

BAS101; BAS101S

High-voltage switching diodes

Rev. 01 — 8 September 2006

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
	Philips	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

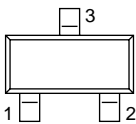
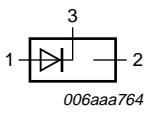
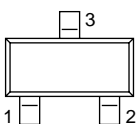
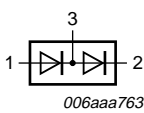
Table 2. Quick reference data

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		Version
	Name	Description	
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; $t_p \leq 1$ μ s	[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

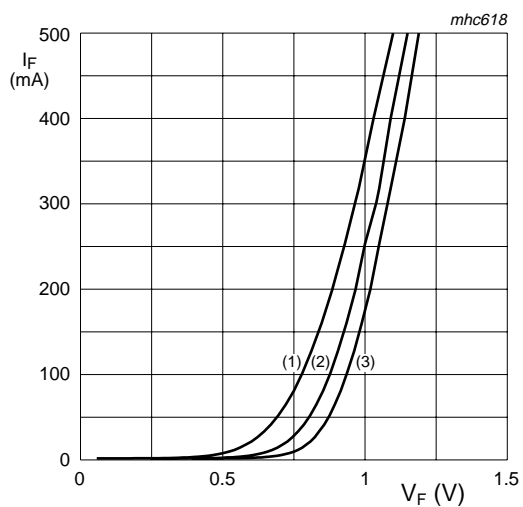
Table 8. Characteristics

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

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

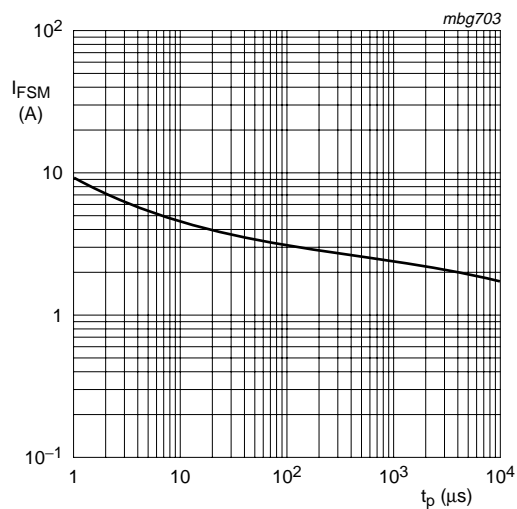
[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

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



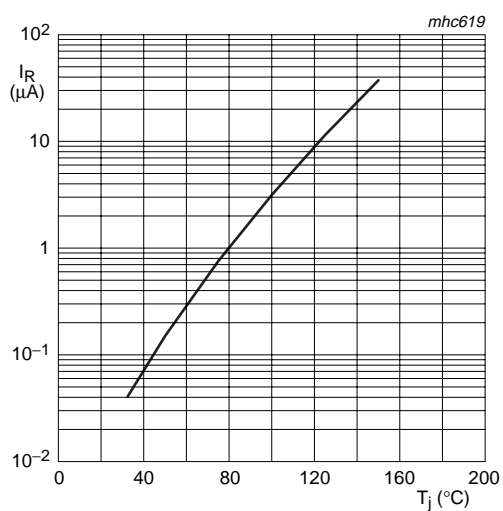
- (1) $T_{amb} = 150\text{ °C}$
 (2) $T_{amb} = 75\text{ °C}$
 (3) $T_{amb} = 25\text{ °C}$

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



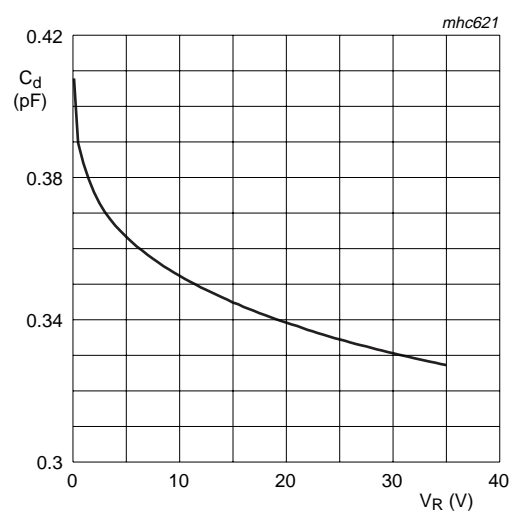
Based on square wave currents.
 $T_j = 25\text{ °C}$; prior to surge

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



$V_R = 300\text{ V}$

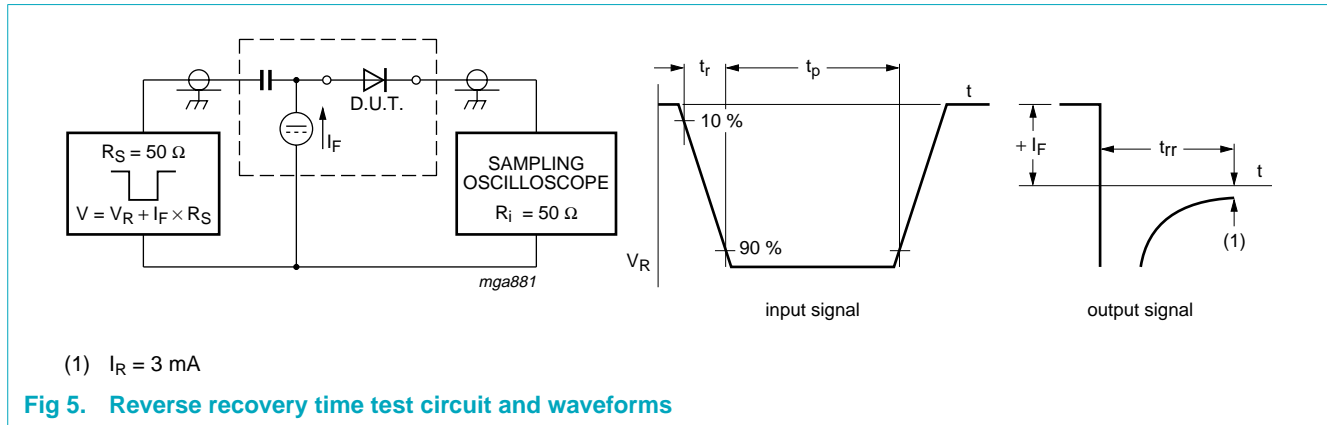
Fig. 3. Reverse current as a function of junction temperature; typical values



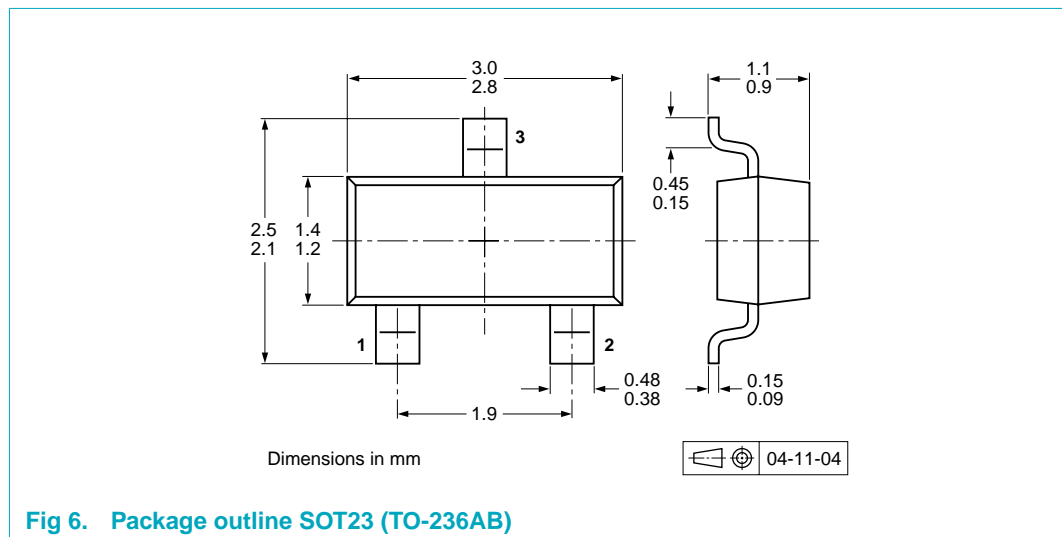
$f = 1\text{ MHz}$; $T_{amb} = 25\text{ °C}$

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.^[1]

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

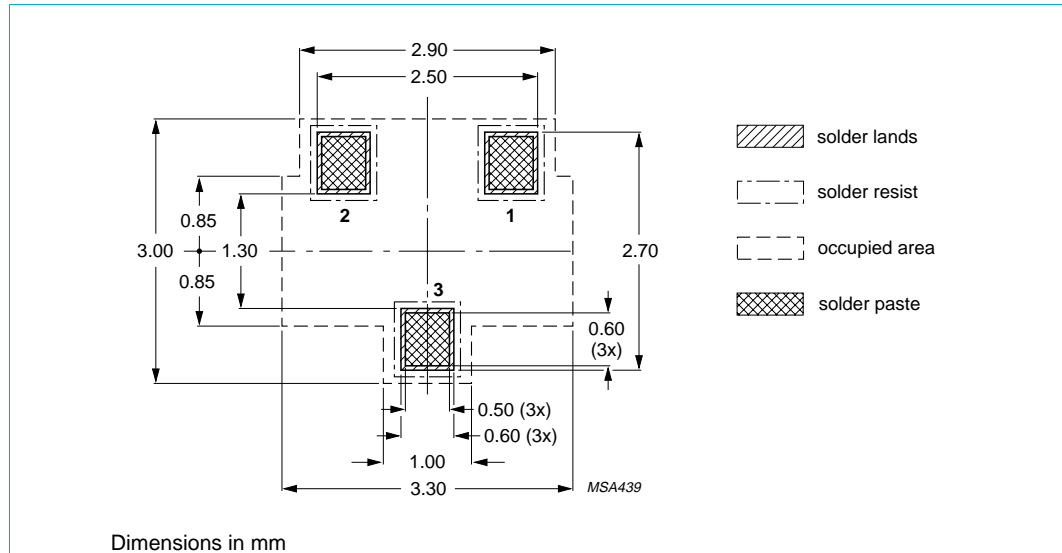


Fig 7. Reflow soldering footprint SOT23 (TO-236AB)

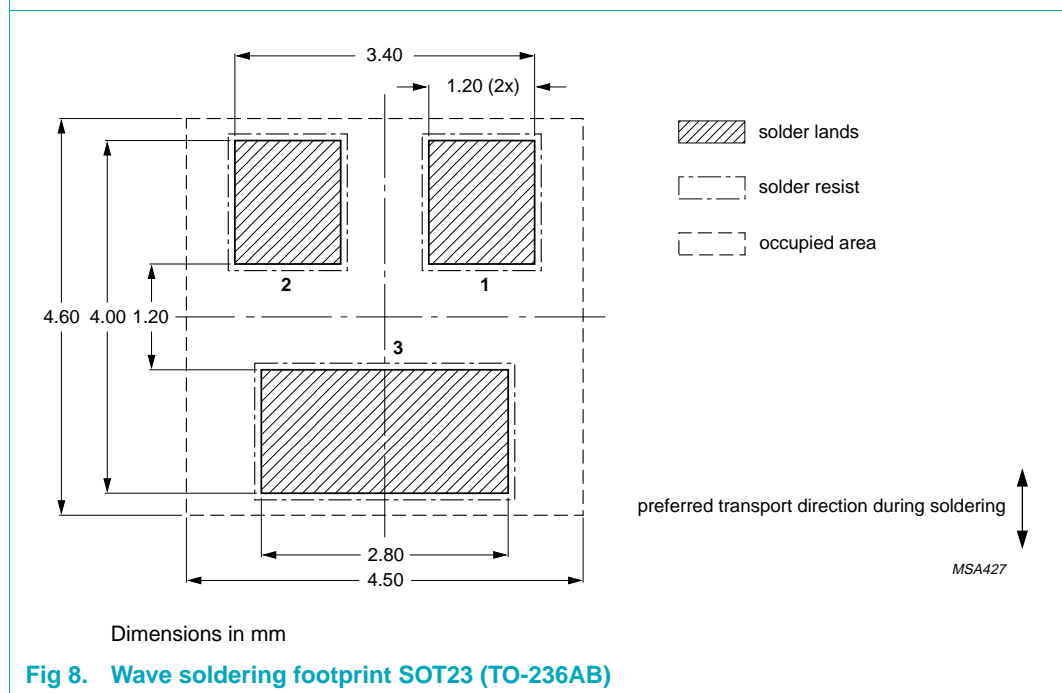
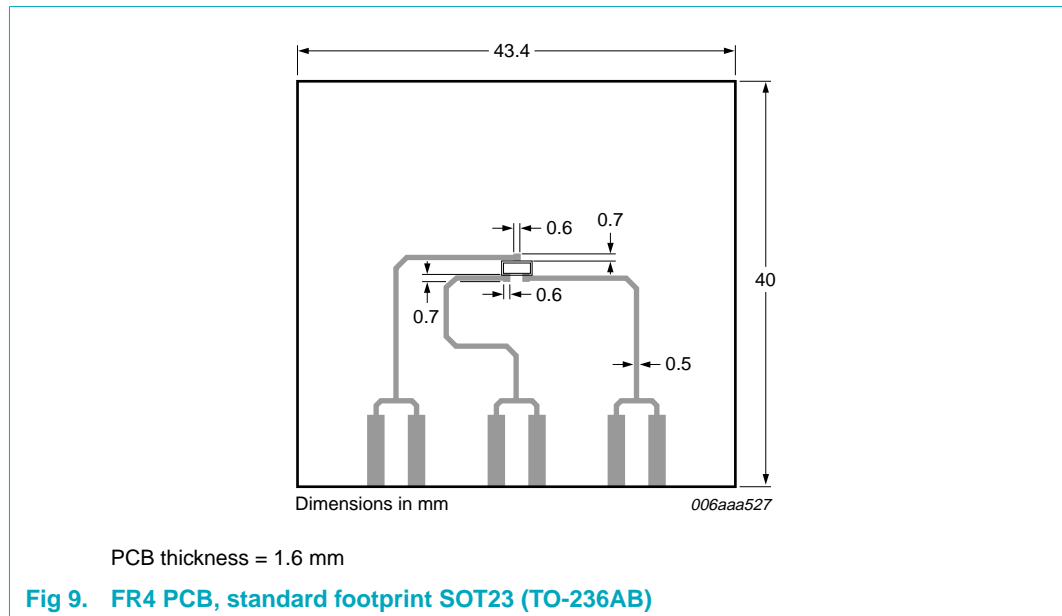


Fig 8. Wave soldering footprint SOT23 (TO-236AB)

12. Mounting



13. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS101_BAS101S_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".

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