



# BAV23-Q

## Dual high-voltage switching diodes

2 February 2022

Product data sheet

### 1. General description

Dual high-voltage switching diodes, encapsulated in a small SOT143B Surface-Mounted Device (SMD) plastic package.

### 2. Features and benefits

- High switching speed:  $t_{rr} \leq 50$  ns
- Low leakage current
- Repetitive peak reverse voltage:  $V_{RRM} \leq 250$  V
- Low capacitance:  $C_d \leq 2$  pF
- Small SMD plastic package
- Qualified according to AEC-Q101 and recommended for use in automotive applications

### 3. Applications

- High-speed switching at high voltage
- High-voltage general-purpose switching

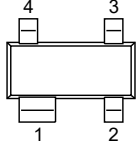
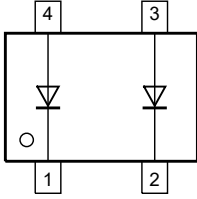
### 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$I_R$	reverse current	$V_R = 200$ V	-	-	100	nA
$V_R$	reverse voltage		-	-	200	V
$t_{rr}$	reverse recovery time	$I_F = 10$ mA; $I_R = 10$ mA; $I_{R(meas)} = 1$ mA; $R_L = 100$ $\Omega$ ; $T_{amb} = 25$ °C	-	-	50	ns

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K1	cathode (diode 1)	 <p>SOT143B</p>	 <p>006aab100</p>
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
BAV23-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 <sup>[1]</sup>
BAV23-Q	%L3

[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			-	200	V
$V_{RRM}$	repetitive peak reverse voltage			-	250	V
$I_F$	forward current	Single diode loaded	[1]	-	225	mA
			[2]	-	125	mA
$I_{FRM}$	repetitive peak forward current			-	625	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1 \mu\text{s}$ ; square wave	[3]	-	9	A
		$t_p = 100 \mu\text{s}$ ; square wave	[3]	-	3	A
		$t_p = 10 \text{ms}$ ; square wave	[3]	-	1.7	A
<b>Per device</b>						
$P_{tot}$	total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$	[4]	-	250	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] Single diode loaded.

[2] Double diode loaded.

[3]  $T_j = 25 \text{ }^\circ\text{C}$  prior to surge.

[4] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

## 9. Thermal characteristics

**Table 6. Thermal characteristics**

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per device</b>							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	360	K/W

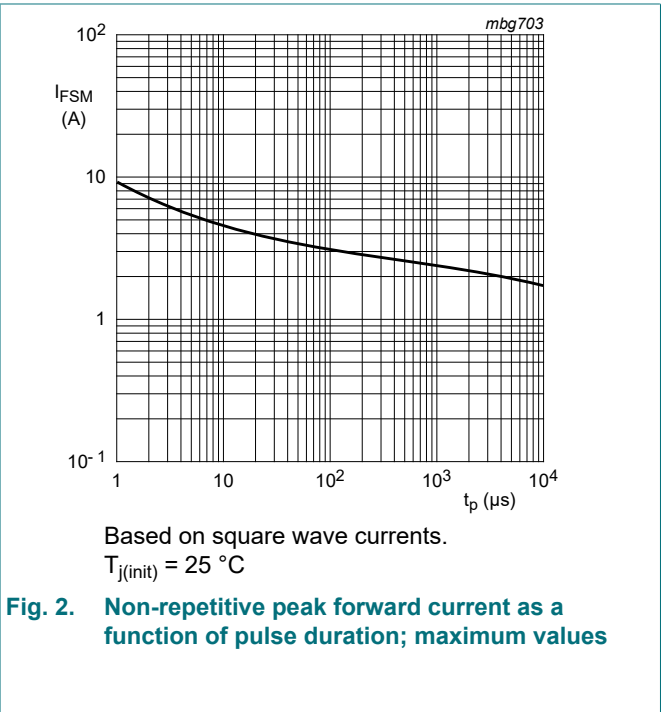
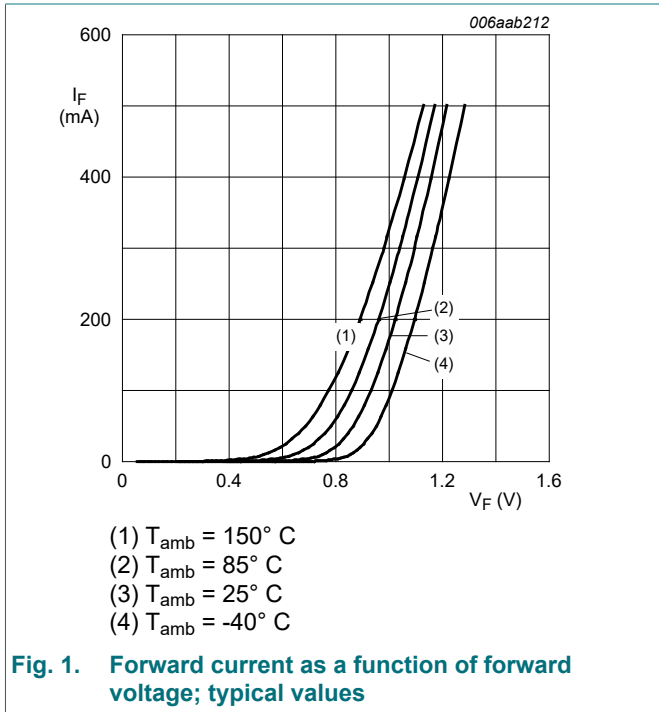
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

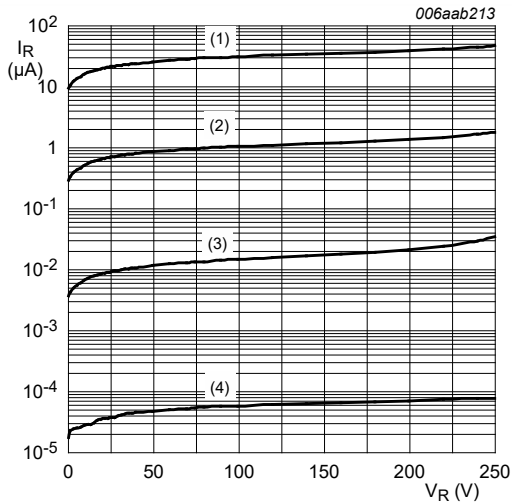
## 10. Characteristics

**Table 7. Characteristics**

$T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

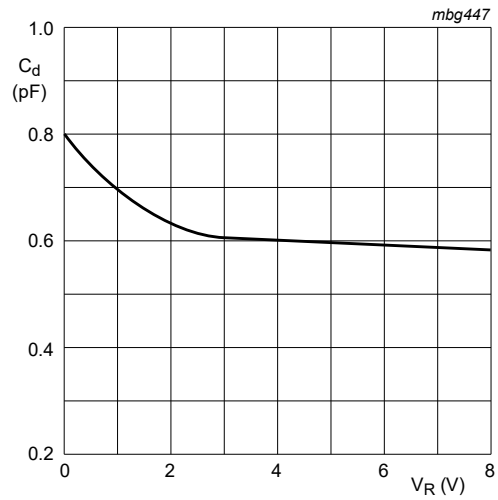
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	forward voltage	$I_F = 100\text{ mA}$	-	-	1	V
		$I_F = 200\text{ mA}$	-	-	1.25	V
$I_R$	reverse current	$V_R = 200\text{ V}$	-	-	100	nA
		$V_R = 200\text{ V}; T_J = 150\text{ }^{\circ}\text{C}$	-	-	100	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}$	-	-	2	pF
$t_{rr}$	reverse recovery time	$I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{R(\text{meas})} = 1\text{ mA}; R_L = 100\text{ }\Omega; T_{amb} = 25\text{ }^{\circ}\text{C}$	-	-	50	ns





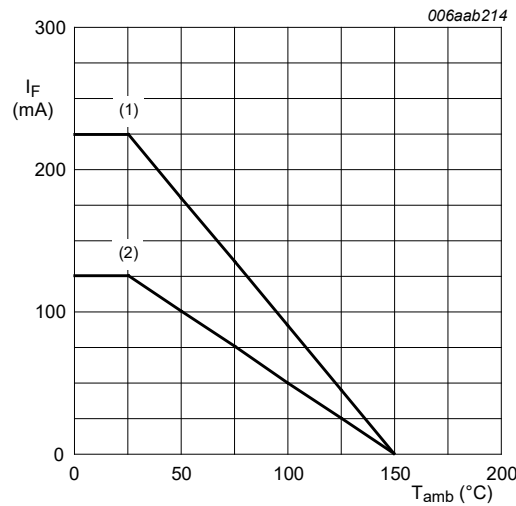
- (1)  $T_{\text{amb}} = 150^\circ\text{C}$
- (2)  $T_{\text{amb}} = 85^\circ\text{C}$
- (3)  $T_{\text{amb}} = 25^\circ\text{C}$
- (4)  $T_{\text{amb}} = -40^\circ\text{C}$

Fig. 3. Reverse current as a function of reverse voltage; typical values



$f = 1\text{ MHz}$   
 $T_j = 25^\circ\text{C}$ .

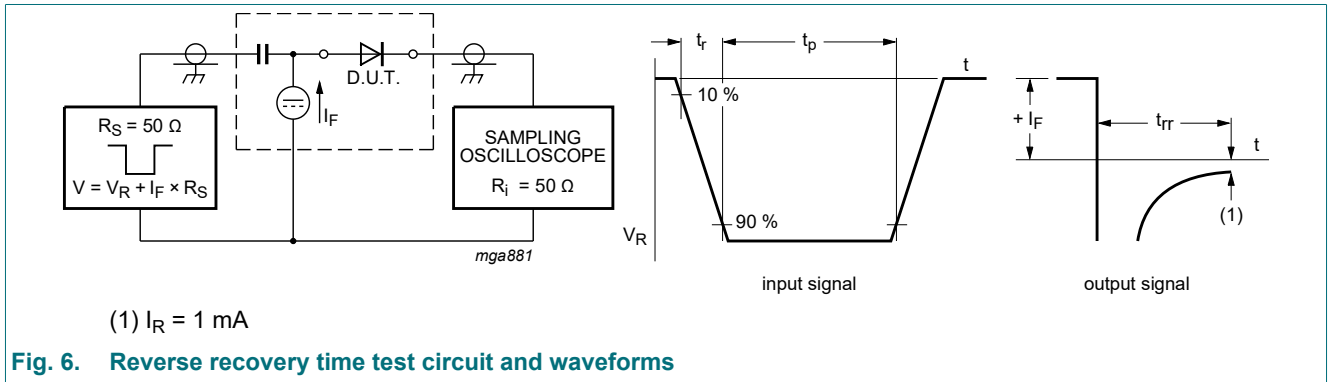
Fig. 4. Diode capacitance as a function of reverse voltage; typical values.



FR4 PCB, standard footprint  
 (1) Single diode loaded  
 (2) Double diode loaded

Fig. 5. Forward current as a function of ambient temperature; derating curves

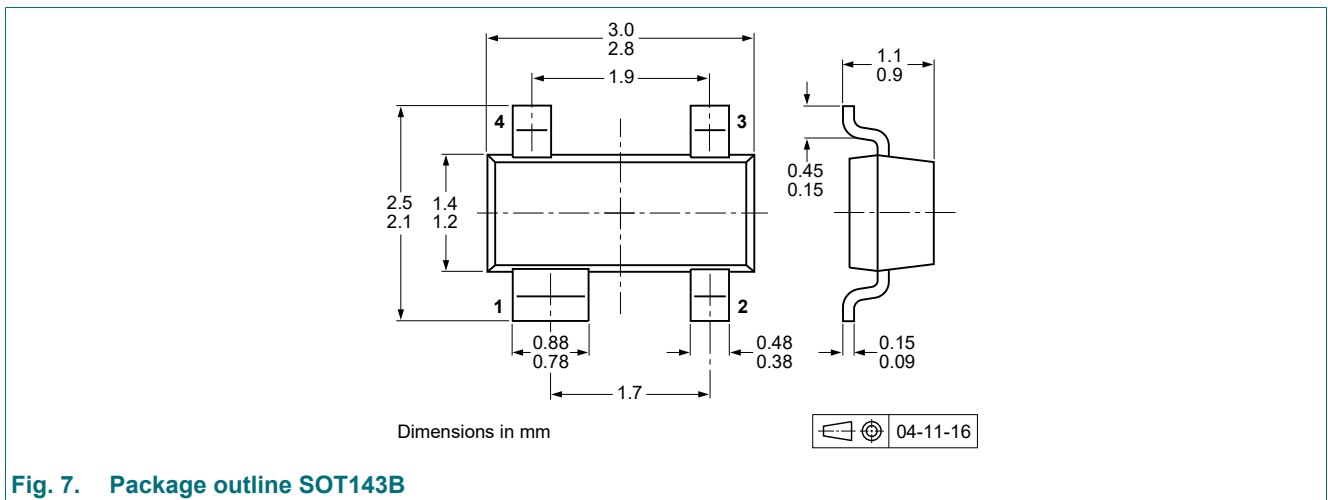
## 11. Test information



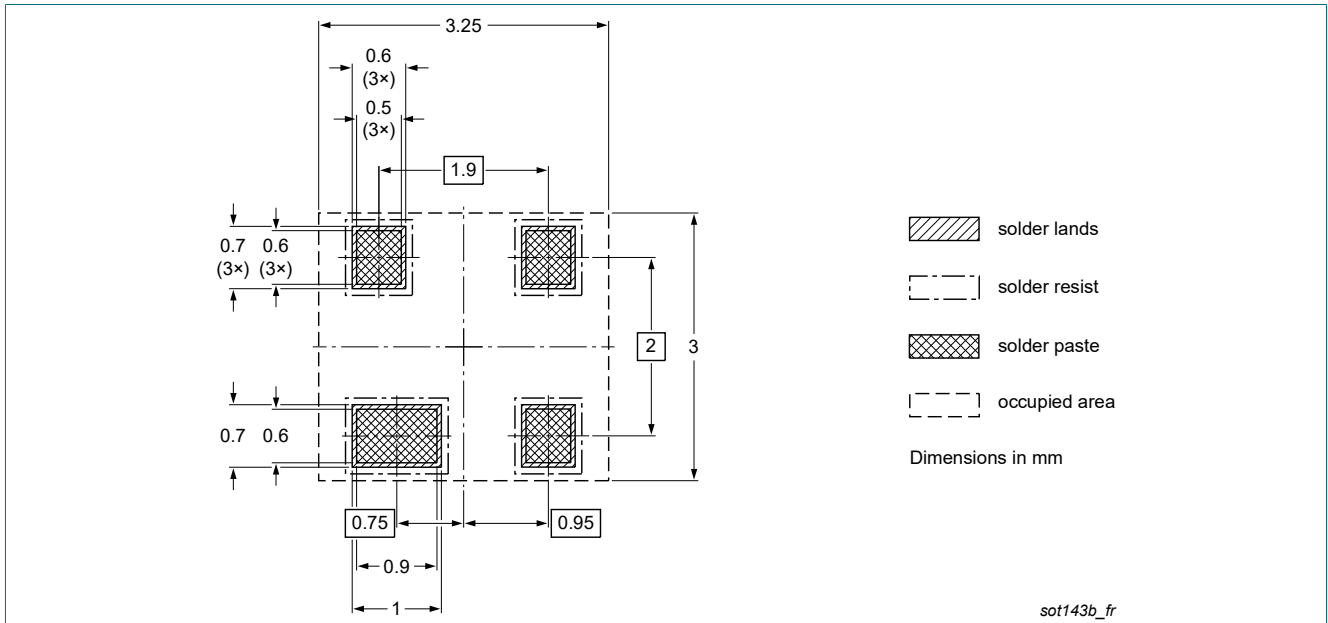
### Quality information

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.

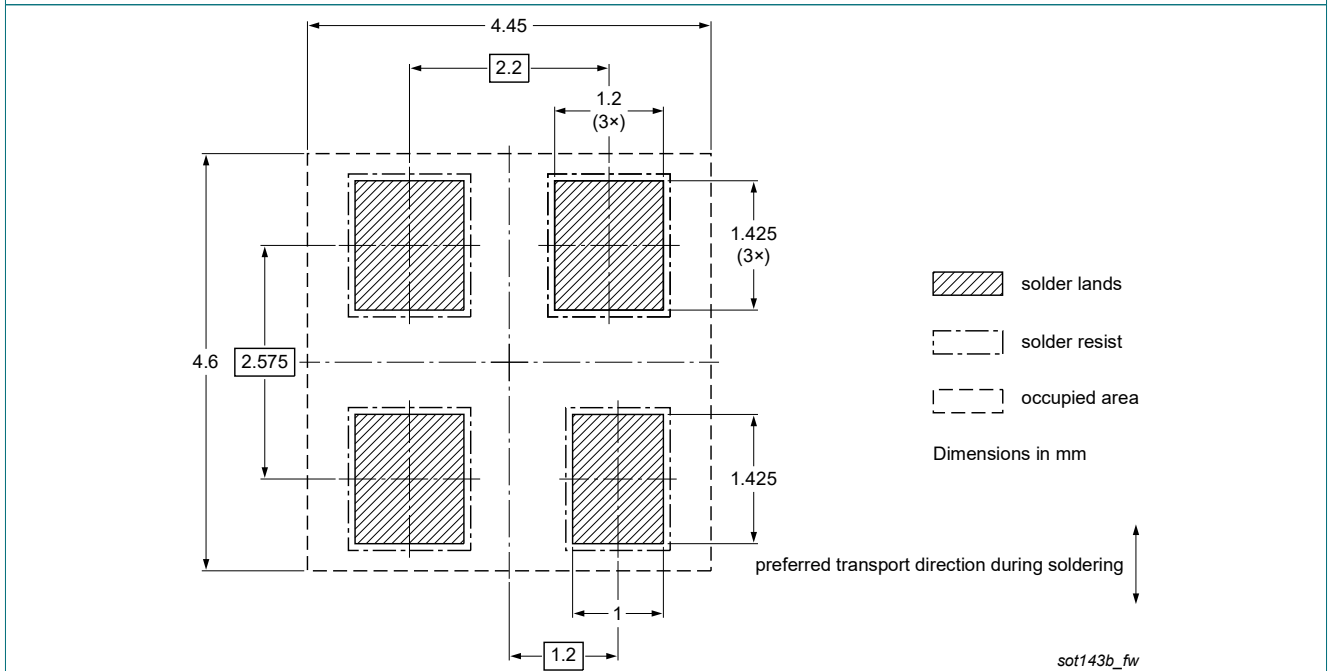
## 12. Package outline



### 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
BAV23-Q v.1	20220202	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.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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