

BAV102; BAV103

Single general-purpose switching diodes

Rev. 4 — 6 August 2010

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 and benefits

- 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; $\delta \leq 0.02$.

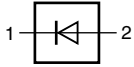

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[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 | Graphic symbol |
|-----|-------------|---|--|
| 1 | cathode | [1] |  006aab040 |
| 2 | anode |  | |

[1] The marking band indicates the cathode.

3. Ordering information

Table 4. Ordering information

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

4. Marking

Table 5. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BAV102 | marking band |
| BAV103 | marking band |

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 |
| 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 |

Table 6. Limiting values ...continued

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

| Symbol | Parameter | Conditions | Min | Max | Unit |
|------------------|-------------------------|------------------------------------|-------|------|------|
| P_{tot} | total power dissipation | $T_{\text{amb}} \leq 25\text{ °C}$ | [2] - | 400 | mW |
| T_{j} | junction temperature | | - | 175 | °C |
| T_{amb} | ambient temperature | | -65 | +175 | °C |
| T_{stg} | storage temperature | | -65 | +175 | °C |

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

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

[3] $T_{\text{j}} = 25\text{ °C}$ prior to surge.

6. Thermal characteristics

Table 7. Thermal characteristics

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

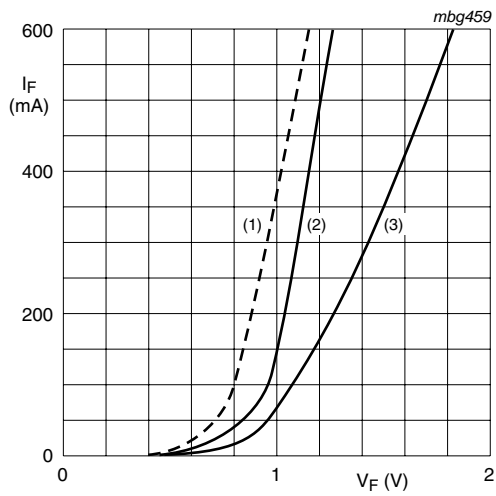
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

7. Characteristics

Table 8. Characteristics $T_{\text{amb}} = 25\text{ °C}$ unless otherwise specified.

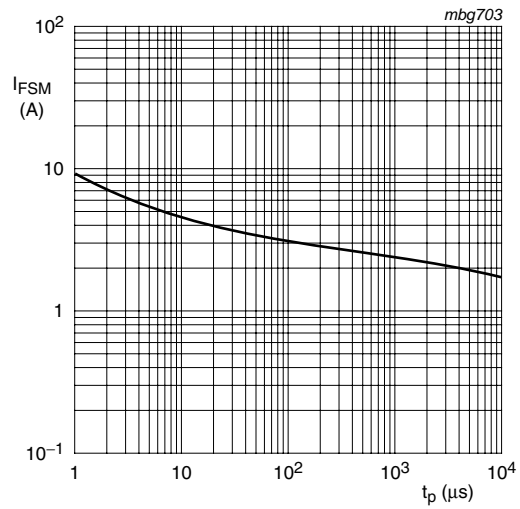
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit | |
|-----------------|-----------------------|---|---|-----|------|---------------|---------------|
| V_{F} | forward voltage | | [1] | | | | |
| | | $I_{\text{F}} = 100\text{ mA}$ | - | - | 1.0 | V | |
| | | $I_{\text{F}} = 200\text{ mA}$ | - | - | 1.25 | V | |
| I_{R} | reverse current | | | | | | |
| | | BAV102 | $V_{\text{R}} = 150\text{ V}$ | - | - | 100 | nA |
| | | | $V_{\text{R}} = 150\text{ V}; T_{\text{j}} = 150\text{ °C}$ | - | - | 100 | μA |
| | | BAV103 | $V_{\text{R}} = 200\text{ V}$ | - | - | 100 | nA |
| | | $V_{\text{R}} = 200\text{ V}; T_{\text{j}} = 150\text{ °C}$ | - | - | 100 | μA | |
| C_{d} | diode capacitance | $f = 1\text{ MHz}; V_{\text{R}} = 0\text{ V}$ | - | - | 5 | pF | |
| t_{rr} | reverse recovery time | | [2] - | - | 50 | ns | |

[1] Pulse test: $t_p \leq 300\ \mu\text{s}$; $\delta \leq 0.02$.[2] When switched from $I_{\text{F}} = 30\text{ mA}$ to $I_{\text{R}} = 30\text{ mA}$; $R_{\text{L}} = 100\ \Omega$; measured at $I_{\text{R}} = 3\text{ mA}$.



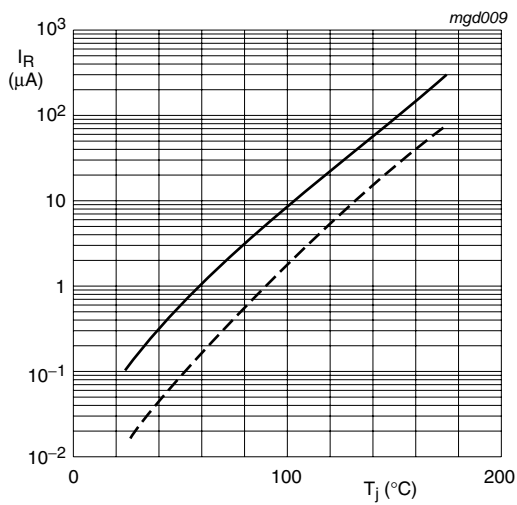
- (1) $T_{amb} = 150\text{ °C}$; typical values
- (2) $T_{amb} = 25\text{ °C}$; typical values
- (3) $T_{amb} = 25\text{ °C}$; maximum values

Fig 1. Forward current as a function of forward voltage



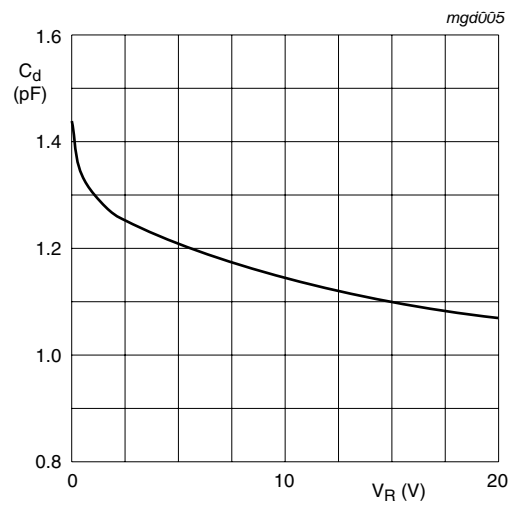
Based on square wave currents.
 $T_j = 25\text{ °C}$; prior to surge

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



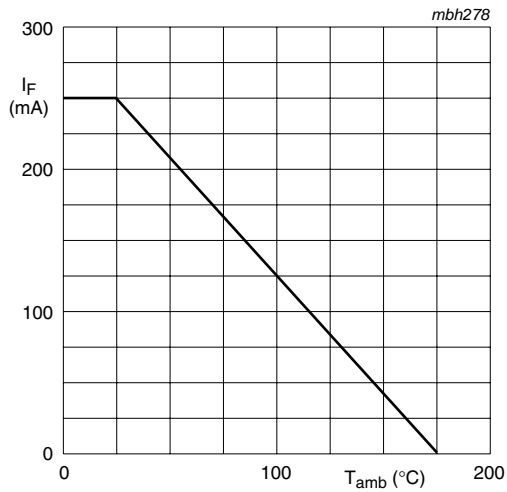
$V_R = V_{Rmax}$
 Solid line: maximum values
 Dotted line: typical values

Fig 3. Reverse current as a function of junction temperature



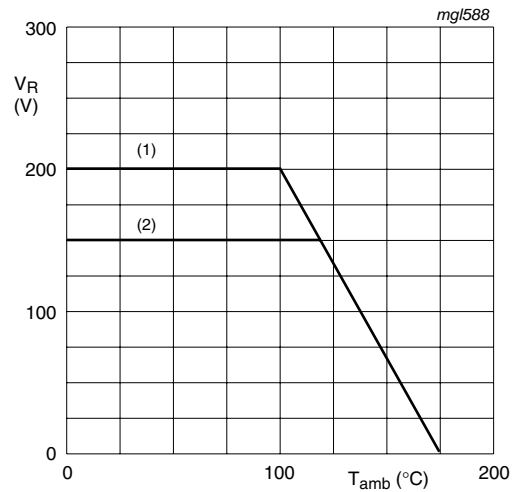
$f = 1\text{ MHz}$; $T_{amb} = 25\text{ °C}$

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

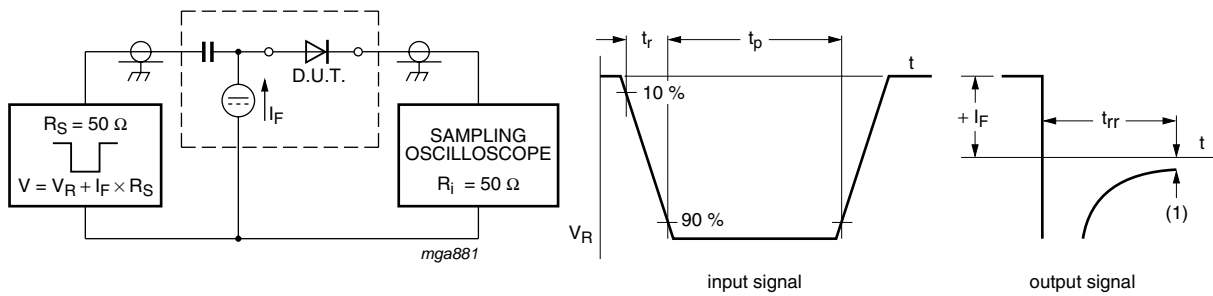


FR4 PCB, standard footprint

- (1) BAV103
- (2) BAV102

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

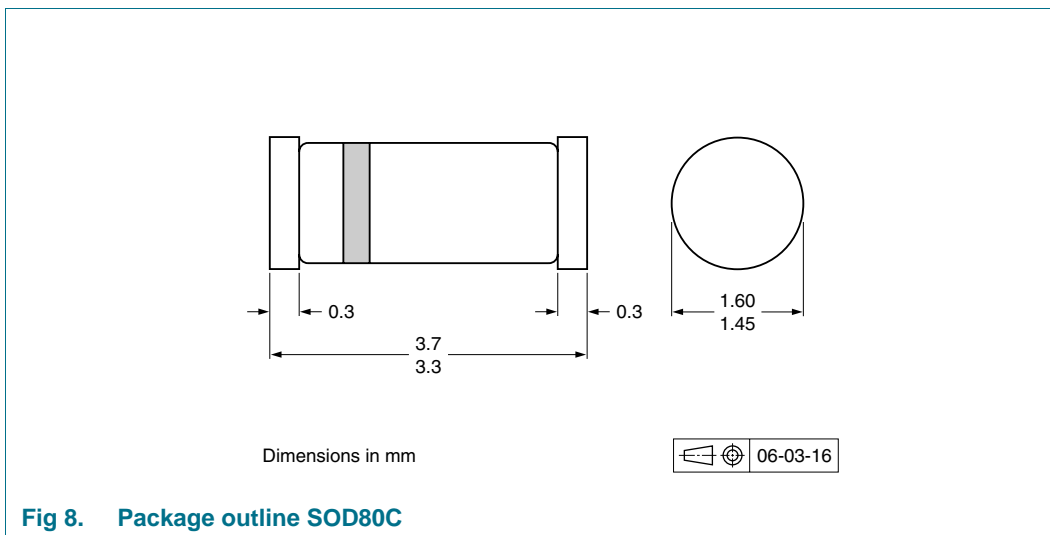
8. Test information



- (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

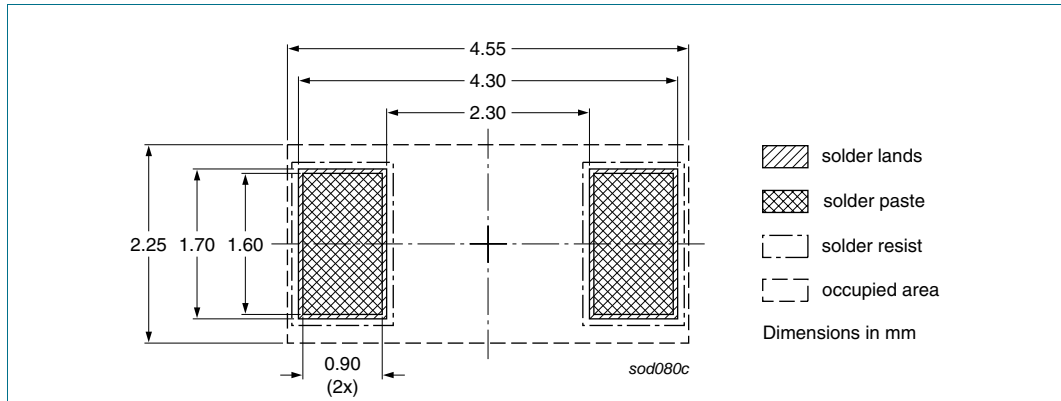


Fig 9. Reflow soldering footprint SOD80C

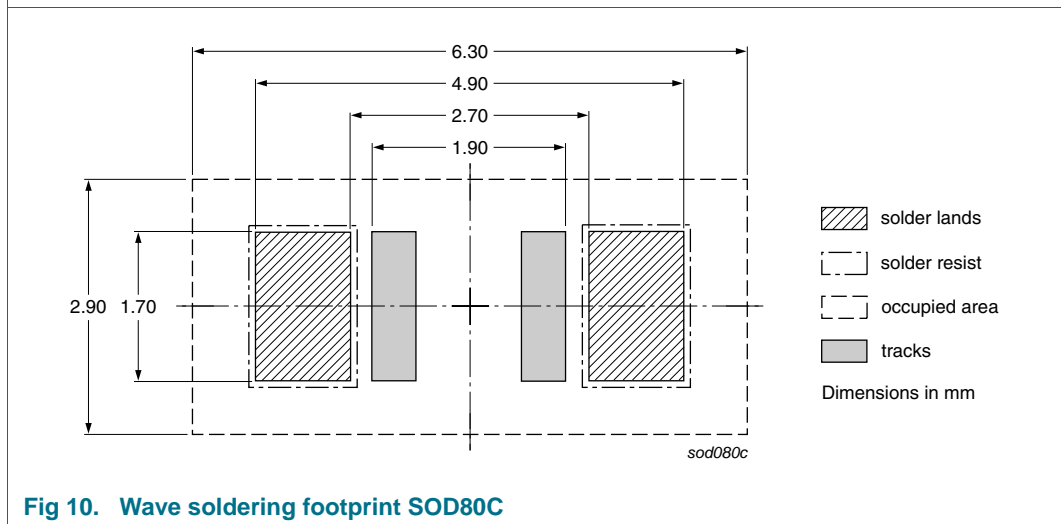


Fig 10. Wave soldering footprint SOD80C

12. Revision history

Table 10. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|-------------------|--|-----------------------|---------------|-----------------|
| BAV102_BAV103 v.4 | 20100806 | Product data sheet | - | BAV102_BAV103_3 |
| Modifications: | <ul style="list-style-type: none">• Section 4 "Marking": updated• Section 13 "Legal information": updated | | | |
| BAV102_BAV103_3 | 20070816 | Product data sheet | - | BAV100_2 |
| 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".

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