



# BAV70

## High-speed switching double diode

1 July 2022

Product data sheet

### 1. General description

High-speed switching double diode, encapsulated in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

### 2. Features and benefits

- High switching speed:  $t_{rr} \leq 4$  ns
- Low capacitance:  $C_d \leq 1.5$  pF
- Low leakage current
- Reverse voltage:  $V_R \leq 100$  V
- Small SMD plastic package

### 3. Applications

- High-speed switching
- General-purpose switching

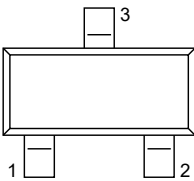
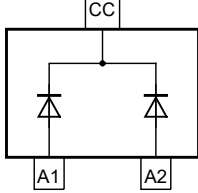
### 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
$I_R$	reverse current	$V_R = 80$ V; $T_{amb} = 25$ °C	-	-	0.5	$\mu$ A
$V_R$	reverse voltage		-	-	100	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	-	-	4	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 SOT23	 aaa-033587
2	A2	anode (diode 2)		
3	CC	common cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAV70	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]
BAV70	A4%

[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			-	100	V
$V_{RRM}$	repetitive peak reverse voltage			-	100	V
$I_F$	forward current	$T_{amb} \leq 25\text{ °C}$		-	215	mA
$I_{FRM}$	repetitive peak forward current			-	450	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1\text{ }\mu\text{s}$ ; square wave	[1]	-	4	A
		$t_p = 1\text{ ms}$ ; square wave	[1]	-	1	A
		$t_p = 1\text{ s}$ ; square wave	[1]	-	0.5	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[2]	-	250	mW
<b>Per device</b>						
$I_F$	forward current	$T_{amb} \leq 25\text{ °C}$		-	125	mA
$T_j$	junction temperature			-	150	°C
$T_{amb}$	ambient temperature			-65	150	°C
$T_{stg}$	storage temperature			-65	150	°C

[1]  $t_j = 25\text{ °C}$  prior to surge

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

## 9. Thermal characteristics

**Table 6. Thermal characteristics**

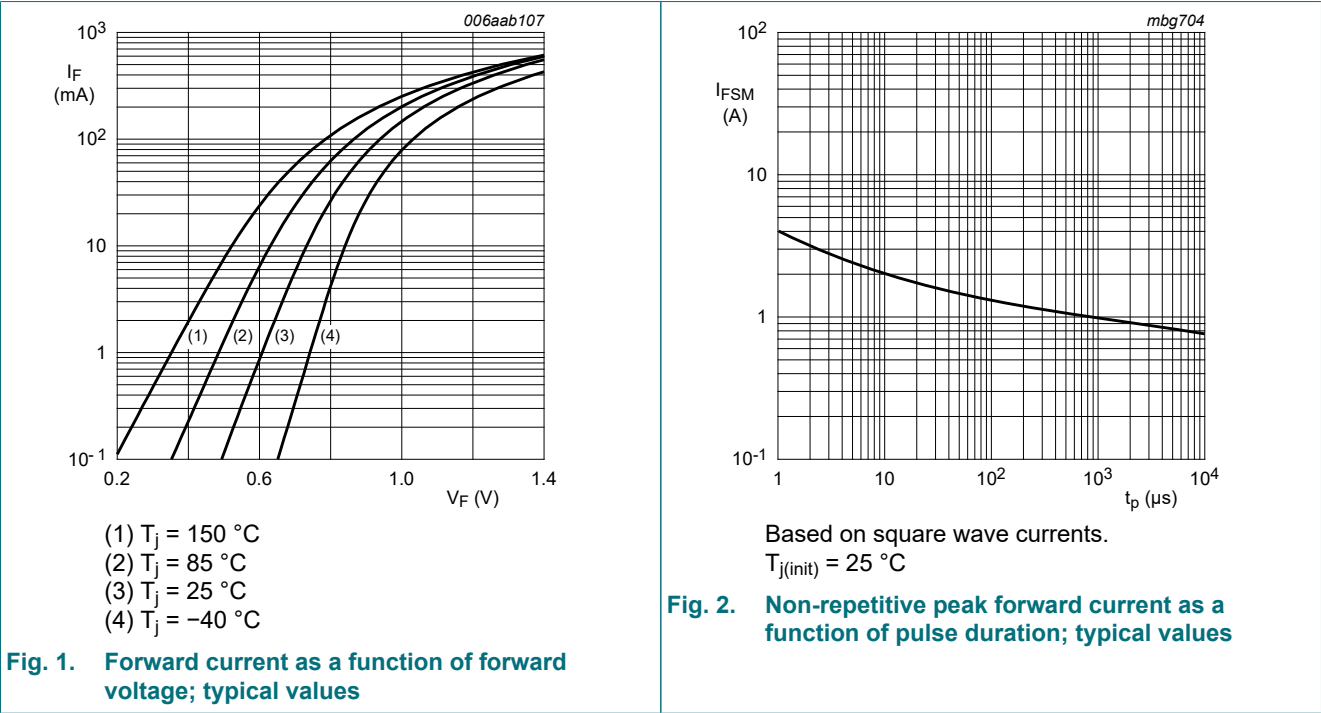
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W

[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
<b>Per diode</b>						
$V_F$	forward voltage	$I_F = 1 \text{ mA}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	715	mV
		$I_F = 10 \text{ mA}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	855	mV
		$I_F = 50 \text{ mA}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1	V
		$I_F = 150 \text{ mA}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1.25	V
$I_R$	reverse current	$V_R = 25 \text{ V}$ ; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	30	nA
		$V_R = 80 \text{ V}$ ; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	0.5	$\mu\text{A}$
		$V_R = 25 \text{ V}$ ; $T_J = 150 \text{ } ^\circ\text{C}$	-	-	30	$\mu\text{A}$
		$V_R = 80 \text{ V}$ ; $T_J = 150 \text{ } ^\circ\text{C}$	-	-	100	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 0 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1.5	pF
$t_{rr}$	reverse recovery time	$I_F = 10 \text{ mA}$ ; $I_R = 10 \text{ mA}$ ; $I_{R(\text{meas})} = 1 \text{ mA}$ ; $R_L = 100 \text{ } \Omega$ ; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	4	ns
$V_{FRM}$	peak forward recovery voltage	$I_F = 10 \text{ mA}$ ; $t_r = 20 \text{ ns}$ ; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1.75	V



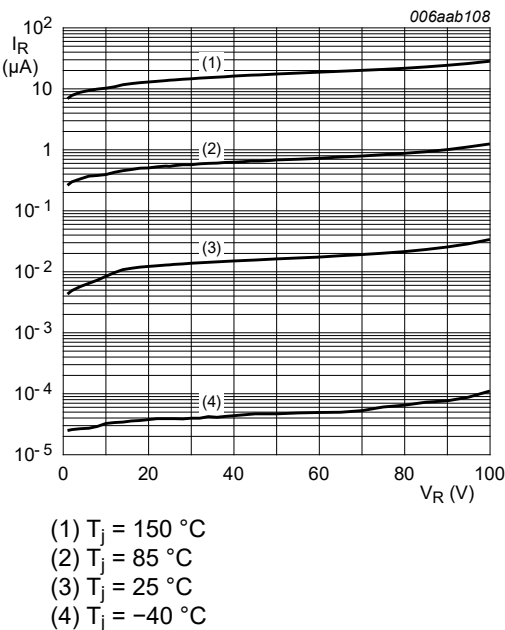


Fig. 3. Reverse current as a function of reverse voltage; typical values

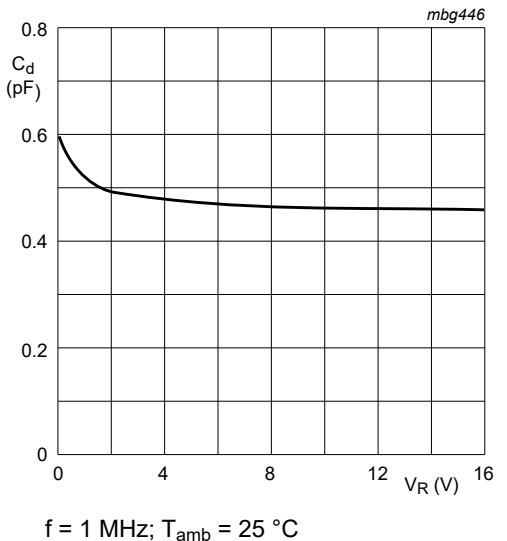


Fig. 4. Diode capacitance as a function of reverse voltage; typical values

## 11. Test information

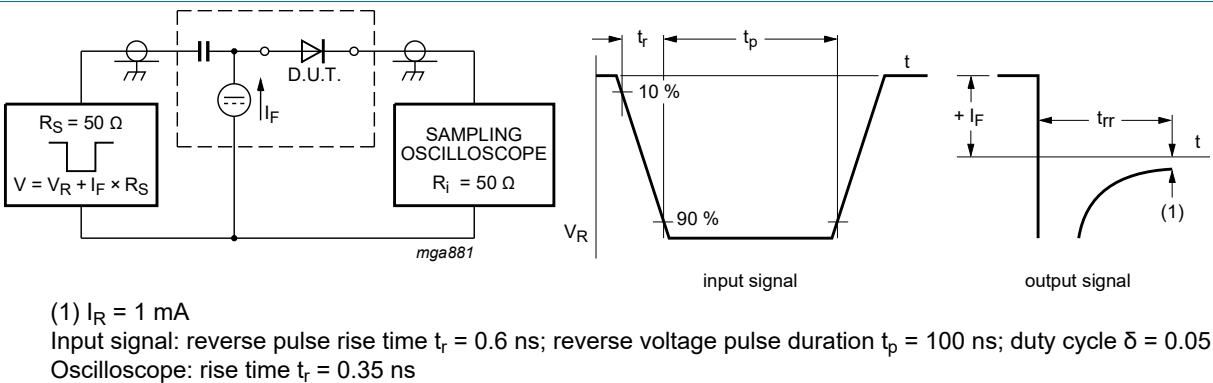


Fig. 5. Reverse recovery time test circuit and waveforms

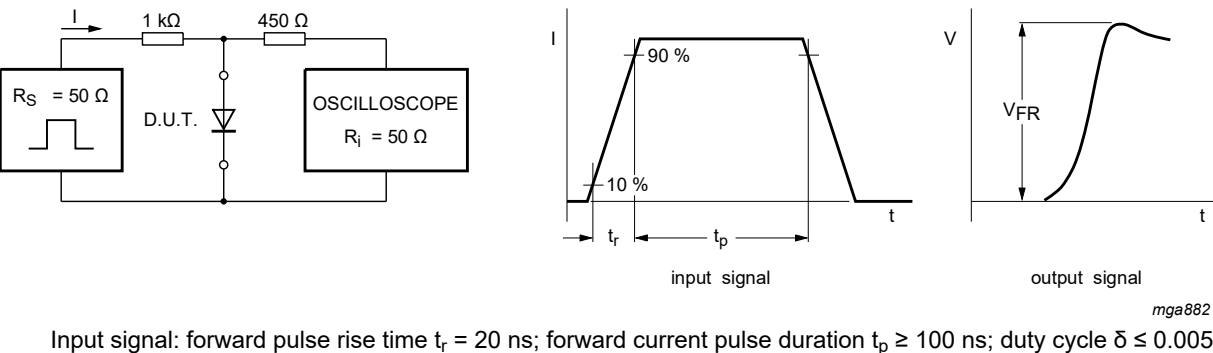


Fig. 6. Forward recovery voltage test circuit and waveforms

12. Package outline

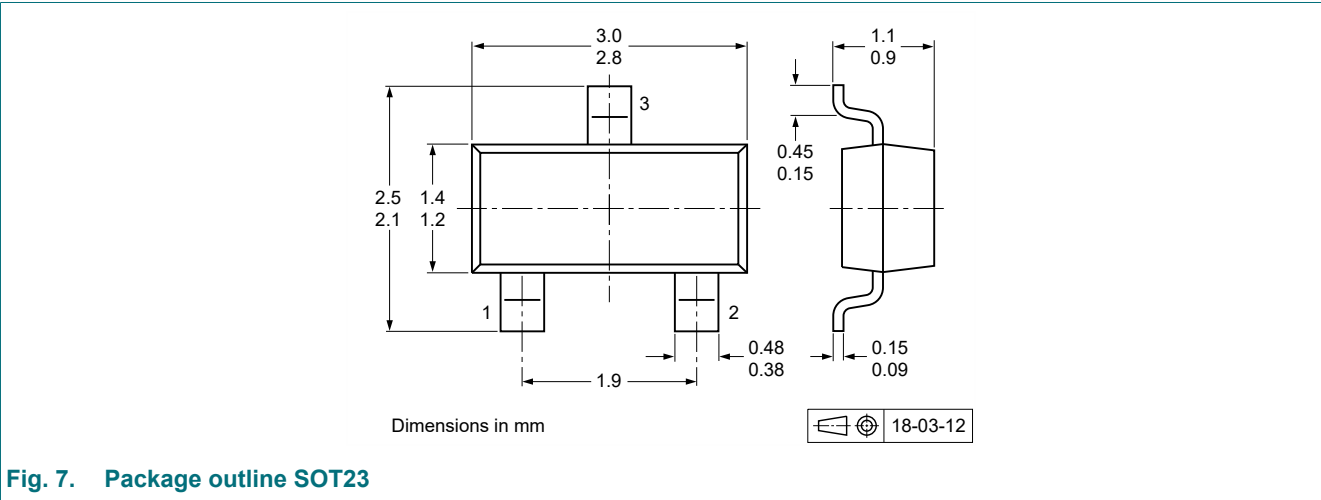


Fig. 7. Package outline SOT23

13. Soldering



Fig. 8. Reflow soldering footprint for SOT23

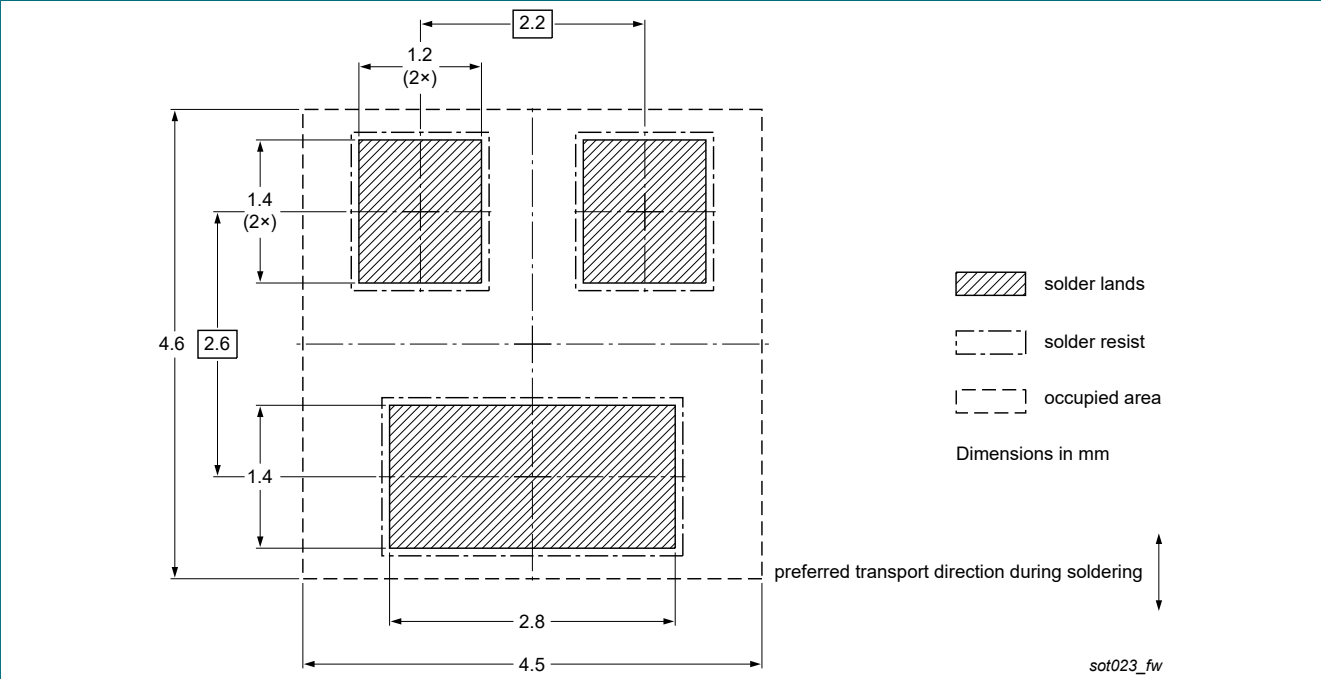


Fig. 9. Wave soldering footprint for SOT23

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAV70 v.9	20220701	Product data sheet	-	BAV70_SER v.8
Modification:	<ul style="list-style-type: none"> <li>Family data sheet reduced to single type data sheet.</li> <li>Product changed to non-automotive qualification. Please refer to <a href="https://www.nexperia.com">nexperia.com</a> for automotive (-Q) product alternative(s).</li> <li>Packing information removed.</li> </ul>			
BAV70_SER v.8	20150318	Product data sheet	-	BAV70_SER_7
BAV70_SER_7	20071127	Product data sheet	-	BAV70_6 BAV70S_2 BAV70T_3 BAV70W_6
BAV70_6	20020403	Product specification	-	BAV70_5
BAV70S_2	19971021	Product specification	-	BAV70S_1
BAV70T_3	20040204	Product specification	-	BAV70T_2
BAV70W_6	20020405	Product specification	-	BAV70W_5



## 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".
- [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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