



# BAS101

## High-voltage switching diode

5 April 2024

Product data sheet

## 1. General description

High-voltage switching dual diode, encapsulated in a SOT23 small 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:  $V_{RRM} \leq 300$
- Low capacitance:  $C_d \leq 2$  pF
- Reverse voltage:  $V_R \leq 300$  V
- Small SMD plastic package
- AEC-Q101 qualified

## 3. Applications

- High-speed switching
- High-voltage switching
- Voltage clamping
- Reverse polarity protection

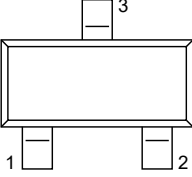
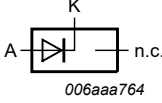
## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$I_F$	forward current		-	-	200	mA
$I_R$	reverse current	$V_R = 250$ V; $T_{amb} = 25$ °C	-	-	150	nA
$V_R$	reverse voltage		-	-	300	V
$t_{rr}$	reverse recovery time	When switched from $I_F = 30$ mA to $I_R = 30$ mA; $R_L = 100$ Ω; measured at $I_R = 3$ mA; $T_{amb} = 25$ °C	-	-	50	ns

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A1	anode (diode 1)	 <p style="text-align: center;"><b>SOT23</b></p>	 <p style="text-align: center;">006aaa764</p>
2	n.c.	not connected		
3	K	cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
<a href="#">BAS101</a>	SOT23	plastic, surface-mounted package; 3 terminals; 1.9 mm pitch; 2.9 mm x 1.3 mm x 1 mm body	<a href="#">SOT23</a>

## 7. Marking

Table 4. Marking codes

Type number	Marking code <sup>[1]</sup>
BAS101	%HQ

[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>						
$V_{RRM}$	repetitive peak reverse voltage			-	300	V
$V_R$	reverse voltage			-	300	V
$I_F$	forward current			-	200	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p \leq 1 \mu\text{s}$ ; square wave; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	9	A
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1 \text{ ms}$ ; $\delta \leq 0.25$		-	1	A
<b>Per device</b>						
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} \leq 25 \text{ }^\circ\text{C}$	[1]	-	250	mW
$T_j$	junction temperature			-	150	$^\circ\text{C}$
$T_{\text{amb}}$	ambient temperature			-65	150	$^\circ\text{C}$
$T_{\text{stg}}$	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**

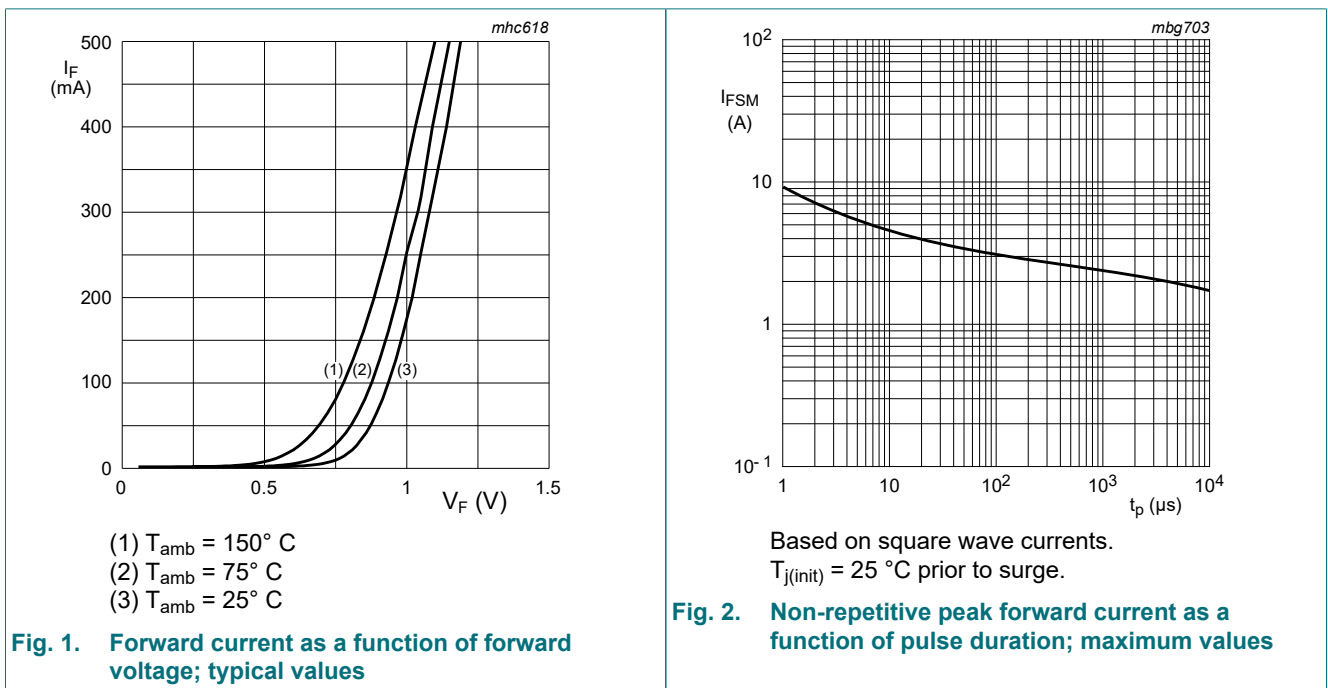
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
<b>Per device</b>							
$R_{\text{th}(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	500	K/W

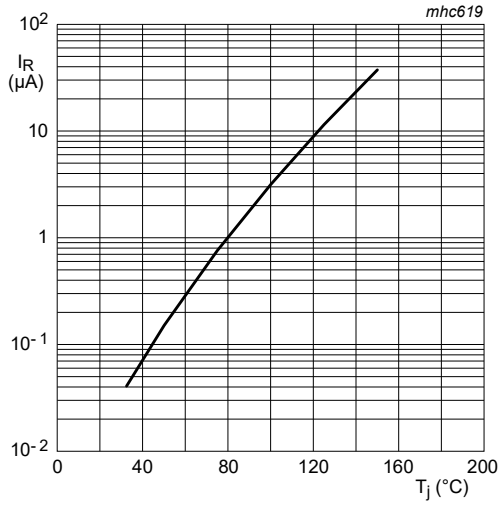
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

## 10. Characteristics

Table 7. Characteristics

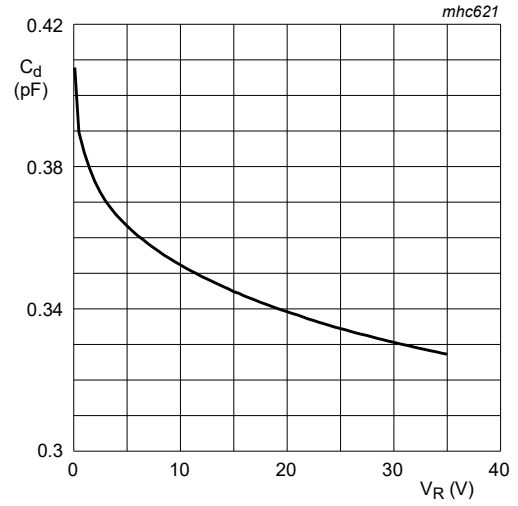
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	forward voltage	$I_F = 100 \text{ mA}$ ; $t_p \leq 300 \text{ } \mu\text{s}$ ; $\delta \leq 0.02$ ; pulsed; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	1.1	V
$I_R$	reverse current	$V_R = 250 \text{ V}$ ; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	150	nA
		$V_R = 250 \text{ V}$ ; $T_j = 150 \text{ } ^\circ\text{C}$	-	-	100	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 0 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	2	pF
$t_{rr}$	reverse recovery time	When switched from $I_F = 30 \text{ mA}$ to $I_R = 30 \text{ mA}$ ; $R_L = 100 \text{ } \Omega$ ; measured at $I_R = 3 \text{ mA}$ ; $T_{\text{amb}} = 25 \text{ } ^\circ\text{C}$	-	-	50	ns





$V_R = 300 \text{ V}$

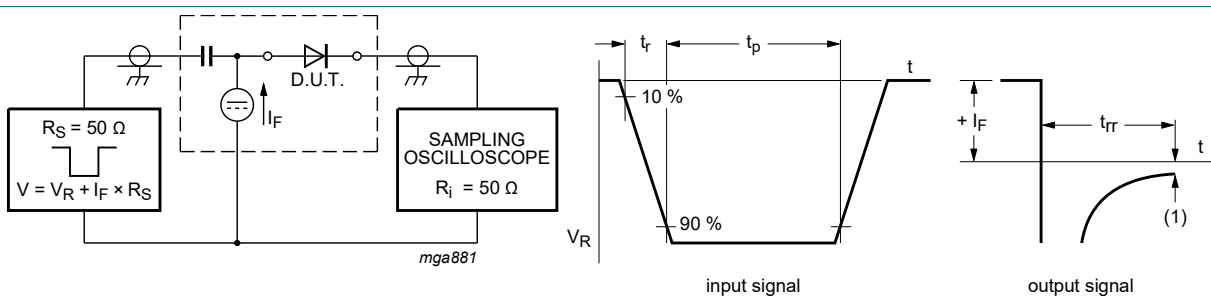
**Fig. 3. Reverse current as a function of junction temperature; typical values**



$f = 1 \text{ MHz}$   
 $T_{\text{amb}} = 25 \text{ °C}$

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

## 11. Test information



(1)  $I_R = 3 \text{ mA}$

**Fig. 5. Reverse recovery time 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

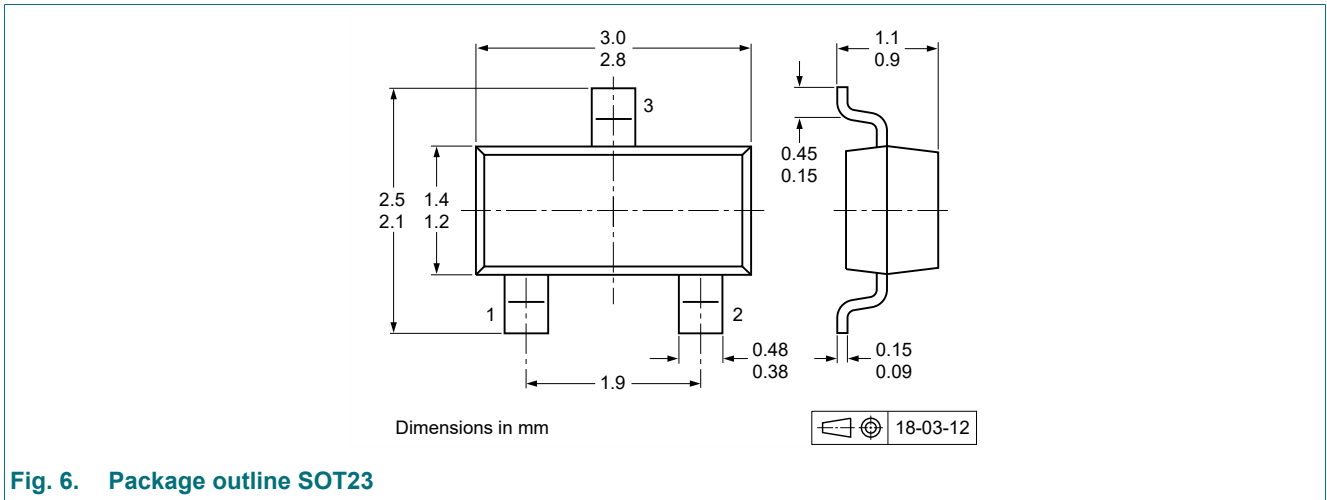


Fig. 6. Package outline SOT23

## 13. Soldering

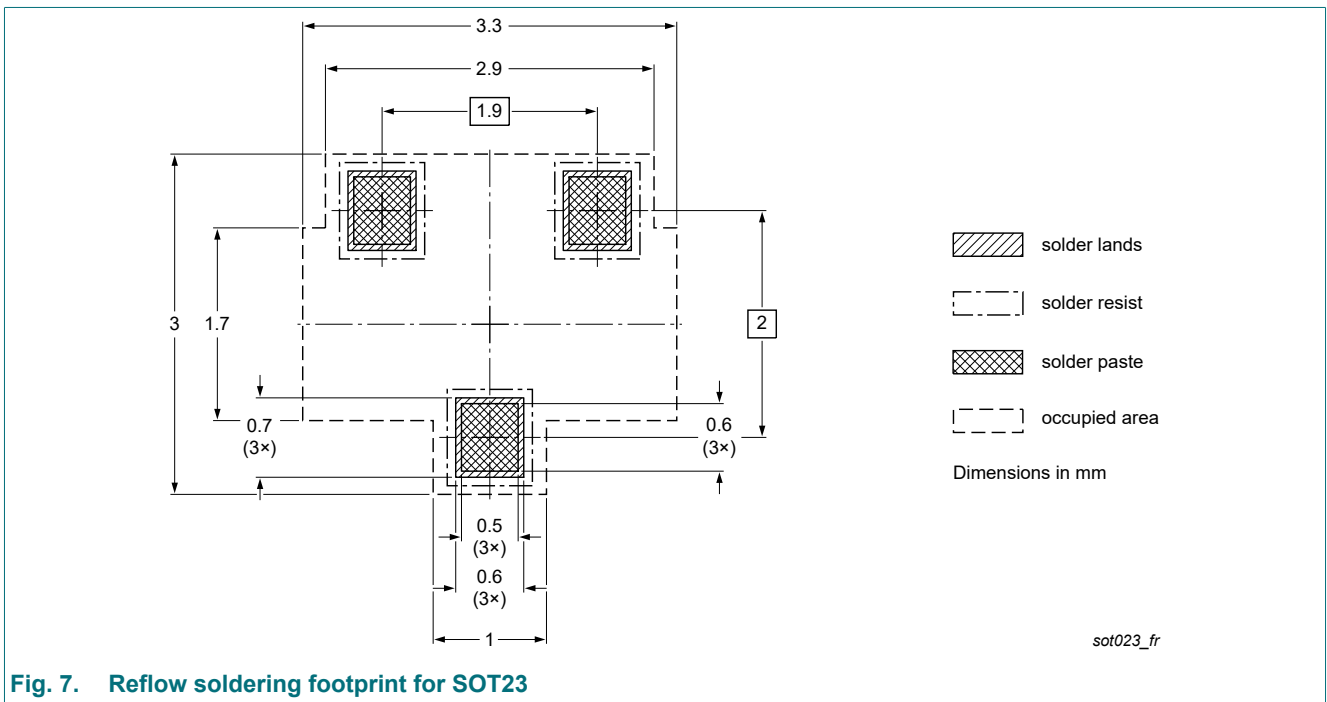


Fig. 7. Reflow soldering footprint for SOT23

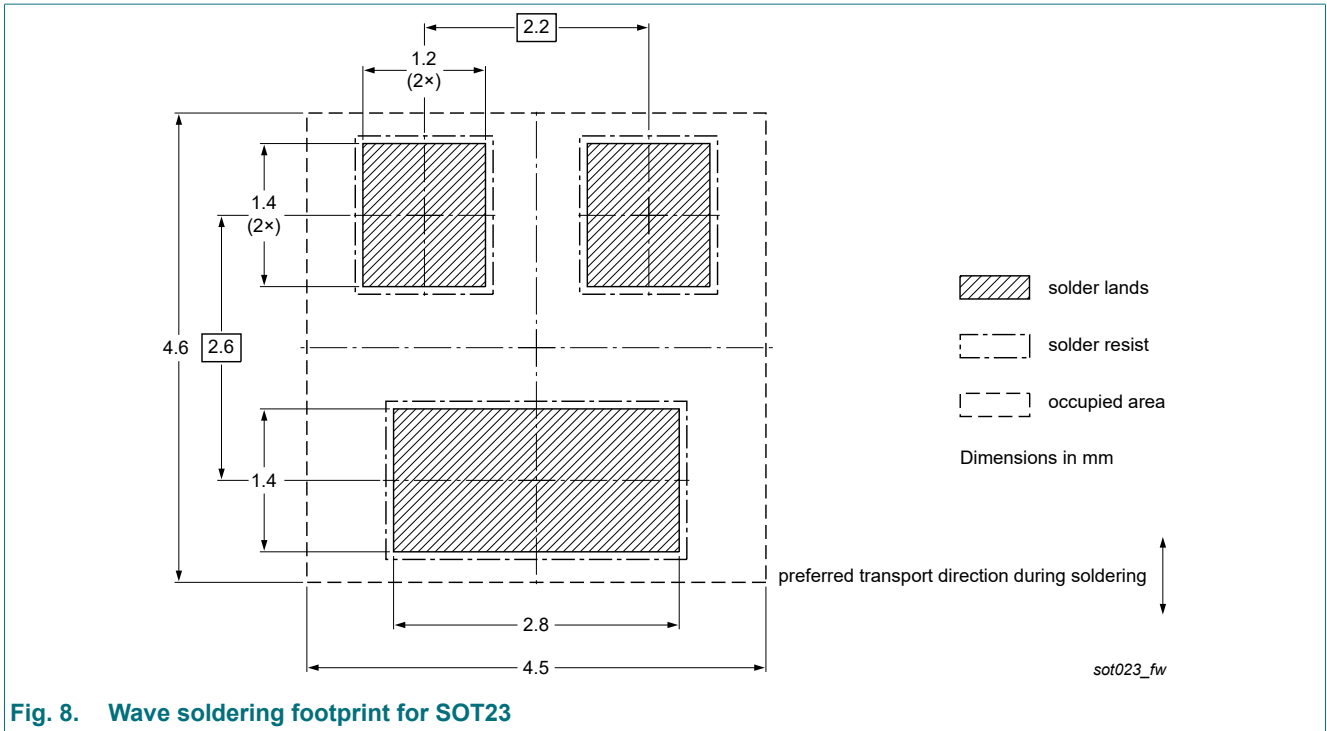


Fig. 8. Wave soldering footprint for SOT23

## 14. Mounting

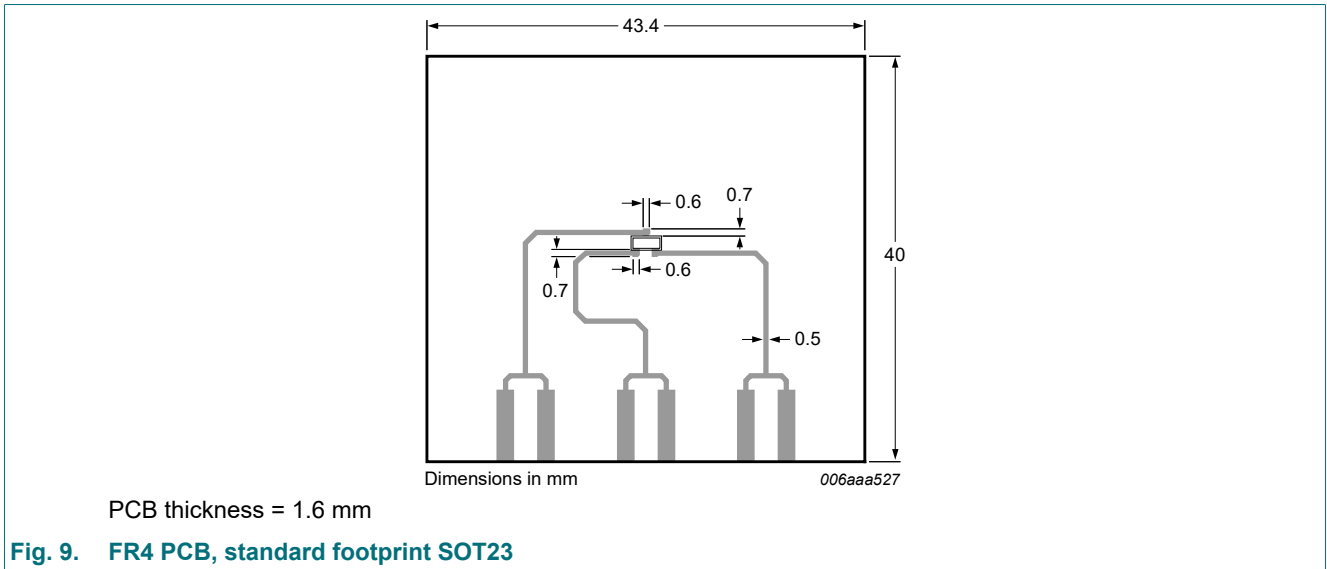


Fig. 9. FR4 PCB, standard footprint SOT23

## 15. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAS101 v.3	20240405	Product data sheet	-	BAS101_BAS101S_2
Modifications:	<ul style="list-style-type: none"><li>• Family data sheet splitted to single type data sheets.</li><li>• Characteristics: Notes of Fig. 2 and 3 changed</li><li>• Section "Packing information" removed.</li></ul>			
BAS101_BAS101S_2	20091214	Product data sheet	-	BAS101_BAS101S_1
BAS101_BAS101S_1	20060908	Product data sheet	-	-



## 16. 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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