

# BAS21H

Single high-voltage switching diode in small SOD123F package

Rev. 01 — 11 April 2005

Product data sheet

## 1. Product profile

### 1.1 General description

Single high-voltage switching diode, encapsulated in a SOD123F small and flat lead SMD plastic package.

### 1.2 Features

- Small and flat lead SMD plastic package
- Continuous reverse voltage:  $\leq 200$  V

### 1.3 Applications

- General-purpose switching

### 1.4 Quick reference data



Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current		-	-	200	mA
$V_R$	reverse voltage		-	-	200	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 2: Pinning

Pin	Description	Simplified outline	Symbol
1	cathode		
2	anode		

sym001

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
BAS21H	-	plastic surface mounted package; 2 leads	SOD123F

## 4. Marking

Table 4: Marking codes

Type number	Marking code
BAS21H	B2

## 5. 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		-	250	V
$V_R$	reverse voltage		-	200	V
$I_F$	forward current		-	200	mA
$I_{FRM}$	repetitive peak forward current		-	625	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p = 1 \mu s$	-	9	A
		$t_p = 1 ms$	-	3	A
		$t_p = 1 s$	-	1.7	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25^\circ C$	[1]	375	mW
$T_j$	junction temperature		-	150	$^\circ C$
$T_{amb}$	ambient temperature		-65	+150	$^\circ C$
$T_{stg}$	storage temperature		-65	+150	$^\circ C$

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

## 6. 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] [2] -	-	330	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		-	-	70	K/W

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

[2] Reflow soldering is the only recommended soldering method.

## 7. Characteristics

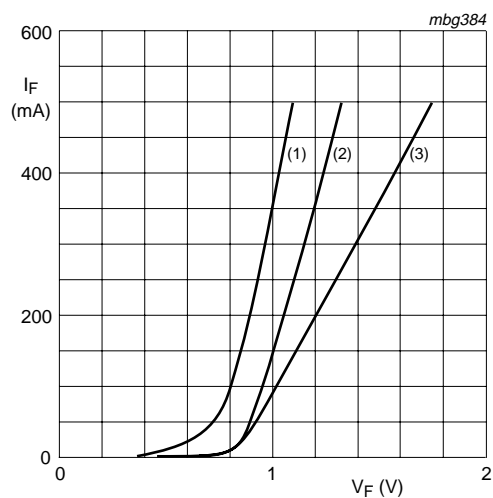
**Table 7: Characteristics**

$T_{amb} = 25\text{ }^{\circ}\text{C}$  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	mV
		$I_F = 200\text{ mA}$	[1] -	-	1.25	mV
$I_R$	reverse current	$V_R = 200\text{ V}$	-	-	100	nA
		$V_R = 200\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	-	100	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}$	-	-	5	pF
$t_{rr}$	reverse recovery time		[2] -	-	50	ns

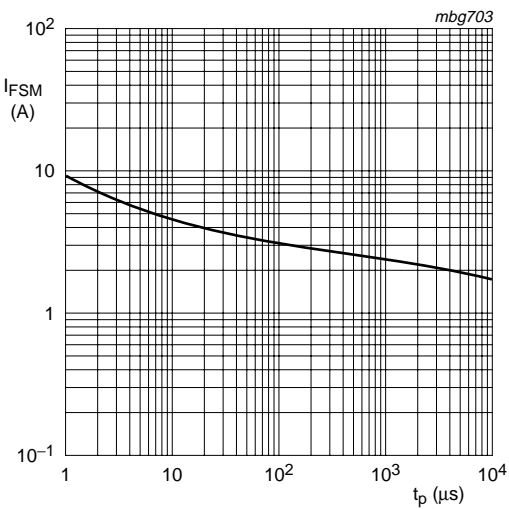
[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

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



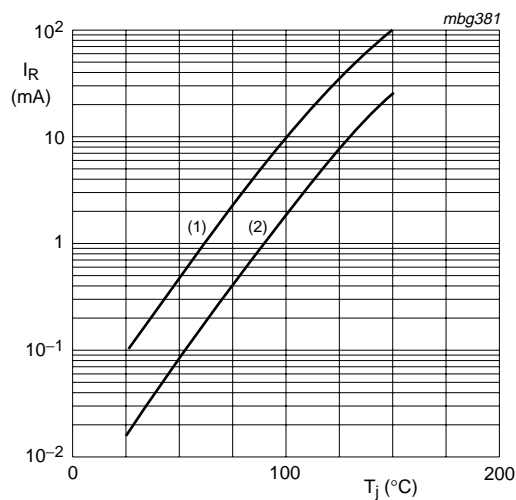
- (1)  $T_{amb} = 150\text{ °C}$ ; typical values
- (2)  $T_{amb} = 25\text{ °C}$ ; typical values
- (3)  $T_{amb} = 25\text{ °C}$ ; maximum values

Fig 1. Forward current as a function of forward voltage



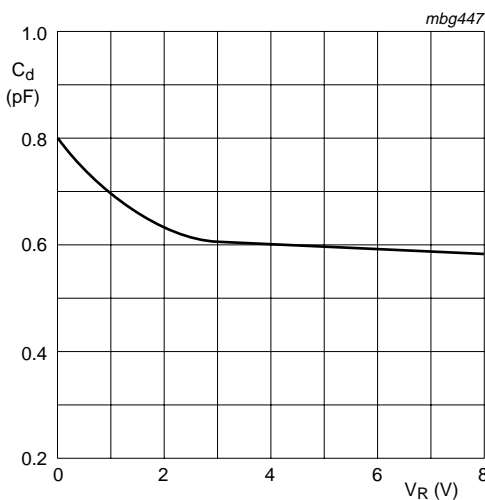
- Based on square wave currents
- (1)  $T_j = 25\text{ °C}$ ; prior to surge

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



- (1)  $V_R = V_{Rmax}$ ; maximum values
- (2)  $V_R = V_{Rmax}$ ; typical values

Fig 3. Reverse current as a function of junction temperature

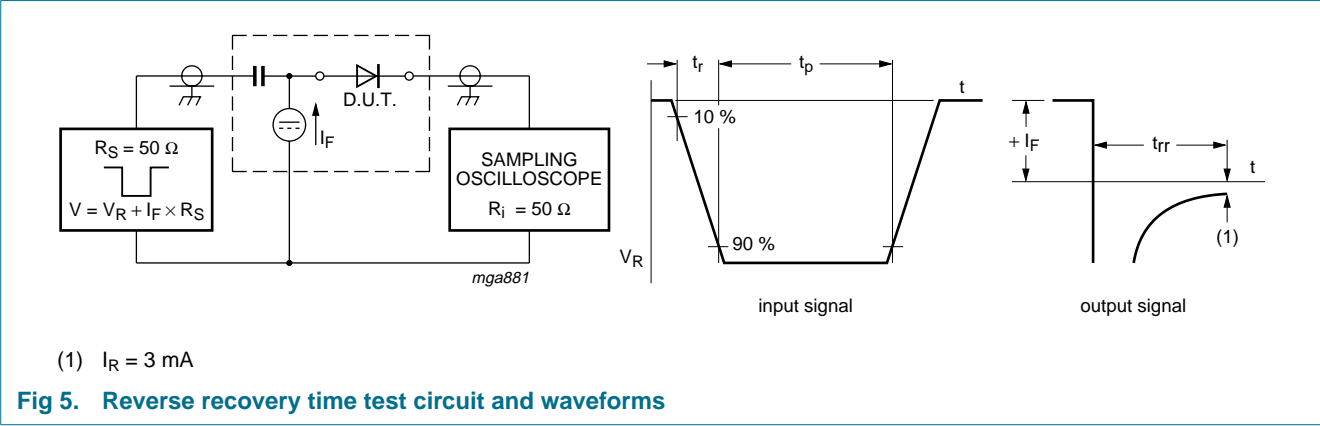


$T_{amb} = 25\text{ °C}$ ;  $f = 1\text{ MHz}$

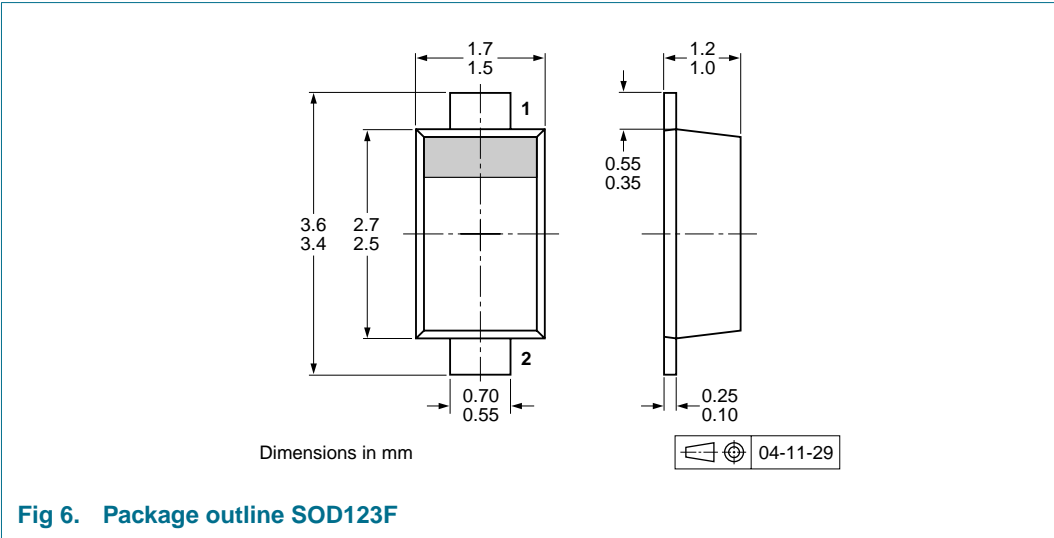
Fig 4. Diode capacitance as a function of reverse voltage; typical values



8. Test information



9. Package outline



10. Packing information

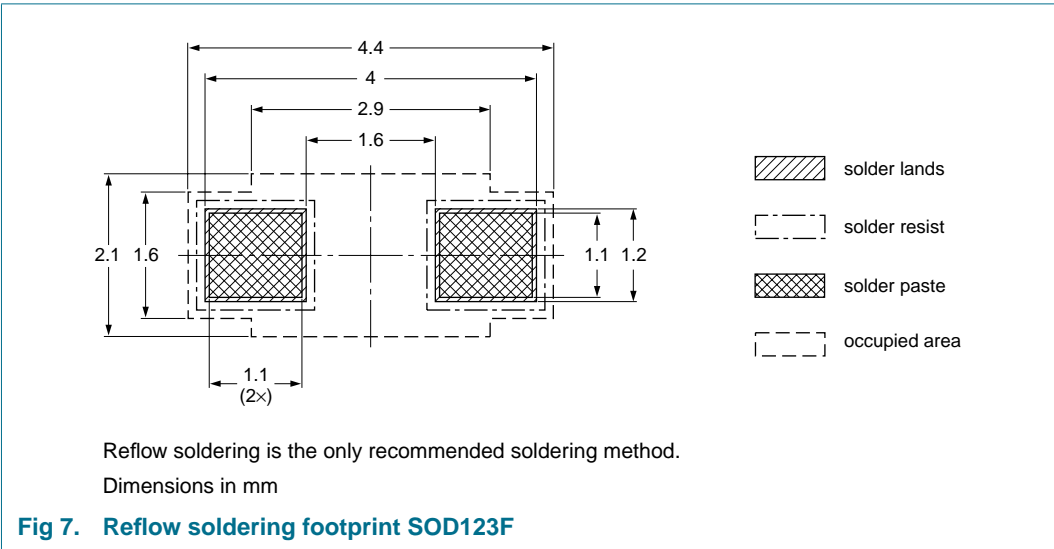
Table 8: Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code. [\[1\]](#)

Type number	Package	Description	Packing quantity	
			3000	10000
BAS21H	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see [Section 16](#).

11. Soldering





## 12. Revision history

Table 9: Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
BAS21H_1	20050411	Product data sheet	-	9397 750 14879	-

## 13. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2] [3]</sup>	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

[1] Please consult the most recently issued data sheet before initiating or completing a design.

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

## 14. Definitions

**Short-form specification** — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

**Application information** — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

## 15. Disclaimers

**Life support** — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

**Right to make changes** — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status 'Production'), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

## 16. Contact information

For additional information, please visit: <http://www.semiconductors.philips.com>

For sales office addresses, send an email to: [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com)





17. Contents

1	Product profile .....	1
1.1	General description.....	1
1.2	Features .....	1
1.3	Applications .....	1
1.4	Quick reference data.....	1
2	Pinning information.....	2
3	Ordering information.....	2
4	Marking .....	2
5	Limiting values.....	2
6	Thermal characteristics.....	3
7	Characteristics.....	3
8	Test information.....	5
9	Package outline .....	6
10	Packing information.....	6
11	Soldering .....	6
12	Revision history.....	7
13	Data sheet status .....	8
14	Definitions .....	8
15	Disclaimers.....	8
16	Contact information .....	8



© Koninklijke Philips Electronics N.V. 2005

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: 11 April 2005  
Document number: 9397 750 14879

Published in The Netherlands