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Kind regards,

Team Nexperia
1. Product profile

1.1 General description
Planar Schottky barrier diode with an integrated guard ring for stress protection, encapsulated in a hermetically-sealed subminiature SOD68 (DO-34) package. The diode is suitable for mounting on a 2 E (5.08 mm) pitch.

1.2 Features and benefits
• Low forward voltage
• Guard ring protected
• Hermetically-sealed leaded glass package

1.3 Applications
• Ultra high-speed switching
• Voltage clamping
• Protection circuits
• Blocking diodes

1.4 Quick reference data

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{F(AV)}$</td>
<td>average forward current</td>
<td>$\delta = 0.5 ; f = 20 \text{ kHz}; T_{\text{amb}} \leq 50 \degree \text{C}; \text{PCB mounting, lead length} = 4 \text{ mm}$</td>
<td>-</td>
<td>-</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>$V_R$</td>
<td>reverse voltage</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 10 \text{ mA}; T_{\text{amb}} = 25 \degree \text{C}$</td>
<td>-</td>
<td>-</td>
<td>450</td>
<td>mV</td>
</tr>
</tbody>
</table>

2. Pinning information

<table>
<thead>
<tr>
<th>Pin</th>
<th>Symbol</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>K</td>
<td>cathode[$^1$]</td>
<td>![Simplified outline]</td>
<td>![Graphic symbol]</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
<td>anode</td>
<td>![Simplified outline]</td>
<td>![Graphic symbol]</td>
</tr>
</tbody>
</table>

[$^1$] The marking band indicates the cathode.
3. Ordering information

Table 3. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAT86</td>
<td>DO-34</td>
<td>hermetically sealed glass package; axial leaded; 2 leads</td>
<td>SOD68</td>
</tr>
</tbody>
</table>

4. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAT86</td>
<td>marking band</td>
</tr>
</tbody>
</table>

5. Limiting values

Table 5. 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_R</td>
<td>reverse voltage</td>
<td></td>
<td>-</td>
<td>50</td>
<td>V</td>
</tr>
<tr>
<td>I_F</td>
<td>forward current</td>
<td></td>
<td>-</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>I_F(AV)</td>
<td>average forward current</td>
<td>δ = 0.5 ; f = 20 kHz; T_amb ≤ 50 °C; PCB mounting, lead length = 4 mm</td>
<td>-</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>I_FRM</td>
<td>repetitive peak forward current</td>
<td>t_p ≤ 1 s; δ ≤ 0.5</td>
<td>-</td>
<td>500</td>
<td>mA</td>
</tr>
<tr>
<td>I_FSM</td>
<td>non-repetitive peak forward current</td>
<td>t_p ≤ 10 ms; T_{j_{init}} = 25 °C</td>
<td>-</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>T_j</td>
<td>junction temperature</td>
<td></td>
<td>-</td>
<td>125</td>
<td>°C</td>
</tr>
<tr>
<td>T_amb</td>
<td>ambient temperature</td>
<td></td>
<td>-65</td>
<td>125</td>
<td>°C</td>
</tr>
<tr>
<td>T_stg</td>
<td>storage temperature</td>
<td></td>
<td>-65</td>
<td>150</td>
<td>°C</td>
</tr>
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</table>

6. Thermal characteristics

Table 6. Thermal characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>R_{th(j-a)}</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1]</td>
<td>-</td>
<td>320</td>
<td>K/W</td>
</tr>
</tbody>
</table>

## 7. Characteristics

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_F$</td>
<td>forward voltage</td>
<td>$I_F = 0.1 \ mA; \ T_{amb} = 25 \ ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>300</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 1 \ mA; \ T_{amb} = 25 \ ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>380</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 10 \ mA; \ T_{amb} = 25 \ ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>450</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 30 \ mA; \ T_{amb} = 25 \ ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>600</td>
<td>mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 40 \ V; \ T_{amb} = 25 \ ^\circ C$; pulsed; $t_p = 300 \ \mu s; \delta = 0.02$</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>$\mu A$</td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$f = 1 \ MHz; \ T_{amb} = 25 \ ^\circ C; V_R = 1 \ V$</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>pF</td>
</tr>
<tr>
<td>$t_{rr}$</td>
<td>reverse recovery time</td>
<td>$I_F = 10 \ mA; \ I_R = 10 \ mA; R_L = 100 \ \Omega$; $I_{R(meas)} = 1 \ mA; \ T_{amb} = 25 \ ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td>ns</td>
</tr>
</tbody>
</table>

**Fig. 1.** Forward current as a function of forward voltage; typical values

**Fig. 2.** Reverse current as a function of reverse voltage; typical values
8. Test information

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

Fig. 4. Average forward current as a function of ambient temperature; derating curve

Fig. 5. Reverse recovery time test circuit and waveforms
9. Package outline

Fig. 6. DO-34 (SOD68)

10. Revision history

<table>
<thead>
<tr>
<th>Data sheet ID</th>
<th>Release date</th>
<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
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<tr>
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<td>20120725</td>
<td>Product data sheet</td>
<td>-</td>
<td>BAT86 v.2</td>
</tr>
<tr>
<td>BAT86 v.2</td>
<td>20000525</td>
<td>Product specification</td>
<td>-</td>
<td>BAT86 v.1</td>
</tr>
<tr>
<td>BAT86 v.1</td>
<td>19960320</td>
<td>Product specification</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Modifications:
- The format of this document has been redesigned to comply with the new identity guidelines of NXP Semiconductors.
- Legal texts have been adapted to the new company name where appropriate.
- Section "Marking" added
- Package outline drawing replaced by minimized package outline drawing
- Section "Test information" added
11. Legal information

11.1 Data sheet status

<table>
<thead>
<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
</tr>
</thead>
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<tr>
<td>Objective [short] data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary [short] data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product [short] data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

[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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12. Contents

1  Product profile .......................................................... 1
1.1 General description .................................................. 1
1.2 Features and benefits ............................................ 1
1.3 Applications .......................................................... 1
1.4 Quick reference data ............................................ 1
2  Pinning information .................................................. 1
3  Ordering information ................................................ 2
4  Marking ................................................................. 2
5  Limiting values ........................................................ 2
6  Thermal characteristics ............................................ 2
7  Characteristics ........................................................ 3
8  Test information ....................................................... 4
9  Package outline ........................................................ 5
10 Revision history ........................................................ 5
11 Legal information ..................................................... 6
11.1 Data sheet status ................................................... 6
11.2 Definitions ............................................................ 6
11.3 Disclaimers ........................................................... 6
11.4 Trademarks ........................................................... 7

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