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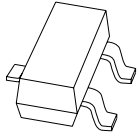
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Kind regards,

Team Nexperia



# BAS101; BAS101S

## High-voltage switching diodes

Rev. 02 — 14 December 2009

Product data sheet

## 1. Product profile

### 1.1 General description

High-voltage switching diodes, encapsulated in a SOT23 small Surface-Mounted Device (SMD) plastic package.

Table 1. Product overview

Type number	Package		Configuration
	NXP	JEITA	
BAS101	SOT23	-	single
BAS101S	SOT23	-	dual series

### 1.2 Features

- High switching speed:  $t_{rr} \leq 50$  ns
- Low leakage current
- Repetitive peak reverse voltage:  $V_{RRM} \leq 300$  V
- Low capacitance:  $C_d \leq 2$  pF
- Reverse voltage:  $V_R \leq 300$  V
- Small SMD plastic package

### 1.3 Applications

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

### 1.4 Quick reference data

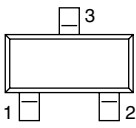
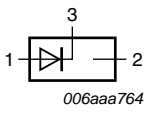
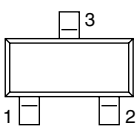
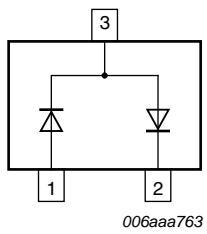
Table 2. Quick reference data

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	-	-	150	nA
$V_R$	reverse voltage		-	-	300	V
$t_{rr}$	reverse recovery time		[1]	-	50	ns

[1] When switched from  $I_F = 30$  mA to  $I_R = 30$  mA;  $R_L = 100$   $\Omega$ ; measured at  $I_R = 3$  mA.

## 2. Pinning information

**Table 3. Pinning**

Pin	Description	Simplified outline	Symbol
<b>BAS101</b>			
1	anode		
2	not connected		
3	cathode		
<b>BAS101S</b>			
1	anode (diode 1)		
2	cathode (diode 2)		
3	cathode (diode 1), anode (diode 2)		

## 3. Ordering information

**Table 4. Ordering information**

Type number	Package		Version
	Name	Description	
BAS101	-	plastic surface-mounted package; 3 leads	SOT23
BAS101S			

## 4. Marking

**Table 5. Marking codes**

Type number	Marking code <sup>[1]</sup>
BAS101	*HQ
BAS101S	*HR

[1] \* = -: made in Hong Kong  
 \* = p: made in Hong Kong  
 \* = t: made in Malaysia  
 \* = W: made in China

## 5. Limiting values

**Table 6. 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
		series connection	-	600	V
$V_R$	reverse voltage		-	300	V
		series connection	-	600	V
$I_F$	forward current		-	200	mA
		series connection	-	100	mA
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1$ ms; $\delta \leq 0.25$	-	1	A
$I_{FSM}$	non-repetitive peak forward current	square wave; $t_p \leq 1$ $\mu$ s	[1] -	9	A
<b>Per device</b>					
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	[2] -	250	mW
$T_j$	junction temperature		-	150	°C
$T_{amb}$	ambient temperature		-65	+150	°C
$T_{stg}$	storage temperature		-65	+150	°C

[1]  $T_j = 25$  °C prior to surge

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

## 6. Thermal characteristics

**Table 7. Thermal characteristics**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per device</b>						
$R_{th(j-a)}$	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.

## 7. Characteristics

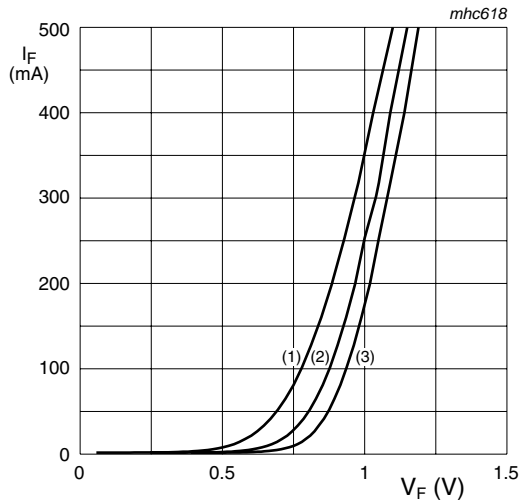
**Table 8. Characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
$V_F$	forward voltage	$I_F = 100\text{ mA}$	[1]	-	1.1	V
$I_R$	reverse current	$V_R = 250\text{ V}$	-	-	150	nA
		$V_R = 250\text{ V}; T_j = 150\text{ °C}$	-	-	100	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}$	-	-	2	pF
$t_{rr}$	reverse recovery time		[2]	-	50	ns

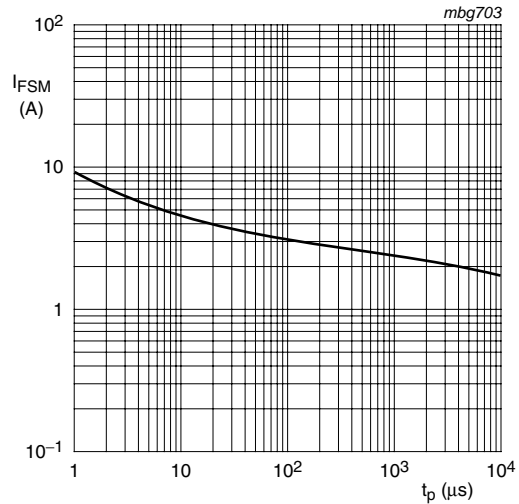
[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

[2] When switched from  $I_F = 30\text{ mA}$  to  $I_R = 30\text{ mA}$ ;  $R_L = 100\text{ }\Omega$ ; measured at  $I_R = 3\text{ mA}$ .



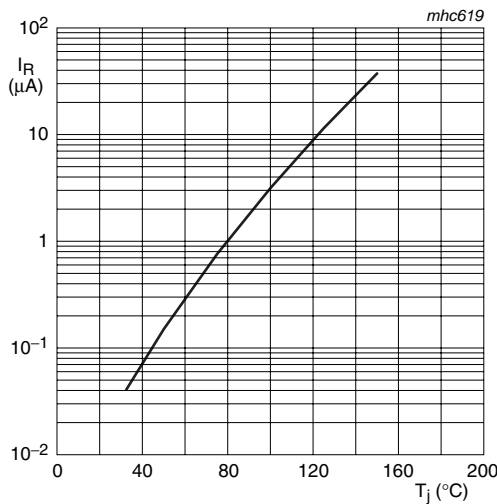
- (1)  $T_{amb} = 150\text{ }^\circ\text{C}$
- (2)  $T_{amb} = 75\text{ }^\circ\text{C}$
- (3)  $T_{amb} = 25\text{ }^\circ\text{C}$

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



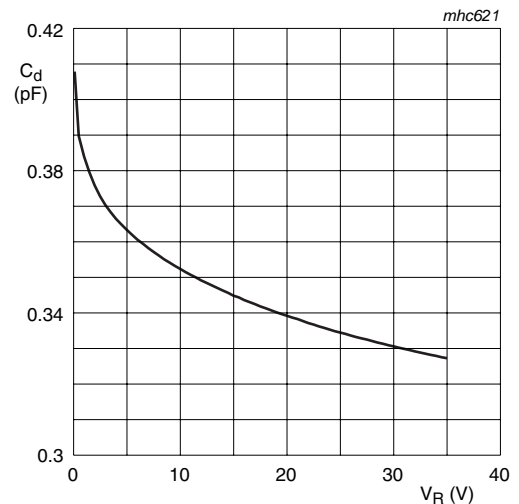
Based on square wave currents  
 $T_j = 25\text{ }^\circ\text{C}$ ; prior to surge

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



$V_R = 300\text{ V}$

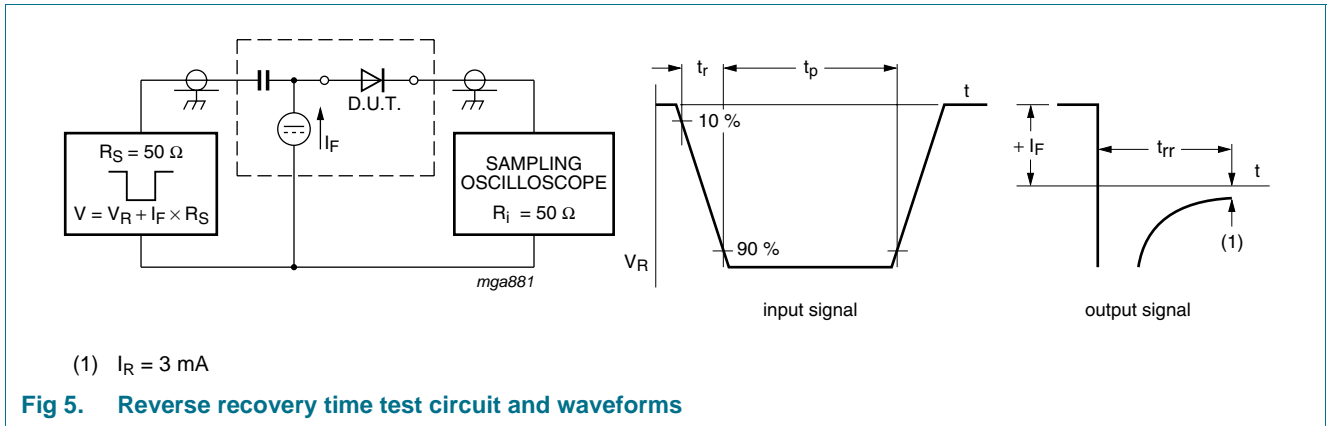
**Fig 3. Reverse current as a function of junction temperature; typical values**



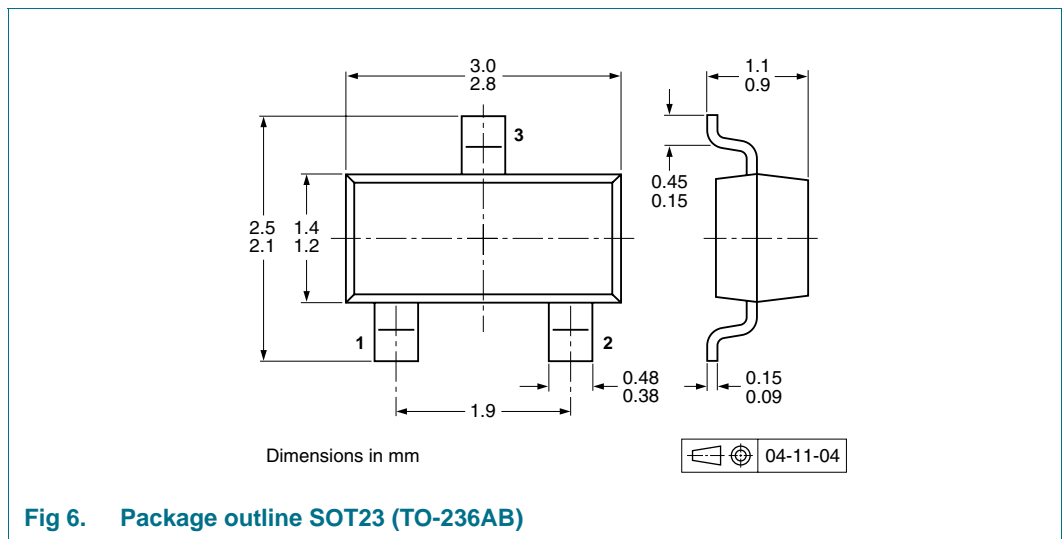
$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ }^\circ\text{C}$

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

**8. Test information**



**9. Package outline**



**10. Packing information**

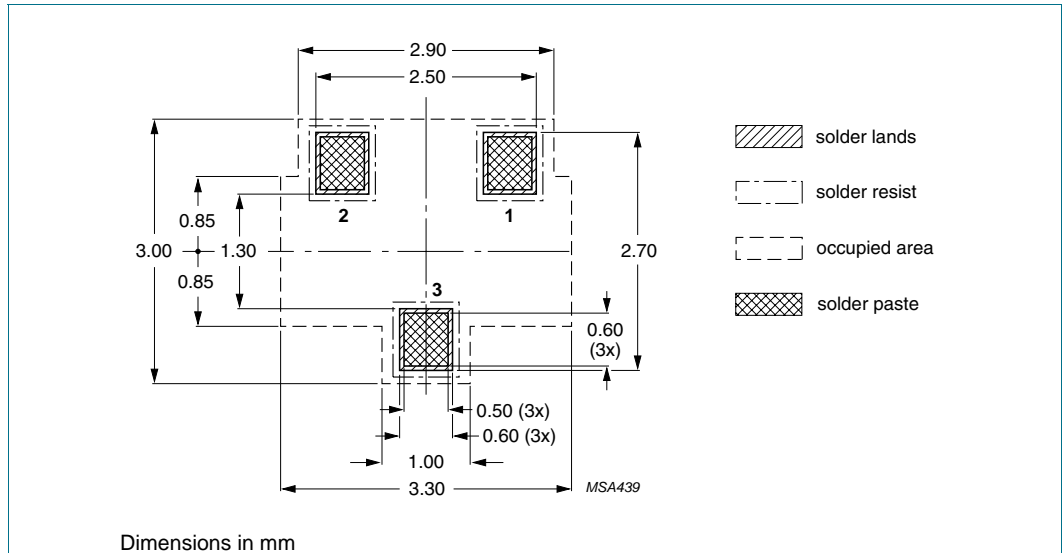
**Table 9. Packing methods**

The indicated -xxx are the last three digits of the 12NC ordering code.<sup>[1]</sup>

Type number	Package	Description	Packing quantity	
			3000	10000
BAS101	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235
BAS101S				

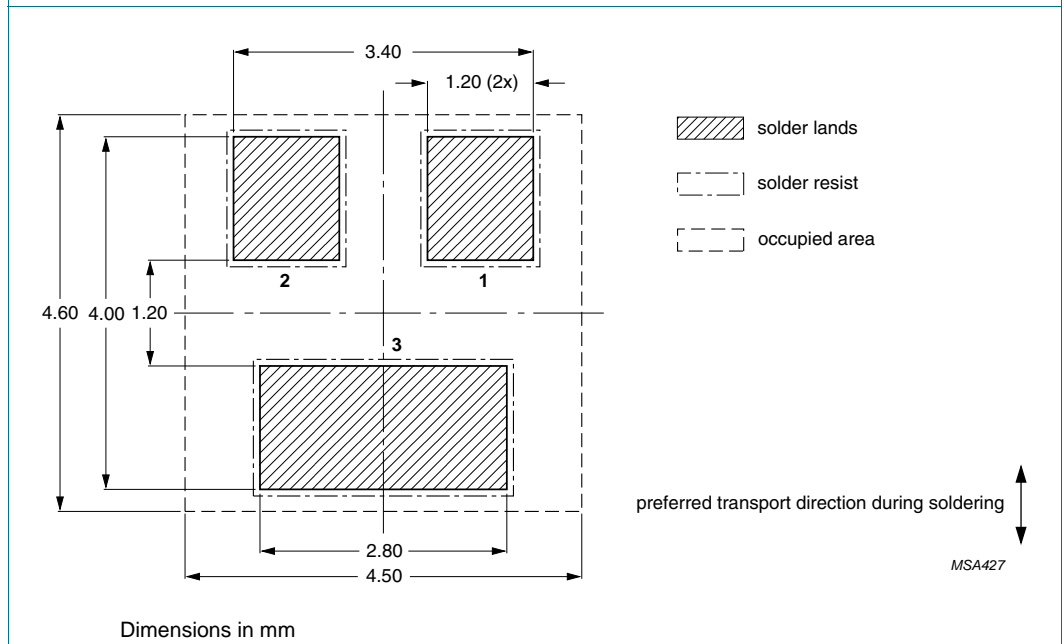
[1] For further information and the availability of packing methods, see [Section 15](#).

**11. Soldering**



Dimensions in mm

**Fig 7. Reflow soldering footprint SOT23 (TO-236AB)**

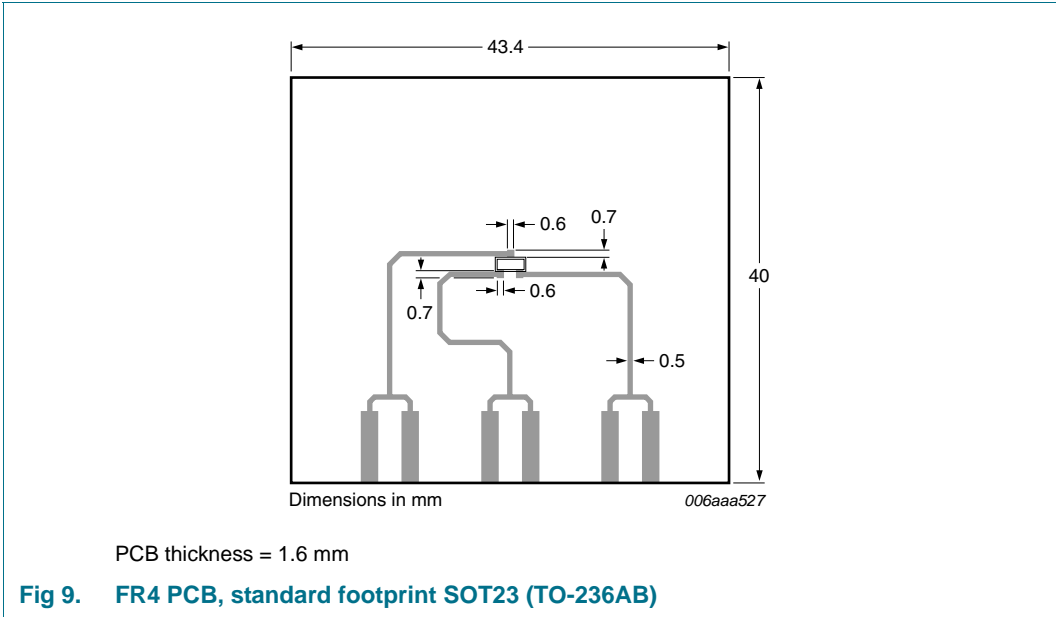


Dimensions in mm

**Fig 8. Wave soldering footprint SOT23 (TO-236AB)**



12. Mounting



## 13. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS101_BAS101S_2	20091214	Product data sheet	-	BAS101_BAS101S_1
Modifications:	<ul style="list-style-type: none"><li>• This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content.</li><li>• <a href="#">Table 3 "Pinning"</a>: updated</li></ul>			
BAS101_BAS101S_1	20060908	Product data sheet	-	-

## 14. Legal information

### 14.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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 URL <http://www.nxp.com>.

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