

# BAS21H

Single high-voltage switching diode

Rev. 02 — 3 November

Product data sheet

## 1. Product profile

### 1.1 General description

Single high-voltage switching diode, encapsulated in a SOD123F small and flat lead Surface-Mounted Device (SMD) plastic package.

### 1.2 Features

- Small and flat lead SMD plastic package
- Reverse voltage:  $V_R \leq 200\text{ V}$

### 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	[1]	-	-	200	mA
$V_R$	reverse voltage		-	-	200	V
$t_{rr}$	reverse recovery time	[2]	-	-	50	ns

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

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

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Symbol
1	cathode <sup>[1]</sup>		 <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
$V_{RRM}$	repetitive peak reverse voltage		-	250	V
$V_R$	reverse voltage		-	200	V
$I_F$	forward current		[1]	200	mA
$I_{FRM}$	repetitive peak forward current	$t_p = 1 \text{ ms};$ $\delta = 0.25$	-	625	mA
$I_{FSM}$	non-repetitive peak forward current	square wave	[2]		
		$t_p = 1 \text{ }\mu\text{s}$	-	9	A
		$t_p = 100 \text{ }\mu\text{s}$	-	3	A
		$t_p = 10 \text{ ms}$	-	1.7	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$	[3]	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] Pulse test:  $t_p \leq 300 \text{ }\mu\text{s}; \delta \leq 0.02$ .

[2]  $T_j = 25 \text{ }^\circ\text{C}$  prior to surge.

[3] 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		[3]	-	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.

[3] Soldering point of cathode tab.

## 7. Characteristics

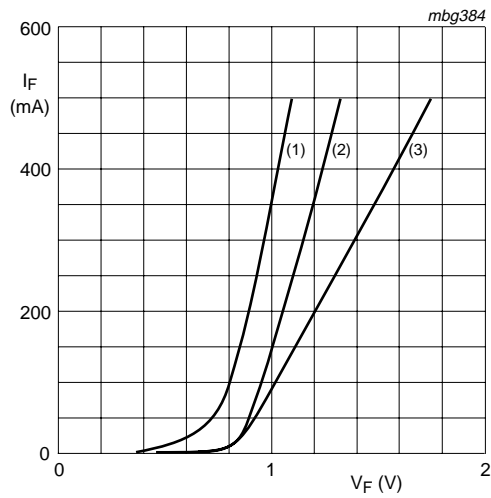
**Table 7. Characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 100\text{ mA}$	[1]	-	1	V
		$I_F = 200\text{ mA}$	[1]	-	1.25	V
$I_R$	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

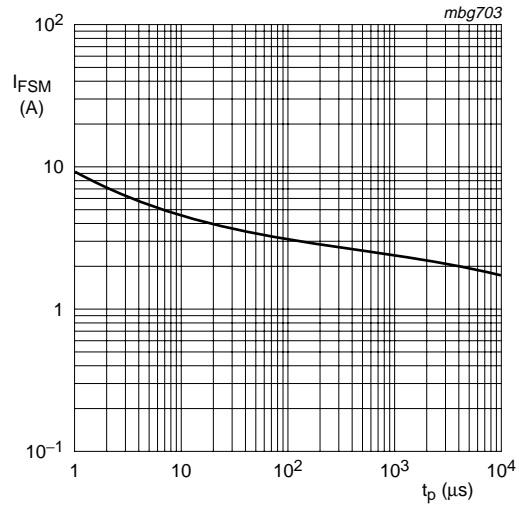
[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

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



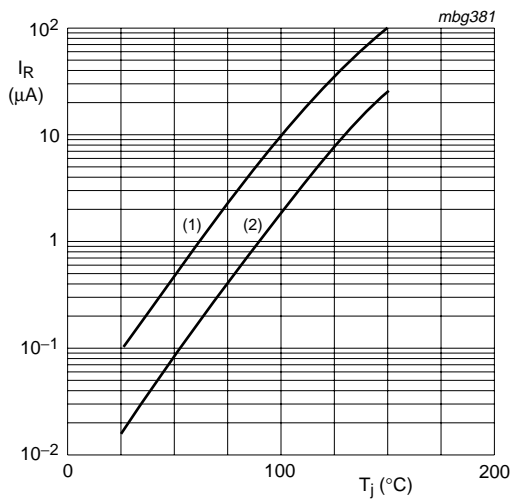
- (1)  $T_{amb} = 150\text{ °C}$ ; typical values
- (2)  $T_{amb} = 25\text{ °C}$ ; typical values
- (3)  $T_{amb} = 25\text{ °C}$ ; maximum values

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



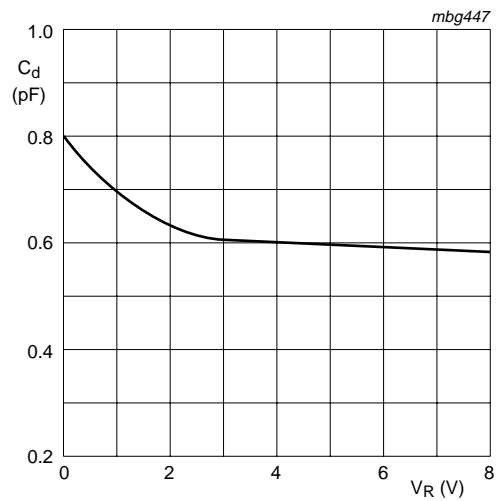
Based on square wave currents.  
 $T_j = 25\text{ °C}$ ; prior to surge

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



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

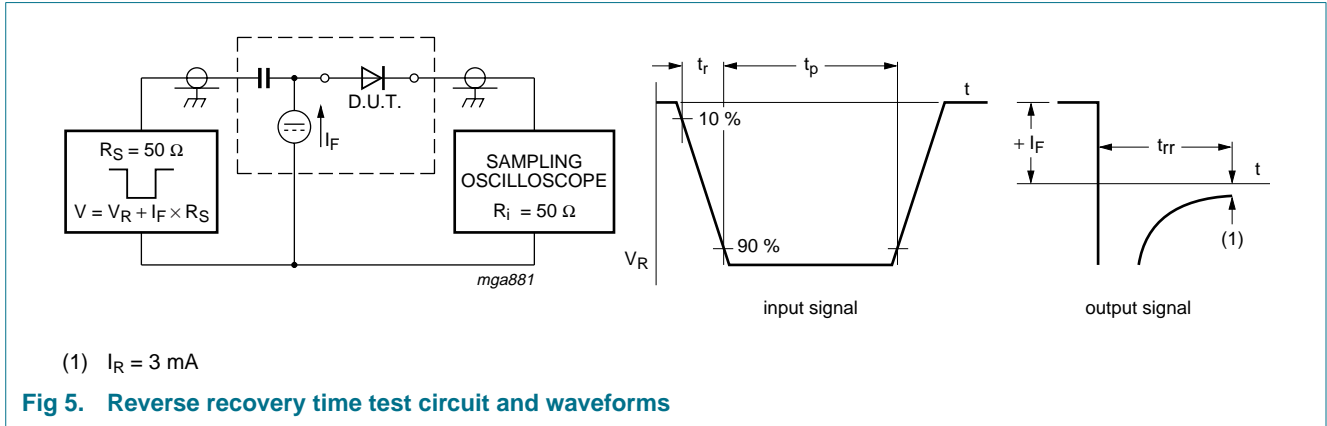
**Fig 3. Reverse current as a function of junction temperature**



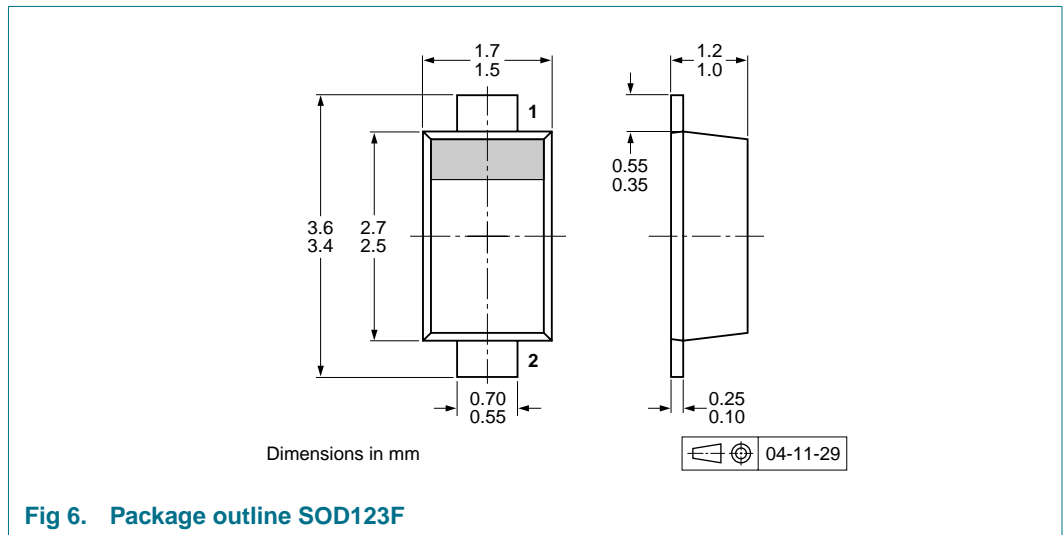
$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ °C}$

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

### 8. Test information



### 9. Package outline



### 10. Packing information

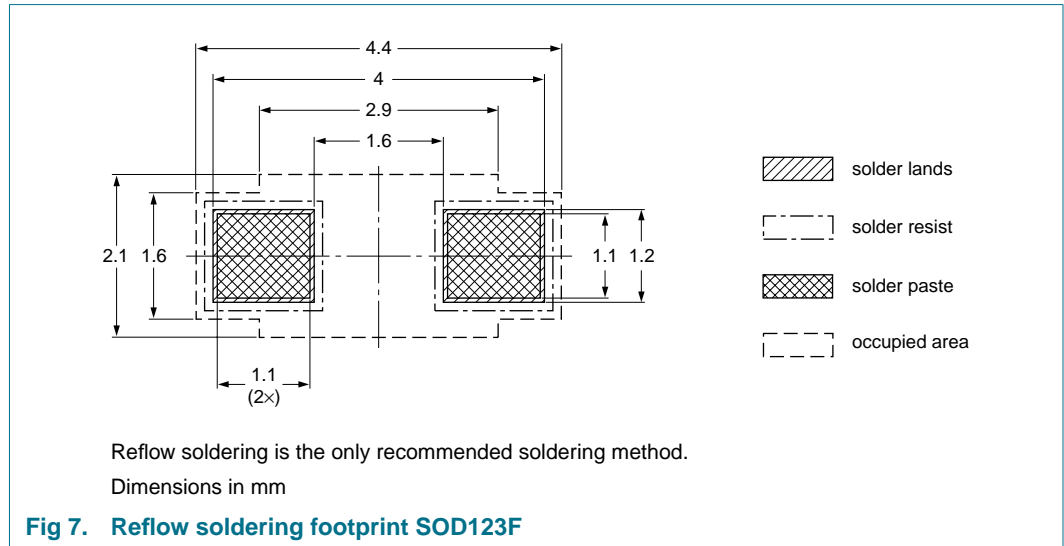
**Table 8. Packing methods**

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

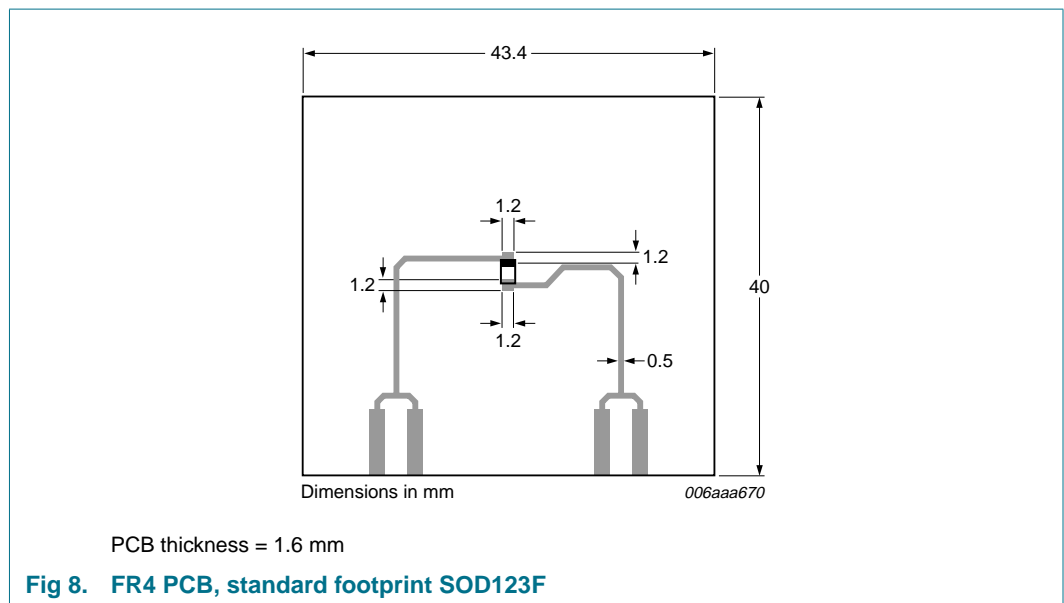
Type number	Package	Description	Packing quantity	
			3000	10000
BAS21H	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135

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

## 11. Soldering



## 12. Mounting



## 13. Revision history

**Table 9.** Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS21H_2	20061103	Product data sheet	-	BAS21H_1
Modifications:	<ul style="list-style-type: none"> <li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>• Legal texts have been adapted to the new company name where appropriate.</li> <li>• <a href="#">Section 1.1 “General description”</a>: amended</li> <li>• <a href="#">Table 1 “Quick reference data”</a>: <math>I_F</math> forward current table note added</li> <li>• <a href="#">Table 5 “Limiting values”</a>: <math>I_F</math> forward current table note added</li> <li>• <a href="#">Table 5 “Limiting values”</a>: <math>I_{FRM}</math> repetitive peak forward current condition amended</li> <li>• <a href="#">Table 5 “Limiting values”</a>: <math>I_{FSM}</math> non-repetitive peak forward current condition amended</li> <li>• <a href="#">Table 6</a>: <math>R_{th(j-sp)}</math> thermal resistance from junction to solder point table note added</li> <li>• <a href="#">Table 7 “Characteristics”</a>: <math>V_F</math> forward voltage unit amended</li> <li>• <a href="#">Figure 2</a>: figure title and figure note amended</li> <li>• <a href="#">Figure 3</a>: amended</li> <li>• <a href="#">Section 12 “Mounting”</a>: added</li> <li>• <a href="#">Section 14.4 “Trademarks”</a>: added</li> </ul>			
BAS21H_1	20050411	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".

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