



BAS16QA

Single high-speed switching diode

8 October 2024

Product data sheet

1. General description

Single high-speed 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: $t_{rr} \leq 4 \text{ ns}$
- Low leakage current: $I_R \leq 0.5 \text{ }\mu\text{A}$
- Reverse voltage $V_R \leq 100 \text{ V}$
- Low capacitance $C_d \leq 1.5 \text{ pF}$
- Ultra small SMD plastic package
- Low package height of 0.37 mm
- Suitable for Automatic Optical Inspection (AOI) of solder joint

3. Applications

- High-speed switching
- General-purpose switching

4. Quick reference data

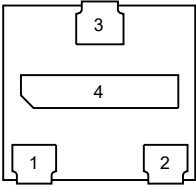
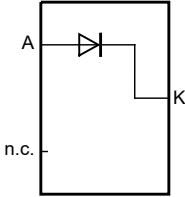
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_F	forward current	$T_{amb} = 25 \text{ }^\circ\text{C}$	[1]	-	-	290	mA
V_R	reverse voltage	$T_j = 25 \text{ }^\circ\text{C}$		-	-	100	V
V_F	forward voltage	$I_F = 150 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$		-	-	1.25	V
I_R	reverse current	$V_R = 80 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$		-	-	0.5	μA
t_{rr}	reverse recovery time	$I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; I_{R(meas)} = 1 \text{ mA}; R_L = 100 \text{ }\Omega; T_j = 25 \text{ }^\circ\text{C}$		-	-	4	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	A	anode	 <p>Transparent top view DFN1010D-3 (SOT1215)</p>	 <p>aaa-021941</p>
2	n.c.	not connected		
3	K	cathode		
4	K	cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAS16QA	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
BAS16QA	Z 101

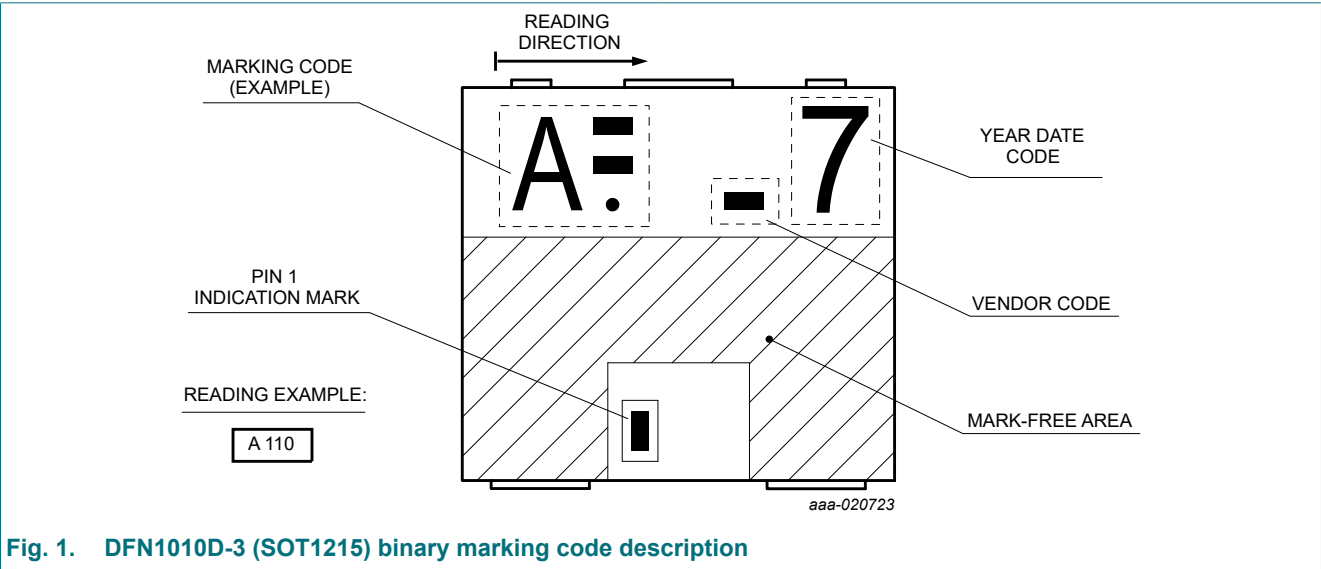


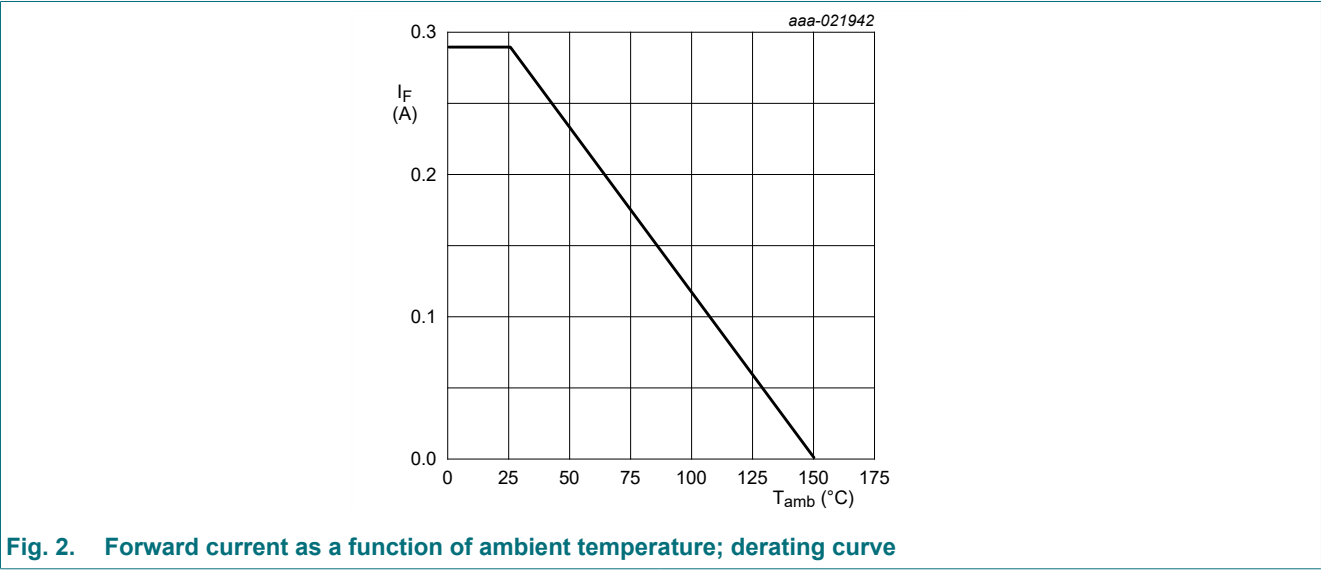
Fig. 1. DFN1010D-3 (SOT1215) binary marking code description

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	T _j = 25 °C		-	100	V
I _F	forward current	T _{amb} = 25 °C	[1]	-	290	mA
I _{FRM}	repetitive peak forward current	t _p ≤ 0.5 ms; δ ≤ 0.25		-	700	mA
I _{FSM}	non-repetitive peak forward current	t _p = 100 μs; square wave; T _{j(init)} = 25 °C		-	4	A
		t _p = 1 ms; square wave; T _{j(init)} = 25 °C		-	1.5	A
		t _p = 1 s; square wave; T _{j(init)} = 25 °C		-	0.5	A
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C	[1]	-	305	mW
			[2]	-	470	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]	-	-	410	K/W
			[2]	-	-	265	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	55	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.

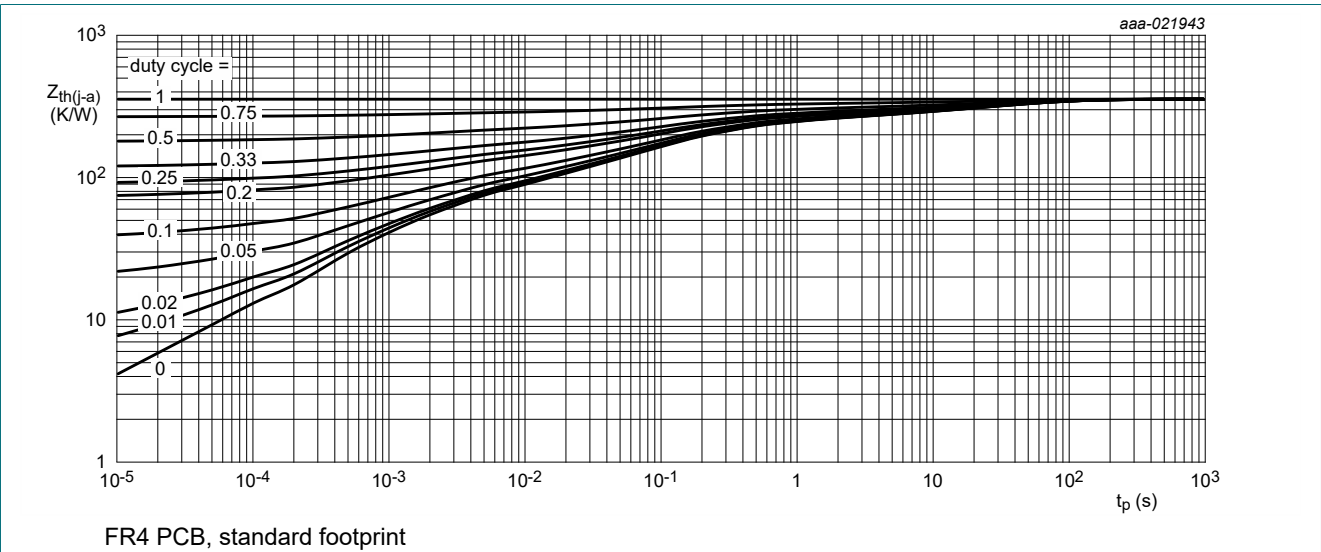


Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

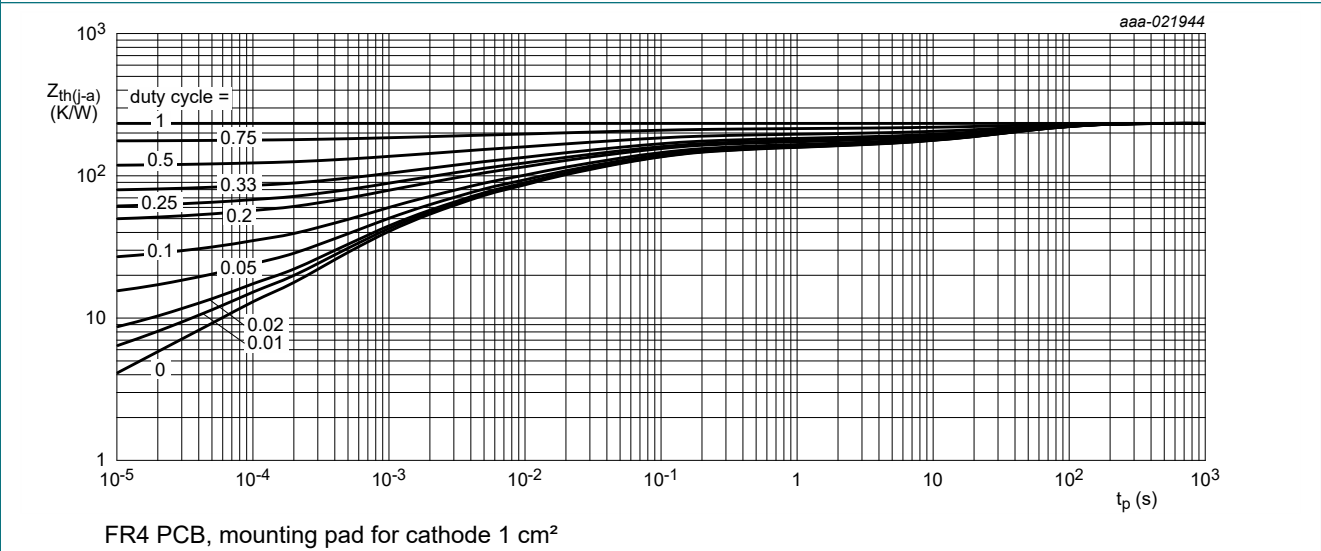
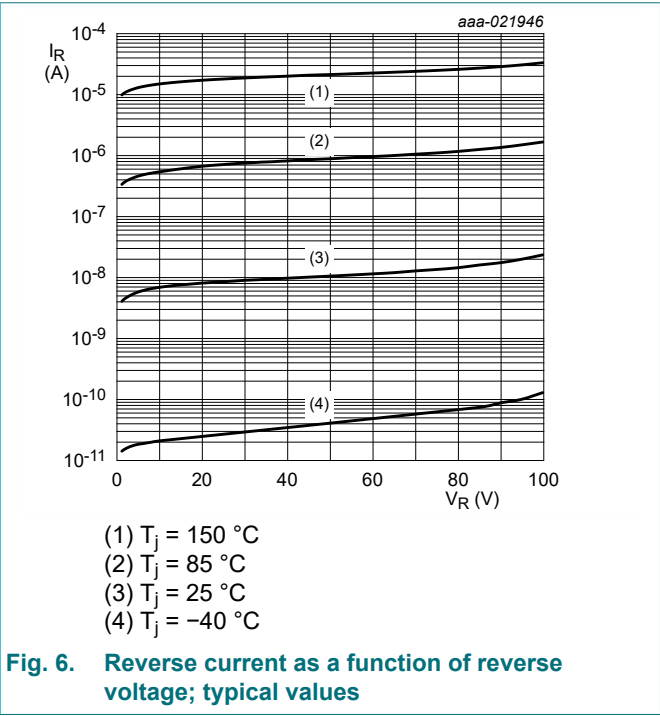
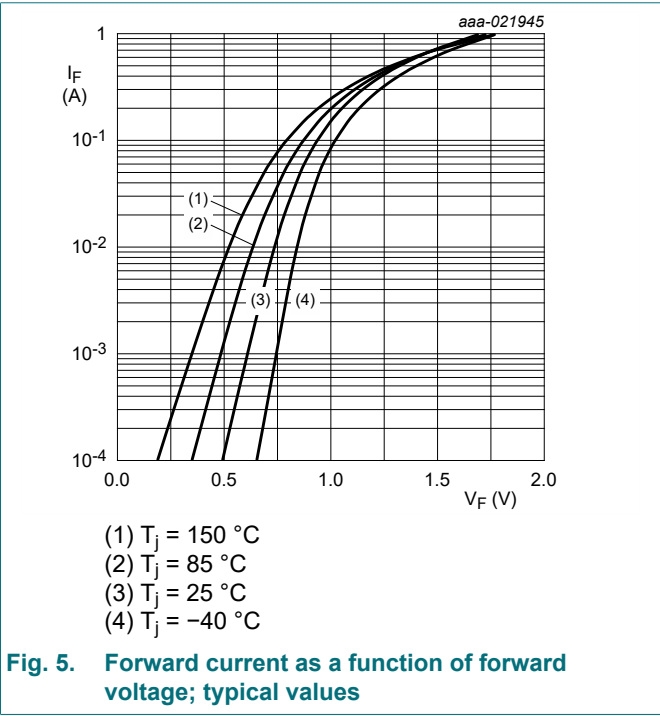


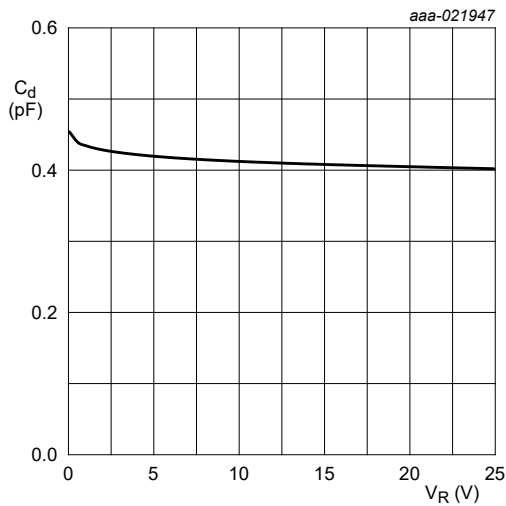
Fig. 4. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

10. Characteristics

Table 7. Characteristics

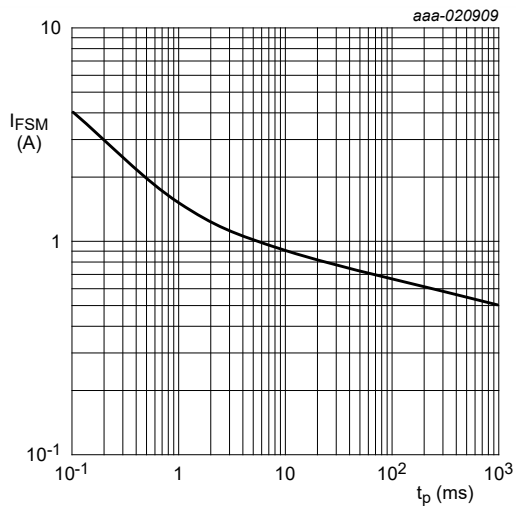
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_F	forward voltage	$I_F = 1\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$	-	-	715	mV
		$I_F = 10\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$	-	-	855	mV
		$I_F = 50\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$	-	-	1	V
		$I_F = 150\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$	-	-	1.25	V
I_R	reverse current	$V_R = 25\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$	-	-	30	nA
		$V_R = 80\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$	-	-	0.5	μA
		$V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	30	μA
		$V_R = 80\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	50	μA
C_d	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}; T_j = 25\text{ }^{\circ}\text{C}$	-	-	1.5	pF
t_{rr}	reverse recovery time	$I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{R(\text{meas})} = 1\text{ mA}; R_L = 100\text{ }\Omega; T_j = 25\text{ }^{\circ}\text{C}$	-	-	4	ns
V_{FRM}	peak forward recovery voltage	$I_F = 10\text{ mA}; t_r = 20\text{ ns}; T_j = 25\text{ }^{\circ}\text{C}$	-	-	1.75	V





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

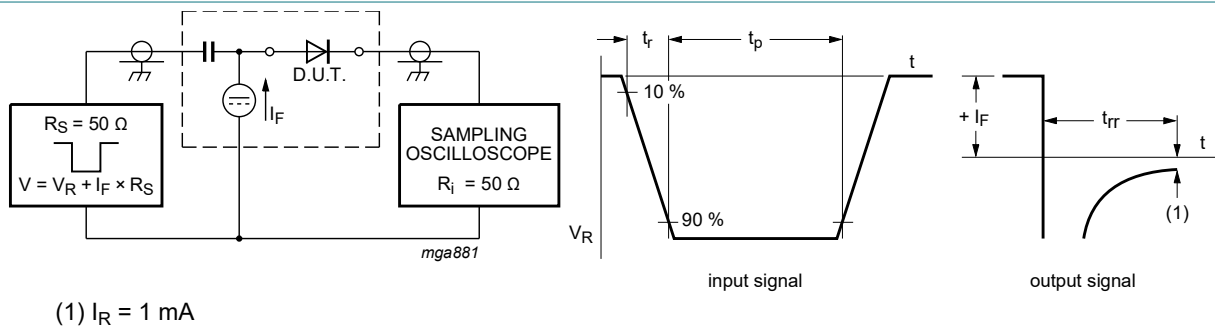
Fig. 7. Diode capacitance as a function of reverse voltage; typical values



Based on square wave currents.
 $T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$

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

11. Test information



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

Fig. 9. Reverse recovery time test circuit and waveforms

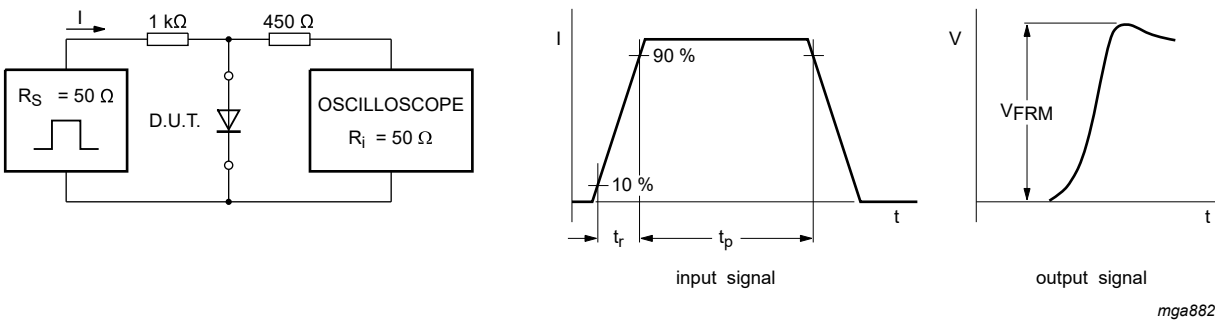
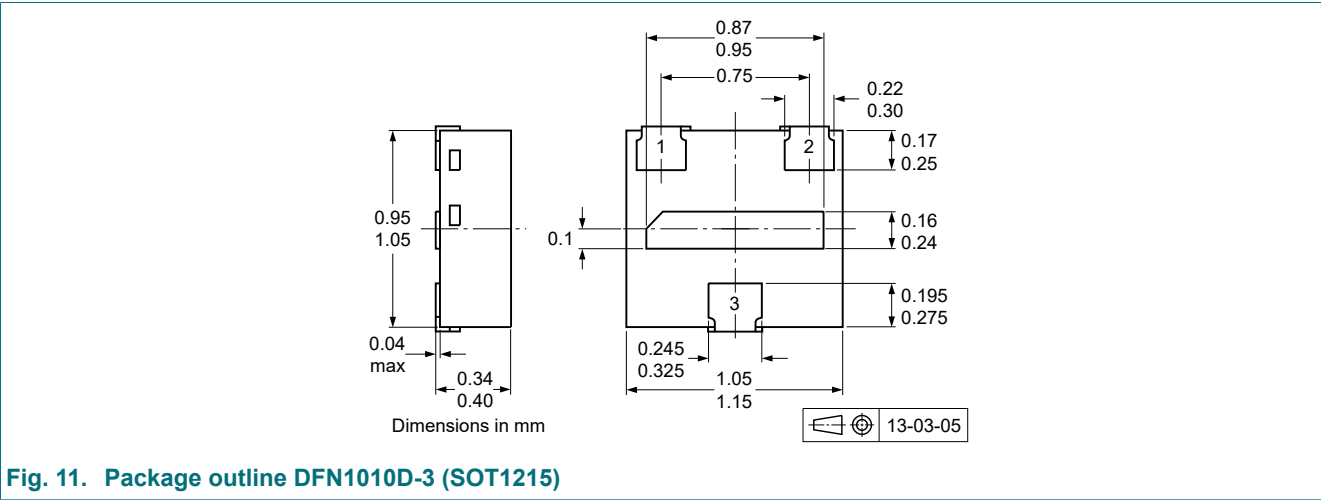


Fig. 10. Forward recovery voltage test circuit and waveforms

12. Package outline



13. Soldering

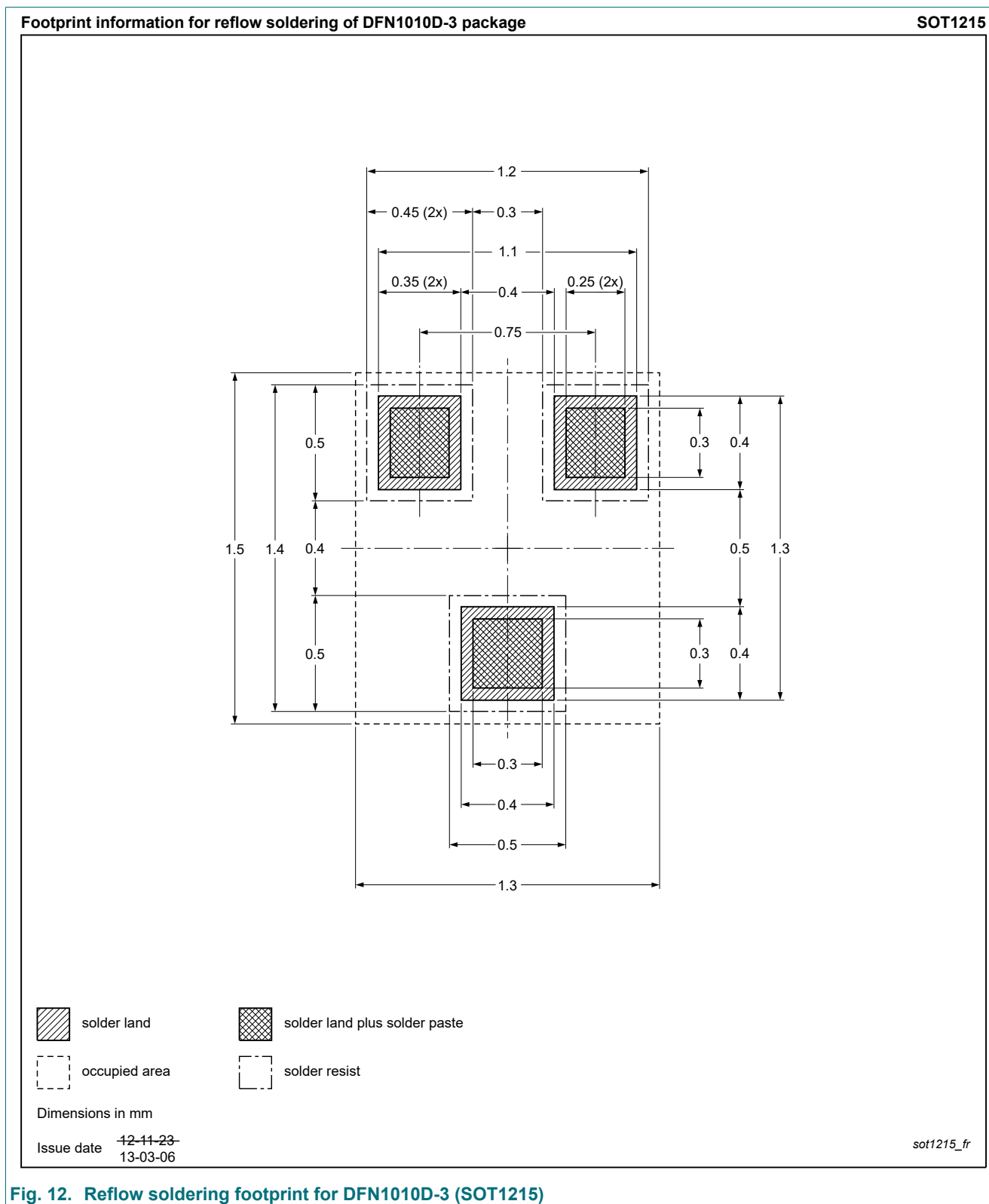


Fig. 12. Reflow soldering footprint for DFN1010D-3 (SOT1215)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS16QA v.3	20241008	Product data sheet	-	BAS16QA v.2
Modification:	<ul style="list-style-type: none">Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
BAS16QA v.2	20160504	Product data sheet	-	BAS16QA v.1
BAS16QA v.1	20160217	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.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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