**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:  $t_{rr} \le 4$  ns
- Low leakage current
- Repetitive peak reverse voltage: V<sub>RRM</sub> ≤ 100 V
- AEC-Q101 qualified

- Low capacitance
- Reverse voltage: V<sub>R</sub> ≤ 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	Тур	Max	Unit
$I_{F}$	forward current		<u>[1]</u> _	-	215	mA
I <sub>R</sub>	reverse current	V <sub>R</sub> = 80 V	-	-	0.5	μΑ
$V_R$	reverse voltage		-	-	100	V
t <sub>rr</sub>	reverse recovery time		[2] _	-	4	ns

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



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

#### Single high-speed switching diode

# 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode	<u>[1]</u>	
2	anode	1 2	1 2 006aab040
		Transparent top view	

<sup>[1]</sup> The marking bar indicates the cathode.

# 3. Ordering information

Table 3. Ordering information

Type number	r Package			
	Name	Description	Version	
BAS16LD	-	leadless ultra small plastic package; 2 terminals; body 1.0 $\times$ 0.6 $\times$ 0.4 mm	SOD882D	

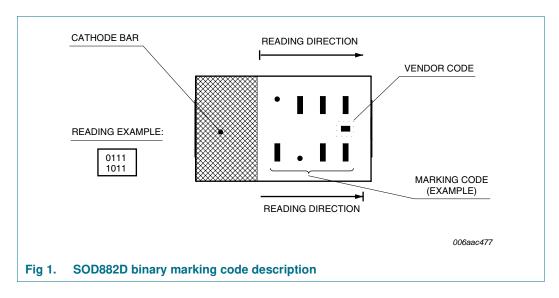
# 4. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
BAS16LD	1000
	0000

<sup>[1]</sup> For SOD882D binary marking code description, see Figure 1.

### 4.1 Binary marking code description



#### Single high-speed switching diode

# 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 <sub>F</sub>	forward current		<u>[1]</u>	215	mA
I <sub>FRM</sub>	repetitive peak forward current	$t_p \leq 0.5~\mu\text{s}; \\ \delta \leq 0.25$	-	500	mA
I <sub>FSM</sub>	non-repetitive peak forward current	square wave	<u>[2]</u>		
		t <sub>p</sub> = 1 μs	-	4	Α
		t <sub>p</sub> = 1 ms	-	1	Α
		t <sub>p</sub> = 1 s	-	0.5	Α
P <sub>tot</sub>	total power dissipation	$T_{amb} \leq 25~^{\circ}C$	<u>[1][3]</u> _	250	mW
Tj	junction temperature		-	150	°C
T <sub>amb</sub>	ambient temperature		-55	+150	°C
T <sub>stg</sub>	storage temperature		-65	+150	°C

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

### 6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1][2] _	-	500	K/W

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

<sup>[2]</sup>  $T_i = 25$  °C prior to surge.

<sup>[3]</sup> Reflow soldering is the only recommended soldering method.

<sup>[2]</sup> Reflow soldering is the only recommended soldering method.

#### Single high-speed switching diode

# 7. Characteristics

**Table 7. Characteristics** 

T<sub>amb</sub> = 25 °C unless otherwise specified.

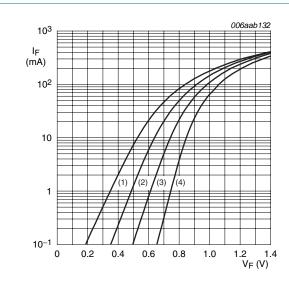
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$V_{F}$	forward voltage		<u>[1]</u>			
		I <sub>F</sub> = 1 mA	-	-	715	mV
		I <sub>F</sub> = 10 mA	-	-	855	mV
		I <sub>F</sub> = 50 mA	-	-	1	V
		I <sub>F</sub> = 150 mA	-	-	1.25	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 25 V	-	-	30	nA
		V <sub>R</sub> = 80 V	-	-	0.5	μΑ
		V <sub>R</sub> = 25 V; T <sub>j</sub> = 150 °C	-	-	30	μΑ
		V <sub>R</sub> = 80 V; T <sub>j</sub> = 150 °C	-	-	50	μΑ
C <sub>d</sub>	diode capacitance	$f = 1 MHz; V_R = 0 V$	-	-	1.5	pF
t <sub>rr</sub>	reverse recovery time		[2] _	-	4	ns
$V_{FR}$	forward recovery voltage		[3]	-	1.75	V

<sup>[1]</sup> Pulse test:  $t_D \le 300 \ \mu s; \ \delta \le 0.02$ .

<sup>[2]</sup> When switched from I<sub>F</sub> = 10 mA to I<sub>R</sub> = 10 mA; R<sub>L</sub> = 100  $\Omega$ ; measured at I<sub>R</sub> = 1 mA.

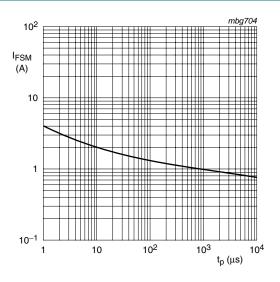
<sup>[3]</sup> When switched from  $I_F = 10$  mA;  $t_r = 20$  ns.

#### Single high-speed switching diode



- (1) T<sub>amb</sub> = 150 °C
- (2)  $T_{amb} = 85 \, ^{\circ}C$
- (3)  $T_{amb} = 25 \, ^{\circ}C$
- (4)  $T_{amb} = -40 \, ^{\circ}C$

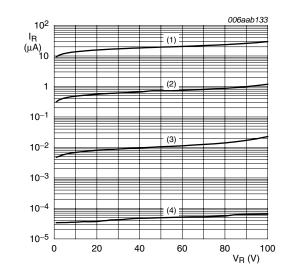
Fig 2. Forward current as a function of forward voltage; typical values



Based on square wave currents.

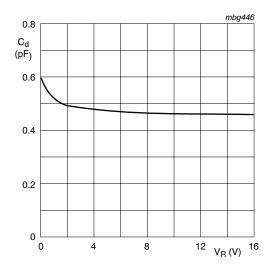
T<sub>j</sub> = 25 °C; prior to surge

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



- (1) T<sub>amb</sub> = 150 °C
- (2)  $T_{amb} = 85 \, ^{\circ}C$
- (3)  $T_{amb} = 25 \,^{\circ}C$
- (4) T<sub>amb</sub> = -40 °C

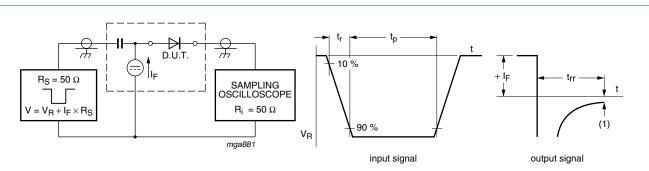
Fig 4. Reverse current as a function of reverse voltage; typical values



f = 1 MHz; T<sub>amb</sub> = 25 °C

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

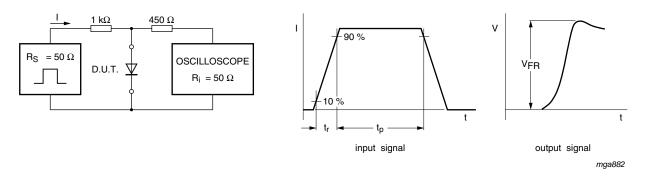
# 8. Test information



(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  $t_r = 0.35$  ns

Fig 6. Reverse recovery time test circuit and waveforms

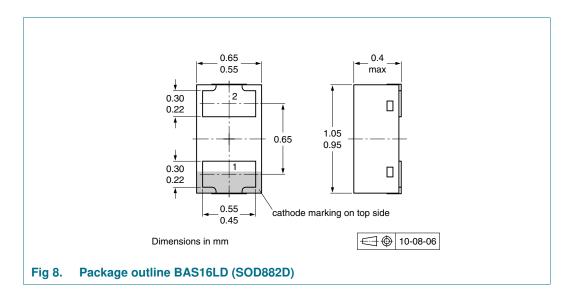


Input signal: forward pulse rise time  $t_r$  = 20 ns; forward current pulse duration  $t_p \ge 100$  ns; duty cycle  $\delta \le 0.005$ 

Fig 7. Forward recovery voltage test circuit and waveforms

Single high-speed switching diode

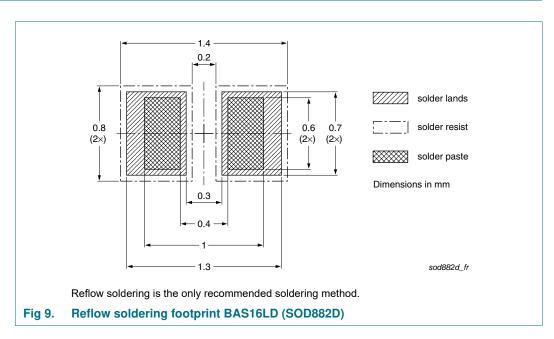
# 9. Package outline



# 10. Packing information

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

# 11. Soldering



BAS16LD

# Single high-speed switching diode

# 12. Revision history

### Table 9. Revision history

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

#### Single high-speed switching diode

### 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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### Single high-speed switching diode

**Quick reference data** — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

### 13.4 Trademarks

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### Single high-speed switching diode

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