



# BAV199QC-Q

## Low-leakage double diode

1 March 2024

Product data sheet

## 1. General description

Epitaxial, medium-speed switching, double diode in an ultra small DFN1412D-3 (SOT8009) leadless Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

## 2. Features and benefits

- Switching time:  $t_{rr} = 0.8 \mu\text{s}$
- Maximum leakage current:  $I_R = 5 \text{ nA}$
- Repetitive peak reverse voltage  $V_{RRM} \leq 85 \text{ V}$
- Low capacitance  $C_d = 2 \text{ pF}$
- Ultra small SMD plastic package
- Low package height of 0.5 mm
- Suitable for Automatic Optical Inspection (AOI) of solder joint
- Smaller footprint compared to conventional leaded SMD packages
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Low-leakage current applications
- General-purpose switching

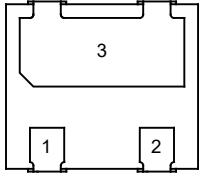
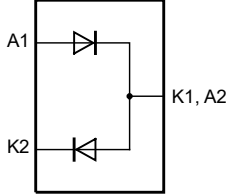
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$I_F$	forward current	single diode loaded; $T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	215	mA
$V_R$	reverse voltage	$T_j = 25 \text{ }^\circ\text{C}$	-	-	75	V
$I_R$	reverse current	$V_R = 75 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	-	5	nA
$t_{rr}$	reverse recovery time	$I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; I_{R(meas)} = 1 \text{ mA}; R_L = 100 \text{ } \Omega; T_{amb} = 25 \text{ }^\circ\text{C}$	-	0.8	3	$\mu\text{s}$

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 <p>Transparent top view DFN1412D-3 (SOT8009)</p>	 <p>aaa-022858</p>
2	K2	cathode (diode 2)		
3	K1, A2	cathode (diode 1) and anode (diode 2)		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">BAV199QC-Q</a>	DFN1412D-3	plastic, leadless ultra small outline package with side-wettable flanks (SWF); 3 terminals; 0.8 mm pitch; 1.4 mm x 1.2 mm x 0.48 mm body	<a href="#">SOT8009</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code
BAV199QC-Q	G4

## 8. Limiting values

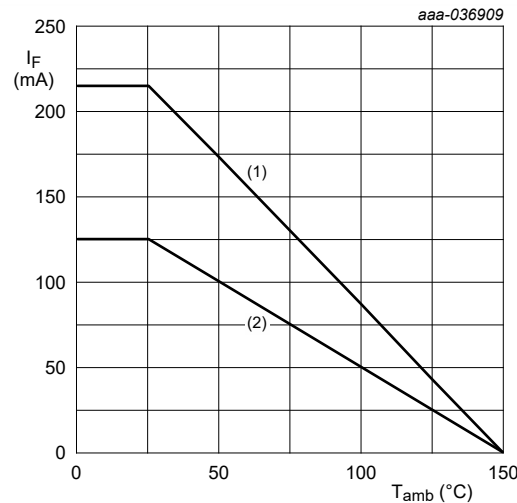
**Table 5. Limiting values**

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

Symbol	Parameter	Conditions		Min	Max	Unit
<b>Per diode</b>						
$V_R$	reverse voltage	$T_j = 25\text{ °C}$		-	75	V
$V_{RRM}$	repetitive peak reverse voltage			-	85	V
$I_F$	forward current	single diode loaded; $T_{amb} = 25\text{ °C}$		-	215	mA
		double diode loaded; $T_{amb} = 25\text{ °C}$		-	125	mA
$I_{FRM}$	repetitive peak forward current	$t_p \leq 0.5\text{ ms}$ ; $\delta \leq 0.25$ ; $T_j = 25\text{ °C}$		-	1.5	A
$I_{FSM}$	non-repetitive peak forward current	$t_p = 50\text{ }\mu\text{s}$ ; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	9.1	A
		$t_p = 10\text{ ms}$ ; square wave; $T_{j(\text{init})} = 25\text{ °C}$		-	1.8	A
<b>Per device; one diode loaded</b>						
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	335	mW
			[2]	-	595	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 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.



Device mounted on an FR4 printed-circuit board.

(1) Single diode loaded

(2) Double diode loaded

**Fig. 1. Maximum permissible continuous forward current as a function of ambient temperature.**

## 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]	-	-	210	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	50	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 1 cm<sup>2</sup>.
- [3] Soldering point of cathode tab.

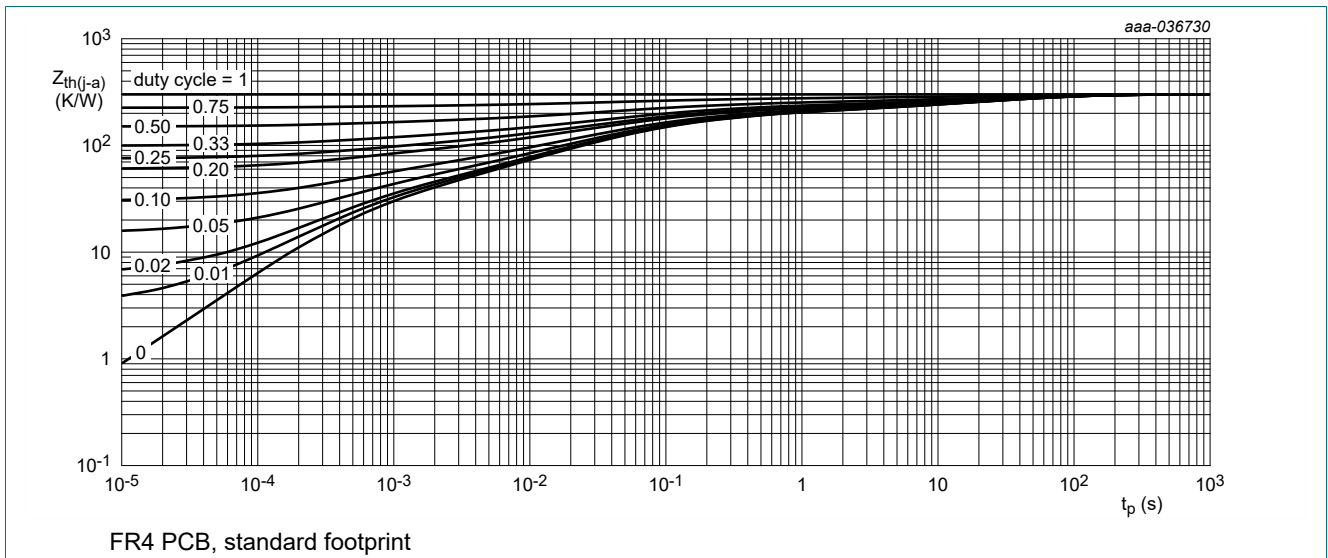


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

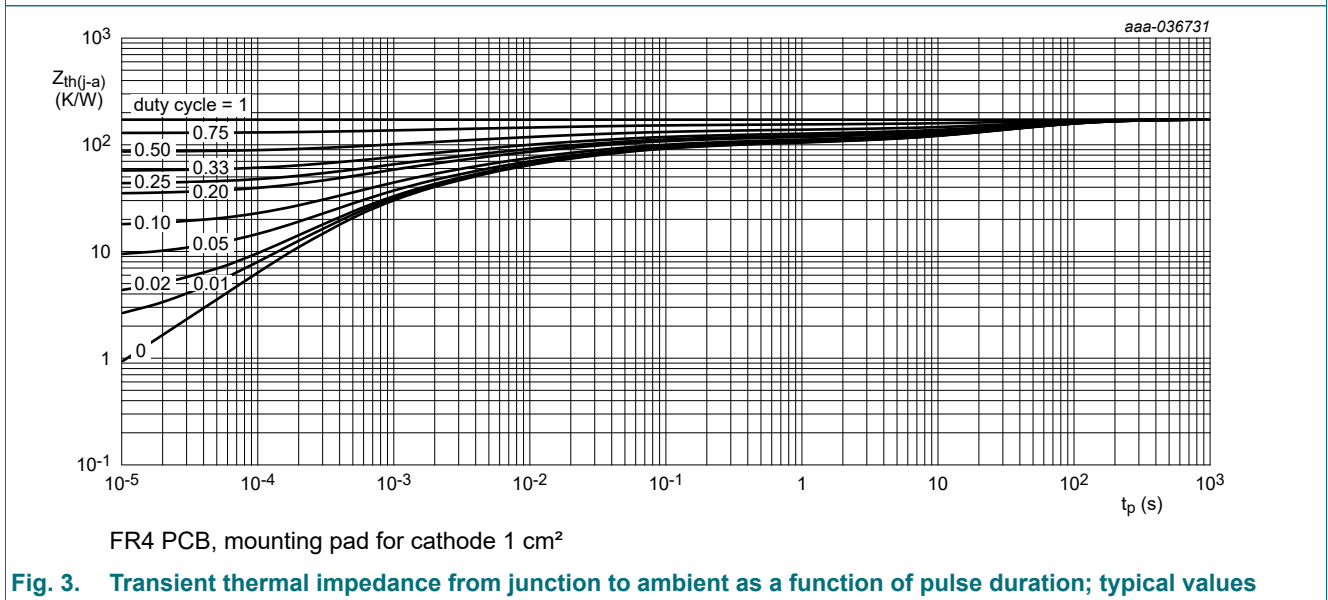
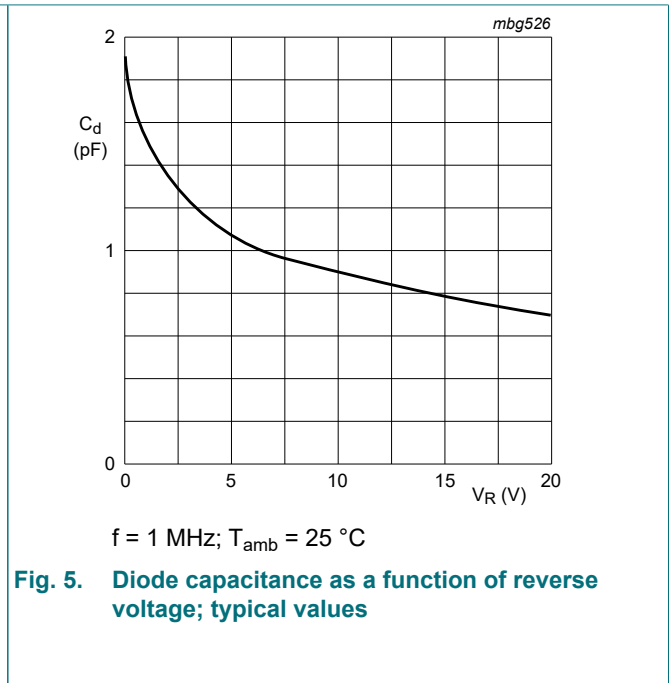
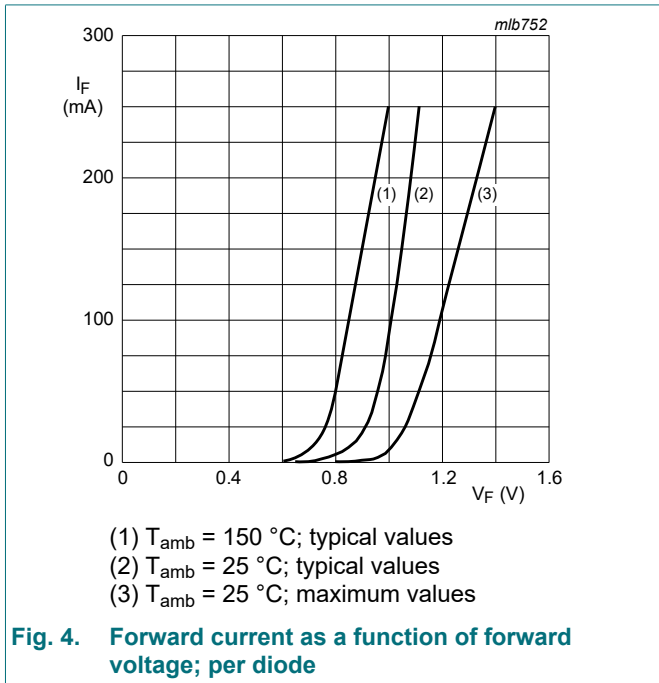


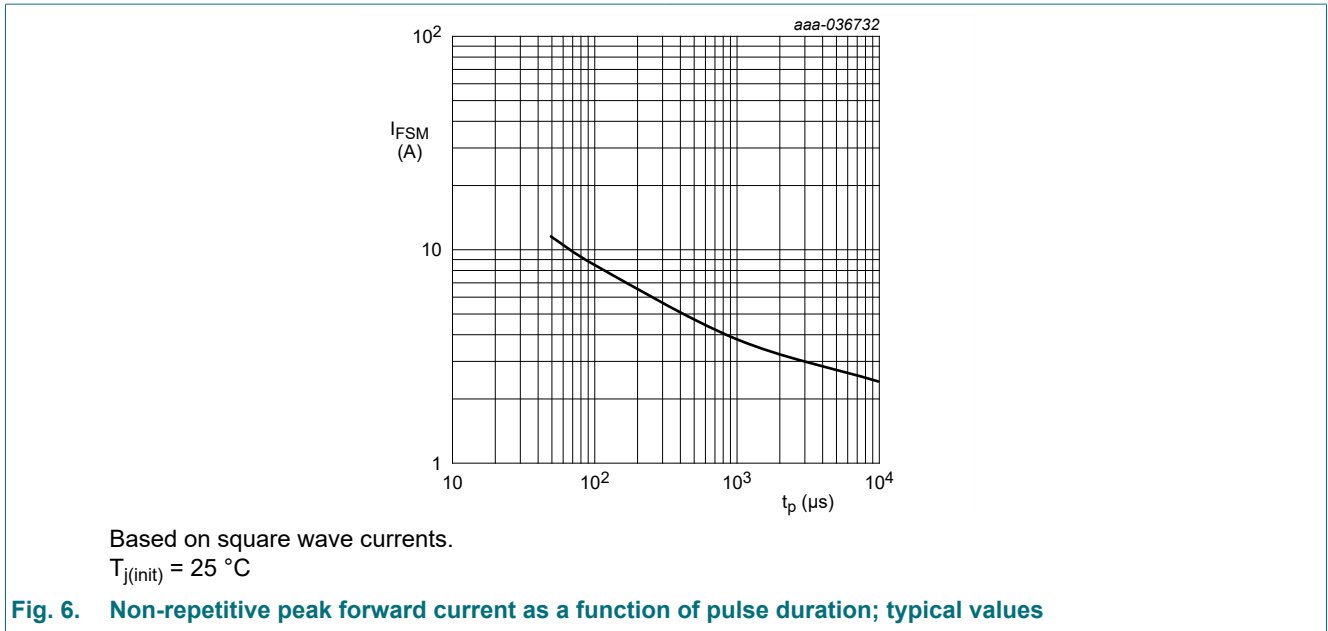
Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

## 10. Characteristics

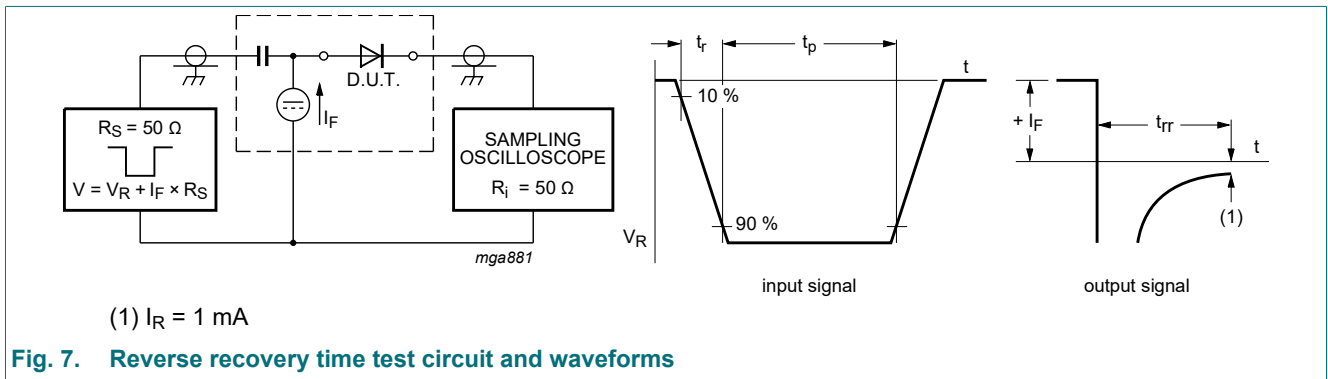
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	forward voltage	$I_F = 1 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	0.9	V
		$I_F = 10 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1	V
		$I_F = 50 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1.1	V
		$I_F = 150 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1.25	V
$I_R$	reverse current	$V_R = 75 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	-	5	nA
		$V_R = 75 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	-	80	nA
$C_d$	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	$I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; I_{R(\text{meas})} = 1 \text{ mA}; R_L = 100 \text{ } \Omega; T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	-	0.8	3	$\mu\text{s}$





### 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

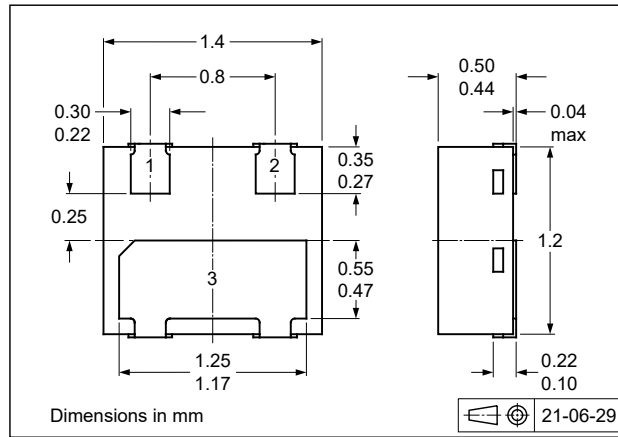
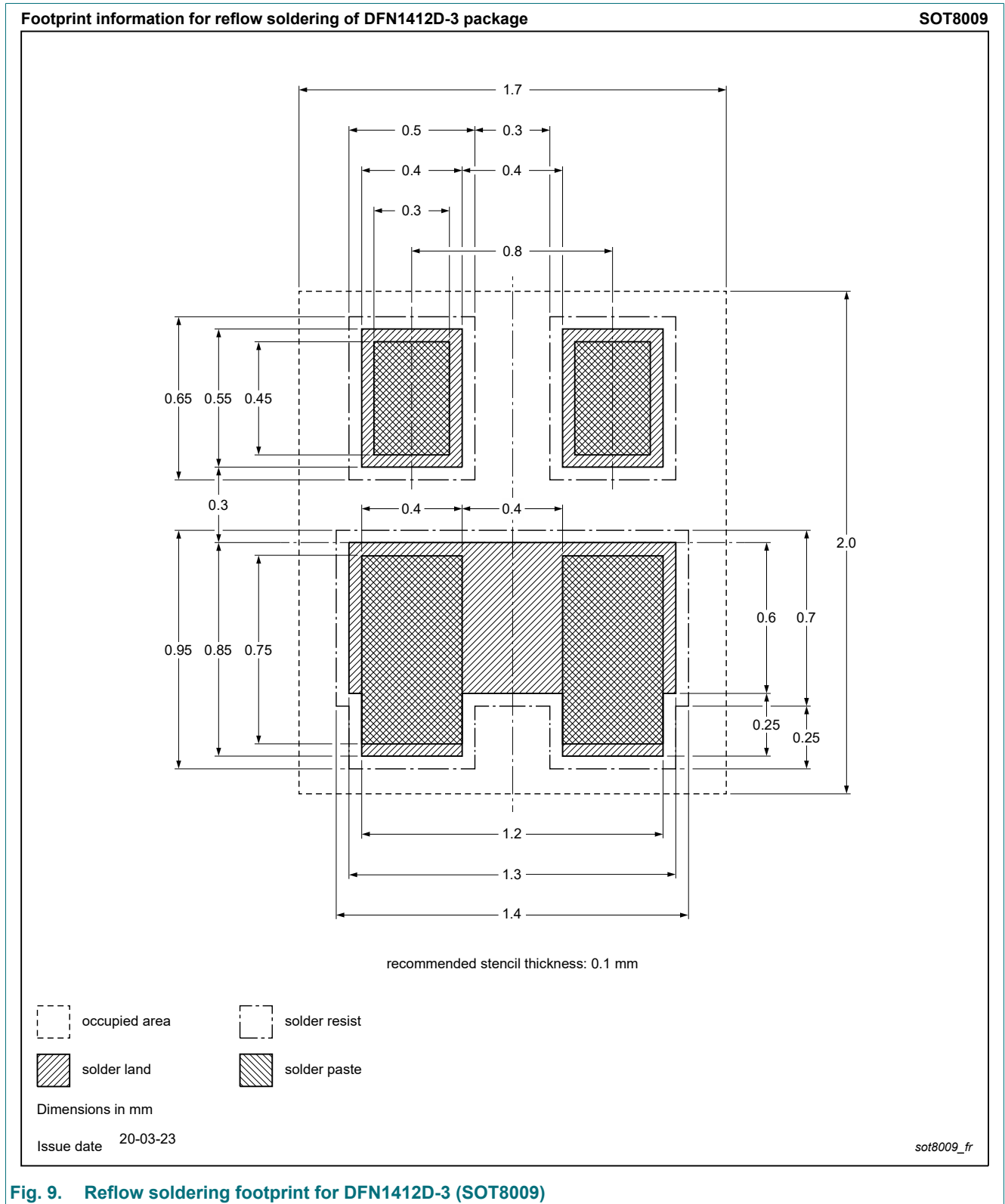


Fig. 8. Package outline DFN1412D-3 (SOT8009)

### 13. Soldering



**Fig. 9. Reflow soldering footprint for DFN1412D-3 (SOT8009)**



## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV199QC-Q v.1	20240301	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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- [2] The term 'short data sheet' is explained in section "Definitions".
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## Contents

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1. General description.....	1
2. Features and benefits.....	1
3. Applications.....	1
4. Quick reference data.....	1
5. Pinning information.....	2
6. Ordering information.....	2
7. Marking.....	2
8. Limiting values.....	3
9. Thermal characteristics.....	4
10. Characteristics.....	5
11. Test information.....	6
12. Package outline.....	7
13. Soldering.....	8
14. Revision history.....	9
15. Legal information.....	10

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