



# BAS21H

Single high-voltage switching diode

Rev. 02 — 3 November 2006

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:  $V_R \leq 200$  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:  $t_p \leq 300$   $\mu$ s;  $\delta \leq 0.02$ .

[2] 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 <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	$t_p = 1$ ms; $\delta = 0.25$	-	625	mA
$I_{FSM}$	non-repetitive peak forward current	square wave	[2]		
		$t_p = 1$ $\mu$ s	-	9	A
		$t_p = 100$ $\mu$ s	-	3	A
		$t_p = 10$ ms	-	1.7	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °C	[3]	375	mW
$T_j$	junction temperature		-	150	°C
$T_{amb}$	ambient temperature		-65	+150	°C
$T_{stg}$	storage temperature		-65	+150	°C

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

[2]  $T_j = 25$  °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.

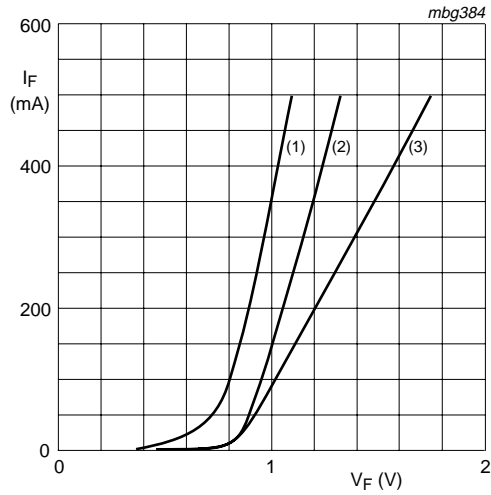
## 7. Characteristics

**Table 7. Characteristics***T<sub>amb</sub> = 25 °C unless otherwise specified.*

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 100 mA	[1]	-	1	V
		I <sub>F</sub> = 200 mA	[1]	-	1.25	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 200 V	-	-	100	nA
		V <sub>R</sub> = 200 V; T <sub>j</sub> = 150 °C	-	-	100	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 0 V; f = 1 MHz	-	-	5	pF
t <sub>rr</sub>	reverse recovery time		[2]	-	50	ns

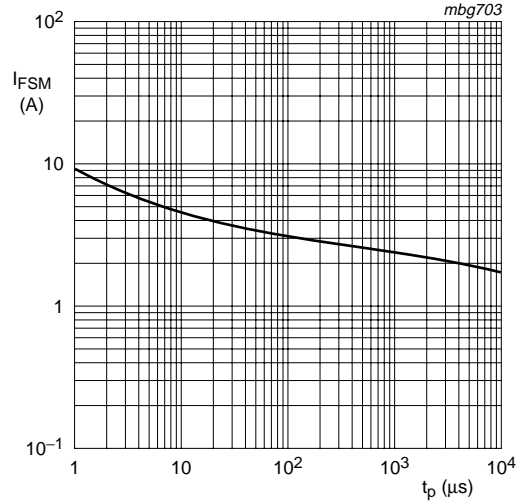
[1] Pulse test: t<sub>p</sub> ≤ 300 μs; δ ≤ 0.02.

[2] When switched from I<sub>F</sub> = 30 mA to I<sub>R</sub> = 30 mA; R<sub>L</sub> = 100 Ω; measured at I<sub>R</sub> = 3 mA.



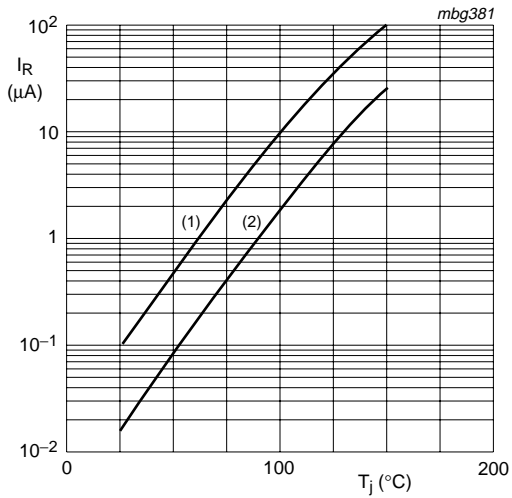
- (1)  $T_{amb} = 150\text{ °C}$ ; typical values
- (2)  $T_{amb} = 25\text{ °C}$ ; typical values
- (3)  $T_{amb} = 25\text{ °C}$ ; maximum values

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



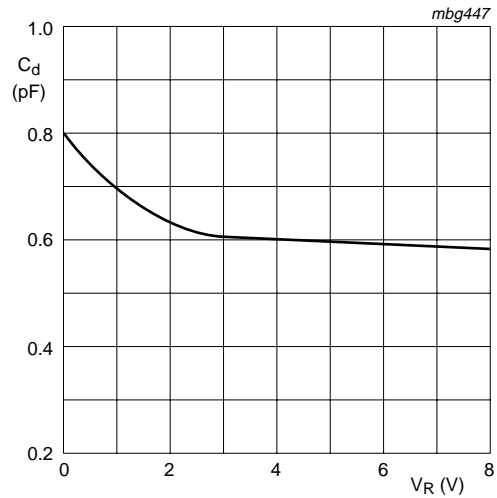
Based on square wave currents.  
 $T_j = 25\text{ °C}$ ; prior to surge

**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

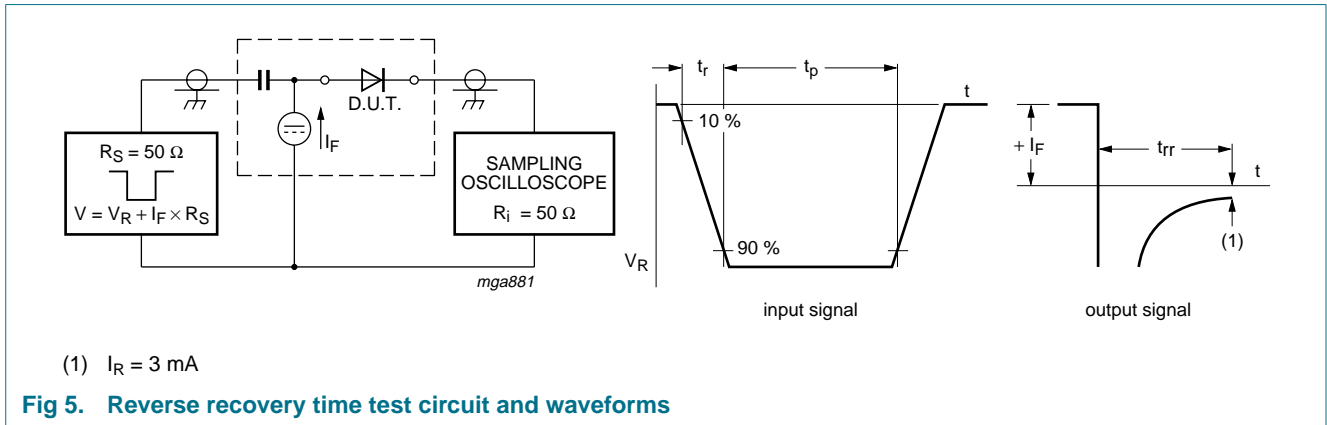
**Fig 3. Reverse current as a function of junction temperature**



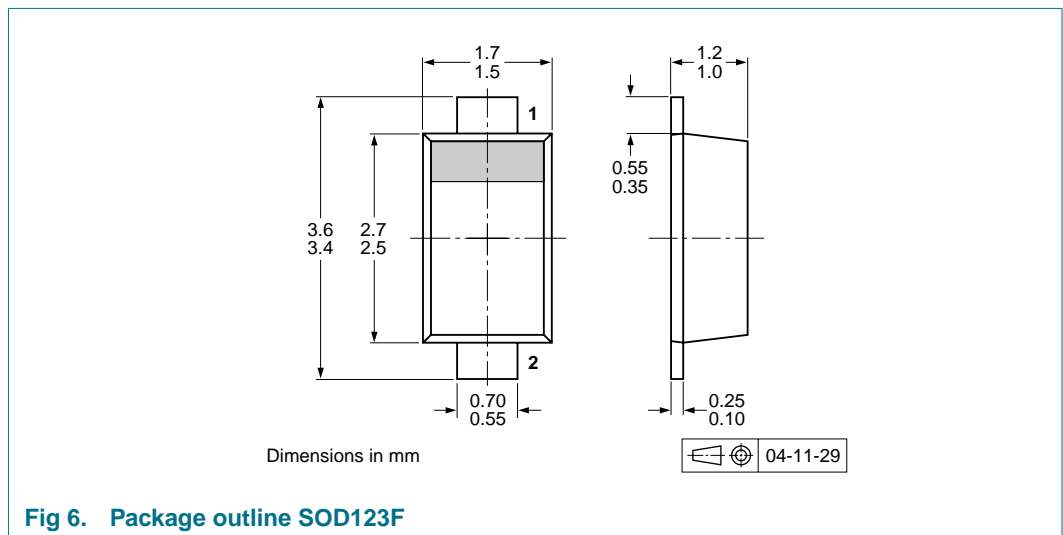
$f = 1\text{ MHz}$ ;  $T_{amb} = 25\text{ °C}$

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

### 8. Test information



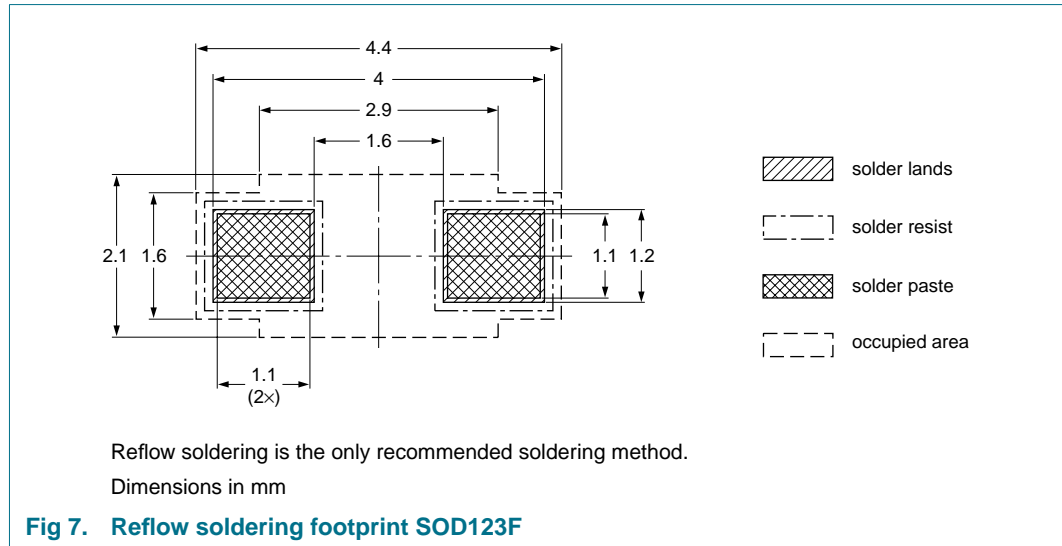
### 9. Package outline



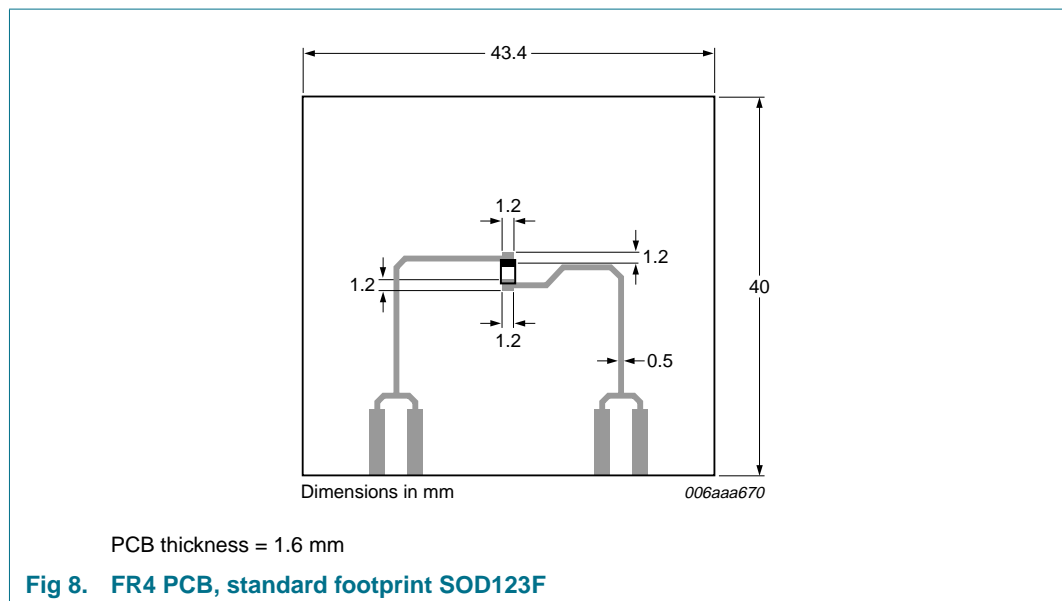
### 10. Packing information

Please refer to packing information on [www.nexperia.com](http://www.nexperia.com).

## 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>: I<sub>F</sub> forward current table note added</li> <li>• <a href="#">Table 5 “Limiting values”</a>: I<sub>F</sub> forward current table note added</li> <li>• <a href="#">Table 5 “Limiting values”</a>: I<sub>FRM</sub> repetitive peak forward current condition amended</li> <li>• <a href="#">Table 5 “Limiting values”</a>: I<sub>FSM</sub> non-repetitive peak forward current condition amended</li> <li>• <a href="#">Table 6</a>: R<sub>th(j-sp)</sub> thermal resistance from junction to solder point table note added</li> <li>• <a href="#">Table 7 “Characteristics”</a>: V<sub>F</sub> 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".

[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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