Important notice

Dear Customer,

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In data sheets and application notes which still contain NXP or Philips Semiconductors references, use the references to Nexperia, as shown below.


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Should be replaced with:
- © Nexperia B.V. (year). All rights reserved.

If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via salesaddresses@nexperia.com). Thank you for your cooperation and understanding.

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 small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

1.2 Features and benefits
- Low forward voltage
- Low capacitance
- AEC-Q101 qualified

1.3 Applications
- Ultra high-speed switching
- Line termination
- Voltage clamping
- Reverse polarity protection

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>( V_R )</td>
<td>reverse voltage</td>
<td>-</td>
<td>-</td>
<td>40</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>( V_F )</td>
<td>forward voltage</td>
<td>( I_F = 500 \text{ mA} )</td>
<td>[1]</td>
<td>-</td>
<td>550</td>
<td>mV</td>
</tr>
<tr>
<td>( I_R )</td>
<td>reverse current</td>
<td>( V_R = 35 \text{ V} )</td>
<td>[1]</td>
<td>-</td>
<td>100</td>
<td>( \mu \text{A} )</td>
</tr>
</tbody>
</table>

[1] Pulse test: \( t_p \leq 300 \mu\text{s} \); \( \delta \leq 0.02 \).

2. Pinning information

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>anode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>not connected</td>
<td></td>
<td>n.c.</td>
</tr>
<tr>
<td>3</td>
<td>cathode</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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>BAT720</td>
<td></td>
<td>plastic surface-mounted package; 3 leads</td>
<td>SOT23</td>
</tr>
</tbody>
</table>

4. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code[1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAT720</td>
<td>L6*</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>40 V</td>
<td></td>
</tr>
<tr>
<td>$I_F$</td>
<td>forward current</td>
<td></td>
<td>-</td>
<td>500 mA</td>
<td></td>
</tr>
<tr>
<td>$I_{FSM}$</td>
<td>non-repetitive peak</td>
<td>square wave; $t_p &lt; 10$ ms</td>
<td>[1] -</td>
<td>2 A</td>
<td></td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25$ °C</td>
<td>[2] -</td>
<td>200 mW</td>
<td></td>
</tr>
<tr>
<td>$T_J$</td>
<td>junction temperature</td>
<td></td>
<td>-</td>
<td>125 °C</td>
<td></td>
</tr>
<tr>
<td>$T_{amb}$</td>
<td>ambient temperature</td>
<td></td>
<td>-55</td>
<td>+125 °C</td>
<td></td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td></td>
<td>-65</td>
<td>+150 °C</td>
<td></td>
</tr>
</tbody>
</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>500</td>
<td>K/W</td>
</tr>
</tbody>
</table>

7. Characteristics

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>$I_F = 500 \text{ mA}$</td>
<td>[1]</td>
<td>-</td>
<td>-</td>
<td>550 mV</td>
</tr>
<tr>
<td>$I_R$</td>
<td>reverse current</td>
<td>$V_R = 35 \text{ V}$</td>
<td>[1]</td>
<td>-</td>
<td>-</td>
<td>100 $\mu\text{A}$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 35 \text{ V}; T_J = 100 \degree \text{ C}$</td>
<td>[1]</td>
<td>-</td>
<td>-</td>
<td>10 mA</td>
</tr>
<tr>
<td>$C_d$</td>
<td>diode capacitance</td>
<td>$f = 1 \text{ MHz}; V_R = 0 \text{ V}$</td>
<td>60</td>
<td>-</td>
<td>90</td>
<td>pF</td>
</tr>
</tbody>
</table>

[1] Pulse test: $t_p \leq 300 \mu\text{s}; \delta \leq 0.02$. 

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

Fig 2. Reverse current as a function of reverse voltage; typical values

(1) $T_{\text{amb}} = 125 \degree \text{ C}$
(2) $T_{\text{amb}} = 85 \degree \text{ C}$
(3) $T_{\text{amb}} = 25 \degree \text{ C}$
8. Test information

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.
9. Package outline

![Package outline SOT23 (TO-236AB)](image)

10. Packing information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Description</th>
<th>Packing quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAT720</td>
<td>SOT23</td>
<td>4 mm pitch, 8 mm tape and reel</td>
<td>3000: -215, 10000: -235</td>
</tr>
</tbody>
</table>

[1] For further information and the availability of packing methods, see Section 14.
11. Soldering

![Fig 5. Reflow soldering footprint SOT23 (TO-236AB)](sot023_fr)

![Fig 6. Wave soldering footprint SOT23 (TO-236AB)](sot023_fw)
12. Revision history

Table 9. Revision history

<table>
<thead>
<tr>
<th>Document ID</th>
<th>Release date</th>
<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
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</thead>
<tbody>
<tr>
<td>BAT720 v.4</td>
<td>20121114</td>
<td>Product data sheet</td>
<td>-</td>
<td>BAT720 v.3</td>
</tr>
<tr>
<td>BAT720 v.3</td>
<td>20030325</td>
<td>Product data sheet</td>
<td>-</td>
<td>BAT720 v.2</td>
</tr>
<tr>
<td>BAT720 v.2</td>
<td>19990526</td>
<td>Product specification</td>
<td>-</td>
<td>BAT720 v.1</td>
</tr>
<tr>
<td>BAT720 v.1</td>
<td>19980121</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 1**: updated
- **Section 4**: updated
- **Table 5**: added ambient temperature $T_{amb}$ and total power dissipation $P_{tot}$
- **Figure 2**: updated
- **Section 8 "Test information"**: added
- **Figure 4**: replaced by minimized package outline drawing
- **Section 10 "Packing information"**: added
- **Section 11 "Soldering"**: added
- **Section 13 "Legal information"**: updated
13. Legal information

13.1 Data sheet status

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<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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14. Contact information

For more information, please visit: http://www.nxp.com

For sales office addresses, please send an email to: salesaddresses@nxp.com
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