



# 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

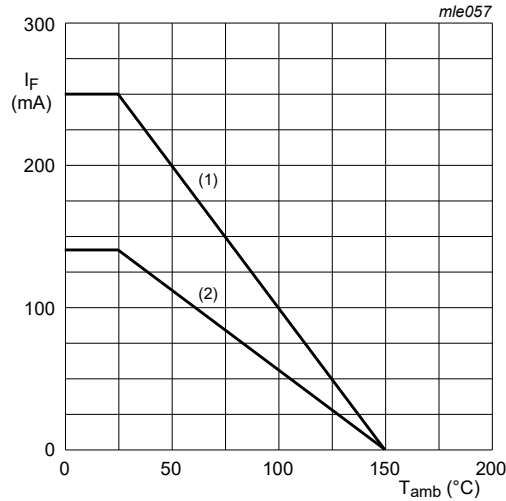
## 8. Limiting values

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

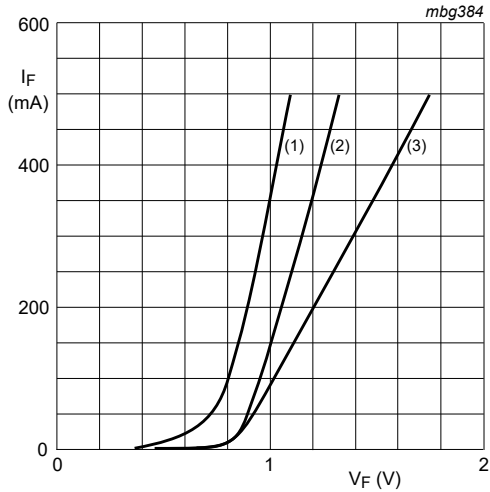
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	357	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	-	255	K/W

[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

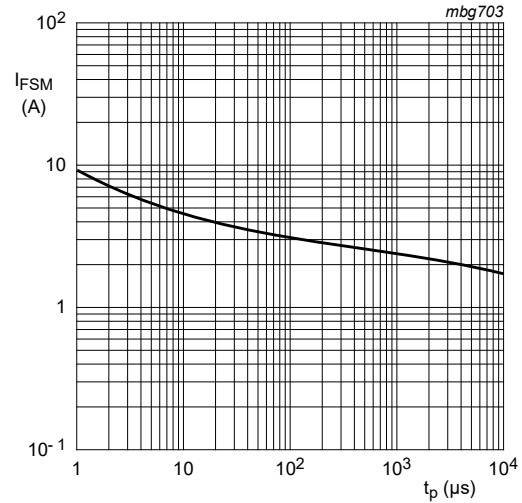
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per diode</b>							
$V_{(BR)R}$	reverse breakdown voltage	$I_R = 100 \text{ }\mu\text{A}$ ; $T_j = 25 \text{ }^\circ\text{C}$		300	-	-	V
$V_F$	forward voltage	$I_F = 100 \text{ mA}$ ; $t_p = 300 \text{ }\mu\text{s}$ ; $\delta = 0.02$ ; 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	$I_F = 30 \text{ mA}$ ; $I_R = 30 \text{ mA}$ ; $R_L = 100 \text{ }\Omega$ ; $T_j = 25 \text{ }^\circ\text{C}$ ; measured at $I_R = 3 \text{ mA}$		-	-	50	ns



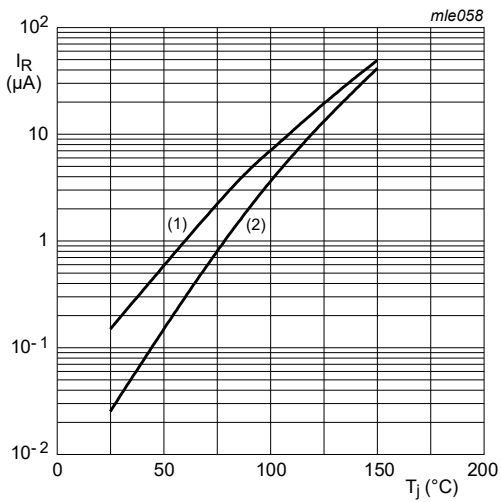
- (1)  $T_j = 150\text{ °C}$ ; typical values
- (2)  $T_j = 25\text{ °C}$ ; typical values
- (3)  $T_j = 25\text{ °C}$ ; maximum values

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



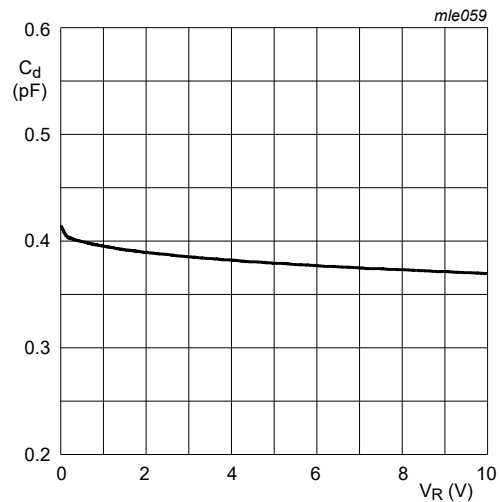
Based on square wave currents.  
 $T_{j(\text{init})} = 25\text{ °C}$

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



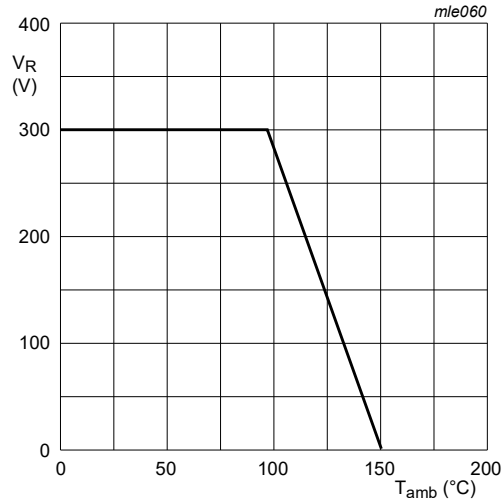
$V_R = V_{R\text{max}}$   
 $V_R = V_{R\text{max}}$

**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

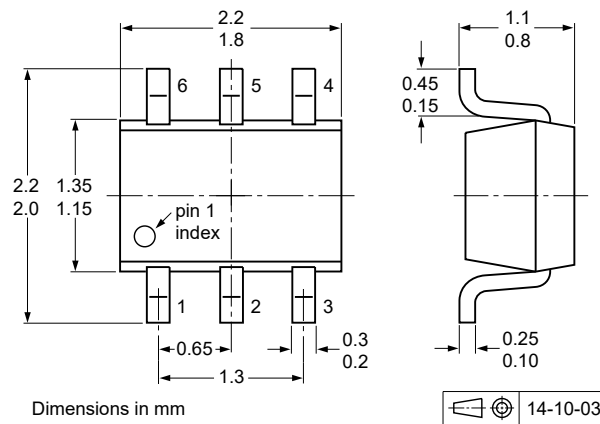


Fig. 7. Package outline TSSOP6 (SOT363)

## 12. Soldering

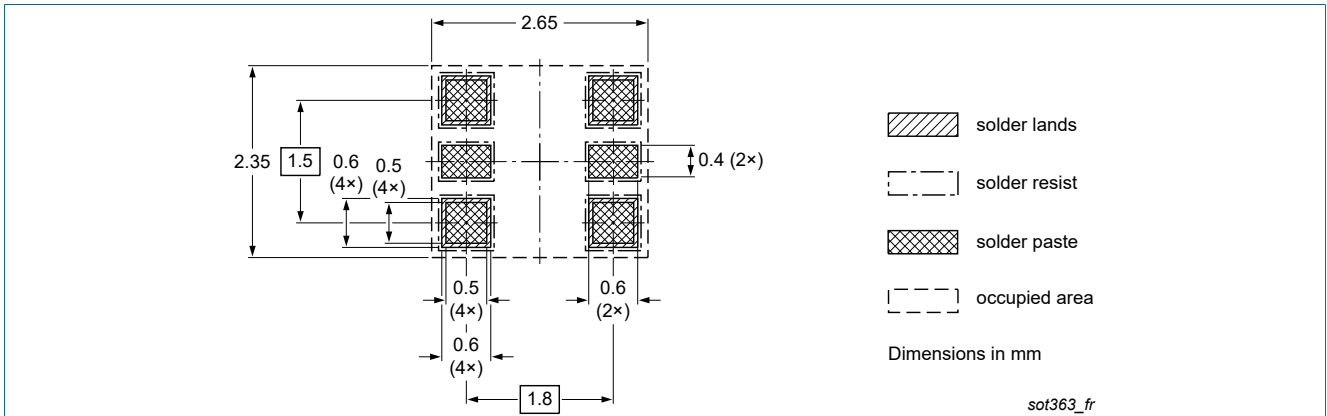


Fig. 8. Reflow soldering footprint for TSSOP6 (SOT363)

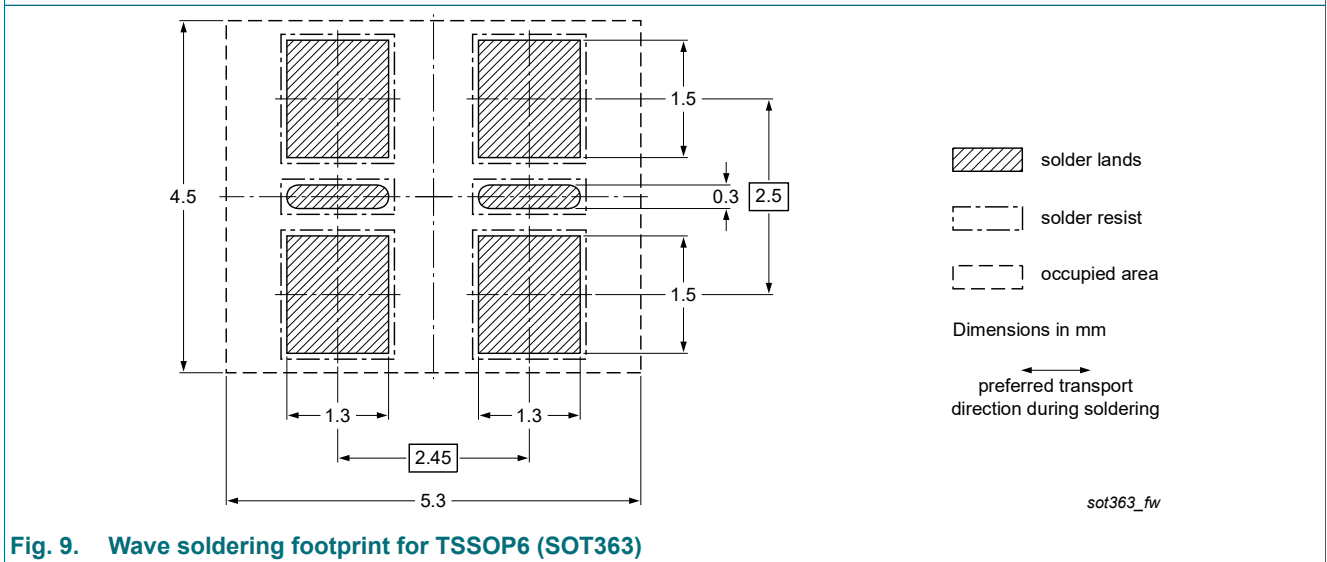


Fig. 9. Wave soldering footprint for TSSOP6 (SOT363)

## 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".
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Date of release: 1 October 2022

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