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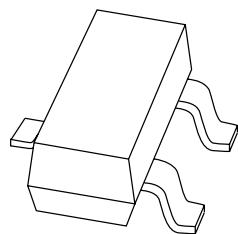
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Kind regards,

Team Nexperia

DATA SHEET



BAL74 High-speed diode

Product data sheet
Supersedes data of 1999 May 26

2003 Dec 17

High-speed diode

BAL74**FEATURES**

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 50 V
- Repetitive peak reverse voltage: max. 50 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAL74 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small SOT23 plastic SMD package.

MARKING

TYPE NUMBER	MARKING CODE ⁽¹⁾
BAL74	JC*

Note

1. * = p : Made in Hong Kong.
- * = t : Made in Malaysia.
- * = W : Made in China.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BAL74	–	plastic surface mounted package; 3 leads	SOT23

PINNING

PIN	DESCRIPTION
1	not connected
2	anode
3	cathode

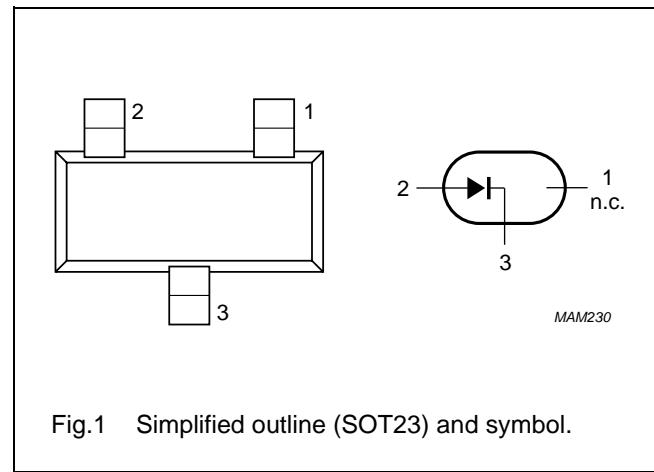


Fig.1 Simplified outline (SOT23) and symbol.

High-speed diode

BAL74

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{RRM}	repetitive peak reverse voltage		–	50	V
V_R	continuous reverse voltage		–	50	V
I_F	continuous forward current	see Fig.2; note 1	–	215	mA
I_{FRM}	repetitive peak forward current		–	500	mA
I_{FSM}	non-repetitive peak forward current	square wave; $T_j = 25^\circ\text{C}$ prior to surge; see Fig.4			
		$t_p = 1 \mu\text{s}$	–	4	A
		$t_p = 1 \text{ ms}$	–	1	A
		$t_p = 1 \text{ s}$	–	0.5	A
P_{tot}	total power dissipation	$T_{\text{amb}} = 25^\circ\text{C}$; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C

Note

1. Device mounted on an FR4 printed-circuit board.

ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
V_F	forward voltage	see Fig.3		
		$I_F = 1 \text{ mA}$	715	mV
		$I_F = 10 \text{ mA}$	855	mV
		$I_F = 50 \text{ mA}$	1	V
		$I_F = 150 \text{ mA}$	1.25	V
I_R	reverse current	see Fig.5		
		$V_R = 50 \text{ V}$	0.1	μA
		$V_R = 50 \text{ V}; T_j = 150^\circ\text{C}$	100	μA
C_d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0$; see Fig.6	2	pF
t_{rr}	reverse recovery time	when switched from $I_F = 10 \text{ mA}$ to $I_R = 10 \text{ mA}$; $R_L = 100 \Omega$; measured at $I_R = 1 \text{ mA}$; see Fig.7	4	ns
V_{fr}	forward recovery voltage	when switched from $I_F = 10 \text{ mA}$; $t_r = 20 \text{ ns}$; see Fig.8	1.75	V

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{\text{th}(j\text{-tp})}$	thermal resistance from junction to tie-point		330	K/W
$R_{\text{th}(j\text{-a})}$	thermal resistance from junction to ambient	note 1	500	K/W

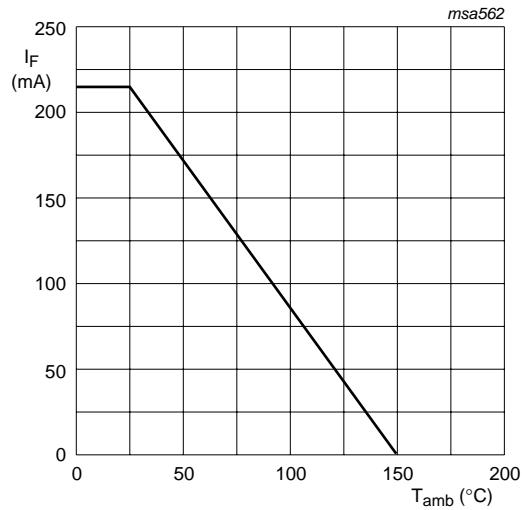
Note

1. Device mounted on an FR4 printed-circuit board.

High-speed diode

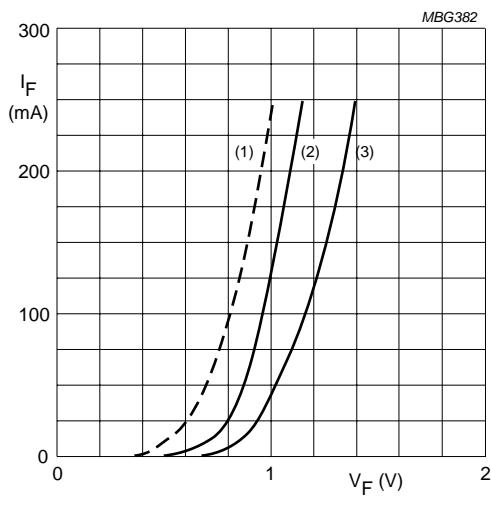
BAL74

GRAPHICAL DATA



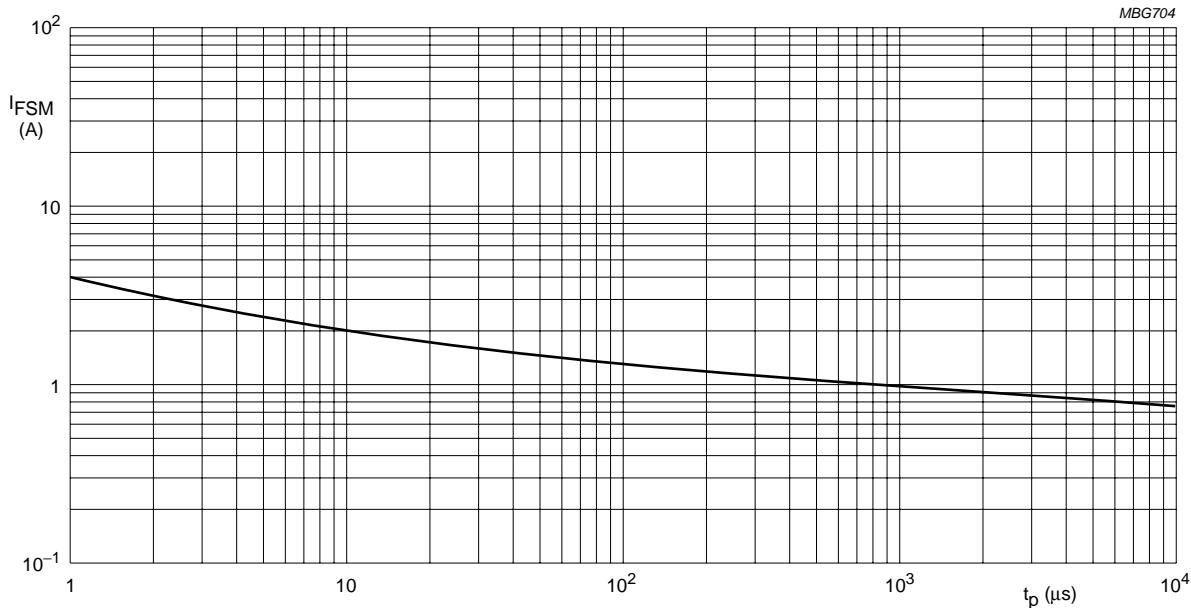
Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible continuous forward current as a function of ambient temperature.



- (1) $T_j = 150 \text{ }^\circ\text{C}$; typical values.
- (2) $T_j = 25 \text{ }^\circ\text{C}$; typical values.
- (3) $T_j = 25 \text{ }^\circ\text{C}$; maximum values.

Fig.3 Forward current as a function of forward voltage.



Based on square wave currents; $T_j = 25 \text{ }^\circ\text{C}$ prior to surge.

Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

High-speed diode

BAL74

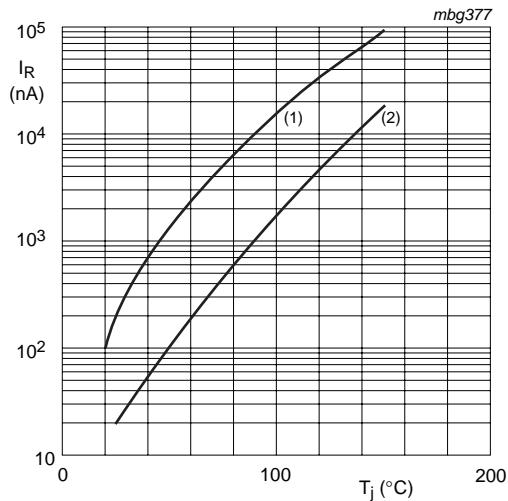


Fig.5 Reverse current as a function of junction temperature.

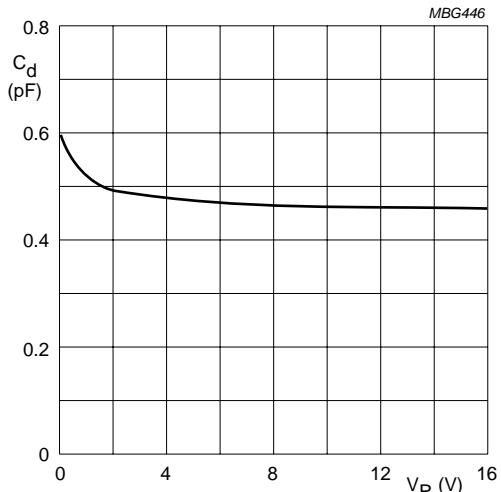


Fig.6 Diode capacitance as a function of reverse voltage; typical values.

High-speed diode

BAL74

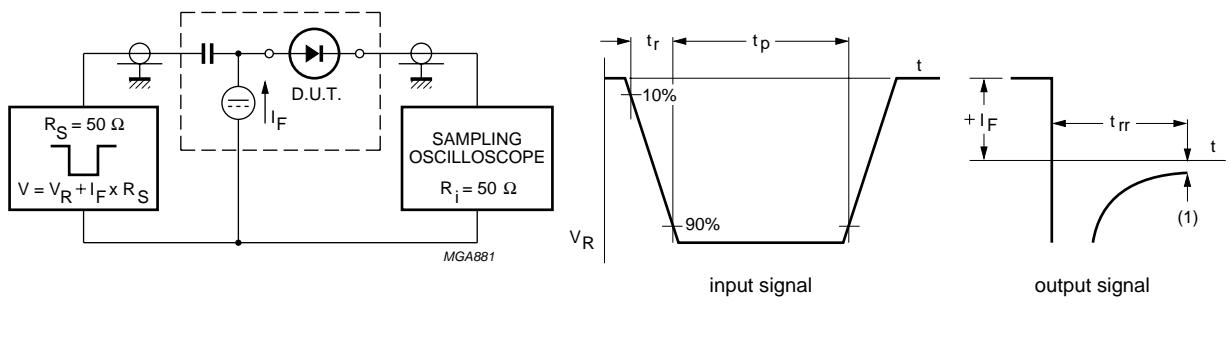


Fig.7 Reverse recovery time test circuit and waveforms.

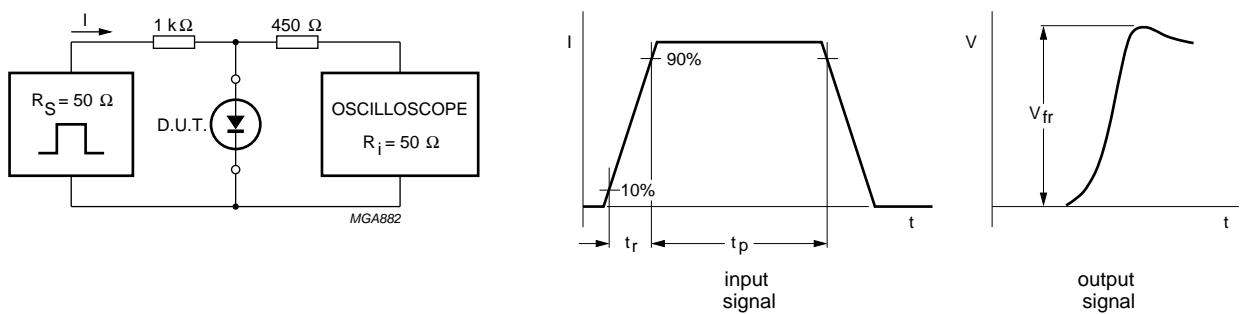


Fig.8 Forward recovery voltage test circuit and waveforms.

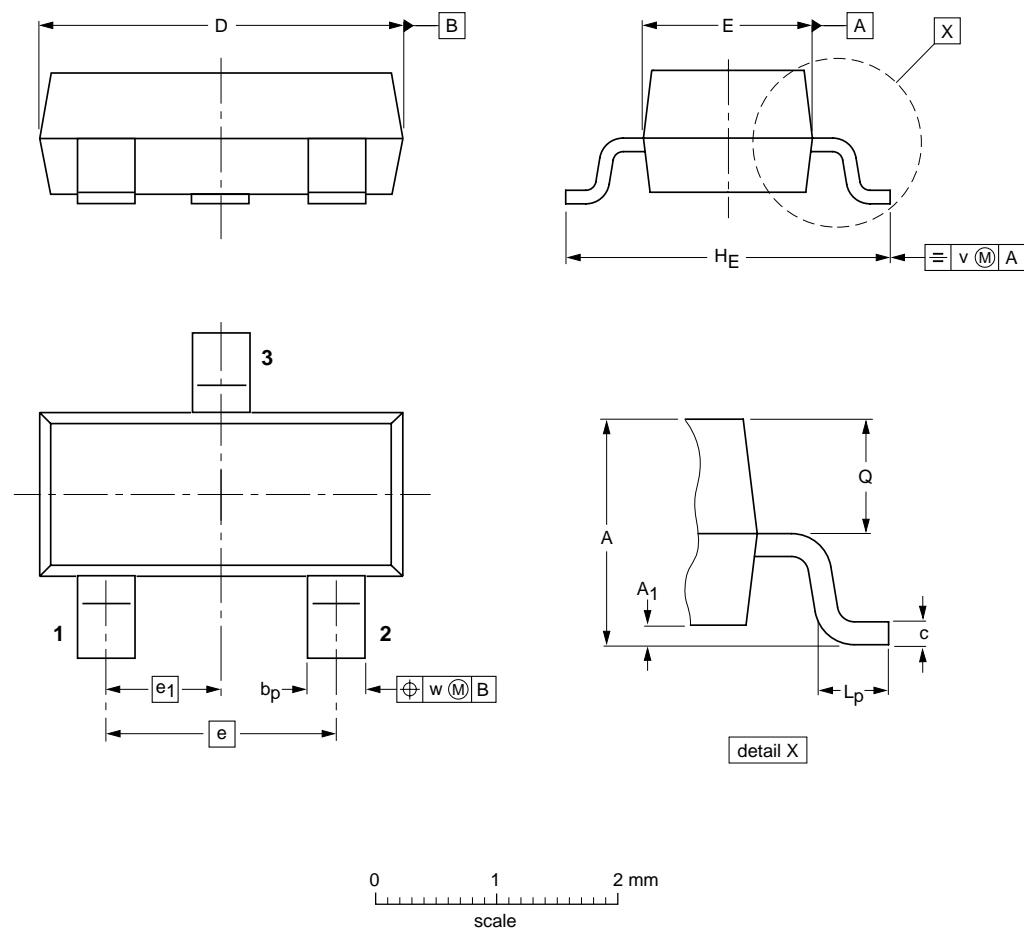
High-speed diode

BAL74

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				-04-11-04- 06-03-16

High-speed diode

BAL74

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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NXP Semiconductors

Customer notification

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, except for package outline drawings which were updated to the latest version.

Contact information

For additional information please visit: <http://www.nxp.com>

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