_R | reverse voltage | | - | 32 | V |
| V_{RM} | peak reverse voltage | in series with a 10 k Ω resistor | - | 35 | V |
| I_F | forward current | | - | 20 | mA |
| T_{stg}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

6. Characteristics

Table 5: Characteristics

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------------------------|-------------------------|--|------|------|------|----------|
| I_R | reverse current | see Figure 2 | | | | |
| | | $V_R = 30\text{ V}$ | - | - | 10 | nA |
| | | $V_R = 30\text{ V}; T_j = 85^{\circ}\text{C}$ | - | - | 200 | nA |
| r_s | diode series resistance | $f = 100\text{ MHz}; C_d = 30\text{ pF}$ | - | 1 | 1.2 | Ω |
| C_d | diode capacitance | $f = 1\text{ MHz};$ see Figure 1 and 3 | | | | |
| | | $V_R = 1\text{ V}$ | 52 | - | 62 | pF |
| | | $V_R = 28\text{ V}$ | 2.48 | 2.7 | 2.89 | pF |
| $\frac{C_{d(1V)}}{C_{d(2V)}}$ | capacitance ratio | $f = 1\text{ MHz}$ | - | 1.31 | - | |
| $\frac{C_{d(1V)}}{C_{d(28V)}}$ | capacitance ratio | $f = 1\text{ MHz}$ | 20.6 | 22 | - | |
| $\frac{C_{d(25V)}}{C_{d(28V)}}$ | 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 | % |



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

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

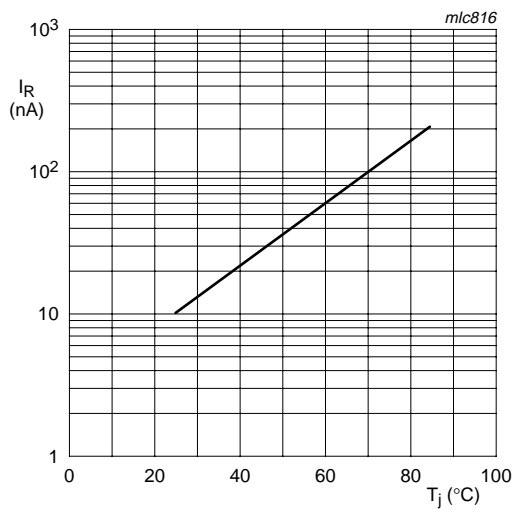
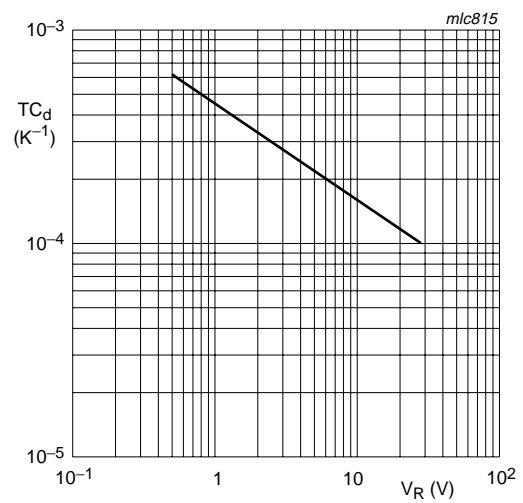


Fig 2. Reverse current as a function of junction temperature; maximum values.



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

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

7. Package outline

Plastic surface mounted package; 2 leads

SOD323

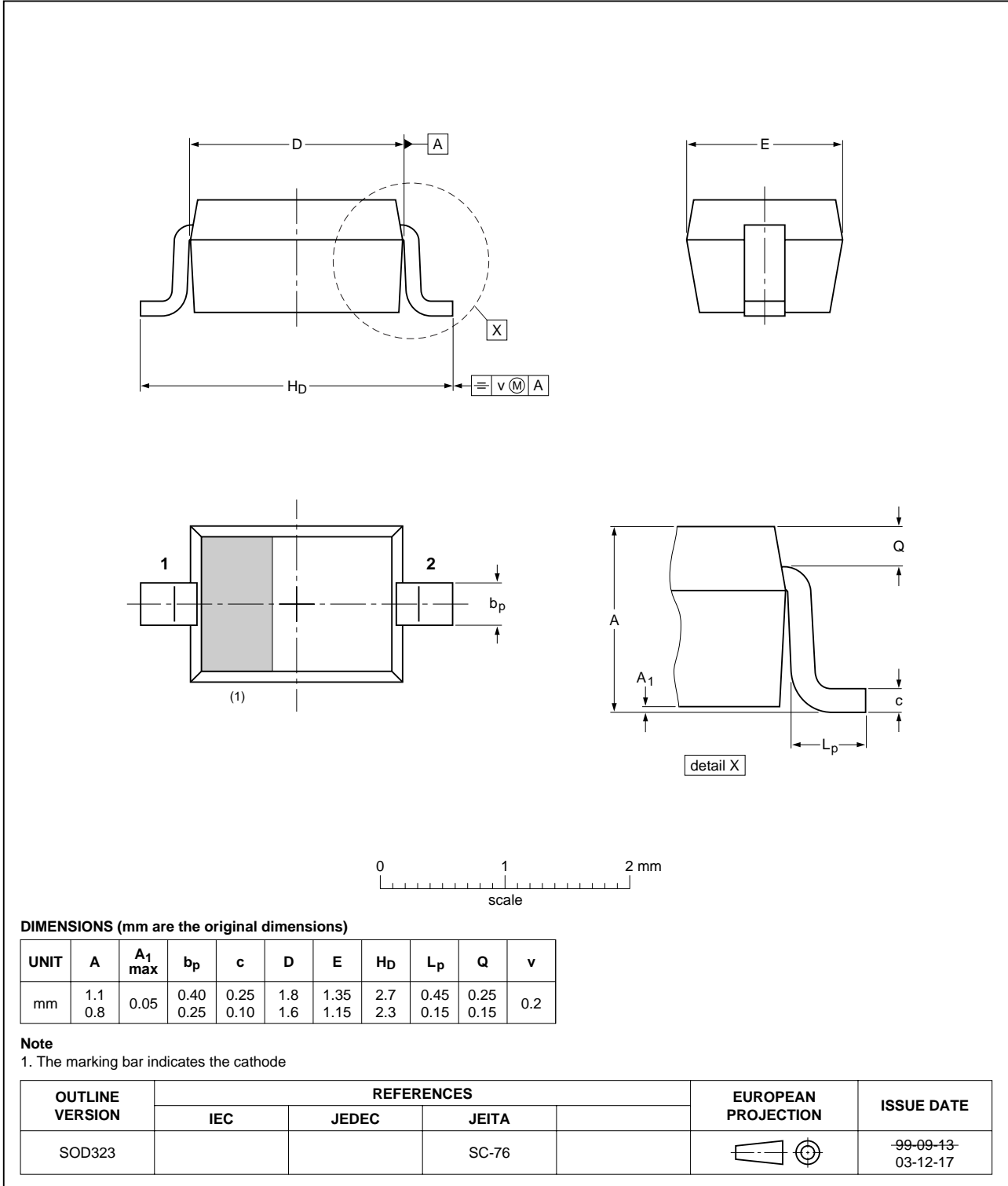


Fig 4. Package outline SOD323 (SC-76).

8. Revision history

Table 6: Revision history

| Document ID | Release date | Data sheet status | Change notice | Doc. number | Supersedes |
|----------------|---|-----------------------|---------------|----------------|------------|
| BB152_3 | 20041005 | Product data sheet | - | 9397 750 13828 | BB152_2 |
| Modifications: | <ul style="list-style-type: none"> The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors. Table 5 "Characteristics": $\Delta C_d/C_d$ conditions changed from sequence of 15 diodes to sequence of 10 diodes Table 5 "Characteristics": added typical value of 2.7 pF for $C_{d(28V)}$ Table 5 "Characteristics": added typical value of 22 for $C_{d(1V)}$ to $C_{d(28V)}$ ratio. | | | | |
| BB152_2 | 20040225 | Product specification | - | 9397 750 12645 | BB152_1 |
| BB152_1 | 19980909 | Product specification | - | 9397 750 04275 | - |

9. Data sheet status

| Level | Data sheet status ^[1] | Product status ^[2] ^[3] | Definition |
|-------|----------------------------------|--|--|
| I | Objective data | Development | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice. |
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

10. Definitions

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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