BAS116LS-Q

Low-leakage diode

3 January 2022 **Product data sheet**

1. General description

Low-leakage diode in an ultra small DFN1006BD-2 (SOD882BD) leadless Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

2. Features and benefits

- Switching time: max. t_{rr} = 3 µs
- Low leakage current: max. I_R = 5 nA
- Repetitive peak reverse voltage: $V_{RRM} \leq 85$ V
- Low capacitance typical: C_d = 2 pF
- Ultra small and leadless SMD plastic package
- Suitable for Automatic Optical Inspection (AOI) of solder joint
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Low-leakage current applications
- General-purpose switching

4. Quick reference data

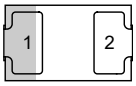
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	T_{amb} = 25 °C	[1]	-	-	325	mA
I_R	reverse current	V_R = 75 V; pulsed; T_{amb} = 25 °C		-	-	5	nA
V_R	reverse voltage	T_{amb} = 25 °C		-	-	75	V
V_F	forward voltage	I_F = 150 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; pulsed; T_{amb} = 25 °C		-	-	1.25	V
V_{RRM}	repetitive peak reverse voltage			-	-	85	V
t_{rr}	reverse recovery time	I_F = 10 mA; I_R = 10 mA; $I_{R(meas)}$ = 1 mA; R_L = 100 Ω; T_{amb} = 25 °C		-	-	3	µs

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 µm 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	 Transparent top view **DFN1006BD-2 (SOD882BD)**	 *aaa-028035*
2	A	anode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS116LS-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
BAS116LS-Q	9C

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_R	reverse voltage	T_{amb} = 25 °C		-	75	V
V_{RRM}	repetitive peak reverse voltage			-	85	V
I_F	forward current	T_{amb} = 25 °C	[1]	-	325	mA
I_{FRM}	repetitive peak forward current	$t_p \leq$ 0.5 ms; $\delta \leq$ 0.25; T_{amb} = 25 °C		-	700	mA
I_{FSM}	non-repetitive peak forward current	t_p = 100 µs; square wave		-	4	A
		t_p = 1 ms; square wave		-	1.5	A
		t_p = 1 s; square wave		-	0.5	A
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

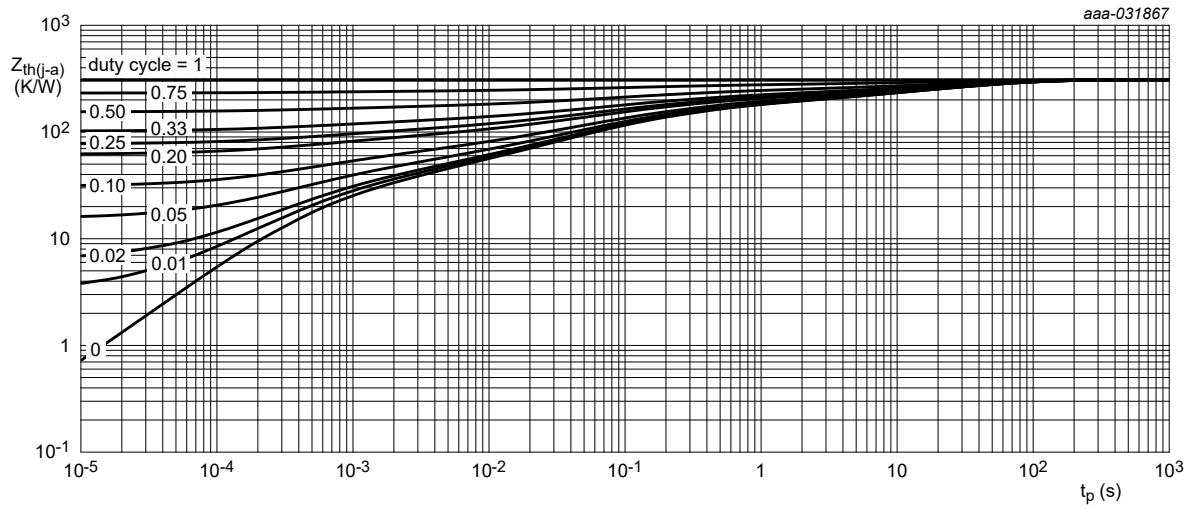
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), 70 µm single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, 70 µm single-sided copper, tin-plated, mounting pad for cathode 1 cm².

9. Thermal characteristics

Table 6. Thermal characteristics

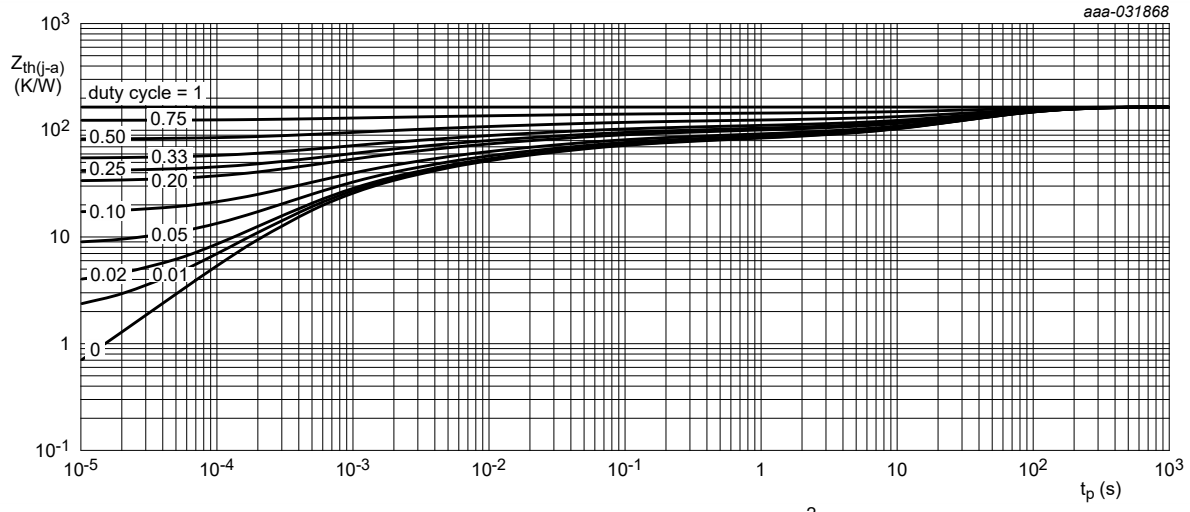
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	360	K/W
			[2]	-	-	195	K/W

[1] Device mounted on an FR4 PCB, 70 µm single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 PCB, 70 µm single-sided copper, tin-plated, mounting pad for cathode 1 cm².



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



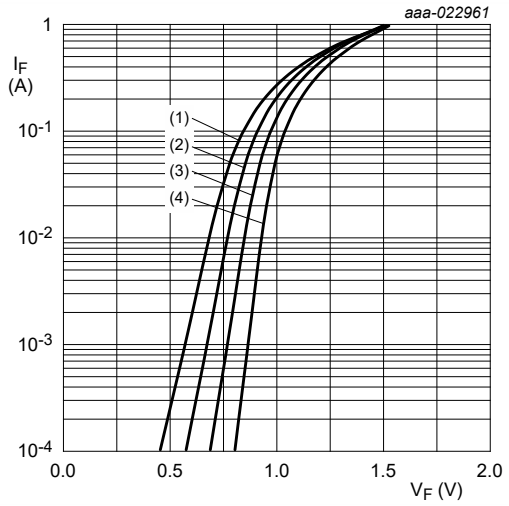
FR4 PCB, 70 µm single sided copper, mounting pad for cathode 1 cm^2

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

10. Characteristics

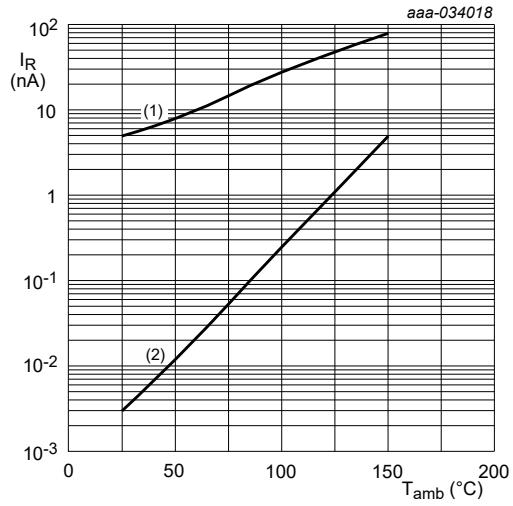
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 1 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; pulsed; T_{amb} = 25 °C		-	-	0.9	V
		I_F = 10 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; pulsed; T_{amb} = 25 °C		-	-	1	V
		I_F = 50 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; pulsed; T_{amb} = 25 °C		-	-	1.1	V
		I_F = 150 mA; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; pulsed; T_{amb} = 25 °C		-	-	1.25	V
I_R	reverse current	V_R = 75 V; pulsed; T_{amb} = 25 °C		-	-	5	nA
		V_R = 75 V; pulsed; T_{amb} = 150 °C		-	-	80	nA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; T_{amb} = 25 °C		-	2	-	pF
t_{rr}	reverse recovery time	I_F = 10 mA; I_R = 10 mA; $I_{R(meas)}$ = 1 mA; R_L = 100 Ω; T_{amb} = 25 °C		-	-	3	µs



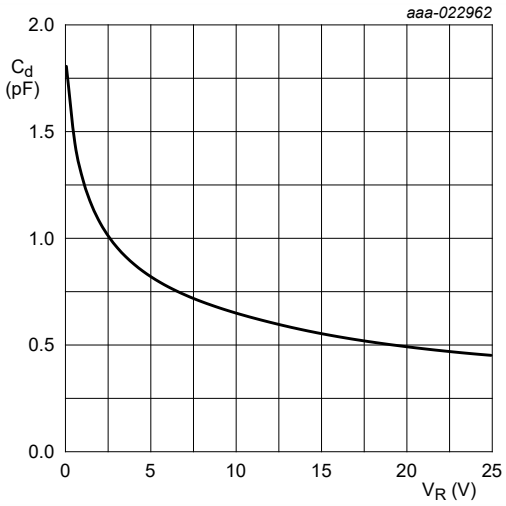
(1) T_{amb} = 150 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = −40 °C

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



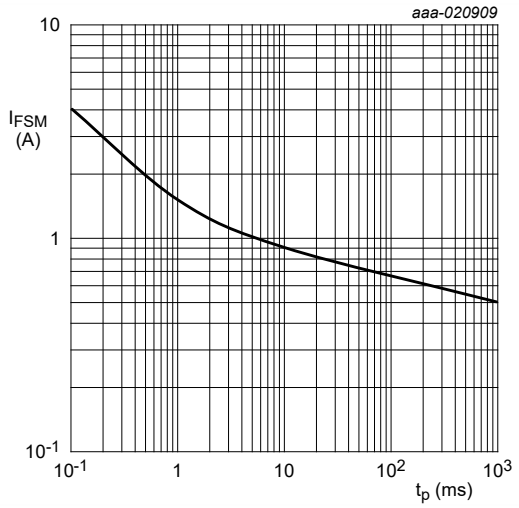
V_R = 75 V
(1) Maximum values
(2) Typical values

Fig. 4. Reverse current as a function of ambient temperature



f = 1 MHz; T_{amb} = 25 °C

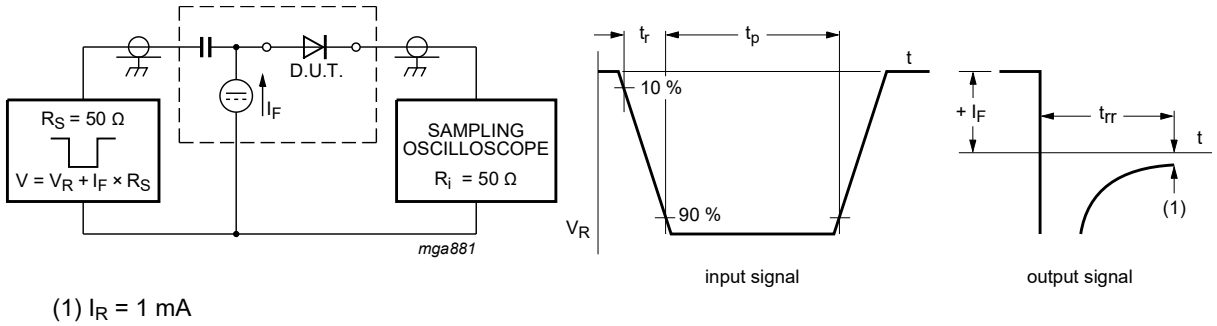
Fig. 5. Diode capacitance as a function of reverse voltage; typical values



Based on square wave currents.
T_{amb} = 25 °C

Fig. 6. Non-repetitive forward current as a function of pulse duration; maximum values

11. Test information



(1) I_R = 1 mA

Fig. 7. Reverse recovery time 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

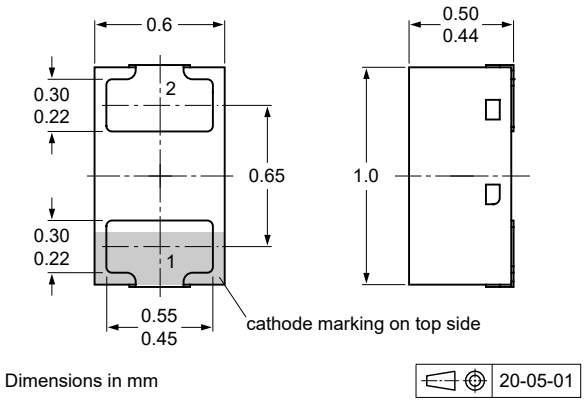


Fig. 8. Package outline DFN1006BD-2 (SOD882BD)

13. Soldering

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

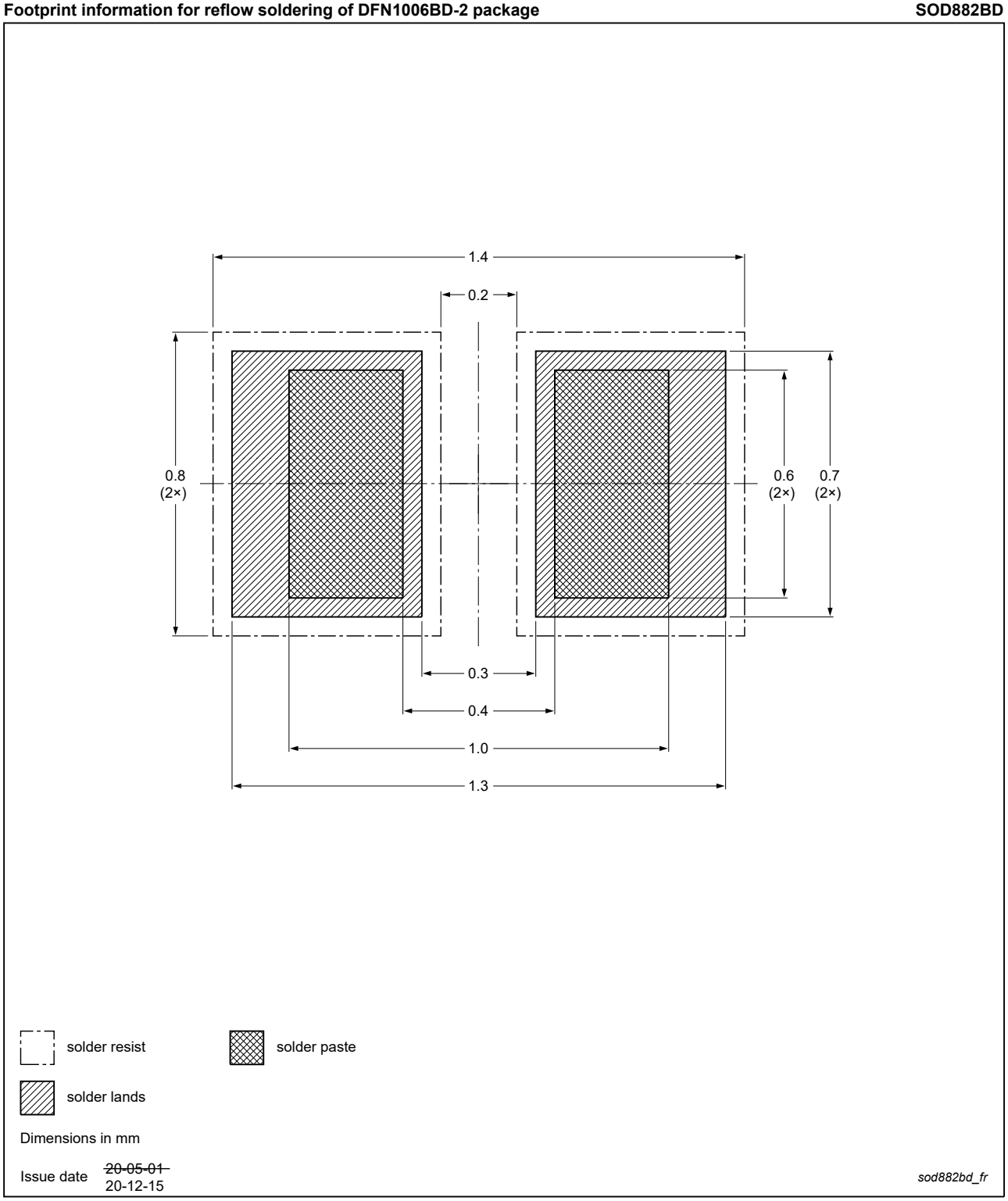


Fig. 9. Reflow soldering footprint for DFN1006BD-2 (SOD882BD)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS116LS-Q v.1	20220103	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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