



# BAW101S-Q

High voltage double diode

14 September 2021

Product data sheet

## 1. General description

The BAW101S is a high-speed switching diode array with two separate dice, fabricated in planar technology and encapsulated in a small SOT363 Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Small plastic SMD package
- High switching speed: max. 50 ns
- High continuous reverse voltage: 300 V
- Electrically insulated diodes
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- High voltage switching
- Automotive
- Communication

## 4. Quick reference data

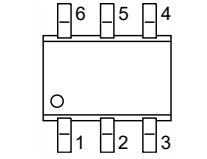
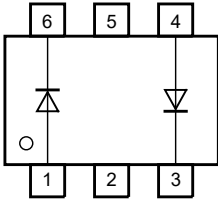
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per diode</b>							
$I_F$	forward current	single diode loaded	[1]	-	-	250	mA
$V_R$	reverse voltage			-	-	300	V
$t_{rr}$	reverse recovery time	$I_F = 30 \text{ mA}$ ; $I_R = 30 \text{ mA}$ ; $R_L = 100 \text{ }\Omega$ ; $T_j = 25 \text{ }^\circ\text{C}$ ; measured at $I_R = 3 \text{ mA}$		-	-	50	ns

[1] Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 cm<sup>2</sup>.

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 <p>TSSOP6 (SOT363)</p>	 <p>aaa-033905</p>
2	n.c.	not connected		
3	K2	cathode 2		
4	A2	anode 2		
5	n.c.	no connection		
6	K1	cathode 1		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAW101S-Q	TSSOP6	plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body	SOT363

## 7. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
BAW101S-Q	K2%

[1] % = placeholder for manufacturing site code

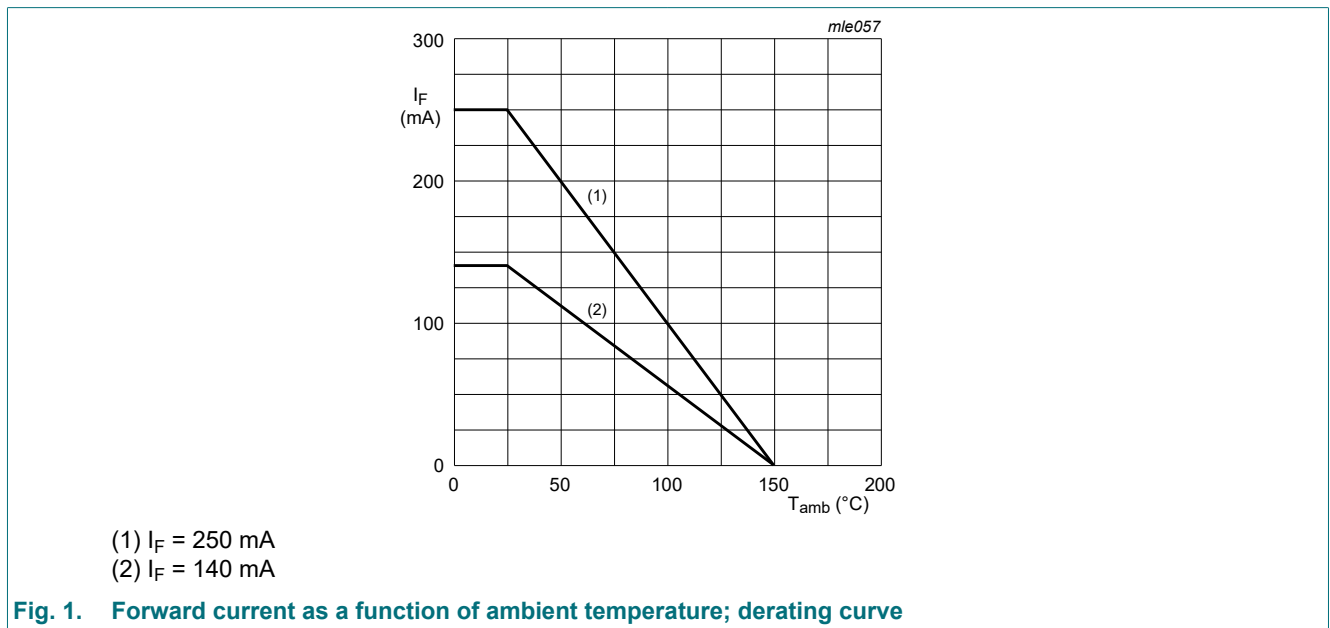
## 8. Limiting values

**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		-	300	V
			-	600	V
$V_{RRM}$	repetitive peak reverse voltage		-	300	V
			-	600	V
$I_F$	forward current	single diode loaded	[1]	250	mA
		double diode loaded	[1]	140	mA
$I_{FRM}$	repetitive peak forward current		-	625	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1 \mu s$ ; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$	-	4.5	A
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25 \text{ }^\circ\text{C}$	[1]	350	mW
$T_j$	junction temperature		-	150	$^\circ\text{C}$
$T_{\text{amb}}$	ambient temperature		-65	150	$^\circ\text{C}$
$T_{\text{stg}}$	storage temperature		-65	150	$^\circ\text{C}$

[1] Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 cm<sup>2</sup>.



## 9. Thermal characteristics

Table 6. Thermal characteristics

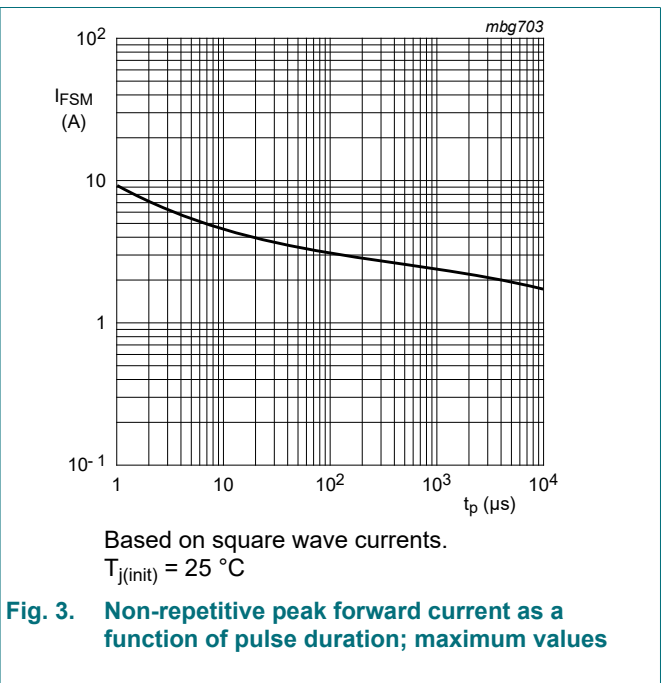
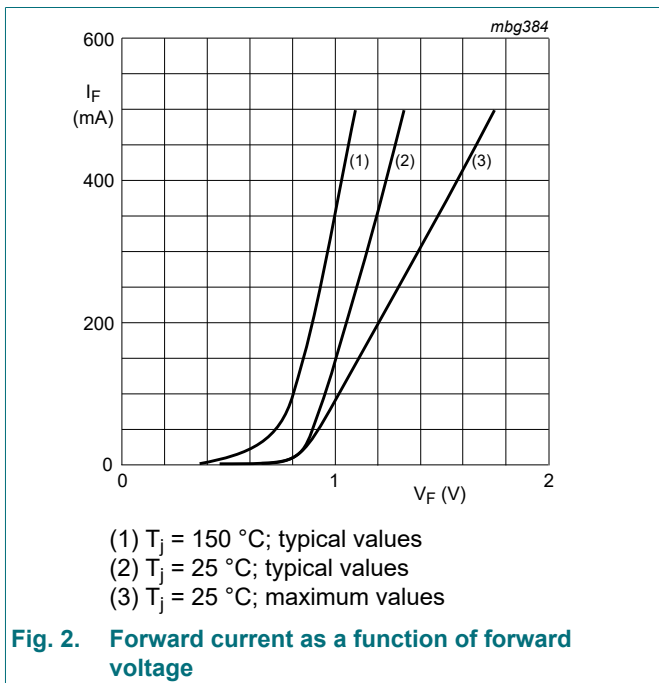
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	357	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	255	K/W

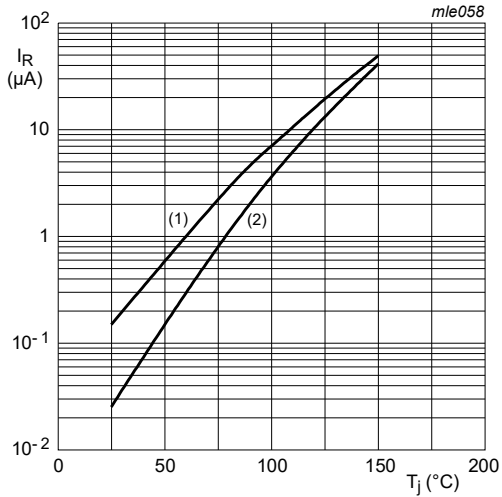
- [1] Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 cm<sup>2</sup>.
- [2] One or more diodes loaded.

## 10. Characteristics

Table 7. Characteristics

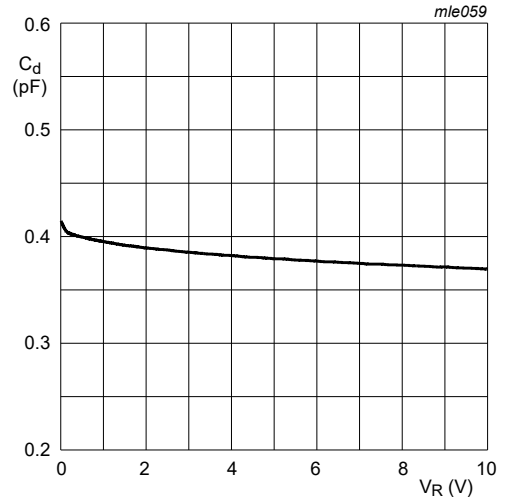
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_{(BR)R}$	reverse breakdown voltage	$I_R = 100 \mu A$ ; $T_j = 25 \text{ }^\circ C$	300	-	-	V
$V_F$	forward voltage	$I_F = 100 \text{ mA}$ ; $t_p = 300 \mu s$ ; $\delta = 0.02$ ; pulsed; $T_j = 25 \text{ }^\circ C$	-	-	1.1	V
$I_R$	reverse current	$V_R = 250 \text{ V}$ ; $T_j = 25 \text{ }^\circ C$	-	-	150	nA
		$V_R = 250 \text{ V}$ ; $T_{amb} = 150 \text{ }^\circ C$	-	-	50	$\mu A$
$C_d$	diode capacitance	$V_R = 0 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_j = 25 \text{ }^\circ C$	-	-	2	pF
$t_{rr}$	reverse recovery time	$I_F = 30 \text{ mA}$ ; $I_R = 30 \text{ mA}$ ; $R_L = 100 \Omega$ ; $T_j = 25 \text{ }^\circ C$ ; measured at $I_R = 3 \text{ mA}$	-	-	50	ns





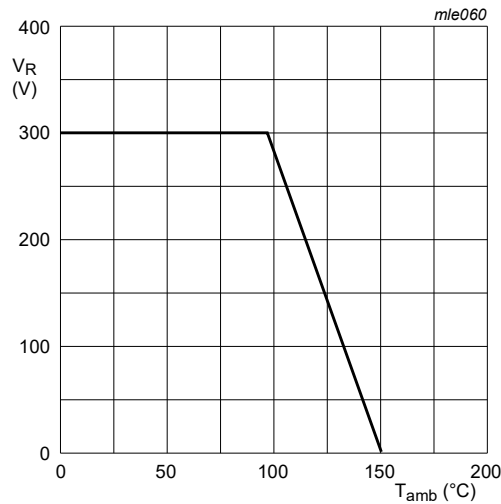
$V_R = V_{Rmax}$   
 $V_R = V_{Rmax}$

Fig. 4. Reverse current as a function of junction temperature; typical values



$f = 1 \text{ MHz}$   
 $T_j = 25 \text{ °C}$

Fig. 5. Diode capacitance as a function of reverse voltage; typical values



$V_R = 300 \text{ V}$   
 $T_{amb} = 150 \text{ °C}$

Fig. 6. Reverse voltage as a function of ambient temperature; typical 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

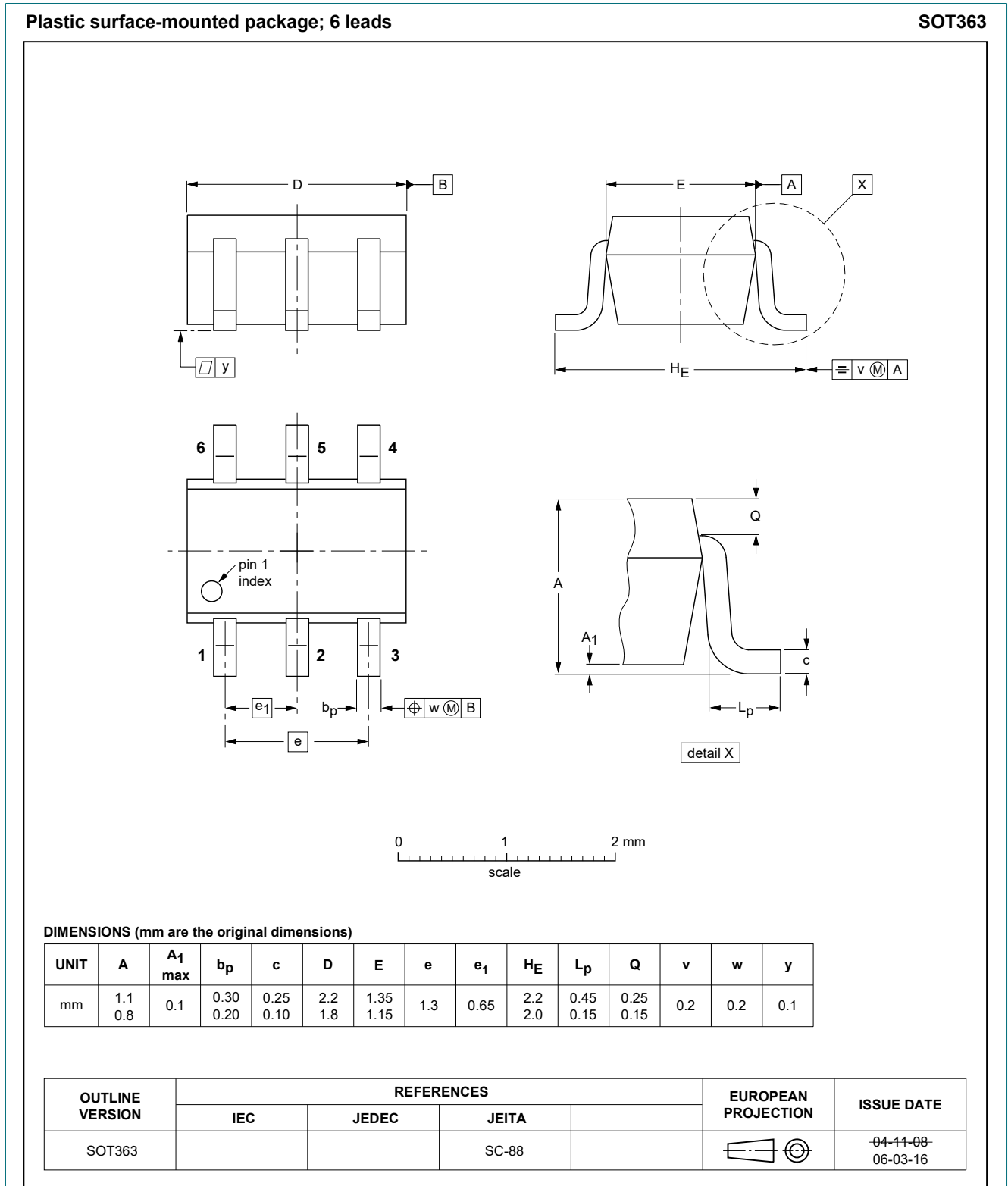


Fig. 7. Package outline TSSOP6 (SOT363)

### 13. Soldering

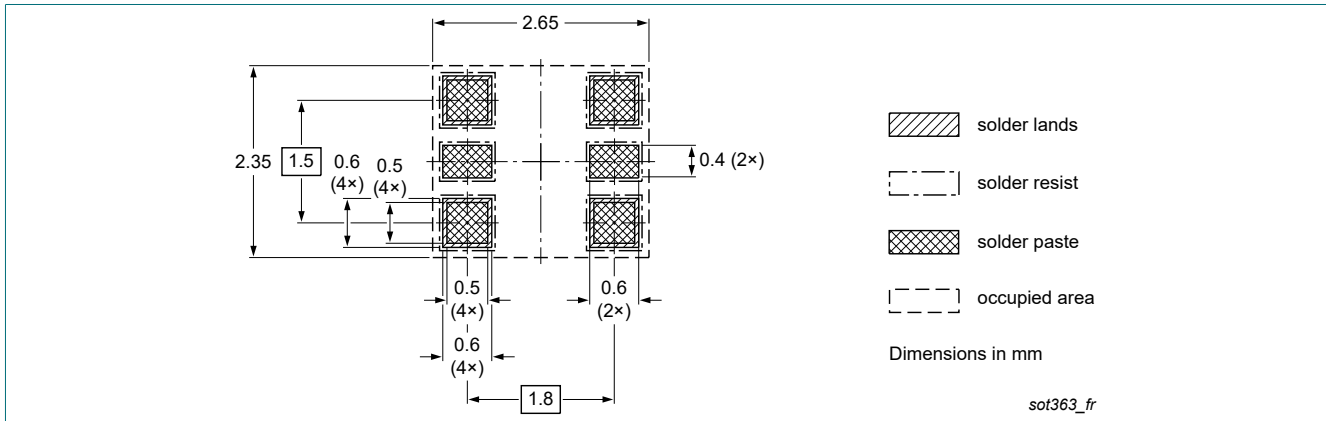


Fig. 8. Reflow soldering footprint for TSSOP6 (SOT363)

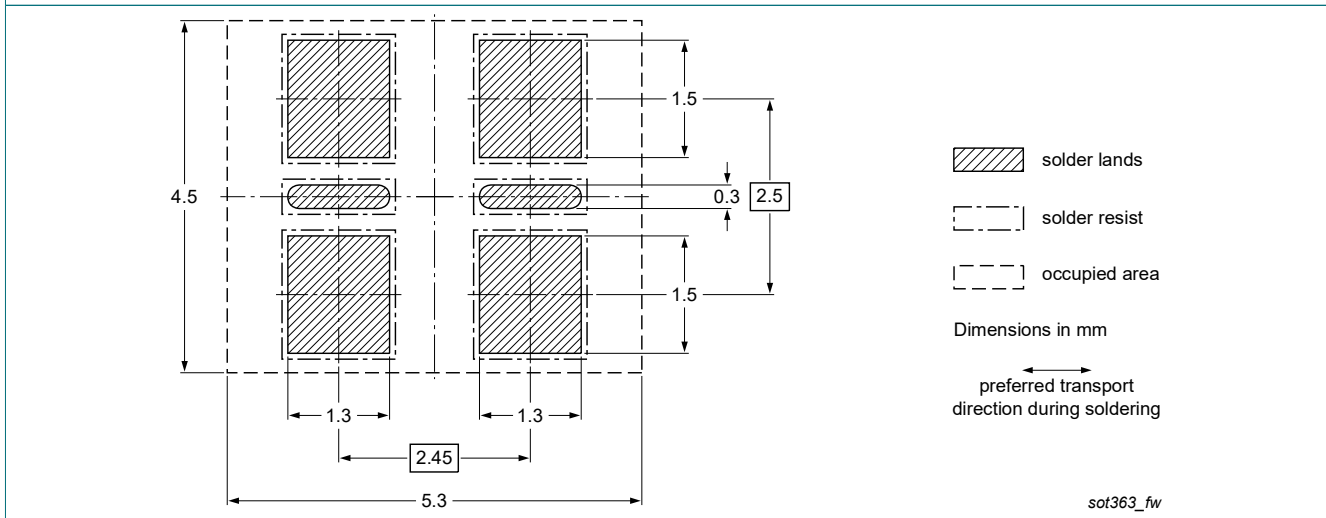


Fig. 9. Wave soldering footprint for TSSOP6 (SOT363)

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAW101S-Q v.1	20210914	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".
- [3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at <https://www.nexperia.com>.

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