



BAW101-Q

High voltage double diode

13 March 2024

Product data sheet

1. General description

The BAW101-Q is a high-speed switching diode array with two separate dice, fabricated in planar technology and encapsulated in a small SOT143B 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
- Communication

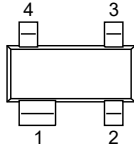
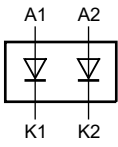
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_R	reverse voltage		-	-	300	V
I_R	reverse current	$V_R = 250\text{ V}; T_j = 25\text{ °C}$	-	-	150	nA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K1	cathode (diode 1)	 SOT143B	 aaa-038542
2	K2	cathode (diode 2)		
3	A2	anode (diode 2)		
4	A1	anode (diode 1)		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAW101-Q	SOT143B	plastic, surface-mounted package; 4 leads; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT143B

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAW101-Q	%AB

[1] % = placeholder for manufacturing site code

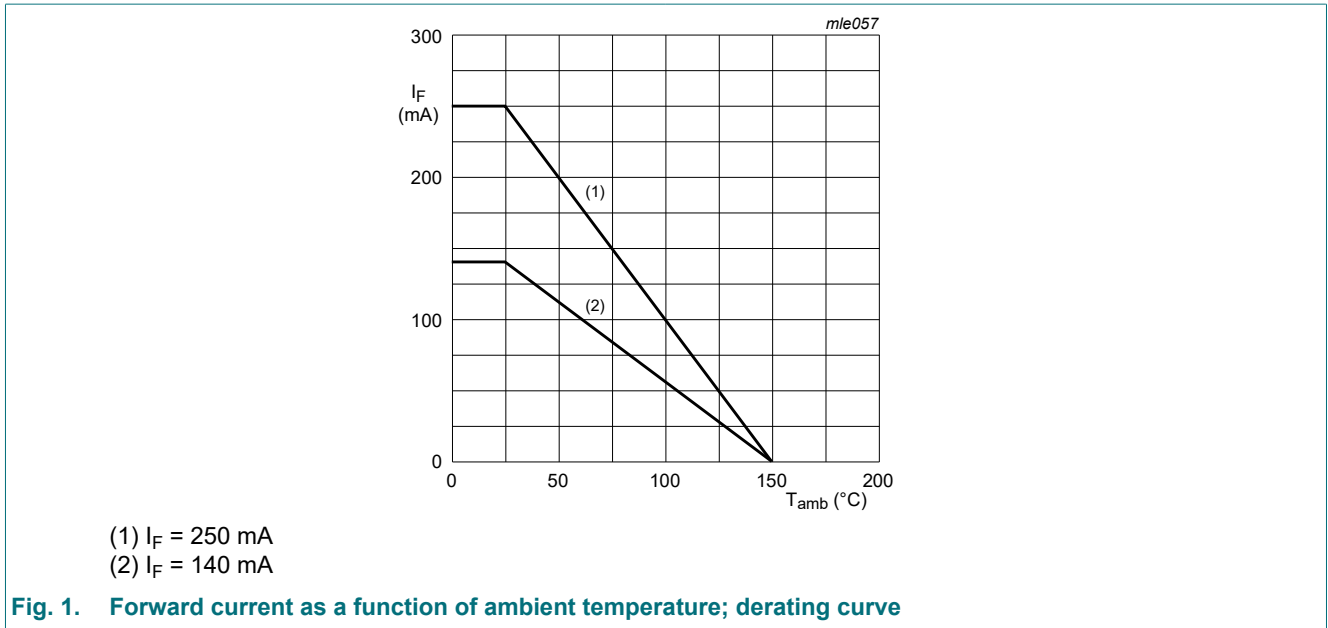
8. Limiting values

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
		series connection		-	600	V
V_{RRM}	repetitive peak reverse voltage			-	300	V
		series connection		-	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_{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_{amb}	ambient temperature			-65	150	$^\circ\text{C}$
T_{stg}	storage temperature			-65	150	$^\circ\text{C}$

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



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

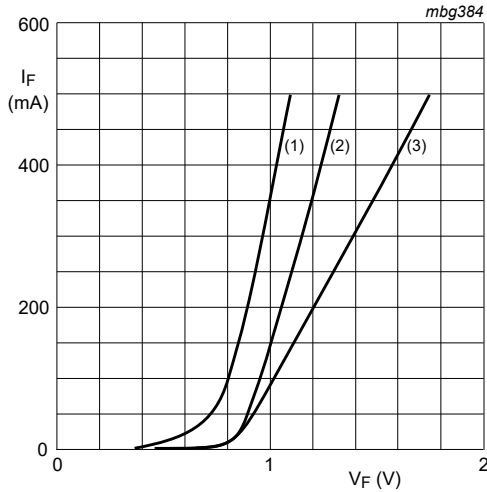
[1] Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 cm².

[2] One or more diodes loaded.

10. Characteristics

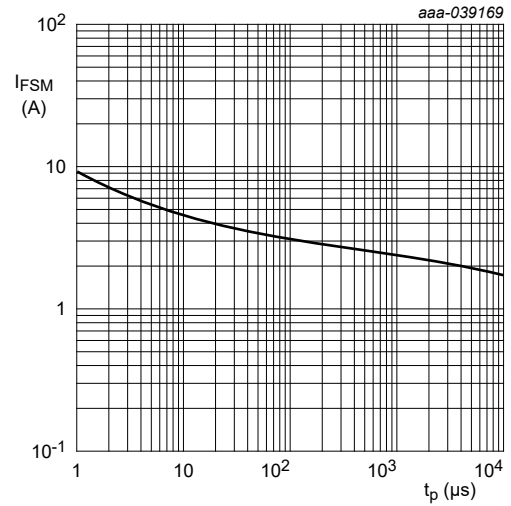
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
$V_{(BR)R}$	reverse breakdown voltage	$I_R = 100 \mu\text{A}; T_j = 25 \text{ }^\circ\text{C}$		300	-	-	V
V_F	forward voltage	$I_F = 100 \text{ mA}; \text{pulsed}; t_p = 300 \mu\text{s}; \delta = 0.02; T_j = 25 \text{ }^\circ\text{C}$		-	-	1.1	V
I_R	reverse current	$V_R = 250 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$		-	-	150	nA
		$V_R = 250 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$		-	-	100	μA
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	$I_F = 30 \text{ mA}; I_R = 30 \text{ mA}; I_{R(\text{meas})} = 3 \text{ mA}; R_L = 100 \Omega; T_j = 25 \text{ }^\circ\text{C}$		-	-	50	ns



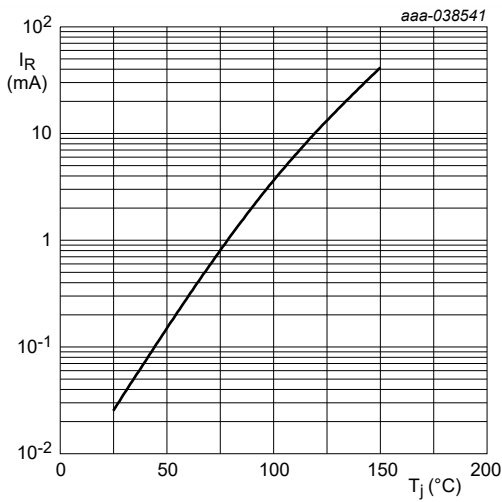
- (1) $T_j = 150\text{ °C}$; typical values
- (2) $T_j = 25\text{ °C}$; typical values
- (3) $T_j = 25\text{ °C}$; maximum values

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



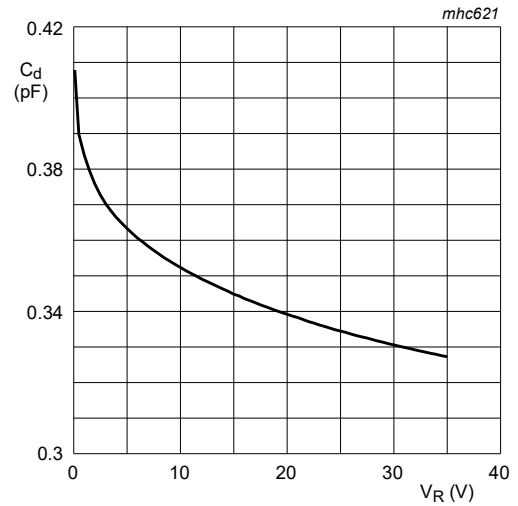
Based on square wave currents.
 $T_j = 25\text{ °C}$ prior to surge.

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



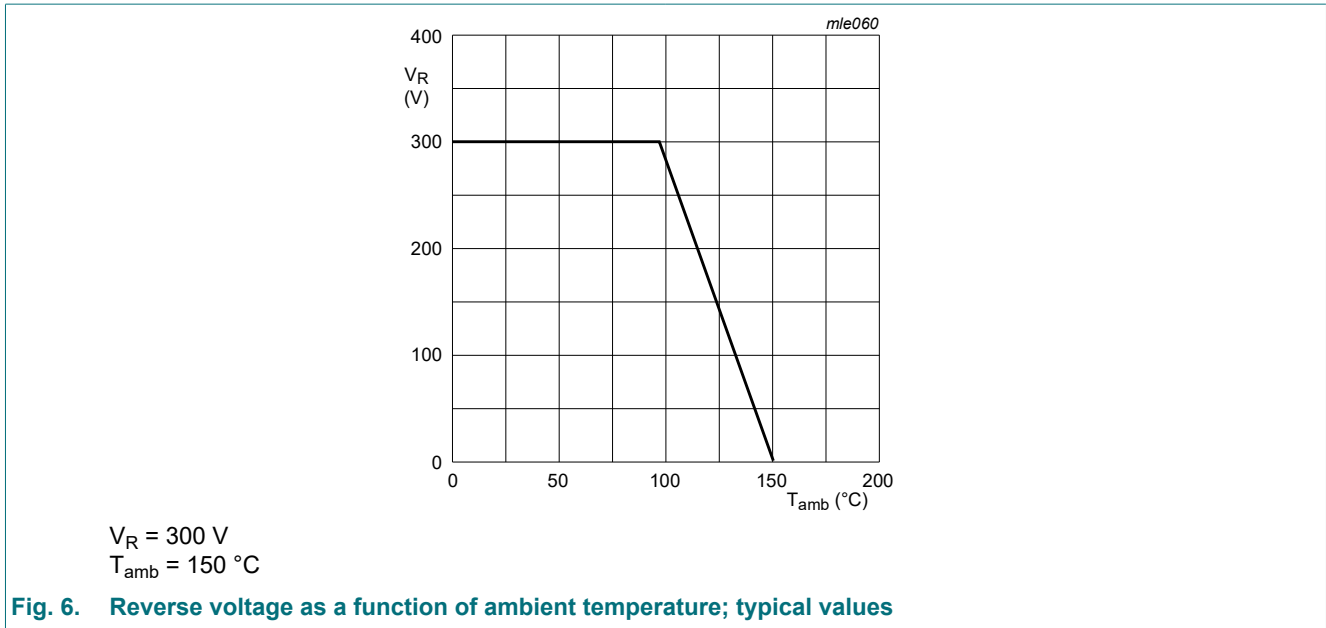
$V_R = V_{Rmax}$; typical values

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



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

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

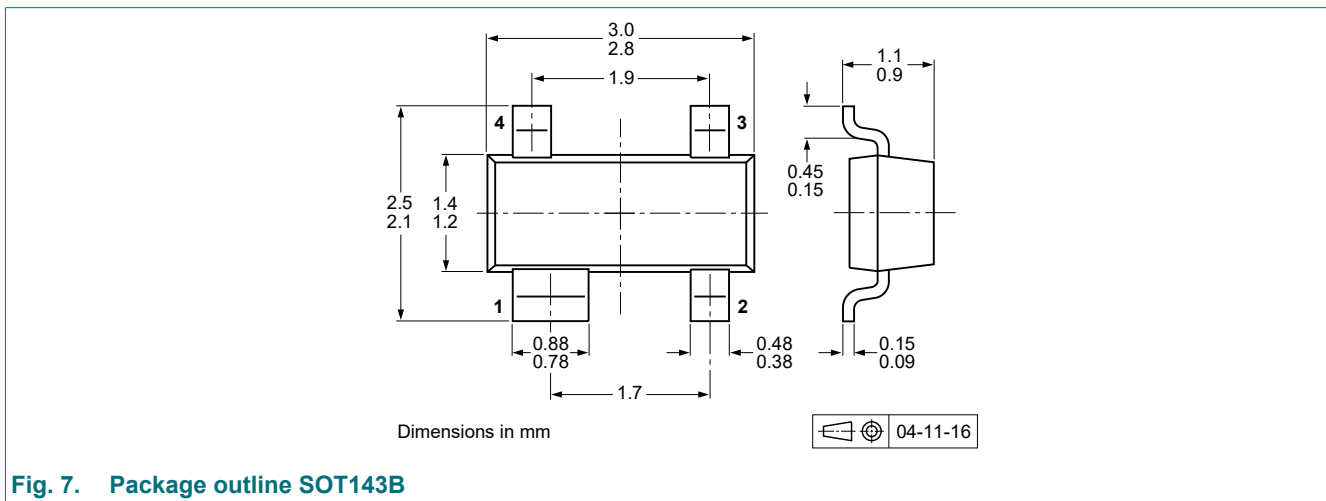


11. Test information

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



13. Soldering

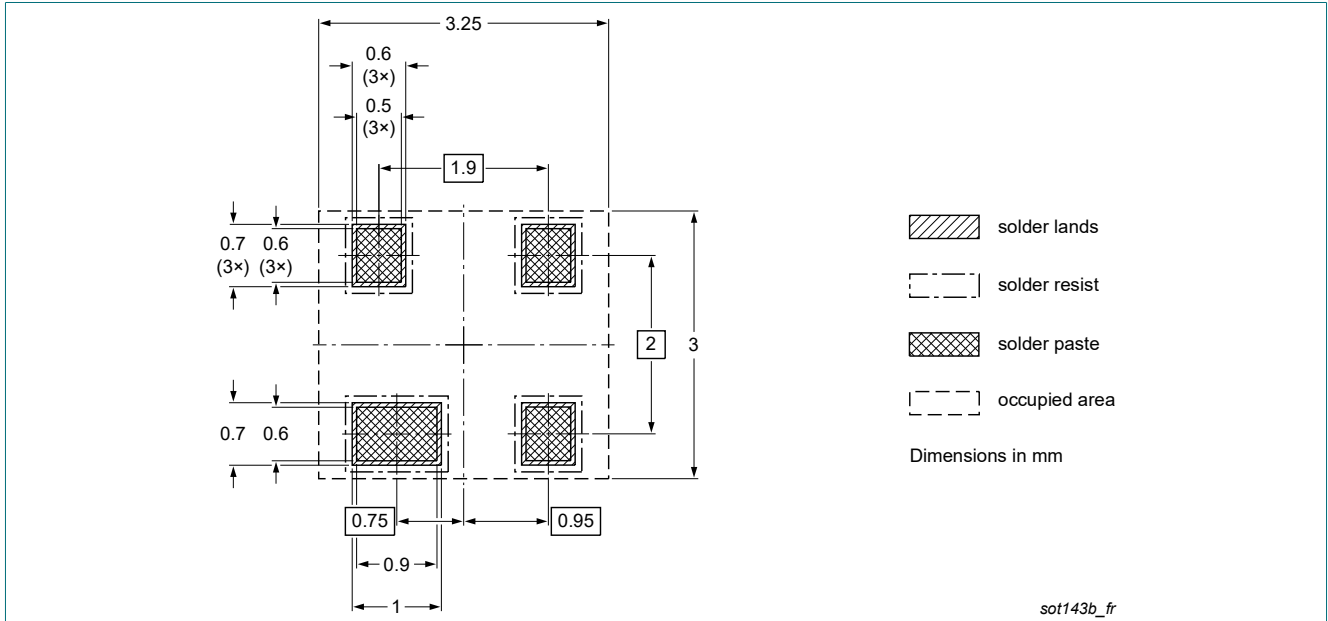


Fig. 8. Reflow soldering footprint for SOT143B

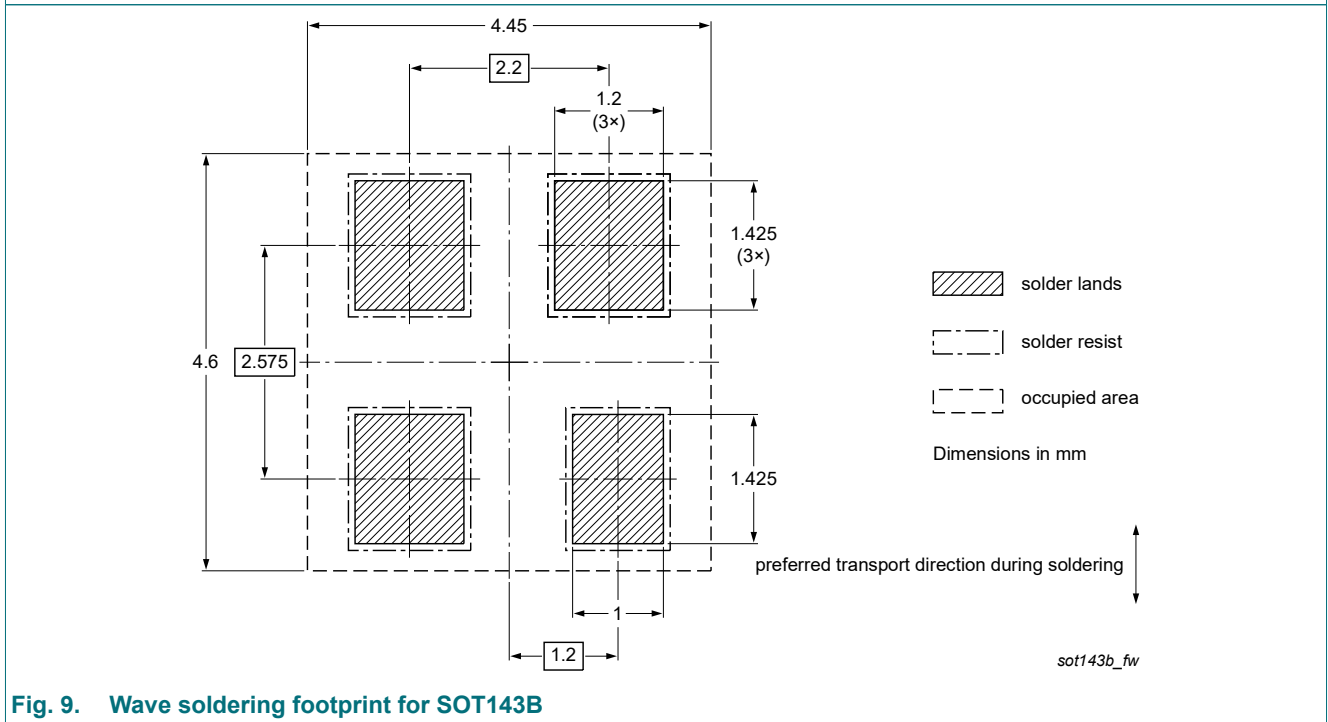


Fig. 9. Wave soldering footprint for SOT143B

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAW101-Q v.1	20240313	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".
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Contents

1. General description.....	1
2. Features and benefits.....	1
3. Applications.....	1
4. Quick reference data.....	1
5. Pinning information.....	1
6. Ordering information.....	2
7. Marking.....	2
8. Limiting values.....	2
9. Thermal characteristics.....	3
10. Characteristics.....	3
11. Test information.....	5
12. Package outline.....	5
13. Soldering.....	6
14. Revision history.....	7
15. Legal information.....	8

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