



# BAS116H

Low leakage switching diode

Rev. 3 — 31 May 2011

Product data sheet

## 1. Product profile

### 1.1 General description

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

### 1.2 Features and benefits

- Small and flat lead SMD plastic package
- Low leakage current
- Excellent coplanarity and improved thermal behavior
- AEC-Q101 qualified

### 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][2]	-	215	mA
$I_R$	reverse current	$V_R = 75\text{ V}$	-	0.003	5.0	nA
$V_R$	reverse voltage		-	-	75	V
$t_{rr}$	reverse recovery time		[3]	0.8	3.0	$\mu\text{s}$




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

[2] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[3] When switched from  $I_F = 10\ \text{mA}$  to  $I_R = 10\ \text{mA}$ ;  $R_L = 100\ \Omega$ ; measured at  $I_R = 1\ \text{mA}$ .

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode	[1]	1  2
2	anode		 sym001

[1] The marking bar indicates the cathode.

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### 3. Ordering information

Table 3. Ordering information

Type number	Package		Version
	Name	Description	
BAS116H	-	plastic surface-mounted package; 2 leads	SOD123F

### 4. Marking

Table 4. Marking codes

Type number	Marking code
BAS116H	B1

### 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		-	85	V
$V_R$	reverse voltage		-	75	V
$I_F$	forward current		[1][2]	215	mA
$I_{FRM}$	repetitive peak forward current		-	500	mA
$I_{FSM}$	non-repetitive peak forward current	square wave	[3]		
		$t_p = 1 \mu\text{s}$	-	4	A
		$t_p = 1 \text{ms}$	-	1	A
		$t_p = 1 \text{s}$	-	0.5	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$	[1][4] [5]	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 PCB, single-sided copper, tin-plated and standard footprint.

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

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

[4] Reflow soldering is the only recommended soldering method.

[5] Soldering point of cathode tab.

## 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

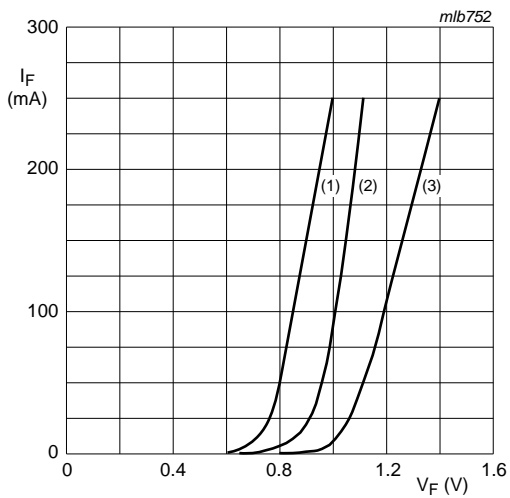
**Table 7. Characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage		[1]			
		$I_F = 1\text{ mA}$	-	-	0.90	V
		$I_F = 10\text{ mA}$	-	-	1.00	V
		$I_F = 50\text{ mA}$	-	-	1.10	V
		$I_F = 150\text{ mA}$	-	-	1.25	V
$I_R$	reverse current	$V_R = 75\text{ V}$	-	0.003	5.0	nA
		$V_R = 75\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	-	3	80.0	nA
$C_d$	diode capacitance	$V_R = 0\text{ V}; f = 1\text{ MHz}$	-	2	-	pF
$t_{rr}$	reverse recovery time		[2]	0.8	3.0	$\mu\text{s}$

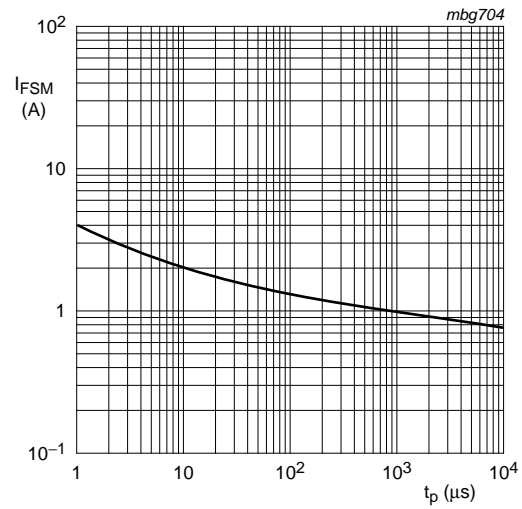
[1] Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

[2] When switched from  $I_F = 10\text{ mA}$  to  $I_R = 10\text{ mA}$ ;  $R_L = 100\text{ }\Omega$ ; measured at  $I_R = 1\text{ mA}$ .



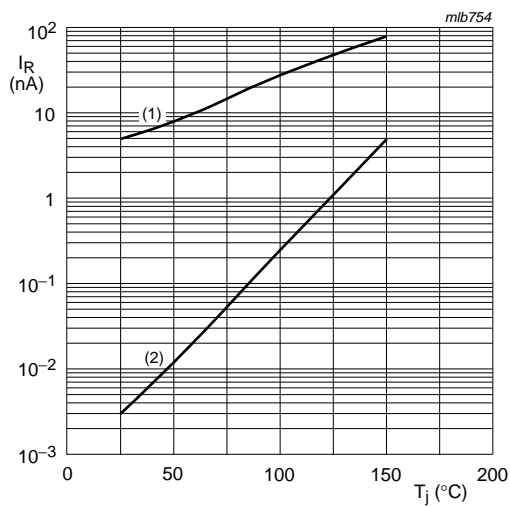
- (1)  $T_{amb} = 150\text{ }^{\circ}\text{C}$ ; typical values
- (2)  $T_{amb} = 25\text{ }^{\circ}\text{C}$ ; typical values
- (3)  $T_{amb} = 25\text{ }^{\circ}\text{C}$ ; maximum values

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



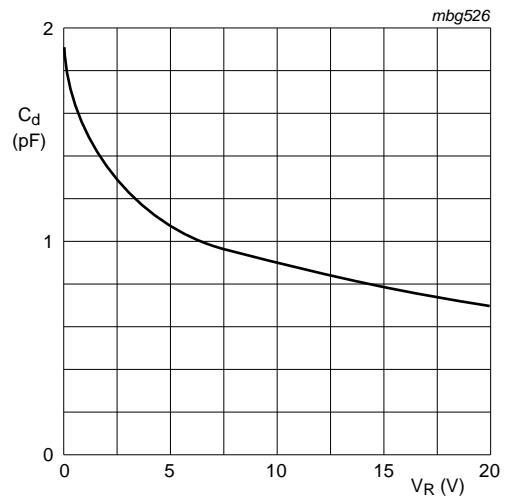
Based on square wave currents  
 $T_j = 25\text{ }^{\circ}\text{C}$ ; prior to surge

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



- $V_R = 75\text{ V}$
- (1) Maximum values
  - (2) Typical values

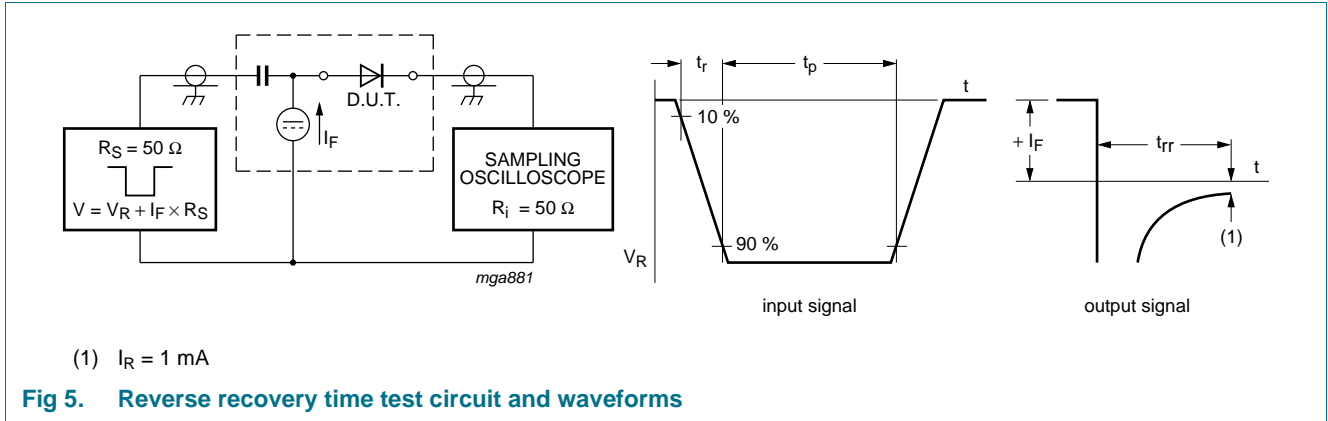
**Fig 3. Reverse current as a function of junction temperature**



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

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

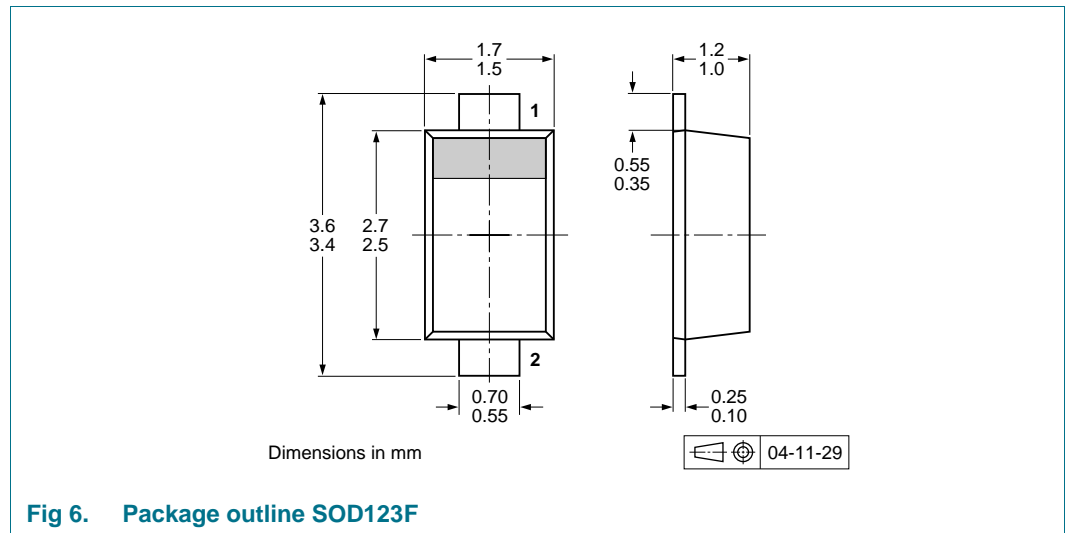
## 8. Test information



### 8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

## 9. Package outline



## 10. Packing information

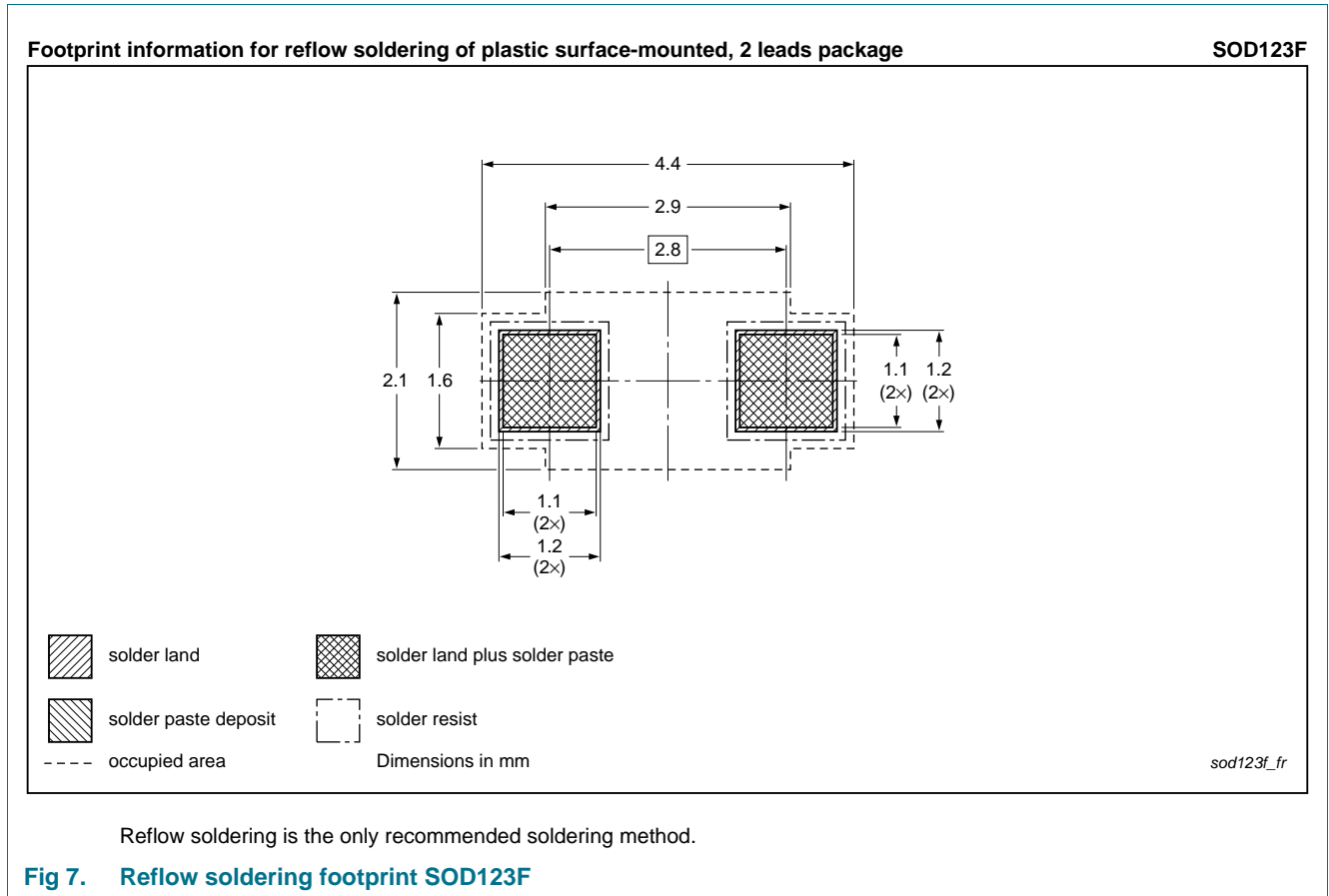
**Table 8. Packing methods**

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

Type number	Package	Description	Packing quantity	
			3000	10000
BAS116H	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135

[1] For further information and the availability of packing methods, see [Section 14](#).

## 11. Soldering



## 12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAS116H v.3	20110531	Product data sheet	-	BAS116H v.2
Modifications:	<ul style="list-style-type: none"><li>• <a href="#">Section 1 "Product profile"</a>: updated.</li><li>• <a href="#">Table 5</a> and <a href="#">6</a>: updated.</li><li>• <a href="#">Table 7</a>: <math>V_F</math> values changed from mV to V.</li><li>• <a href="#">Figure 2</a>: updated.</li><li>• <a href="#">Section 8.1 "Quality information"</a>: added.</li><li>• <a href="#">Figure 7</a>: updated.</li><li>• <a href="#">Section 13 "Legal information"</a>: updated.</li></ul>			
BAS116H v.2	20091214	Product data sheet	-	BAS116H v.1
BAS116H v.1	20050411	Product data sheet	-	-

## 13. Legal information

### 13.1 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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