

BAV23QA-Q

Dual common cathode high-voltage switching diode

17 March 2025

Product data sheet

1. General description

Dual common cathode high-voltage switching diode, encapsulated in a leadless ultra small DFN1010D-3 (SOT1215) Surface-Mounted Device (SMD) plastic package with visible and solderable side pads.

2. Features and benefits

- High switching speed: $t_{rr} \leq 50$ ns
- Low leakage current: $I_R \leq 100$ nA
- High reverse voltage: $V_R \leq 200$ V
- Low capacitance: $C_d \leq 2$ pF
- Ultra small and leadless SMD plastic package
- Low package height of 0.37 mm
- 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

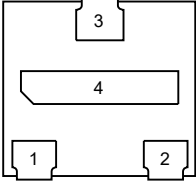
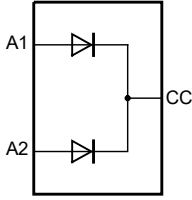
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
I_F	forward current	single diode loaded; $T_j = 25$ °C	[1]	-	-	330	mA
V_R	reverse voltage	$T_j = 25$ °C		-	-	200	V
V_{RRM}	repetitive peak reverse voltage			-	-	250	V
V_F	forward voltage	$I_F = 200$ mA; $t_p \leq 300$ μ s; $\delta \leq 0.02$; $T_j = 25$ °C		-	-	1.25	V
I_R	reverse current	$V_R = 200$ V; pulsed; $T_j = 25$ °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; $T_j = 25$ °C		-	-	50	ns

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

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 <p>Transparent top view DFN1010D-3 (SOT1215)</p>	 <p>aaa-021931</p>
2	A2	anode (diode 2)		
3	CC	common cathode		
4	CC	common cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV23QA-Q	DFN1010D-3	plastic, leadless thermal enhanced ultra thin small outline package with side-wettable flanks (SWF); 3 terminals; 0.75 mm pitch; 1.1 mm x 1 mm x 0.37 mm body	SOT1215

7. Marking

Table 4. Marking codes

Type number	Marking code
BAV23QA-Q	X 010

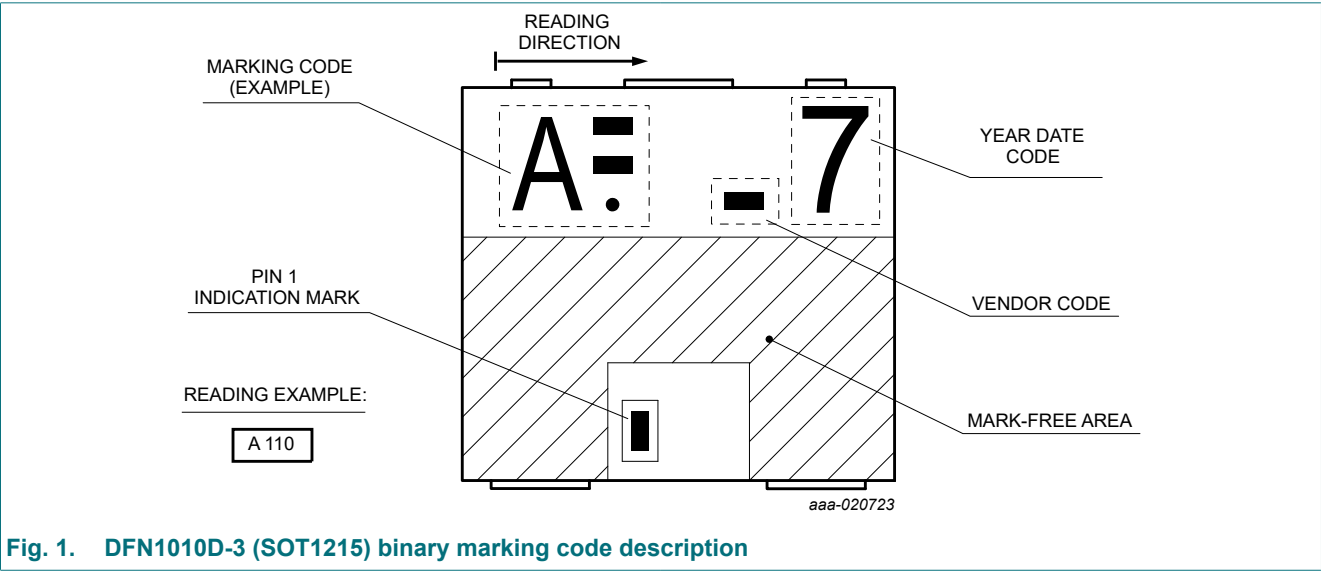


Fig. 1. DFN1010D-3 (SOT1215) binary marking code description

8. Limiting values

Table 5. Limiting values
In accordance with the Absolute Maximum Rating Sytem (IEC 60134)

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
V _{RRM}	repetitive peak reverse voltage	T _j = 25 °C		-	250	V
V _R	reverse voltage			-	200	V
I _F	forward current	single diode loaded; T _j = 25 °C	[1]	-	330	mA
		double diode loaded; T _j = 25 °C	[1]	-	190	mA
I _{FSM}	non-repetitive peak forward current	t _p = 1 µs; square wave; T _{j(init)} = 25 °C		-	9	A
		t _p = 100 µs; square wave; T _{j(init)} = 25 °C		-	3	A
		t _p = 10 ms; square wave; T _{j(init)} = 25 °C		-	1.7	A
I _{FRM}	repetitive peak forward current	t _p ≤ 1 ms; δ ≤ 0.25		-	900	mA
Per device, one diode loaded						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	350	mW
			[2]	-	610	mW
T _j	junction temperature			-	150	°C
T _{amb}	ambient temperature			-55	150	°C
T _{stg}	storage temperature			-65	150	°C

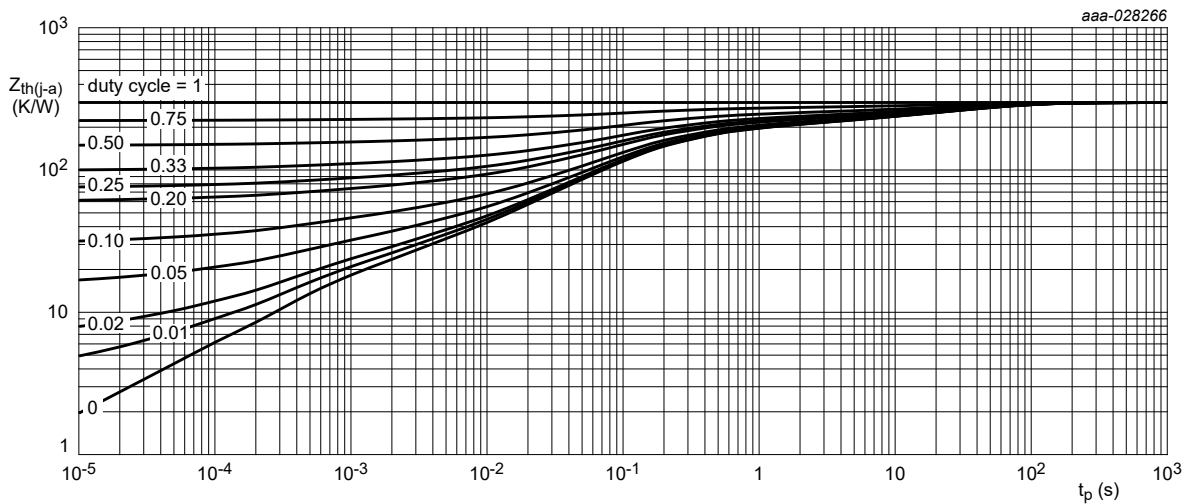
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated mounting pad for cathode 1cm².

9. Thermal characteristics

Table 6. Thermal characteristics

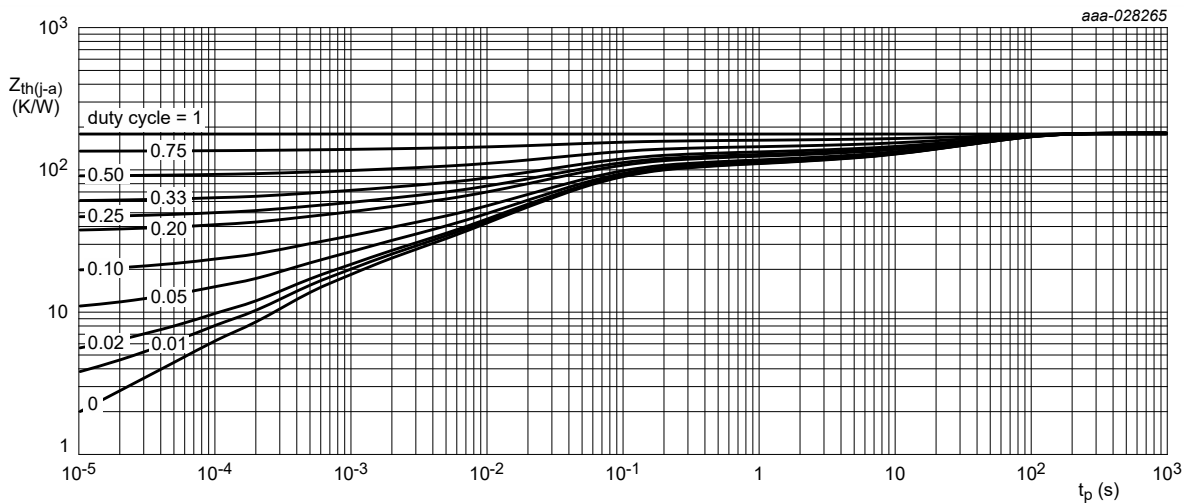
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R _{th(j-a)}	thermal resistance from junction to ambient	In free air	[1]	-	-	355	K/W
			[2]	-	-	205	K/W
R _{th(j-sp)}	thermal resistance from junction to solder point		[3]	-	-	45	K/W

[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 1cm².
[3] Soldering point of cathode tab.



FR4 PCB, standard footprint

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



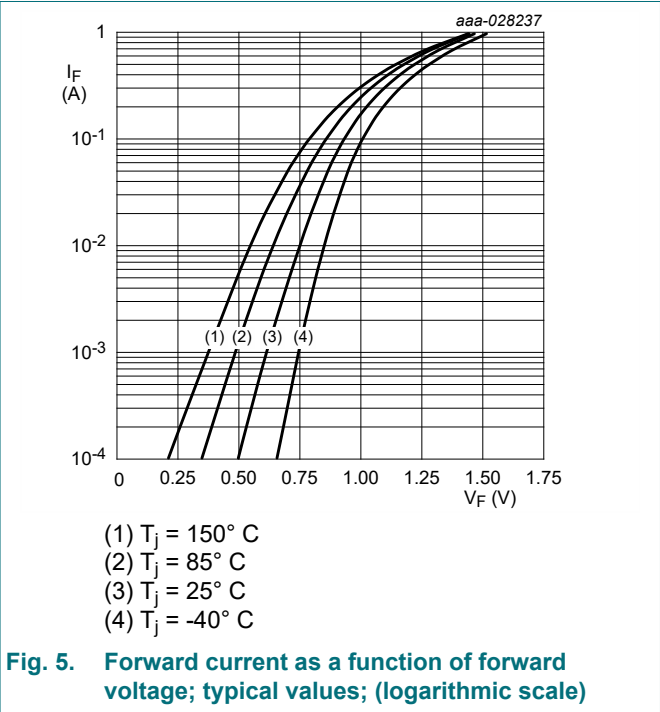
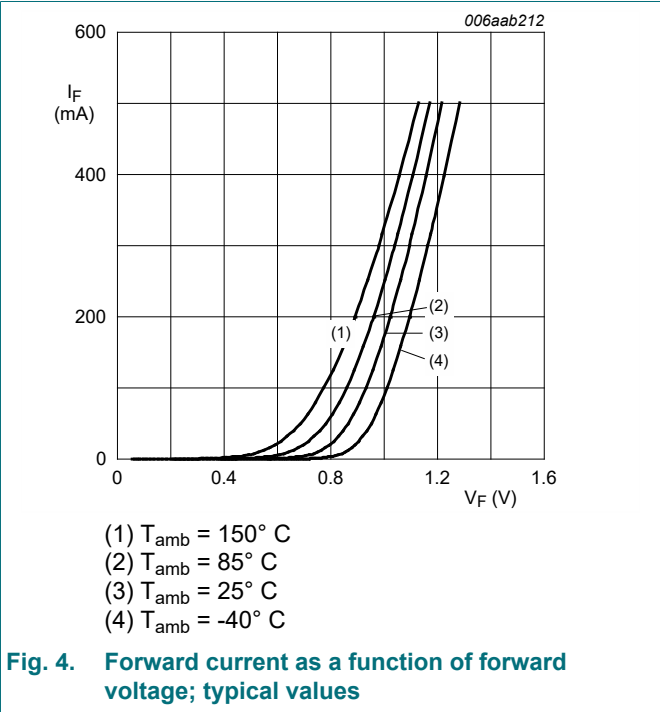
FR4 PCB, mounting pad for cathode 1 cm²

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
Per diode						
V _F	forward voltage	I _F = 100 mA; t _p ≤ 300 μs; δ ≤ 0.02; T _j = 25 °C	-	-	1	V
		I _F = 200 mA; t _p ≤ 300 μs; δ ≤ 0.02; T _j = 25 °C	-	-	1.25	V
I _R	reverse current	V _R = 200 V; pulsed; T _j = 25 °C	-	-	100	nA
		V _R = 200 V; pulsed; T _j = 150 °C	-	-	100	μA
C _d	diode capacitance	V _R = 0 V; f = 1 MHz; T _j = 25 °C	-	-	2	pF
t _{rr}	reverse recovery time	I _F = 30 mA; I _R = 30 mA; R _L = 100 Ω; I _{R(meas)} = 3 mA; T _j = 25 °C	-	-	50	ns



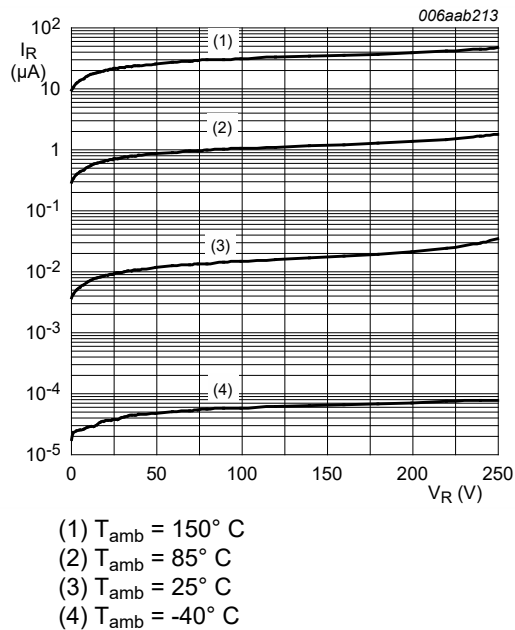


Fig. 6. Reverse current as a function of reverse voltage; typical values

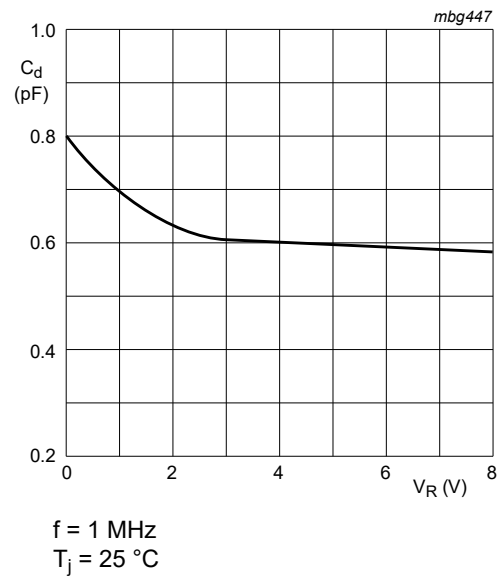
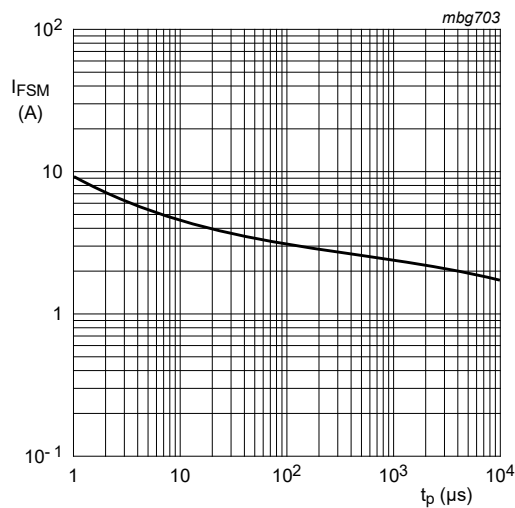


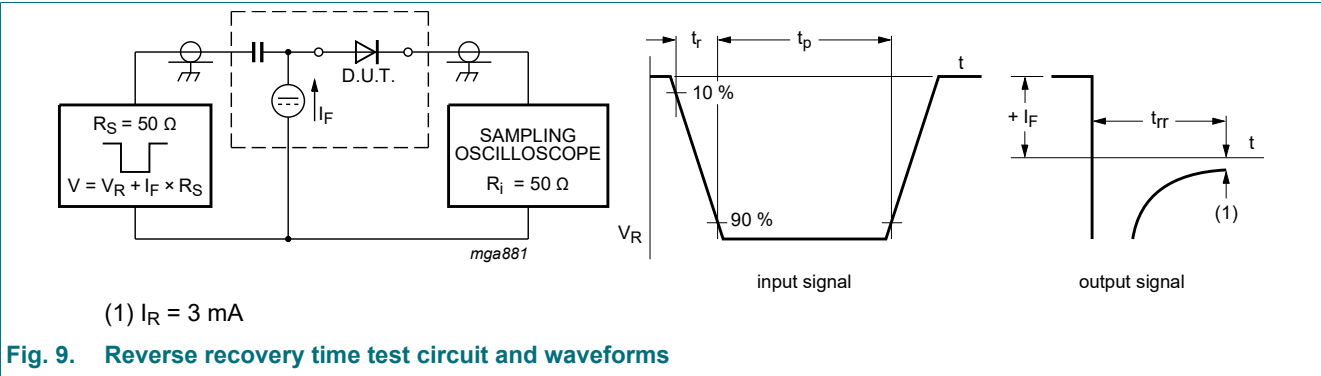
Fig. 7. Diode capacitance as a function of reverse voltage; typical values



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

Fig. 8. Non-repetitive peak forward current as a function of pulse duration; maximum values

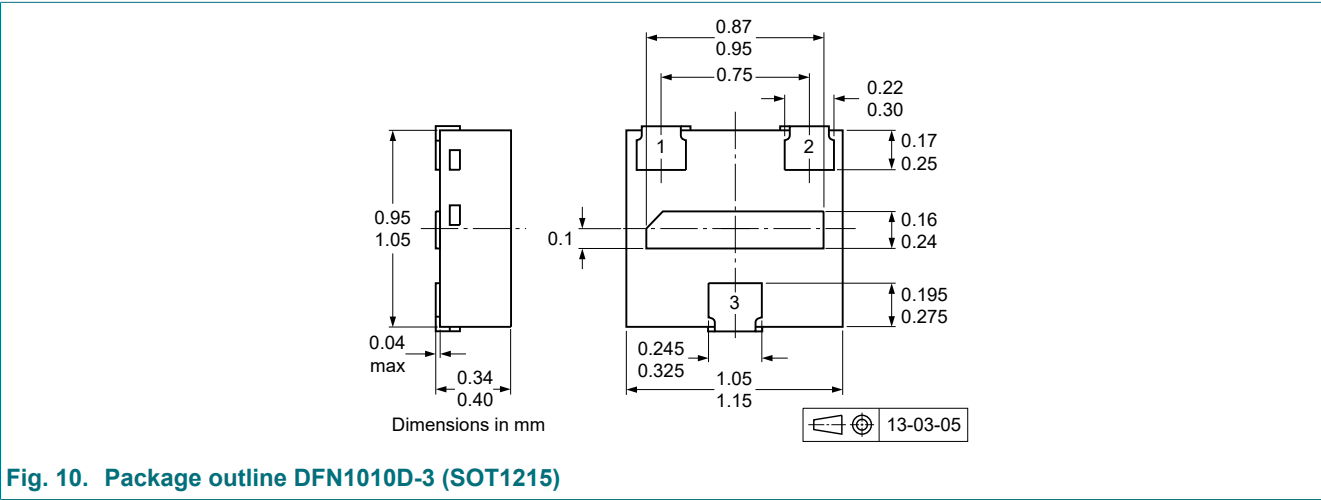
11. Test information



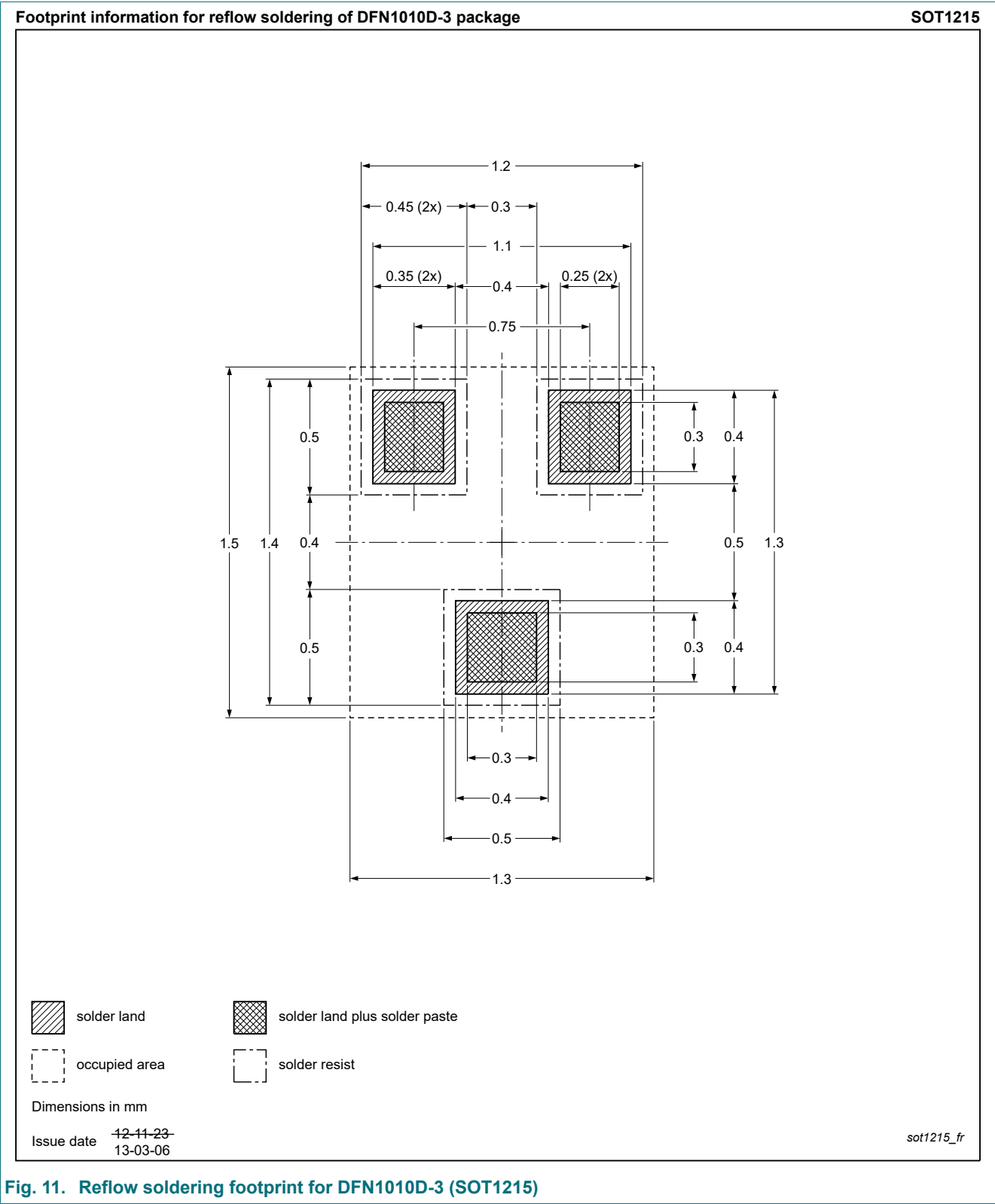
Quality information

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
BAV23QA-Q v.1	20250317	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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