

# BAT54H

Schottky barrier single diode in small SOD123F package

Rev. 01 — 7 April 2005

Product data sheet

## 1. Product profile

### 1.1 General description

Planar Schottky barrier single diode with an integrated guard ring for stress protection, encapsulated in a SOD123F small and flat lead SMD plastic package.

### 1.2 Features

- Low forward voltage
- Small and flat lead SMD plastic package
- Low capacitance
- Flat leads: excellent coplanarity and improved thermal behavior

### 1.3 Applications

- Ultra high-speed switching
- Voltage clamping
- Line termination
- Inverse-polarity protection

### 1.4 Quick reference data



Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_F$	forward current		-	-	200	mA
$V_R$	reverse voltage		-	-	30	V
$V_F$	forward voltage	$I_F = 10 \text{ mA}$	[1]	-	400	mV

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

## 2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
1	cathode	[1]	
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	
BAT54H	-	plastic surface mounted package; 2 leads	SOD123F

### 4. Marking

Table 4: Marking codes

Type number	Marking code
BAT54H	AG

### 5. Limiting values

Table 5: Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
$V_R$	reverse voltage		-	30	V
$I_F$	forward current		-	200	mA
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1 \text{ s}$ ; $\delta \leq 0.5$	-	300	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p \leq 10 \text{ ms}$	-	600	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25 \text{ °C}$	[1]	375	mW
$T_j$	junction temperature		-	125	°C
$T_{amb}$	ambient temperature		-65	+125	°C
$T_{stg}$	storage temperature		-65	+150	°C

[1] 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.

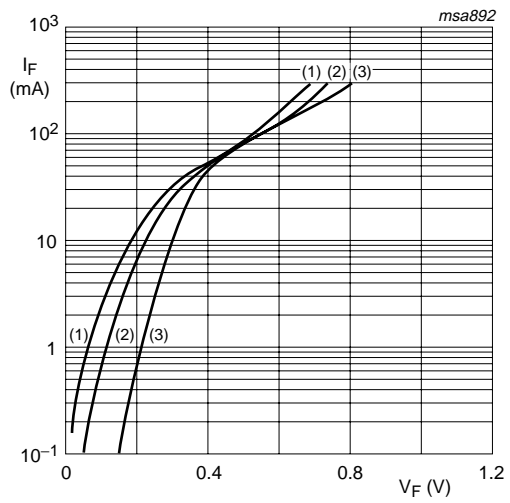
[3] Soldering point of cathode tab.

## 7. Characteristics

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

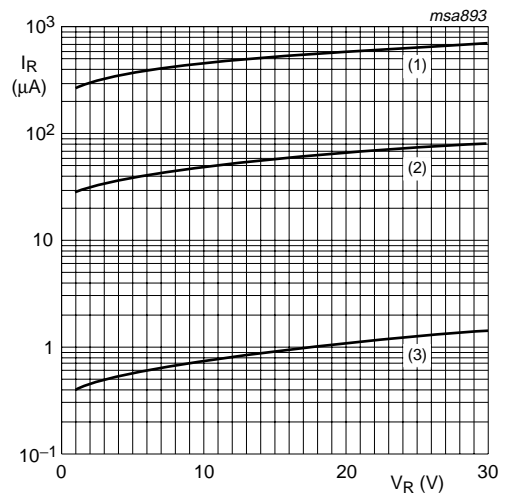
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 0.1 mA	[1] -	-	240	mV
		I <sub>F</sub> = 1 mA	[1] -	-	320	mV
		I <sub>F</sub> = 10 mA	[1] -	-	400	mV
		I <sub>F</sub> = 30 mA	[1] -	-	500	mV
		I <sub>F</sub> = 100 mA	[1] -	-	800	mV
I <sub>R</sub>	reverse current	V <sub>R</sub> = 25 V	-	-	2	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 1 V; f = 1 MHz	-	-	10	pF

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



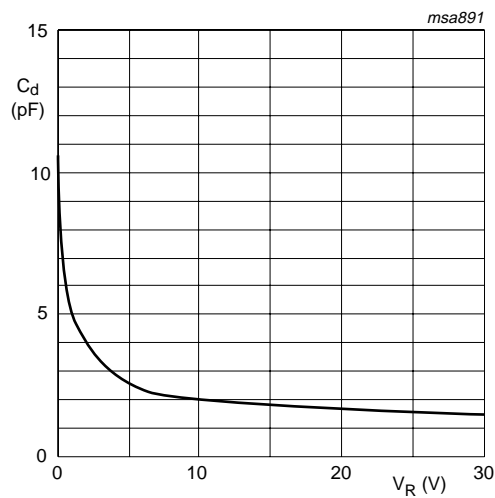
- (1)  $T_{amb} = 125\text{ °C}$
- (2)  $T_{amb} = 85\text{ °C}$
- (3)  $T_{amb} = 25\text{ °C}$

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



- (1)  $T_{amb} = 125\text{ °C}$
- (2)  $T_{amb} = 85\text{ °C}$
- (3)  $T_{amb} = 25\text{ °C}$

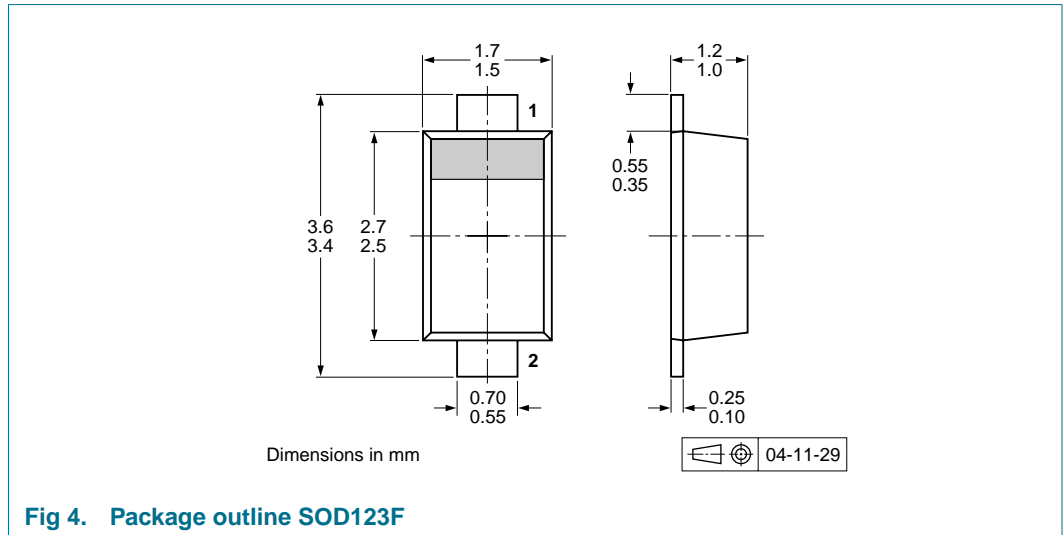
**Fig 2. Reverse current as a function of reverse voltage; typical values**



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

**Fig 3. Diode capacitance as a function of reverse voltage; typical values**

## 8. Package outline



## 9. Packing information

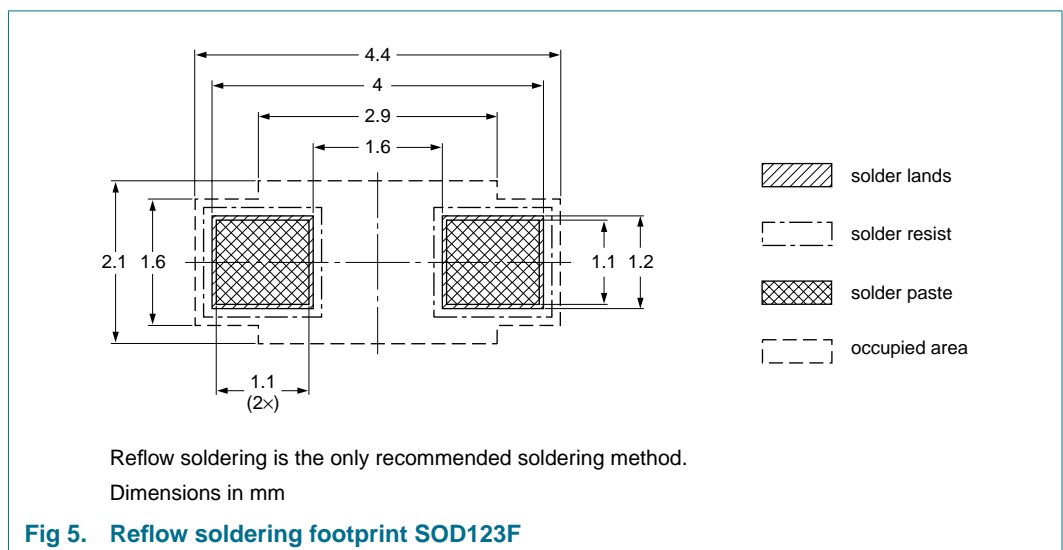
**Table 8: Packing methods**

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

Type number	Package	Description	Packing quantity	
			3000	10000
BAT54H	SOD123F	4 mm pitch, 8 mm tape and reel	-115	-135

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

## 10. Soldering



## 11. Revision history

Table 9: Revision history

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
BAT54H_1	20050407	Product data sheet	-	9397 750 14919	-

## 12. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2] [3]</sup>	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.
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**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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Date of release: 7 April 2005  
Document number: 9397 750 14919

Published in The Netherlands