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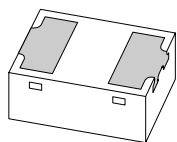
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Kind regards,

Team Nexperia



# BAS16LD

Single high-speed switching diode

Rev. 1 — 12 October 2010

Product data sheet

## 1. Product profile

### 1.1 General description

Single high-speed switching diode, encapsulated in a SOD882D leadless ultra small Surface-Mounted Device (SMD) plastic package with visible and solderable side pads.

### 1.2 Features and benefits

- High switching speed:  $t_{rr} \leq 4$  ns
- Low leakage current
- Repetitive peak reverse voltage:  $V_{RRM} \leq 100$  V
- AEC-Q101 qualified
- Low capacitance
- Reverse voltage:  $V_R \leq 100$  V
- Ultra small and leadless SMD plastic package
- Solderable side pads

### 1.3 Applications

- High-speed switching
- General-purpose switching

### 1.4 Quick reference data

Table 1. Quick reference data

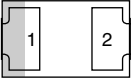
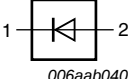
| Symbol   | Parameter             | Conditions   | Min   | Typ | Max | Unit    |
|----------|-----------------------|--------------|-------|-----|-----|---------|
| $I_F$    | forward current       |              | [1] - | -   | 215 | mA      |
| $I_R$    | reverse current       | $V_R = 80$ V | -     | -   | 0.5 | $\mu$ A |
| $V_R$    | reverse voltage       |              | -     | -   | 100 | V       |
| $t_{rr}$ | reverse recovery time |              | [2] - | -   | 4   | ns      |

[1] Device mounted on an FR4 Printed-Circuit Board (PCB) with 60  $\mu$ m copper strip line.

[2] When switched from  $I_F = 10$  mA to  $I_R = 10$  mA;  $R_L = 100$   $\Omega$ ; measured at  $I_R = 1$  mA.



2. Pinning information

| Table 2. Pinning |             |                                                                                                             |                                                                                     |
|------------------|-------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Pin              | Description | Simplified outline                                                                                          | Graphic symbol                                                                      |
| 1                | cathode     | <br>Transparent top view |  |
| 2                | anode       |                                                                                                             |                                                                                     |

[1] The marking bar indicates the cathode.

3. Ordering information

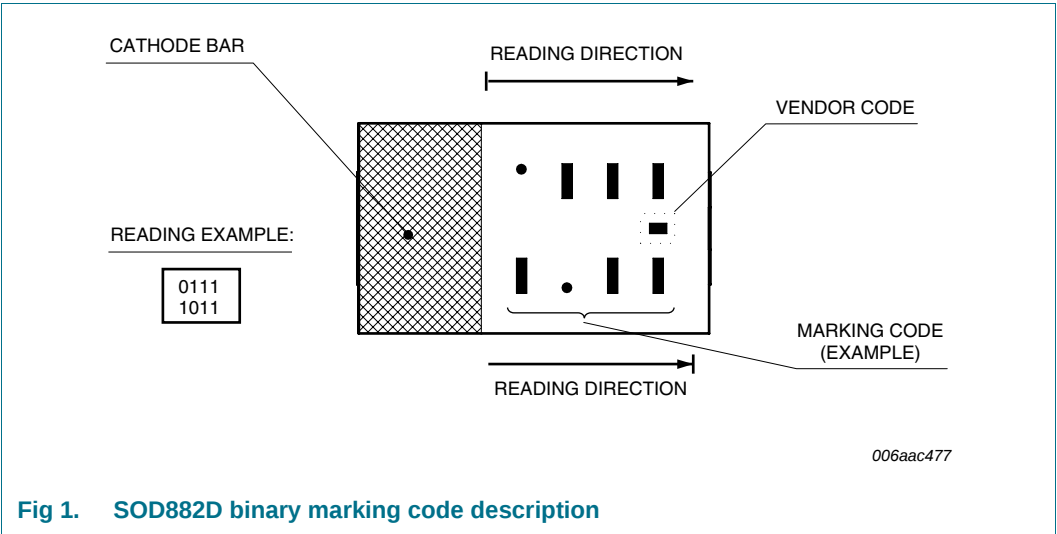
| Table 3. Ordering information |         |                                                                            |         |
|-------------------------------|---------|----------------------------------------------------------------------------|---------|
| Type number                   | Package |                                                                            |         |
|                               | Name    | Description                                                                | Version |
| BAS16LD                       | -       | leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.4 mm | SOD882D |

4. Marking

| Table 4. Marking codes |                             |
|------------------------|-----------------------------|
| Type number            | Marking code <sup>[1]</sup> |
| BAS16LD                | 1000<br>0000                |

[1] For SOD882D binary marking code description, see [Figure 1](#).

4.1 Binary marking code description



## 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     |                                              | -      | 100  | V          |
| $V_R$     | reverse voltage                     |                                              | -      | 100  | V          |
| $I_F$     | forward current                     |                                              | [1]    | 215  | mA         |
| $I_{FRM}$ | repetitive peak forward current     | $t_p \leq 0.5 \mu s$ ;<br>$\delta \leq 0.25$ | -      | 500  | 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][3] | 250  | mW         |
| $T_j$     | junction temperature                |                                              | -      | 150  | $^\circ C$ |
| $T_{amb}$ | ambient temperature                 |                                              | -55    | +150 | $^\circ C$ |
| $T_{stg}$ | storage temperature                 |                                              | -65    | +150 | $^\circ C$ |

[1] Device mounted on an FR4 PCB with 60  $\mu m$  copper strip line.

[2]  $T_j = 25^\circ C$  prior to surge.

[3] Reflow soldering is the only recommended soldering method.

## 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][2] | -   | 500 | K/W  |

[1] Device mounted on an FR4 PCB with 60  $\mu m$  copper strip line.

[2] Reflow soldering is the only recommended soldering method.

## 7. Characteristics

**Table 7. Characteristics**

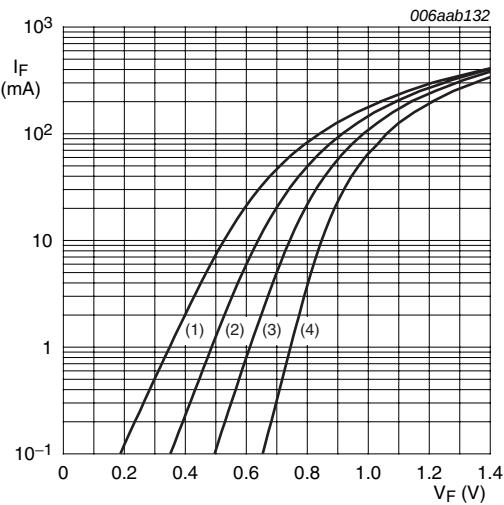
$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

| Symbol   | Parameter                | Conditions                                             | Min | Typ | Max  | Unit          |
|----------|--------------------------|--------------------------------------------------------|-----|-----|------|---------------|
| $V_F$    | forward voltage          |                                                        | [1] |     |      |               |
|          |                          | $I_F = 1\text{ mA}$                                    | -   | -   | 715  | mV            |
|          |                          | $I_F = 10\text{ mA}$                                   | -   | -   | 855  | mV            |
|          |                          | $I_F = 50\text{ mA}$                                   | -   | -   | 1    | V             |
|          |                          | $I_F = 150\text{ mA}$                                  | -   | -   | 1.25 | V             |
| $I_R$    | reverse current          | $V_R = 25\text{ V}$                                    | -   | -   | 30   | nA            |
|          |                          | $V_R = 80\text{ V}$                                    | -   | -   | 0.5  | $\mu\text{A}$ |
|          |                          | $V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$ | -   | -   | 30   | $\mu\text{A}$ |
|          |                          | $V_R = 80\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$ | -   | -   | 50   | $\mu\text{A}$ |
| $C_d$    | diode capacitance        | $f = 1\text{ MHz}; V_R = 0\text{ V}$                   | -   | -   | 1.5  | pF            |
| $t_{rr}$ | reverse recovery time    |                                                        | [2] | -   | 4    | ns            |
| $V_{FR}$ | forward recovery voltage |                                                        | [3] | -   | 1.75 | V             |

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

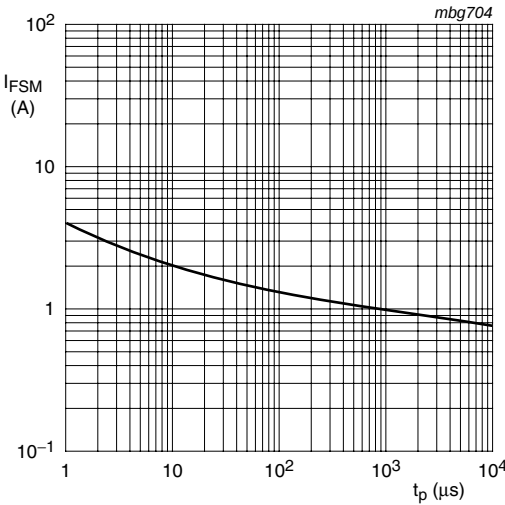
[2] When switched from  $I_F = 10\text{ mA}$  to  $I_R = 10\text{ mA}$ ;  $R_L = 100\text{ }\Omega$ ; measured at  $I_R = 1\text{ mA}$ .

[3] When switched from  $I_F = 10\text{ mA}$ ;  $t_r = 20\text{ ns}$ .



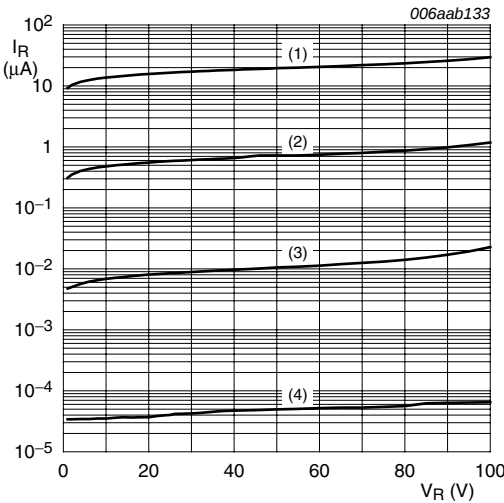
- (1)  $T_{amb} = 150\text{ }^{\circ}\text{C}$
- (2)  $T_{amb} = 85\text{ }^{\circ}\text{C}$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (4)  $T_{amb} = -40\text{ }^{\circ}\text{C}$

Fig 2. Forward current as a function of forward voltage; typical values



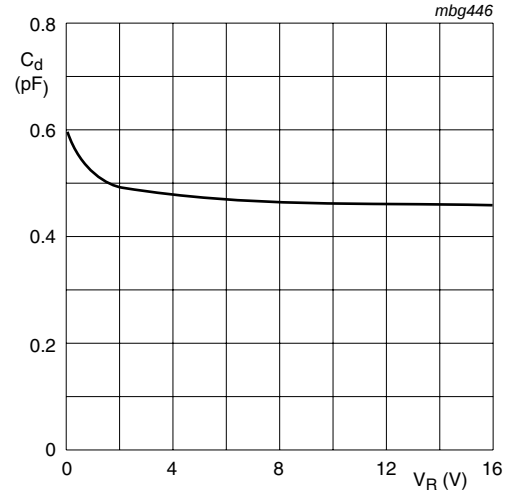
Based on square wave currents.  
 $T_j = 25\text{ }^{\circ}\text{C}$ ; prior to surge

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



- (1)  $T_{amb} = 150\text{ }^{\circ}\text{C}$
- (2)  $T_{amb} = 85\text{ }^{\circ}\text{C}$
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}$
- (4)  $T_{amb} = -40\text{ }^{\circ}\text{C}$

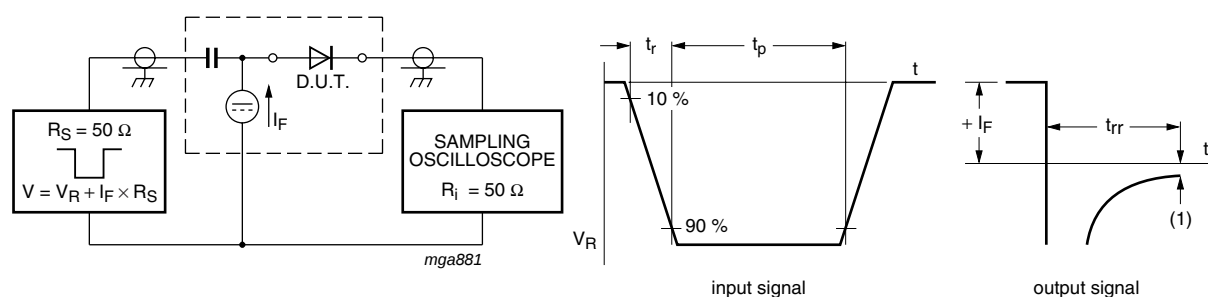
Fig 4. Reverse current as a function of reverse voltage; typical values



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

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

## 8. Test information

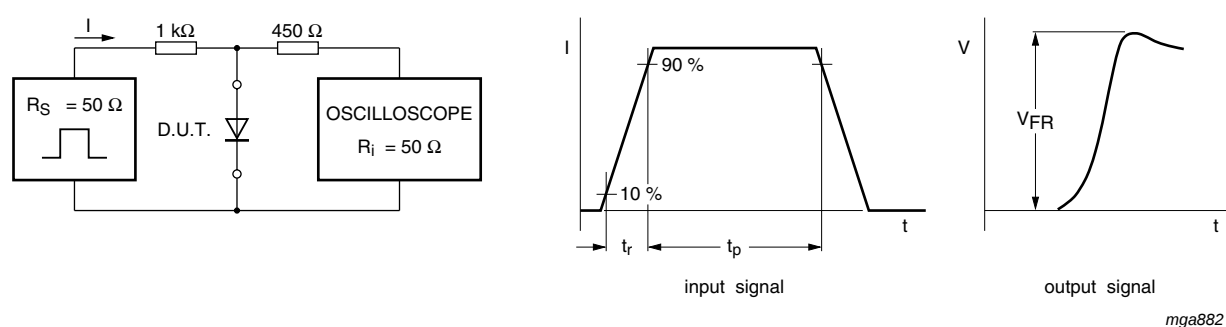


(1)  $I_R = 1 \text{ mA}$

Input signal: reverse pulse rise time  $t_r = 0.6 \text{ ns}$ ; reverse voltage pulse duration  $t_p = 100 \text{ ns}$ ; duty cycle  $\delta = 0.05$

Oscilloscope: rise time  $t_r = 0.35 \text{ ns}$

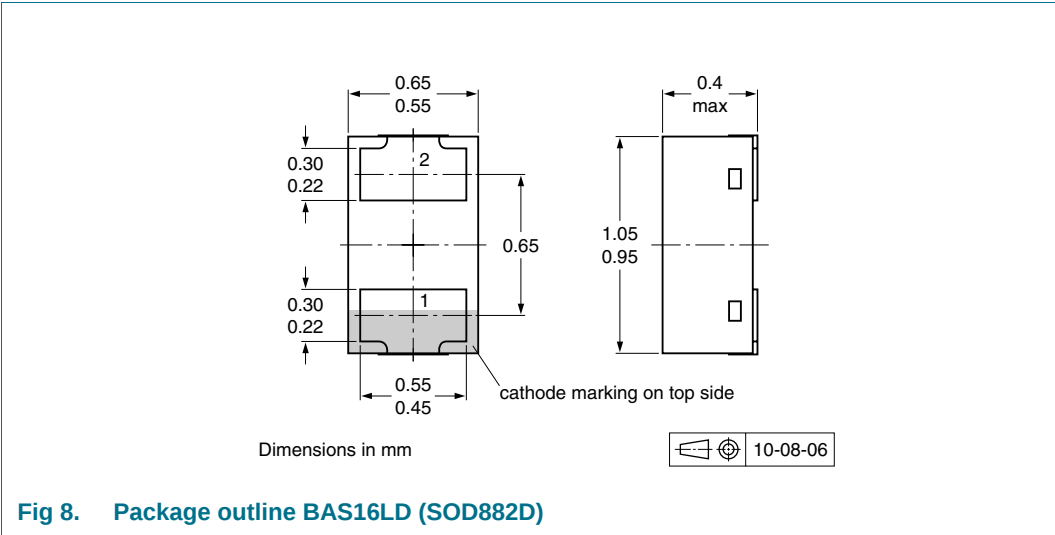
**Fig 6. Reverse recovery time test circuit and waveforms**



Input signal: forward pulse rise time  $t_r = 20 \text{ ns}$ ; forward current pulse duration  $t_p \geq 100 \text{ ns}$ ; duty cycle  $\delta \leq 0.005$

**Fig 7. Forward recovery voltage test circuit and waveforms**

9. Package outline



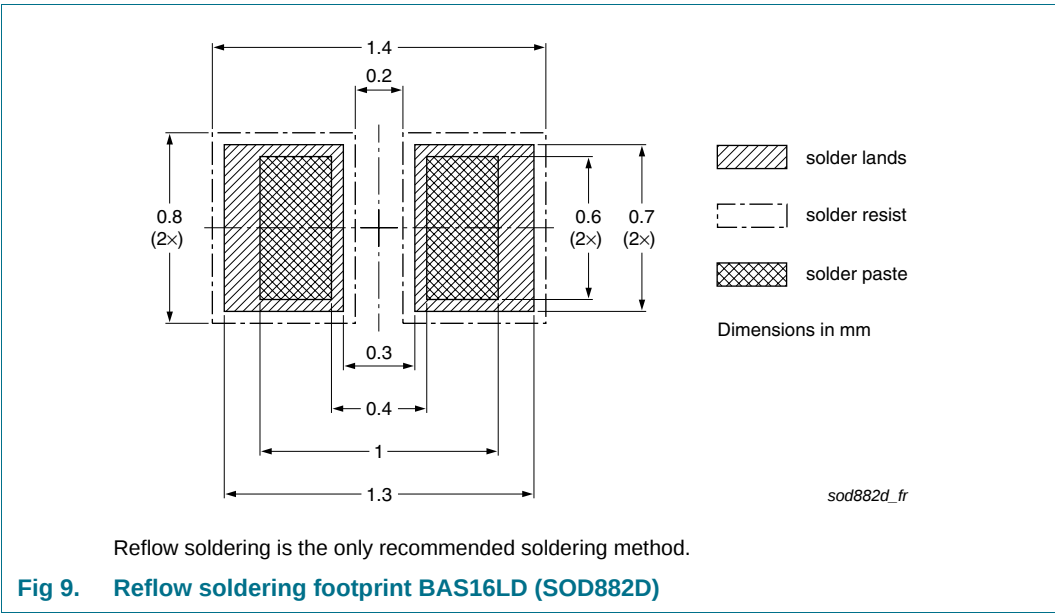
10. Packing information

**Table 8. Packing methods**  
*The indicated -xxx are the last three digits of the 12NC ordering code.*[\[1\]](#)

| Type number | Package | Description                    | Packing quantity |
|-------------|---------|--------------------------------|------------------|
|             |         |                                | 10000            |
| BAS16LD     | SOD882D | 2 mm pitch, 8 mm tape and reel | -315             |

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

11. Soldering



## 12. Revision history

Table 9. Revision history

| Document ID | Release date | Data sheet status  | Change notice | Supersedes |
|-------------|--------------|--------------------|---------------|------------|
| BAS16LD v.1 | 20101012     | Product data sheet | -             | -          |

## 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.

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