



BAV74

High-speed double diode

23 January 2024

Product data sheet

1. General description

The BAV74 consists of two high-speed switching diodes with common cathodes, fabricated in planar technology, and encapsulated in a small SOT23 Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 60 V
- Repetitive peak forward current: max. 450 mA
- AEC-Q101 qualified

3. Applications

- High-speed switching in thick and thin-film circuits

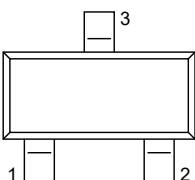
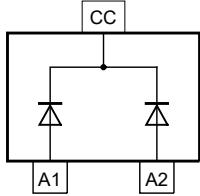
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
V_R	reverse voltage		-	-	50	V
I_R	reverse current	$V_R = 25\text{ V}; T_J = 25\text{ }^\circ\text{C}$	-	-	30	nA
		$V_R = 25\text{ V}; T_J = 150\text{ }^\circ\text{C}$	-	-	30	μA

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 SOT23	 aaa-032141
2	A2	anode (diode 2)		
3	CC	common cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV74	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]
BAV74	JA%

[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			-	50	V
V _{RRM}	repetitive peak reverse voltage			-	60	V
I _F	forward current	single diode loaded	[1]	-	215	mA
		double diode loaded	[1]	-	125	mA
I _{FRM}	repetitive peak forward current			-	450	mA
I _{FSM}	non-repetitive peak forward current	t _p = 1 μs; square wave; T _j = 25 °C prior to surge		-	4	A
		t _p = 1 ms; square wave; T _j = 25 °C prior to surge		-	1	A
		t _p = 1 s; square wave; T _j = 25 °C prior to surge		-	0.5	A
P _{tot}	total power dissipation	T _{amb} = 25 °C	[1]	-	250	mW
T _j	junction temperature			-	150	°C
T _{amb}	ambient temperature			-55	150	°C
T _{stg}	storage temperature			-65	150	°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

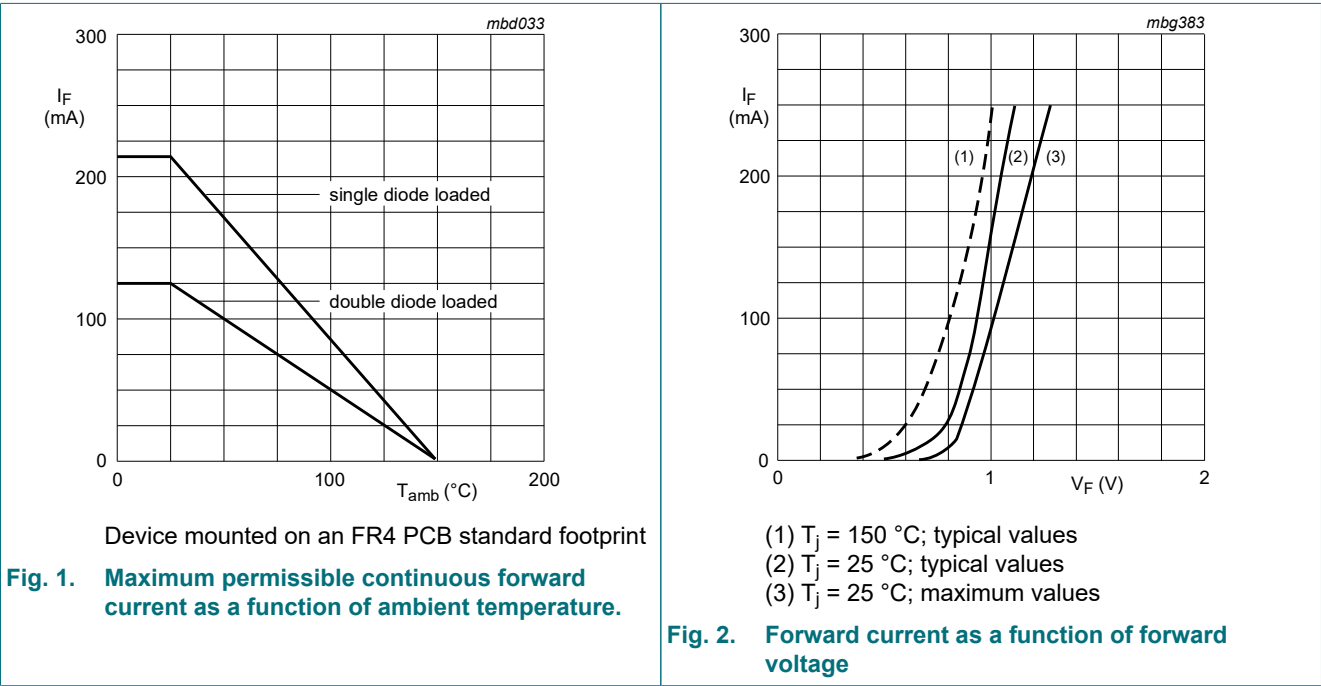
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	360	K/W

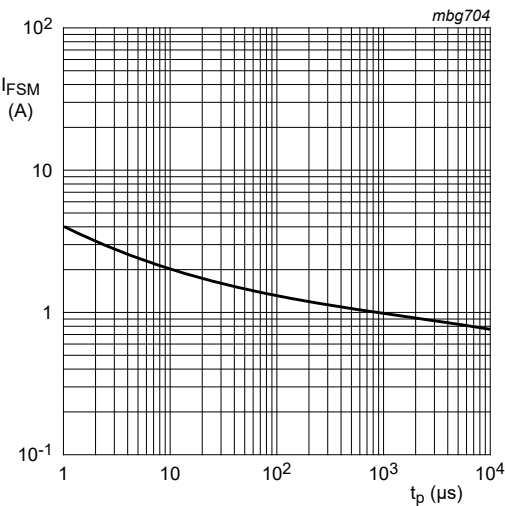
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

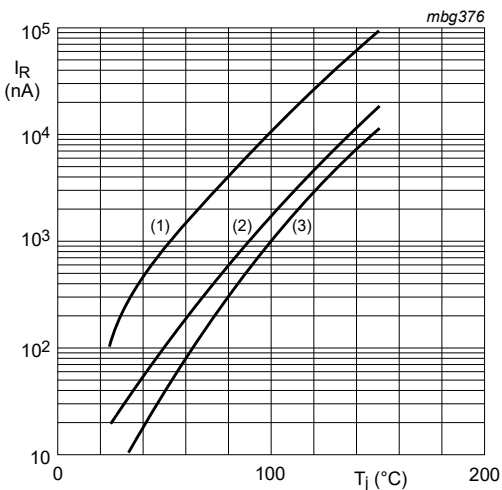
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	$I_F = 1\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$		-	-	715	mV
		$I_F = 10\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$		-	-	855	mV
		$I_F = 100\text{ mA}; T_j = 25\text{ }^{\circ}\text{C}$		-	-	1	V
I_R	reverse current	$V_R = 25\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$		-	-	30	nA
		$V_R = 50\text{ V}; T_j = 25\text{ }^{\circ}\text{C}$		-	-	0.1	μA
		$V_R = 25\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$		-	-	30	μA
		$V_R = 50\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$		-	-	100	μA
C_d	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}; T_j = 25\text{ }^{\circ}\text{C}$		-	-	1.5	pF
t_{rr}	reverse recovery time	$I_F = 10\text{ mA}; I_R = 10\text{ mA}; I_{R(meas)} = 1\text{ mA}; R_L = 100\text{ }\Omega; T_{amb} = 25\text{ }^{\circ}\text{C}$		-	-	4	ns
V_{FRM}	peak forward recovery voltage	$I_F = 10\text{ mA}; t_r = 20\text{ ns}; T_j = 25\text{ }^{\circ}\text{C}$		-	-	1.75	V





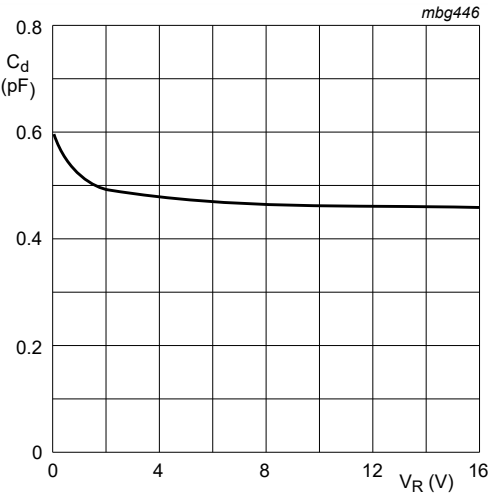
Based on square wave currents.
 $T_{j(init)} = 25\text{ }^{\circ}\text{C}$

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



(1) $V_R = 50\text{ V}$; maximum values
(2) $V_R = 50\text{ V}$; typical values
(3) $V_R = 25\text{ V}$; typical values

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



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

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

11. Test information

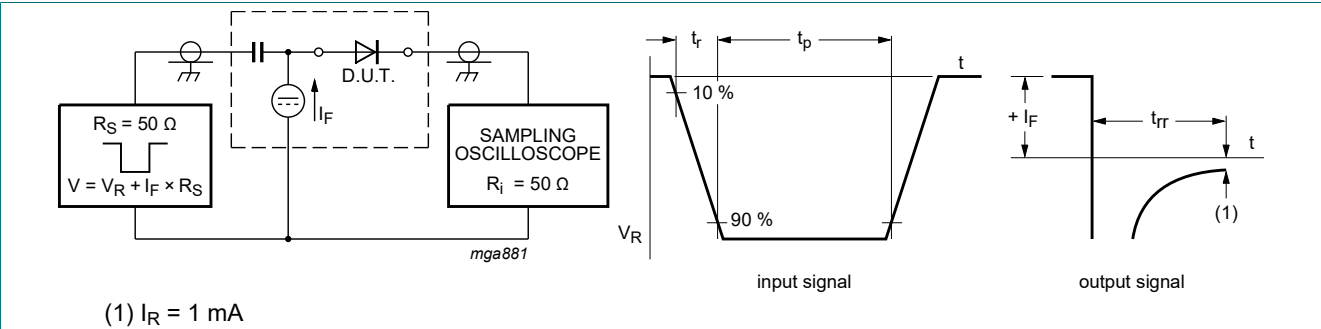


Fig. 6. Reverse recovery time test circuit and waveforms

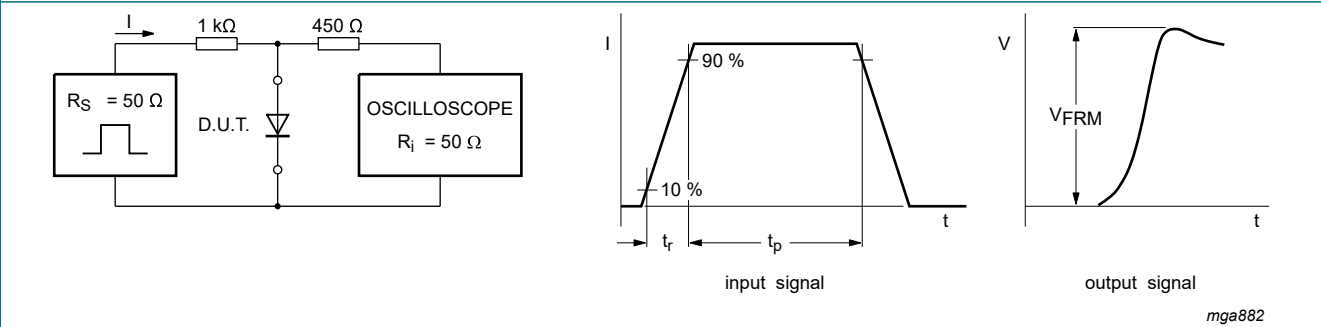


Fig. 7. Forward recovery voltage test circuit and waveforms

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

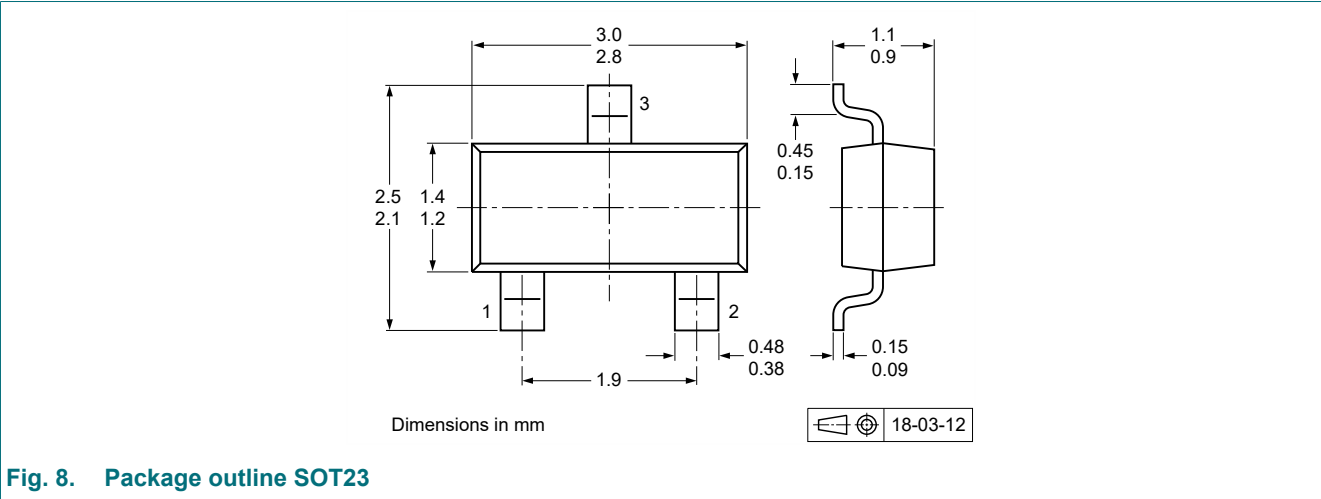


Fig. 8. Package outline SOT23

13. Soldering

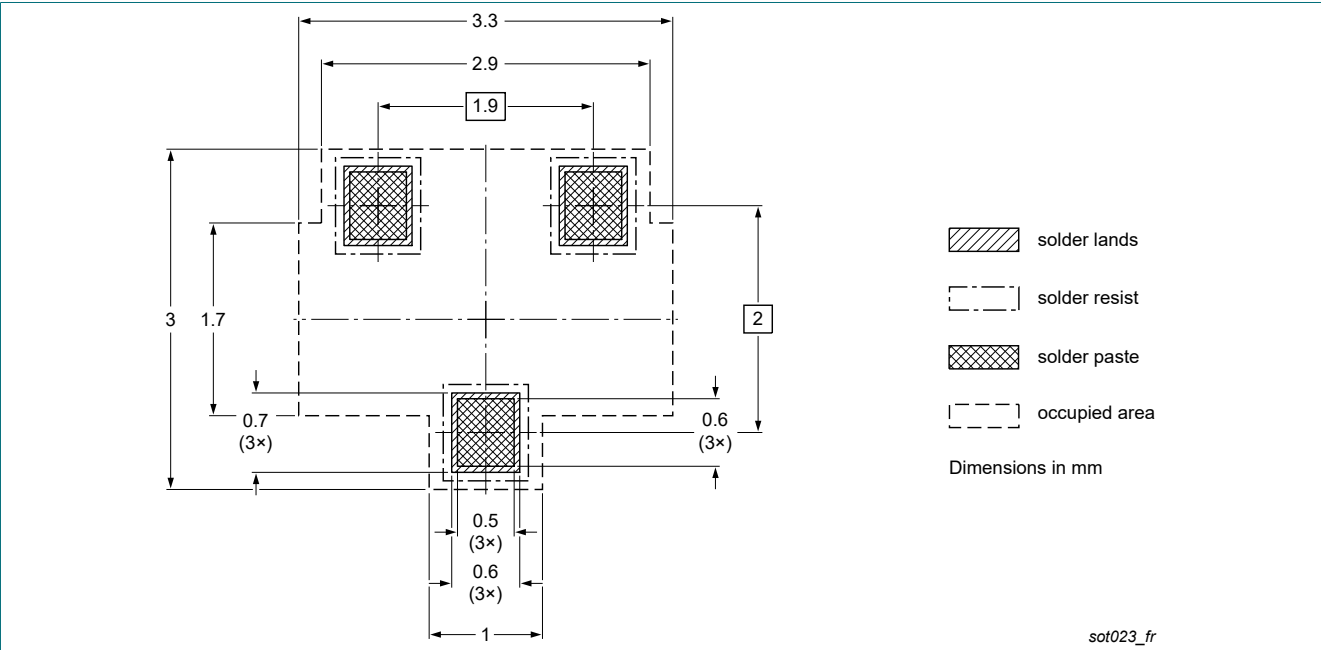


Fig. 9. Reflow soldering footprint for SOT23

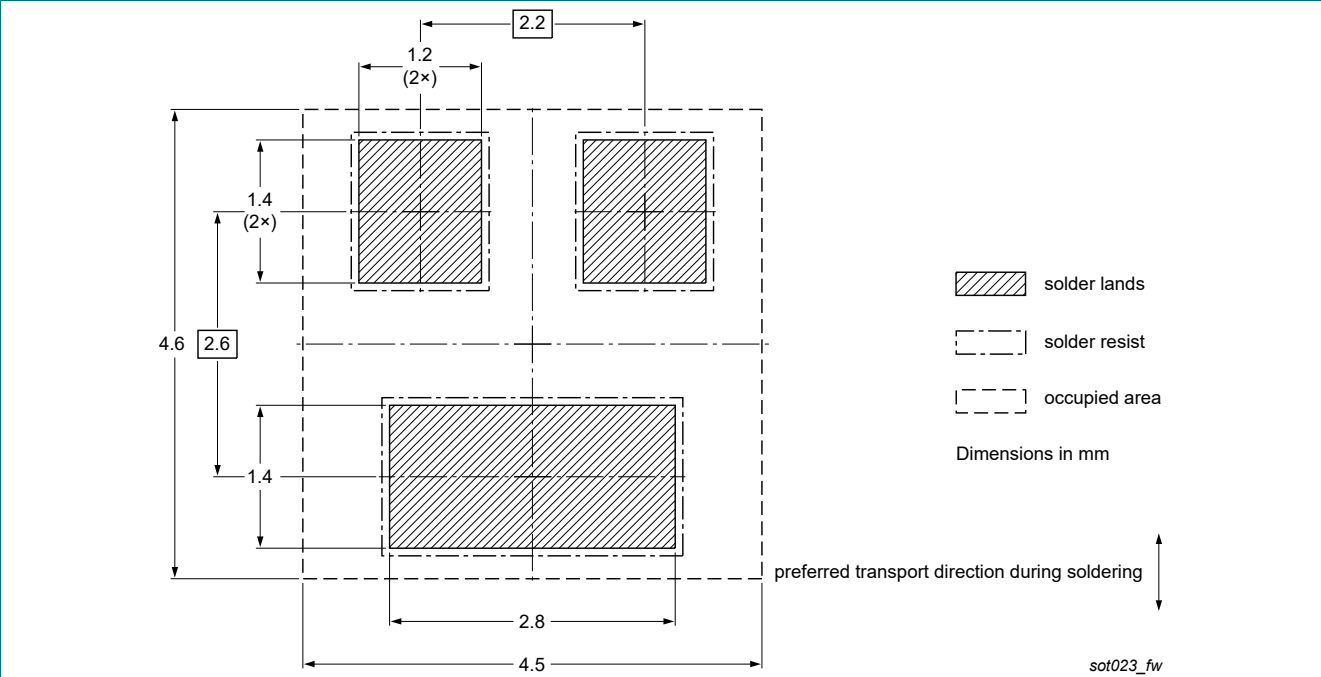


Fig. 10. Wave soldering footprint for SOT23

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV74 v.3	20240123	Product data sheet	-	BAV74 v.2
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.			
BAV74 v.2	20040114	Product data sheet	-	BAV74 v.1
BAV74 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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