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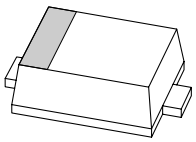


BAS21H

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

[2] 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]		
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
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; δ = 0.25		-	625	mA
I_{FSM}	non-repetitive peak forward current	square wave	[2]			
		t_p = 1 µs		-	9	A
		t_p = 100 µs		-	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: $t_p \leq 300$ µs; $\delta \leq 0.02$.

[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

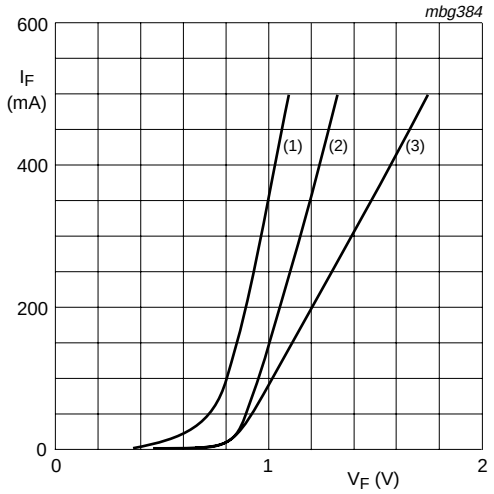
Table 7. Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 100 mA	[1]	-	-	1	V
		I_F = 200 mA	[1]	-	-	1.25	V
I_R	reverse current	V_R = 200 V		-	-	100	nA
		V_R = 200 V; T_j = 150 °C		-	-	100	µA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	-	5	pF
t_{rr}	reverse recovery time		[2]	-	-	50	ns

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

[2] When switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω; measured at I_R = 3 mA.

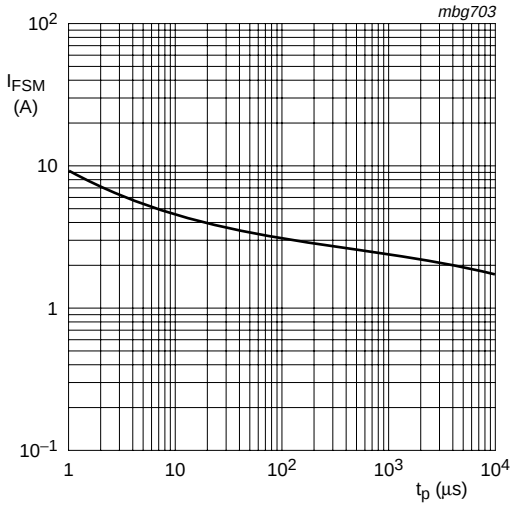


(1) T_{amb} = 150 °C; typical values

(2) T_{amb} = 25 °C; typical values

(3) T_{amb} = 25 °C; maximum values

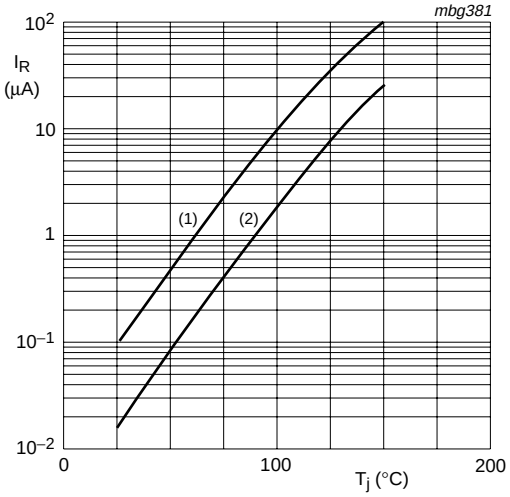
Fig 1. Forward current as a function of forward voltage



Based on square wave currents.

T_j = 25 °C; prior to surge

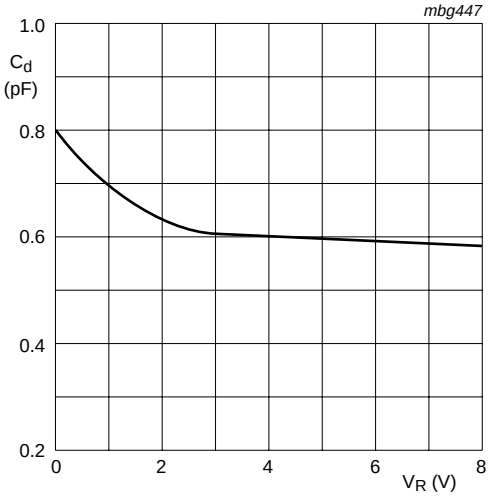
Fig 2. Non-repetitive peak forward current as a function of pulse duration; maximum values



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

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

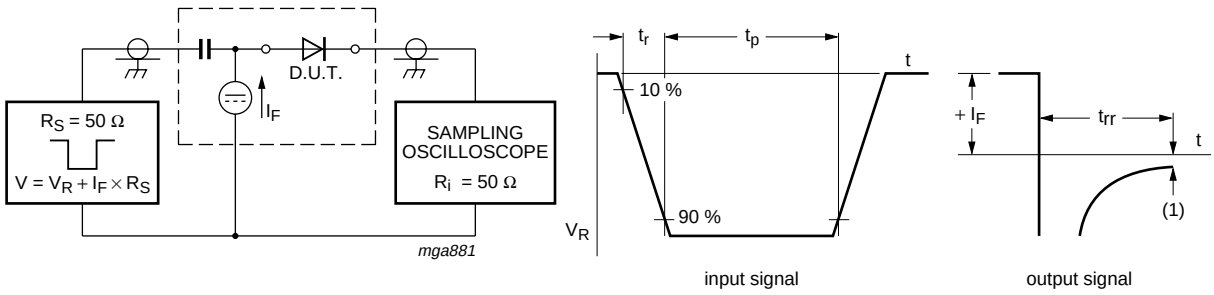
Fig 3. Reverse current as a function of junction temperature



f = 1 MHz; T_{amb} = 25 °C

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

8. Test information



(1) I_R = 3 mA

Fig 5. Reverse recovery time test circuit and waveforms

9. Package outline

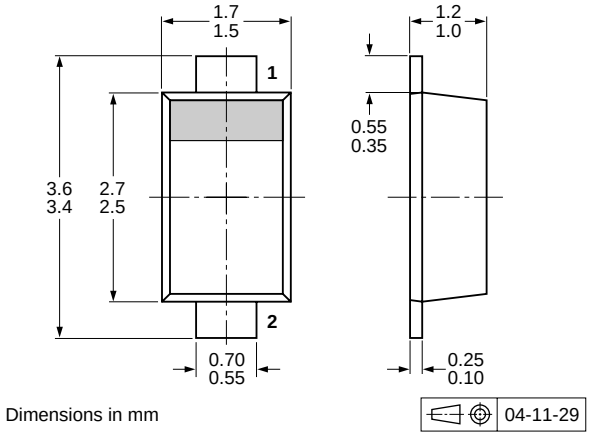


Fig 6. Package outline SOD123F

10. Packing information

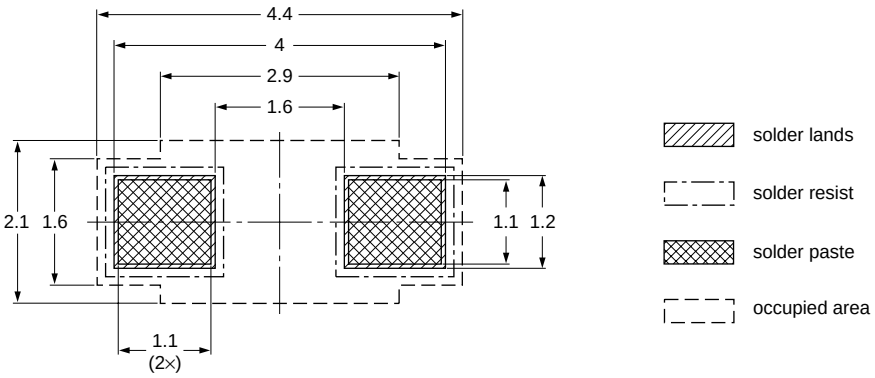
Table 8. Packing methods

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 15.

11. Soldering

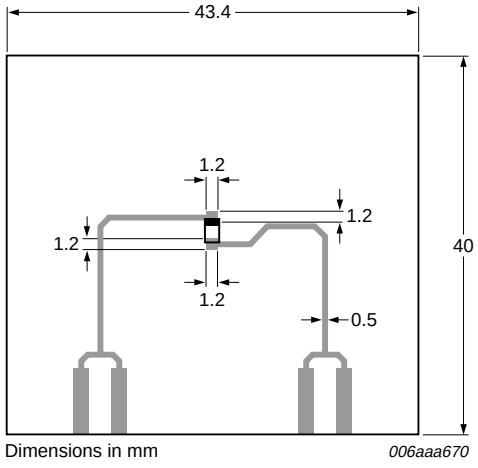


Reflow soldering is the only recommended soldering method.

Dimensions in mm

Fig 7. Reflow soldering footprint SOD123F

12. Mounting



PCB thickness = 1.6 mm

Fig 8. FR4 PCB, standard footprint SOD123F

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:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Section 1.1 “General description”: amended • Table 1 “Quick reference data”: I_F forward current table note added • Table 5 “Limiting values”: I_F forward current table note added • Table 5 “Limiting values”: I_{FRM} repetitive peak forward current condition amended • Table 5 “Limiting values”: I_{FSM} non-repetitive peak forward current condition amended • Table 6: $R_{th(j-sp)}$ thermal resistance from junction to solder point table note added • Table 7 “Characteristics”: V_F forward voltage unit amended • Figure 2: figure title and figure note amended • Figure 3: amended • Section 12 “Mounting”: added • Section 14.4 “Trademarks”: added			
BAS21H_1	20050411	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".

[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.nxp.com.

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16. Contents

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