BAT74

Schottky barrier double diode

Rev. 03 — 19 April 2010 Product data sheet

1. Product profile

1.1 General description

Planar Schottky barrier double diode with an integrated guard ring for stress protection. Two electrically isolated Schottky barrier diodes, encapsulated in a small SOT143B Surface-Mounted Device (SMD) plastic package.

1.2 Features and benefits

- Low forward voltage
- Guard-ring protected
- Small SMD plastic package

1.3 Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits
- Blocking diodes

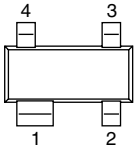
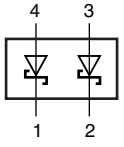
1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per diode						
I_F	forward current		-	-	200	mA
V_R	reverse voltage		-	-	30	V
V_F	forward voltage	I_F = 100 mA	-	-	800	mV

2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	cathode (diode 1)		
2	cathode (diode 2)		
3	anode (diode 2)		
4	anode (diode 1)		

006aaa434

3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT74	-	plastic surface-mounted package; 4 leads	SOT143B

4. Marking

Table 4. Marking codes

Type number	Marking code[1]
BAT74	*L4

[1] * = -: made in Hong Kong
* = p: made in Hong Kong
* = t: made in Malaysia
* = W: made in China

5. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
Per diode						
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	$t_p < 10$ ms		-	600	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C		-	230	mW
T_j	junction temperature			-	125	°C
T_{amb}	ambient temperature			−65	+125	°C
T_{stg}	storage temperature			−65	+150	°C
Double diode operation						
V_R	reverse voltage			-	30	V
			[1]	-	60	V
I_F	forward current		[2]	-	110	mA
I_{FRM}	repetitive peak forward current	$t_p \leq 1$ s; $\delta \leq 0.5$		-	200	mA

[1] Series connection.

[2] If both diodes are in forward operation at the same moment, total device current is max. 110 mA. If one diode is in reverse operation and the other is in forward operation at the same moment, total device current is max. 200 mA.

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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]	-	-	500	K/W

[1] Refer to SOT143B standard mounting conditions.

7. Characteristics

Table 7. Characteristics

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

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per diode							
V_F	forward voltage	I_F = 0.1 mA		-	-	240	mV
		I_F = 1 mA	[1]	-	-	320	mV
		I_F = 10 mA		-	-	400	mV
		I_F = 30 mA		-	-	500	mV
		I_F = 100 mA		-	-	800	mV
I_R	reverse current	V_R = 25 V	[2]	-	-	2	μA
C_d	diode capacitance	V_R = 1 V; f = 1 MHz		-	-	10	pF
t_{rr}	reverse recovery time		[3]	-	-	5	ns

[1] Temperature coefficient of forward voltage −0.6 %/K.

[2] Pulse test: t_p = 300 μs; δ = 0.02.

[3] When switched from I_F = 10 mA to I_R = 10 mA; R_L = 100 Ω; measured at I_R = 1 mA.

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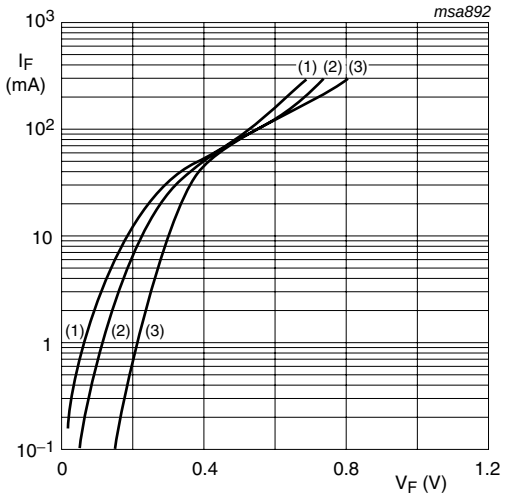
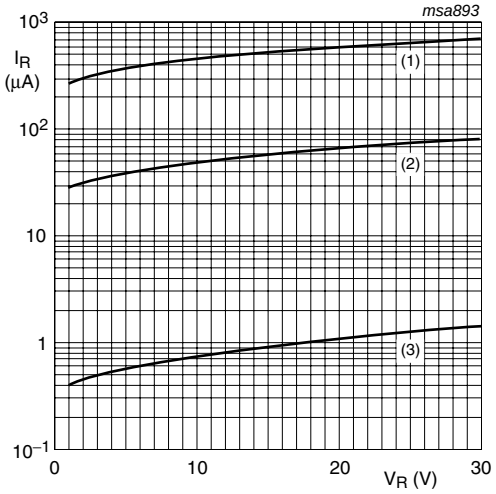


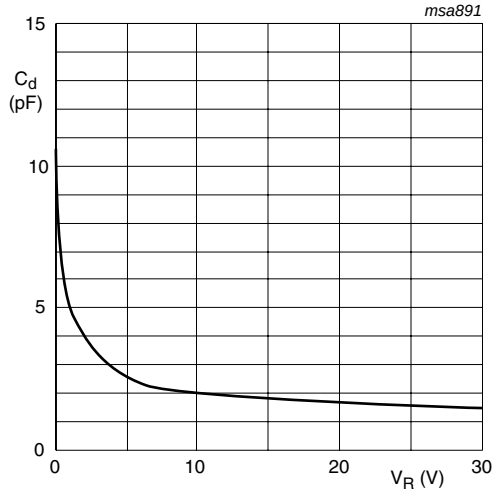
(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C

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



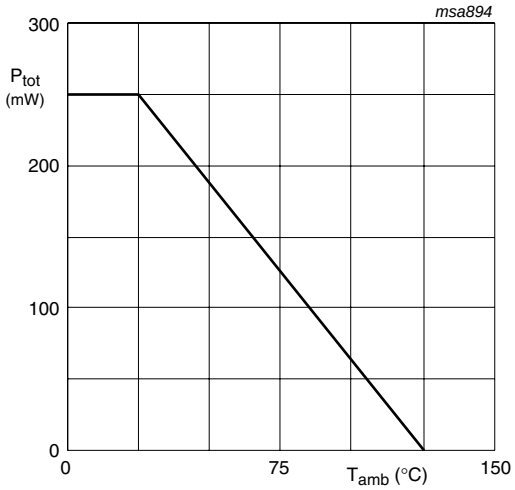
(1) T_{amb} = 125 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C

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



f = 1 MHz; T_{amb} = 25 °C

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



Standard footprint

Fig 4. Power derating curve

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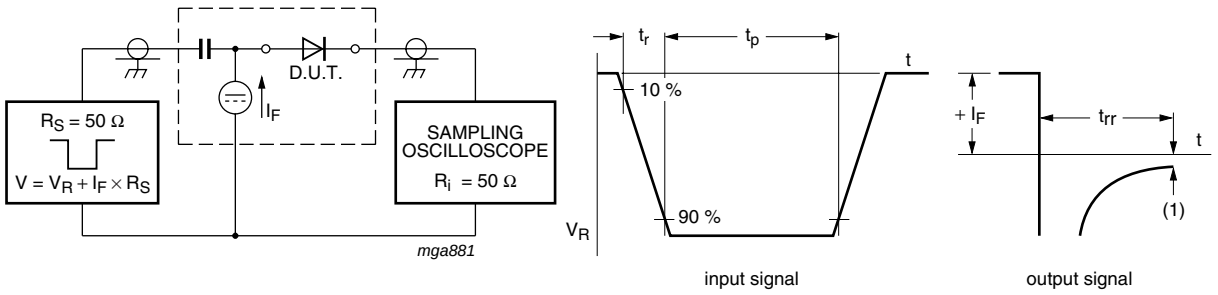
8. Test information



(1) I_R = 1 mA

Fig 5. Reverse recovery time test circuit and waveforms

9. Package outline

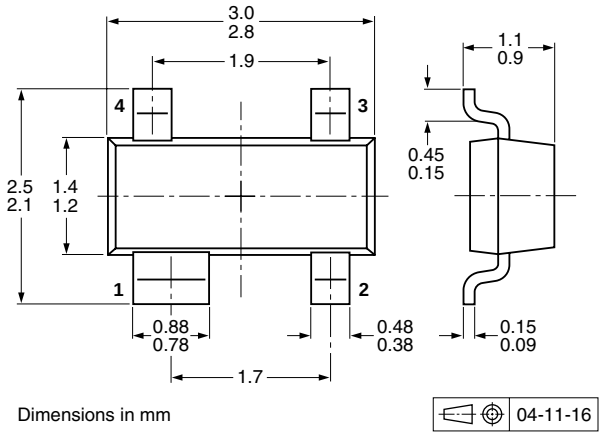


Fig 6. Package outline BAT74 (SOT143B)

10. Packing information

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11. Soldering

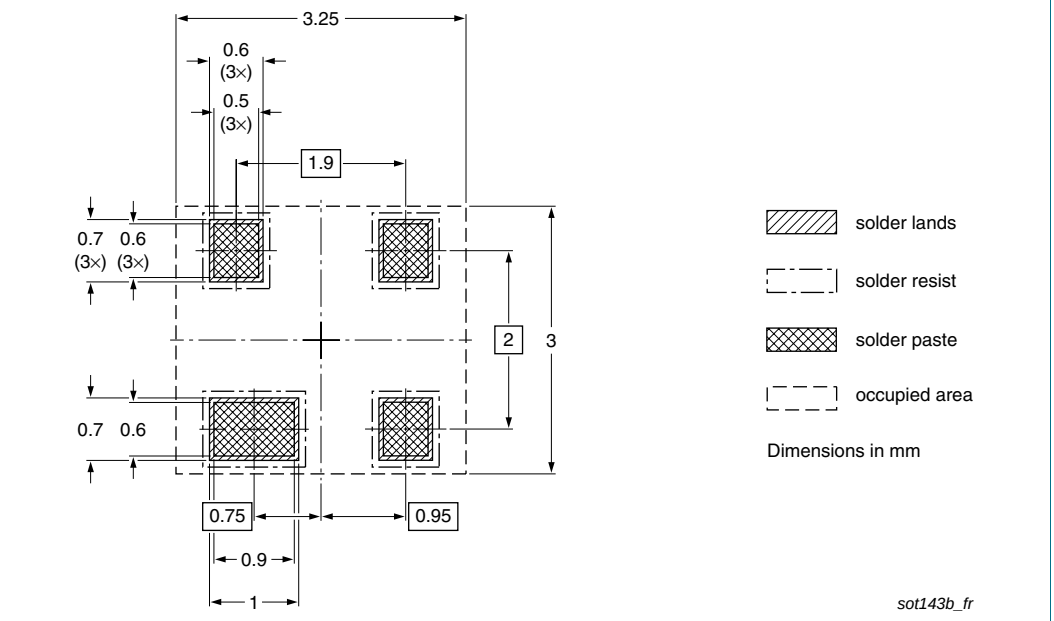

Fig 7. Reflow soldering footprint BAT74 (SOT143B)

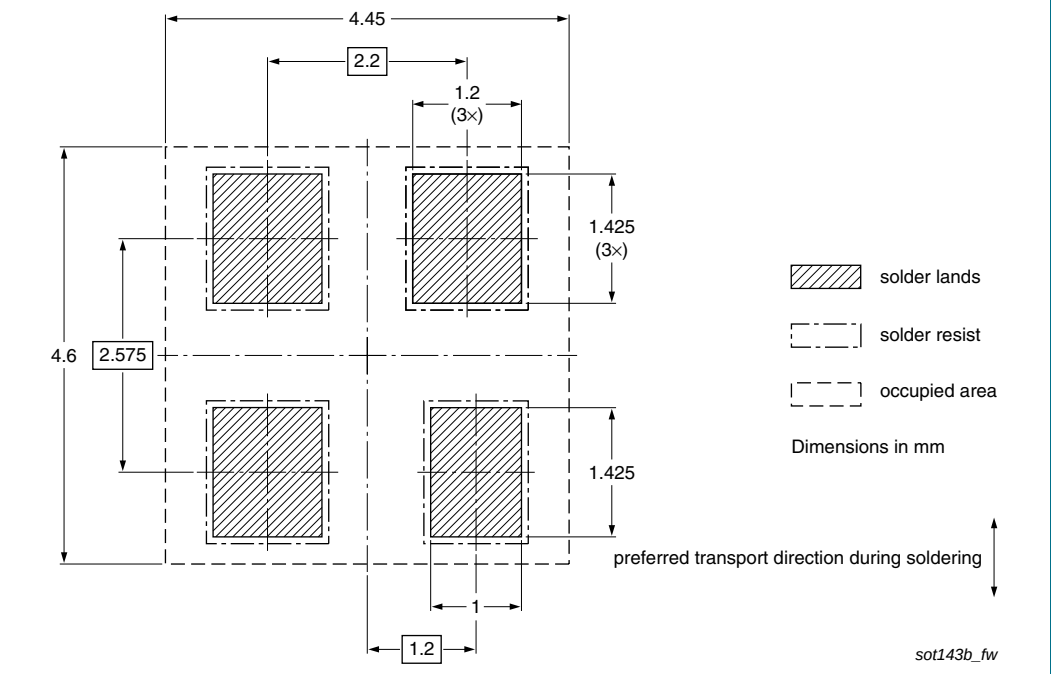

Fig 8. Wave soldering footprint BAT74 (SOT143B)

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12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAT74_3	20100419	Product data sheet	-	BAT74_2
Modifications:	• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors. • Legal texts have been adapted to the new company name where appropriate. • Section 1.1 “General description”: amended • Table 1 “Quick reference data”: added • Section 4 “Marking”: updated • Section 8 “Test information”: added • Figure 5: enhanced • Figure 6: superseded by minimized package outline drawing • Section 10 “Packing information”: added • Section 11 “Soldering”: added • Section 13 “Legal information”: updated			
BAT74_2	20010905	Product specification	-	BAT74_1
BAT74_1	19960319	Product specification	-	-

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13.1 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.
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.nexperia.com.

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