

BAS45AL

Low-leakage diode

Rev. 5 — 6 August 2010

Product data sheet

1. Product profile

1.1 General description

Epitaxial medium-speed switching diode with a low leakage current, encapsulated in a small hermetically sealed glass SOD80C Surface-Mounted Device (SMD) package.

1.2 Features and benefits

- Continuous reverse voltage: max. 125 V
- Repetitive peak forward current: max. 625 mA
- Low reverse current: max. 1 nA
- Switching time: typ. 1.5 μ s

1.3 Applications

- Low leakage current applications

1.4 Quick reference data


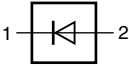
Table 1. Quick reference data

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|--------|-----------------|----------------|-----|-----|------|------|
| I_F | forward current | [1] | - | - | 250 | mA |
| V_R | reverse voltage | | - | - | 125 | V |
| V_F | forward voltage | $I_F = 100$ mA | - | - | 1000 | mV |

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

2. Pinning information

Table 2. Pinning

| Pin | Description | Simplified outline | Graphic symbol |
|-----|-------------|---|---|
| 1 | cathode |  |  |
| 2 | anode | | |

006aab040

[1] The marking band indicates the cathode.

3. Ordering information

Table 3. Ordering information

| Type number | Package | | |
|-------------|---------|--|---------|
| | Name | Description | Version |
| BAS45AL | - | hermetically sealed glass surface-mounted package; 2 connectors | SOD80C |

4. Marking

Table 4. Marking codes

| Type number | Marking code |
|-------------|--------------|
| BAS45AL | 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_{RRM} | repetitive peak reverse voltage | | - | 125 | V |
| V_R | reverse voltage | | - | 125 | V |
| I_F | forward current | [1] | - | 250 | mA |
| I_{FRM} | repetitive peak forward current | | - | 625 | mA |
| I_{FSM} | non-repetitive peak forward current | square wave | [2] | | |
| | | $t_p = 1 \mu s$ | - | 4 | A |
| | | $t_p = 1 ms$ | - | 1 | A |
| | | $t_p = 1 s$ | - | 0.5 | A |
| P_{tot} | total power dissipation | $T_{amb} \leq 25\text{ °C}$ | [1] | - | 400 mW |
| T_j | junction temperature | | - | 175 | °C |
| T_{stg} | storage temperature | | -65 | +175 | °C |

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

[2] $T_j = 25\text{ °C}$ prior to surge.

6. Thermal characteristics

Table 6. Thermal characteristics

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

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

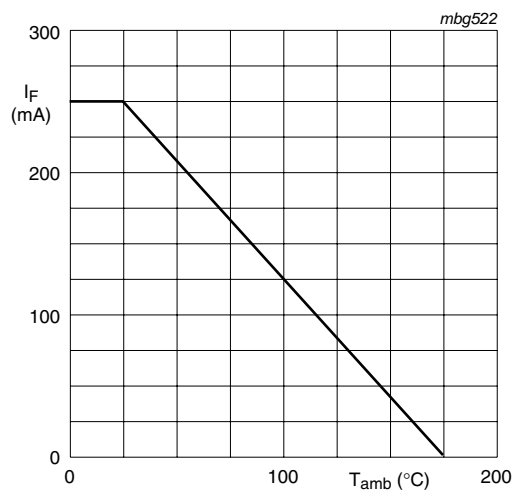
7. Characteristics

Table 7. Characteristics

$T_j = 25\text{ °C}$ unless otherwise specified.

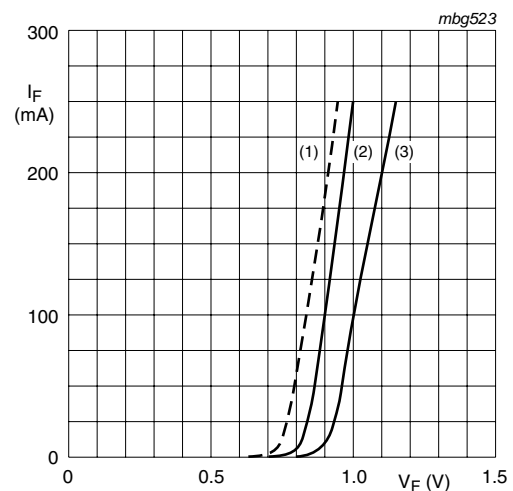
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------|-----------------------|---|-------|-----|------|------|
| V_F | forward voltage | $I_F = 1\text{ mA}$ | - | - | 780 | mV |
| | | $I_F = 10\text{ mA}$ | - | - | 860 | mV |
| | | $I_F = 100\text{ mA}$ | - | - | 1000 | mV |
| I_R | reverse current | $E_{max} = 100\text{ lx}$ | | | | |
| | | $V_R = 125\text{ V}$ | - | - | 1 | nA |
| | | $V_R = 30\text{ V}; T_j = 125\text{ °C}$ | - | - | 300 | nA |
| | | $V_R = 125\text{ V}; T_j = 125\text{ °C}$ | - | - | 500 | nA |
| | | $V_R = 125\text{ V}; T_j = 150\text{ °C}$ | - | - | 2 | μA |
| C_d | diode capacitance | $V_R = 0\text{ V}; f = 1\text{ MHz}$ | - | - | 4 | pF |
| t_{rr} | reverse recovery time | | [1] - | 1.5 | - | μs |

[1] When switched from $I_F = 10\text{ mA}$ to $I_R = 10\text{ mA}$; $R_L = 100\text{ Ω}$; measured at $I_R = 1\text{ mA}$.



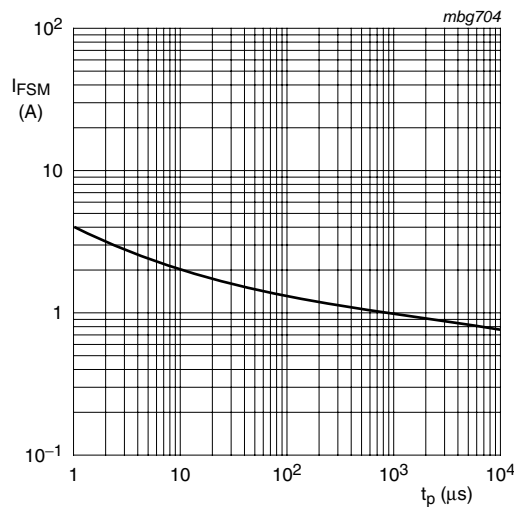
FR4 PCB, standard footprint

Fig 1. Forward current as a function of ambient temperature; derating curve



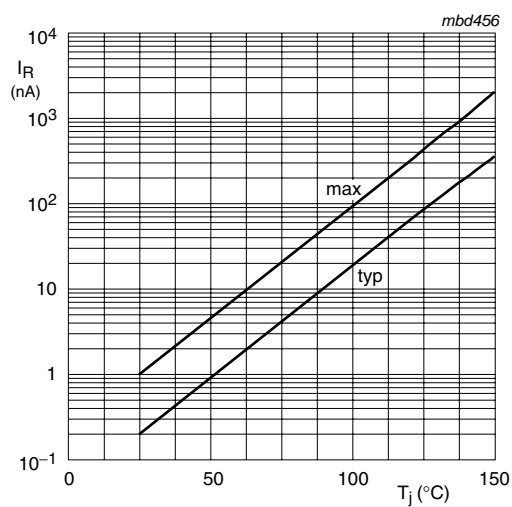
- (1) $T_j = 150\text{ °C}$; typical values
- (2) $T_j = 25\text{ °C}$; typical values
- (3) $T_j = 25\text{ °C}$; maximum values

Fig 2. Forward current as a function of forward voltage



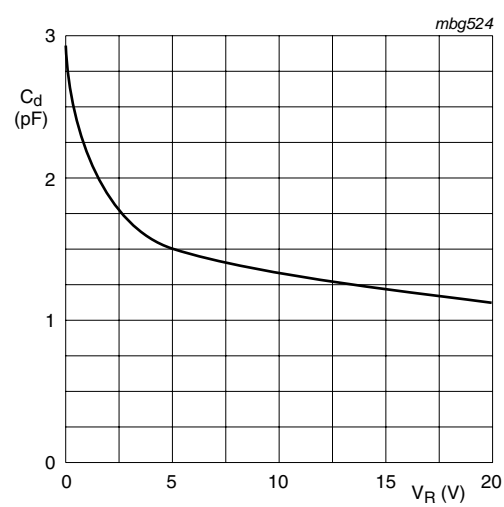
Based on square wave currents.
 $T_j = 25\text{ °C}$ prior to surge

Fig 3. Non-repetitive peak forward current as a function of pulse duration; maximum values



$V_R = 125\text{ V}$

Fig 4. Reverse current as a function of junction temperature



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

Fig 5. Diode capacitance as a function of reverse voltage; typical values

8. Test information

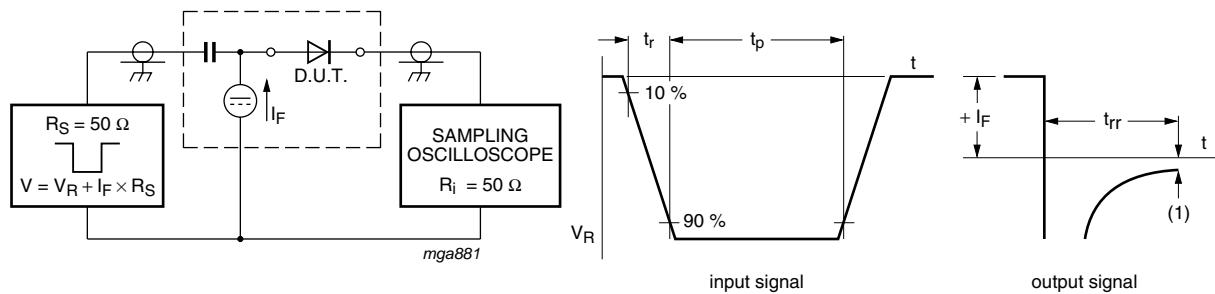
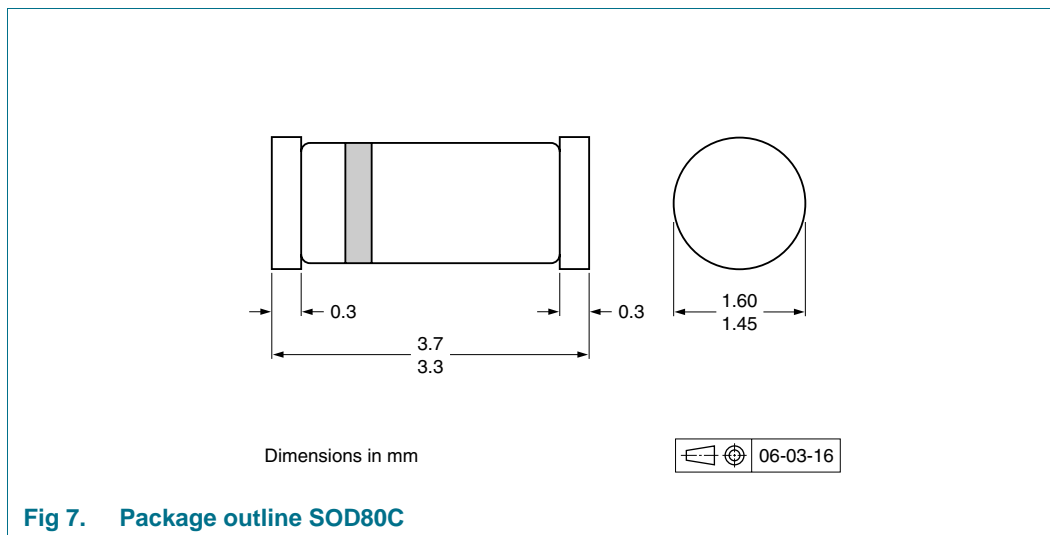


Fig 6. Reverse recovery time test circuit and waveforms

9. Package outline



10. Packing information

Please refer to packing information on www.nexperia.com.

11. Soldering

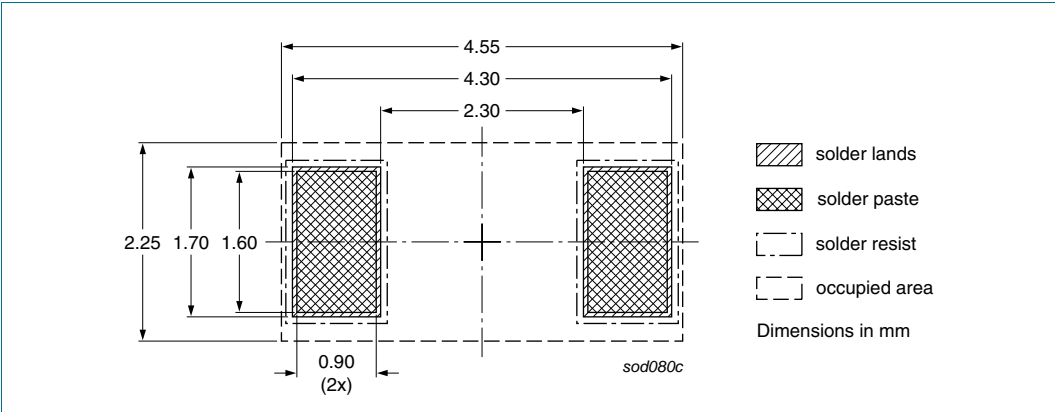


Fig 8. Reflow soldering footprint SOD80C

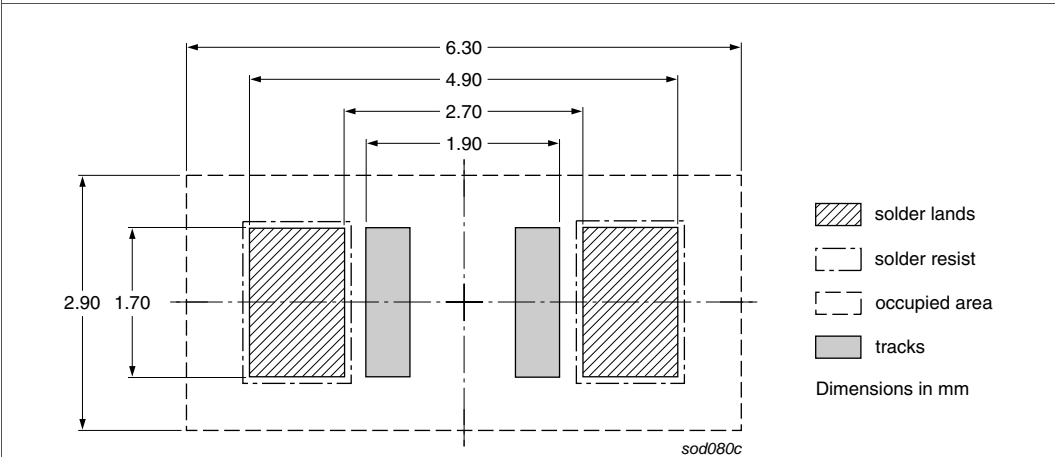


Fig 9. Wave soldering footprint SOD80C

12. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|---|-----------------------|---------------|------------|
| BAS45AL v.5 | 20100806 | Product data sheet | - | BAS45AL_4 |
| 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.• Table 1 “Quick reference data”: added• Section 4 “Marking”: added• Figure 7: superseded by minimized package outline drawing• Section 10 “Packing information”: added• Section 11 “Soldering”: added• Section 13 “Legal information”: updated | | | |
| BAS45AL_4 | 19990528 | Product specification | - | BAS45AL_3 |
| BAS45AL_3 | 19990504 | Product specification | - | BAS45AL_2 |
| BAS45AL_2 | 19960313 | Product specification | - | BAS45AL_1 |

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.nexperia.com>.

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