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Kind regards,

Team Nexperia

# BAT86

## Schottky barrier single diode

25 July 2012

Product data sheet

## 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 1. Quick reference data

| Symbol      | Parameter               | Conditions  | Min | Typ | Max | Unit |
|-------------|-------------------------|---|-----|-----|-----|------|
| $I_{F(AV)}$ | average forward current | $\delta = 0.5$ ; $f = 20$ kHz; $T_{amb} \leq 50$ °C; PCB mounting, lead length = 4 mm | -   | -   | 200 | mA   |
| $V_R$       | reverse voltage         |   | -   | -   | 50  | V    |
| $V_F$       | forward voltage         | $I_F = 10$ mA; $T_{amb} = 25$ °C  | -   | -   | 450 | mV   |

## 2. Pinning information

Table 2. Pinning information

| Pin | Symbol | Description | Simplified outline   | Graphic symbol   |
|-----|--------|-------------|--|--|
| 1   | K      | cathode[1]  | <br>DO-34 (SOD68) | <br>K  A<br>aaa-003679 |
| 2   | A      | anode       |  |  |

[1] The marking band indicates the cathode.



### 3. Ordering information

Table 3. Ordering information

| Type number | Package |  |         |
|-------------|---------|--|---------|
|             | Name    | Description  | Version |
| BAT86       | DO-34   | hermetically sealed glass package; axial leaded; 2 leads | SOD68   |

### 4. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BAT86       | marking band |

### 5. Limiting values

Table 5. Limiting values

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

| Symbol      | Parameter                           | Conditions  | Min | Max | Unit |
|-------------|-------------------------------------|---|-----|-----|------|
| $V_R$       | reverse voltage                     |   | -   | 50  | V    |
| $I_F$       | forward current                     |   | -   | 200 | mA   |
| $I_{F(AV)}$ | average forward current             | $\delta = 0.5$ ; $f = 20$ kHz; $T_{amb} \leq 50$ °C; PCB mounting, lead length = 4 mm | -   | 200 | mA   |
| $I_{FRM}$   | repetitive peak forward current     | $t_p \leq 1$ s; $\delta \leq 0.5$   | -   | 500 | mA   |
| $I_{FSM}$   | non-repetitive peak forward current | $t_p \leq 10$ ms; $T_{j(init)} = 25$ °C   | -   | 5   | A    |
| $T_j$       | junction temperature                |   | -   | 125 | °C   |
| $T_{amb}$   | ambient temperature                 |   | -65 | 125 | °C   |
| $T_{stg}$   | storage temperature                 |   | -65 | 150 | °C   |

### 6. Thermal characteristics

Table 6. Thermal characteristics

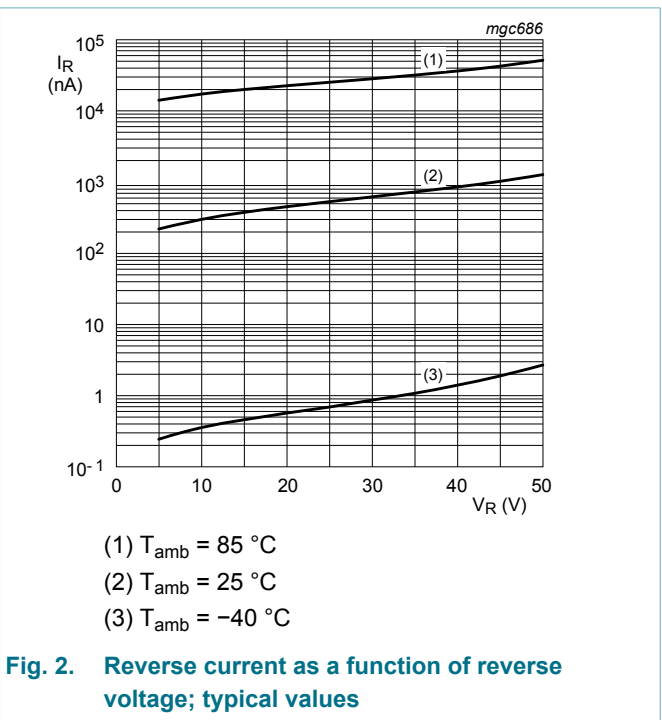
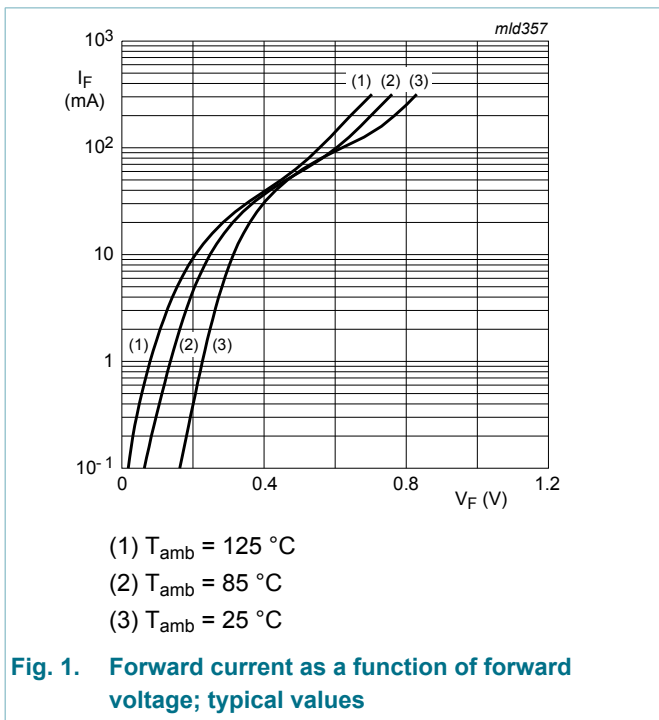
| Symbol        | Parameter                                   | Conditions  |     | Min | Typ | Max | Unit |
|---------------|---|-------------|-----|-----|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | -   | -   | 320 | K/W  |

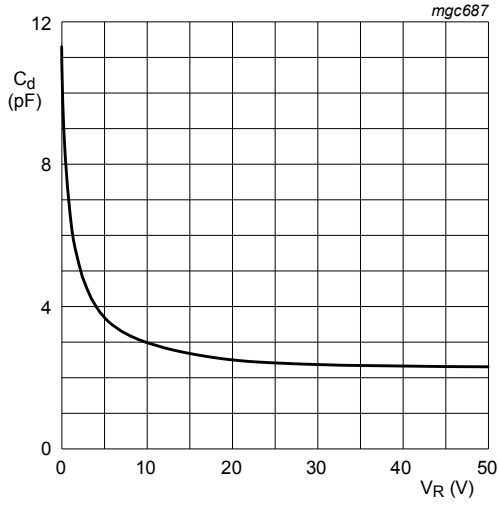
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 7. Characteristics

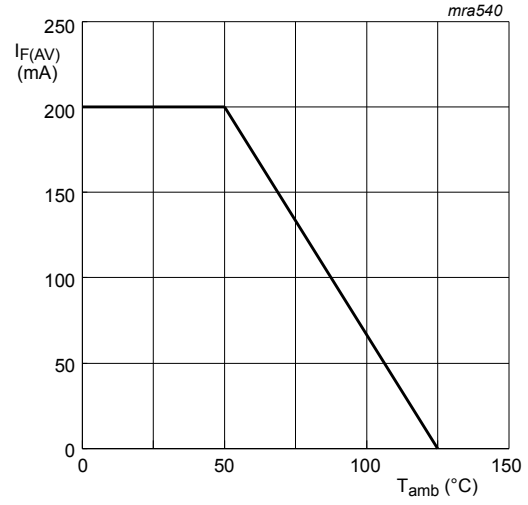
Table 7. Characteristics

| Symbol   | Parameter             | Conditions  | Min | Typ | Max | Unit          |
|----------|-----------------------|---|-----|-----|-----|---------------|
| $V_F$    | forward voltage       | $I_F = 0.1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$   | -   | -   | 300 | mV            |
|          |                       | $I_F = 1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$   | -   | -   | 380 | mV            |
|          |                       | $I_F = 10 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$  | -   | -   | 450 | mV            |
|          |                       | $I_F = 30 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$  | -   | -   | 600 | mV            |
|          |                       | $I_F = 100 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$   | -   | -   | 900 | mV            |
| $I_R$    | reverse current       | $V_R = 40 \text{ V}; T_{amb} = 25 \text{ }^\circ\text{C}; \text{pulsed}; t_p = 300 \text{ } \mu\text{s}; \delta = 0.02$                       | -   | -   | 5   | $\mu\text{A}$ |
| $C_d$    | diode capacitance     | $f = 1 \text{ MHz}; T_{amb} = 25 \text{ }^\circ\text{C}; V_R = 1 \text{ V}$   | -   | -   | 8   | pF            |
| $t_{rr}$ | reverse recovery time | $I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; R_L = 100 \text{ } \Omega; I_{R(\text{meas})} = 1 \text{ mA}; T_{amb} = 25 \text{ }^\circ\text{C}$ | -   | -   | 4   | ns            |



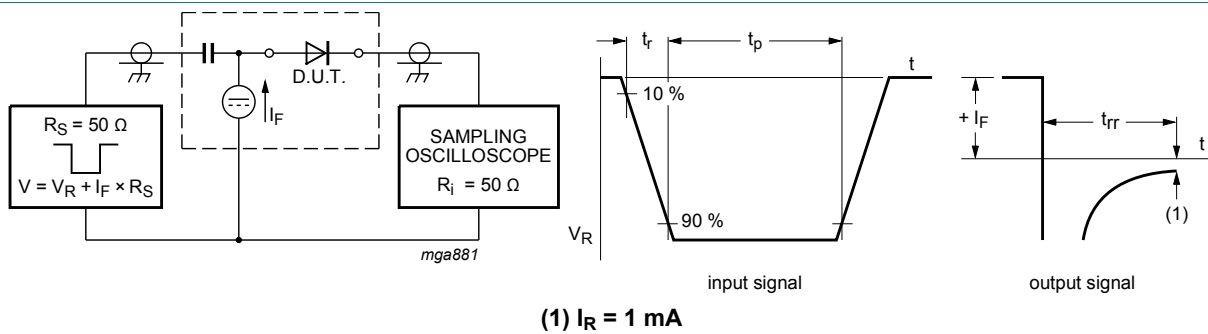


**Fig. 3. Diode capacitance as a function of reverse voltage; typical values**



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

## 8. Test information



**Fig. 5. Reverse recovery time test circuit and waveforms**

## 9. Package outline

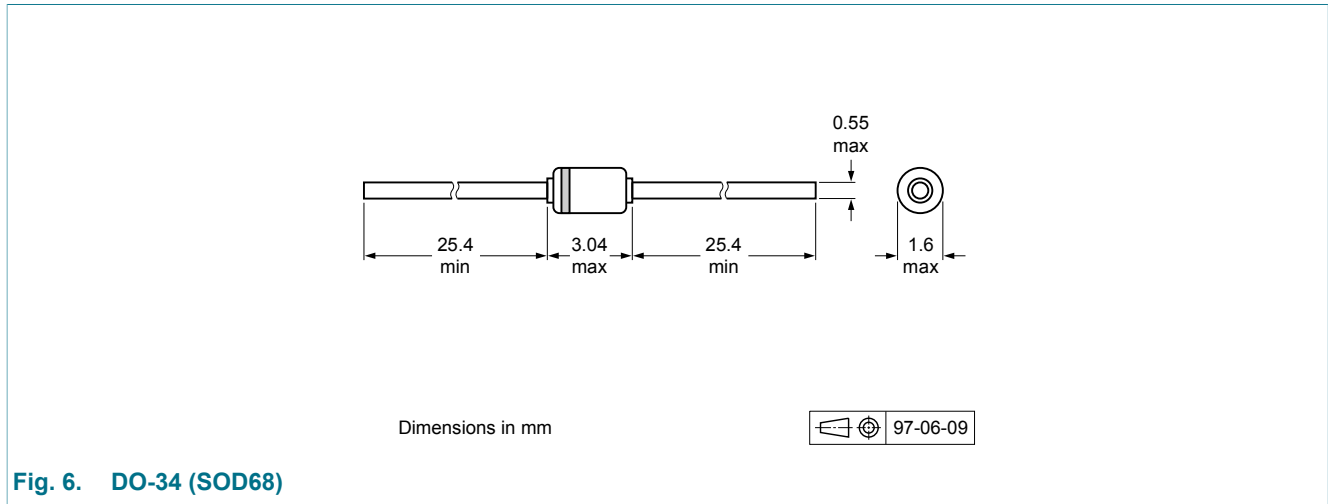


Fig. 6. DO-34 (SOD68)

## 10. Revision history

Table 8. Revision history

| Data sheet ID  | Release date  | Data sheet status     | Change notice | Supersedes |
|----------------|---|-----------------------|---------------|------------|
| BAT86 v.3      | 20120725  | Product data sheet    | -             | BAT86 v.2  |
| Modifications: | <ul style="list-style-type: none"> <li>The format of this document has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Section "Marking" added</li> <li>Package outline drawing replaced by minimized package outline drawing</li> <li>Section "Test information" added</li> </ul> |                       |               |            |
| BAT86 v.2      | 20000525  | Product specification | -             | BAT86 v.1  |
| BAT86 v.1      | 19960320  | Product specification | -             | -          |

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| Document status [1][2]         | Product status [3] | Definition  |
|--------------------------------|--------------------|---|
| Objective [short] data sheet   | Development        | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification      | This document contains data from the preliminary specification.                       |
| Product [short] data sheet     | Production         | This document contains the product specification.                                     |

- [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".
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