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Kind regards,

Team Nexperia.
BAS416
Low-leakage diode

Product data sheet
Supersedes data of 2002 Nov 19

2004 Jan 26

DISCRETE SEMICONDUCTORS

DATA SHEET

NXP
founded by Philips
FEATURES
• Plastic SMD package
• Low leakage current: typ. 3 pA
• Switching time: typ. 0.8 µs
• Continuous reverse voltage: max. 75 V
• Repetitive peak reverse voltage: max. 85 V
• Repetitive peak forward current: max. 500 mA.

APPLICATIONS
• Low-leakage current applications in surface mounted circuits.

DESCRIPTION
Epitaxial, medium-speed switching diode with a low leakage current encapsulated in a small SOD323 SMD plastic package.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>TYPE NUMBER</th>
<th>PACKAGE NAME</th>
<th>DESCRIPTION</th>
<th>VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAS416</td>
<td>–</td>
<td>plastic surface mounted package; 2 leads</td>
<td>SOD323</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>CONDITIONS</th>
<th>MIN.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>V_{RRM}</td>
<td>repetitive peak reverse voltage</td>
<td></td>
<td>–</td>
<td>85</td>
<td>V</td>
</tr>
<tr>
<td>V_{R}</td>
<td>continuous reverse voltage</td>
<td></td>
<td>–</td>
<td>75</td>
<td>V</td>
</tr>
<tr>
<td>I_{F}</td>
<td>continuous forward current</td>
<td>see Fig.2</td>
<td>–</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>I_{FRM}</td>
<td>repetitive peak forward current</td>
<td></td>
<td>–</td>
<td>500</td>
<td>mA</td>
</tr>
<tr>
<td>I_{FSM}</td>
<td>non-repetitive peak forward current</td>
<td>square wave; T_{J} = 25 °C prior to surge; see Fig.4</td>
<td>–</td>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t = 1 µs</td>
<td>–</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>t = 1 ms</td>
<td>–</td>
<td>0.5</td>
<td>A</td>
</tr>
<tr>
<td>P_{tot}</td>
<td>total power dissipation</td>
<td>T_{amb} = 25 °C; note 1</td>
<td>–</td>
<td>250</td>
<td>mW</td>
</tr>
<tr>
<td>T_{stg}</td>
<td>storage temperature</td>
<td>–65</td>
<td>+150</td>
<td></td>
<td>°C</td>
</tr>
<tr>
<td>T_{J}</td>
<td>junction temperature</td>
<td>–</td>
<td>150</td>
<td></td>
<td>°C</td>
</tr>
</tbody>
</table>

Note
1. Device mounted on an FR4 printed-circuit board.
**CHARACTERISTICS**

$T_{\text{amb}} = 25 \, ^\circ\text{C}$ unless otherwise specified.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>see Fig. 3</td>
<td>–</td>
<td>0.9</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 1 , \text{mA}$</td>
<td>–</td>
<td>1</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 10 , \text{mA}$</td>
<td>–</td>
<td>1.1</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 50 , \text{mA}$</td>
<td>–</td>
<td>1.25</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 150 , \text{mA}$</td>
<td>–</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>see Fig. 5</td>
<td>0.003</td>
<td>5</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 75 , \text{V}$</td>
<td>3</td>
<td>80</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 75 , \text{V}; , T_j = 150 , ^\circ\text{C}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$V_R = 0; , f = 1 , \text{MHz};$ see Fig. 6</td>
<td>2</td>
<td>–</td>
<td>pF</td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>when switched from $I_F = 10 , \text{mA}$ to $I_R = 10 , \text{mA}; , R_L = 100 , \Omega;$ measured at $I_R = 1 , \text{mA};$ see Fig. 7</td>
<td>0.8</td>
<td>3</td>
<td>µs</td>
</tr>
</tbody>
</table>

**THERMAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{\theta(j-a)}$</td>
<td>thermal resistance from junction to ambient</td>
<td>note 1</td>
<td>450</td>
<td>K/W</td>
</tr>
</tbody>
</table>

**Note**

1. Refer to SOD323 (SC-76) standard mounting conditions.
Low-leakage diode  

**GRAPHICAL DATA**

![Graph 1: Maximum permissible continuous forward current as a function of ambient temperature.](image1)

Device mounted on an FR4 printed-circuit board.

**Fig.2**  Maximum permissible continuous forward current as a function of ambient temperature.

![Graph 2: Forward current as a function of forward voltage.](image2)

(1) $T_j = 150 \, ^\circ C$; typical values.
(2) $T_j = 25 \, ^\circ C$; typical values.
(3) $T_j = 25 \, ^\circ C$; maximum values.

**Fig.3**  Forward current as a function of forward voltage.

![Graph 3: Maximum permissible non-repetitive peak forward current as a function of pulse duration.](image3)

Based on square wave currents.

$T_j = 25 \, ^\circ C$ prior to surge.

**Fig.4**  Maximum permissible non-repetitive peak forward current as a function of pulse duration.
**Low-leakage diode**

**Fig. 5** Reverse current as a function of junction temperature.

- $V_R = 75$ V.
- (1) Maximum values.
- (2) Typical values.

**Fig. 6** Diode capacitance as a function of reverse voltage; typical values.

**Fig. 7** Reverse recovery voltage test circuit and waveforms.

- $I_R = 1$ mA.
- Input signal: reverse pulse rise time $t_r = 0.6$ ns; reverse voltage pulse duration $t_p = 100$ ns; duty factor $\delta = 0.05$.
- Oscilloscope: rise time $t_i = 0.35$ ns.

(1) $I_R = 1$ mA.
Low-leakage diode

BAS416

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>0.85</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>0.15</td>
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</table>

Note
1. The marking bar indicates the cathode

REFERENCES

<table>
<thead>
<tr>
<th>OUTLINE VERSION</th>
<th>IEC</th>
<th>JEDEC</th>
<th>JEITA</th>
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<tbody>
<tr>
<td>SOD323</td>
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<td>SC-76</td>
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</tbody>
</table>

EUROPEAN PROJECTION

ISSUE DATE

03-12-17
06-03-16
Low-leakage diode

BAS416

DATA SHEET STATUS

<table>
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<tr>
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<th>DEFINITION</th>
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</thead>
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<tr>
<td>Objective data sheet</td>
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<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>
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Notes

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