



BAS21LD

High-voltage switching diode

28 February 2018

Product data sheet

1. General description

High-voltage switching diode, encapsulated in an leadless ultra small DFN1006D-2 (SOD882D) Surface-Mounted Device (SMD) plastic package with visible and solderable side pads.

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 and leadless SMD plastic package
- Solderable side pads
- Package height typ. 0.37 mm
- AEC-Q101 qualified

3. Applications

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

4. Quick reference data

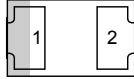

Table 1. Quick reference data

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; $t_p \leq 300$ μ 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; $R_L = 100$ Ω ; $I_{R(meas)} = 3$ 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>DFN1006D-2 (SOD882D)</p>	 <p>aaa-028035</p>
2	A	anode		

6. Ordering information

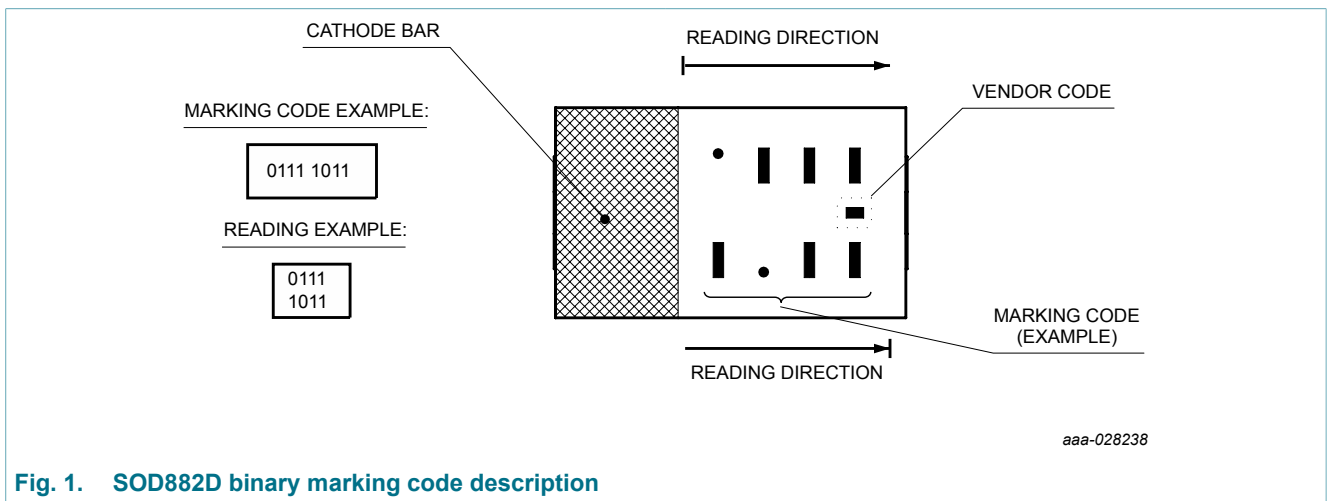
Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS21LD	DFN1006D-2	leadless ultra small plastic package; 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.4 mm body	SOD882D

7. Marking

Table 4. Marking codes

Type number	Marking code
BAS21LD	0110 0001



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_{tot}	total power dissipation	$T_{\text{amb}} \leq 25\text{ °C}$	[1]	-	335	mW
			[2]	-	610	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	150	°C
T_{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 1cm^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]	-	-	40	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 1cm^2 .

[3] Soldering point of cathode tab.

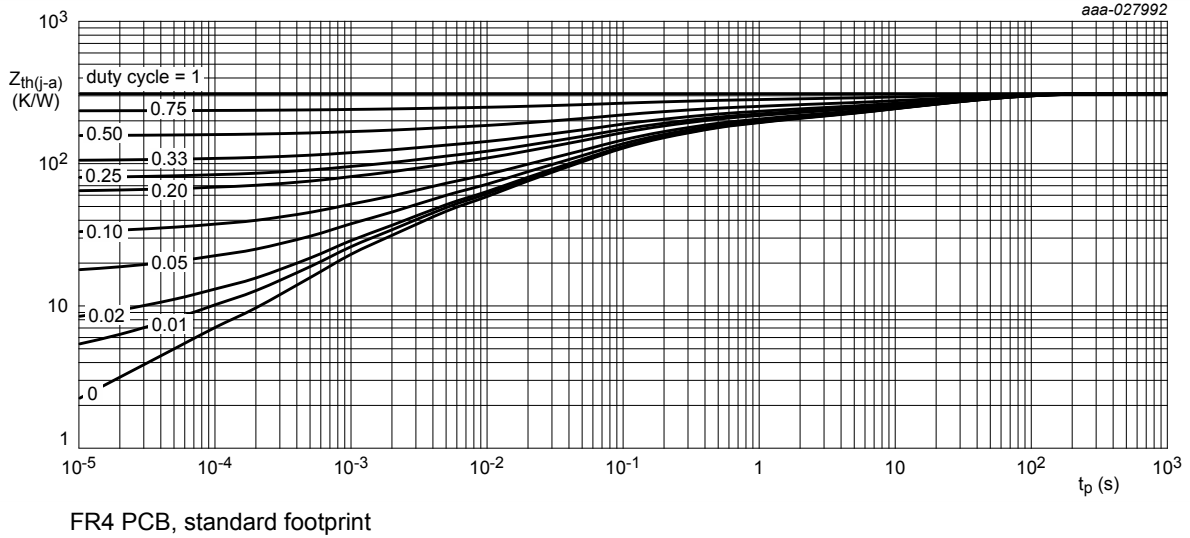


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

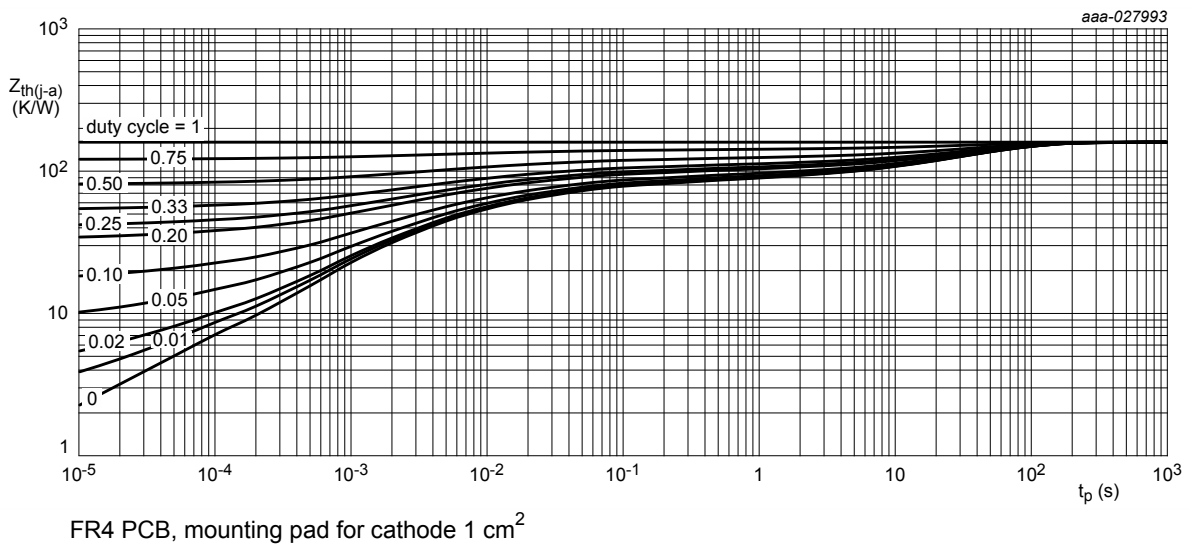
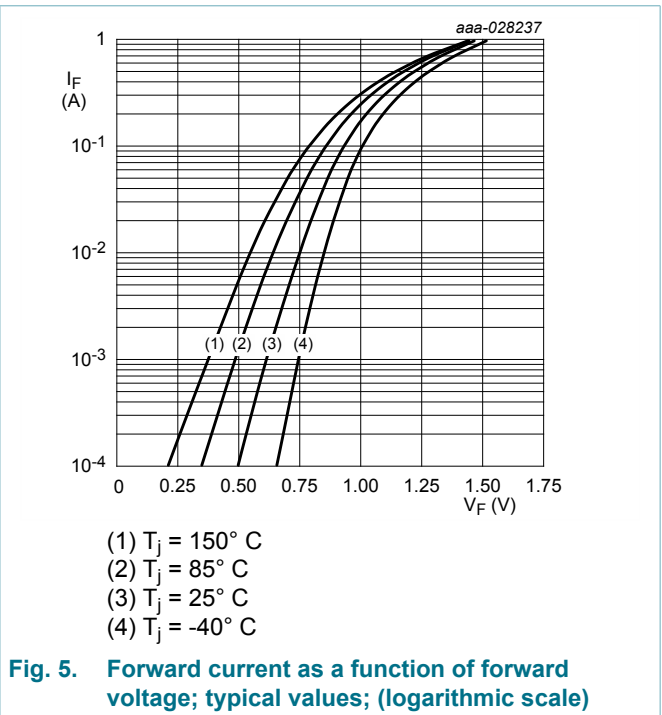
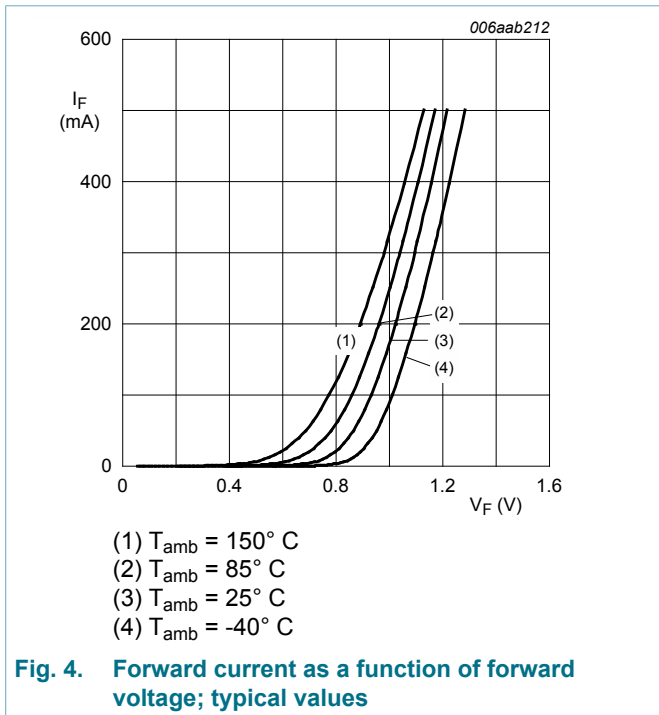


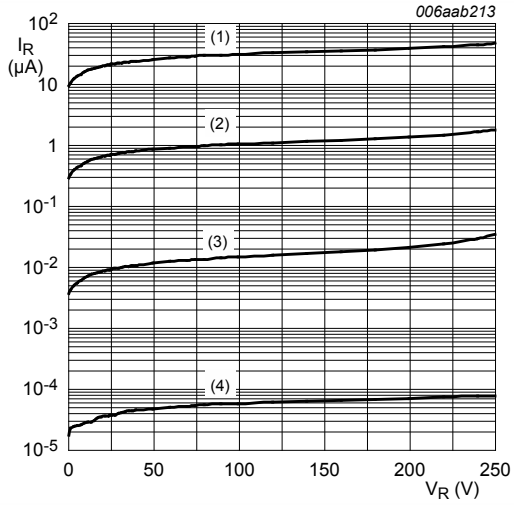
Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

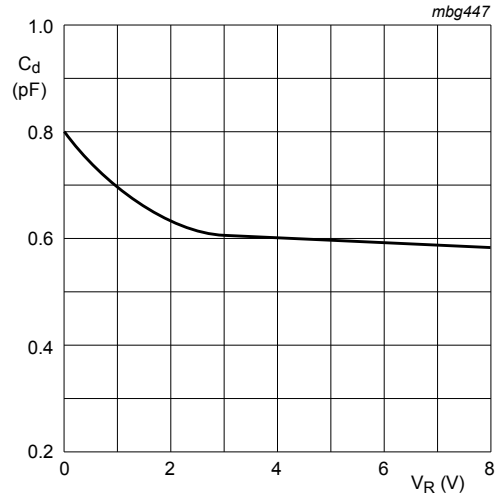
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 100 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02 ; T_j = 25 \text{ } ^\circ\text{C}$	-	-	1	V
		$I_F = 200 \text{ mA}; t_p \leq 300 \text{ } \mu\text{s}; \delta \leq 0.02 ; T_j = 25 \text{ } ^\circ\text{C}$	-	-	1.25	V
I_R	reverse current	$V_R = 200 \text{ V}; \text{pulsed}; T_j = 25 \text{ } ^\circ\text{C}$	-	-	100	nA
		$V_R = 200 \text{ V}; \text{pulsed}; T_j = 150 \text{ } ^\circ\text{C}$	-	-	100	μA
C_d	diode capacitance	$V_R = 0 \text{ V}; f = 1 \text{ MHz}; T_j = 25 \text{ } ^\circ\text{C}$	-	-	2	pF
t_{rr}	reverse recovery time	$I_F = 30 \text{ mA}; I_R = 30 \text{ mA}; R_L = 100 \text{ } \Omega; I_{R(\text{meas})} = 3 \text{ mA}; T_j = 25 \text{ } ^\circ\text{C}$	-	-	50	ns





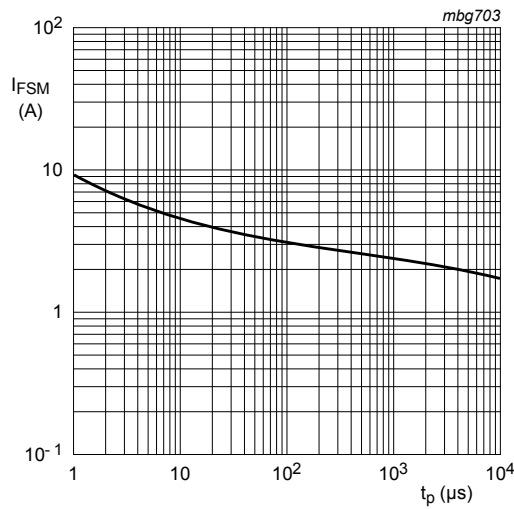
- (1) $T_{\text{amb}} = 150^\circ\text{C}$
- (2) $T_{\text{amb}} = 85^\circ\text{C}$
- (3) $T_{\text{amb}} = 25^\circ\text{C}$
- (4) $T_{\text{amb}} = -40^\circ\text{C}$

Fig. 6. Reverse current as a function of reverse voltage; typical values



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

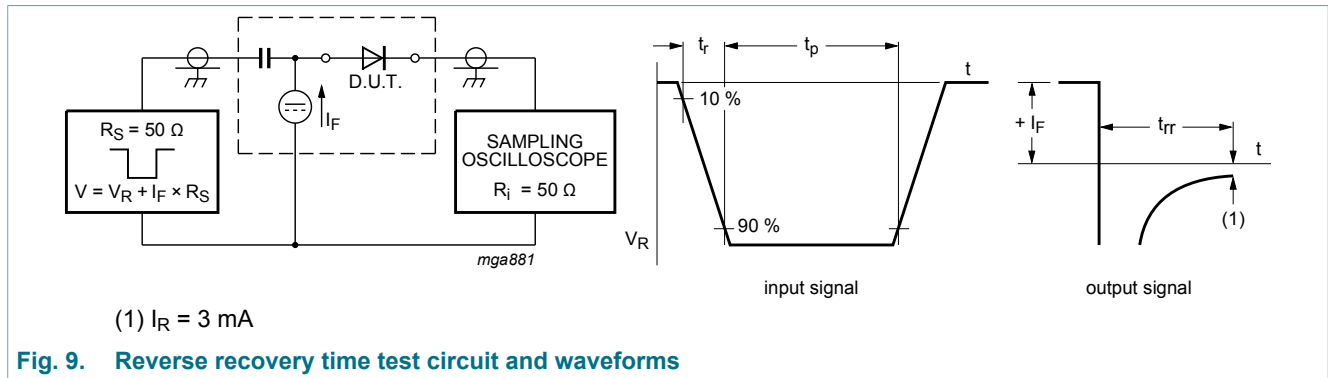
Fig. 7. Diode capacitance as a function of reverse voltage; typical values.



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

Fig. 8. Non-repetitive peak forward current as a function of pulse duration; maximum values

11. Test information



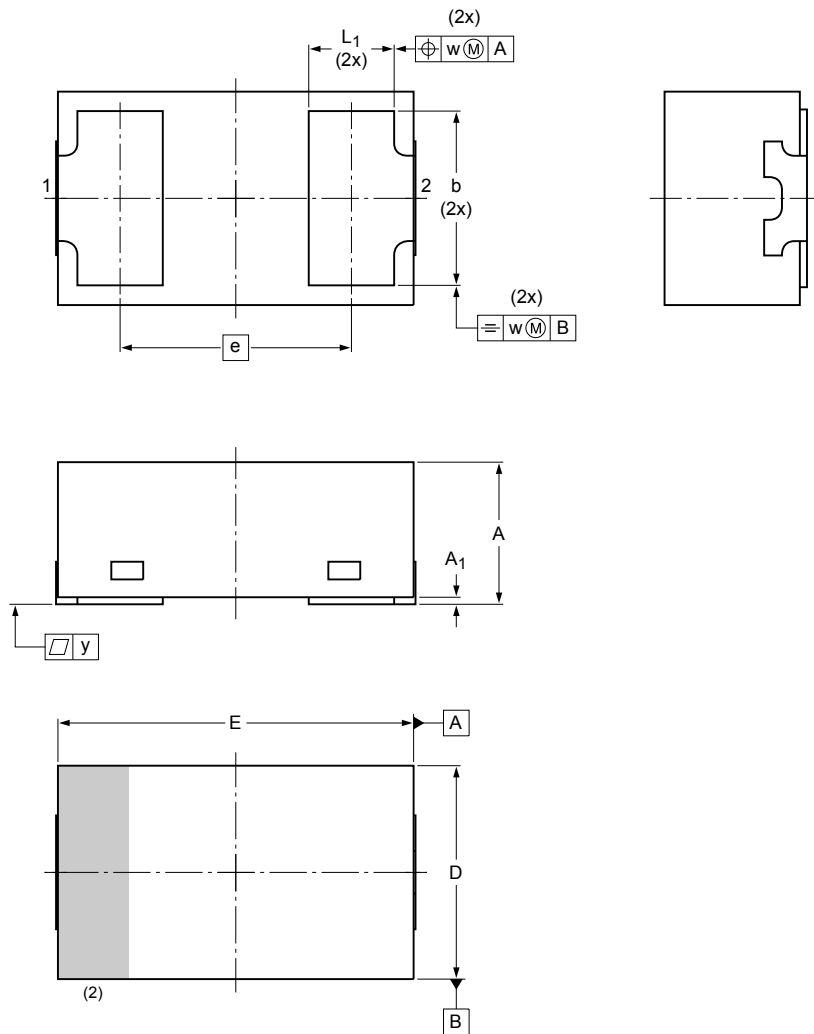
Quality information

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

DFN1006D-2: Leadless ultra small plastic package; 2 terminals; body 1 x 0.6 x 0.4 mm

SOD882D



Dimensions

Unit	A ⁽¹⁾	A ₁	b	D	E	e	L ₁	w	y
max	0.4	0.04	0.55	0.65	1.05		0.30	0.1	0.03
mm nom			0.50	0.60	1.00	0.65	0.25		
min			0.45	0.55	0.95	0.22			

Note

1. Dimension including plating thickness.
2. The marking bar indicates the cathode (if applicable).

sod882d_po

Outline version	References			European projection	Issue date
	IEC	JEDEC	JEITA		
SOD882D					-10-09-27- 12-05-01

Fig. 10. Package outline DFN1006D-2 (SOD882D)

13. Soldering

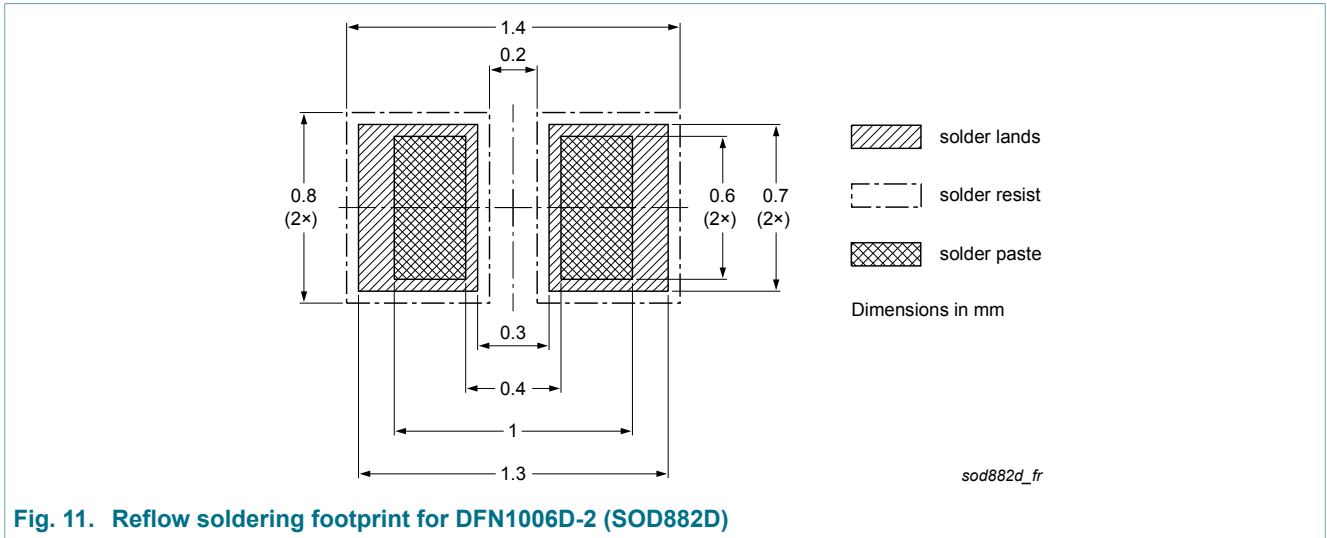


Fig. 11. Reflow soldering footprint for DFN1006D-2 (SOD882D)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS21LD v.1	20180228	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.

- [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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Date of release: 28 February 2018
