



BAV170QA

Dual common cathode low-leakage diode

3 May 2016

Product data sheet

1. General description

Dual common cathode low-leakage 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: $t_{rr} = 0.8 \mu s$
- Low leakage current: $I_R = 3 \text{ pA}$
- 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 0.37 mm
- Suitable for Automatic Optical Inspection (AOI) of solder joint
- AEC-Q101 qualified

3. Applications

- Low-leakage current applications
- General-purpose switching

4. Quick reference data

Table 1. Quick reference data

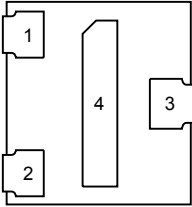
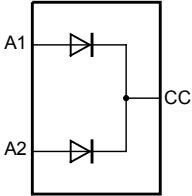
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
I_F	forward current	$T_{amb} = 25 \text{ }^\circ\text{C}$; single diode loaded	[1]	-	-	320	mA
V_R	reverse voltage	$T_j = 25 \text{ }^\circ\text{C}$		-	-	75	V
Per diode							
I_R	reverse current	$V_R = 75 \text{ V}$; $T_j = 25 \text{ }^\circ\text{C}$		-	0.003	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	μs

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

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5. Pinning information

Table 2. Pinning information

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

6. Ordering information

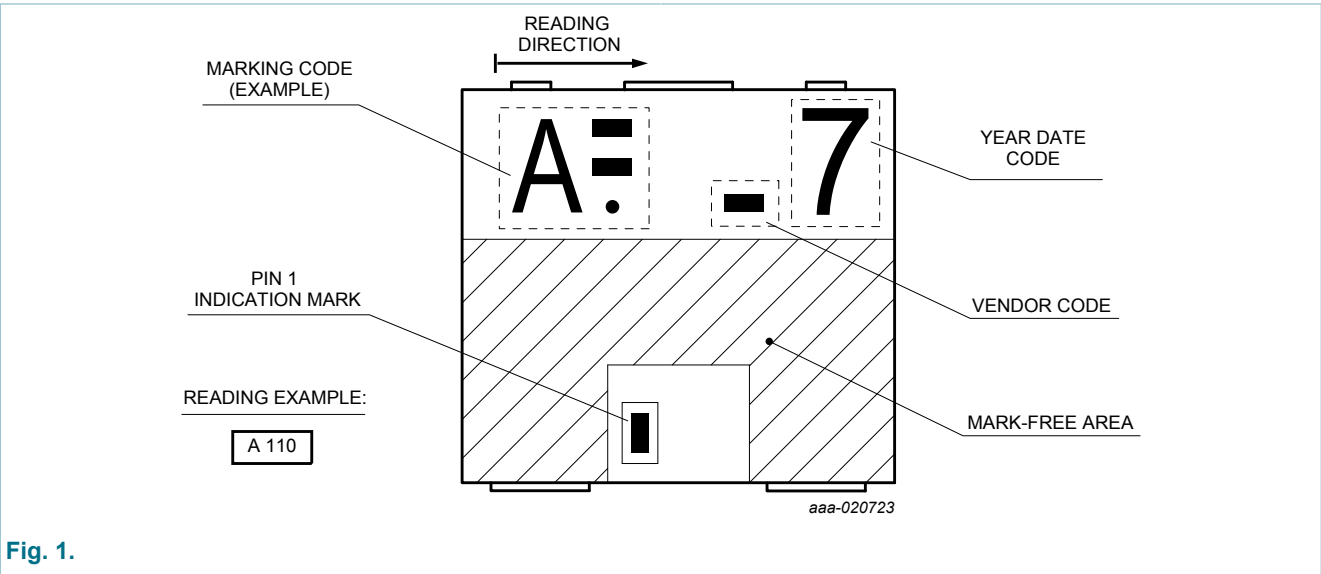
Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV170QA	DFN1010D-3	DFN1010D-3: plastic thermal enhanced ultra thin small outline package; no leads; 3 terminals; body 1.1 x 1.0 x 0.37 mm	SOT1215

7. Marking

Table 4. Marking codes

Type number	Marking code
BAV170QA	Z 011

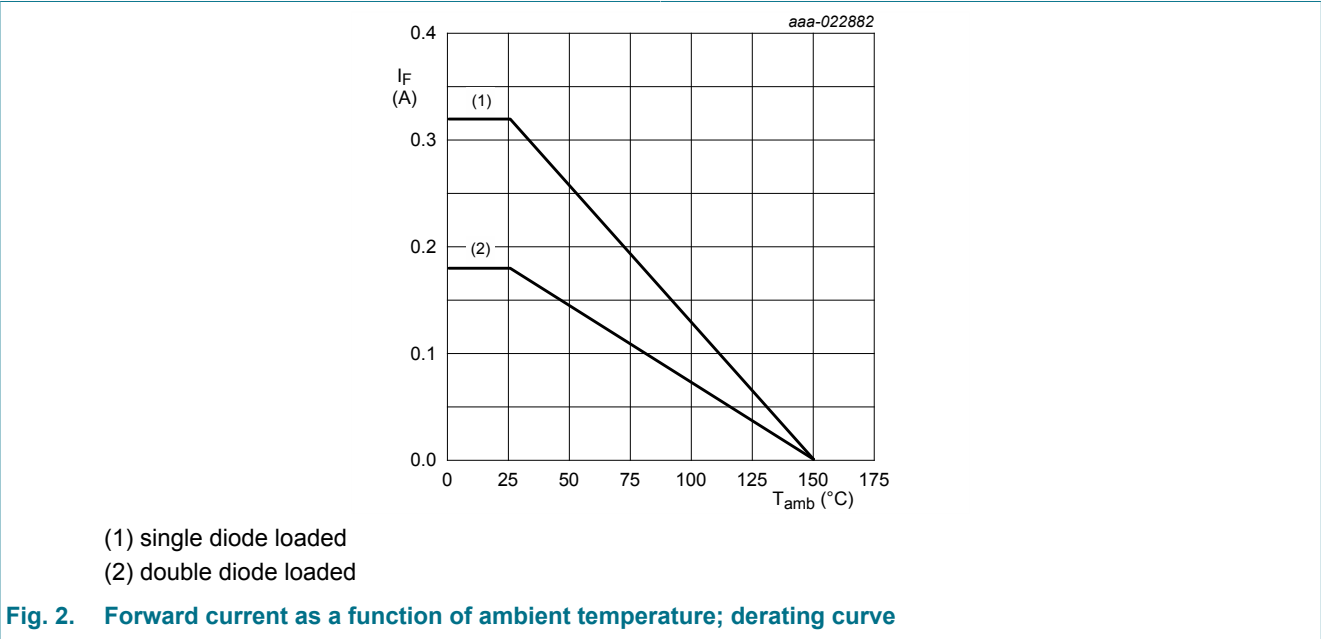


8. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
V _R	reverse voltage	T _j = 25 °C		-	75	V
V _{RRM}	repetitive peak reverse voltage			-	85	V
I _F	forward current	T _{amb} = 25 °C; single diode loaded	[1]	-	320	mA
		T _{amb} = 25 °C; double diode loaded	[1]	-	180	mA
I _{FRM}	repetitive peak forward current	t _p ≤ 0.5 ms; δ ≤ 0.25 ; T _j = 25 °C		-	1	A
I _{FSM}	non-repetitive peak forward current	t _p = 100 μs; T _{j(init)} = 25 °C; square wave		-	4	A
		t _p = 1 ms; T _{j(init)} = 25 °C; square wave		-	1.5	A
		t _p = 1 s; T _{j(init)} = 25 °C; square wave		-	0.5	A
Per device; one diode loaded						
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	325	mW
			[2]	-	540	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 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]	-	-	385	K/W
			[2]	-	-	230	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 cm².
- [3] Soldering point of cathode tab.

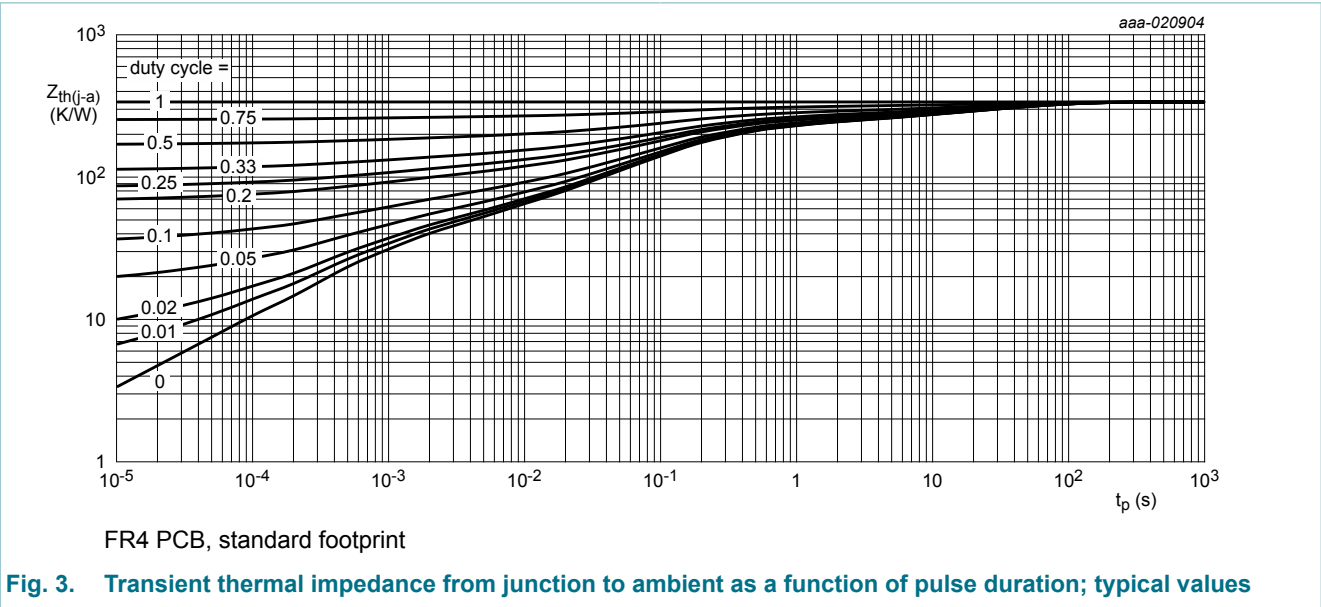
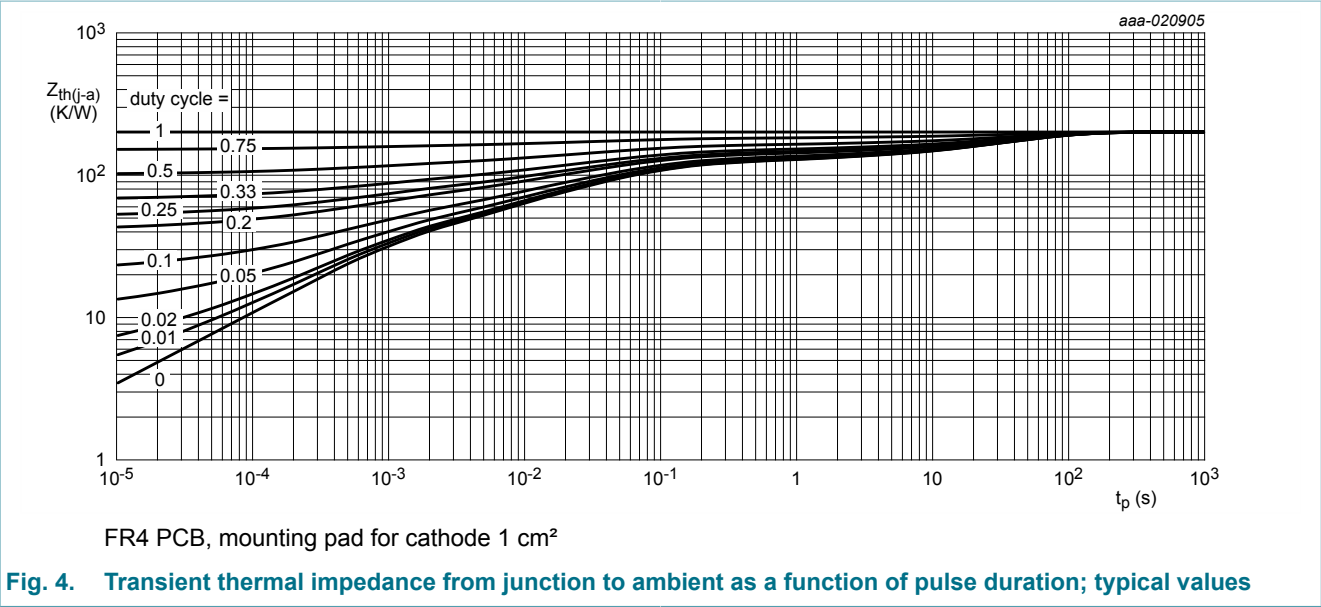


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V _F	forward voltage	I _F = 1 mA; T _j = 25 °C	-	-	0.9	V
		I _F = 10 mA; T _j = 25 °C	-	-	1	V
		I _F = 50 mA; T _j = 25 °C	-	-	1.1	V
		I _F = 150 mA; T _j = 25 °C	-	-	1.25	V
I _R	reverse current	V _R = 75 V; T _j = 25 °C	-	0.003	5	nA
		V _R = 75 V; T _j = 150 °C	-	3	80	nA
C _d	diode capacitance	V _R = 0 V; f = 1 MHz; T _j = 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	-	0.8	3	μs

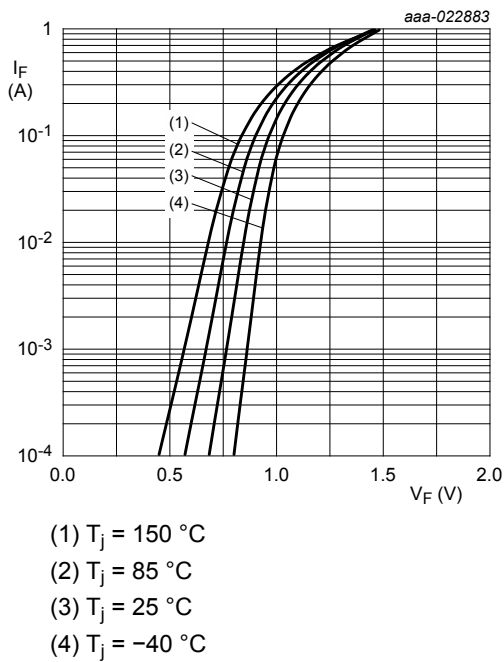


Fig. 5. Forward current as a function of forward voltage; typical values

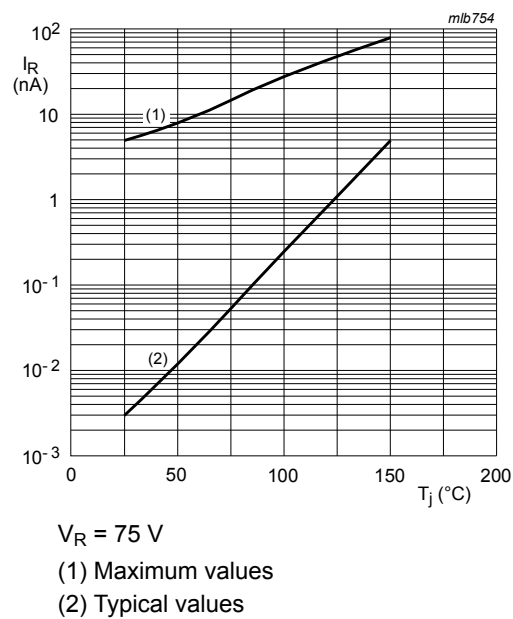


Fig. 6. Reverse current as a function of junction temperature

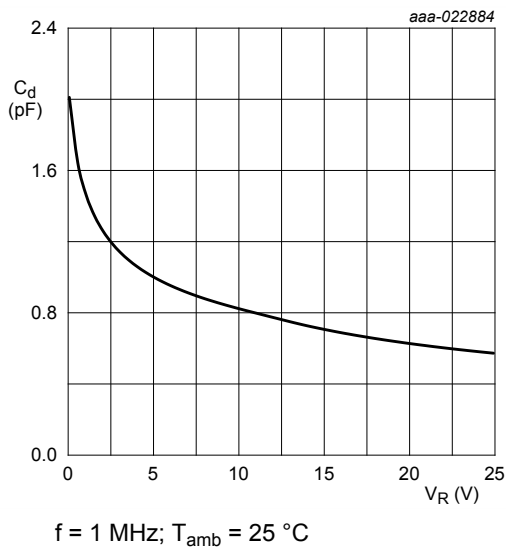


Fig. 7. Diode capacitance as a function of reverse voltage; typical values

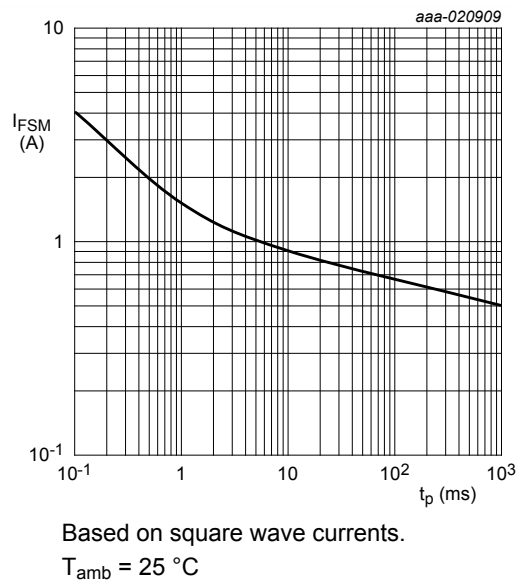
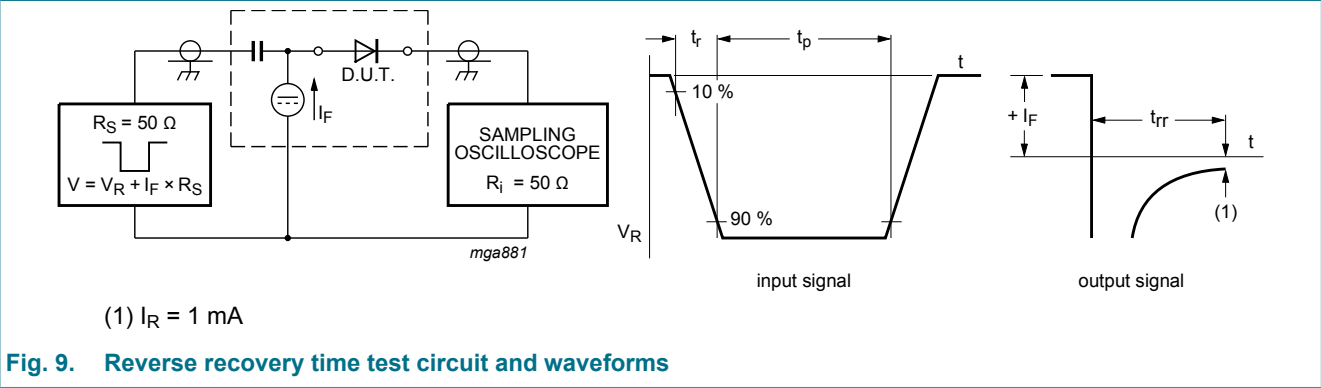


Fig. 8. Non-repetitive forward current as a function of pulse duration; maximum values

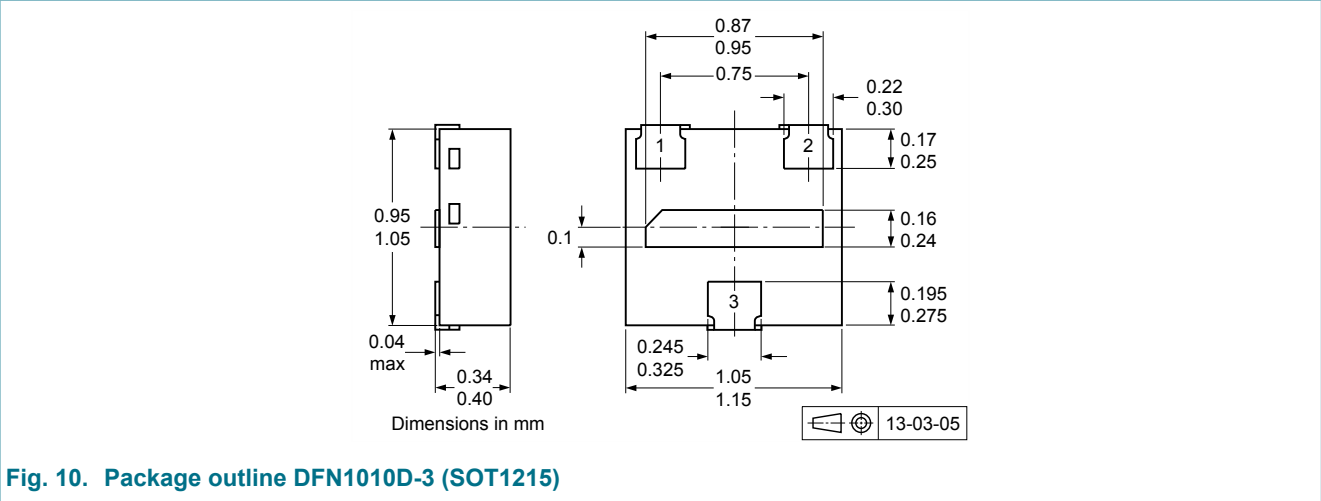
11. Test information



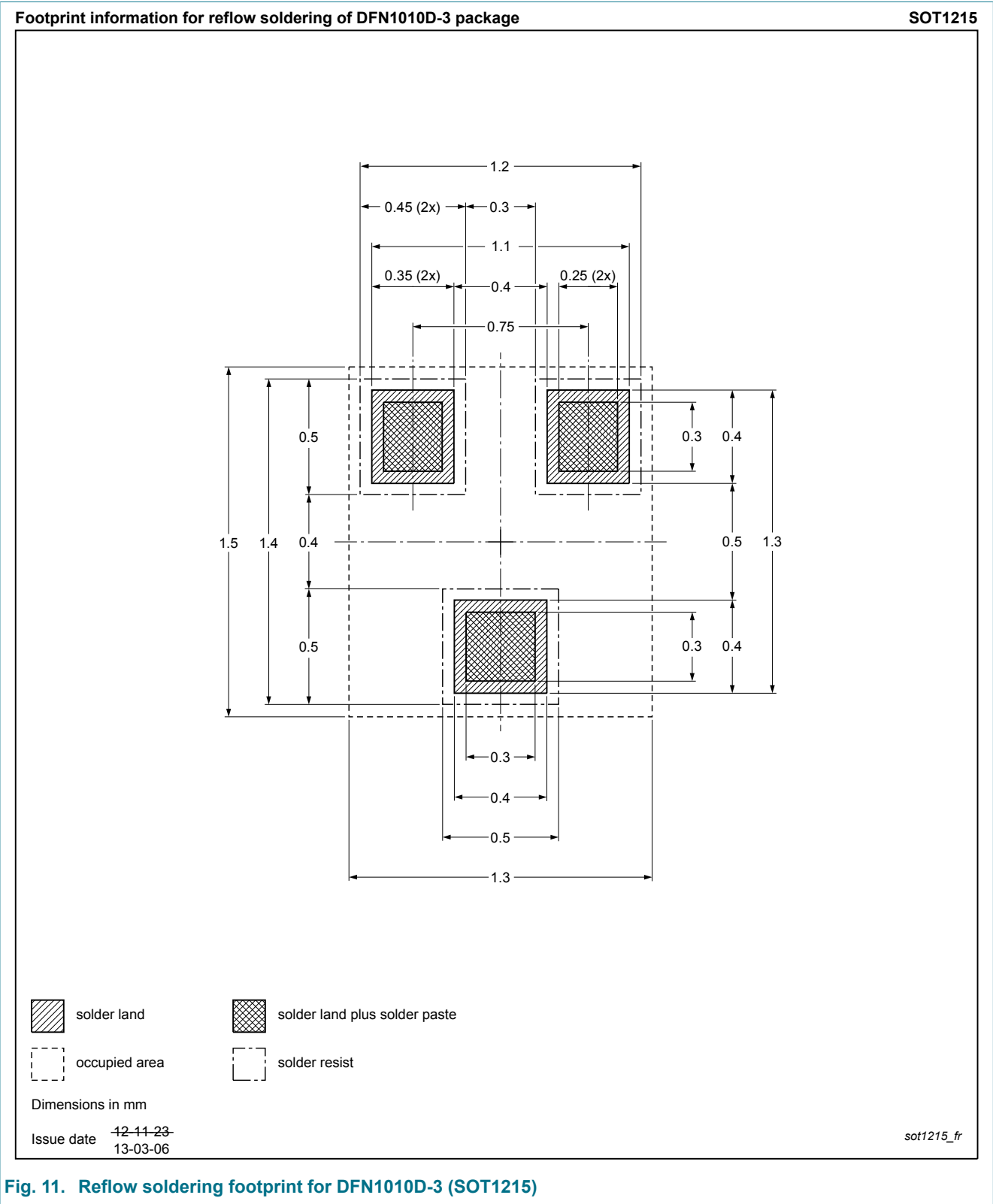
11.1 Quality information

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
BAV170QA v.1	20160503	Product data sheet	-	-

15. Legal information

15.1 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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