



# BAV70SRA

## Quad high-speed switching diodes

14 September 2018

Product data sheet

## 1. General description

Quad high-speed switching diodes with common cathode configurations encapsulated in a leadless ultra small DFN1412-6 (SOT1268) Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- High switching speed:  $t_{rr} \leq 4$  ns
- Low leakage current:  $I_R \leq 0.5$   $\mu$ A
- Reverse voltage  $V_R \leq 100$  V
- Low capacitance  $C_d \leq 1.5$  pF
- Ultra small SMD plastic package
- AEC-Q101 qualified

## 3. Applications

- High-speed switching
- General-purpose switching

## 4. Quick reference data

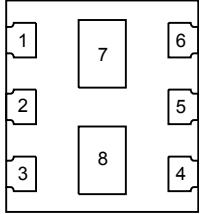
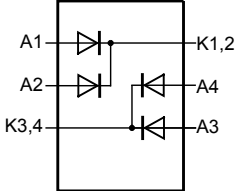
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per diode</b>							
$I_F$	forward current	single diode loaded; $T_{amb} = 25$ °C	[1]	-	-	355	mA
$I_R$	reverse current	$V_R = 80$ V; pulsed; $T_j = 25$ °C		-	-	0.5	$\mu$ A
$V_R$	reverse voltage	$T_j = 25$ °C		-	-	100	V
$t_{rr}$	reverse recovery time	$I_F = 10$ mA; $I_R = 10$ mA; $R_L = 100$ $\Omega$ ; $I_{R(meas)} = 1$ mA; $T_{amb} = 25$ °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	A1	anode (diode 1)	 <p>Transparent top view DFN1412-6 (SOT1268)</p>	 <p>aaa-025707</p>
2	A2	anode (diode 2)		
3	K3,4	com. cathode (diodes 3, 4)		
4	A3	anode (diode 3)		
5	A4	anode (diode 4)		
6	K1,2	com. cathode (diodes 1, 2)		
7	K1,2	com. cathode (diodes 1, 2)		
8	K3,4	com. cathode (diodes 3, 4)		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV70SRA	DFN1412-6	plastic, thermal enhanced ultra thin small outline package; no leads; 6 terminals; 1.4 mm x 1.2 mm x 0.47 mm body	SOT1268

## 7. Marking

Table 4. Marking codes

Type number	Marking code
BAV70SRA	A3

## 8. Limiting values

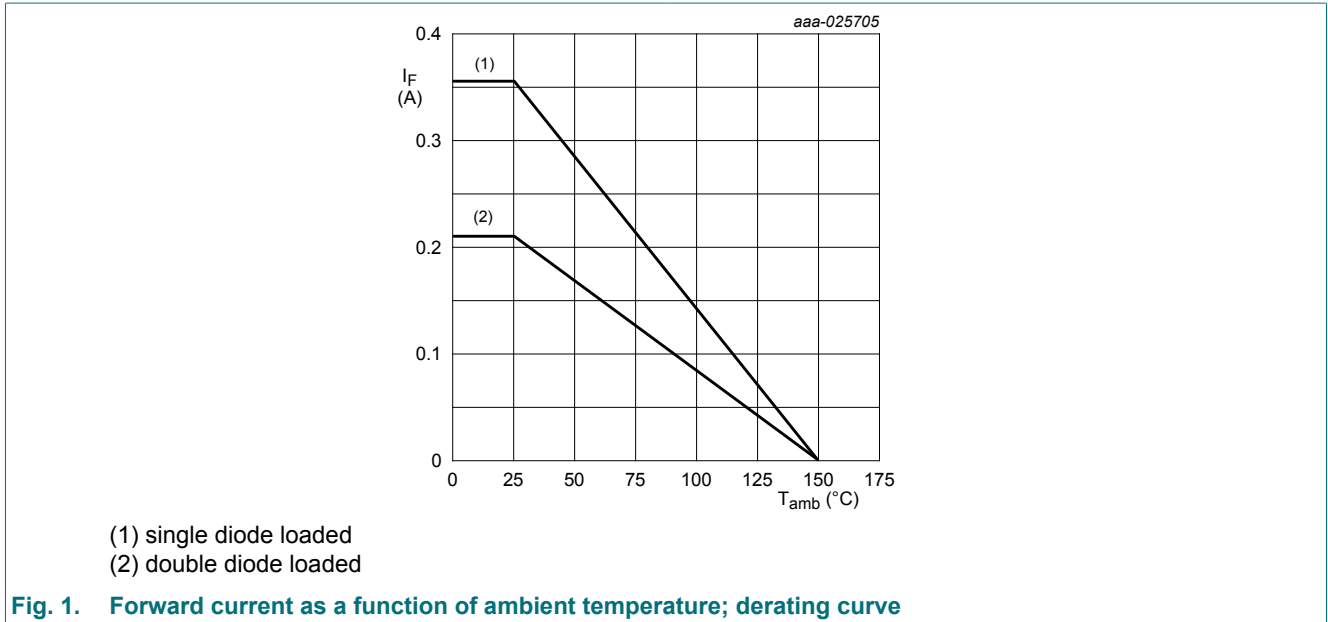
**Table 5. Limiting values**

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

Symbol	Parameter	Conditions		Min	Max	Unit
<b>Per diode</b>						
$V_R$	reverse voltage	$T_j = 25\text{ °C}$		-	100	V
$I_F$	forward current	single diode loaded; $T_{amb} = 25\text{ °C}$	[1]	-	355	mA
		double diodes loaded; $T_{amb} = 25\text{ °C}$	[1]	-	210	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 100\text{ }\mu\text{s}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; square wave		-	4	A
		$t_p = 1\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; square wave		-	1.5	A
		$t_p = 1\text{ s}$ ; $T_{j(\text{init})} = 25\text{ °C}$ ; square wave		-	0.5	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 0.5\text{ ms}$ ; $\delta \leq 0.25$		-	1	A
<b>Per device; one diode loaded</b>						
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	410	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 1cm<sup>2</sup>.



## 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]	-	-	305	K/W
			[2]	-	-	205	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[3]	-	-	40	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 1cm<sup>2</sup>.
- [3] Soldering point of cathode tab.

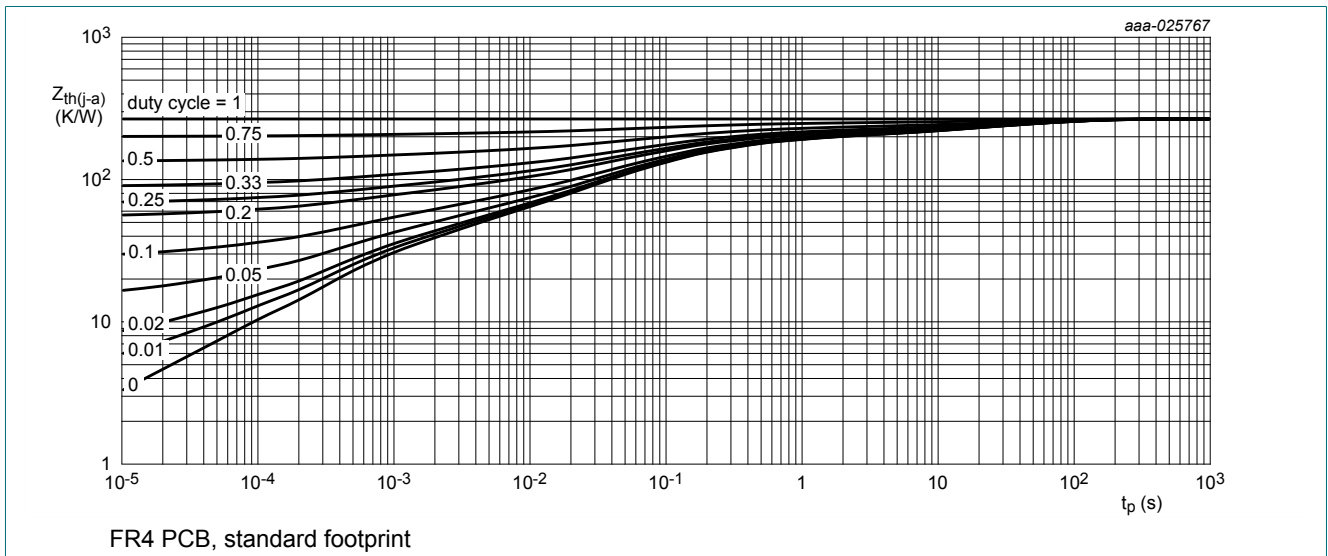


Fig. 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

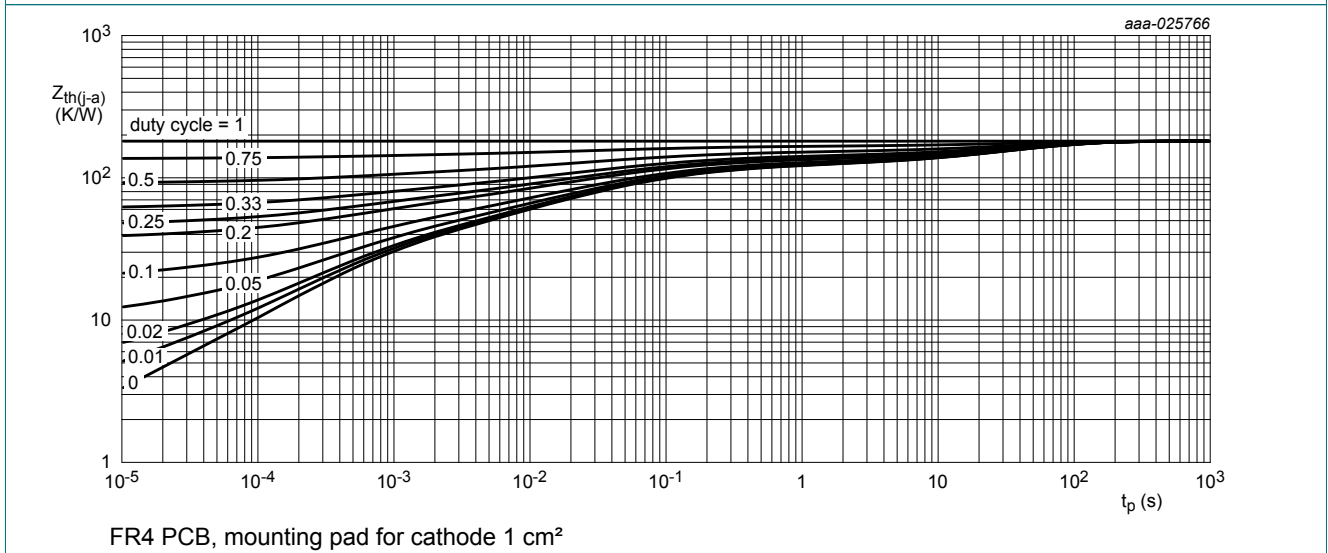
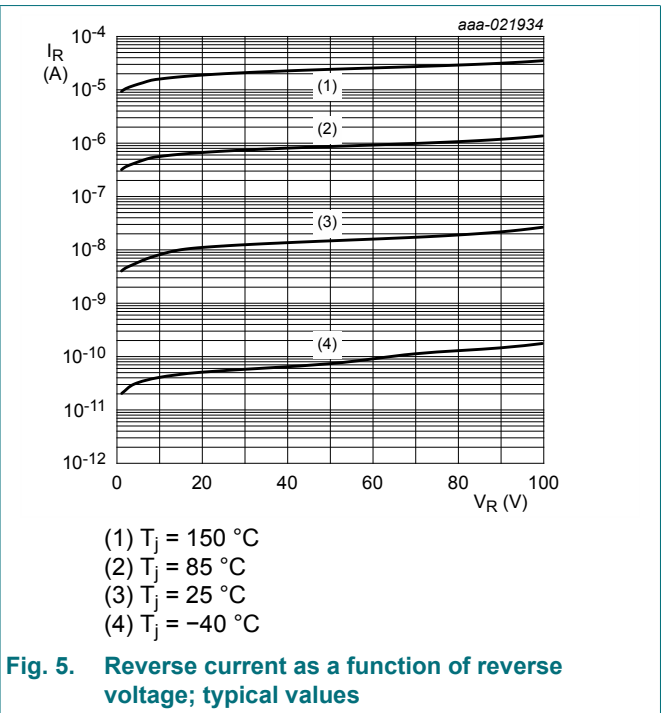
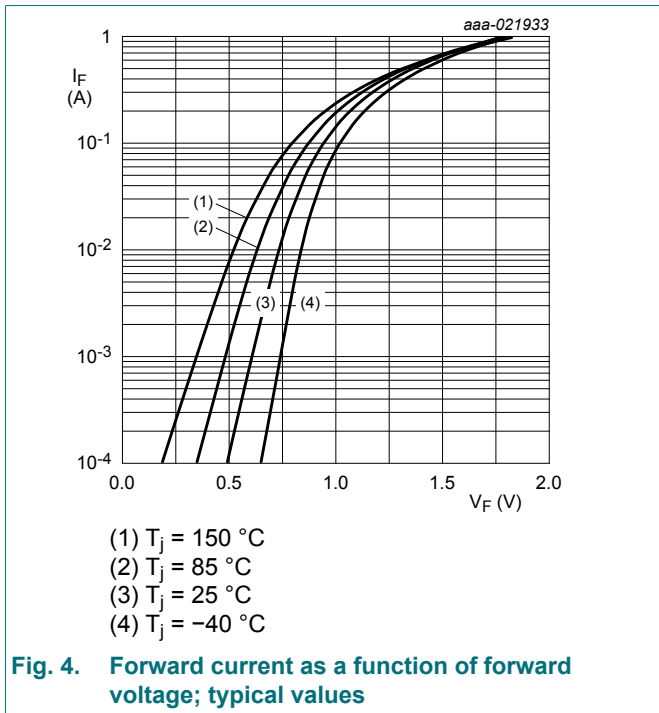


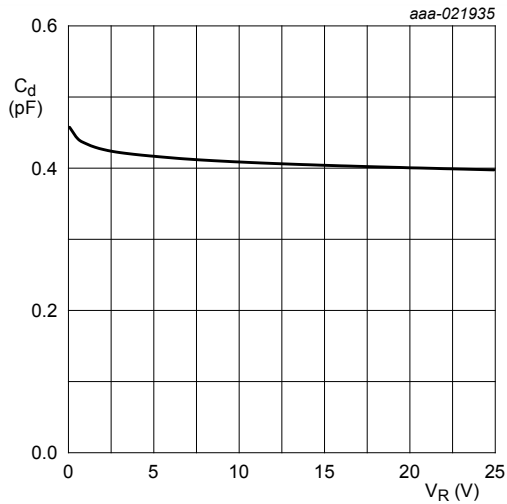
Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

## 10. Characteristics

Table 7. Characteristics

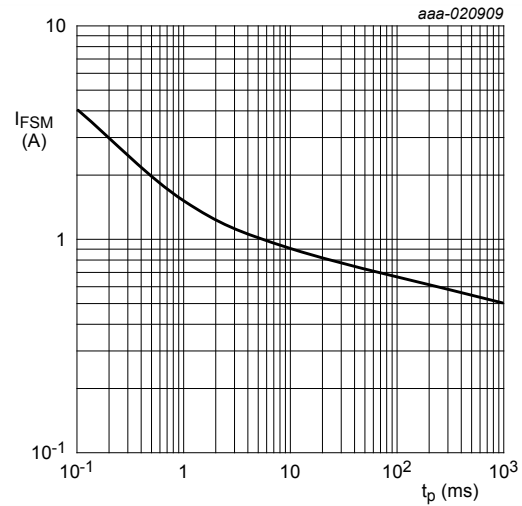
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 1 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	-	715	mV
		I <sub>F</sub> = 10 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	-	855	mV
		I <sub>F</sub> = 50 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	-	1	V
		I <sub>F</sub> = 150 mA; t <sub>p</sub> ≤ 300 μs; δ ≤ 0.02; T <sub>j</sub> = 25 °C	-	-	1.25	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 25 V; pulsed; T <sub>j</sub> = 25 °C	-	-	30	nA
		V <sub>R</sub> = 80 V; pulsed; T <sub>j</sub> = 25 °C	-	-	0.5	μA
		V <sub>R</sub> = 25 V; pulsed; T <sub>j</sub> = 150 °C	-	-	30	μA
		V <sub>R</sub> = 80 V; pulsed; T <sub>j</sub> = 150 °C	-	-	100	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0 V; f = 1 MHz; T <sub>j</sub> = 25 °C	-	-	1.5	pF
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 10 mA; I <sub>R</sub> = 10 mA; R <sub>L</sub> = 100 Ω; I <sub>R(meas)</sub> = 1 mA; T <sub>amb</sub> = 25 °C	-	-	4	ns
V <sub>FRM</sub>	peak forward recovery voltage	I <sub>F</sub> = 10 mA; t <sub>r</sub> = 20 ns	-	-	1.75	V





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

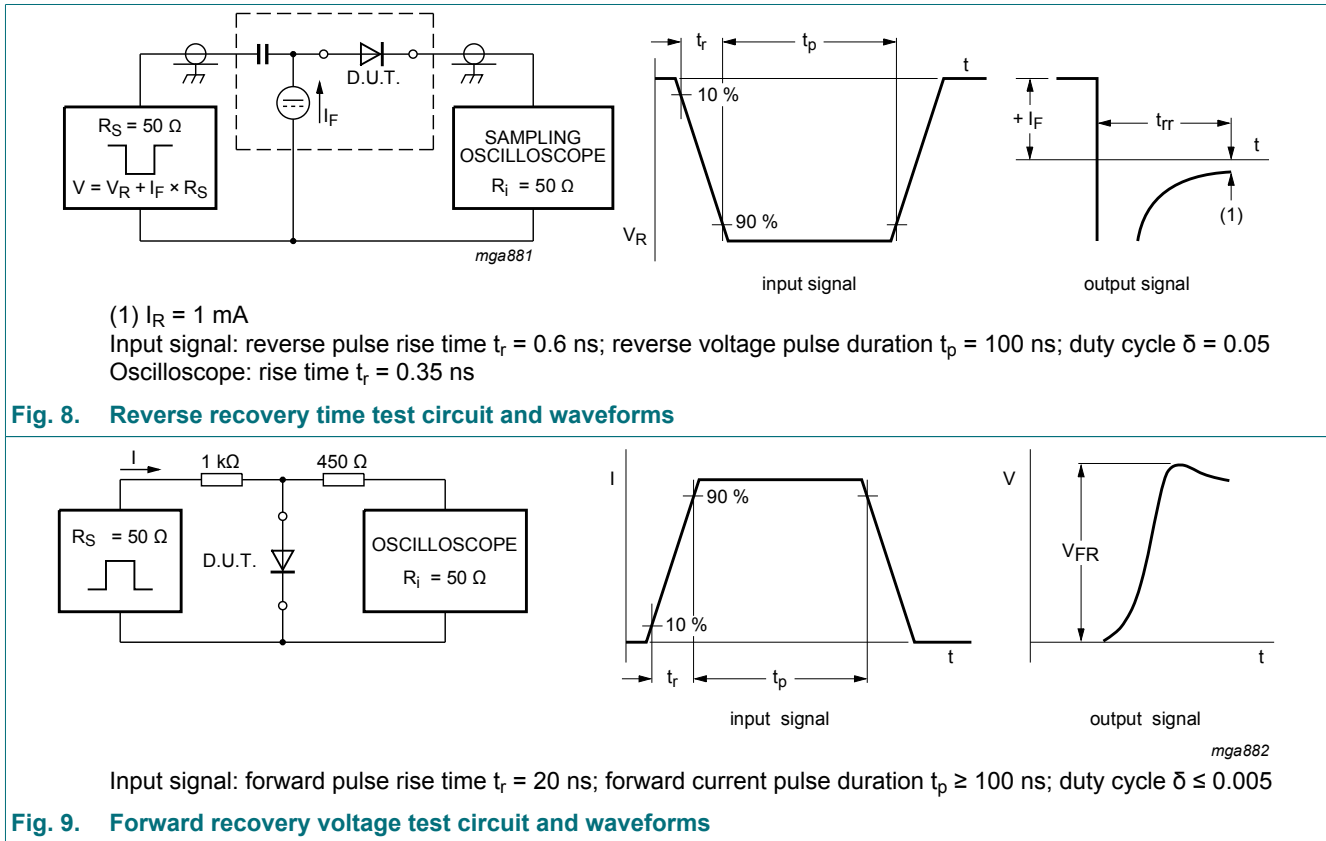
**Fig. 6. Diode capacitance as a function of reverse voltage; typical values**



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

**Fig. 7. Non-repetitive 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

DFN1412-6: plastic thermal enhanced ultra thin small outline package; no leads; 6 terminals; body: 1.4 x 1.2 x 0.47 mm

SOT1268

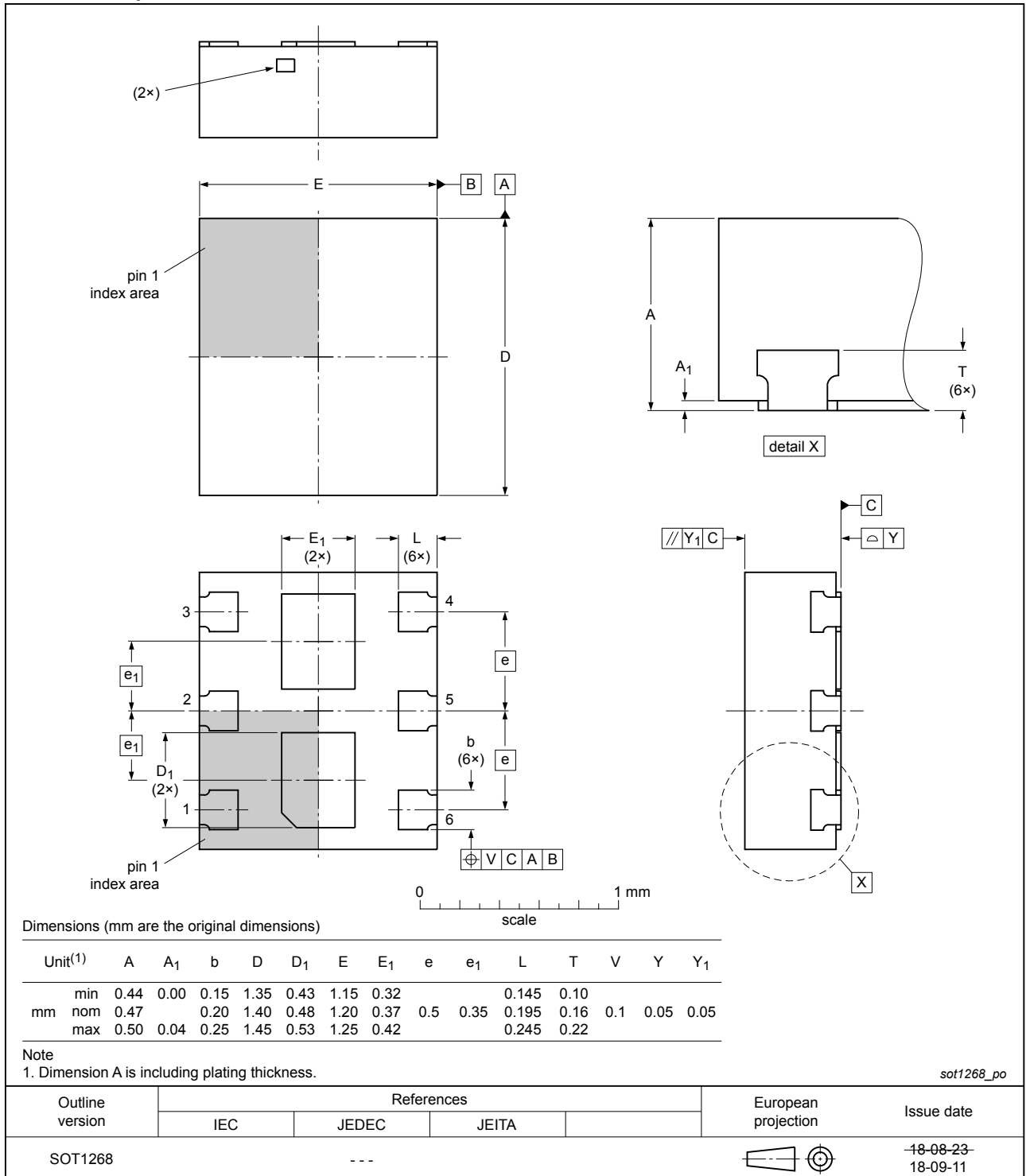


Fig. 10. Package outline DFN1412-6 (SOT1268)



### 13. Soldering

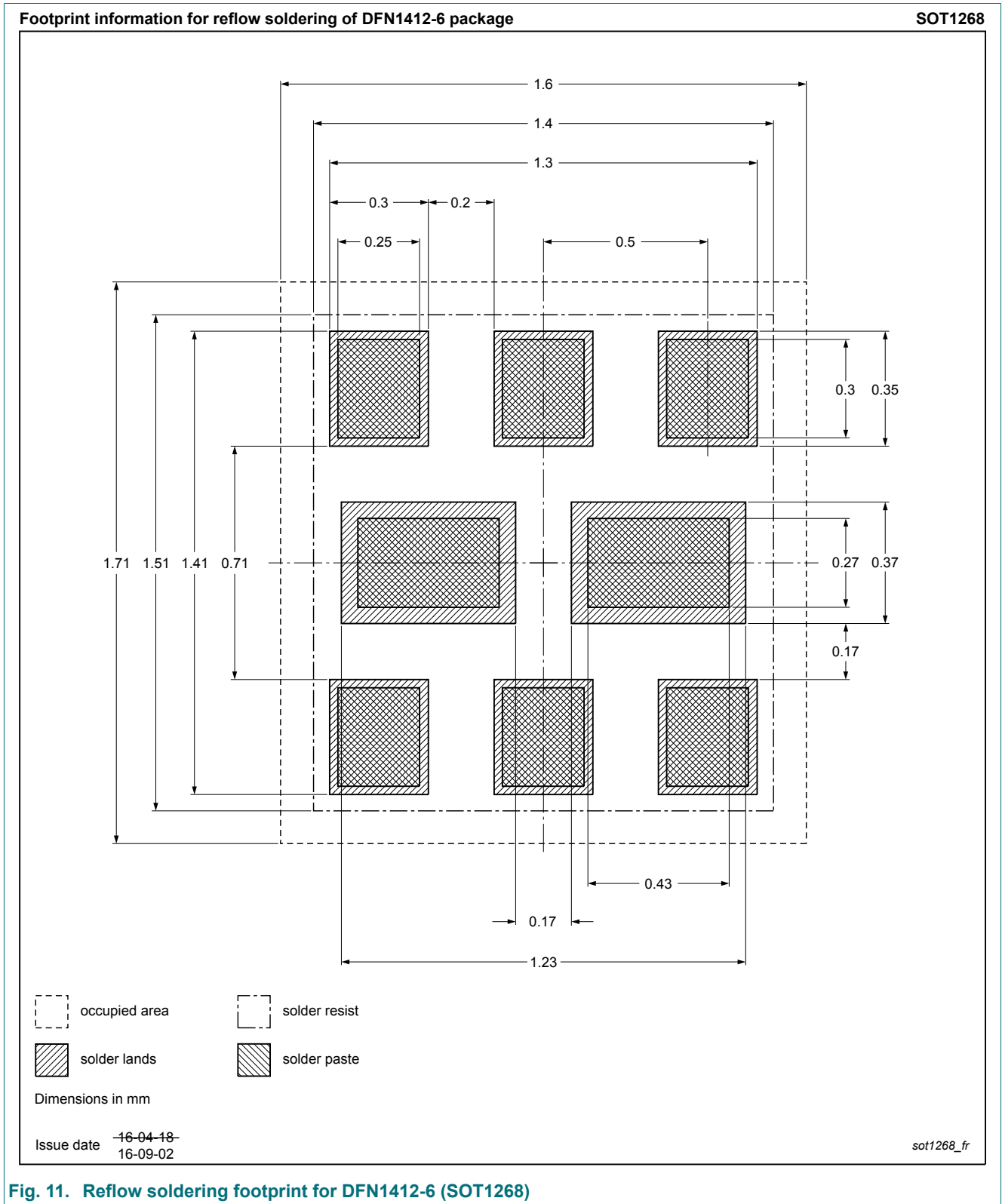


Fig. 11. Reflow soldering footprint for DFN1412-6 (SOT1268)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV70SRA v.2	2018914	Product data sheet	-	BAV70SRA v.1
Modifications:	• Package outline drawing updated: Unit T added			
BAV70SRA v.1	20170626	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.
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