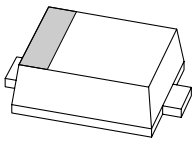

# BAT54H

## 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 mA | [1] | - | - | 400 | mV |

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

## 2. Pinning information

**Table 2: Pinning**

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

[1] The marking bar indicates the cathode.

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## 3. Ordering information

**Table 3: Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| 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.

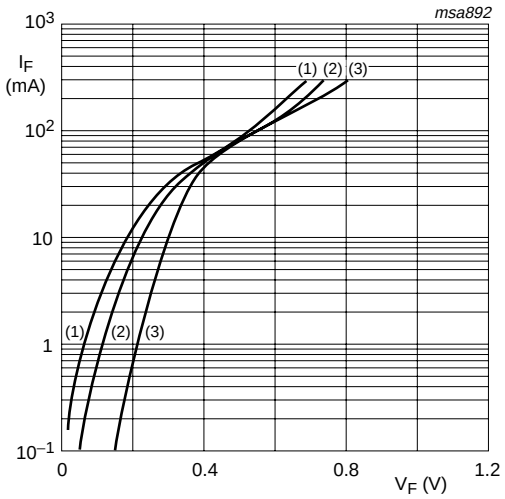
## 7. Characteristics

**Table 7: Characteristics**

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

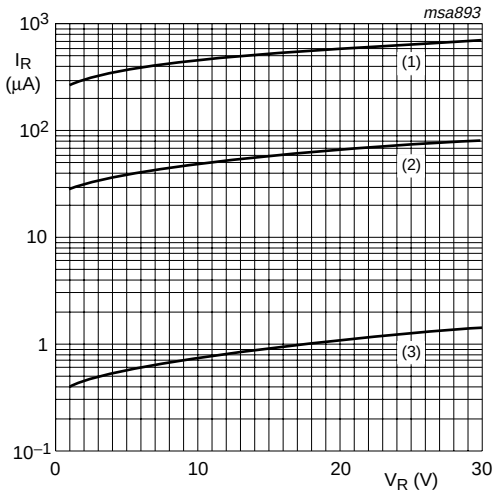
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $V_F$ | forward voltage | $I_F$ = 0.1 mA | [1] | - | - | 240 | mV |
| | | $I_F$ = 1 mA | [1] | - | - | 320 | mV |
| | | $I_F$ = 10 mA | [1] | - | - | 400 | mV |
| | | $I_F$ = 30 mA | [1] | - | - | 500 |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

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



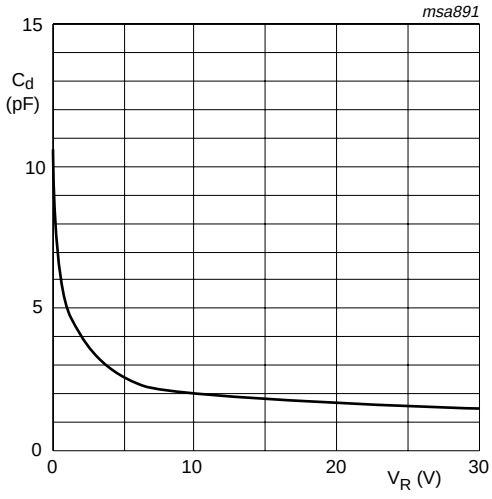

(1) $T_{amb}$ = 125 °C
(2) $T_{amb}$ = 85 °C
(3) $T_{amb}$ = 25 °C

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




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

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




$T_{amb}$ = 25 °C; f = 1 MHz

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

## 8. Package outline

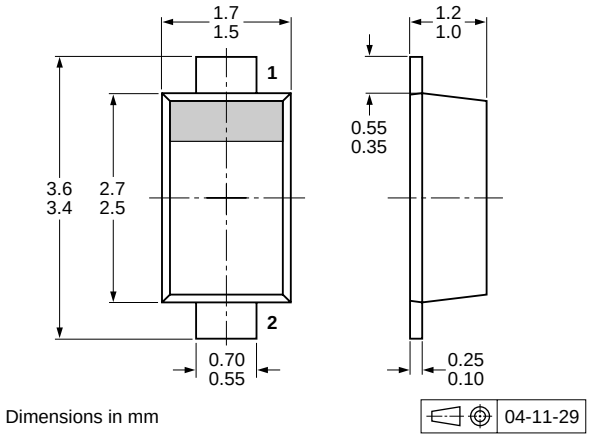



**Fig 4. Package outline SOD123F**

## 9. Packing information

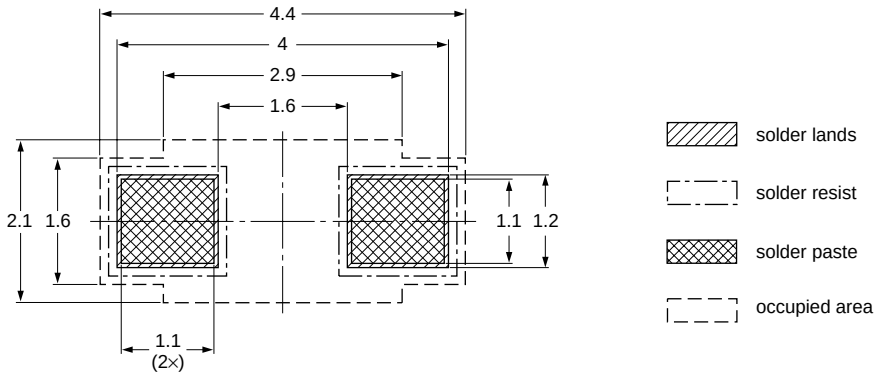
**Table 8: Packing methods**

*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




Reflow soldering is the only recommended soldering method.

Dimensions in mm

**Fig 5. Reflow soldering footprint SOD123F**

## 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 [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. |
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

## 13. Definitions

**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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