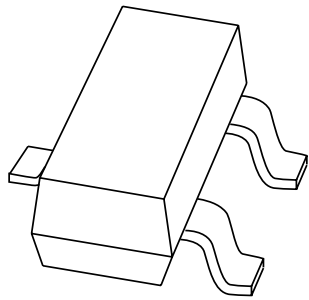


# DATA SHEET



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

Product specification  
Supersedes data of 1996 Sep 10

1999 May 21

# 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

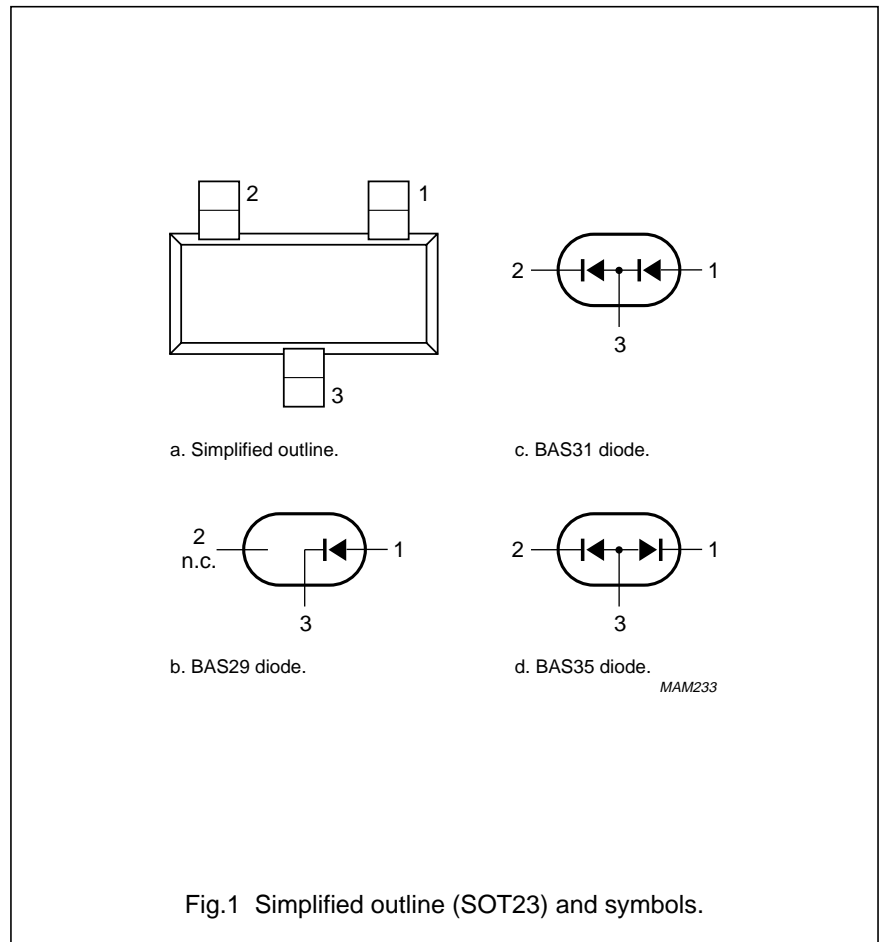
General purpose switching diodes fabricated in planar technology, and encapsulated in small rectangular plastic SMD SOT23 packages. The BAS29 consists of a single diode. The BAS31 has two diodes in series. The BAS35 has two diodes with a common anode.

### MARKING

TYPE NUMBER	MARKING CODE
BAS29	L20
BAS31	L21
BAS35	L22

### 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 134).

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			
		$t = 1\ \mu\text{s}$	–	10	A
		$t = 100\ \mu\text{s}$	–	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	$t_p \geq 50\ \mu\text{s}$ ; $f \leq 20\ \text{Hz}$ ; $T_j = 25\text{ °C}$	–	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

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
<b>Per diode</b>					
$V_F$	forward voltage	see Fig.3			
		$I_F = 10\text{ mA}$	–	750	mV
		$I_F = 50\text{ mA}$	–	840	mV
		$I_F = 100\text{ mA}$	–	900	mV
		$I_F = 200\text{ mA}$	–	1	V
		$I_F = 400\text{ mA}$	–	1.25	V
$I_R$	reverse current	see Fig.5			
		$V_R = 90\text{ V}$	–	100	nA
		$V_R = 90\text{ V}; T_j = 150\text{ °C}$	–	100	$\mu\text{A}$
$V_{(BR)R}$	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 $I_R = 30\text{ mA}$ ; $R_L = 100\ \Omega$ ; 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

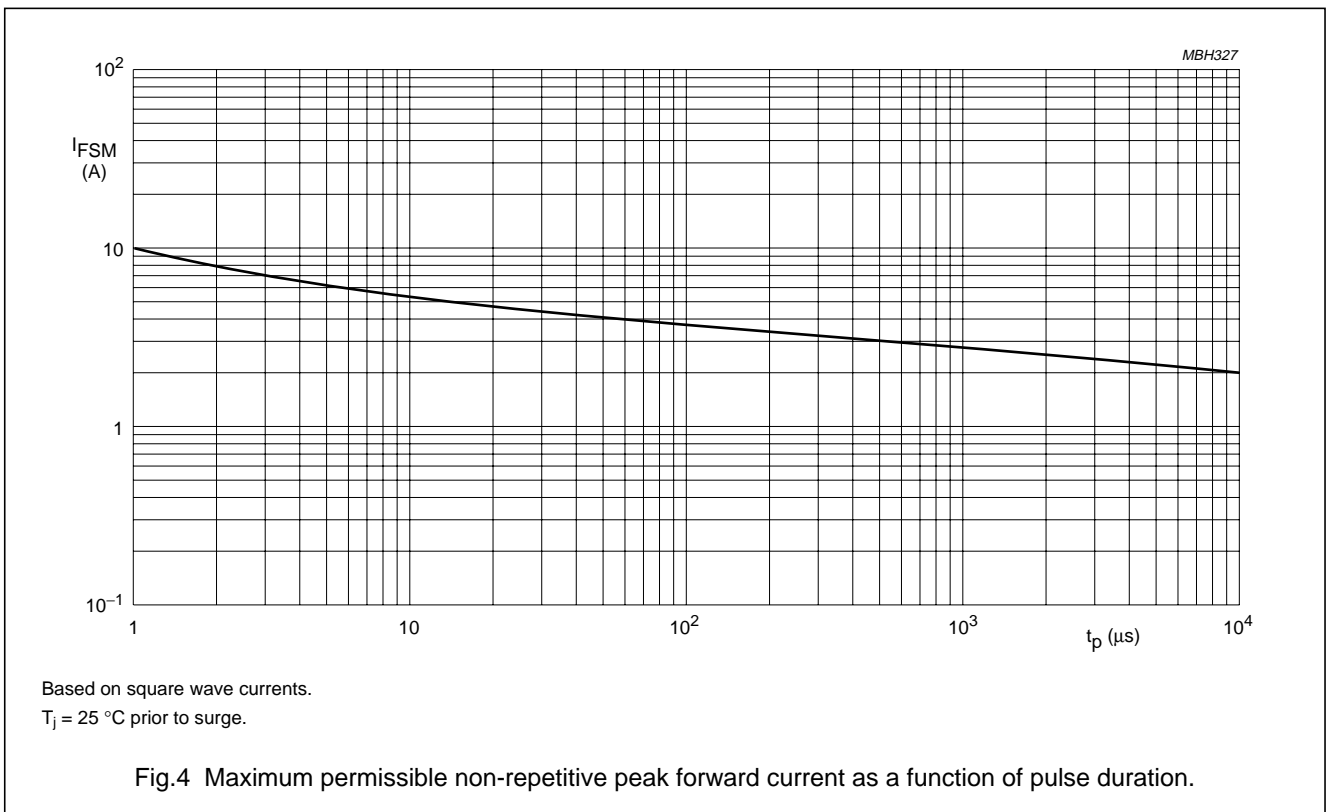
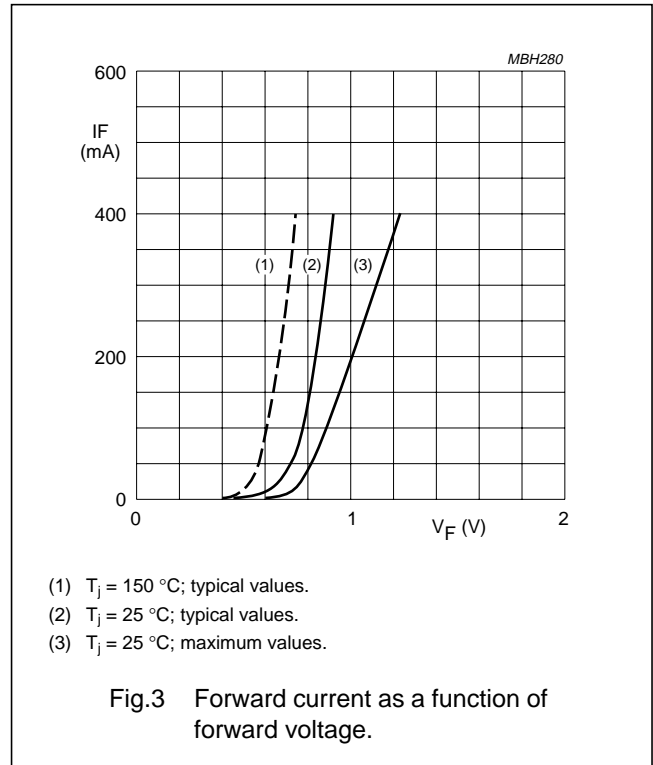
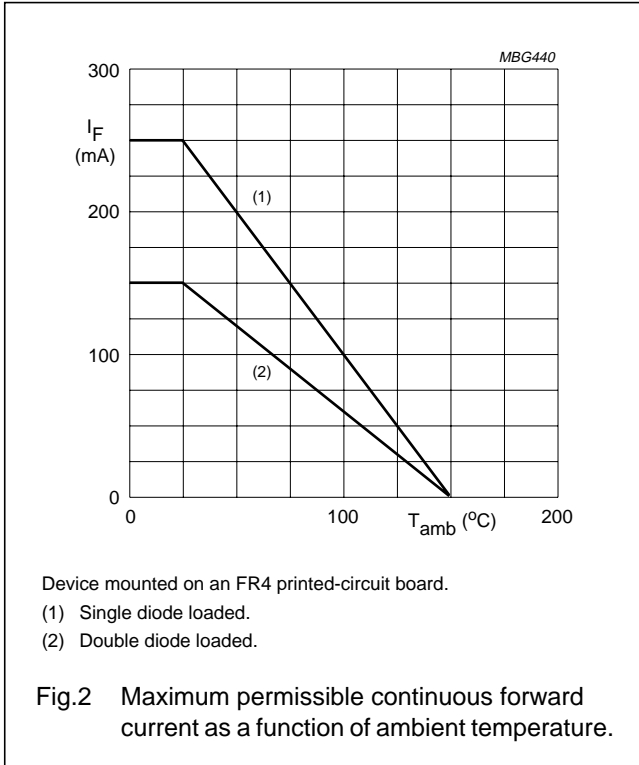
#### Note

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

General purpose controlled avalanche  
(double) diodes

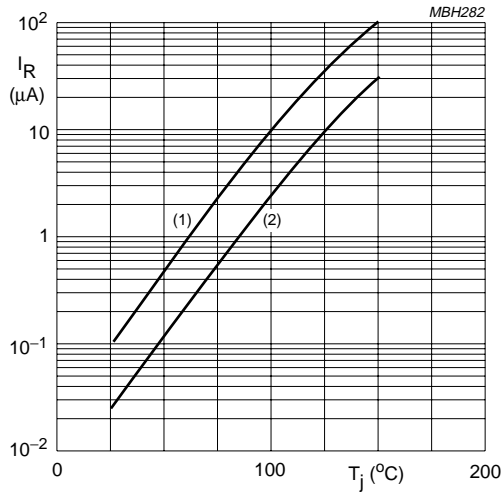
BAS29; BAS31; BAS35

GRAPHICAL DATA



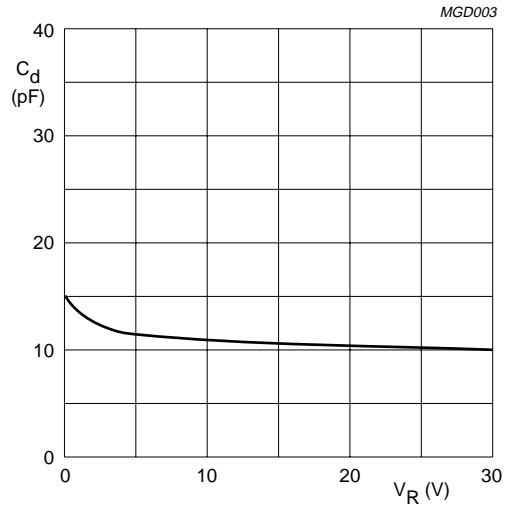
General purpose controlled avalanche  
(double) diodes

BAS29; BAS31; BAS35



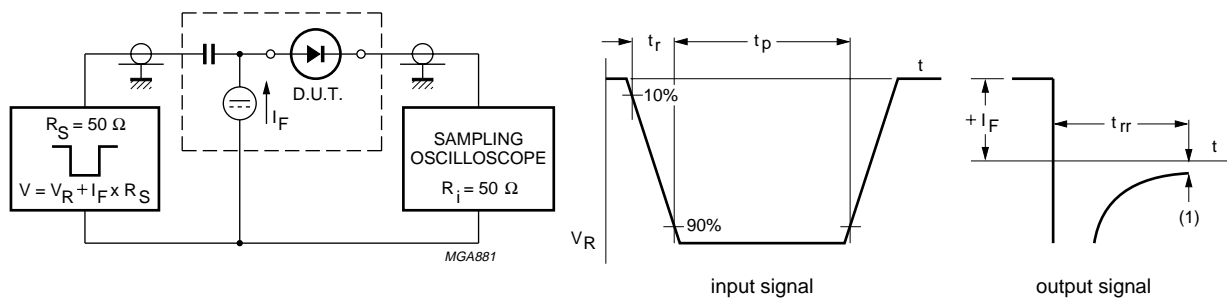
- (1)  $V_R = 90\text{ V}$ ; maximum values.
- (2)  $V_R = 90\text{ V}$ ; typical values.

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



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

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.

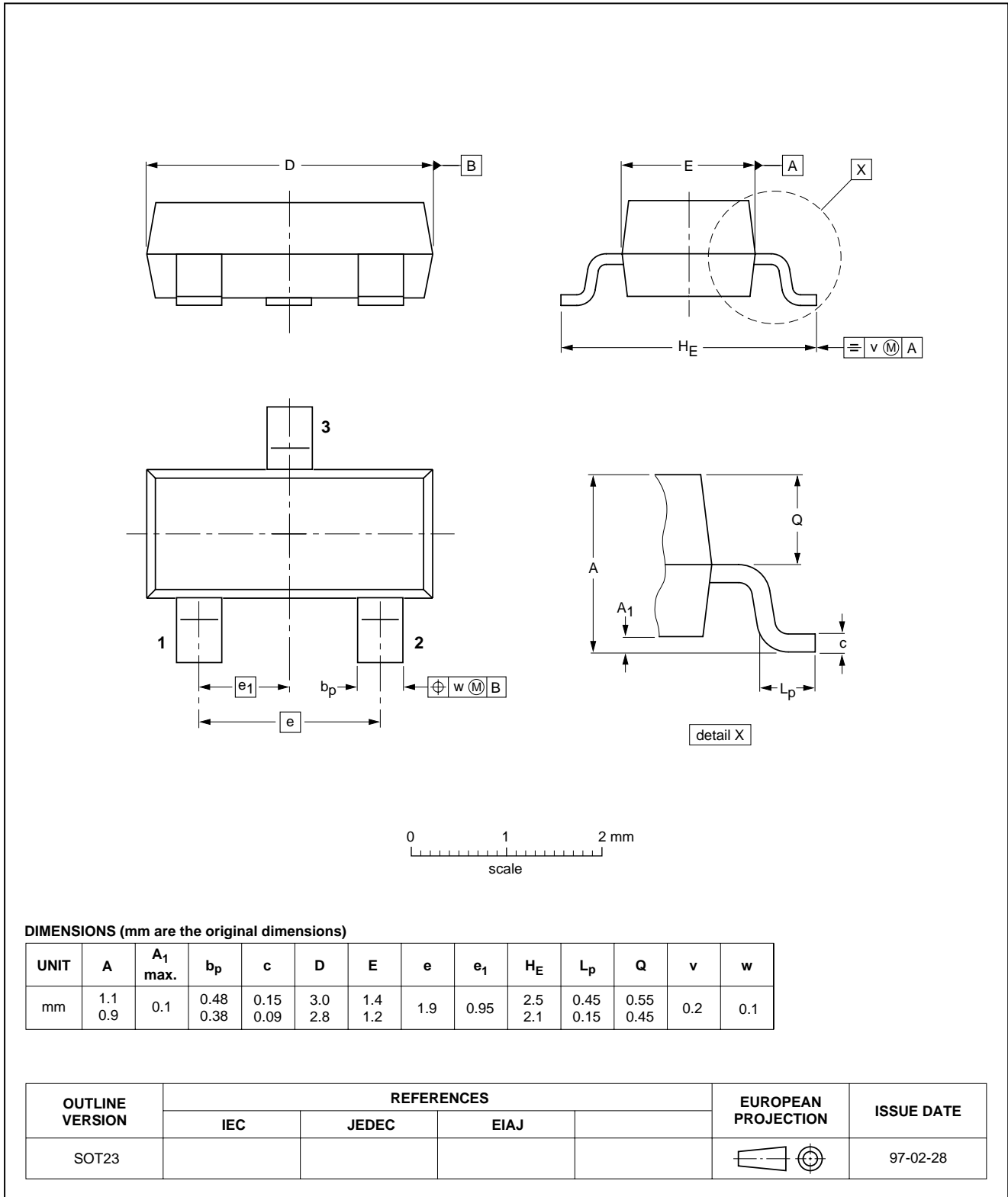
General purpose controlled avalanche  
(double) diodes

BAS29; BAS31; BAS35

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



# General purpose controlled avalanche (double) diodes

## BAS29; BAS31; BAS35

### DEFINITIONS

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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General purpose controlled avalanche  
(double) diodes

BAS29; BAS31; BAS35

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**NOTES**

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General purpose controlled avalanche  
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**NOTES**

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General purpose controlled avalanche  
(double) diodes

BAS29; BAS31; BAS35

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**NOTES**

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Printed in The Netherlands

115002/00/03/pp12

Date of release: 1999 May 21

Document order number: 9397 750 05967

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