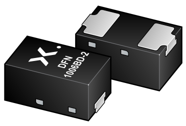

BAS16LS-Q

High-speed switching diode

22 February 2021 | Product data sheet

1. General description

High-speed switching diode, encapsulated in a leadless ultra small DFN1006BD-2 (SOD882BD) Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

2. Features and benefits

- High switching speed: $t_{rr} \leq 4$ ns
- Low leakage current
- Repetitive peak reverse voltage $V_{RRM} \leq 100$ V
- Suitable for Automatic Optical Inspection (AOI) of solder joint
- Low capacitance
- Reverse voltage $V_R \leq 100$ V
- Ultra small and leadless SMD plastic package
- AEC-Q101 qualified

3. Applications

- High-speed switching
- General-purpose switching

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]	-	-	215	mA
I_R	reverse current	V_R = 80 V; T_j = 25 °C		-	-	0.5	µA
V_R	reverse voltage	T_j = 25 °C		-	-	100	V
t_{rr}	reverse recovery time	I_F = 10 mA; I_R = 10 mA; R_L = 100 Ω; $I_{R(meas)}$ = 1 mA; T_{amb} = 25 °C		-	-	4	ns

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 µm single-sided copper, tin-plated and standard footprint.

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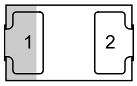
5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 Transparent top view **DFN1006BD-2 (SOD882BD)**	 *aaa-028035*
2	A	anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS16LS-Q	DFN1006BD-2	Leadless ultra small plastic package with side-wettable flanks (SWF); 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.47 mm body	SOD882BD

7. Marking

Table 4. Marking codes

Type number	Marking code
BAS16LS-Q	M8

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 °C		-	100	V
V_R	reverse voltage			-	100	V
I_F	forward current		[1]	-	215	mA
I_{FSM}	non-repetitive peak forward current	t_p = 1 µs; square wave; $T_{j(init)}$ = 25 °C		-	4	A
		t_p = 1 ms; square wave; $T_{j(init)}$ = 25 °C		-	1	A
		t_p = 1 s; square wave; $T_{j(init)}$ = 25 °C		-	0.5	A
I_{FRM}	repetitive peak forward current	$t_p \leq$ 0.5 ms; $\delta \leq$ 0.25		-	500	mA
P_{tot}	total power dissipation	$T_{amb} \leq$ 25 °C	[1]	-	345	mW
			[2]	-	645	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	150	°C
T_{stg}	storage temperature			-65	150	°C

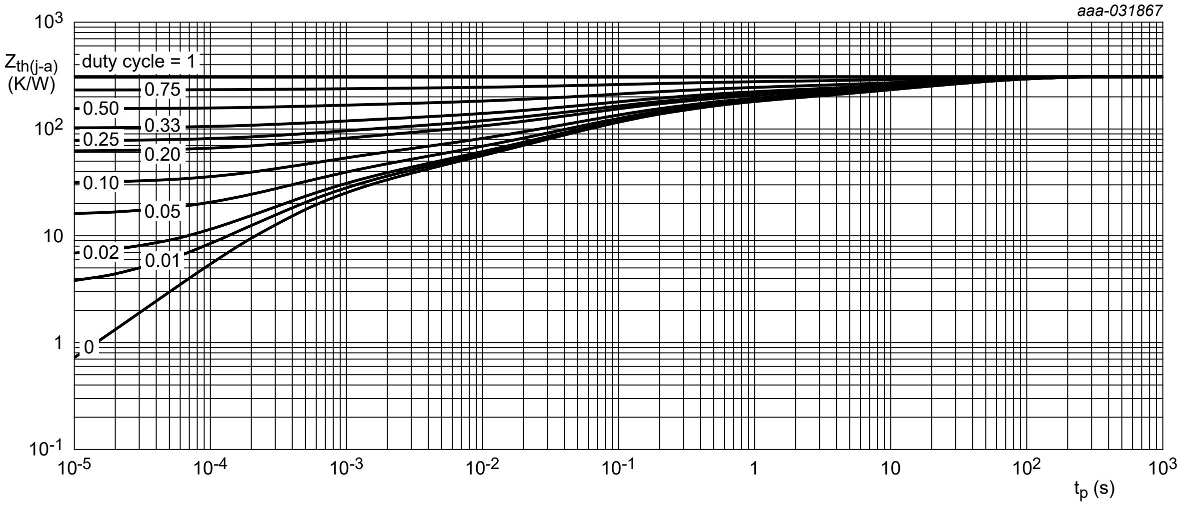
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 µm single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 µm single-sided copper, tin-plated mounting pad for cathode 1cm^2.

9. Thermal characteristics

Table 6. Thermal characteristics

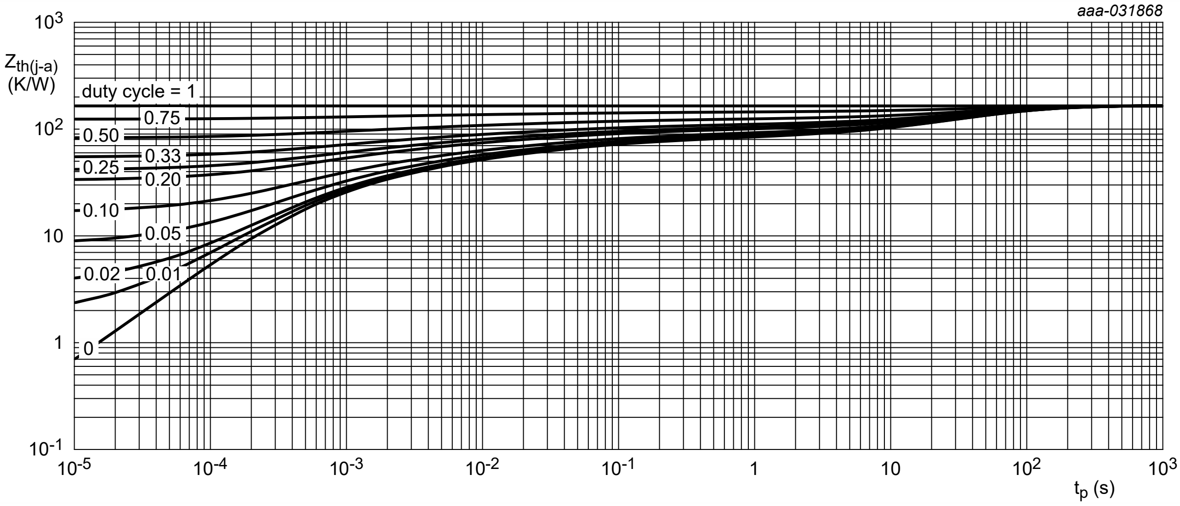
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	360	K/W
			[2]	-	-	195	K/W

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 µm single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 µm single-sided copper, tin-plated mounting pad for cathode 1cm^2.



FR4 PCB, 70 µm single sided copper standard footprint

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



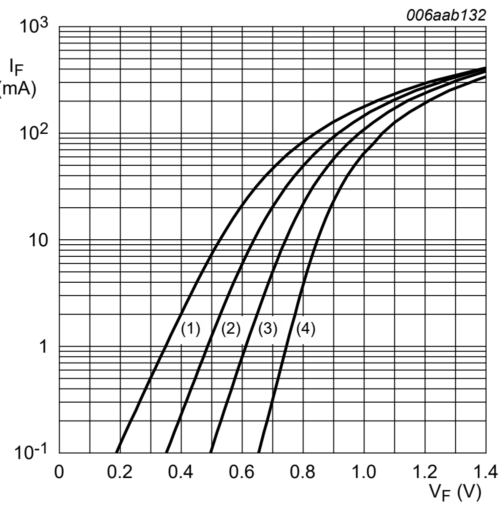
FR4 PCB, 70 µm single sided copper, mounting pad for cathode 1 cm^2

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

10. Characteristics

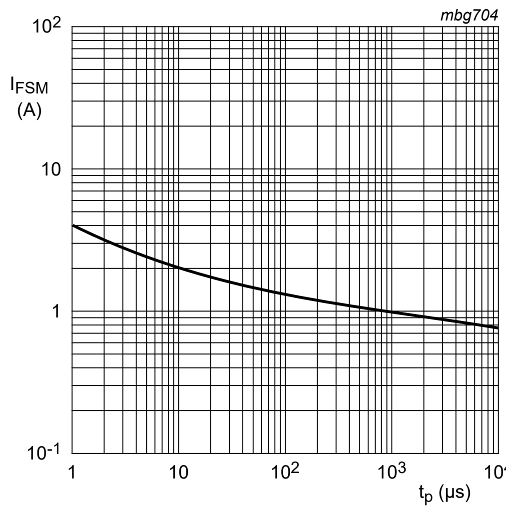
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 1 mA; $t_p \leq$ 300 μs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	715	mV
		I_F = 10 mA; $t_p \leq$ 300 μs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	855	mV
		I_F = 50 mA; $t_p \leq$ 300 μs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	1	V
		I_F = 150 mA; $t_p \leq$ 300 μs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	1.25	V
I_R	reverse current	V_R = 25 V; T_j = 25 °C		-	-	30	nA
		V_R = 80 V; T_j = 25 °C		-	-	0.5	μA
		V_R = 25 V; T_j = 150 °C		-	-	30	μA
		V_R = 80 V; T_j = 150 °C		-	-	50	μA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; T_{amb} = 25 °C		-	-	1.5	pF
t_{rr}	reverse recovery time	I_F = 10 mA; I_R = 10 mA; R_L = 100 Ω; $I_{R(meas)}$ = 1 mA; T_{amb} = 25 °C		-	-	4	ns
V_{FRM}	peak forward recovery voltage	I_F = 10 mA; t_r = 20 ns; T_{amb} = 25 °C		-	-	1.75	V



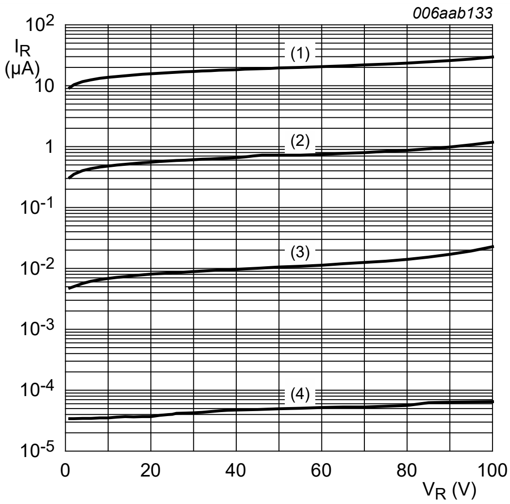
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -40 °C

Fig. 3. Forward current as a function of forward voltage; typical values



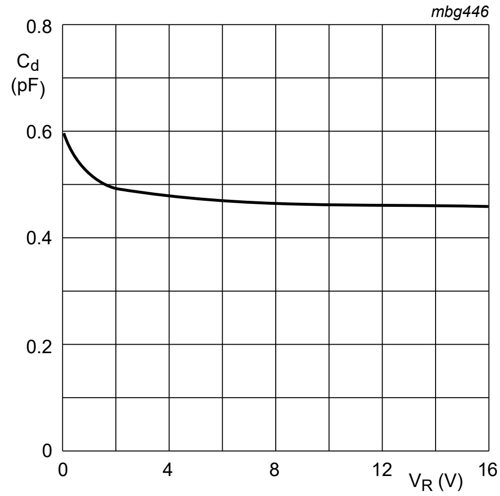
Based on square wave currents.
$T_{j(init)}$ = 25 °C

Fig. 4. Non-repetitive peak forward current as a function of pulse duration; typical values



(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = -40 °C

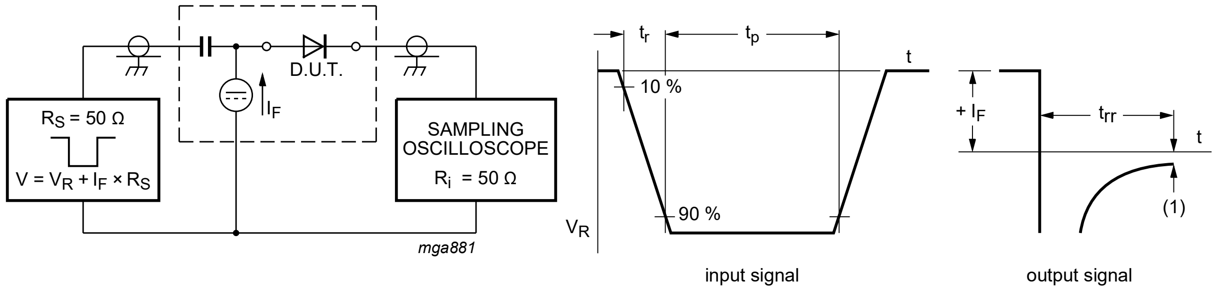
Fig. 5. Reverse current as a function of reverse voltage; typical values



f = 1 MHz; T_{amb} = 25 °C

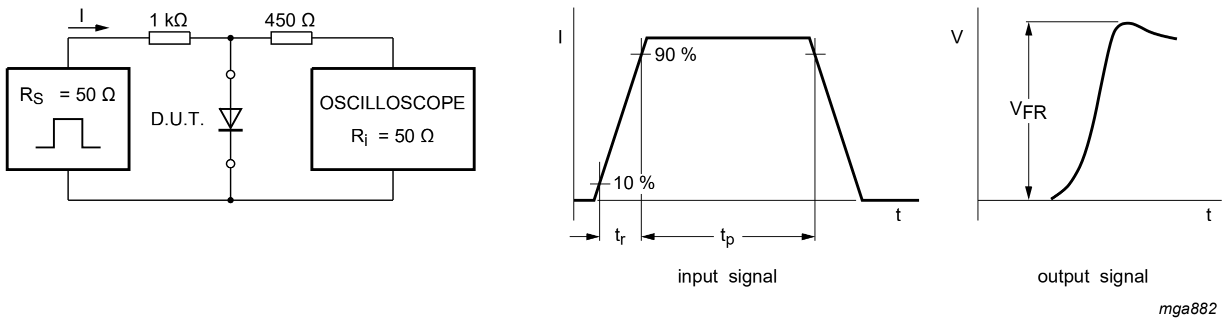
Fig. 6. Diode capacitance as a function of reverse voltage; typical values

11. Test information



(1) I_R = 1 mA
Input signal: reverse pulse rise time t_r = 0.6 ns; reverse voltage pulse duration t_p = 100 ns; duty cycle δ = 0.05
Oscilloscope: rise time t_r = 0.35 ns

Fig. 7. Reverse recovery time test circuit and waveforms



Input signal: forward pulse rise time t_r = 20 ns; forward current pulse duration t_p ≥ 100 ns; duty cycle δ ≤ 0.005

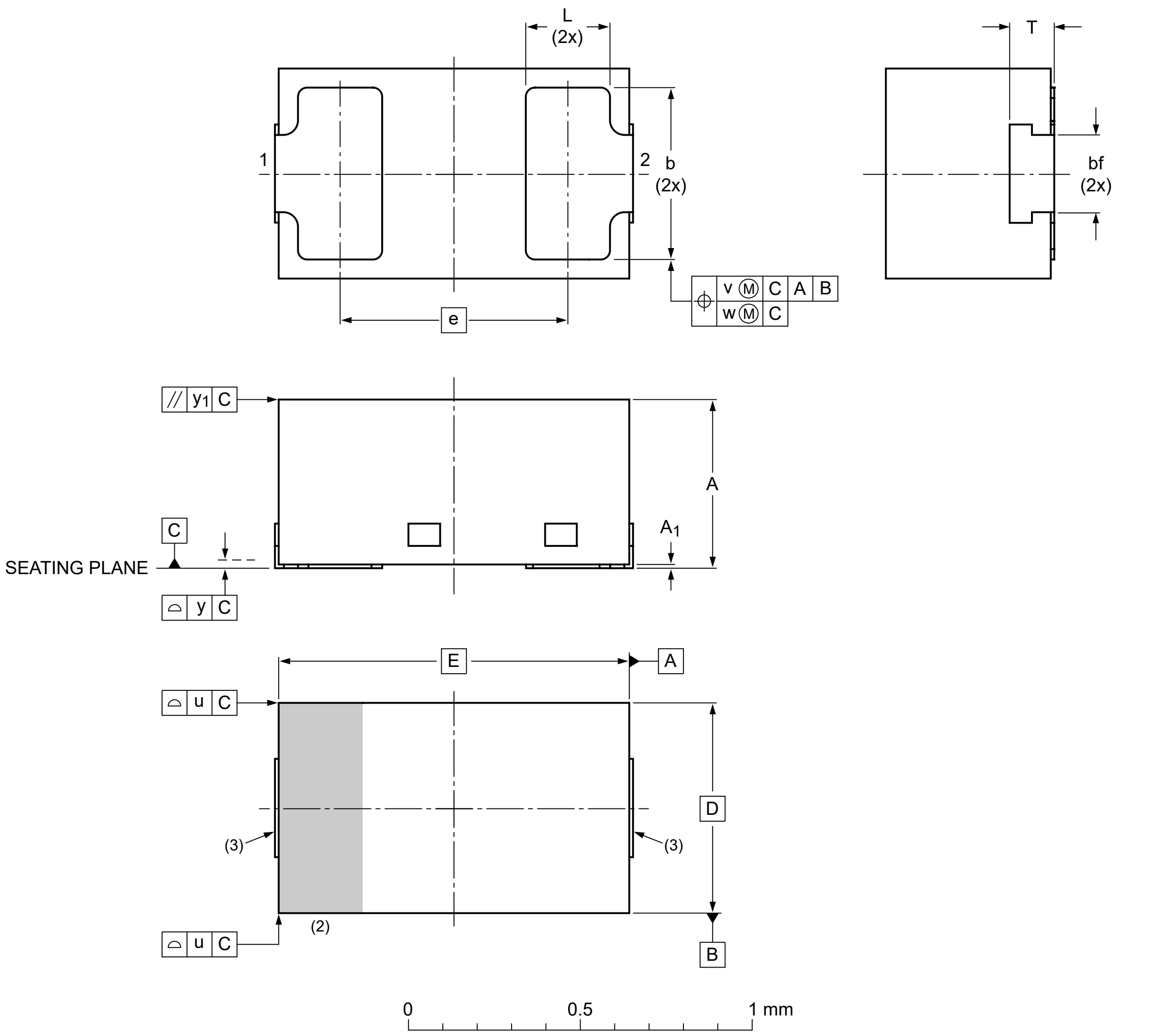
Fig. 8. Forward recovery voltage test circuit and waveforms

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

DFN1006BD-2 Leadless ultra small plastic package with side-wettable flanks (SWF); 2 terminals; 0.65 mm pitch; 1 mm x 0.6 mm x 0.47 mm body **SOD882BD**



Dimensions

Unit		$A^{(1)}$	A_1	$bf^{(1)}$	b	D	E	e	L	$T^{(1)}$	u	v	w	y	y_1
	max	0.50	0.04		0.55				0.30	0.22					
mm	nom	0.47			0.50	0.60	1.00	0.65	0.25	0.16	0.05	0.10	0.05	0.05	0.05
	min	0.44		0.20	0.45				0.22	0.10					

Note
1. Dimension including plating thickness.
2. The marking bar indicates the cathode.
3. Solderable lead end, protrusion max. 0.02 mm.

sod882bd_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD882BD		MO-343AA				~~20-06-22~~ 20-06-23

Fig. 9. Package outline DFN1006BD-2 (SOD882BD)

13. Soldering

Footprint information for reflow soldering of DFN1006BD-2 package **SOD882BD**

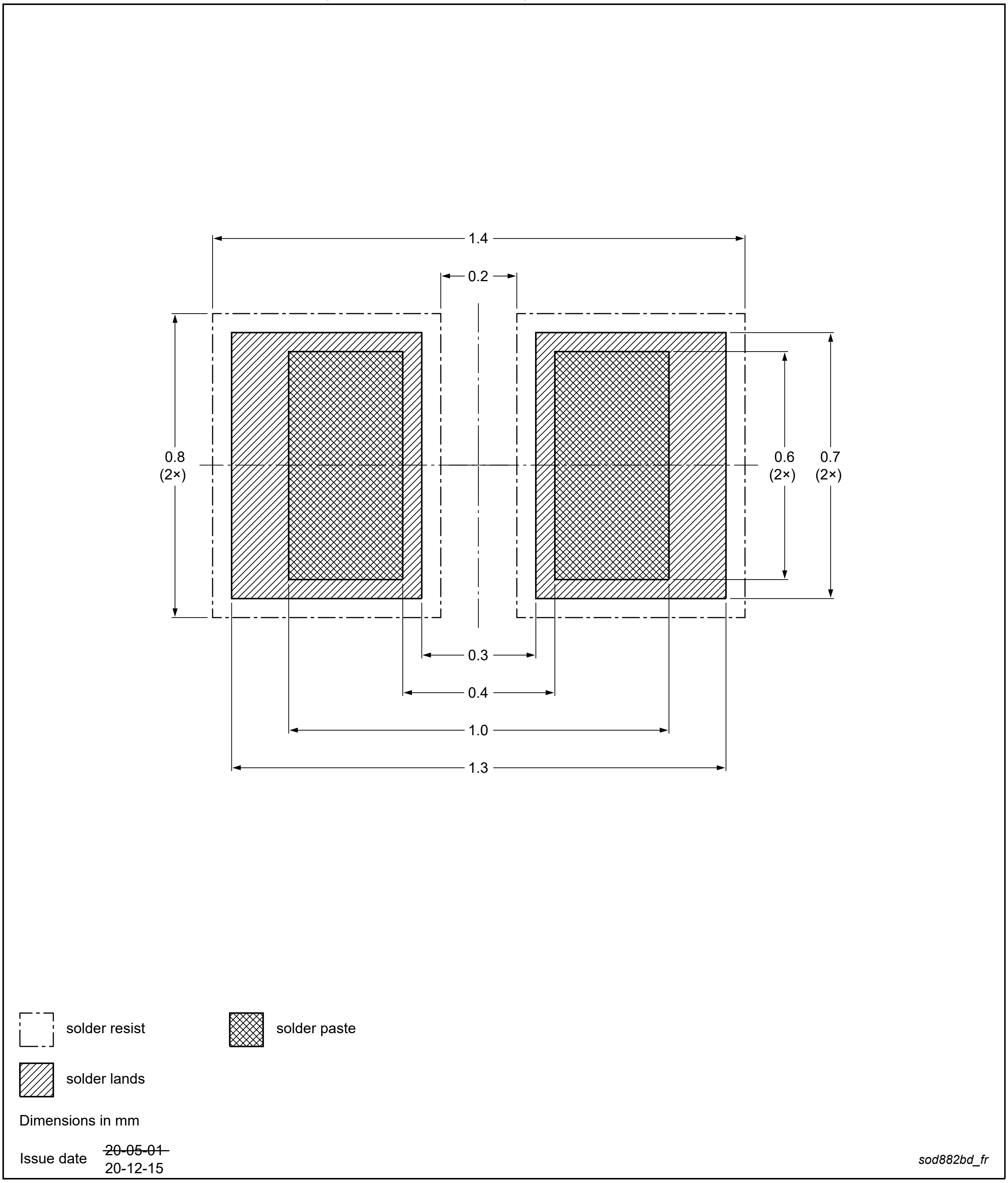


Fig. 10. Reflow soldering footprint for DFN1006BD-2 (SOD882BD)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS16LS-Q v.2	20210222	Product data sheet	-	BAS16LS-Q v.1
	• Changed package outline from minimized to standard			
BAS16LS-Q v.1	20210209	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: 22 February 2021