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
	Nexperia	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

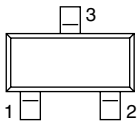
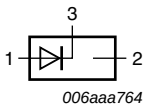
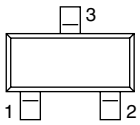
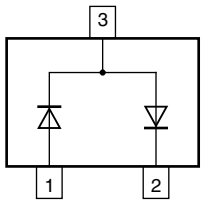
Table 2. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
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 Ω; measured at I_R = 3 mA.

2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Symbol
BAS101			
1	anode		
2	not connected		
3	cathode		
BAS101S			
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		
	Name	Description	Version
BAS101	-	plastic surface-mounted package; 3 leads	SOT23
BAS101S			

4. Marking

Table 5. Marking codes

Type number	Marking code[1]
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
Per diode						
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; $t_p \leq 1$ μs	[1]	-	9	A
Per device						
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
Per device							
$R_{th(j-a)}$	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

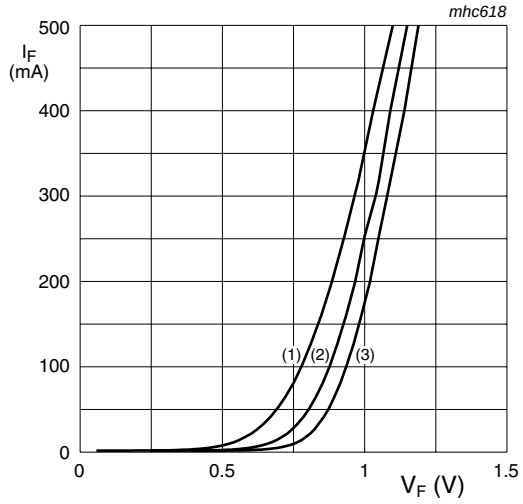
Table 8. Characteristics

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

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

[1] Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

[2] When switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA.

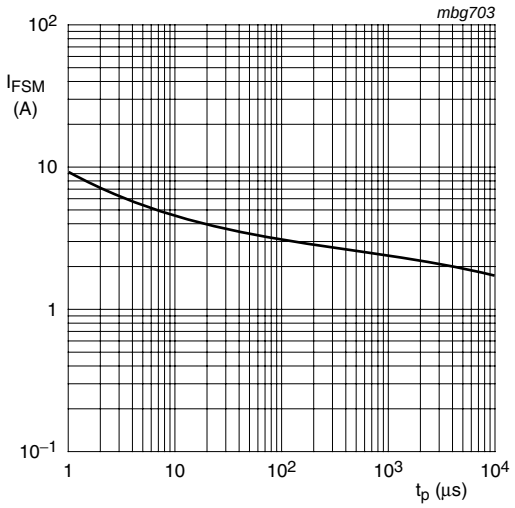


(1) T_{amb} = 150 °C

(2) T_{amb} = 75 °C

(3) T_{amb} = 25 °C

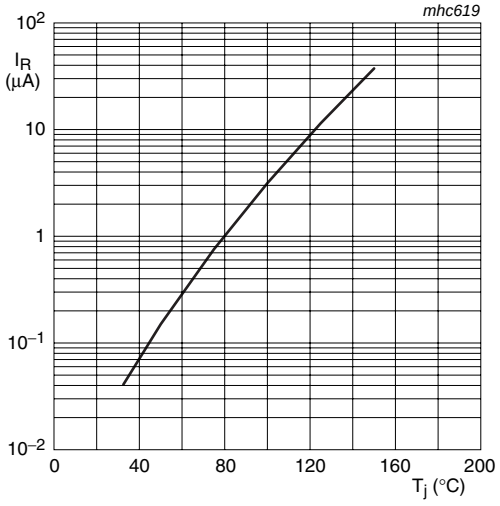
Fig 1. Forward current as a function of forward voltage; typical values



Based on square wave currents

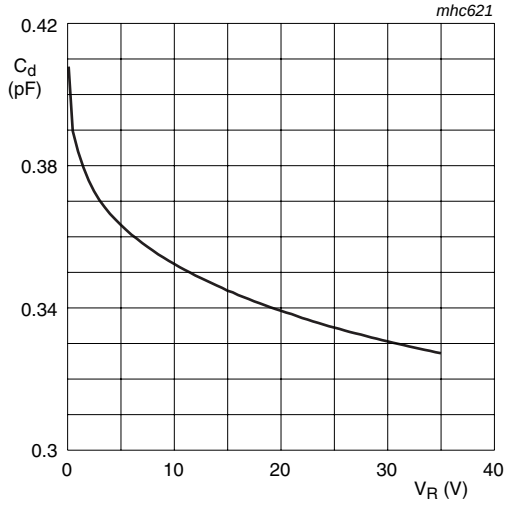
T_j = 25 °C; prior to surge

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



V_R = 300 V

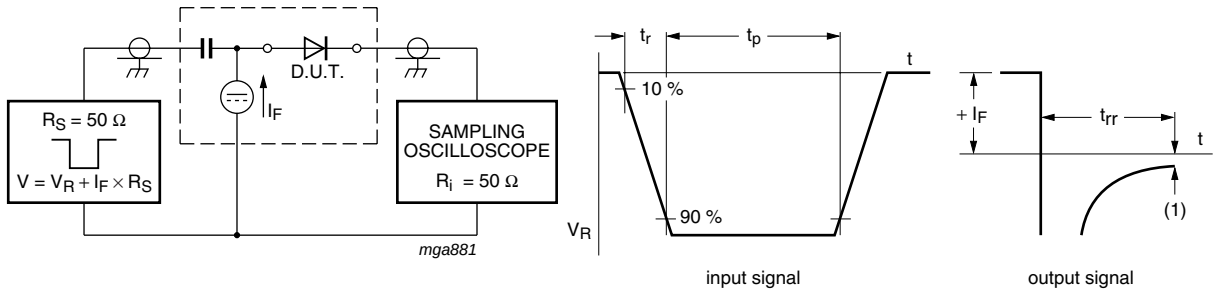
Fig 3. Reverse current as a function of junction temperature; typical values



f = 1 MHz; T_{amb} = 25 °C

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

8. Test information



(1) $I_R = 3$ mA

Fig 5. Reverse recovery time test circuit and waveforms

9. Package outline

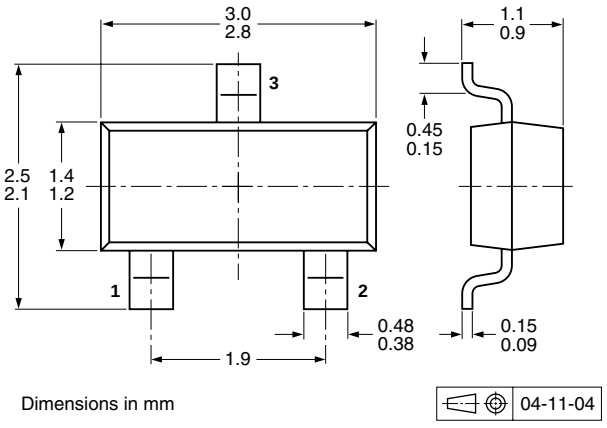
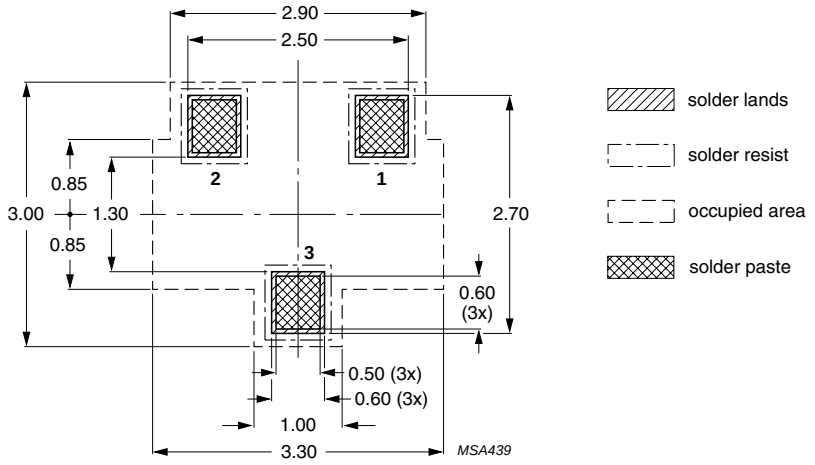


Fig 6. Package outline SOT23 (TO-236AB)

10. Packing information

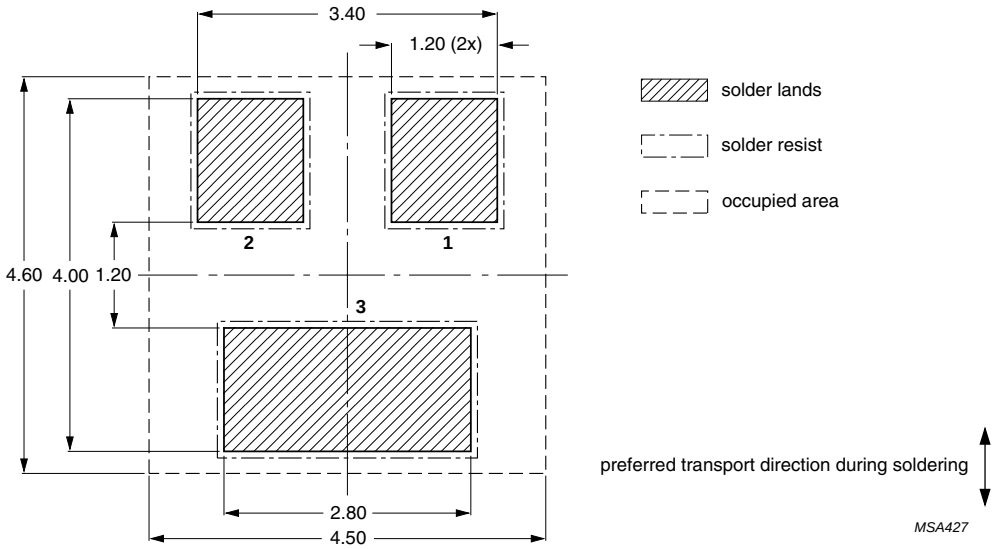
Please refer to packing information on www.nexperia.com.

11. Soldering



Dimensions in mm

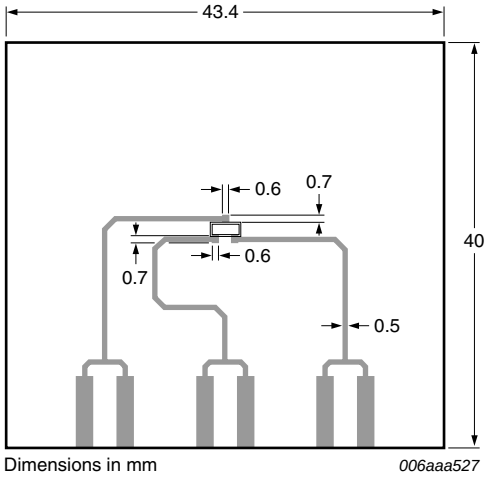
Fig 7. Reflow soldering footprint SOT23 (TO-236AB)



Dimensions in mm

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

12. Mounting



PCB thickness = 1.6 mm

Fig 9. FR4 PCB, standard footprint SOT23 (TO-236AB)

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:	• 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. • Table 3 “Pinning”: updated			
BAS101_BAS101S_1	20060908	Product data sheet	-	-

14. Legal information

14.1 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 URL http://www.nexperia.com.

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15. Contents

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