



# BAT54H

Schottky barrier single diode in small SOD123F package

08 October 2024

Product data sheet

## 1. General description

Planar Schottky barrier diode with an integrated guard ring for stress protection, encapsulated in a SOD123F small and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Low forward voltage
- Low capacitance

## 3. Applications

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

## 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	$I_F = 10 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25^\circ\text{C}$	-	-	400	mV

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode <sup>[1]</sup>		
2	A	anode		

[1] The marking bar indicates the cathode.

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## 6. Ordering information

**Table 3. Ordering information**

Type number	Package		
	Name	Description	Version
BAT54H	SOD123F	plastic, surface-mounted package; 2 leads; 2.6 mm x 1.6 mm x 1.1 mm body	<a href="#">SOD123F</a>

## 7. Marking

**Table 4. Marking codes**

Type number	Marking code
BAT54H	AG

## 8. 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	$t_p \leq 10 \text{ ms}; T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$		-	600	mA
$P_{\text{tot}}$	total power dissipation	$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	-	375	mW
$T_j$	junction temperature			-	125	$^\circ\text{C}$
$T_{\text{amb}}$	ambient temperature			-65	125	$^\circ\text{C}$
$T_{\text{stg}}$	storage temperature			-65	150	$^\circ\text{C}$

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

## 9. Thermal characteristics

**Table 6. Thermal characteristics**

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

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Soldering point of cathode tab.

## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 0.1 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25^\circ\text{C}$		-	-	240	mV
		$I_F = 1 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25^\circ\text{C}$		-	-	320	mV
		$I_F = 10 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25^\circ\text{C}$		-	-	400	mV
		$I_F = 30 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25^\circ\text{C}$		-	-	500	mV
		$I_F = 100 \text{ mA}$ ; pulsed; $t_p \leq 300 \mu\text{s}$ ; $\delta \leq 0.02$ ; $T_{\text{amb}} = 25^\circ\text{C}$		-	-	800	mV
$I_R$	reverse current	$V_R = 25 \text{ V}$ ; $T_{\text{amb}} = 25^\circ\text{C}$		-	-	2	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1 \text{ V}$ ; $f = 1 \text{ MHz}$ ; $T_{\text{amb}} = 25^\circ\text{C}$		-	-	10	$\text{pF}$

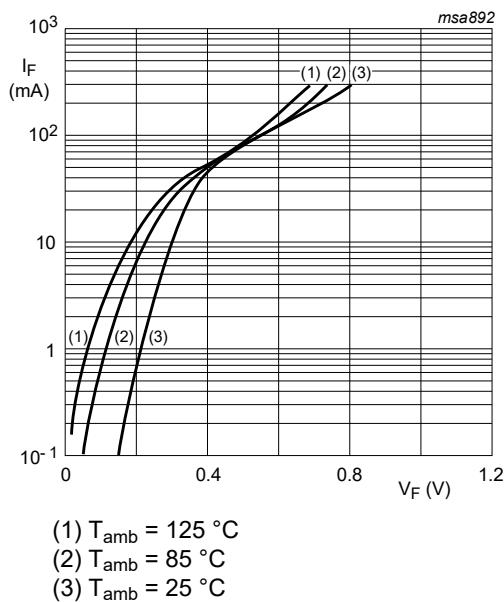


Fig. 1. Forward current as a function of forward voltage; typical values

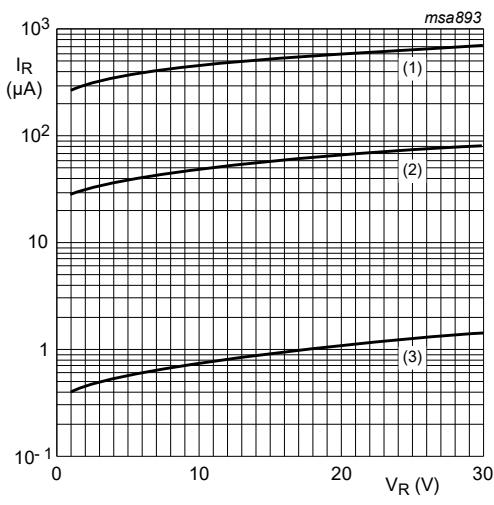
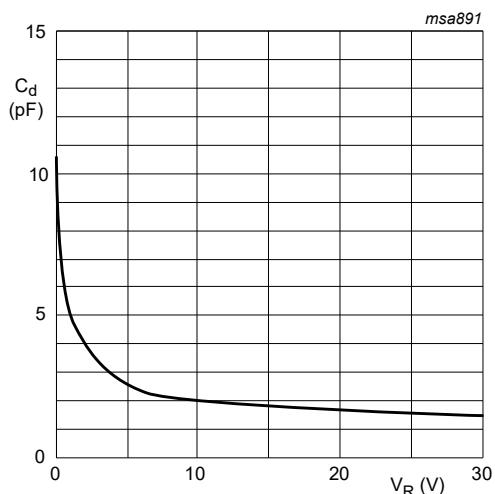


Fig. 2. Reverse current as a function of reverse voltage; typical values

## Schottky barrier single diode in small SOD123F package



$f = 1$  MHz;  $T_{amb} = 25$  °C

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

## 11. Package outline

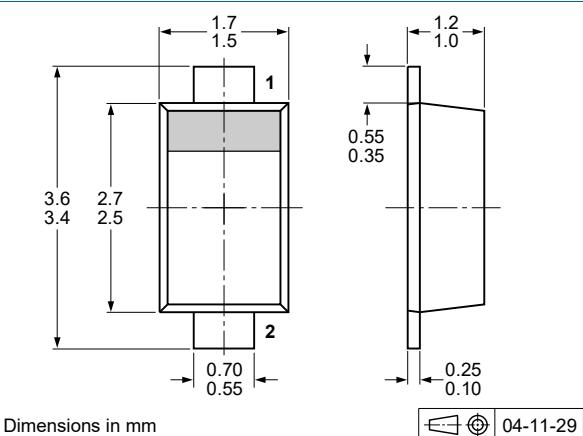


Fig. 4. Package outline SOD123F

## 12. Soldering

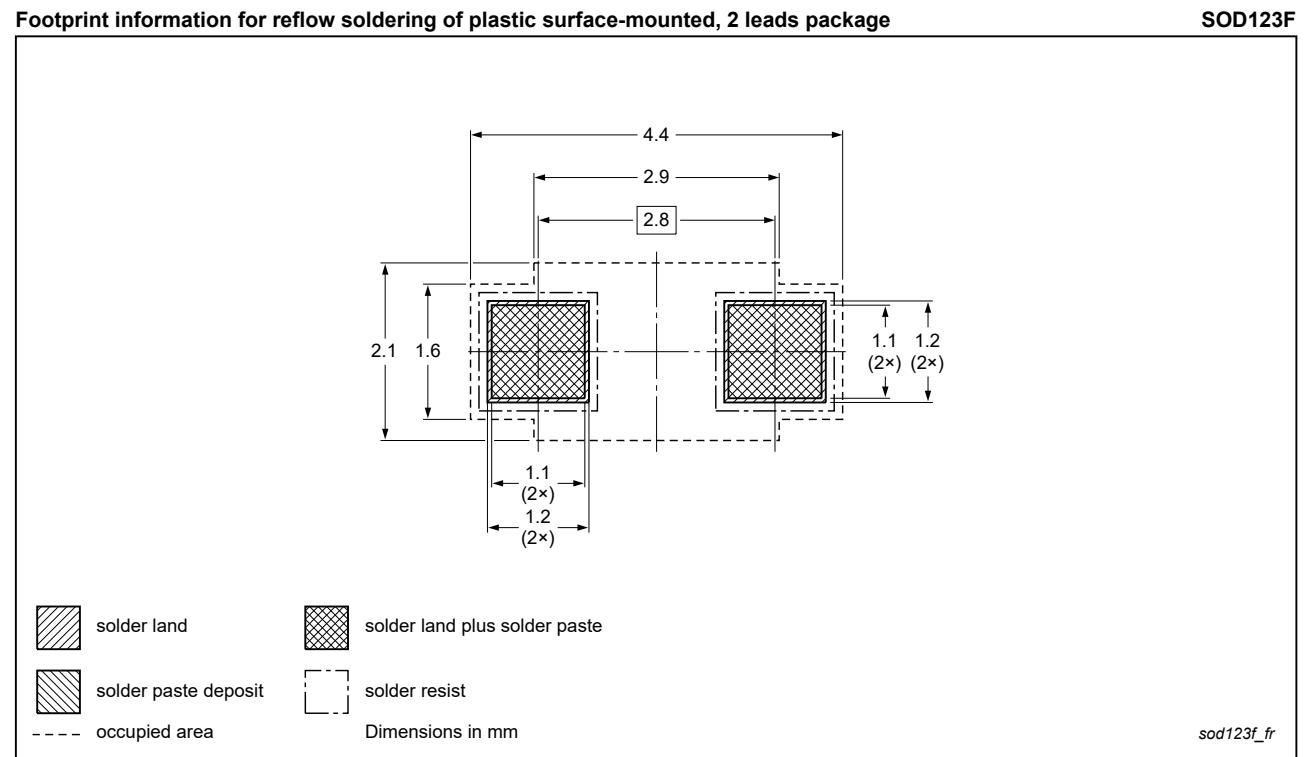


Fig. 5. Reflow soldering footprint for SOD123F

## 13. Revision history

**Table 8. Revision history**

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT54H v.4	20241008	Product data sheet	-	BAT54H v.3
Modifications:	<ul style="list-style-type: none"><li>Product changed to non automotive. Please refer to the automotive product(s) with -Q.</li></ul>			
BAT54H v.3	20120725	Product data sheet	-	BAT54H v.2
BAT54H v.2	20100128	Product data sheet	-	BAT54H v.1
BAT54H v.1	20050407	Product data sheet	-	

## 14. Legal information

### Data sheet status

Document status [1][2]	Product status [3]	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.
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