



BAT46LS-Q

General-purpose Schottky diode

19 October 2022

Product data sheet

1. General description

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

2. Features and benefits

- Low leakage current
- Low capacitance
- Reverse voltage: $V_R \leq 100 \text{ V}$
- Ultra small 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

- High-speed switching
- Line termination
- Voltage clamping
- Reverse polarity protection

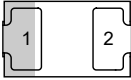
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I_F	forward current		-	-	250	mA
I_R	reverse current	$V_R = 75 \text{ V}$; pulsed; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	3	μA
V_R	reverse voltage		-	-	100	V

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]	 Transparent top view DFN1006BD-2 (SOD882BD)	 sym001
2	A	anode		

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT46LS-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
BAT46LS-Q	8Z

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			-	100	V
I_F	forward current			-	250	mA
I_{FSM}	non-repetitive peak forward current	square wave; $t_p \leq 10$ ms; $T_j = 25$ °C before surge		-	2.5	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1] [2]	-	335	mW
			[3] [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] Reflow soldering is the only recommended soldering method.

[3] Device mounted on an FR4 PCB, 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] [2]	-	-	375	K/W
			[3]	-	-	205	K/W

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

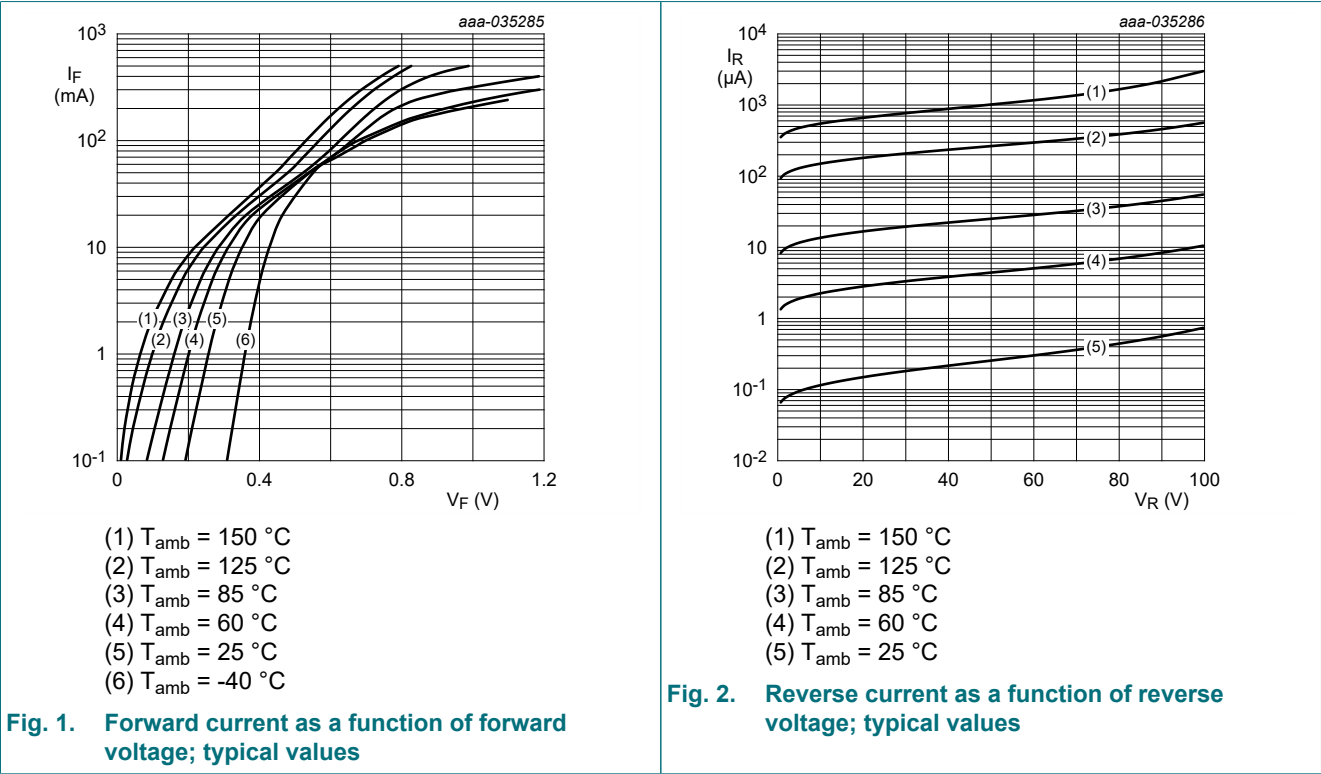
[2] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses P_R are a significant part of the total power losses.

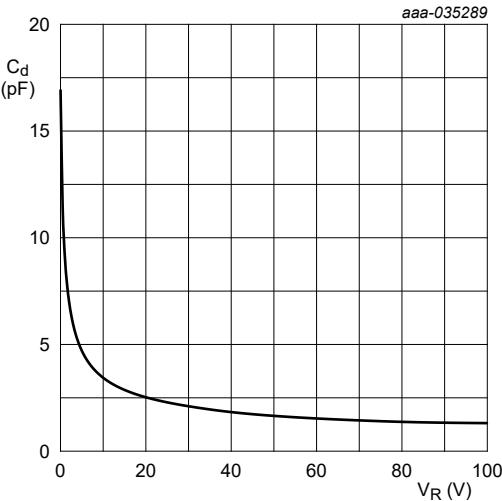
[3] Device mounted on an FR4 PCB, 70 µm single-sided copper, tin-plated, mounting pad for cathode 1 cm².

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _F	forward voltage	I _F = 0.1 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	-	-	250	mV
		I _F = 10 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	-	-	450	mV
		I _F = 150 mA; t _p ≤ 300 μs; δ ≤ 0.02; pulsed; T _{amb} = 25 °C	-	-	960	mV
		I _F = 250 mA; t _p ≤ 300 μs; δ ≤ 0.02; T _{amb} = 25 °C	-	-	1.35	V
I _R	reverse current	V _R = 1.5 V; pulsed; T _{amb} = 25 °C	-	-	0.3	μA
		V _R = 10 V; pulsed; T _{amb} = 25 °C	-	-	0.4	μA
		V _R = 50 V; pulsed; T _{amb} = 25 °C	-	-	1.41	μA
		V _R = 75 V; pulsed; T _{amb} = 25 °C	-	-	3	μA
		V _R = 100 V; pulsed; T _{amb} = 25 °C	-	-	9	μA
C _d	diode capacitance	V _R = 0 V; f = 1 MHz; T _{amb} = 25 °C	-	-	25	pF
		V _R = 1 V; f = 1 MHz; T _{amb} = 25 °C	-	-	13	pF
t _{rr}	reverse recovery time	T _{amb} = 25 °C; When switched from I _F = 10 mA to I _R = 10 mA; R _L = 100 Ω; measured at I _R = 1 mA.	-	3	-	ns

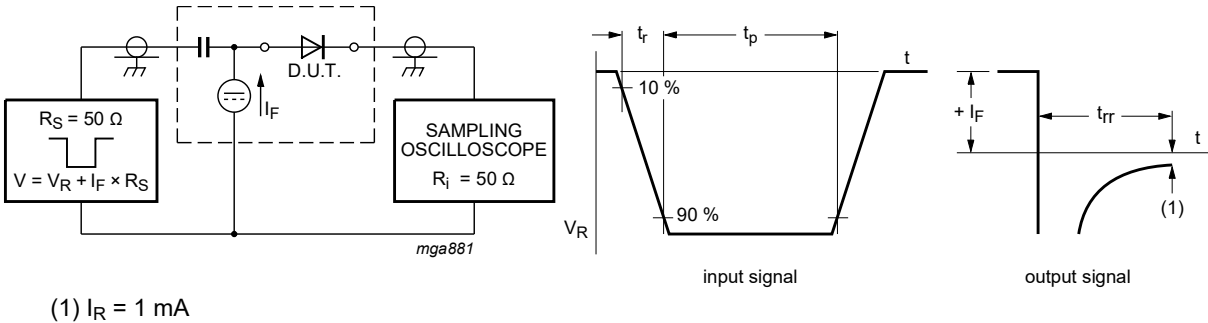




$f = 1\text{ MHz}$; $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$

Fig. 3. Diode capacitance as a function of reverse voltage; typical values

11. Test information



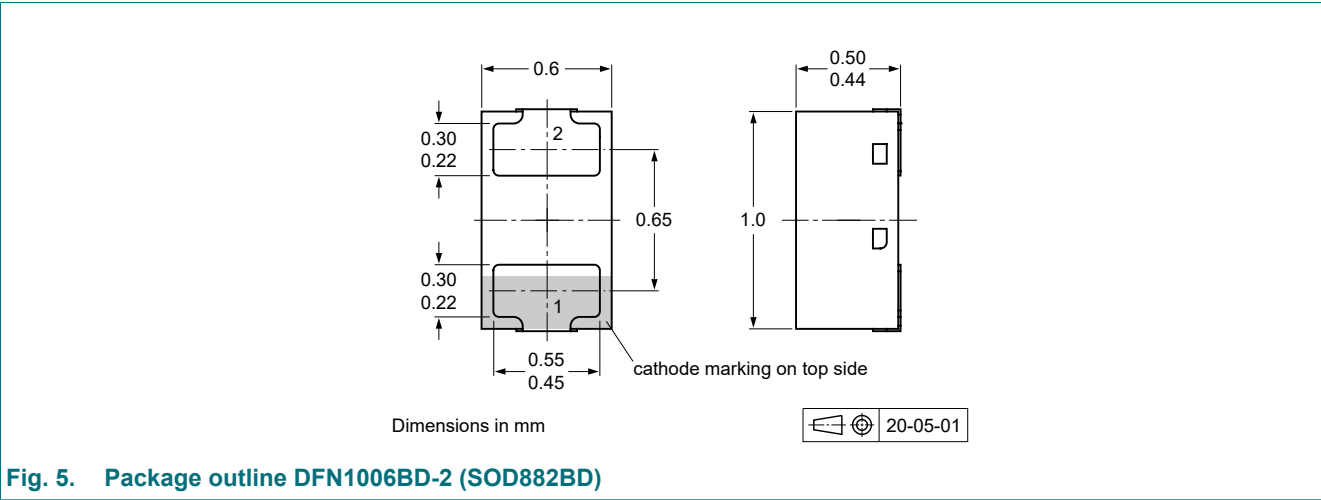
(1) $I_R = 1\text{ mA}$

Fig. 4. 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



13. Soldering

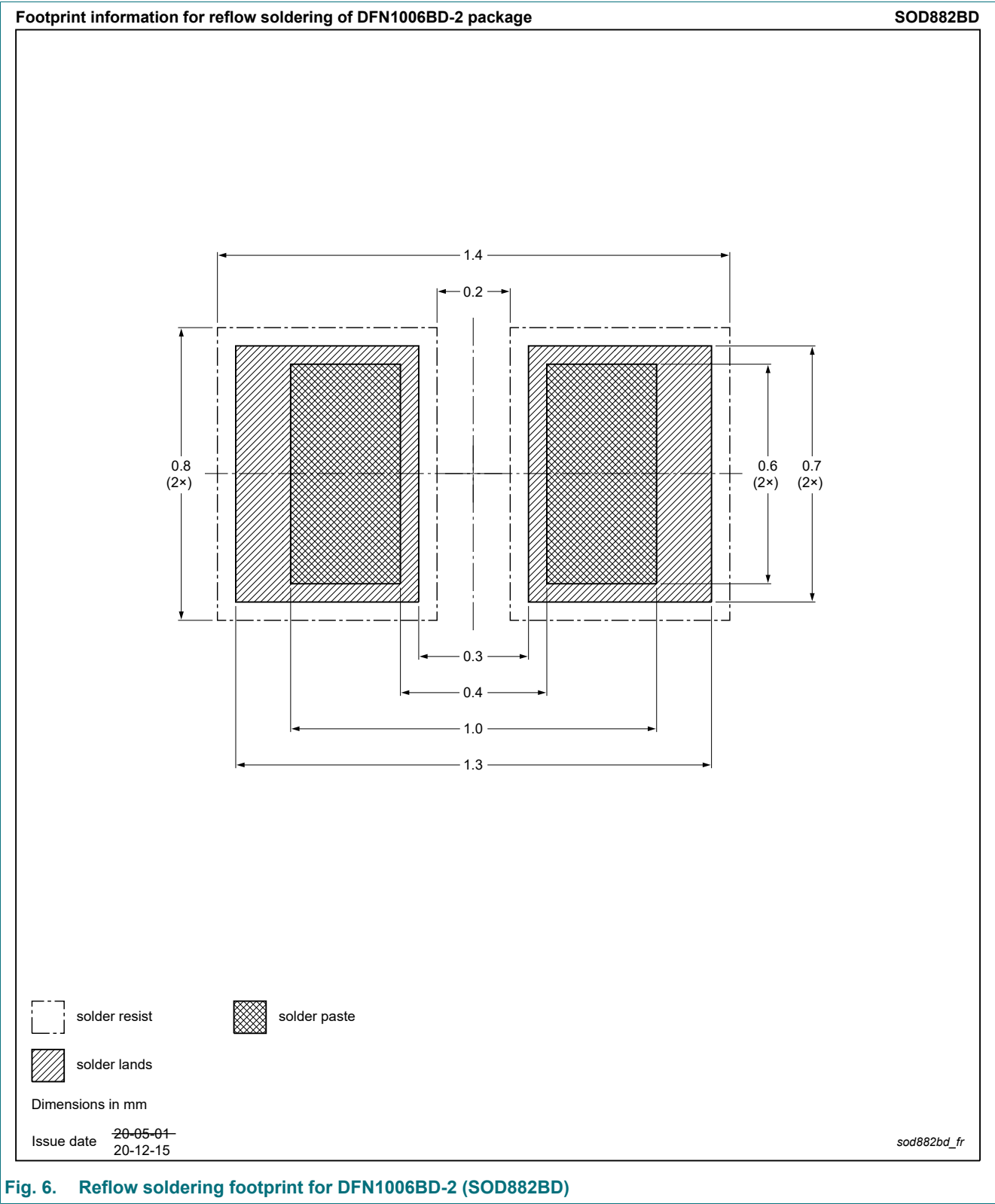


Fig. 6. Reflow soldering footprint for DFN1006BD-2 (SOD882BD)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT46LS-Q v.1	20221019	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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