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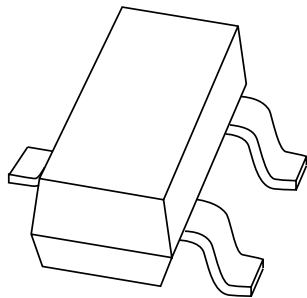
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Kind regards,

Team Nexperia

# 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

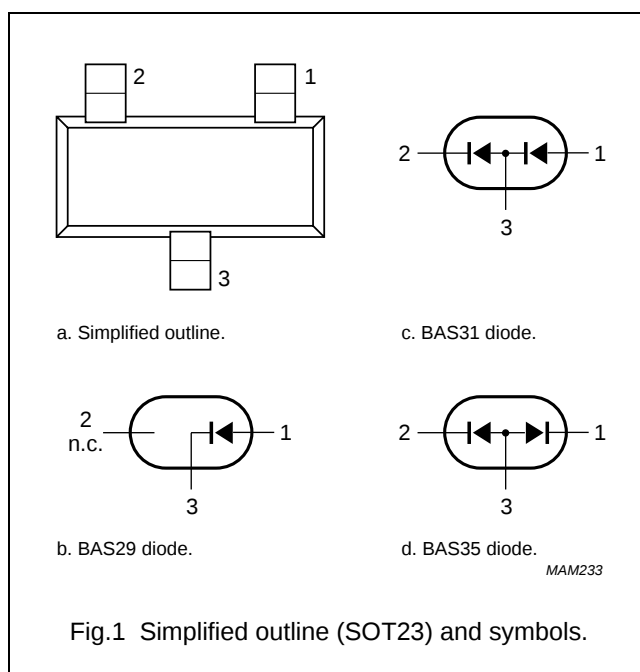
| TYPE NUMBER | MARKING CODE <sup>(1)</sup> |
|-------------|-----------------------------|
| BAS29       | L20 or *A8                  |
| BAS31       | L21 or *V1                  |
| BAS35       | L22 or *V2                  |

### 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;<br>note 1                                       | –    | 250  | mA   |
|                  |                                     | double diode loaded; see Fig.2;<br>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<br>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<br>$I_F = 10\text{ mA}$<br>$I_F = 50\text{ mA}$<br>$I_F = 100\text{ mA}$<br>$I_F = 200\text{ mA}$<br>$I_F = 400\text{ mA}$      | –<br>–<br>–<br>–<br>– | 750<br>840<br>900<br>1<br>1.25 | mV<br>mV<br>mV<br>V<br>V |
| $I_R$            | reverse current                     | see Fig.5<br>$V_R = 90\text{ V}$<br>$V_R = 90\text{ V}; T_j = 150\text{ }^{\circ}\text{C}$                                                | –<br>–                | 100<br>100                     | nA<br>$\mu\text{A}$      |
| $V_{(BR)R}$      | 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  |

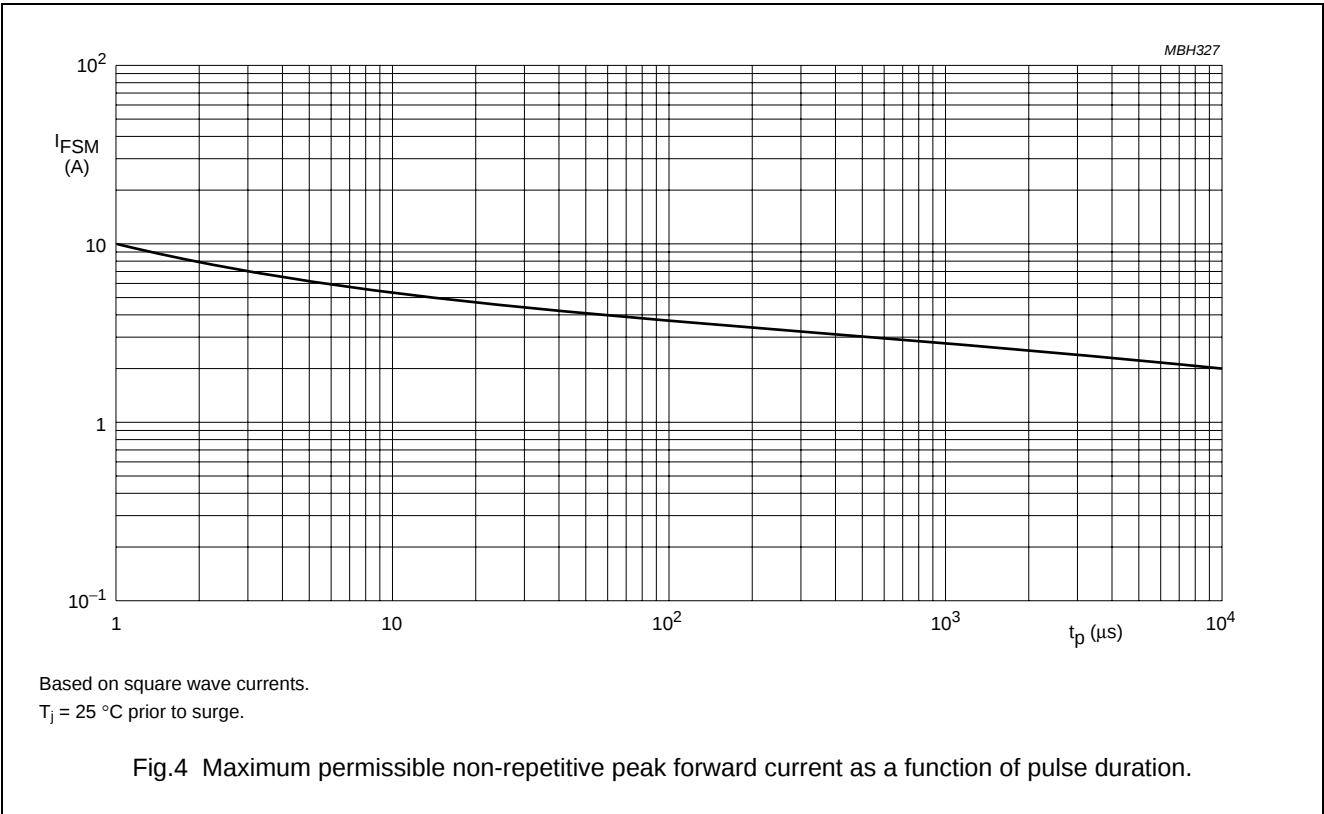
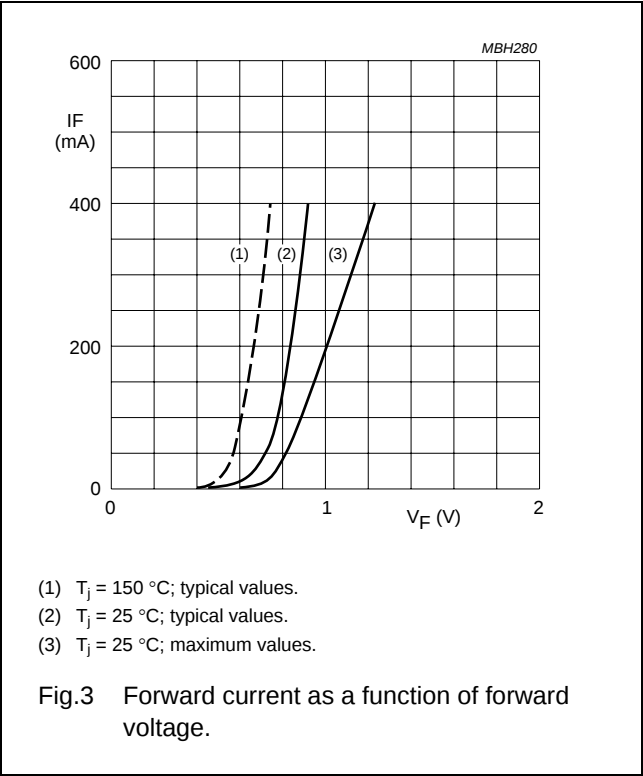
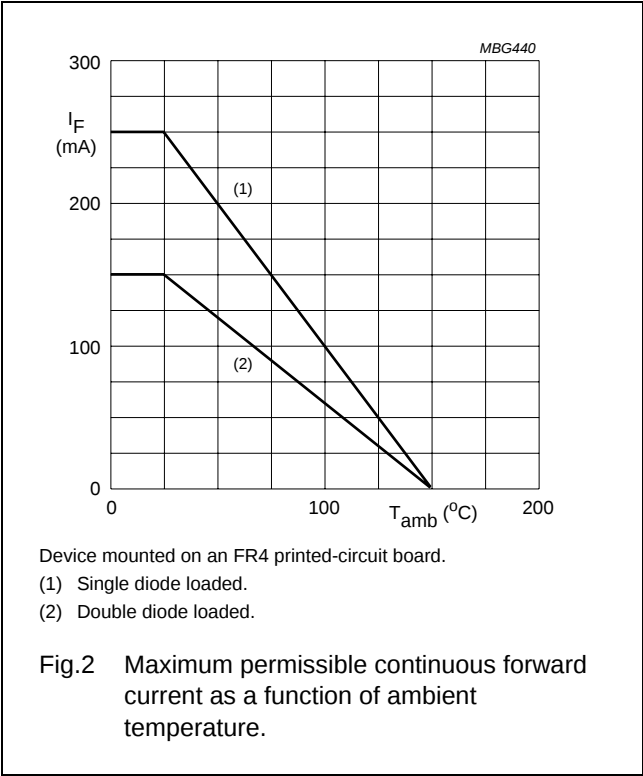
### Note

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

General purpose controlled avalanche  
(double) diodes

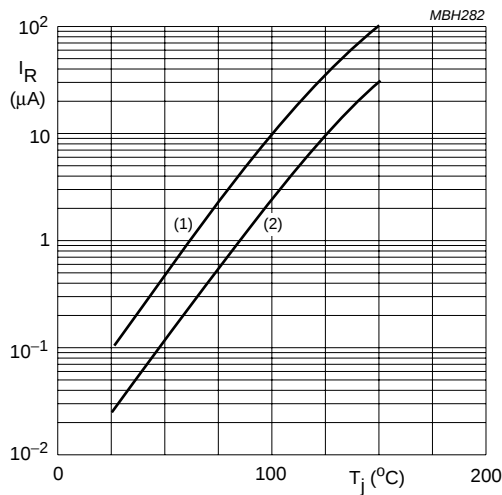
BAS29; BAS31; BAS35

GRAPHICAL DATA



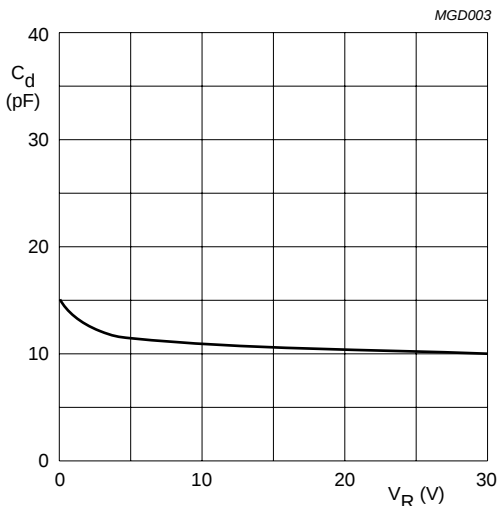
General purpose controlled avalanche  
(double) diodes

BAS29; BAS31; BAS35



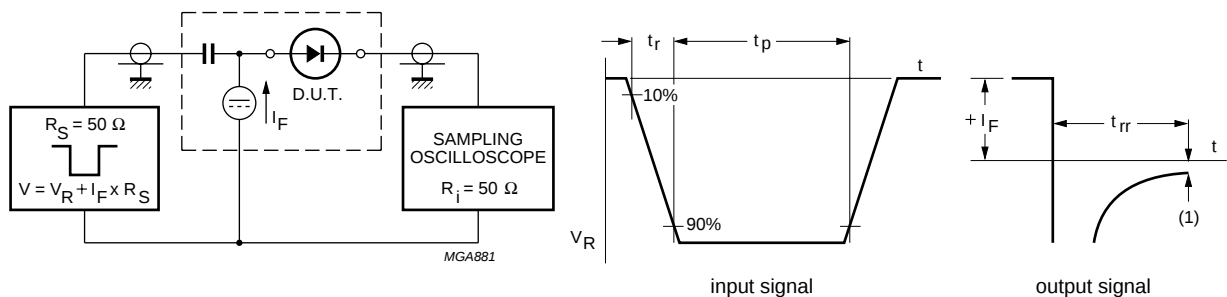
- (1)  $V_R = 90\text{ V}$ ; maximum values.
- (2)  $V_R = 90\text{ V}$ ; typical values.

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.

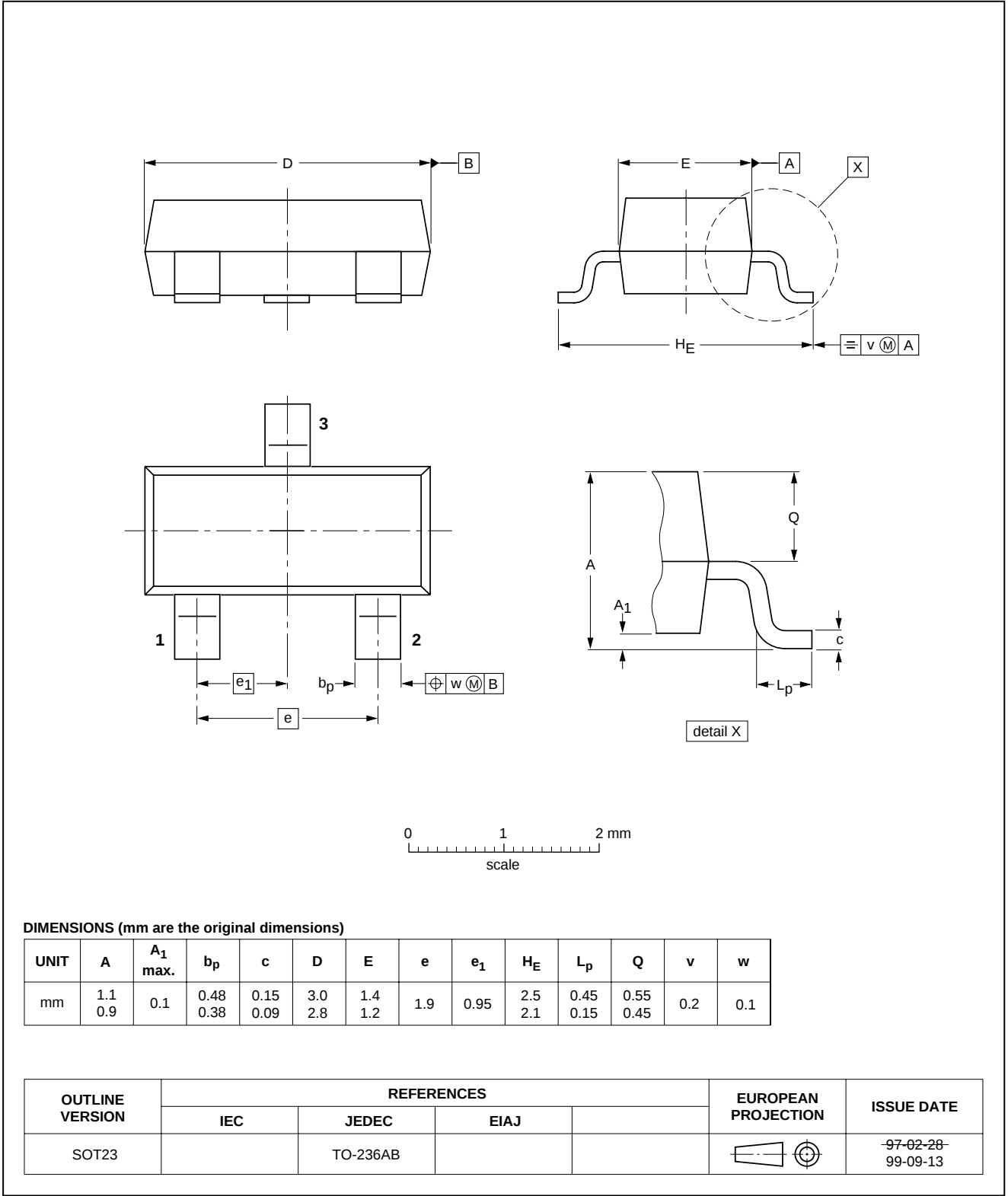
General purpose controlled avalanche  
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PACKAGE OUTLINE

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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# ***NXP Semiconductors***

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## **Contact information**

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

For sales offices addresses send e-mail to: **[salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)**

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