

BAV102; BAV103

Single general-purpose switching diodes

Rev. 03 — 16 August 2007

Product data sheet

1. Product profile

1.1 General description

Single general-purpose switching diodes, fabricated in planar technology, and encapsulated in small hermetically sealed glass SOD80C Surface-Mounted Device (SMD) packages.

Table 1. Product overview

| Type number | Package | | Configuration |
|-------------|---------|-------|---------------|
| | NXP | JEITA | |
| BAV102 | SOD80C | - | single |
| BAV103 | | | |

1.2 Features

- High switching speed: $t_{rr} \leq 50$ ns
- Low leakage current
- Low capacitance: $C_d \leq 5$ pF
- Small hermetically sealed glass SMD package

1.3 Applications

- High-speed switching
- General-purpose switching
- Voltage clamping
- Reverse polarity protection

1.4 Quick reference data

Table 2. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------|-----------------------|------------|-----|-----|-----|------|
| I_F | forward current | [1][2] | - | - | 250 | mA |
| V_R | reverse voltage | | | | | |
| | BAV102 | | - | - | 150 | V |
| | BAV103 | | - | - | 200 | V |
| t_{rr} | reverse recovery time | [3] | - | - | 50 | ns |


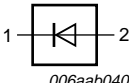
[1] Pulse test: $t_p \leq 300$ μ s; $\delta \leq 0.02$.

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

[3] When switched from $I_F = 30$ mA to $I_R = 30$ mA; $R_L = 100$ Ω ; measured at $I_R = 3$ mA.

2. Pinning information

Table 3. Pinning

| Pin | Description | Simplified outline | Symbol |
|-----|-------------|---|---|
| 1 | cathode |  |  |
| 2 | anode | | |

[1] The marking band indicates the cathode.

3. Ordering information

Table 4. Ordering information

| Type number | Package | | Version |
|-------------|---------|--|---------|
| | Name | Description | |
| BAV102 | - | hermetically sealed glass surface-mounted package; | SOD80C |
| BAV103 | - | 2 connectors | |

4. Marking

Table 5. Marking codes

| Type number | Marking code ^[1] |
|-------------|-----------------------------|
| BAV102 | marking band |
| BAV103 | |

[1] green: made in Philippines

5. Limiting values

Table 6. Limiting values

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|---------------------------------|------------|-----|-----|------|
| V_{RRM} | repetitive peak reverse voltage | | | | |
| | | BAV102 | - | 200 | V |
| | | BAV103 | - | 250 | V |
| V_R | reverse voltage | | | | |
| | | BAV102 | - | 150 | V |
| | | BAV103 | - | 200 | V |
| I_F | forward current | [1][2] | - | 250 | mA |
| I_{FRM} | repetitive peak forward current | | - | 625 | mA |

Table 6. Limiting values ...continued

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|-----------|-------------------------------------|--|-----|------|------------------|
| I_{FSM} | non-repetitive peak forward current | square wave | [3] | | |
| | | $t_p = 1 \mu s$ | - | 9 | A |
| | | $t_p = 100 \mu s$ | - | 3 | A |
| | | $t_p = 1 s$ | - | 1 | A |
| P_{tot} | total power dissipation | $T_{amb} \leq 25 \text{ }^\circ\text{C}$ | [2] | 400 | mW |
| T_j | junction temperature | | - | 175 | $^\circ\text{C}$ |
| T_{amb} | ambient temperature | | -65 | +175 | $^\circ\text{C}$ |
| T_{stg} | storage temperature | | -65 | +175 | $^\circ\text{C}$ |

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

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[3] $T_j = 25 \text{ }^\circ\text{C}$ prior to surge.

6. Thermal characteristics

Table 7. Thermal characteristics

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---------------|---|-------------|-----|-----|-----|------|
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | in free air | [1] | - | 375 | K/W |
| $R_{th(j-t)}$ | thermal resistance from junction to tie-point | | - | - | 300 | K/W |

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

7. Characteristics

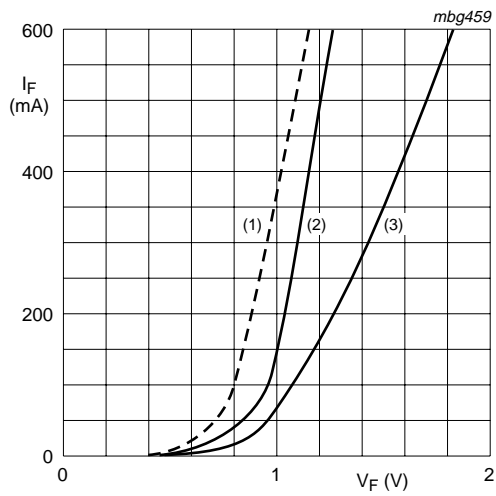
Table 8. Characteristics

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit | |
|----------|-----------------------|------------------------|---|--|------|------|---------------|
| V_F | forward voltage | | [1] | | | | |
| | | $I_F = 100 \text{ mA}$ | - | - | 1.0 | V | |
| | | $I_F = 200 \text{ mA}$ | - | - | 1.25 | V | |
| I_R | reverse current | BAV102 | $V_R = 150 \text{ V}$ | - | - | 100 | nA |
| | | | $V_R = 150 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$ | - | - | 100 | μA |
| | | BAV103 | $V_R = 200 \text{ V}$ | - | - | 100 | nA |
| | | | $V_R = 200 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$ | - | - | 100 | μA |
| | | C_d | diode capacitance | $f = 1 \text{ MHz}; V_R = 0 \text{ V}$ | - | - | 5 |
| t_{rr} | reverse recovery time | | [2] | - | 50 | ns | |

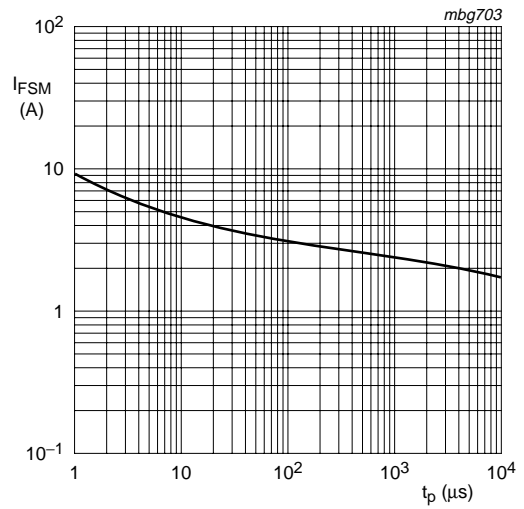
[1] Pulse test: $t_p \leq 300 \mu s$; $\delta \leq 0.02$.

[2] When switched from $I_F = 30 \text{ mA}$ to $I_R = 30 \text{ mA}$; $R_L = 100 \Omega$; measured at $I_R = 3 \text{ mA}$.



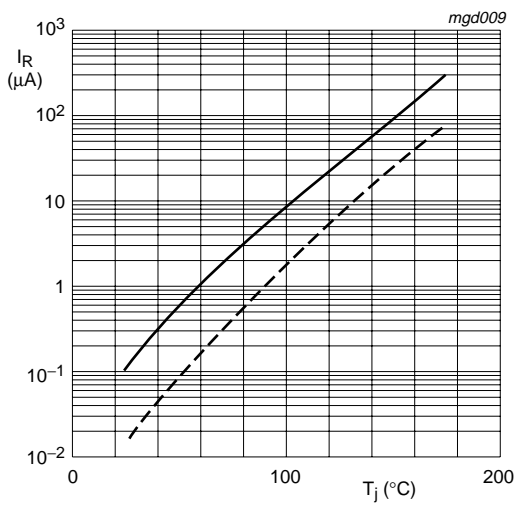
- (1) $T_{amb} = 150\text{ °C}$; typical values
- (2) $T_{amb} = 25\text{ °C}$; typical values
- (3) $T_{amb} = 25\text{ °C}$; maximum values

Fig 1. Forward current as a function of forward voltage



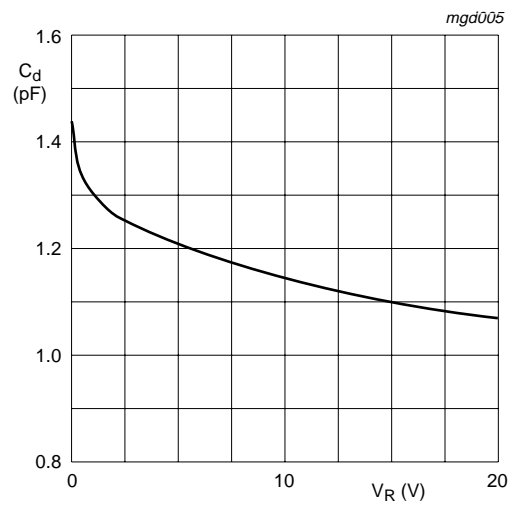
Based on square wave currents.
 $T_j = 25\text{ °C}$; prior to surge

Fig 2. Non-repetitive peak forward current as a function of pulse duration; maximum values



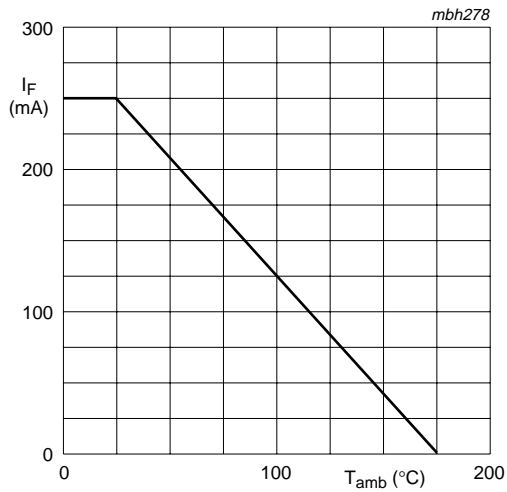
$V_R = V_{Rmax}$
 Solid line: maximum values
 Dotted line: typical values

Fig 3. Reverse current as a function of junction temperature



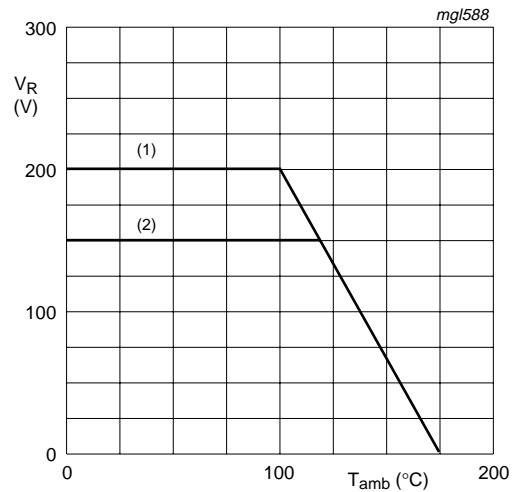
$f = 1\text{ MHz}$; $T_{amb} = 25\text{ °C}$

Fig 4. Diode capacitance as a function of reverse voltage; typical values



FR4 PCB, standard footprint

Fig 5. Forward current as a function of ambient temperature; derating curve

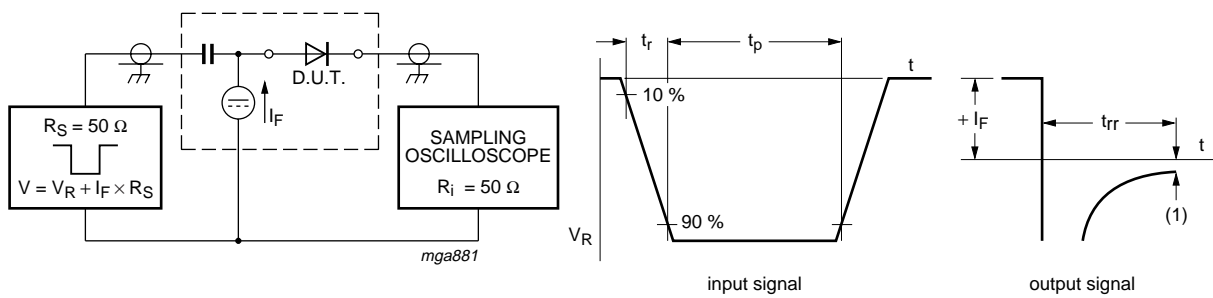


FR4 PCB, standard footprint

- (1) BAV103
- (2) BAV102

Fig 6. Reverse voltage as a function of ambient temperature; derating curve

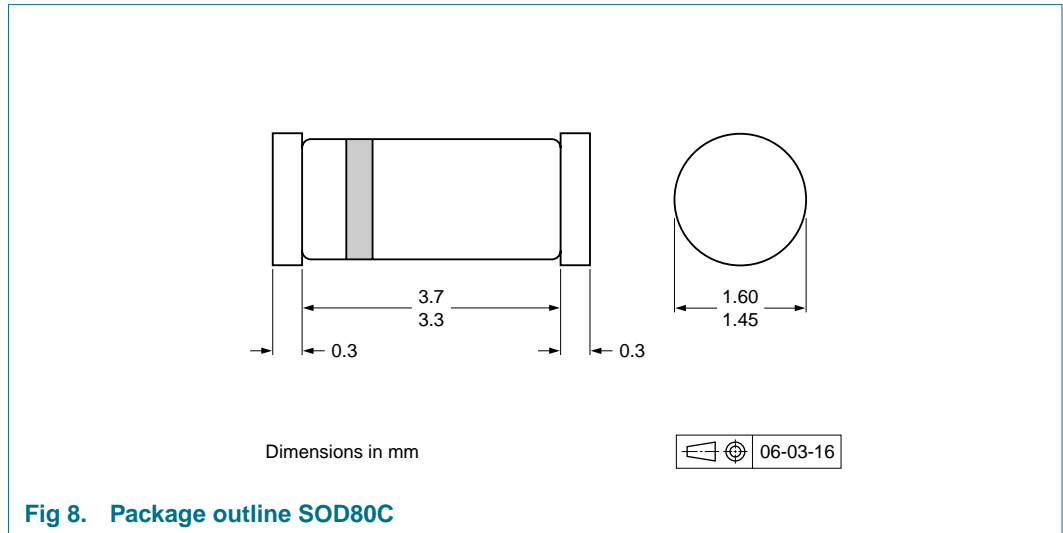
8. Test information



- (1) $I_R = 1 \text{ mA}$

Fig 7. Reverse recovery time test circuit and waveforms

9. Package outline



10. Packing information

Table 9. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.^[1]

| Type number | Package | Description | Packing quantity | |
|-------------|---------|--------------------------------|------------------|-------|
| | | | 2500 | 10000 |
| BAV102 | SOD80C | 4 mm pitch, 8 mm tape and reel | -115 | -135 |
| BAV103 | | | | |

[1] For further information and the availability of packing methods, see [Section 14](#).

11. Soldering

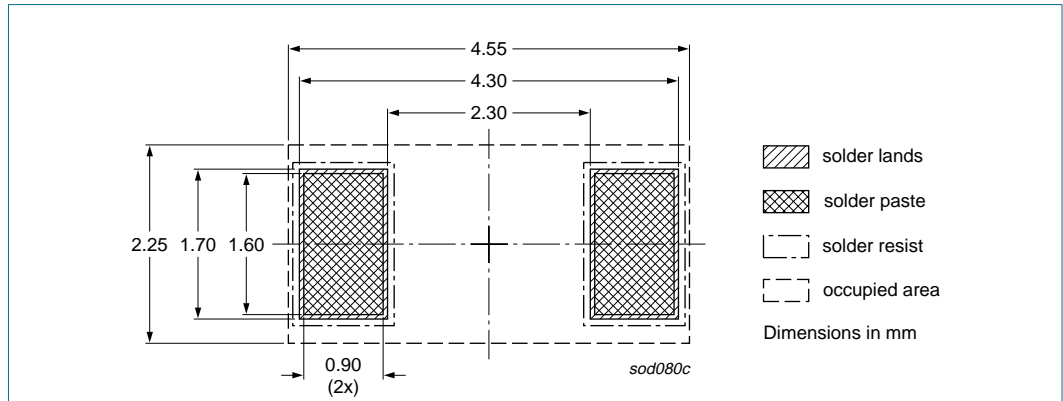


Fig 9. Reflow soldering footprint SOD80C

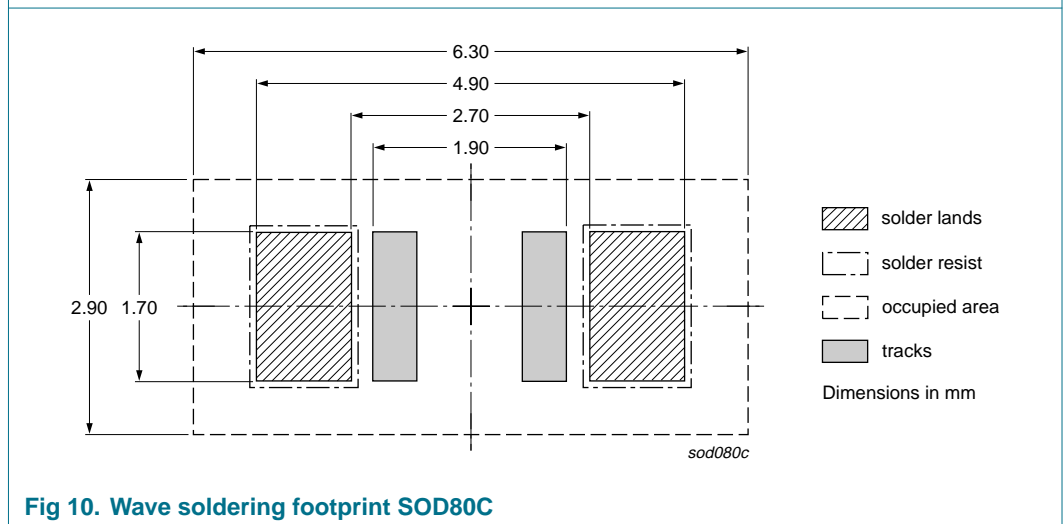


Fig 10. Wave soldering footprint SOD80C

12. Revision history

Table 10. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-----------------|--|-----------------------|---------------|------------|
| BAV102_BAV103_3 | 20070816 | Product data sheet | - | BAV100_2 |
| Modifications: | <ul style="list-style-type: none"> • The format of this data sheet 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. • Type numbers BAV100 and BAV101 have been removed • Section 1.1 “General description”: amended • Table 1 “Product overview”: added • Table 2 “Quick reference data”: added • Section 3 “Ordering information”: added • Figure 7: figure title amended • Figure 8: superseded by minimized package outline drawing • Section 10 “Packing information”: added • Section 11 “Soldering”: added • Section 13 “Legal information”: updated | | | |
| BAV100_2 | 19960917 | Product specification | - | BAV100_1 |
| BAV100_1 | 19960423 | Product specification | - | - |

13. Legal information

13.1 Data sheet status

| 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".

[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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