



BAS21LS-Q

High-speed switching diode

3 November 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: $t_{rr} \leq 50$ ns
- Low leakage current
- High reverse voltage $V_R \leq 200$ V
- Low capacitance: $C_d \leq 2$ 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

- 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]	-	-	250	mA
V_R	reverse voltage			-	-	200	V
V_{RRM}	repetitive peak reverse voltage			-	-	250	V
I_R	reverse current	$V_R = 200$ V; $T_j = 25$ °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; $T_{amb} = 25$ °C		-	-	50	ns

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided, 70 µm 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
BAS21LS-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
BAS21LS-Q	M9

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]	-	250	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 50\text{ }\mu\text{s}$; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	9.5	A
		$t_p = 10\text{ ms}$; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	2.1	A
I_{FRM}	repetitive peak forward current	$t_p \leq 1\text{ ms}$; $\delta \leq 0.25$		-	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[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, 70 μm copper, tin-plated and standard footprint.

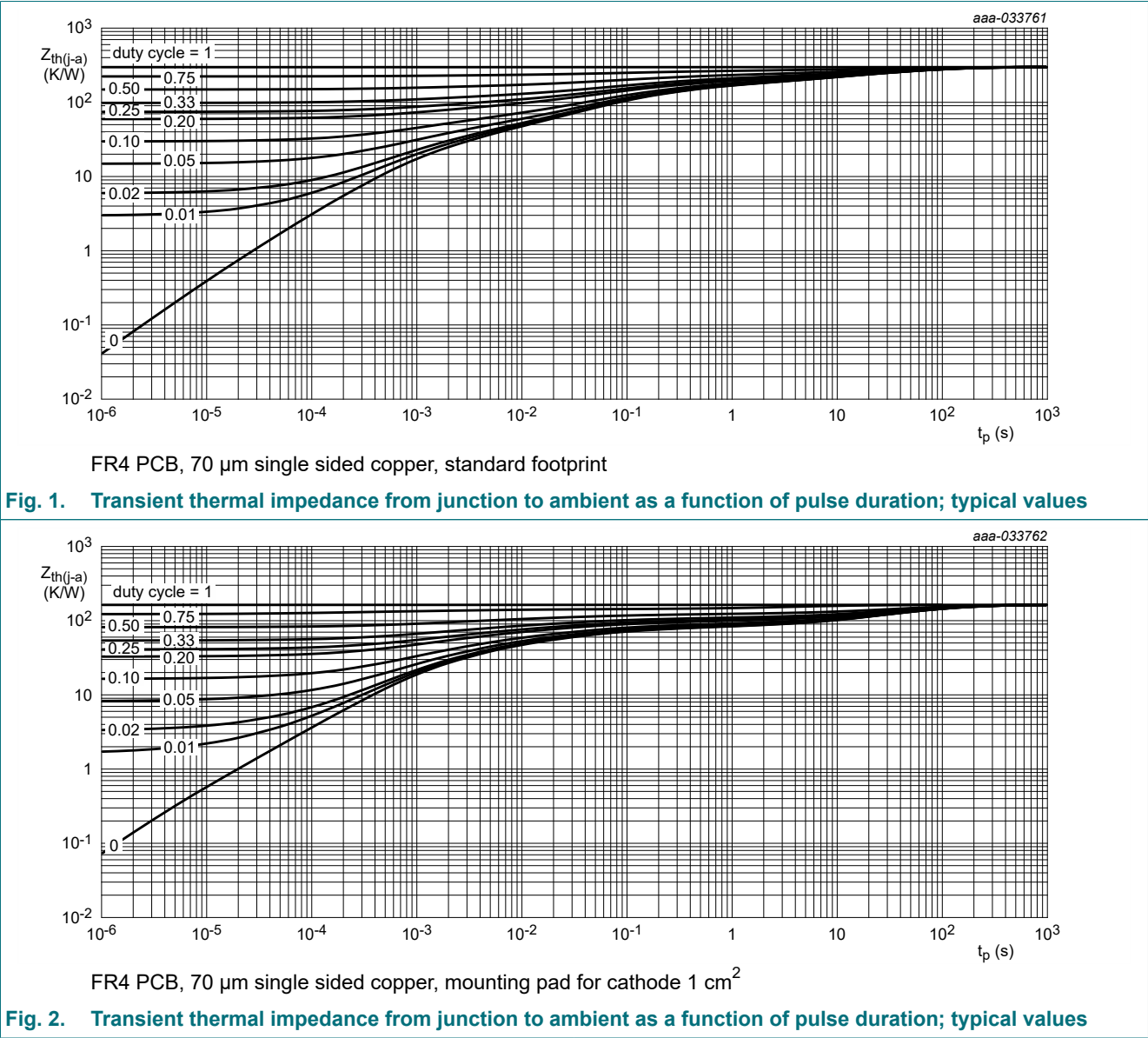
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided, 70 μm copper, tin-plated mounting pad for cathode 1 cm².

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]	-	-	375	K/W
			[2]	-	-	205	K/W

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



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 100\text{ mA}; t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02; T_j = 25\text{ }^\circ\text{C}$	-	-	1.1	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	$V_R = 200\text{ V}; T_j = 25\text{ }^\circ\text{C}$	-	-	100	nA
		$V_R = 200\text{ V}; T_j = 150\text{ }^\circ\text{C}$	-	-	100	μA
C_d	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}; T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-	-	2	pF
t_{rr}	reverse recovery time	$I_F = 30\text{ mA}; I_R = 30\text{ mA}; R_L = 100\text{ }\Omega; I_{R(\text{meas})} = 3\text{ mA}; T_{\text{amb}} = 25\text{ }^\circ\text{C}$	-	-	50	ns

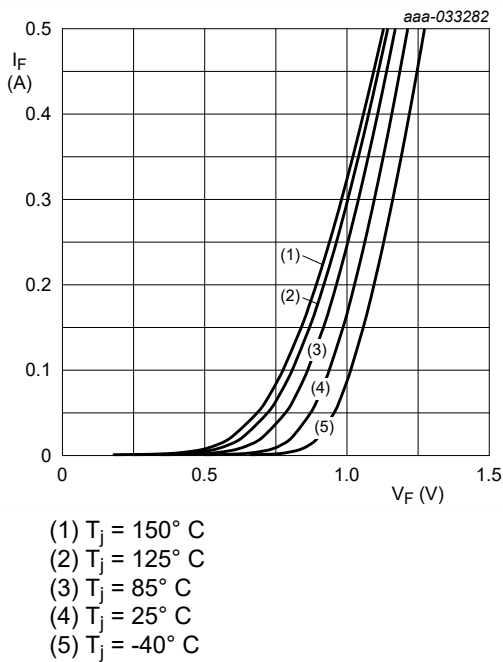


Fig. 3. Forward current as a function of forward voltage; typical values

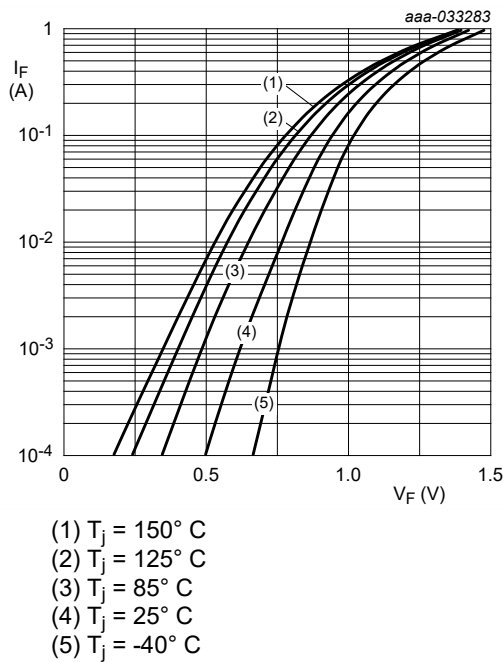


Fig. 4. Forward current as a function of forward voltage; typical values; (logarithmic scale)

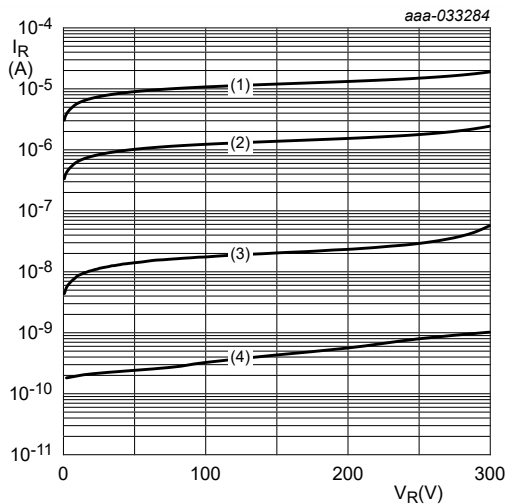


Fig. 5. Reverse current as a function of reverse voltage; typical values

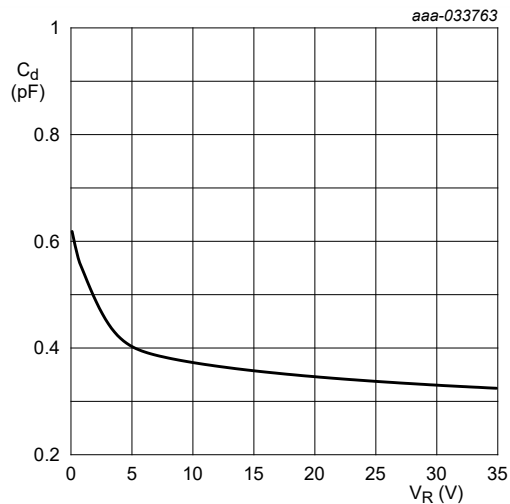
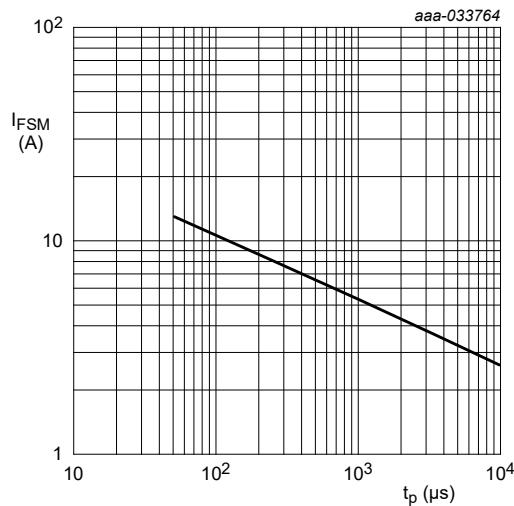


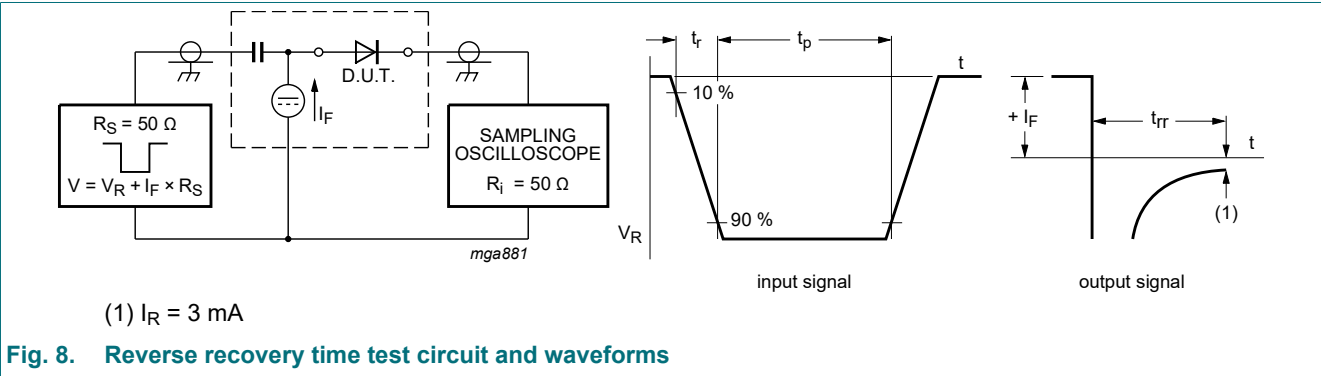
Fig. 6. Diode capacitance as a function of reverse voltage; typical values



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; typical values

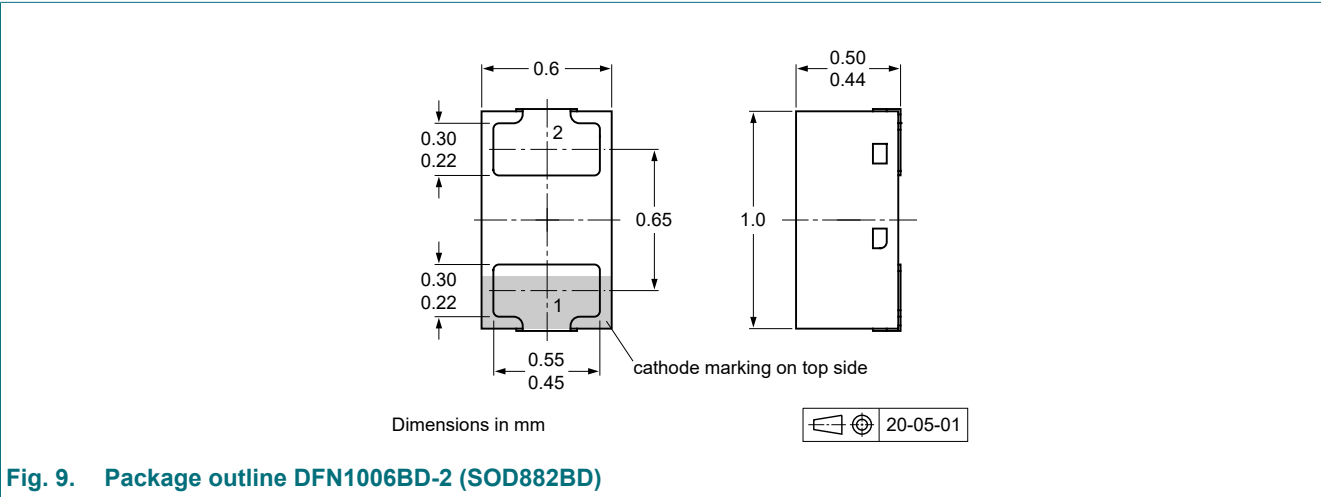
11. Test information



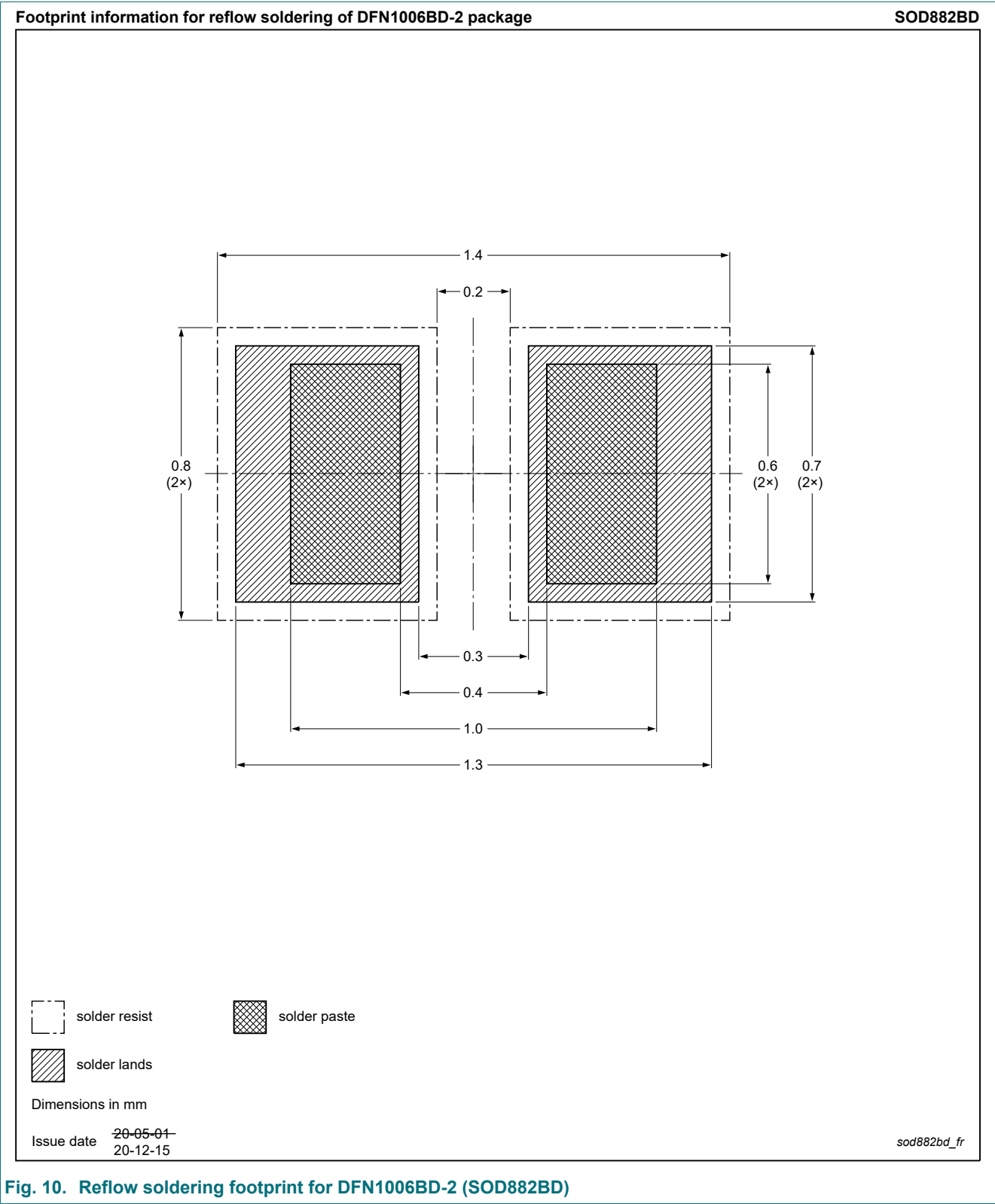
Quality information

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



13. Soldering



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS21LS-Q v.3	20211103	Product data sheet	-	BAS21LS-Q v.2
Modifications:	Product status changed			
BAS21LS-Q v.2	20211007	Preliminary data sheet	-	BAS21LS-Q v.1
BAS21LS-Q v.1	20210422	Objective 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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- [2] The term 'short data sheet' is explained in section "Definitions".
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