



# BAS21LL

## High-voltage switching diode

27 February 2018

Product data sheet

### 1. General description

High-voltage switching diode, encapsulated in a leadless ultra small DFN1006-2 (SOD882) Surface-Mounted Device (SMD) plastic package.

### 2. Features and benefits

- High switching speed:  $t_{rr} \leq 50$  ns
- Low leakage current:  $I_R \leq 100$  nA
- High reverse voltage  $V_R \leq 200$  V
- Low capacitance:  $C_d \leq 2$  pF
- Ultra small SMD plastic package
- AEC-Q101 qualified

### 3. Applications

- High-speed switching
- General-purpose switching
- Voltage clamping
- Reverse polarity protection

### 4. Quick reference data

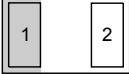

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$I_F$	forward current	$T_j = 25$ °C	[1]	-	-	330	mA
$V_R$	reverse voltage			-	-	200	V
$V_{RRM}$	repetitive peak reverse voltage			-	-	250	V
$V_F$	forward voltage	$I_F = 200$ mA; $t_p \leq 300$ $\mu$ s; $\delta \leq 0.02$ ; $T_j = 25$ °C		-	-	1.25	V
$I_R$	reverse current	$V_R = 200$ V; pulsed; $T_j = 25$ °C		-	-	100	nA
$t_{rr}$	reverse recovery time	$I_F = 30$ mA; $I_R = 30$ mA; $R_L = 100$ $\Omega$ ; $I_{R(meas)} = 3$ mA; $T_j = 25$ °C		-	-	50	ns

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

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 <p>Transparent top view</p> <p><b>DFN1006-2 (SOD882)</b></p>	 <p>aaa-028035</p>
2	A	anode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS21LL	DFN1006-2	plastic, leadless ultra small package; 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.48 mm body	SOD882

## 7. Marking

Table 4. Marking codes

Type number	Marking code
BAS21LL	J3

## 8. 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	$T_j = 25\text{ °C}$		-	250	V
$V_R$	reverse voltage			-	200	V
$I_F$	forward current		[1]	-	330	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1\ \mu\text{s}; T_{j(\text{init})} = 25\text{ °C}; \text{square wave}$		-	9	A
		$t_p = 100\ \mu\text{s}; T_{j(\text{init})} = 25\text{ °C}; \text{square wave}$		-	3	A
		$t_p = 10\ \text{ms}; T_{j(\text{init})} = 25\text{ °C}; \text{square wave}$		-	1.7	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\ \text{ms}; \delta \leq 0.25$		-	900	mA
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25\text{ °C}$	[1]	-	335	mW
			[2]	-	610	mW
$T_j$	junction temperature			-	150	°C
$T_{\text{amb}}$	ambient temperature			-55	150	°C
$T_{\text{stg}}$	storage temperature			-65	150	°C

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

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated mounting pad for cathode  $1\text{cm}^2$ .

## 9. Thermal characteristics

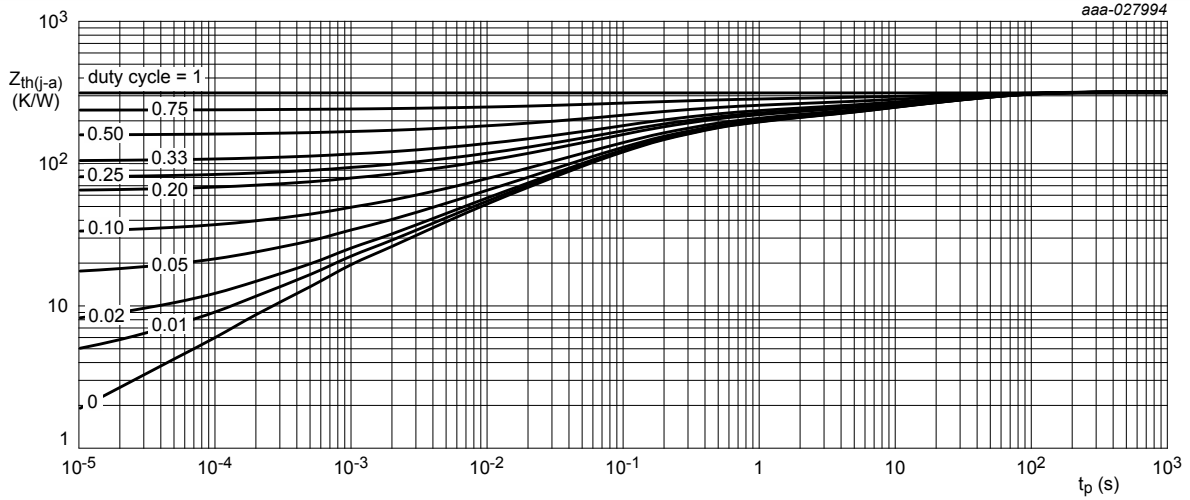
**Table 6. Thermal characteristics**

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
			[2]	-	-	205	K/W
$R_{\text{th}(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	45	K/W

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

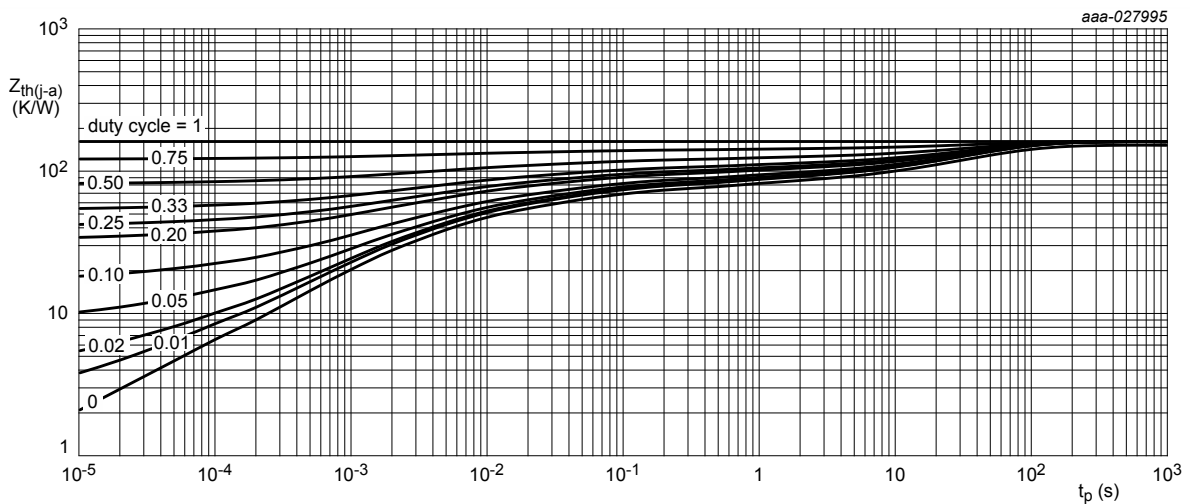
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated mounting pad for cathode  $1\text{cm}^2$ .

[3] Soldering point of cathode tab.



FR4 PCB, standard footprint

Fig. 1. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



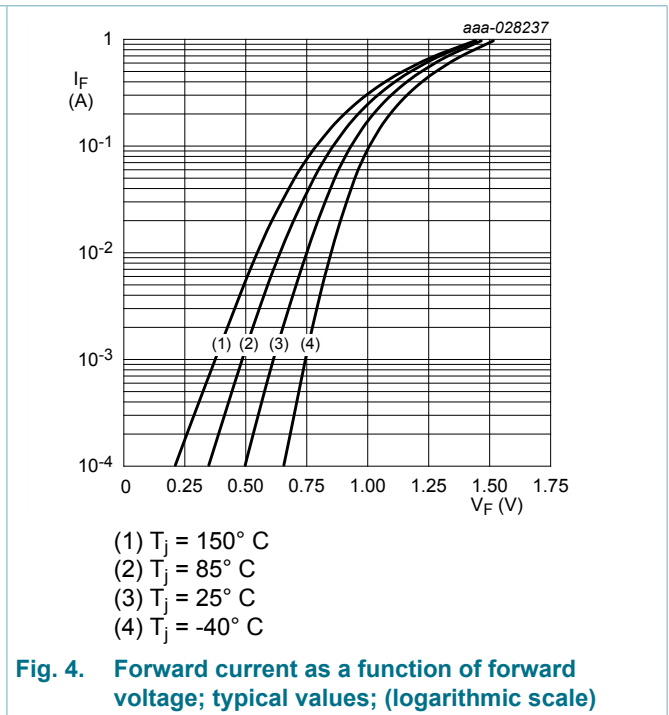
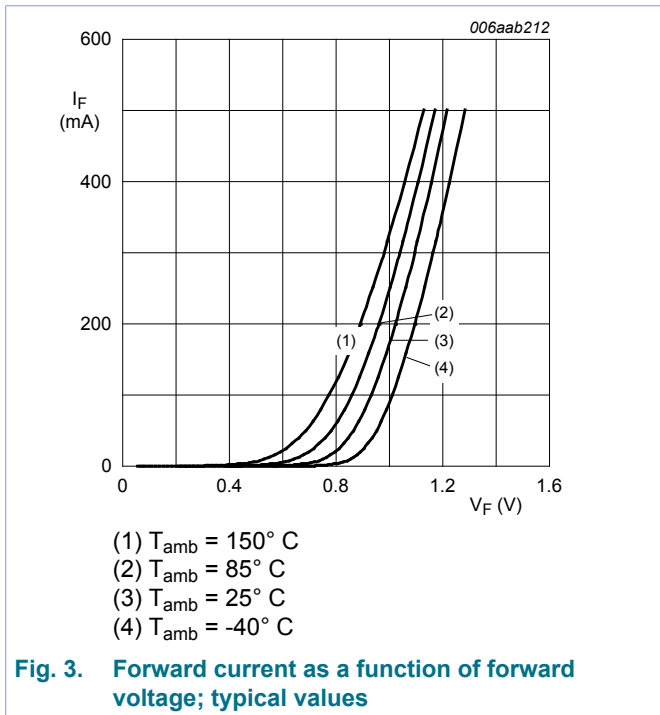
FR4 PCB, mounting pad for cathode 1 cm<sup>2</sup>

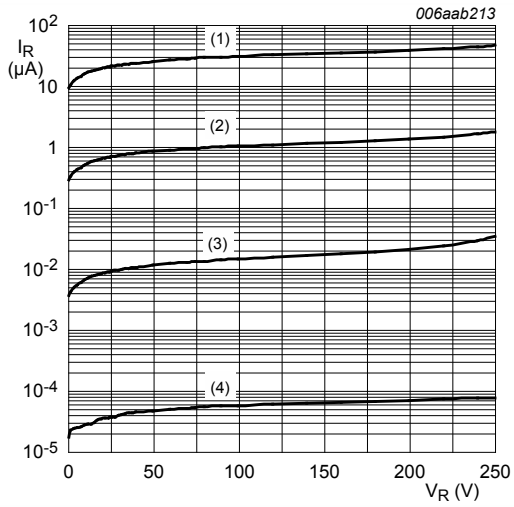
Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

### 10. Characteristics

Table 7. Characteristics

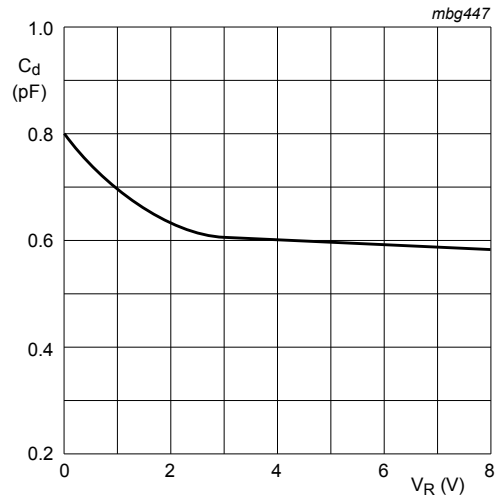
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 100 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02 ; T <sub>j</sub> = 25 °C	-	-	1	V
		I <sub>F</sub> = 200 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02 ; T <sub>j</sub> = 25 °C	-	-	1.25	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 200 V; pulsed; T <sub>j</sub> = 25 °C	-	-	100	nA
		V <sub>R</sub> = 200 V; pulsed; T <sub>j</sub> = 150 °C	-	-	100	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0 V; f = 1 MHz; T <sub>j</sub> = 25 °C	-	-	2	pF
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 30 mA; I <sub>R</sub> = 30 mA; R <sub>L</sub> = 100 Ω; I <sub>R(meas)</sub> = 3 mA; T <sub>j</sub> = 25 °C	-	-	50	ns





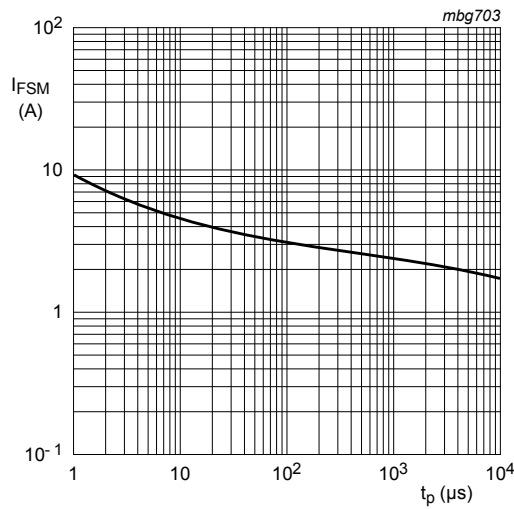
- (1)  $T_{\text{amb}} = 150^\circ\text{C}$
- (2)  $T_{\text{amb}} = 85^\circ\text{C}$
- (3)  $T_{\text{amb}} = 25^\circ\text{C}$
- (4)  $T_{\text{amb}} = -40^\circ\text{C}$

**Fig. 5. Reverse current as a function of reverse voltage; typical values**



$f = 1\text{ MHz}$   
 $T_j = 25^\circ\text{C}$ .

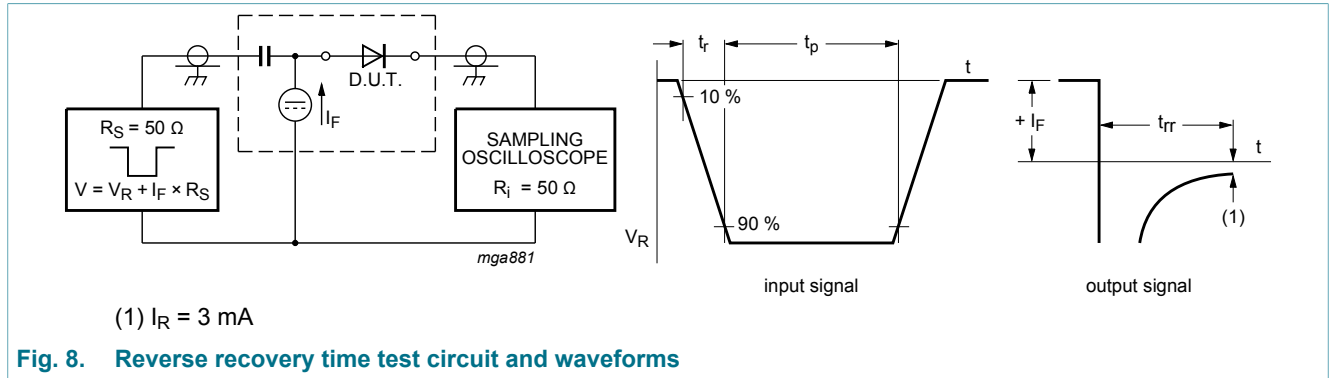
**Fig. 6. Diode capacitance as a function of reverse voltage; typical values.**



Based on square wave currents.  
 $T_{j(\text{init})} = 25^\circ\text{C}$

**Fig. 7. Non-repetitive peak forward current as a function of pulse duration; maximum values**

### 11. Test information



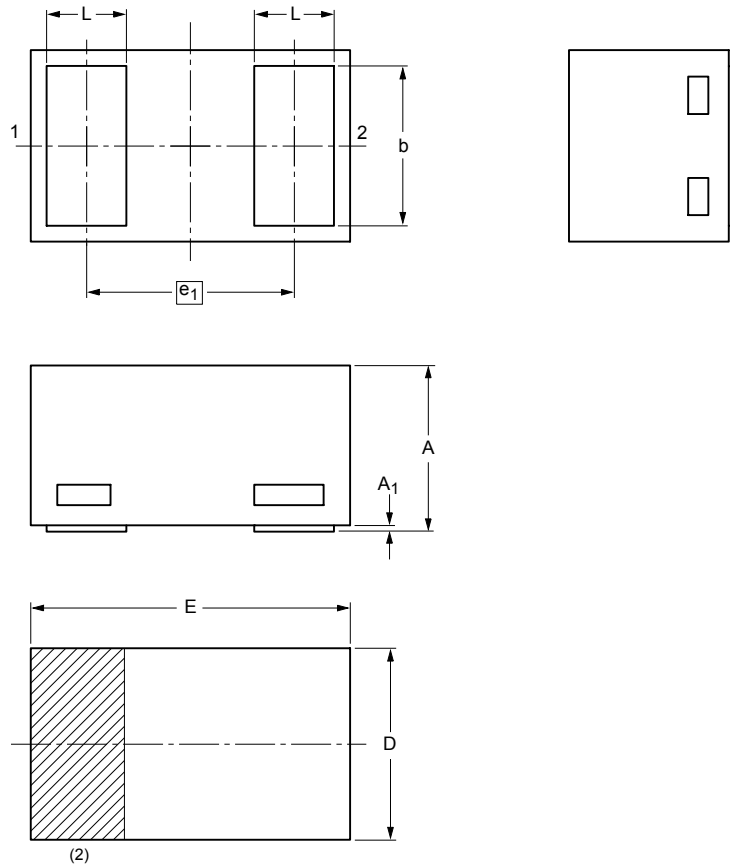
#### Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

## 12. Package outline

DFN1006-2: Leadless ultra small plastic package; 2 terminals; body 1.0 x 0.6 x 0.5 mm

SOD882



Dimensions (mm are the original dimensions)

Unit	A <sup>(1)</sup>	A <sub>1</sub>	b	D	E	e <sub>1</sub>	L
mm	max 0.50	0.03	0.55	0.62	1.02	0.30	
	nom					0.65	
	min 0.46		0.47	0.55	0.95	0.22	

Note

- Including plating thickness
- The marking bar indicates the cathode (if applicable)

sod882\_po

Outline version	References			European projection	Issue date
	IEC	JEDEC	JEITA		
SOD882					<del>14-08-26</del> 14-08-27

Fig. 9. Package outline DFN1006-2 (SOD882)



### 13. Soldering

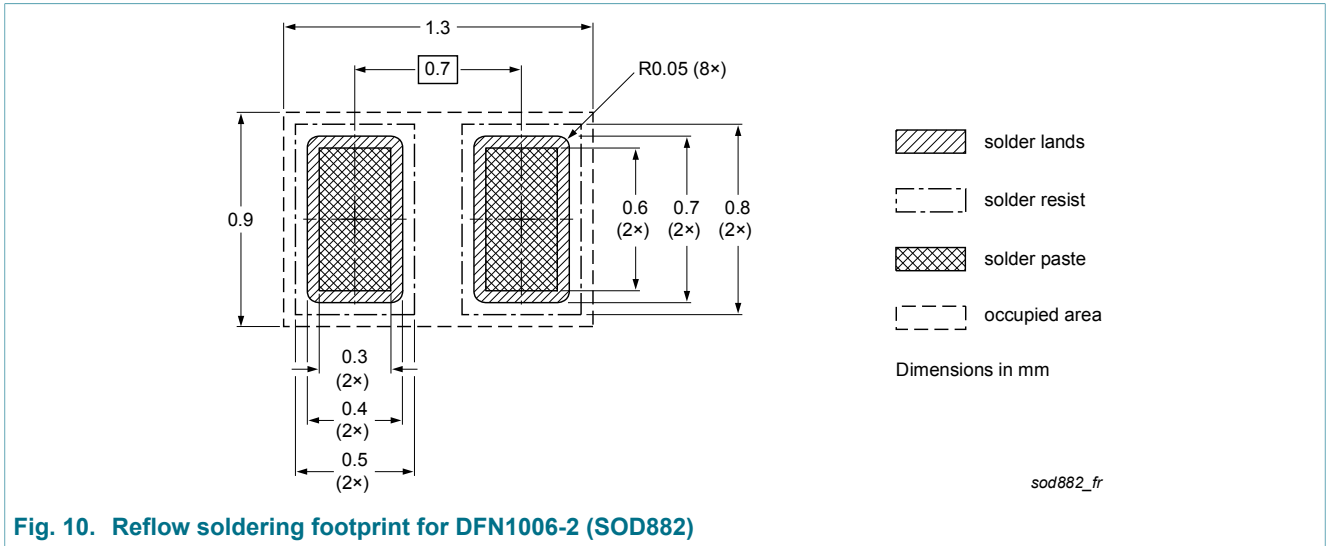


Fig. 10. Reflow soldering footprint for DFN1006-2 (SOD882)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS21LL v.1	20180227	Product data sheet	-	-

## 15. Legal information

### 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.

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## 16. Contents

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1. General description.....	1
2. Features and benefits.....	1
3. Applications.....	1
4. Quick reference data.....	1
5. Pinning information.....	2
6. Ordering information.....	2
7. Marking.....	2
8. Limiting values.....	3
9. Thermal characteristics.....	3
10. Characteristics.....	5
11. Test information.....	7
12. Package outline.....	8
13. Soldering.....	9
14. Revision history.....	10
15. Legal information.....	11

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