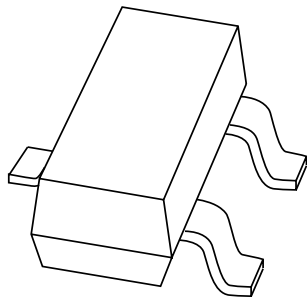


# DATA SHEET



## **BAS29; BAS31; BAS35** General purpose controlled avalanche (double) diodes

Product data sheet  
Supersedes data of 2001 Oct 10

2003 Mar 20

# General purpose controlled avalanche (double) diodes

## BAS29; BAS31; BAS35

### FEATURES

- Small plastic SMD package
- Switching speed: max. 50 ns
- General application
- Continuous reverse voltage: max. 90 V
- Repetitive peak reverse voltage: max. 110 V
- Repetitive peak forward current: max. 600 mA
- Repetitive peak reverse current: max. 600 mA.

### APPLICATIONS

- General purpose switching in e.g. surface mounted circuits.

### DESCRIPTION

General purpose switching diodes fabricated in planar technology, and encapsulated in small rectangular plastic SMD SOT23 packages. The BAS29 consists of a single diode. The BAS31 has two diodes in series. The BAS35 has two diodes with a common anode.

### MARKING

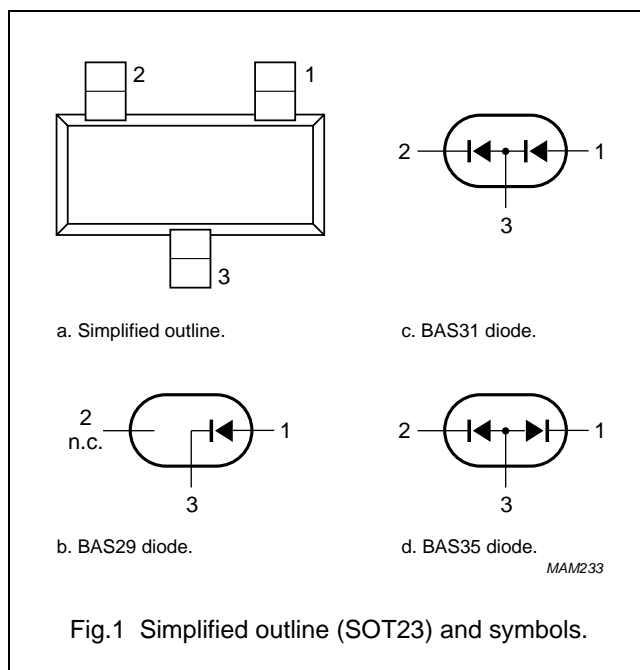
TYPE NUMBER	MARKING CODE <sup>(1)</sup>
BAS29	L20 or *A8
BAS31	L21 or *V1
BAS35	L22 or *V2

### Note

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

### PINNING

PIN	DESCRIPTION		
	BAS29	BAS31	BAS35
1	anode	anode	cathode (k1)
2	not connected	cathode	cathode (k2)
3	cathode	common connection	common anode



# General purpose controlled avalanche (double) diodes

BAS29; BAS31; BAS35

## LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Per diode</b>					
$V_{RRM}$	repetitive peak reverse voltage		–	110	V
$V_R$	continuous reverse voltage		–	90	V
$I_F$	continuous forward current	single diode loaded; see Fig.2; note 1	–	250	mA
		double diode loaded; see Fig.2; note 1	–	150	mA
$I_{FRM}$	repetitive peak forward current		–	600	mA
$I_{FSM}$	non-repetitive peak forward current	square wave; $T_j = 25\text{ °C}$ prior to surge; see Fig.4			
		$t = 1\text{ }\mu\text{s}$	–	10	A
		$t = 100\text{ }\mu\text{s}$	–	4	A
		$t = 1\text{ s}$	–	0.75	A
$P_{tot}$	total power dissipation	$T_{amb} = 25\text{ °C}$ ; note 1	–	250	mW
$I_{RRM}$	repetitive peak reverse current		–	600	mA
$E_{RRM}$	repetitive peak reverse energy	$t_p \geq 50\text{ }\mu\text{s}$ ; $f \leq 20\text{ Hz}$ ; $T_j = 25\text{ °C}$	–	5	mJ
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C

## Note

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

# General purpose controlled avalanche (double) diodes

BAS29; BAS31; BAS35

## ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Per diode</b>					
$V_F$	forward voltage	see Fig.3 $I_F = 10\text{ mA}$ $I_F = 50\text{ mA}$ $I_F = 100\text{ mA}$ $I_F = 200\text{ mA}$ $I_F = 400\text{ mA}$	– – – – –	750 840 900 1 1.25	mV mV mV V V
$I_R$	reverse current	see Fig.5 $V_R = 90\text{ V}$ $V_R = 90\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$	– –	100 100	nA $\mu\text{A}$
$V_{(BR)R}$	reverse avalanche breakdown voltage	$I_R = 1\text{ mA}$	120	170	V
$C_d$	diode capacitance	$f = 1\text{ MHz}; V_R = 0$ ; see Fig.6	–	35	pF
$t_{rr}$	reverse recovery time	when switched from $I_F = 30\text{ mA}$ to $I_R = 30\text{ mA}$ ; $R_L = 100\text{ }\Omega$ ; measured at $I_R = 3\text{ mA}$ ; see Fig.7	–	50	ns

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-tp}$	thermal resistance from junction to tie-point		360	K/W
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	500	K/W

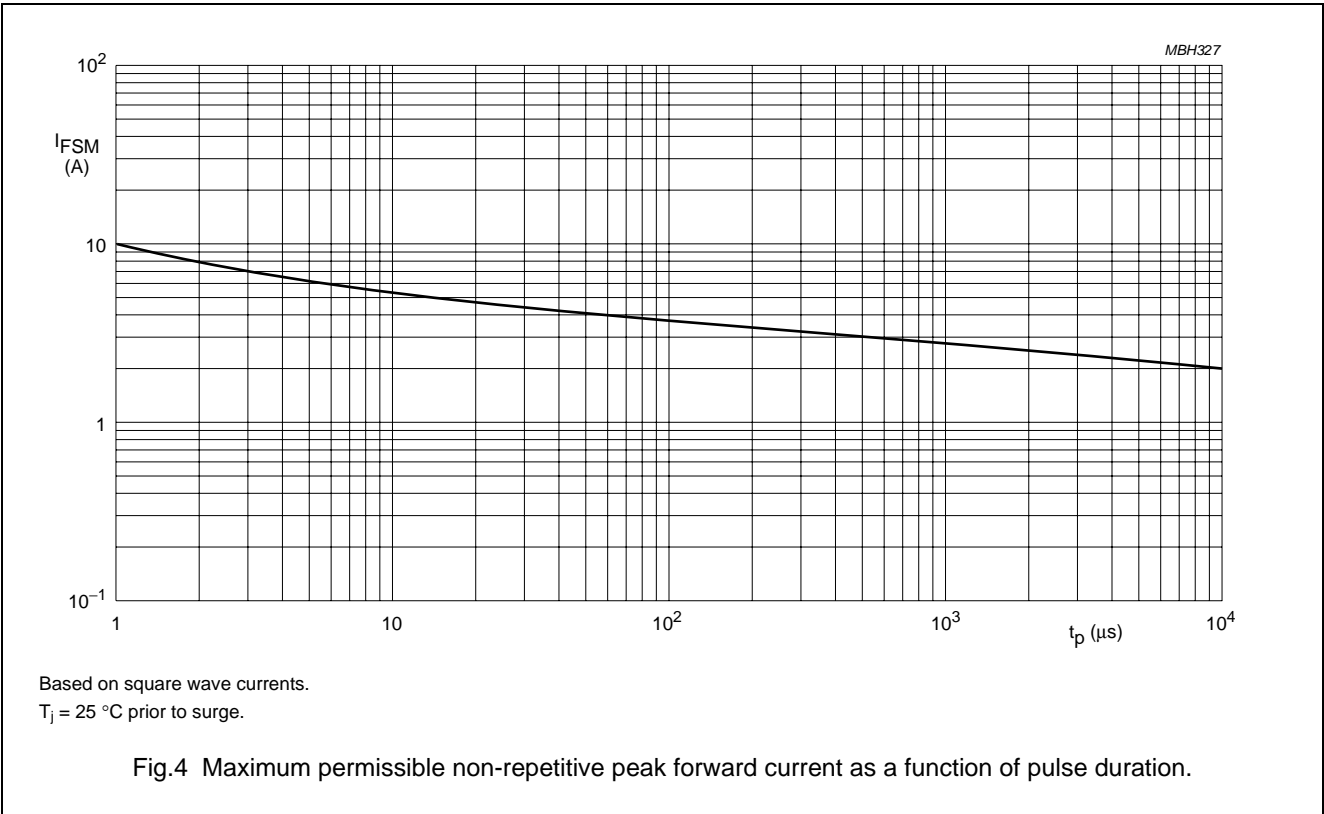
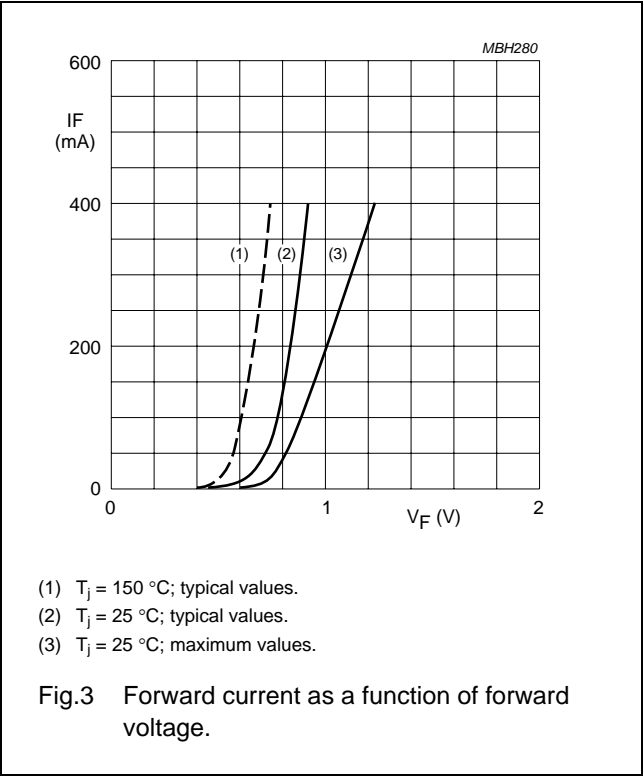
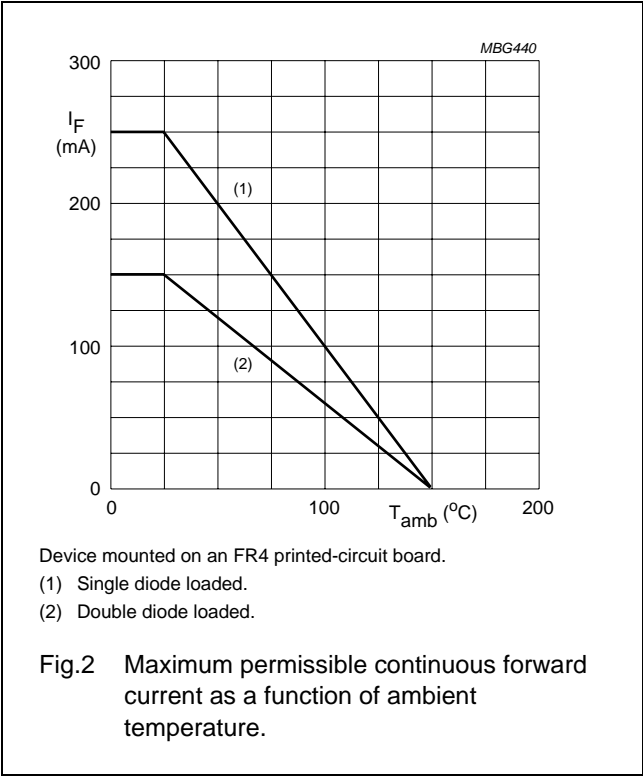
### Note

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

General purpose controlled avalanche  
(double) diodes

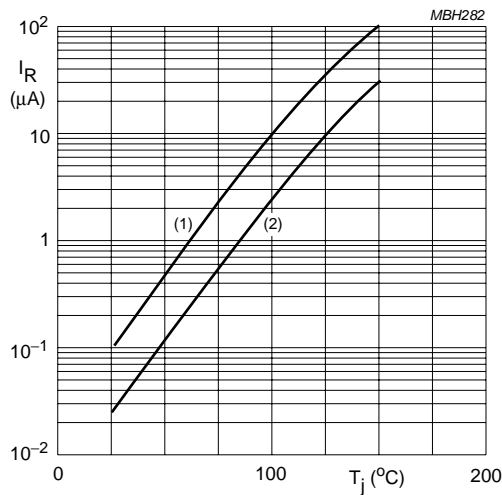
BAS29; BAS31; BAS35

GRAPHICAL DATA



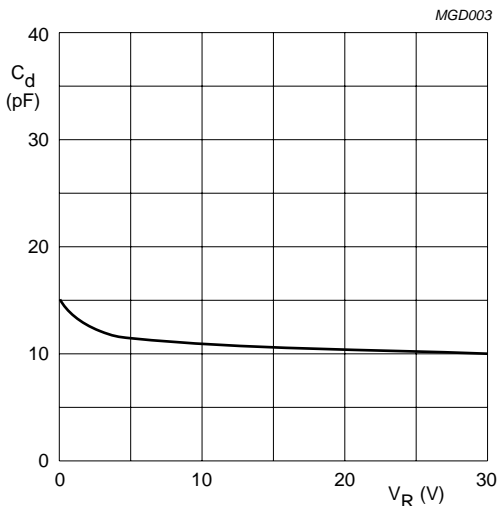
General purpose controlled avalanche  
(double) diodes

BAS29; BAS31; BAS35



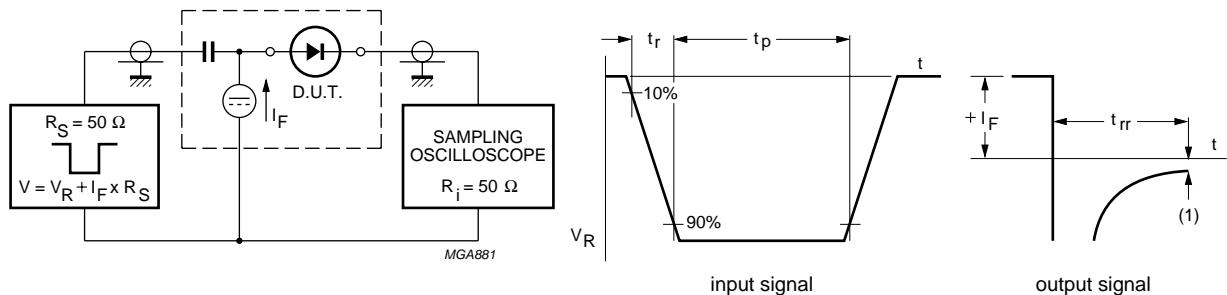
- (1)  $V_R = 90\text{ V}$ ; maximum values.
- (2)  $V_R = 90\text{ V}$ ; typical values.

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



$f = 1\text{ MHz}$ ;  $T_j = 25\text{ }^{\circ}C$ .

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



- (1)  $I_R = 3\text{ mA}$ .

Fig.7 Reverse recovery voltage test circuit and waveforms.

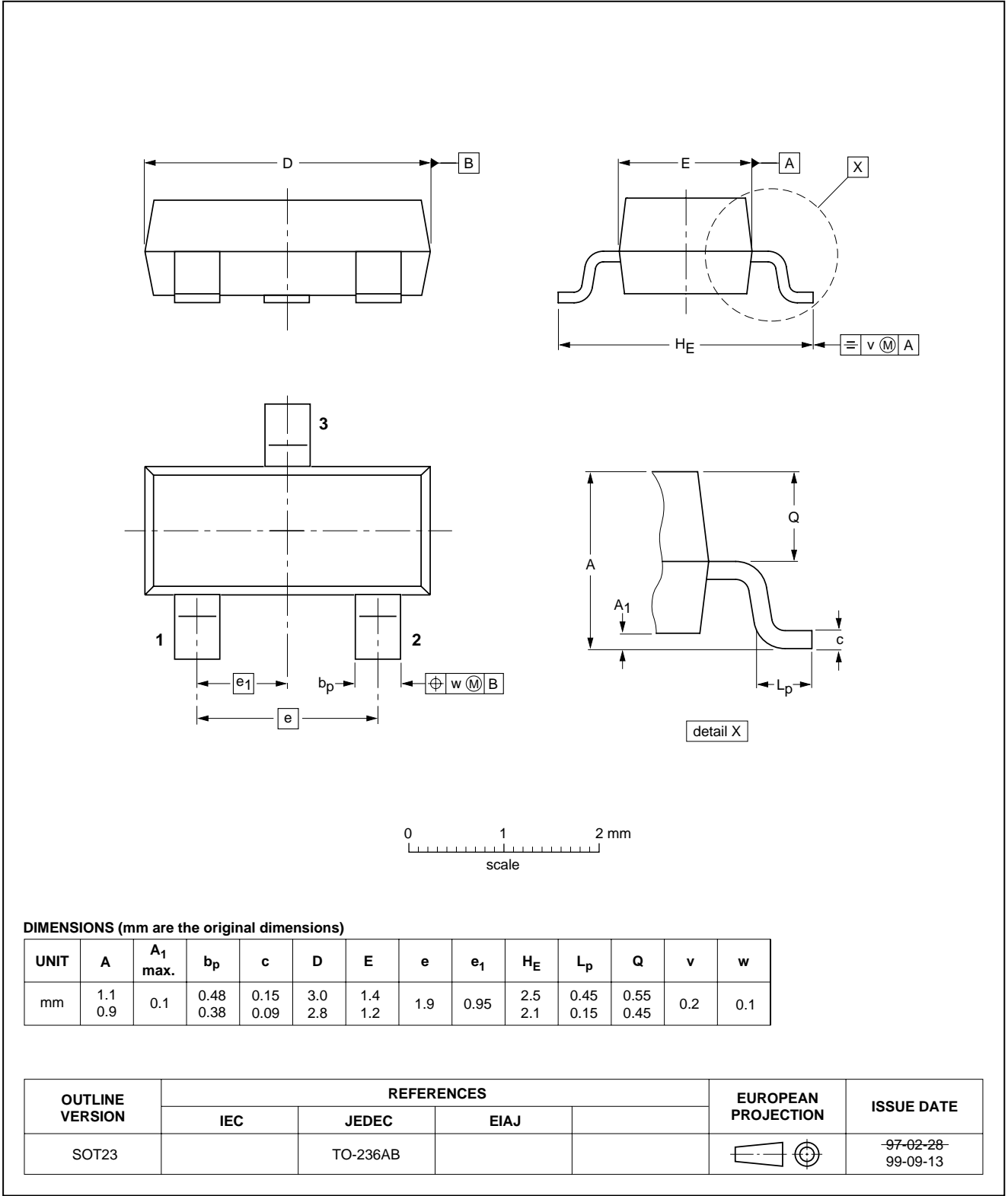
General purpose controlled avalanche  
(double) diodes

BAS29; BAS31; BAS35

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



# General purpose controlled avalanche (double) diodes

## BAS29; BAS31; BAS35

### DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	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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