

# BAT54H

Schottky barrier single diode in small SOD123F package

Rev. 02 — 13 January 2010

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


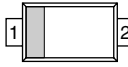
Table 1. Quick reference data

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:  $t_p \leq 300 \text{ } \mu\text{s}$ ;  $\delta \leq 0.02$ .

## 2. Pinning information

Table 2. Pinning

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

*sym001*

[1] The marking bar indicates the cathode.

### 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	$t_p \leq 1$ s; $\delta \leq 0.5$	-	300	mA
$I_{FSM}$	non-repetitive peak forward current	$t_p \leq 10$ ms	-	600	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25$ °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.

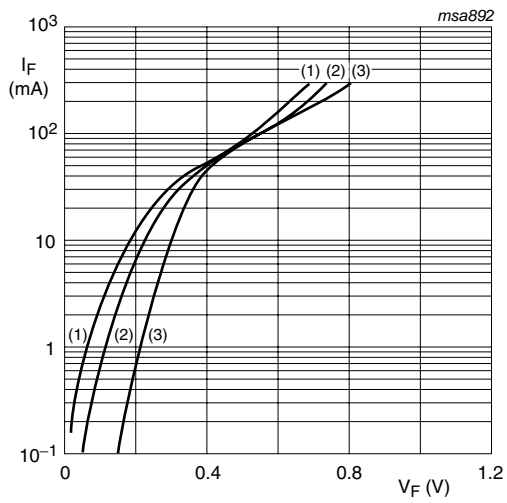
## 7. Characteristics

**Table 7. Characteristics**

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

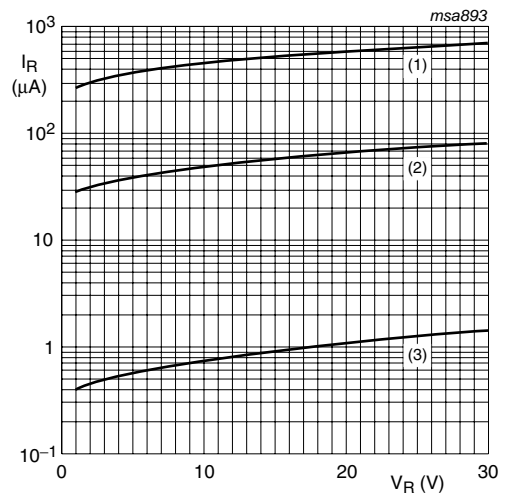
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 0.1\text{ mA}$	[1] -	-	240	mV
		$I_F = 1\text{ mA}$	[1] -	-	320	mV
		$I_F = 10\text{ mA}$	[1] -	-	400	mV
		$I_F = 30\text{ mA}$	[1] -	-	500	mV
		$I_F = 100\text{ mA}$	[1] -	-	800	mV
$I_R$	reverse current	$V_R = 25\text{ V}$	-	-	2	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}$	-	-	10	pF

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



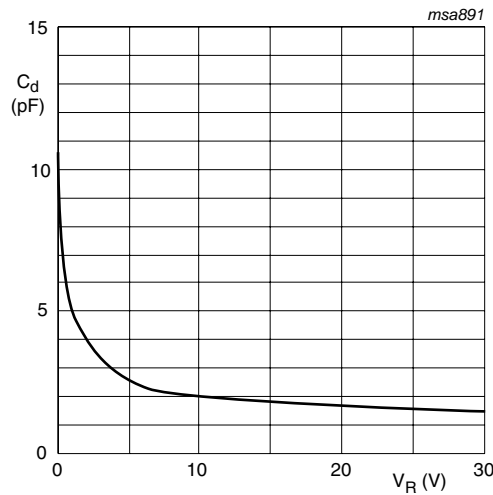
- (1)  $T_{amb} = 125\text{ }^\circ\text{C}$
- (2)  $T_{amb} = 85\text{ }^\circ\text{C}$
- (3)  $T_{amb} = 25\text{ }^\circ\text{C}$

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



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

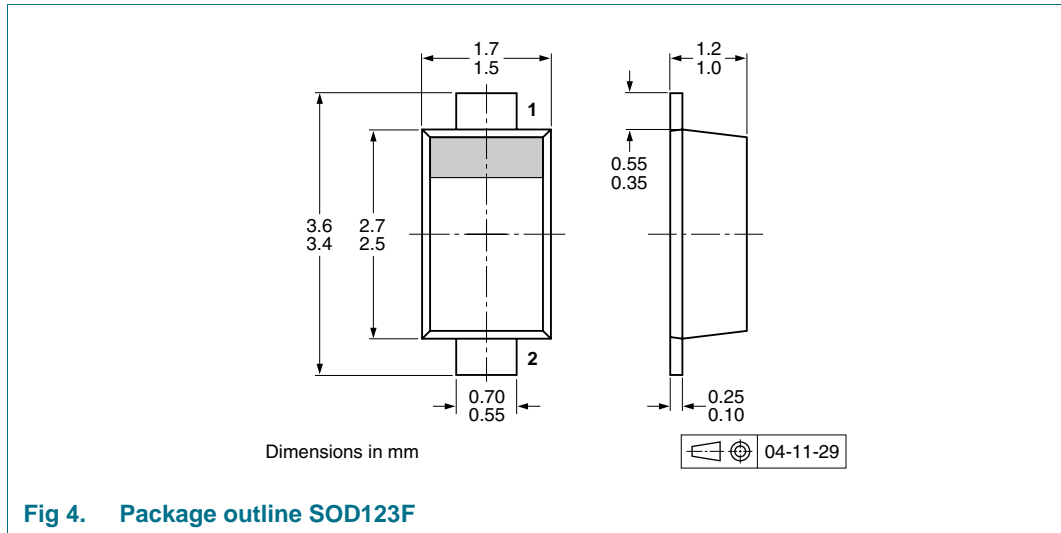
**Fig 2. Reverse current as a function of reverse voltage; typical values**



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

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

## 8. Package outline



## 9. Packing information

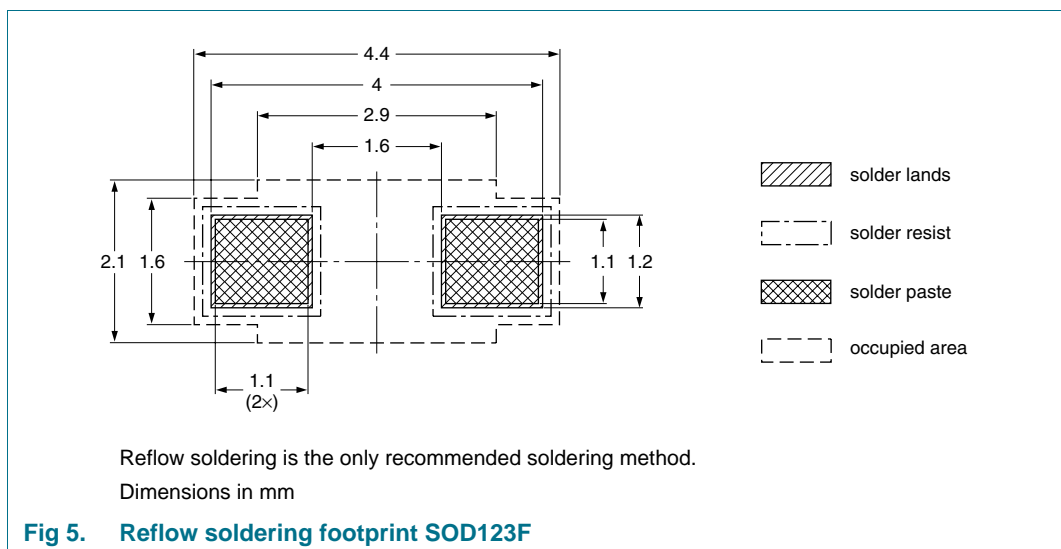
**Table 8. Packing methods**

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

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 13](#).

## 10. Soldering



## 11. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAT54H_2	20100113	Product data sheet	-	BAT54H_1
Modifications:	<ul style="list-style-type: none"><li>This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content.</li></ul>			
BAT54H_1	20050407	Product data sheet	-	-

## 12. Legal information

### 12.1 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.nxp.com>.

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