



BAV199

Low-leakage double diode

1 April 2023

Product data sheet

1. General description

Epitaxial, medium-speed switching, double diode in a small SOT23 Surface-Mounted Device (SMD) plastic package. The diodes are connected in series.

2. Features and benefits

- Plastic SMD package
- Low leakage current: typ. 3 pA
- Switching time: typ. 0.8 us
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

3. Applications

- Low-leakage current applications in surface mounted circuits.

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_R	reverse voltage		-	-	75	V
I_R	reverse current	$V_R = 75 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	3	80	nA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	<p>SOT23</p>	<p>006aaa763</p>
2	K2	cathode (diode 2)		
3	K1, A2	cathode (diode 1) and anode (diode 2)		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV199	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	SOT23

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAV199	JY%

[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			-	75	V
V_{RRM}	repetitive peak reverse voltage			-	85	V
I_F	forward current	single diode loaded		-	160	mA
		double diode loaded		-	140	mA
I_{FRM}	repetitive peak forward current			-	500	mA
I_{FSM}	non-repetitive peak forward current	$t_p = 1 \mu\text{s}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	4	A
		$t_p = 1 \text{ ms}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	1	A
		$t_p = 1 \text{ s}$; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	0.5	A
Per device; one diode loaded						
P_{tot}	total power dissipation	$T_{\text{amb}} \leq 25 \text{ }^\circ\text{C}$	[1]	-	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] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

9. Thermal characteristics

Table 6. Thermal characteristics

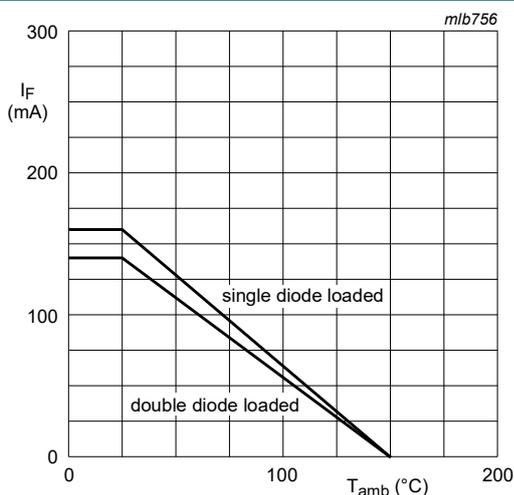
Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$R_{th(j-a)}$	thermal resistance from junction to ambient	single diode loaded; in free air	[1]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		-	-	360	K/W	

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

10. Characteristics

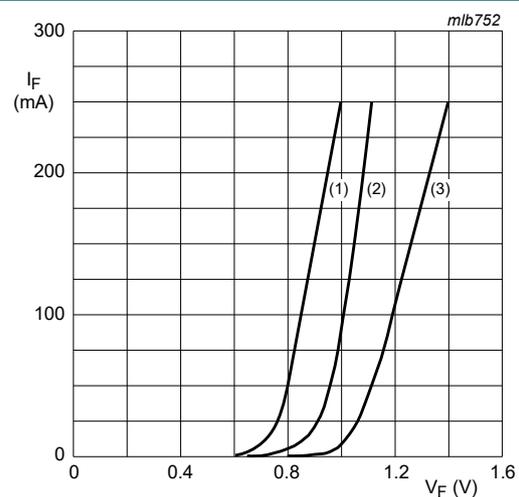
Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_F	forward voltage	$I_F = 1 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	900	mV
		$I_F = 10 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1	V
		$I_F = 50 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1.1	V
		$I_F = 150 \text{ mA}; T_j = 25 \text{ }^\circ\text{C}$	-	-	1.25	V
I_R	reverse current	$V_R = 75 \text{ V}; T_j = 25 \text{ }^\circ\text{C}$	-	0.003	5	nA
		$V_R = 75 \text{ V}; T_j = 150 \text{ }^\circ\text{C}$	-	3	80	nA
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	$I_F = 10 \text{ mA}; I_R = 10 \text{ mA}; I_{R(meas)} = 1 \text{ mA}; R_L = 100 \text{ }^\Omega; T_{amb} = 25 \text{ }^\circ\text{C}$	-	0.8	3	μs
V_{FRM}	peak forward recovery voltage	$I_F = 10 \text{ mA}; t_r = 20 \text{ ns}; T_{amb} = 25 \text{ }^\circ\text{C}$	-	-	1.75	V



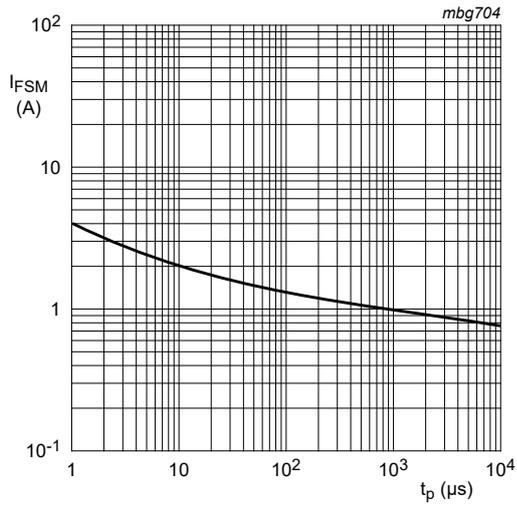
Device mounted on an FR4 printed-circuit board.

Fig. 1. Maximum permissible continuous forward current as a function of ambient temperature.



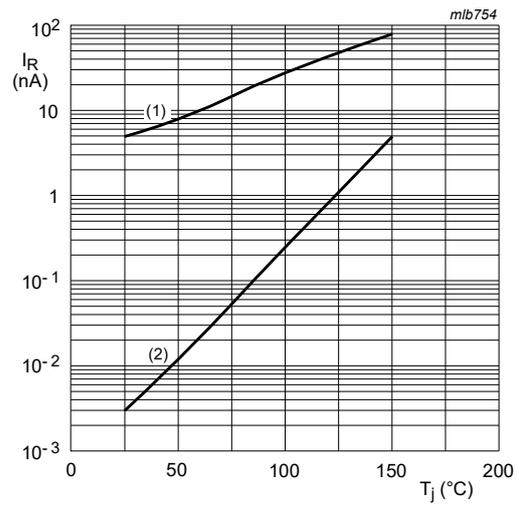
- (1) $T_{amb} = 150 \text{ }^\circ\text{C}$; typical values
- (2) $T_{amb} = 25 \text{ }^\circ\text{C}$; typical values
- (3) $T_{amb} = 25 \text{ }^\circ\text{C}$; maximum values

Fig. 2. Forward current as a function of forward voltage; per diode



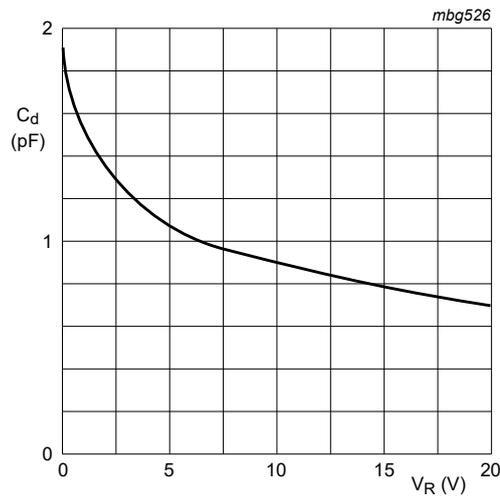
Based on square wave currents.
 $T_{j(\text{init})} = 25\text{ }^\circ\text{C}$

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



$V_R = 75\text{ V}$
 (1) Maximum values
 (2) Typical values

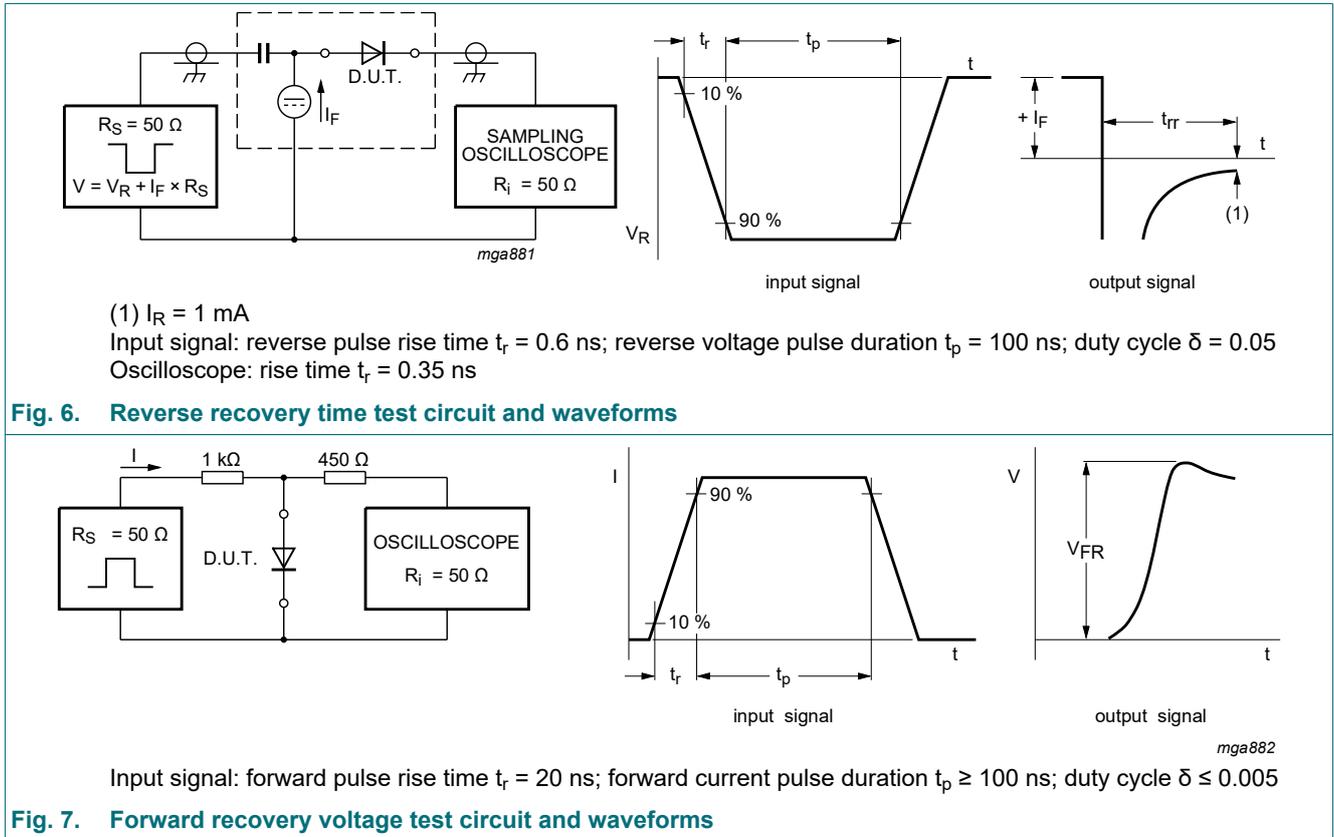
Fig. 4. Reverse current as a function of junction temperature



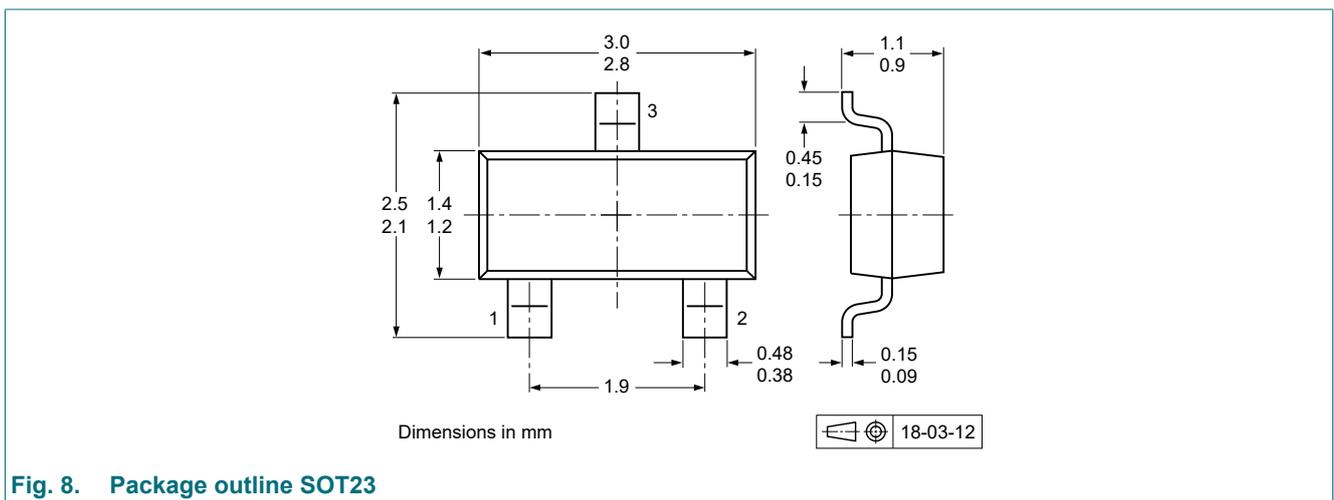
$f = 1\text{ MHz}; T_{\text{amb}} = 25\text{ }^\circ\text{C}$

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

11. Test information



12. Package outline



13. Soldering

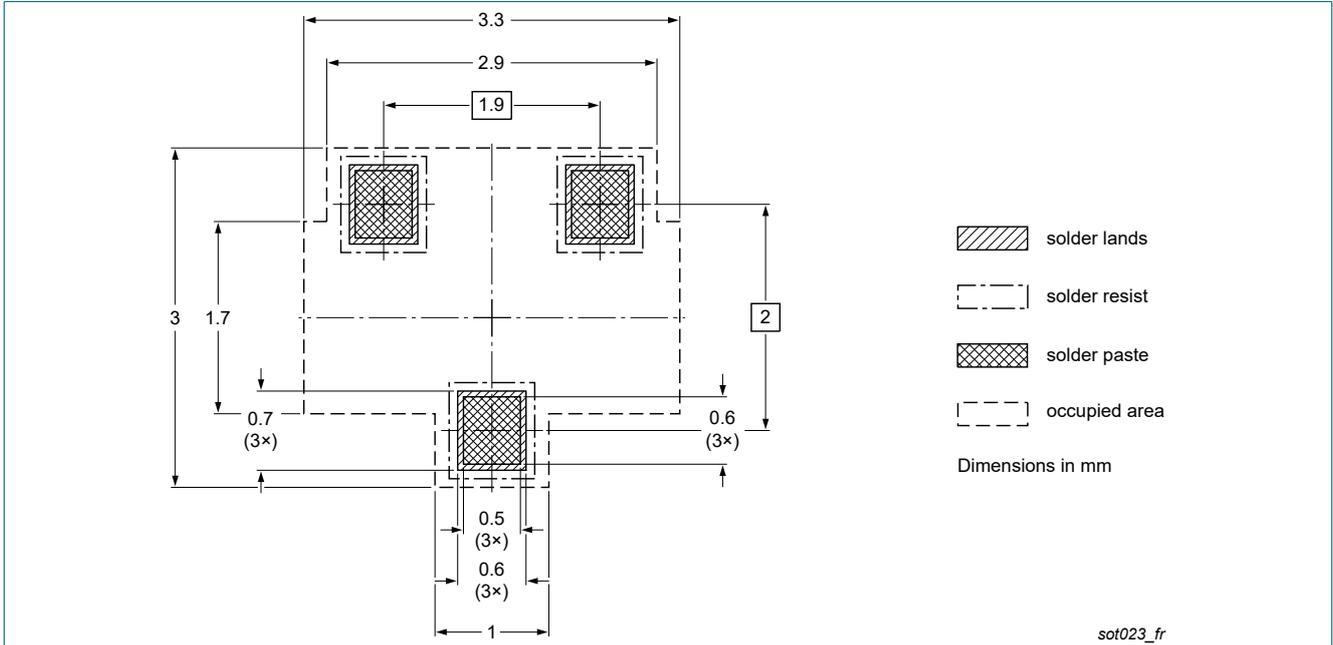


Fig. 9. Reflow soldering footprint for SOT23

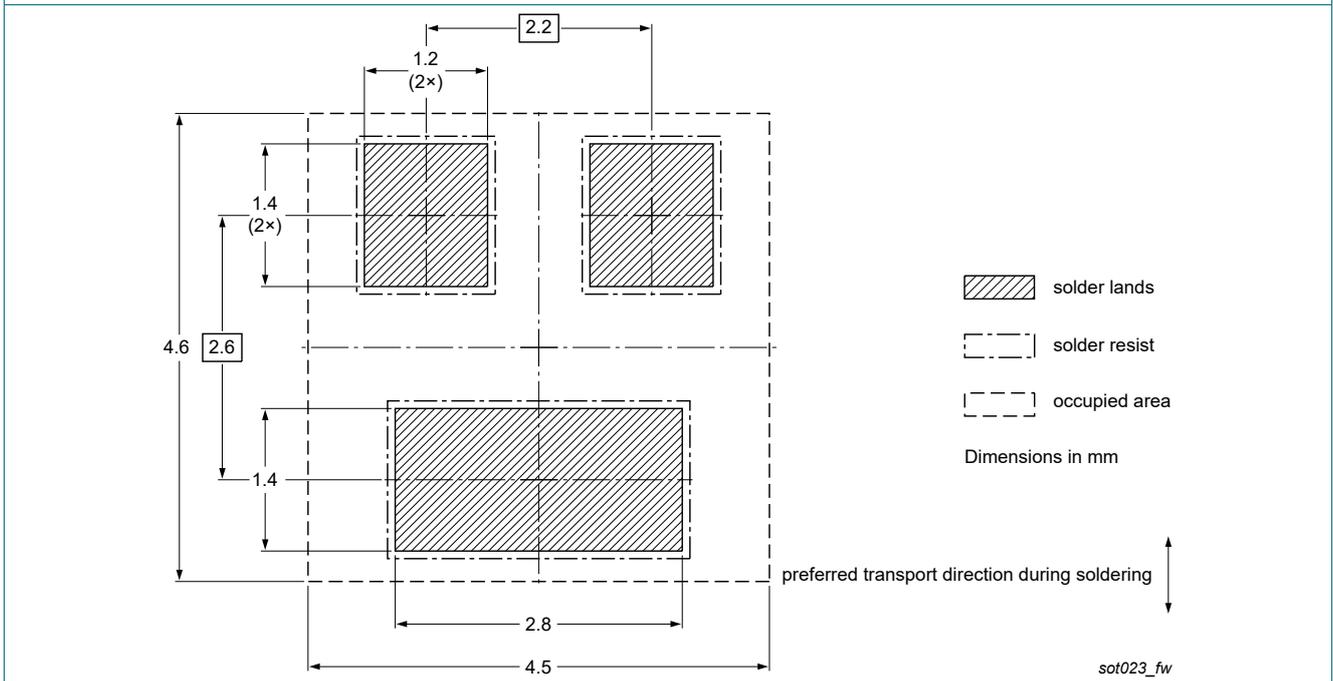


Fig. 10. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV199 v.4	20230401	Product data sheet	-	BAV199 v.3
Modifications:	• Product changed to non automotive. Please refer to the automotive product(s) with -Q.			
BAV199 v.3	20200901	Product data sheet	-	BAV199 v.2
BAV199 v.2	20011012	Product data sheet	-	BAV199 v.1
BAV199 v.1	19990511	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".
- [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
