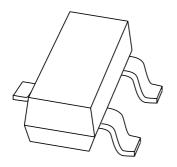
DISCRETE SEMICONDUCTORS

DATA SHEET



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

Product specification Supersedes data of 1999 May 21 2001 Oct 10





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

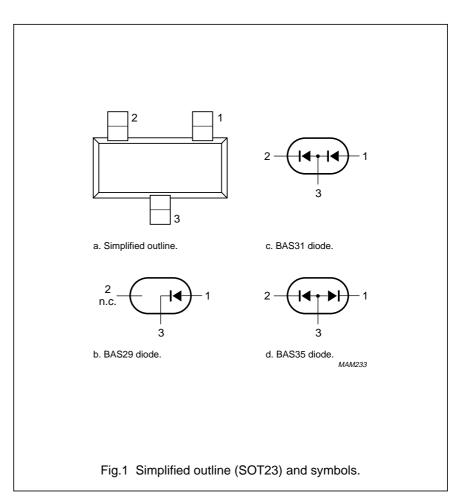
TYPE NUMBER	MARKING CODE ⁽¹⁾
BAS29	L20
BAS31	L21 or *V1
BAS35	L22 or *V2

Note

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

PINNING

PIN	DESCRIPTION				
FIN	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

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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode			•		•
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 °C prior to surge; see Fig.4			
		t = 1 μs	_	10	Α
		t = 100 μs	_	4	Α
		t = 1 s	_	0.75	Α
P _{tot}	total power dissipation	T _{amb} = 25 °C; note 1	_	250	mW
I _{RRM}	repetitive peak reverse current		_	600	mA
E _{RRM}	repetitive peak reverse energy	$t_p \ge 50 \ \mu s; \ f \le 20 \ Hz; \ T_j = 25 \ ^{\circ}C$	_	5	mJ
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature		_	150	°C

Note

^{1.} Device mounted on an FR4 printed-circuit board.

General purpose controlled avalanche (double) diodes

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ELECTRICAL CHARACTERISTICS

 $T_i = 25$ °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode				•	•
V _F	forward voltage	see Fig.3			
		I _F = 10 mA	_	750	mV
		$I_F = 50 \text{ mA}$	_	840	mV
		I _F = 100 mA	_	900	mV
		I _F = 200 mA	_	1	V
		$I_F = 400 \text{ mA}$	_	1.25	V
I _R	reverse current	see Fig.5			
		V _R = 90 V	_	100	nA
		V _R = 90 V; T _j = 150 °C	_	100	μΑ
V _{(BR)R}	reverse avalanche breakdown voltage	I _R = 1 mA	120	170	V
C _d	diode capacitance	f = 1 MHz; V _R = 0; see Fig.6	_	35	pF
t _{rr}	reverse recovery time	when switched from I_F = 30 mA to I_R = 30 mA; R_L = 100 Ω ; measured at I_R = 3 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

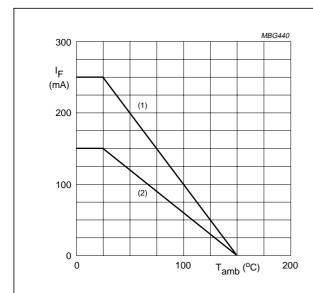
Note

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

General purpose controlled avalanche (double) diodes

BAS29; BAS31; BAS35

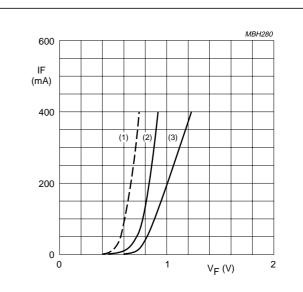
GRAPHICAL DATA



Device mounted on an FR4 printed-circuit board.

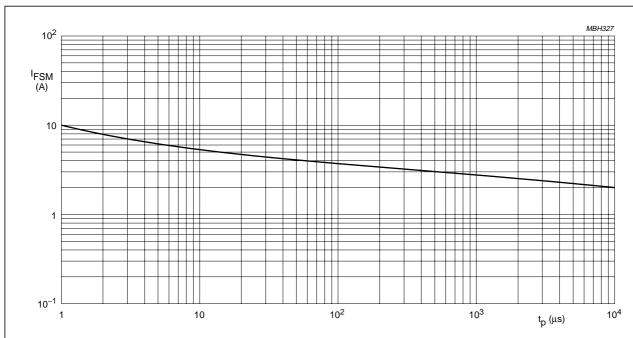
- (1) Single diode loaded.
- (2) Double diode loaded.

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



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

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



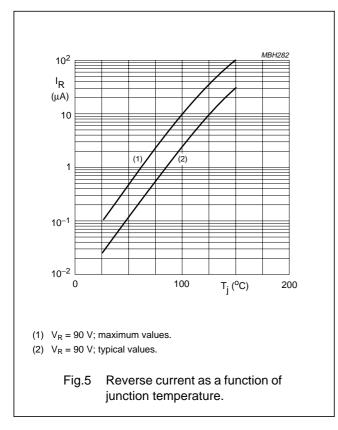
Based on square wave currents.

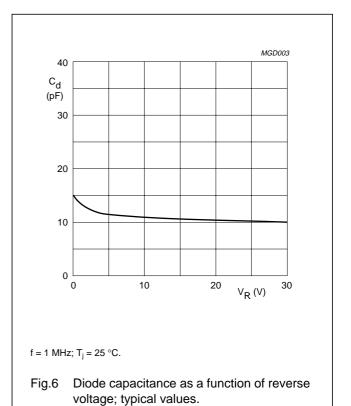
 T_j = 25 °C prior to surge.

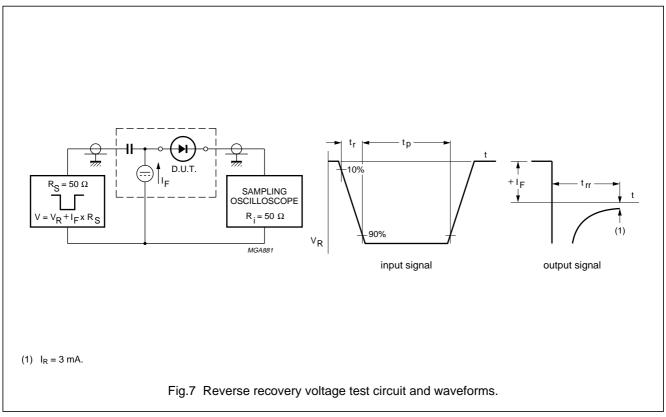
Fig.4 Maximum permissible non-repetitive peak forward current as a function of pulse duration.

General purpose controlled avalanche (double) diodes

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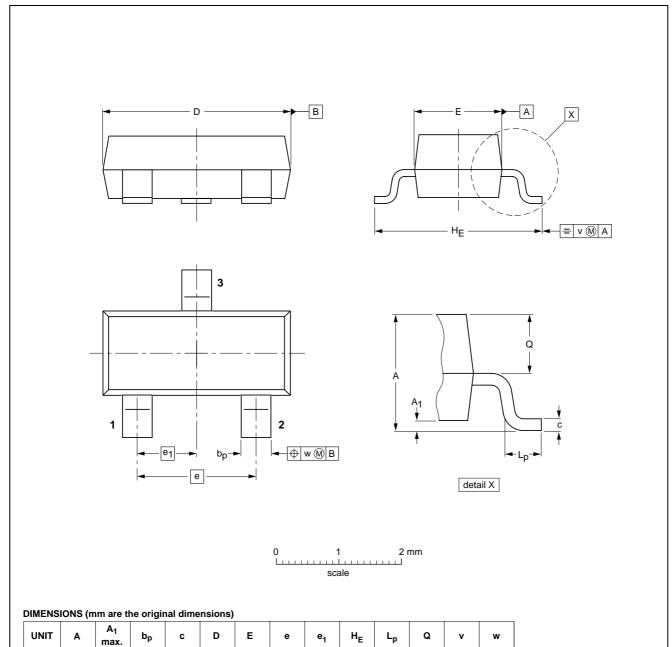
General purpose controlled avalanche (double) diodes

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



OUTLINE	REFERENCES		EUROPEAN	ICCUE DATE		
VERSION	IEC	JEDEC	EIAJ		PROJECTION	ISSUE DATE
SOT23		TO-236AB				-97-02-28 99-09-13

1.9

0.45

0.55

0.1

2001 Oct 10 7

0.48

0.38

0.15

1.1

mm

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DATA SHEET STATUS

DATA SHEET STATUS(1)	PRODUCT STATUS ⁽²⁾	DEFINITIONS
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.
Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A.

Notes

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- 2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

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NOTES

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NOTES

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