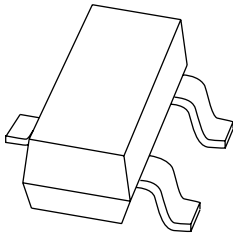


# DATA SHEET



## **BAL74** High-speed diode

Product specification  
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 <sup>(1)</sup>
BAL74	JC*

### Note

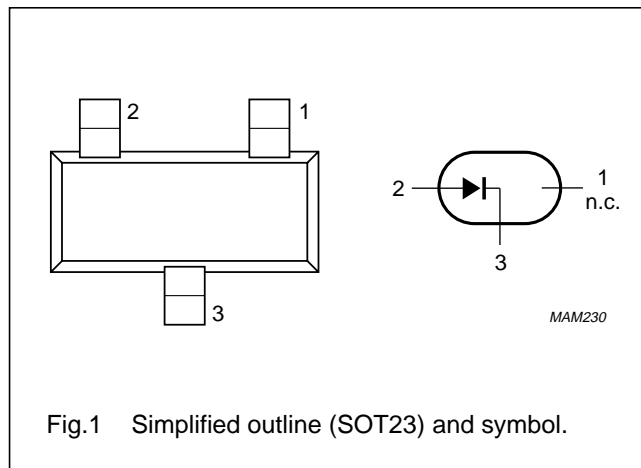
- \* = p : Made in Hong Kong.  
 \* = t : Made in Malaysia.  
 \* = W : Made in China.

### 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



## 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; $T_j = 25\text{ °C}$ prior to surge; see Fig.4 $t_p = 1\ \mu\text{s}$ $t_p = 1\ \text{ms}$ $t_p = 1\ \text{s}$	–	4 1 0.5	A A A
$P_{tot}$	total power dissipation	$T_{amb} = 25\text{ °C}$ ; 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**

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

SYMBOL	PARAMETER	CONDITIONS	MAX.	UNIT
$V_F$	forward voltage	see Fig.3 $I_F = 1\ \text{mA}$ $I_F = 10\ \text{mA}$ $I_F = 50\ \text{mA}$ $I_F = 150\ \text{mA}$	715 855 1 1.25	mV mV V V
$I_R$	reverse current	see Fig.5 $V_R = 50\ \text{V}$ $V_R = 50\ \text{V}; T_j = 150\text{ °C}$	0.1 100	$\mu\text{A}$ $\mu\text{A}$
$C_d$	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
$R_{th(j-tp)}$	thermal resistance from junction to tie-point		330	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	500	K/W

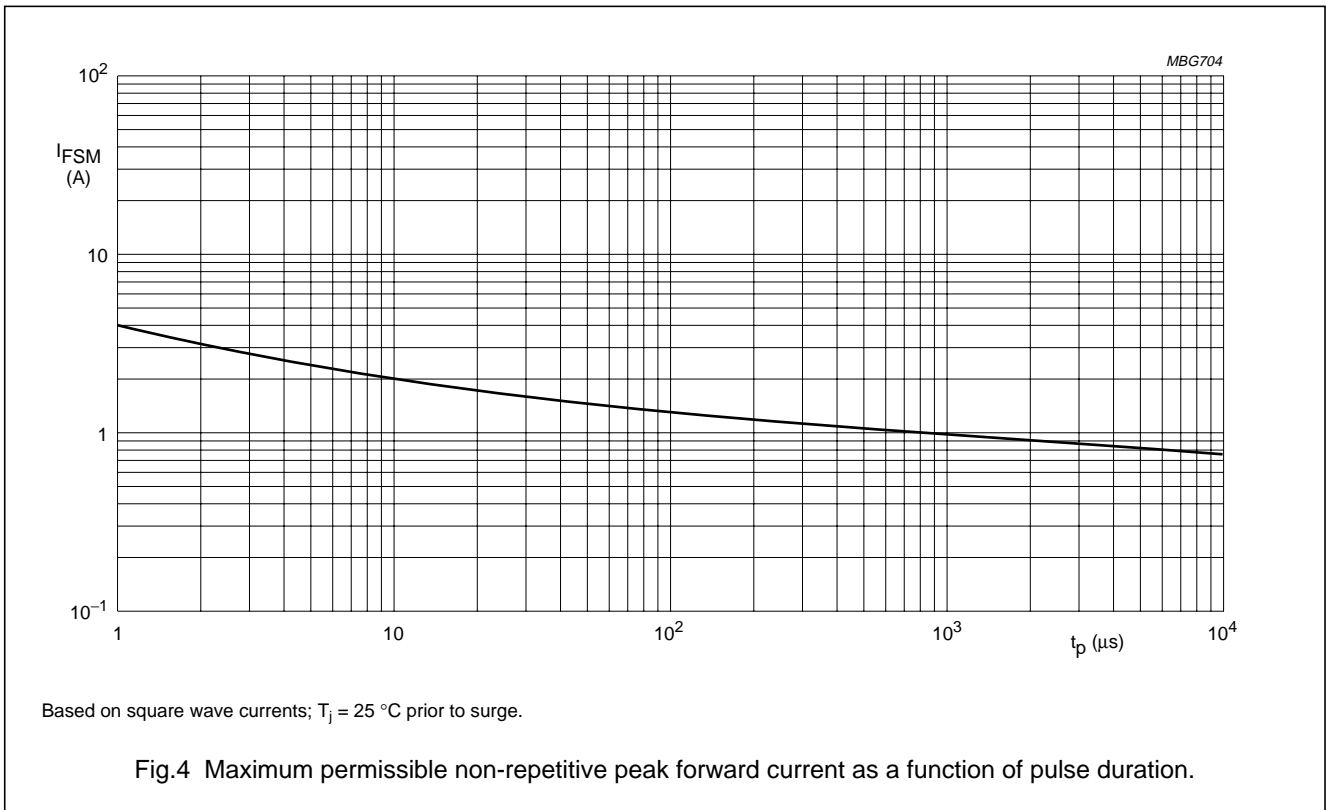
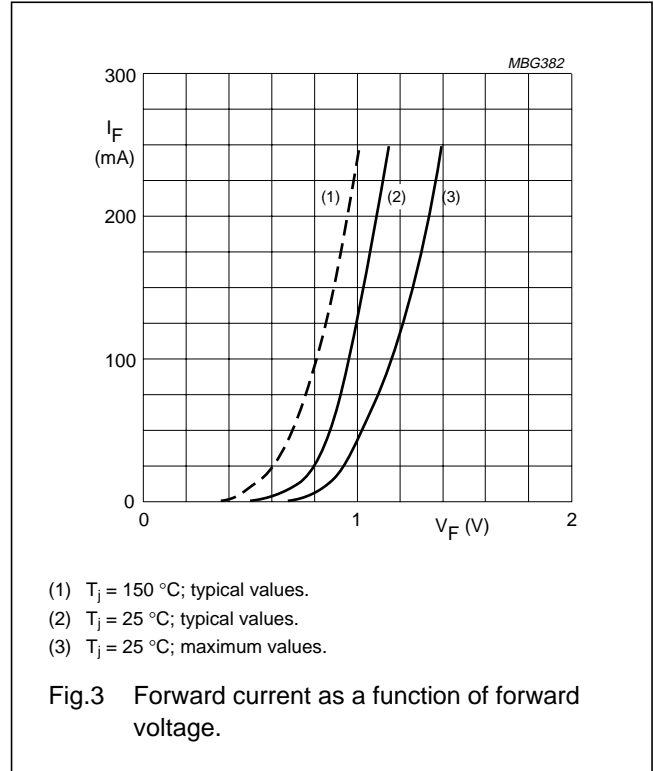
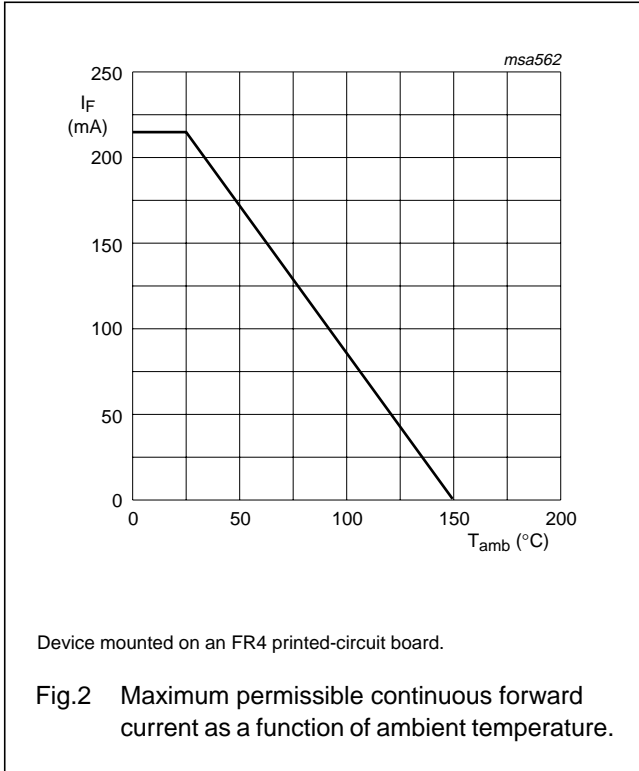
**Note**

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

High-speed diode

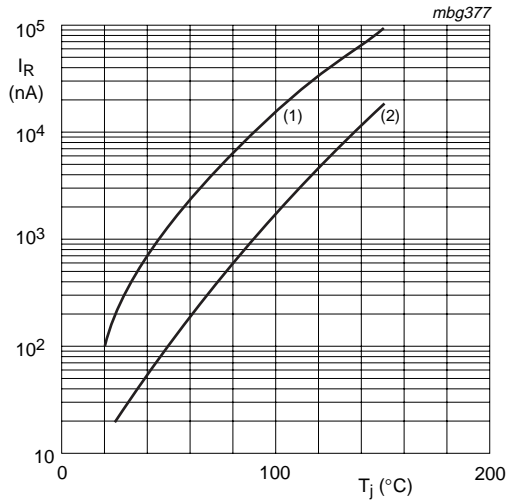
BAL74

GRAPHICAL DATA



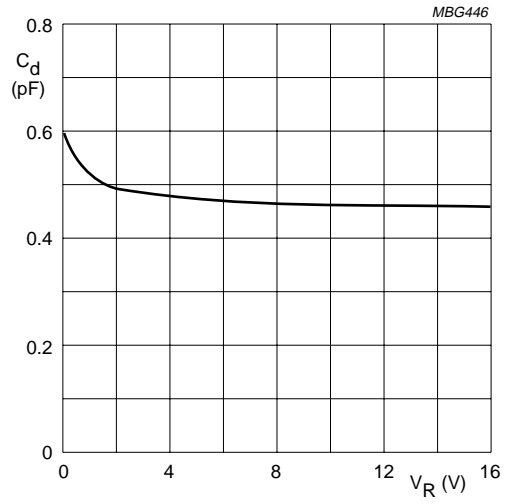
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- (1)  $V_R = 50$  V; maximum values.
- (2)  $V_R = 50$  V; typical values.

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

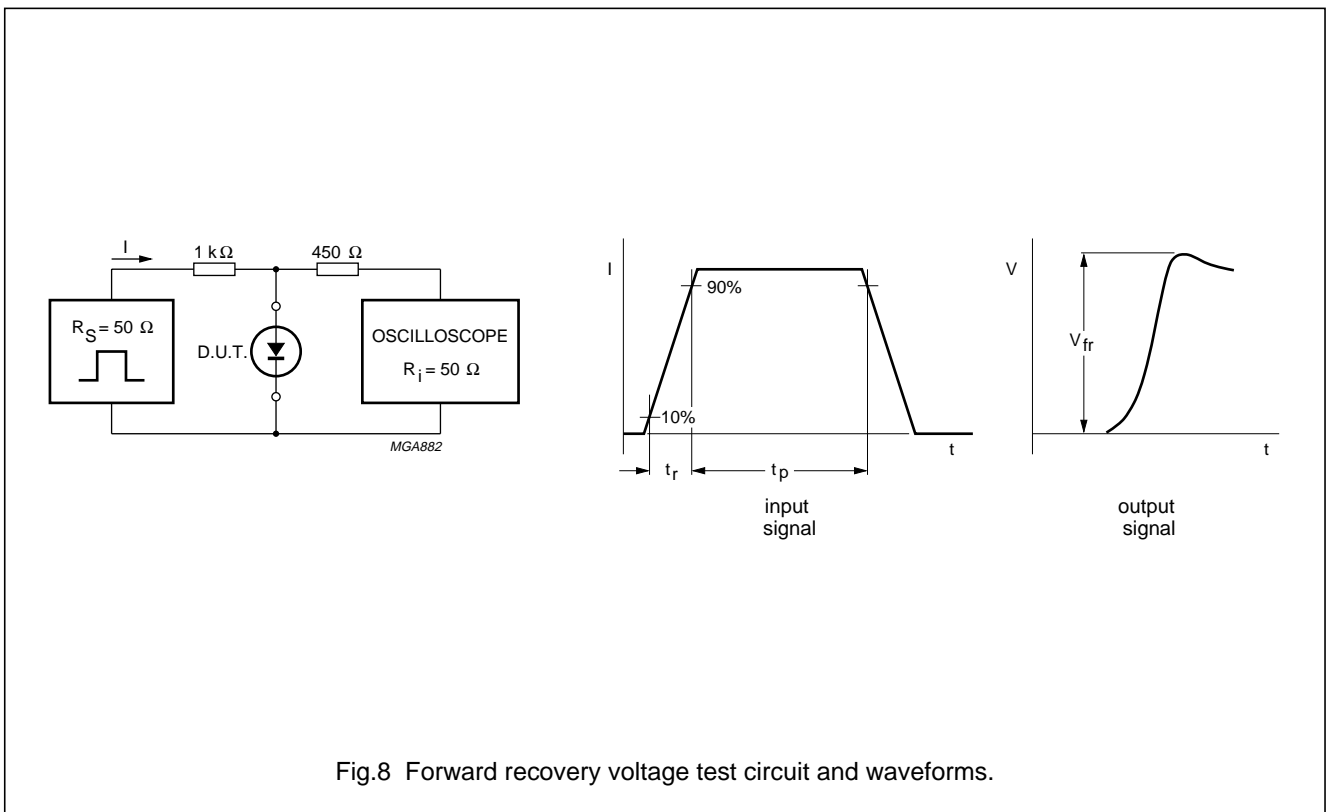
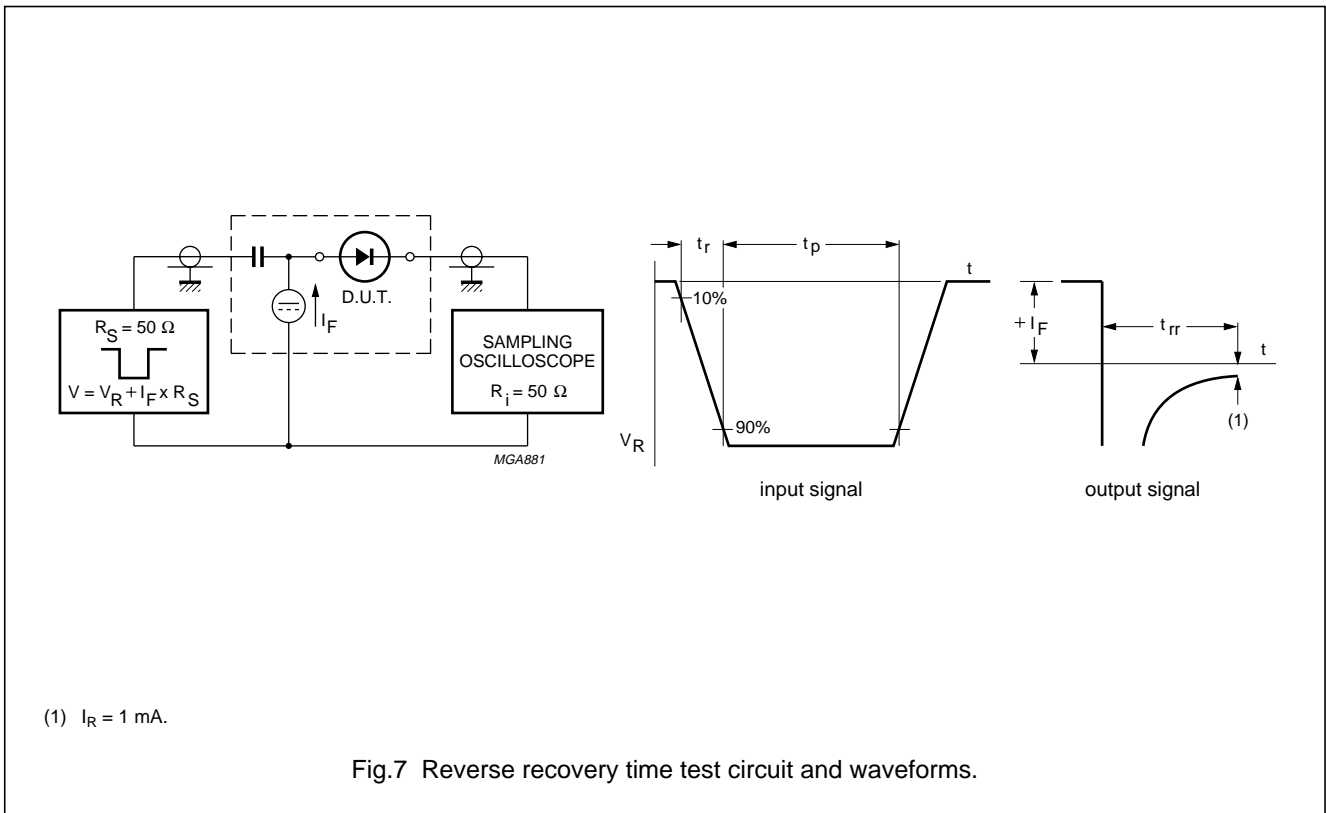


$f = 1$  MHz;  $T_j = 25$  °C.

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

High-speed diode

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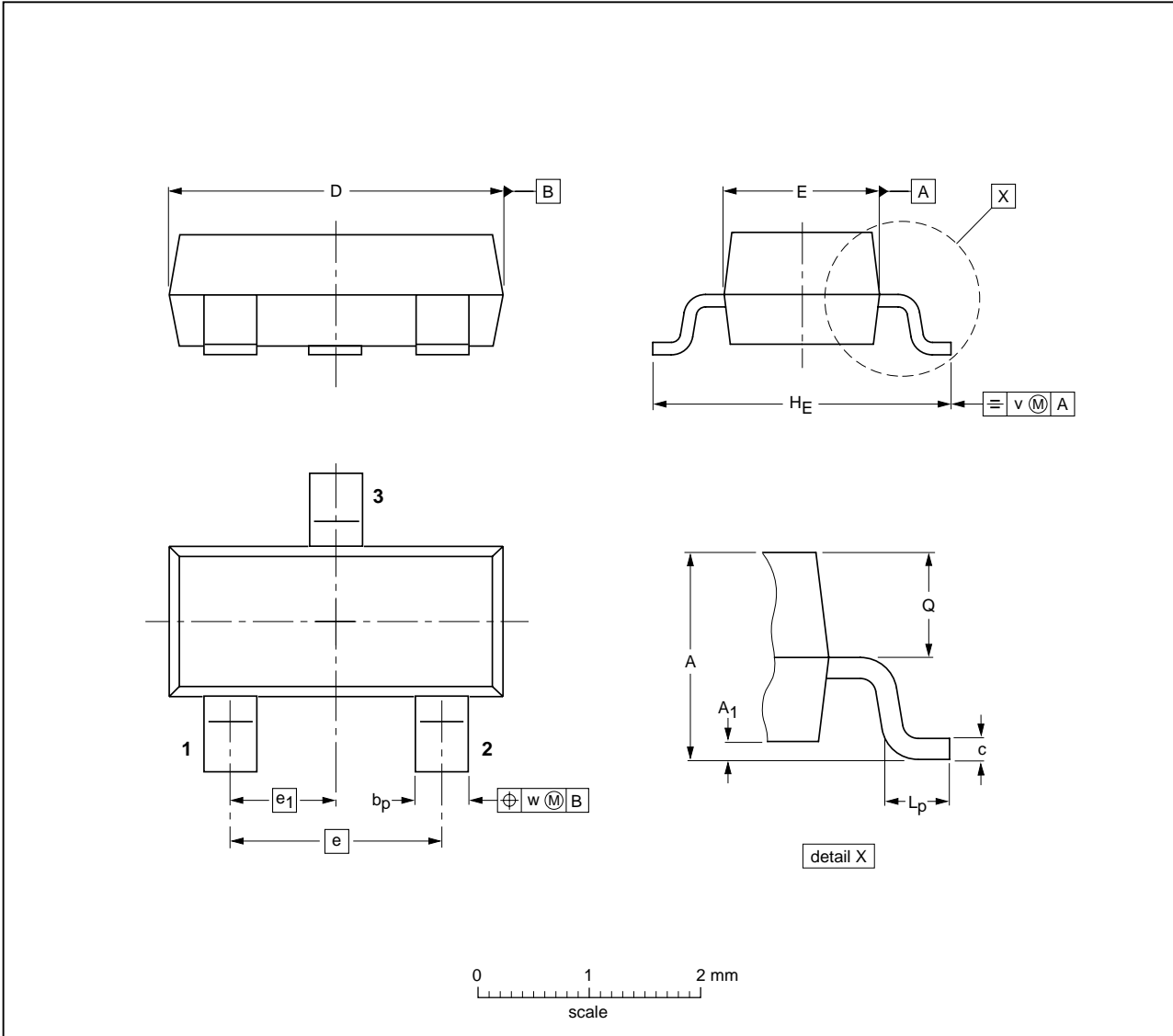
# High-speed diode

BAL74

## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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	EIAJ		
SOT23		TO-236AB			97-02-28 99-09-13

## High-speed diode

BAL74

## DATA SHEET STATUS

LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	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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**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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