



# BAW101S

High voltage double diode

1 October 2022

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

## 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	$I_F = 30 \text{ mA}$ ; $I_R = 30 \text{ mA}$ ; $R_L = 100 \Omega$ ; $T_j = 25 \text{ }^\circ\text{C}$ ; 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
<a href="#">BAW101S</a>	TSSOP6	plastic, surface-mounted package; 6 leads; 0.65 mm pitch; 2.1 mm x 1.25 mm x 0.95 mm body	<a href="#">SOT363</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAW101S	K2%

[1] % = placeholder for manufacturing site code

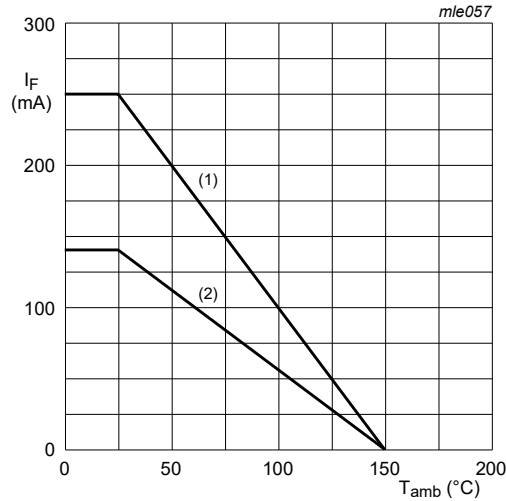
## 8. Limiting values

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>.



(1)  $I_F = 250 \text{ mA}$   
 (2)  $I_F = 140 \text{ mA}$

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

## 9. Thermal characteristics

Table 6. Thermal characteristics

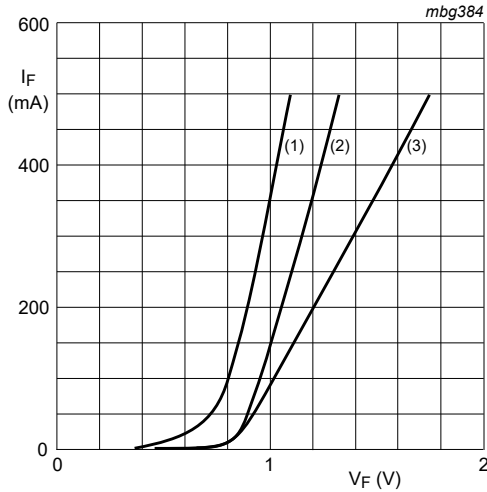
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	357	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	-	255	K/W

[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

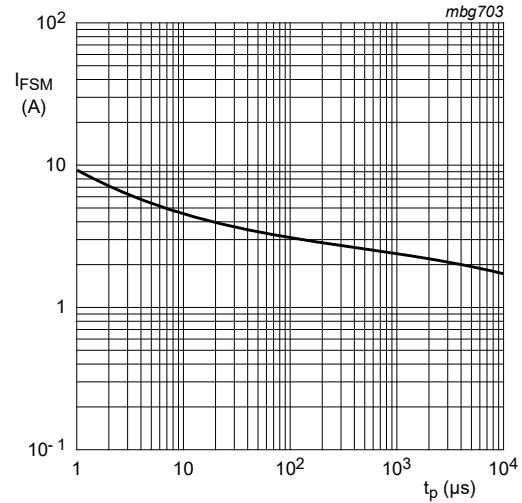
Table 7. Characteristics

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



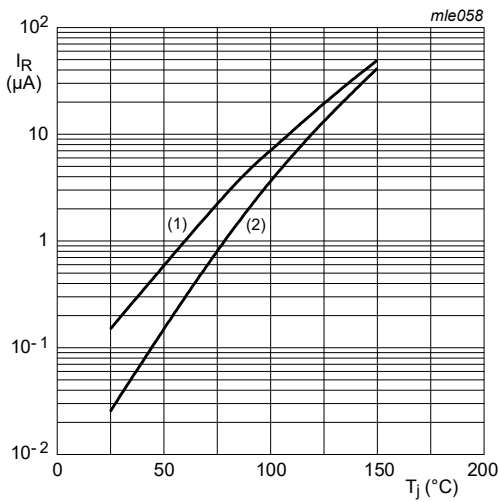
- (1)  $T_j = 150\text{ °C}$ ; typical values
- (2)  $T_j = 25\text{ °C}$ ; typical values
- (3)  $T_j = 25\text{ °C}$ ; maximum values

**Fig. 2. Forward current as a function of forward voltage**



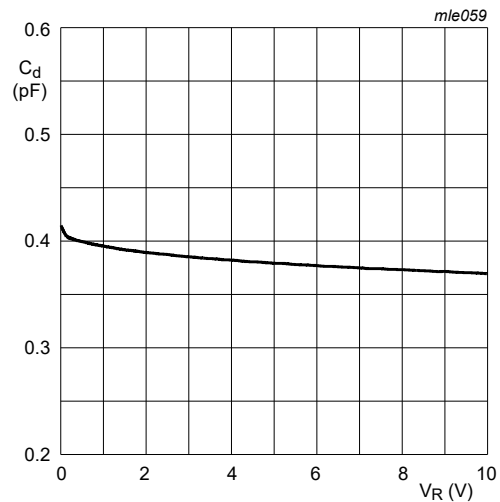
Based on square wave currents.  
 $T_{j(\text{init})} = 25\text{ °C}$

**Fig. 3. Non-repetitive peak forward current as a function of pulse duration; maximum values**



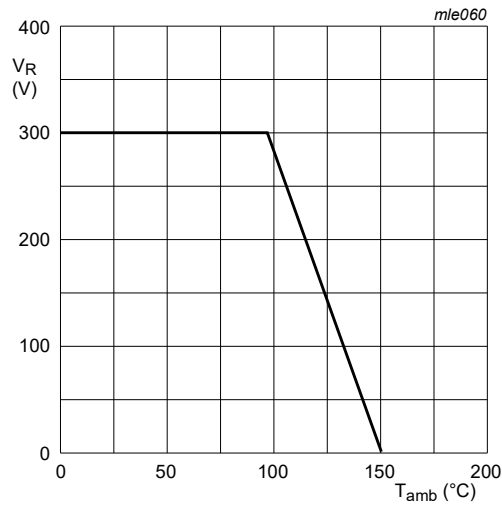
$V_R = V_{R\text{max}}$   
 $V_R = V_{R\text{max}}$

**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<sub>R</sub> = 300 V  
 T<sub>amb</sub> = 150 °C

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

### 11. Package outline

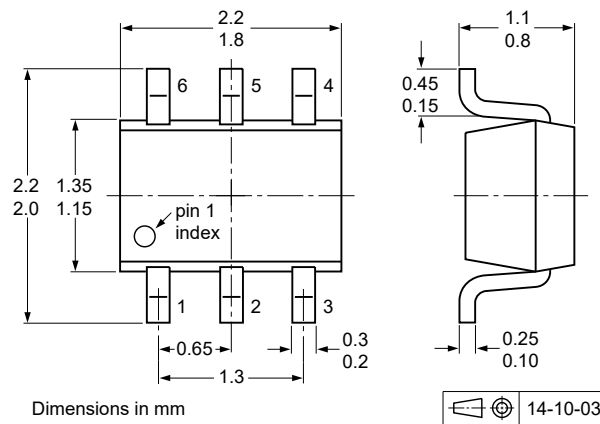


Fig. 7. Package outline TSSOP6 (SOT363)

## 12. Soldering

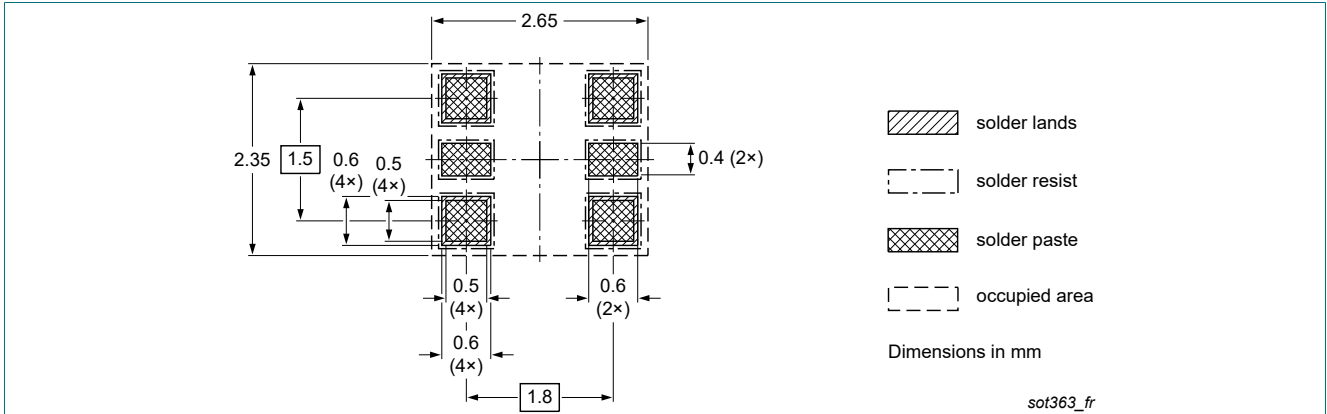


Fig. 8. Reflow soldering footprint for TSSOP6 (SOT363)

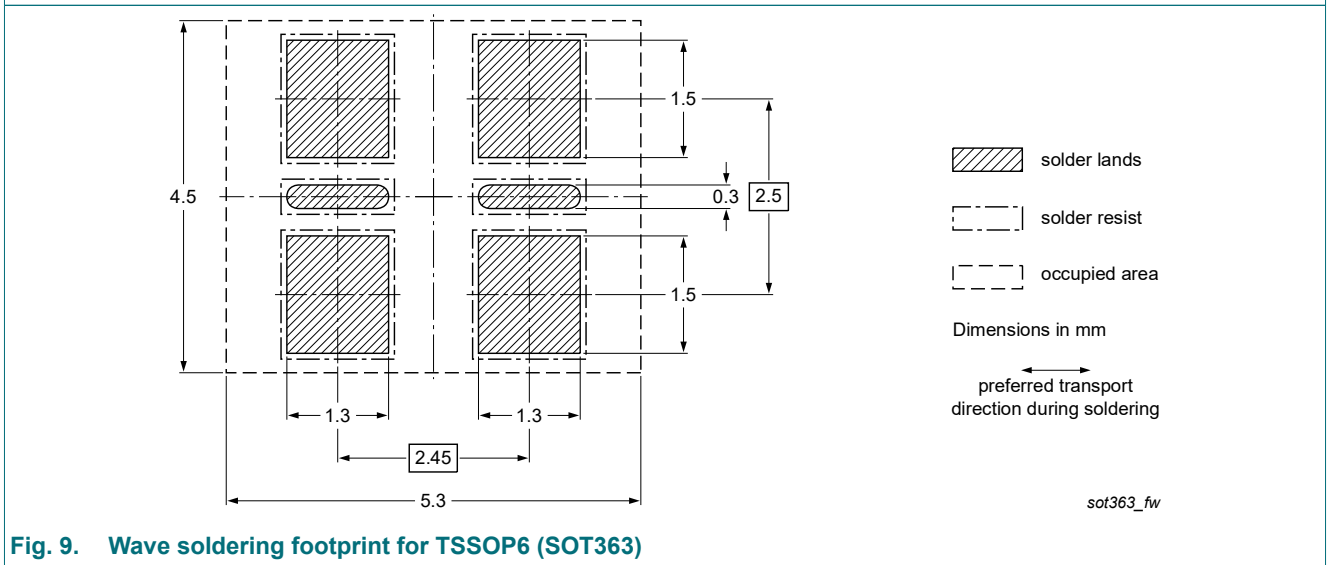


Fig. 9. Wave soldering footprint for TSSOP6 (SOT363)

## 13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAW101S v.2	20221001	Product data sheet	-	BAW101S v.1
Modifications:	<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia.</li><li>Legal texts have been adapted to the new company name where appropriate.</li><li>Product changed to non automotive. Please refer to the automotive product(s) with -Q.</li></ul>			
BAW101S v.1	20030513	Product specification	-	-

## 14. 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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