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

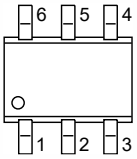
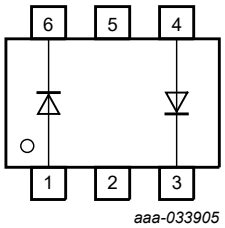
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
I_F	forward current	single diode loaded	[1]	-	-	250	mA
V_R	reverse voltage			-	-	300	V
t_{rr}	reverse recovery time	I_F = 30 mA; I_R = 30 mA; R_L = 100 Ω; T_j = 25 °C; measured at I_R = 3 mA		-	-	50	ns

[1] Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 cm².

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode 1	 TSSOP6 (SOT363)	 aaa-033905
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	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[1]
BAW101S	K2%

[1] % = placeholder for manufacturing site code

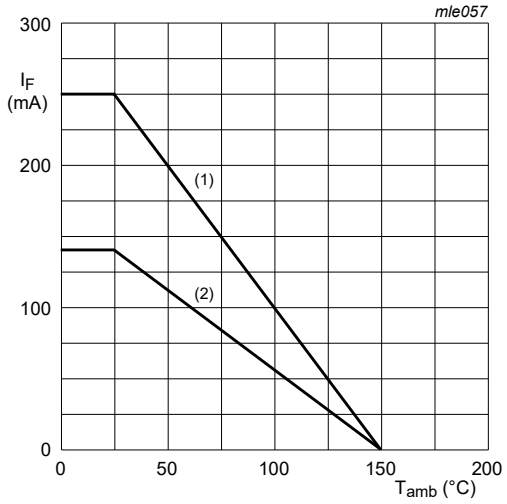
8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
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 µs; square wave; $T_{j(init)}$ = 25 °C		-	4.5	A
P_{tot}	total power dissipation	$T_{amb} \leq$ 25 °C	[1]	-	350	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

[1] Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 cm².



(1) I_F = 250 mA
(2) I_F = 140 mA

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

9. Thermal characteristics

Table 6. Thermal characteristics

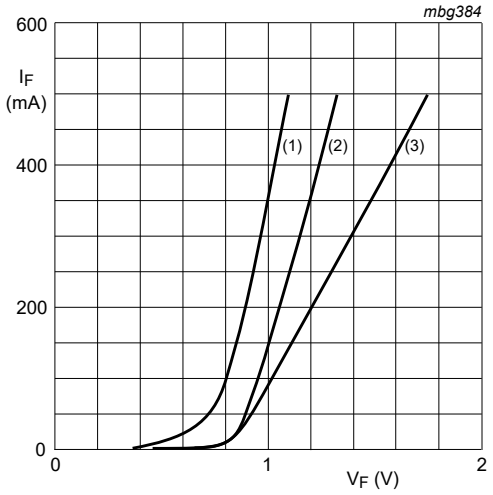
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	357	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		[2]	-	-	255	K/W

[1] Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 cm².
[2] One or more diodes loaded.

10. Characteristics

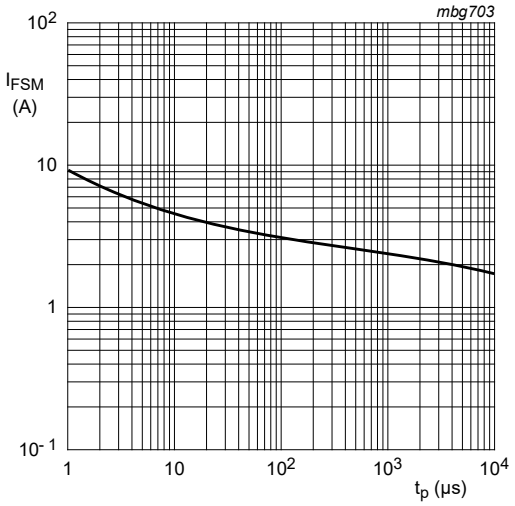
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
$V_{(BR)R}$	reverse breakdown voltage	I_R = 100 µA; T_j = 25 °C		300	-	-	V
V_F	forward voltage	I_F = 100 mA; t_p = 300 µs; δ = 0.02; pulsed; T_j = 25 °C		-	-	1.1	V
I_R	reverse current	V_R = 250 V; T_j = 25 °C		-	-	150	nA
		V_R = 250 V; T_{amb} = 150 °C		-	-	50	µA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz; T_j = 25 °C		-	-	2	pF
t_{rr}	reverse recovery time	I_F = 30 mA; I_R = 30 mA; R_L = 100 Ω; T_j = 25 °C; measured at I_R = 3 mA		-	-	50	ns



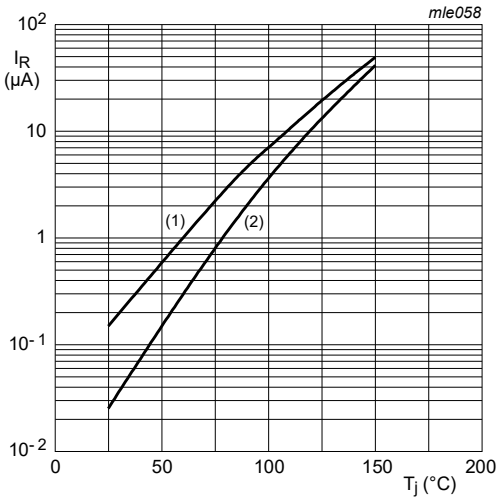
(1) T_j = 150 °C; typical values
(2) T_j = 25 °C; typical values
(3) T_j = 25 °C; maximum values

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



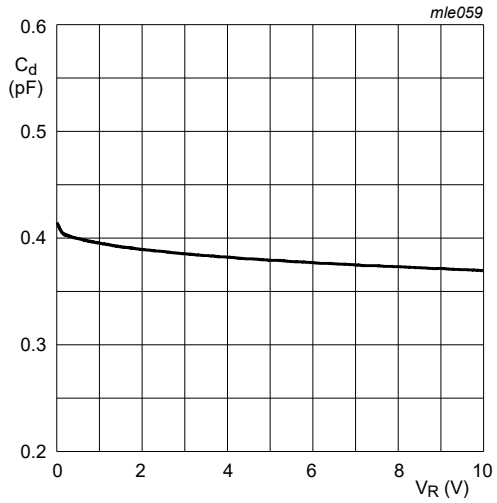
Based on square wave currents.
$T_{j(init)}$ = 25 °C

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



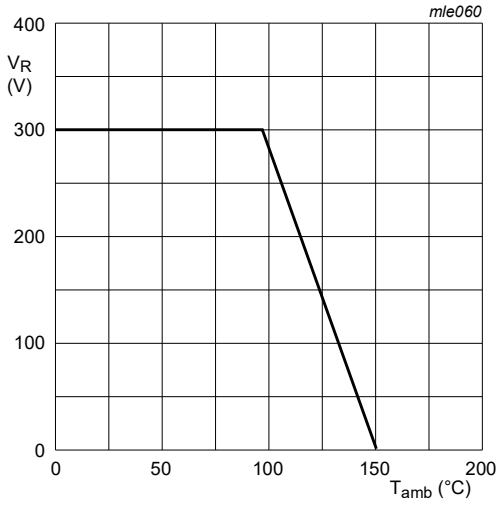
$V_R = V_{Rmax}$
$V_R = V_{Rmax}$

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



f = 1 MHz
T_j = 25 °C

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



V_R = 300 V
T_{amb} = 150 °C

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

11. Package outline

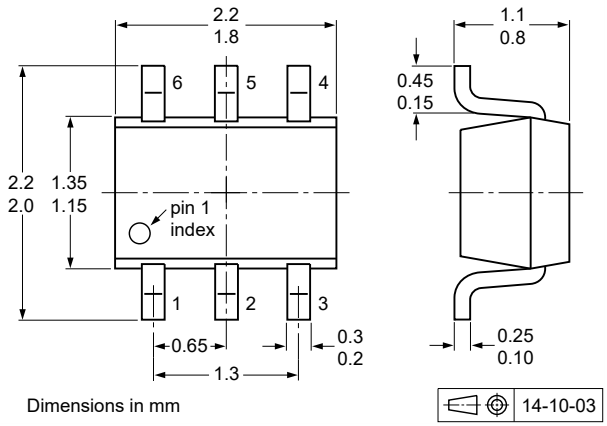


Fig. 7. Package outline TSSOP6 (SOT363)

12. Soldering

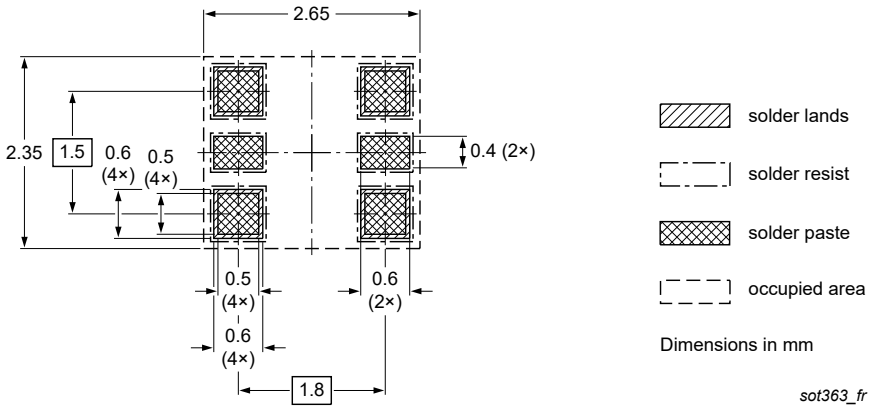


Fig. 8. Reflow soldering footprint for TSSOP6 (SOT363)

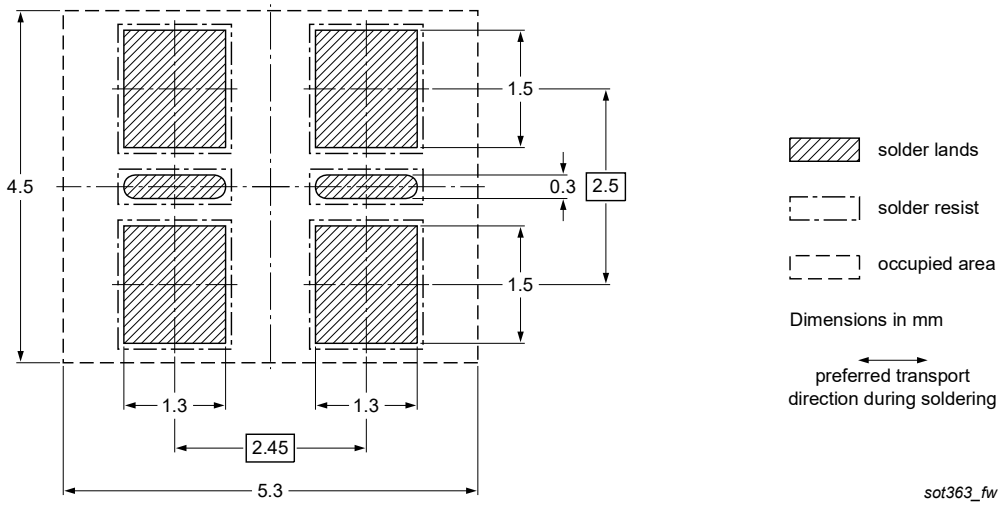


Fig. 9. Wave soldering footprint for TSSOP6 (SOT363)

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:	• The format of this data sheet has been redesigned to comply with the identity guidelines of Nexperia. • Legal texts have been adapted to the new company name where appropriate. • Product changed to non automotive. Please refer to the automotive product(s) with -Q.			
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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Date of release: 1 October 2022

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