BB135
UHF variable capacitance diode

Product specification
Supersedes data of 1998 Sep 15

NXP
UHF variable capacitance diode  BB135

FEATURES
- Excellent linearity
- Very small plastic SMD package.
- C28: 1.9 pF; ratio: 10
- Low series resistance.

APPLICATIONS
- Electronic tuning in UHF television tuners.
- Radio upconversion concepts
- VCO.

DESCRIPTION
The BB135 is a variable capacitance diode, fabricated in planar technology, and encapsulated in the SOD323 very small plastic SMD package.

The matched type, BB134 has the same specification.

PINNING

<table>
<thead>
<tr>
<th>PIN</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>cathode</td>
</tr>
<tr>
<td>2</td>
<td>anode</td>
</tr>
</tbody>
</table>

Fig.1  Simplified outline (SOD323; SC-76) and symbol.

Marking code: P5.
Cathode side indicated by a bar.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>TYPE NUMBER</th>
<th>NAME</th>
<th>DESCRIPTION</th>
<th>VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB135</td>
<td>–</td>
<td>plastic surface mounted package; 2 leads SOD323</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>MIN.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>VR</td>
<td>continuous reverse voltage</td>
<td>–</td>
<td>30</td>
<td>V</td>
</tr>
<tr>
<td>IF</td>
<td>continuous forward current</td>
<td>–</td>
<td>20</td>
<td>mA</td>
</tr>
<tr>
<td>Tstg</td>
<td>storage temperature</td>
<td>–55</td>
<td>+150</td>
<td>°C</td>
</tr>
<tr>
<td>Tj</td>
<td>operating junction temperature</td>
<td>–55</td>
<td>+125</td>
<td>°C</td>
</tr>
</tbody>
</table>
ELECTRICAL CHARACTERISTICS

\( T_J = 25 \, ^\circ\text{C} \) unless otherwise specified.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>MIN.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>( I_R )</td>
<td>reverse current</td>
<td>( V_R = 30 , \text{V}; ) see Fig.3</td>
<td>–</td>
<td>10</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_R = 30 , \text{V}; , T_J = 85 , ^\circ\text{C}; ) see Fig.3</td>
<td>–</td>
<td>200</td>
<td>nA</td>
</tr>
<tr>
<td>( r_s )</td>
<td>diode series resistance</td>
<td>( f = 470 , \text{MHz}; ) note 1</td>
<td>–</td>
<td>0.75</td>
<td>( \Omega )</td>
</tr>
<tr>
<td>( C_d )</td>
<td>diode capacitance</td>
<td>( V_R = 0.5 , \text{V}; , f = 1 , \text{MHz}; ) see Figs 2 and 4</td>
<td>17.5</td>
<td>21</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_R = 28 , \text{V}; , f = 1 , \text{MHz}; ) see Figs 2 and 4</td>
<td>1.7</td>
<td>2.1</td>
<td>pF</td>
</tr>
<tr>
<td>( \frac{C_d(0.5V)}{C_d(28V)} )</td>
<td>capacitance ratio</td>
<td>( f = 1 , \text{MHz} )</td>
<td>8.9</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

1. \( V_R \) is the value at which \( C_d = 9 \, \text{pF} \).
UHF variable capacitance diode

GRAPHICAL DATA

Fig. 2 Diode capacitance as a function of reverse voltage; typical values.

Fig. 3 Reverse current as a function of junction temperature; maximum values.

Fig. 4 Temperature coefficient of diode capacitance as a function of reverse voltage; typical values.
PACKAGE OUTLINE

Plastic surface-mounted package; 2 leads

SOD323

DIMENSIONS (mm are the original dimensions)

<table>
<thead>
<tr>
<th>UNIT</th>
<th>A</th>
<th>A1 max</th>
<th>b_p</th>
<th>c</th>
<th>D</th>
<th>E</th>
<th>H_D</th>
<th>L_p</th>
<th>Q</th>
<th>v</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>1.1</td>
<td>0.05</td>
<td>0.40</td>
<td>0.25</td>
<td>0.25</td>
<td>1.8</td>
<td>1.35</td>
<td>2.7</td>
<td>0.45</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>0.8</td>
<td></td>
<td>0.25</td>
<td>0.10</td>
<td>0.10</td>
<td>1.6</td>
<td>1.15</td>
<td>2.3</td>
<td>0.15</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Note
1. The marking bar indicates the cathode.

OUTLINE VERSION | REFERENCES | EUROPEAN PROJECTION | ISSUE DATE
SOD323          | IEC | JEDEC | JEITA | 03-12-17 | 06-03-16

Note
1. The marking bar indicates the cathode.
DATA SHEET STATUS

<table>
<thead>
<tr>
<th>DOCUMENT STATUS</th>
<th>PRODUCT STATUS</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

Notes
1. Please consult the most recently issued document before initiating or completing a design.
2. 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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Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

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