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Kind regards,

Team Nexperia

# **BAT54H**

# Schottky barrier single diode in small SOD123F package 25 July 2012 Product data sheet

# 1. Product profile

## 1.1 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.

#### 1.2 Features and benefits

- Low forward voltage
- Low capacitance
- AEC-Q101 qualified

# 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	Тур	Max	Unit
l <sub>F</sub>	forward current		-	-	200	mA
$V_R$	reverse voltage		-	-	30	V
V <sub>F</sub>	forward voltage	$I_F$ = 10 mA; pulsed; $t_p \le 300$ μs; $\delta \le 0.02$ ; $T_{amb}$ = 25 °C	-	-	400	mV

# 2. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	К	cathode[1]	1 2	к <del>_<b>ј</b>С </del> А
2	А	anode	SOD123F	aaa-003679

<sup>[1]</sup> The marking bar indicates the cathode.





## Schottky barrier single diode in small SOD123F package

# 3. Ordering information

#### Table 3. Ordering information

Type number	Package	age				
	Name	Description	Version			
BAT54H	SOD123F	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
l <sub>F</sub>	forward current			-	200	mA
I <sub>FRM</sub>	repetitive peak forward current	$t_p \le 1 \text{ s}; \ \delta \le 0.5$		-	300	mA
I <sub>FSM</sub>	non-repetitive peak forward current	$t_p \le 10 \text{ ms; } T_{j(init)} = 25 ^{\circ}\text{C}$		-	600	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> = 25 °C	[1]	-	375	mW
Tj	junction temperature			-	125	°C
T <sub>amb</sub>	ambient temperature			-65	125	°C
T <sub>stg</sub>	storage temperature			-65	150	°C

<sup>[1]</sup> 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	Тур	Max	Unit
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1]	-	-	330	K/W
R <sub>th(j-sp)</sub>	thermal resistance from junction to solder point		[2]	-	-	70	K/W

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## Schottky barrier single diode in small SOD123F package

- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [2] Soldering point of cathode tab.

# 7. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V <sub>F</sub>	forward voltage	$I_F$ = 0.1 mA; pulsed; $t_p \le 300$ μs; $δ \le 0.02$ ; $T_{amb}$ = 25 °C	-	-	240	mV
		$I_F$ = 1 mA; pulsed; $t_p \le 300$ μs; $δ \le 0.02$ ; $T_{amb}$ = 25 °C	-	-	320	mV
		$I_F$ = 10 mA; pulsed; $t_p \le 300$ μs; $δ \le 0.02$ ; $T_{amb}$ = 25 °C	-	-	400	mV
		$I_F$ = 30 mA; pulsed; $t_p \le$ 300 μs; $δ \le$ 0.02 ; $T_{amb}$ = 25 °C	_	-	500	mV
		$I_F$ = 100 mA; pulsed; $t_p \le 300$ μs; $δ \le 0.02$ ; $T_{amb}$ = 25 °C	-	-	800	mV
I <sub>R</sub>	reverse current	V <sub>R</sub> = 25 V; T <sub>amb</sub> = 25 °C	-	-	2	μΑ
C <sub>d</sub>	diode capacitance	f = 1 MHz; T <sub>amb</sub> = 25 °C; V <sub>R</sub> = 1 V	-	-	10	pF

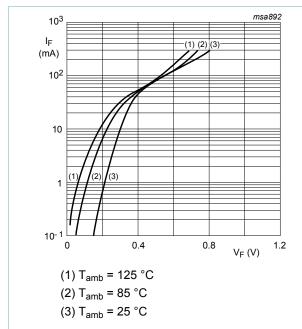
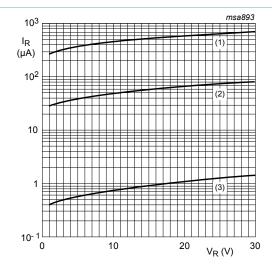


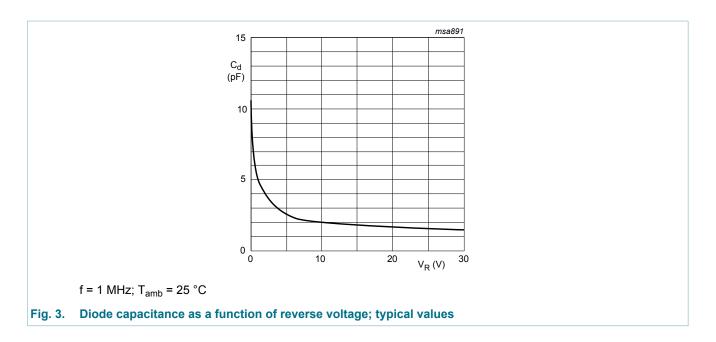
Fig. 1. Forward current as a function of forward voltage; typical values



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

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

## Schottky barrier single diode in small SOD123F package

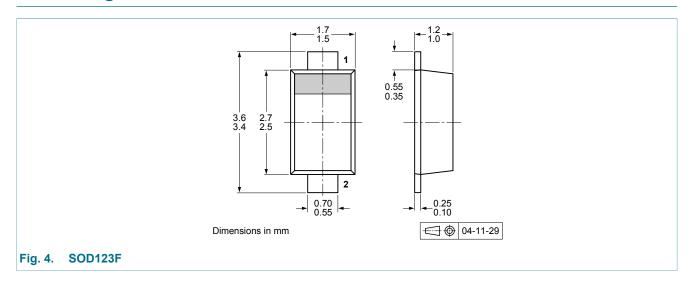


# 8. Test information

# 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.

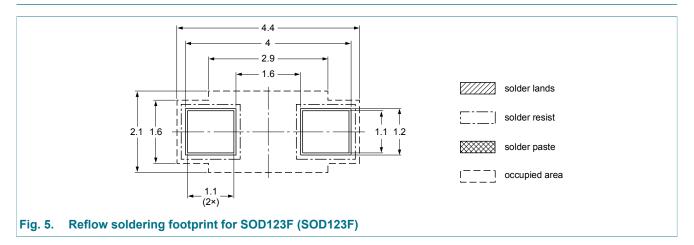
# 9. Package outline



BAT54H

# Schottky barrier single diode in small SOD123F package

# 10. Soldering



# 11. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes		
BAT54H v.3	20120725	Product data sheet	-	BAT54H v.2		
Modifications:	<ul> <li>The format of this document has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> <li>Section "Test information" added</li> </ul>					
BAT54H v.2	20100128	Product data sheet	-	BAT54H v.1		
BAT54H v.1	20050407	Product data sheet	-			

#### Schottky barrier single diode in small SOD123F package

# 12. Legal information

#### 12.1 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.
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Product [short] data sheet	Production	This document contains the product specification.

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BAT54H

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# Schottky barrier single diode in small SOD123F package

# 13. Contents

1	Product profile	1
1.1	General description	1
1.2	Features and benefits	1
1.3	Applications	1
1.4	Quick reference data	1
2	Pinning information	1
3	Ordering information	2
4	Marking	2
5	Limiting values	2
6	Thermal characteristics	2
7	Characteristics	3
8	Test information	4
8.1	Quality information	
9	Package outline	4
10	Soldering	5
11	Revision history	5
12	Legal information	6
12.1	Data sheet status	6
12.2	Definitions	6
12.3	Disclaimers	6
12.4	Trademarks	7

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## Офис по работе с юридическими лицами:

105318, г. Москва, ул. Щербаковская д. 3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru moschip.ru\_6 moschip.ru\_4 moschip.ru\_9