

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: ≤ 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; $R_L = 100$ Ω ; measured at $I_R = 3$ mA

2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
1	cathode	[1]	 $1 \text{ } \overleftarrow{\text{D}} \text{ } 2$ <i>sym001</i>
2	anode		

[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
Per diode					
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	$t_p = 1 \mu\text{s}$	-	9	A
		$t_p = 1 \text{ms}$	-	3	A
		$t_p = 1 \text{s}$	-	1.7	A
P_{tot}	total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$	[1]	-	375 mW
T_j	junction temperature		-	150	$^\circ\text{C}$
T_{amb}	ambient temperature		-65	+150	$^\circ\text{C}$
T_{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.

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

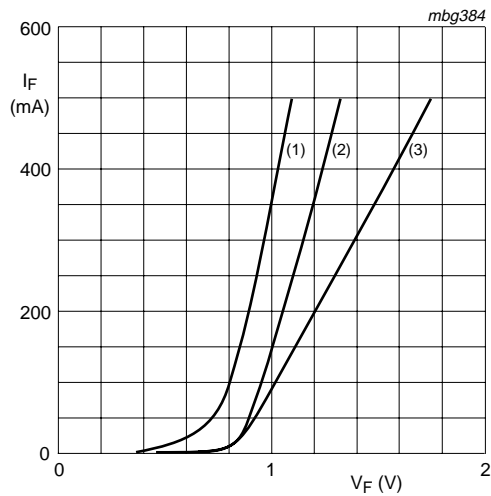
Table 7: Characteristics

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
Per diode							
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	
		$V_R = 200\text{ V}; T_j = 150\text{ °C}$	-	-	100	μA	
C_d	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}$	-	-	5	pF	
t_{rr}	reverse recovery time		[2]	-	-	50	ns

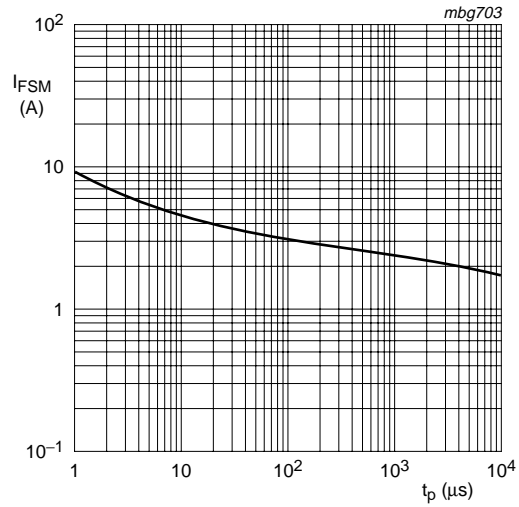
[1] Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

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



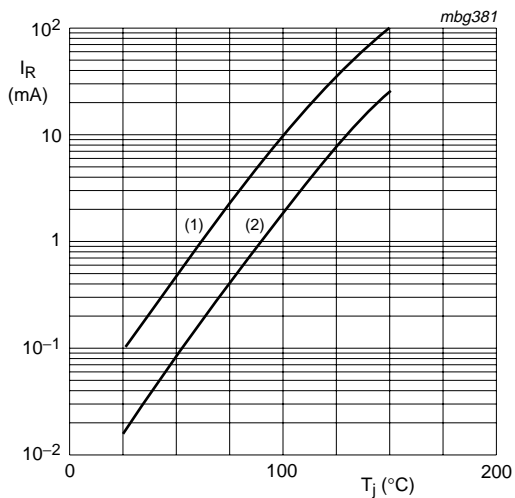
- (1) $T_{amb} = 150\text{ }^{\circ}\text{C}$; typical values
- (2) $T_{amb} = 25\text{ }^{\circ}\text{C}$; typical values
- (3) $T_{amb} = 25\text{ }^{\circ}\text{C}$; maximum values

Fig 1. Forward current as a function of forward voltage



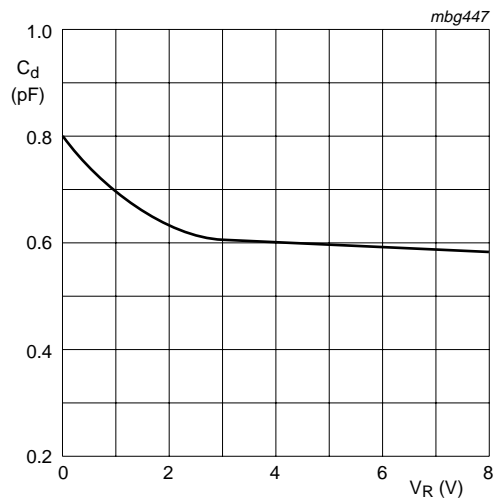
- Based on square wave currents
- (1) $T_j = 25\text{ }^{\circ}\text{C}$; prior to surge

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

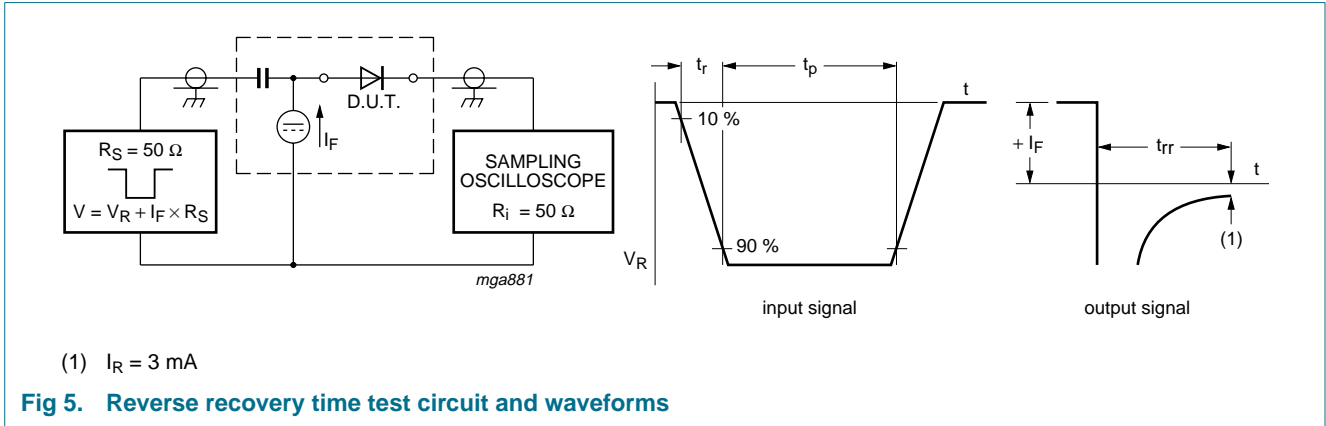
Fig 3. Reverse current as a function of junction temperature



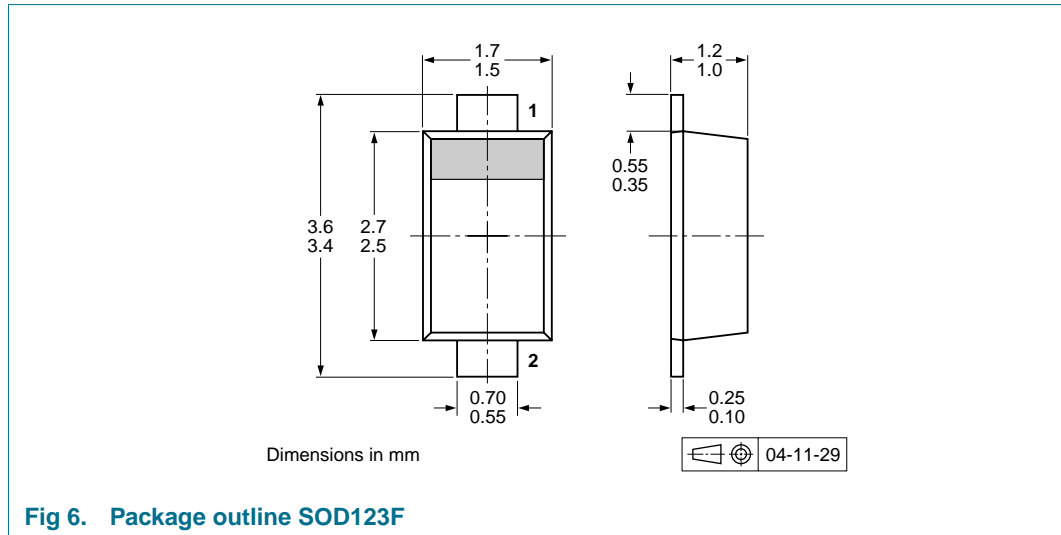
$T_{amb} = 25\text{ }^{\circ}\text{C}$; $f = 1\text{ MHz}$

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

8. Test information



9. Package outline



10. Packing information

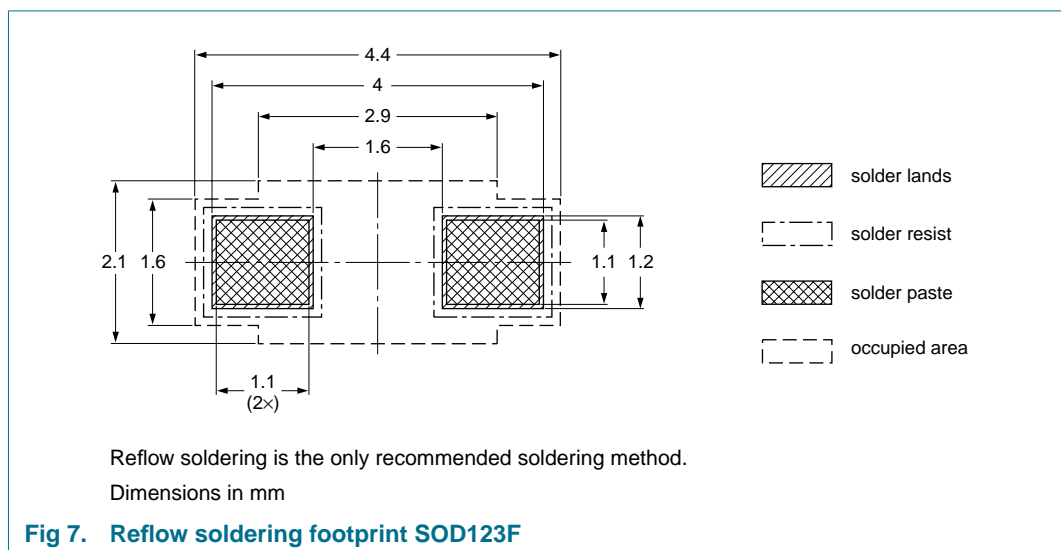
Table 8: Packing methods

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 ^[1]	Product status ^[2] ^[3]	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.
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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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.

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