BAV23

Dual high-voltage switching diodes

1 April 2023 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

3. Applications

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

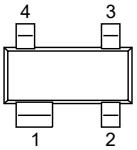
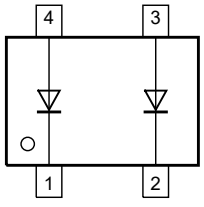
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
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 Ω; 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)	 SOT143B	 006aab100
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	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]
BAV23	%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
Per diode						
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 µs; square wave	[3]	-	9	A
		t_p = 100 µs; square wave	[3]	-	3	A
		t_p = 10 ms; square wave	[3]	-	1.7	A
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq$ 25 °C	[4]	-	250	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

[1] Single diode loaded.
[2] Double diode loaded.
[3] T_j = 25 °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
Per device							
$R_{th(j-a)}$	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

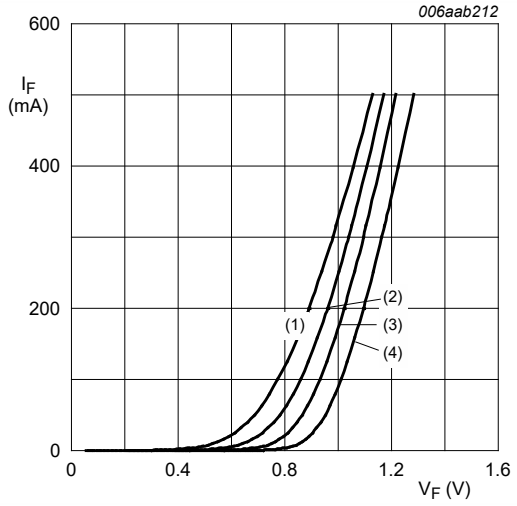
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

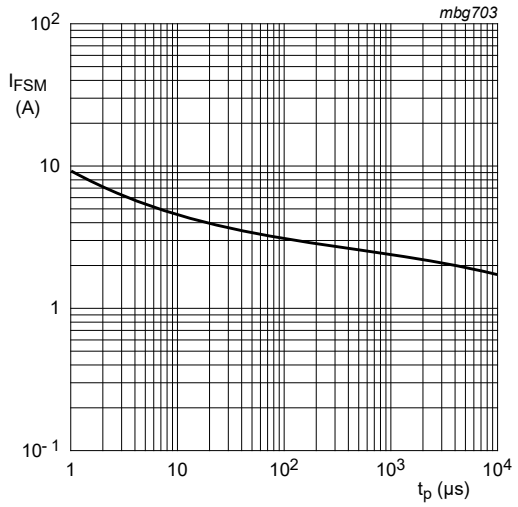
T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	I_F = 100 mA		-	-	1	V
		I_F = 200 mA		-	-	1.25	V
I_R	reverse current	V_R = 200 V		-	-	100	nA
		V_R = 200 V; T_j = 150 °C		-	-	100	µA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	-	2	pF
t_{rr}	reverse recovery time	I_F = 10 mA; I_R = 10 mA; $I_{R(meas)}$ = 1 mA; R_L = 100 Ω; T_{amb} = 25 °C		-	-	50	ns



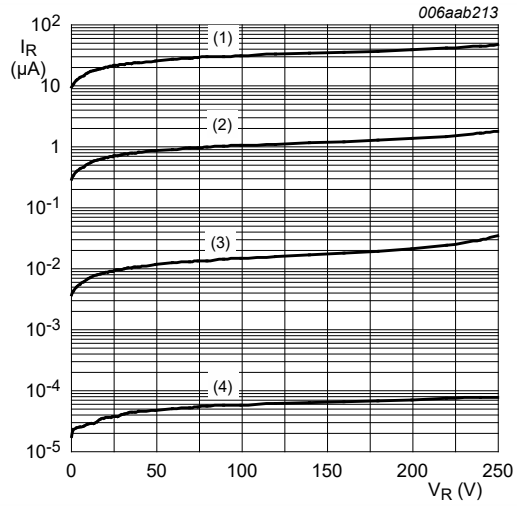
(1) T_{amb} = 150° C
(2) T_{amb} = 85° C
(3) T_{amb} = 25° C
(4) T_{amb} = -40° C

Fig. 1. Forward current as a function of forward voltage; typical values



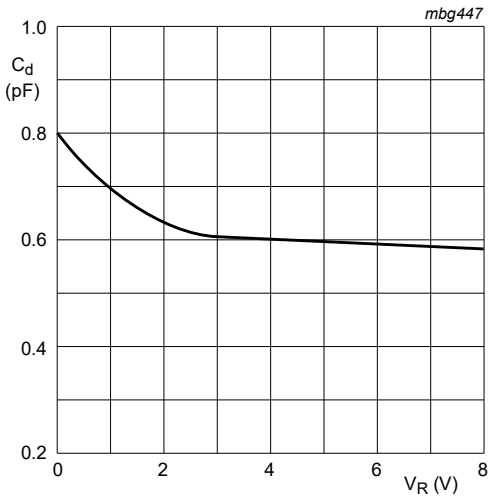
Based on square wave currents.
$T_{j(init)}$ = 25 °C

Fig. 2. Non-repetitive peak forward current as a function of pulse duration; maximum values



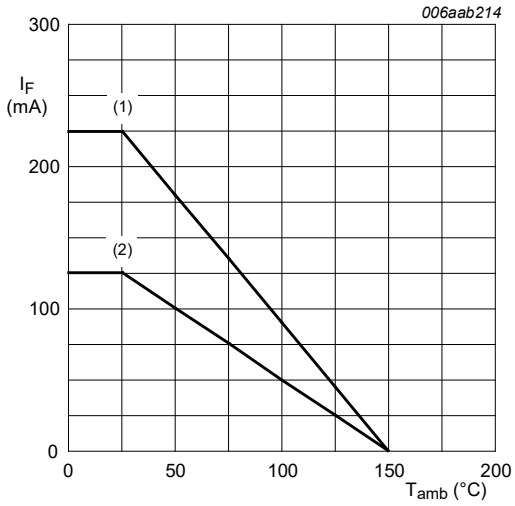
(1) T_{amb} = 150° C
(2) T_{amb} = 85° C
(3) T_{amb} = 25° C
(4) T_{amb} = -40° C

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



f = 1 MHz
T_j = 25 °C.

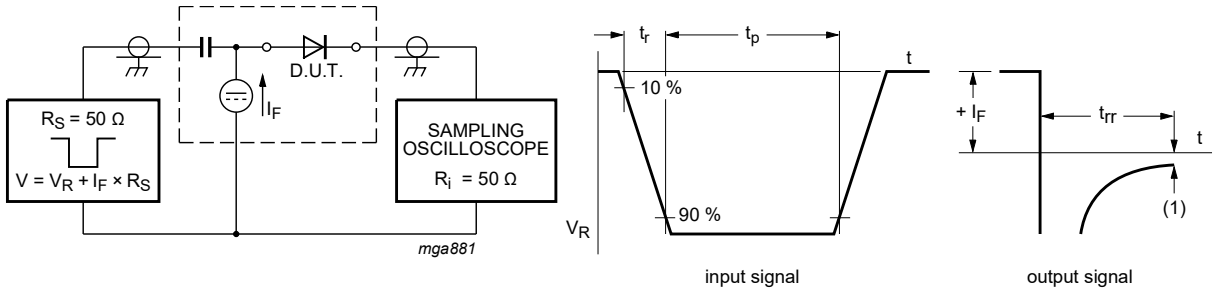
Fig. 4. Diode capacitance as a function of reverse voltage; typical values.



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



(1) I_R = 1 mA

Fig. 6. Reverse recovery time test circuit and waveforms

12. Package outline

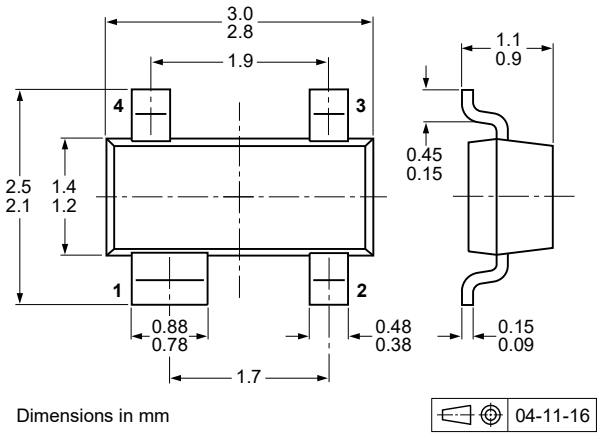


Fig. 7. Package outline SOT143B

13. Soldering

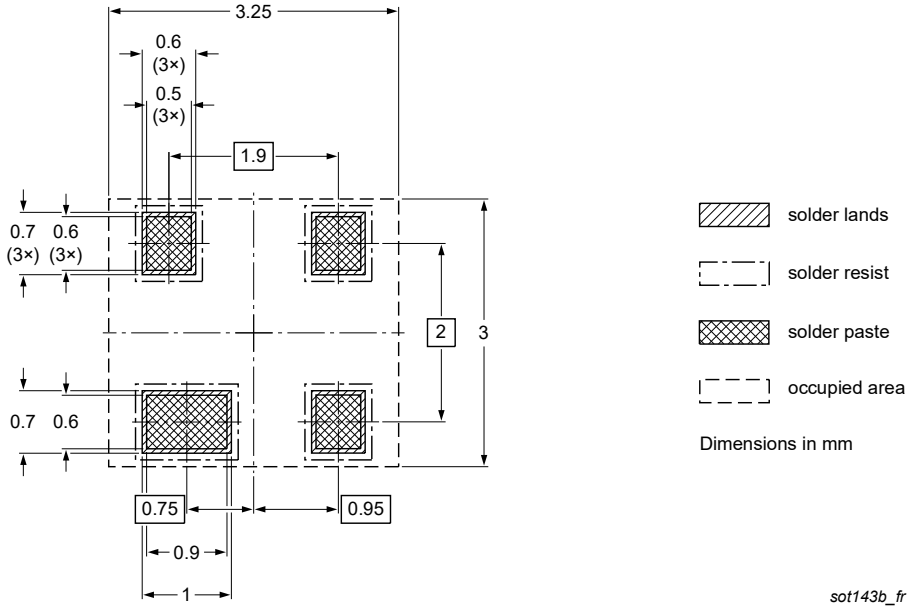


Fig. 8. Reflow soldering footprint for SOT143B

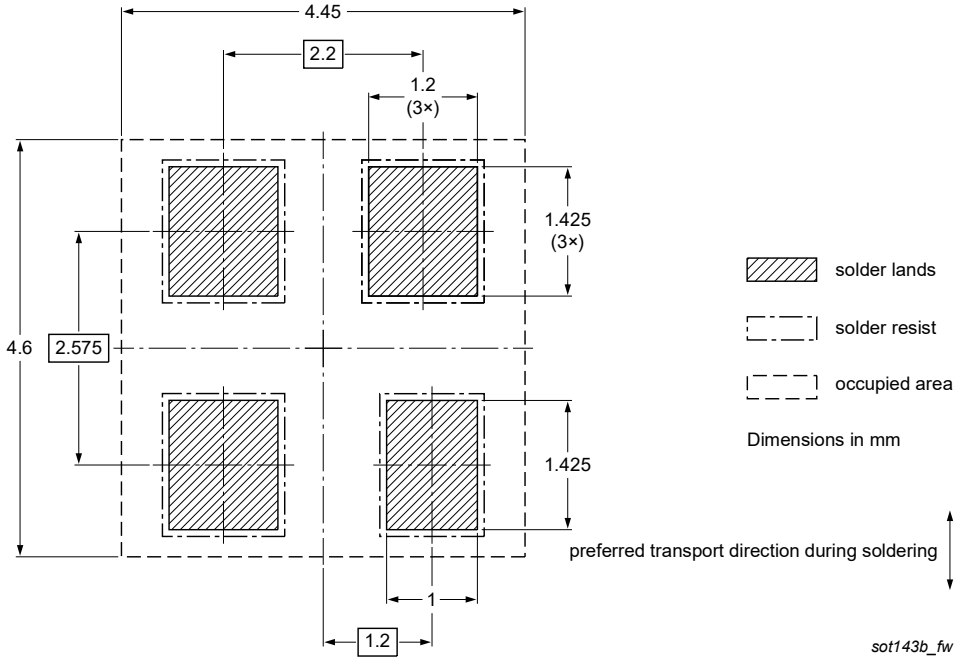


Fig. 9. Wave soldering footprint for SOT143B

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV23 v.8	20230401	Product data sheet	-	BAV23_SER_7
Modifications:	• Family data sheet reduced to single type data sheet. • 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 qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s). • Packing information removed.			
BAV23_SER_7	20100319	Product data sheet	-	BAV23_SER_6
BAV23_SER_6	20080303	Product data sheet	-	BAV23S_5 BAV23_2
BAV23S_5	20011012	Product specification	-	BAV23S_4
BAV23_2	19960917	Product specification	-	BAV23_1

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".
[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 April 2023

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