



# BAW56SRA

Quad high-speed switching diodes

30 September 2025

Product data sheet

## 1. General description

Quad high-speed switching diodes with common anode 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
- Reverse voltage  $V_R \leq 90$  V
- Low capacitance  $C_d \leq 2$  pF
- Ultra small SMD plastic package

## 3. Applications

- High-speed switching
- General-purpose switching

## 4. Quick reference data

Table 1. Quick reference data

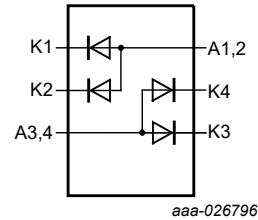
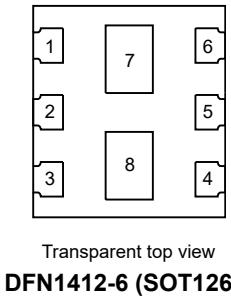
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per diode</b>							
$I_F$	forward current	single diode loaded; $T_{amb} = 25$ °C	[1]	-	-	375	mA
$I_R$	reverse current	$V_R = 80$ V; pulsed; $T_j = 25$ °C		-	-	0.5	µA
$V_F$	forward voltage	$I_F = 150$ mA; $t_p \leq 300$ µs; $\delta \leq 0.02$ ; $T_j = 25$ °C		-	-	1.25	V
$V_R$	reverse voltage	$T_j = 25$ °C		-	-	90	V
$t_{rr}$	reverse recovery time	$I_F = 10$ mA; $I_R = 10$ mA; $R_L = 100$ Ω; $I_{R(meas)} = 1$ 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	K1	cathode (diode 1)		
2	K2	cathode (diode 2)		
3	A3,4	com. anode (diodes 3, 4)		
4	K3	cathode (diode 3)		
5	K4	cathode (diode 4)		
6	A1,2	com. anode (diodes 1, 2)		
7	A1,2	com. anode (diodes 1, 2)		
8	A3,4	com. anode (diodes 3, 4)		



## 6. Ordering information

**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
BAW56SRA	DFN1412-6	plastic, 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
BAW56SRA	A2

## 8. Limiting values

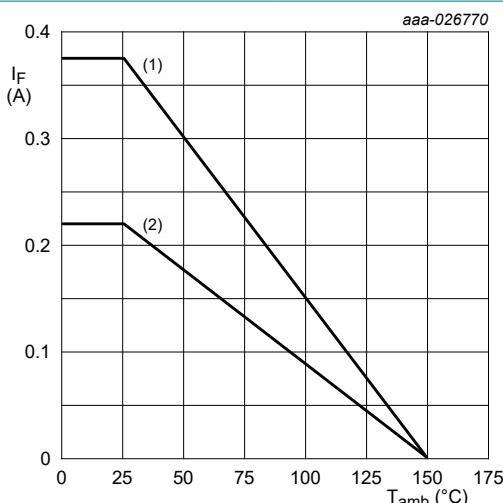
**Table 5. Limiting values**

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

Symbol	Parameter	Conditions		Min	Max	Unit
<b>Per diode</b>						
$V_R$	reverse voltage	$T_j = 25^\circ\text{C}$		-	90	V
$I_F$	forward current	single diode loaded; $T_{\text{amb}} = 25^\circ\text{C}$	[1]	-	375	mA
		double diodes loaded; $T_{\text{amb}} = 25^\circ\text{C}$	[1]	-	220	mA
$I_{\text{FSM}}$	non-repetitive peak forward current	$t_p = 100\ \mu\text{s}$ ; square wave; $T_{j(\text{init})} = 25^\circ\text{C}$		-	4	A
		$t_p = 1\ \text{ms}$ ; square wave; $T_{j(\text{init})} = 25^\circ\text{C}$		-	1.5	A
		$t_p = 1\ \text{s}$ ; square wave; $T_{j(\text{init})} = 25^\circ\text{C}$		-	0.5	A
$I_{\text{FRM}}$	repetitive peak forward current	$t_p \leq 0.5\ \text{ms}$ ; $\delta \leq 0.25$		-	1	A
<b>Per device; one diode loaded</b>						
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25^\circ\text{C}$	[1]	-	410	mW
			[2]	-	610	mW
$T_j$	junction temperature			-	150	°C
$T_{\text{amb}}$	ambient temperature			-55	150	°C
$T_{\text{stg}}$	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>.



(1) single diode loaded  
 (2) double diode loaded

**Fig. 1. Forward current as a function of ambient temperature; derating curve**

## 9. Thermal characteristics

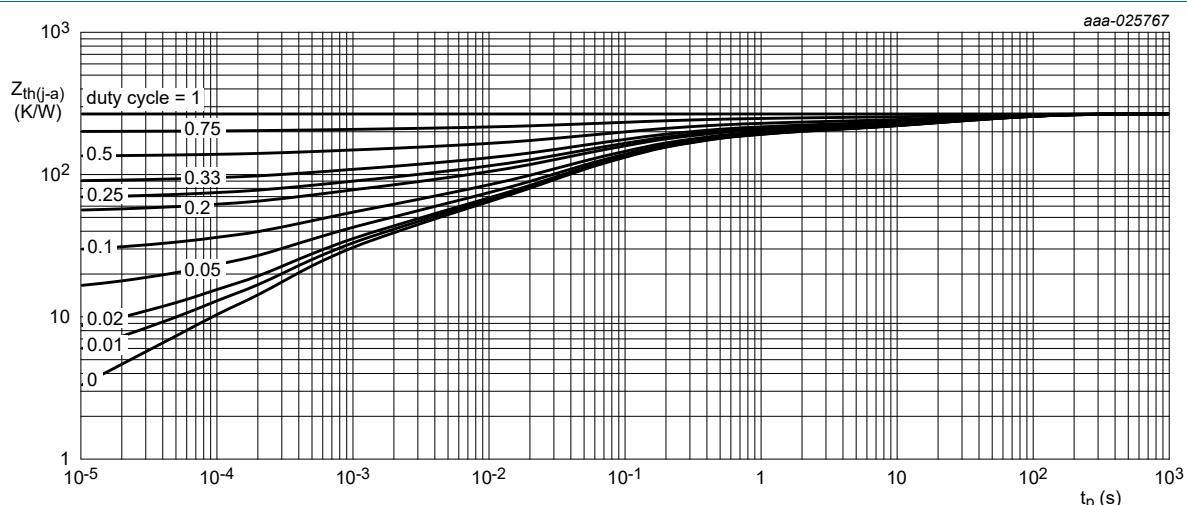
**Table 6. Thermal characteristics**

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.

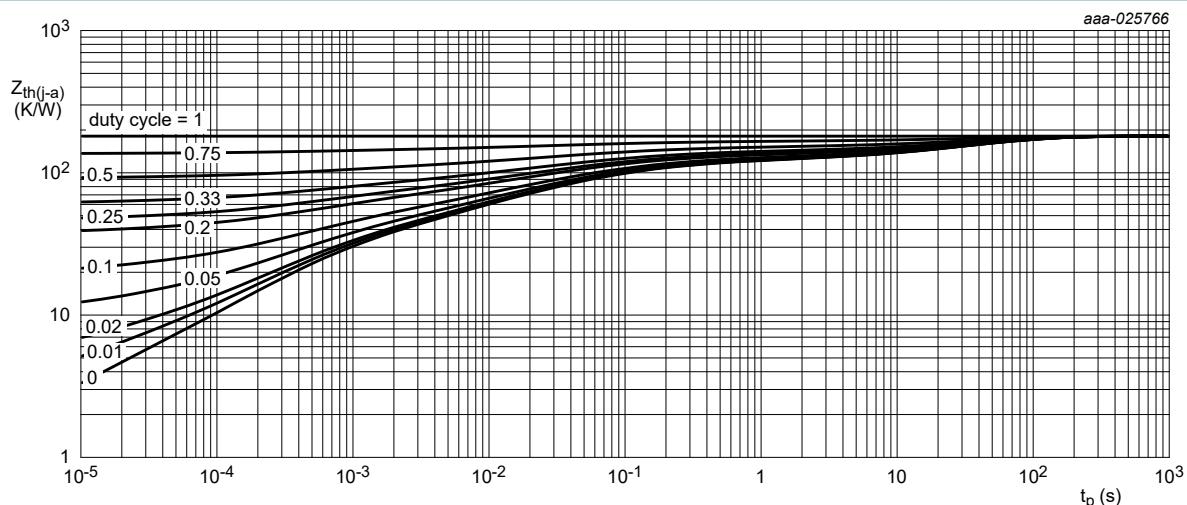
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated mounting pad for cathode 1cm<sup>2</sup>.

[3] Soldering point of anode tab.



FR4 PCB, standard footprint

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



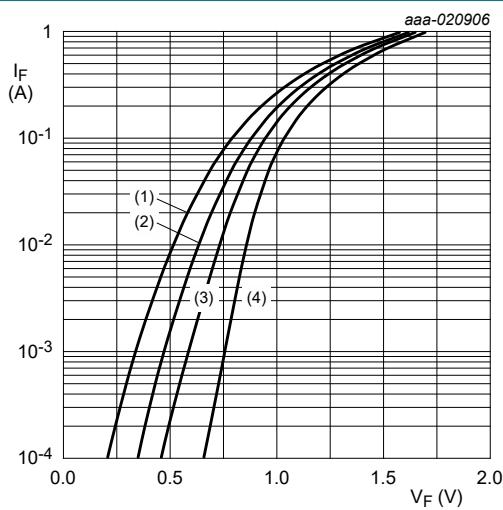
FR4 PCB, mounting pad for cathode 1 cm<sup>2</sup>

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

## 10. Characteristics

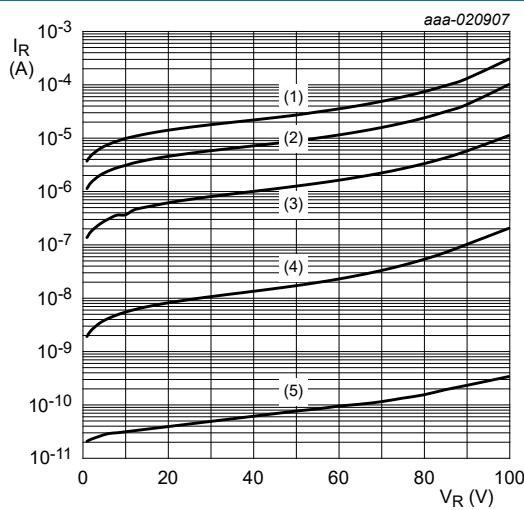
Table 7. Characteristics

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		-	-	150	µA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0 V; f = 1 MHz; T <sub>j</sub> = 25 °C		-	-	2	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



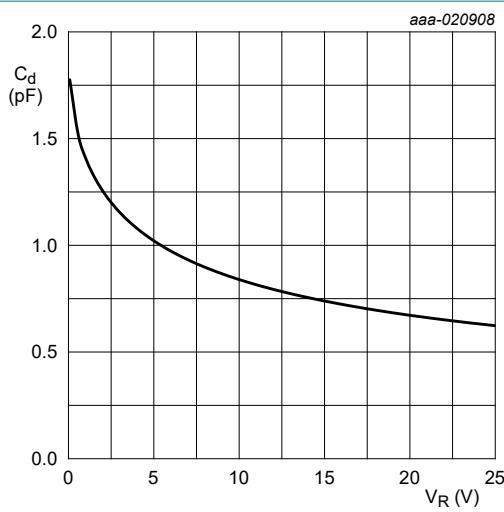
- (1) T<sub>j</sub> = 150 °C
- (2) T<sub>j</sub> = 85 °C
- (3) T<sub>j</sub> = 25 °C
- (4) T<sub>j</sub> = -40 °C

Fig. 4. Forward current as a function of forward voltage; typical values



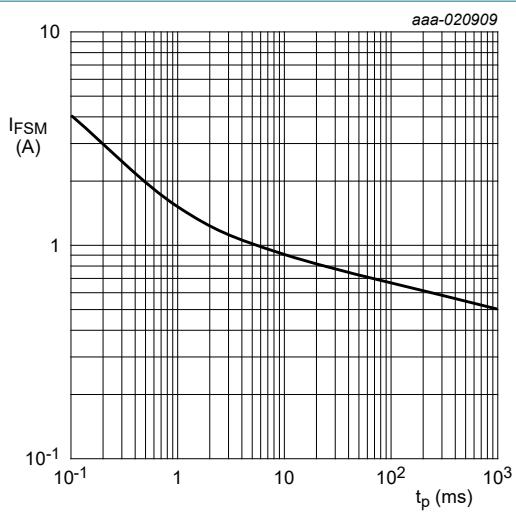
- (1) T<sub>j</sub> = 150 °C
- (2) T<sub>j</sub> = 125 °C
- (3) T<sub>j</sub> = 85 °C
- (4) T<sub>j</sub> = 25 °C
- (5) T<sub>j</sub> = -40 °C

Fig. 5. Reverse current as a function of reverse voltage; typical values



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

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

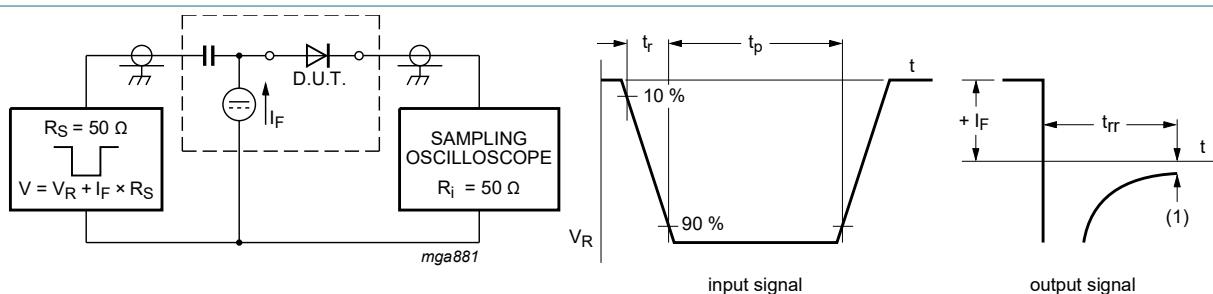


Based on square wave currents.

$T_{\text{amb}} = 25\text{ }^{\circ}\text{C}$

**Fig. 7. Non-repetitive forward current as a function of pulse duration; maximum values**

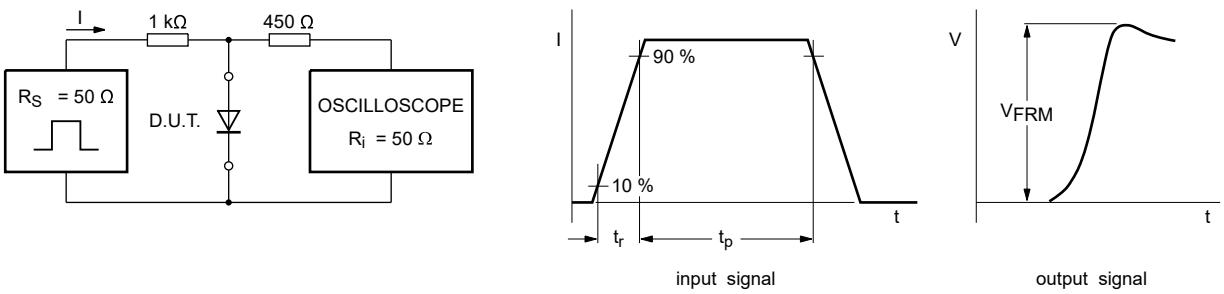
## 11. Test information



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

Input signal: reverse pulse rise time  $t_r = 0.6\text{ ns}$ ; reverse voltage pulse duration  $t_p = 100\text{ ns}$ ; duty cycle  $\delta = 0.05$   
Oscilloscope: rise time  $t_r = 0.35\text{ ns}$

**Fig. 8. Reverse recovery time test circuit and waveforms**



Input signal: forward pulse rise time  $t_r = 20\text{ ns}$ ; forward current pulse duration  $t_p \geq 100\text{ ns}$ ; duty cycle  $\delta \leq 0.005$

**Fig. 9. Forward recovery voltage test circuit and waveforms**

## 12. Package outline

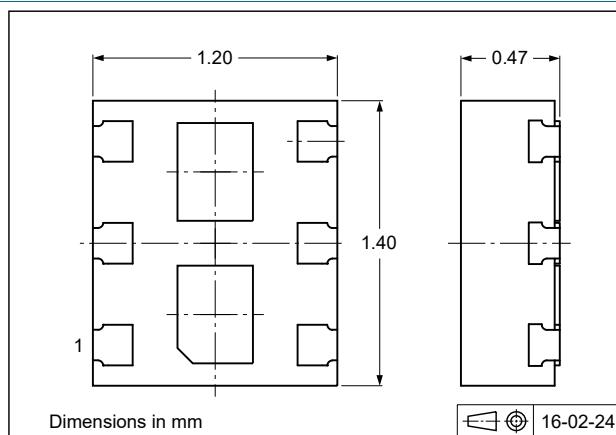
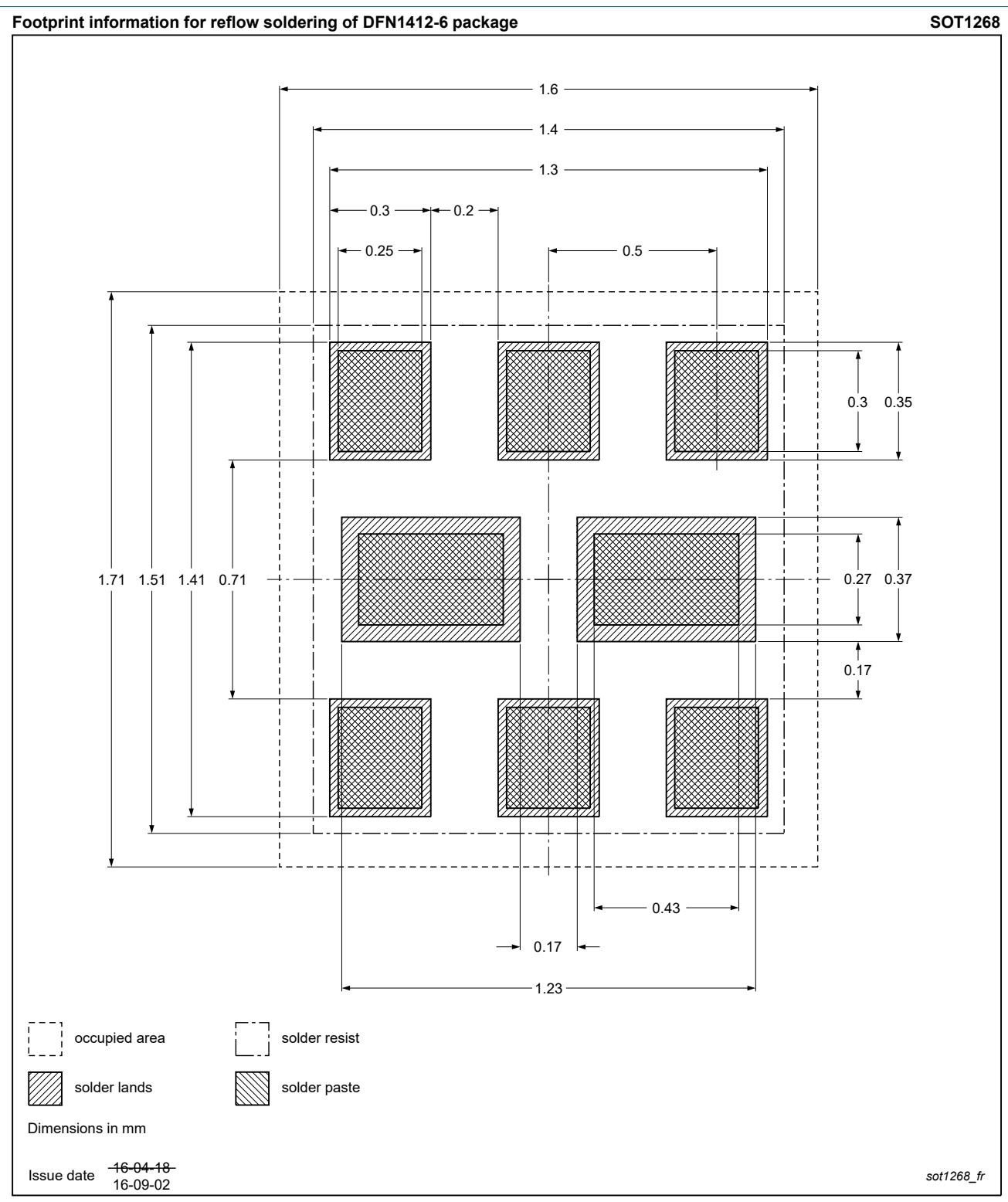


Fig. 10. Package outline DFN1412-6 (SOT1268)

## 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
BAW56SRA v.3	20250930	Product data sheet	-	BAW56SRA v.2
Modification:	<ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to <a href="http://nexperia.com">nexperia.com</a> for automotive (-Q) product alternative(s).</li></ul>			
BAW56SRA v.2	20180914	Product data sheet	-	BAW56SRA v.1
BAW56SRA 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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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