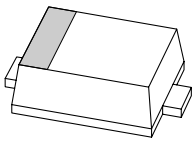

BAS16H

High-speed switching diode in SOD123F package

Rev. 01 — 15 April 2005 Product data sheet

1. Product profile

1.1 General description

The BAS16H is a high-speed switching diode fabricated in planar technology, and encapsulated in a SOD123F small and flat plastic package.

1.2 Features

- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 100 V
- Repetitive peak reverse voltage: max. 100 V
- Repetitive peak forward current: max. 500 mA
- Small and flat plastic package

1.3 Applications

- High-speed switching in hybrid thick and thin-film circuits
- Mobile communication
- Digital (still) cameras
- Personal Digital Assistants (PDA)
- Personal Computer Memory Card International Association (PCMCIA) cards

1.4 Quick reference data

Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_R	reverse voltage		-	-	100	V
I_{FRM}	repetitive peak forward current		-	-	500	mA
t_{rr}	reverse recovery time	[1]	-	-	4	ns

[1] When switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA.

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2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
1	cathode [1]		 sym006
2	anode		

[1] The marking bar indicates the cathode.

3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
BAS16H	-	plastic surface mounted package; 2 leads	SOD123F

4. Marking

Table 4: Marking codes

Type number	Marking code
BAS16H	A1

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			-	100	V
V_R	reverse voltage			-	100	V
I_F	forward current		[1]	-	215	mA
I_{FRM}	repetitive peak forward current			-	500	mA
I_{FSM}	non-repetitive peak forward current	t_p = 50 µs	[2]	-	4	A
		t_p = 1 ms	[2]	-	2	A
		t_p = 10 ms	[2]	-	1.5	A
P_{tot}	total power dissipation		[1]	-	0.38	W
			[3]	-	0.83	W
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			–65	+150	°C
T_{stg}	storage temperature			–65	+150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB) with 60 µm copper strip line.

[2] Square wave; T_j = 25 °C prior to surge.

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.

6. Thermal characteristics

Table 6: Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient		[1]	-	-	330	K/W
			[2]	-	-	150	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point			-	-	70	K/W

[1] Device mounted on an FR4 PCB with 60 µm copper strip line.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2.

7. Characteristics

Table 7: Characteristics

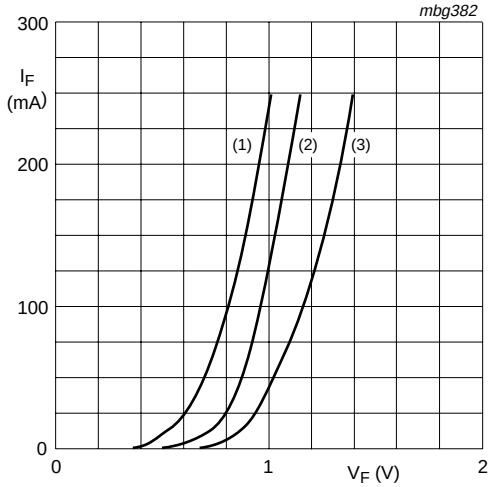
T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_F	forward voltage	I_F = 1 mA	[1]	-	-	715	mV
		I_F = 10 mA	[1]	-	-	855	mV
		I_F = 50 mA	[1]	-	-	1	V
		I_F = 150 mA	[1]	-	-	1.25	V
I_R	reverse current	V_R = 25 V		-	-	30	nA
		V_R = 75 V		-	-	1	µA
		V_R = 25 V; T_j = 150 °C		-	-	30	µA
		V_R = 75 V; T_j = 150 °C		-	-	50	µA
C_d	diode capacitance	V_R = 0 V; f = 1 MHz		-	-	1.5	pF
t_{rr}	reverse recovery time		[2]	-	-	4	ns
V_{FR}	forward recovery voltage		[3]	-	-	1.75	V

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

[2] When switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA.

[3] When switched from I_F = 10 mA; t_p = 20 ns.

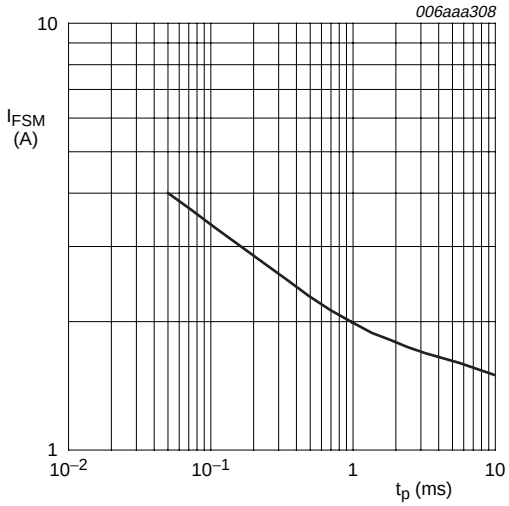


(1) T_{amb} = 150 °C; typical values

(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

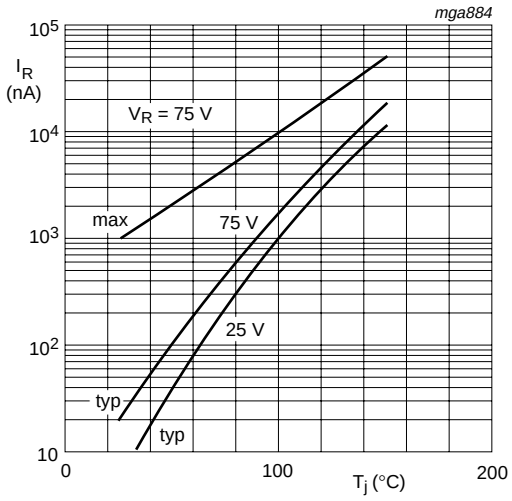
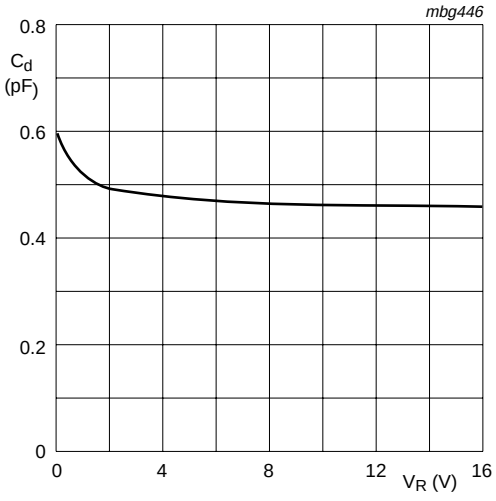


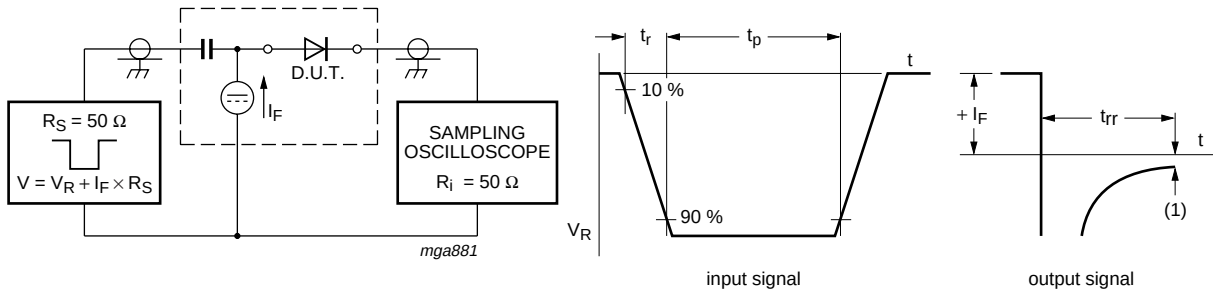
Fig 3. Reverse current as a function of junction temperature



f = 1 MHz; T_j = 25 °C

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

8. Test information

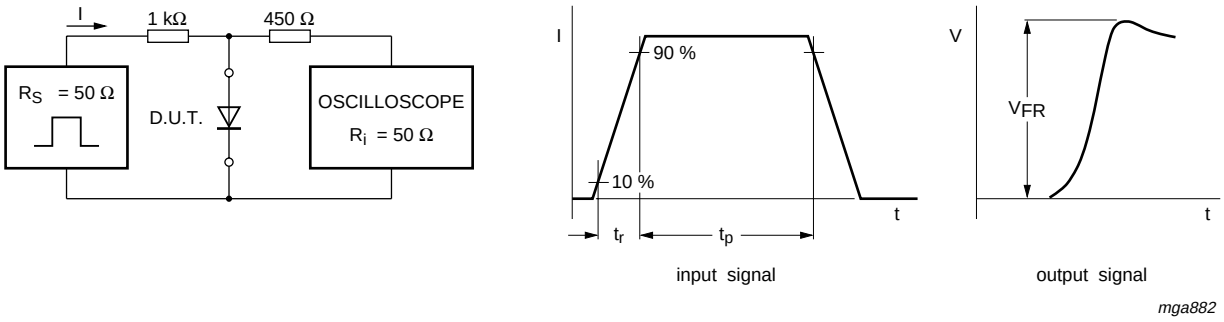


(1) I_R = 1 mA

Input signal: reverse pulse rise time t_r = 0.6 ns; reverse voltage pulse duration t_p = 100 ns; duty factor δ = 0.05

Oscilloscope: rise time t_r = 0.35 ns

Fig 5. Reverse recovery time test circuit and waveforms



Input signal: forward pulse rise time t_r = 20 ns; forward current pulse duration $t_p \geq$ 100 ns; duty factor δ ≤ 0.005

Fig 6. Forward recovery voltage test circuit and waveforms

9. Package outline

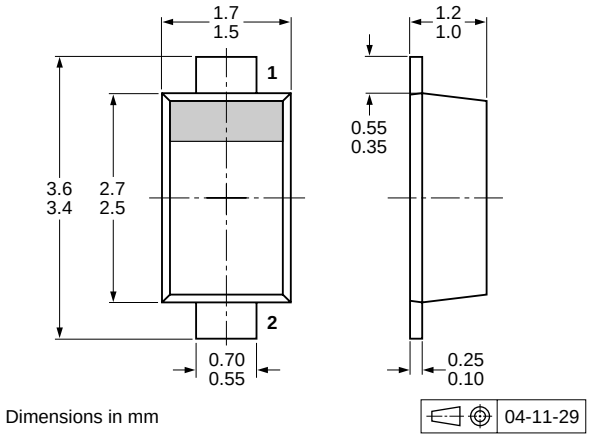


Fig 7. Package outline SOD123F

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
BAS16H	SOD123F	4 mm pitch, 8 mm tape and reel	-115

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

11. Soldering

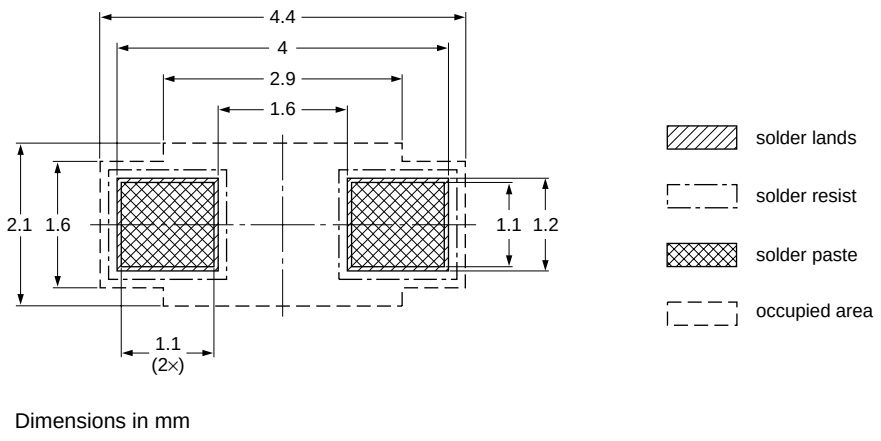


Fig 8. Reflow soldering footprint

12. Revision history

Table 9: Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
BAS16H_1	20050415	Product data sheet	-	9397 750 14478	-

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.
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.

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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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17. Contents

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