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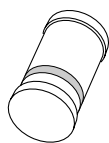
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Kind regards,

Team Nexperia



# 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  $\mu$ s

### 1.3 Applications

- Low leakage current applications

### 1.4 Quick reference data

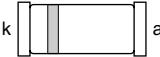
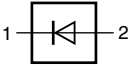
Table 1. Quick reference data

| 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;<br>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             | $T_{amb} \leq 25^\circ C$ | [1] | 400  | mW         |
| $T_j$     | junction temperature                |                           | -   | 175  | $^\circ C$ |
| $T_{stg}$ | storage temperature                 |                           | -65 | +175 | $^\circ C$ |

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

[2]  $T_j = 25^\circ C$  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 | <a href="#">[1]</a> - | -   | 375 | K/W  |

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

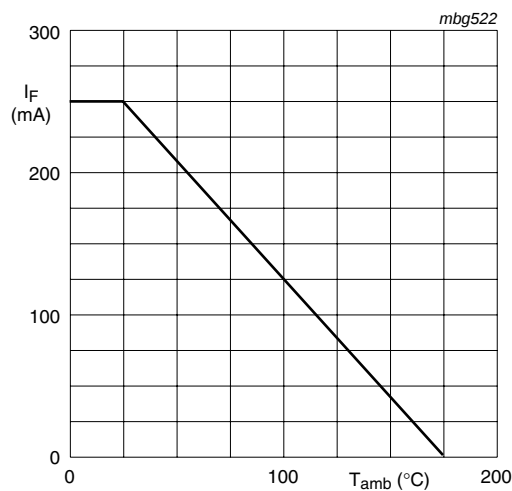
## 7. Characteristics

**Table 7. Characteristics**

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

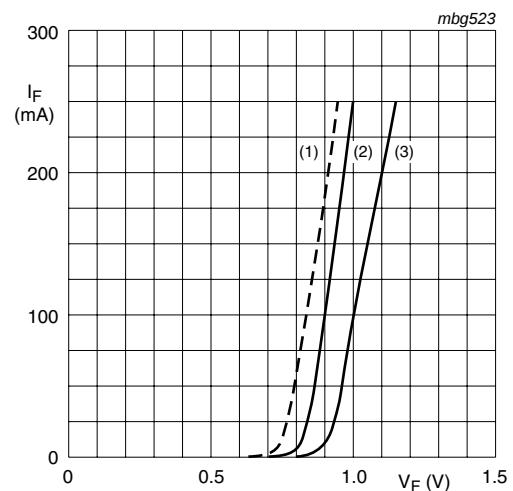
| Symbol   | Parameter             | Conditions                                | Min                   | Typ | Max  | Unit |
|----------|-----------------------|-------------------------------------------|-----------------------|-----|------|------|
| $V_F$    | forward voltage       | $I_F = 1\text{ mA}$                       | -                     | -   | 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 |                                           | <a href="#">[1]</a> - | 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  $I_R = 1\text{ mA}$ .



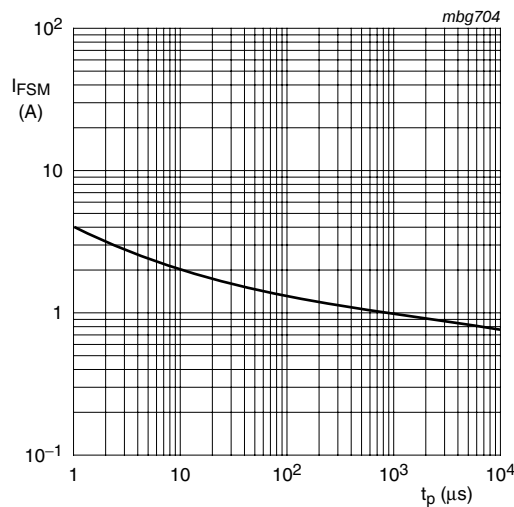
FR4 PCB, standard footprint

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



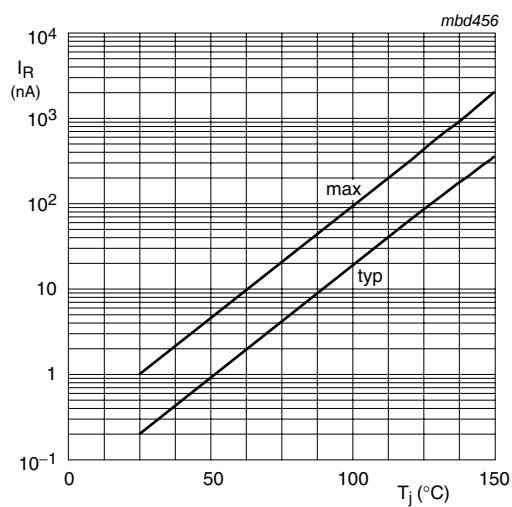
- (1)  $T_j = 150\text{ °C}$ ; typical values
- (2)  $T_j = 25\text{ °C}$ ; typical values
- (3)  $T_j = 25\text{ °C}$ ; maximum values

Fig 2. Forward current as a function of forward voltage



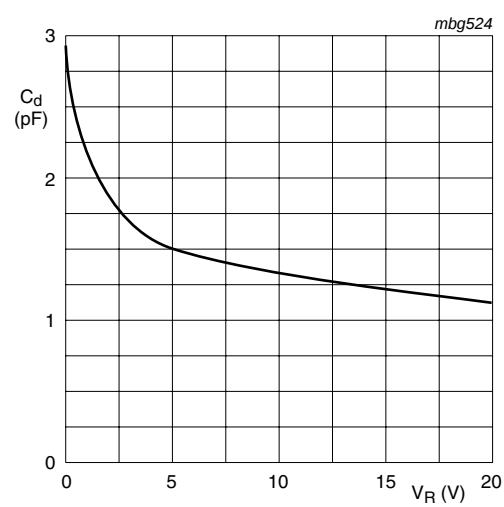
Based on square wave currents.  
 $T_j = 25\text{ °C}$  prior to surge

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

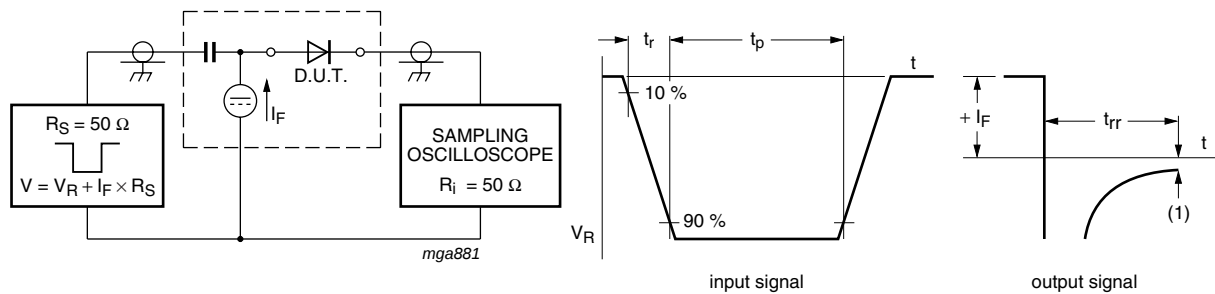
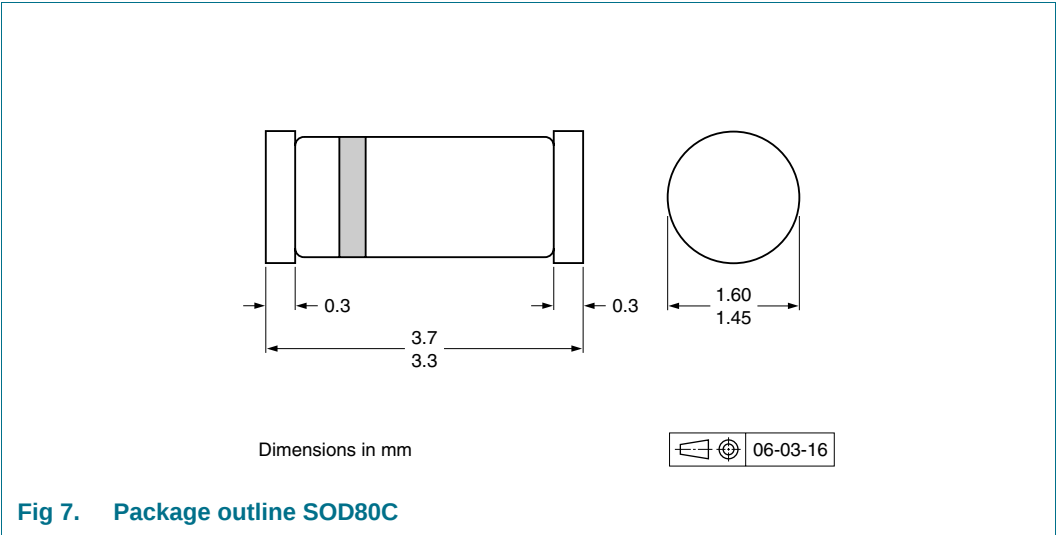


Fig 6. Reverse recovery time test circuit and waveforms

9. Package outline



10. Packing information

**Table 8. Packing methods**  
The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

| Type number | Package | Description                    | Packing quantity |       |
|-------------|---------|--------------------------------|------------------|-------|
|             |         |                                | 2500             | 10000 |
| BAS45AL     | SOD80C  | 4 mm pitch, 8 mm tape and reel | -115             | -135  |

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

11. Soldering

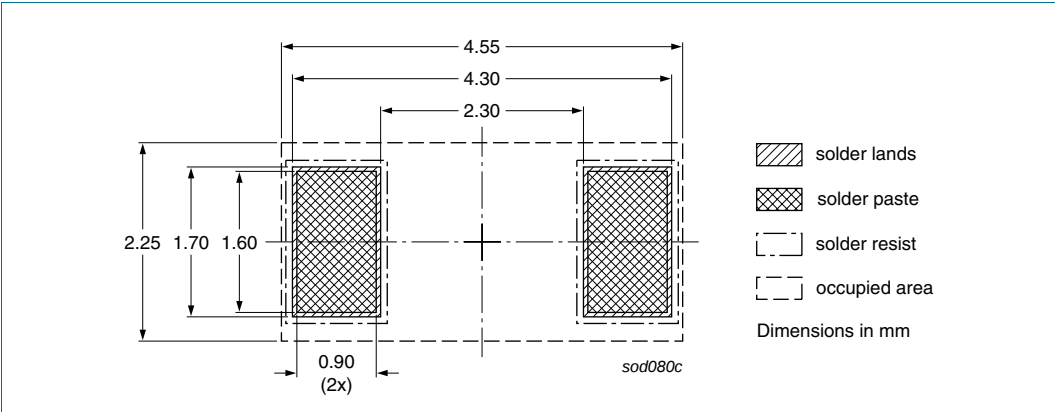


Fig 8. Reflow soldering footprint SOD80C

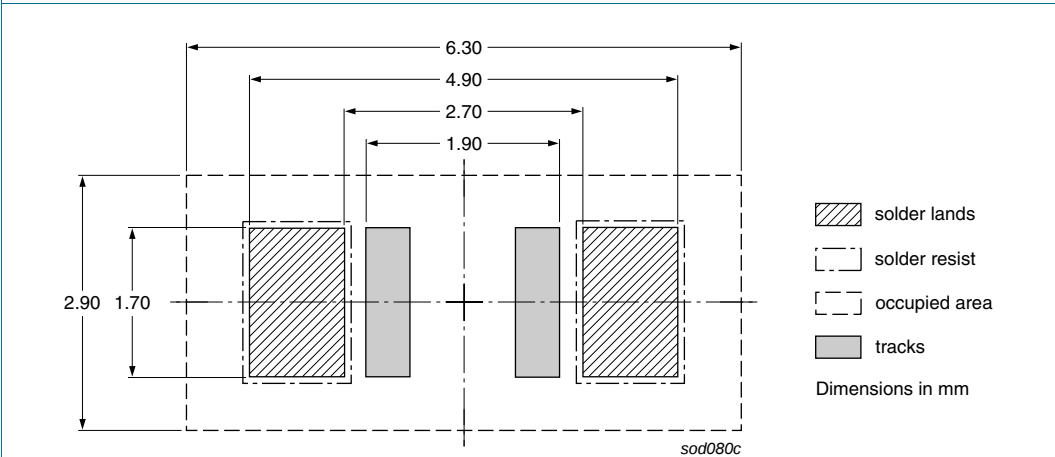


Fig 9. Wave soldering footprint SOD80C

## 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"><li>• The format of this data sheet 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>• <a href="#">Table 1 "Quick reference data"</a>: added</li><li>• <a href="#">Section 4 "Marking"</a>: added</li><li>• <a href="#">Figure 7</a>: superseded by minimized package outline drawing</li><li>• <a href="#">Section 10 "Packing information"</a>: added</li><li>• <a href="#">Section 11 "Soldering"</a>: added</li><li>• <a href="#">Section 13 "Legal information"</a>: updated</li></ul> |                       |               |            |
| 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 <sup>[1][2]</sup> | Product status <sup>[3]</sup> | 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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Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

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Date of release: 6 August 2010

Document identifier: BAS45AL

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