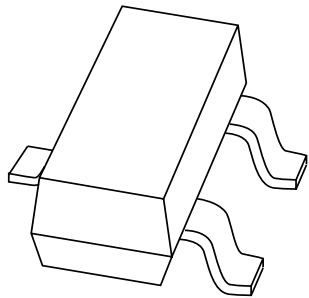


DATA SHEET



BAL99 High-speed diode

Product data sheet
Supersedes data of 1999 May 26

2003 Dec 12

High-speed diode

BAL99

FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 70 V
- Repetitive peak reverse voltage: max. 70 V
- Repetitive peak forward current: max. 500 mA.

APPLICATIONS

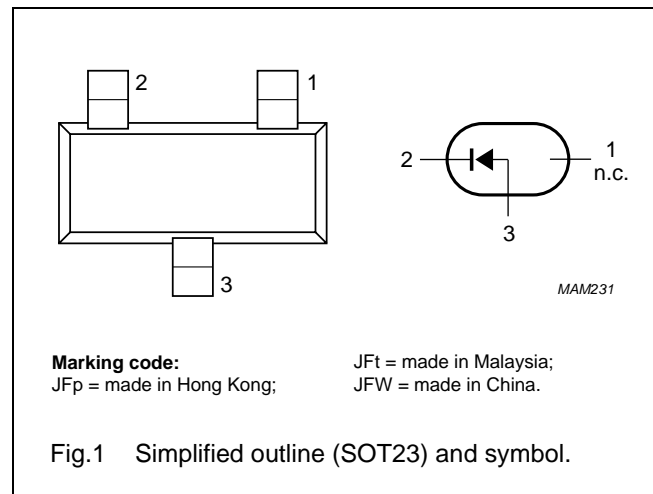
- High-speed switching in e.g. surface mounted circuits.

DESCRIPTION

The BAL99 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small SOT23 plastic SMD package.

PINNING

| PIN | DESCRIPTION |
|-----|---------------|
| 1 | not connected |
| 2 | cathode |
| 3 | anode |



ORDERING INFORMATION

| TYPE NUMBER | PACKAGE | | |
|-------------|---------|--|---------|
| | NAME | DESCRIPTION | VERSION |
| BAL99 | - | plastic surface mounted package; 3 leads | SOT23 |

LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|-------------------------------------|--|------|---------------|-------------|
| V_{RRM} | repetitive peak reverse voltage | | - | 70 | V |
| V_R | continuous reverse voltage | | - | 70 | 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.

High-speed diode

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

| SYMBOL | PARAMETER | CONDITIONS | MAX. | UNIT |
|----------|--------------------------|---|------|---------------|
| V_F | forward voltage | see Fig.3 | | |
| | | $I_F = 1\text{ mA}$ | 715 | mV |
| | | $I_F = 10\text{ mA}$ | 855 | mV |
| | | $I_F = 50\text{ mA}$ | 1 | V |
| | | $I_F = 150\text{ mA}$ | 1.25 | V |
| I_R | reverse current | see Fig.5 | | |
| | | $V_R = 25\text{ V}$ | 30 | nA |
| | | $V_R = 70\text{ V}$ | 1 | μA |
| | | $V_R = 25\text{ V}; T_j = 150\text{ °C}$ | 30 | μA |
| | | $V_R = 70\text{ V}; T_j = 150\text{ °C};$ | 50 | μA |
| C_d | diode capacitance | $f = 1\text{ MHz}; V_R = 0$; see Fig.6 | 1.5 | 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 | | 360 | K/W |
| $R_{th(j-a)}$ | thermal resistance from junction to ambient | note 1 | 500 | K/W |

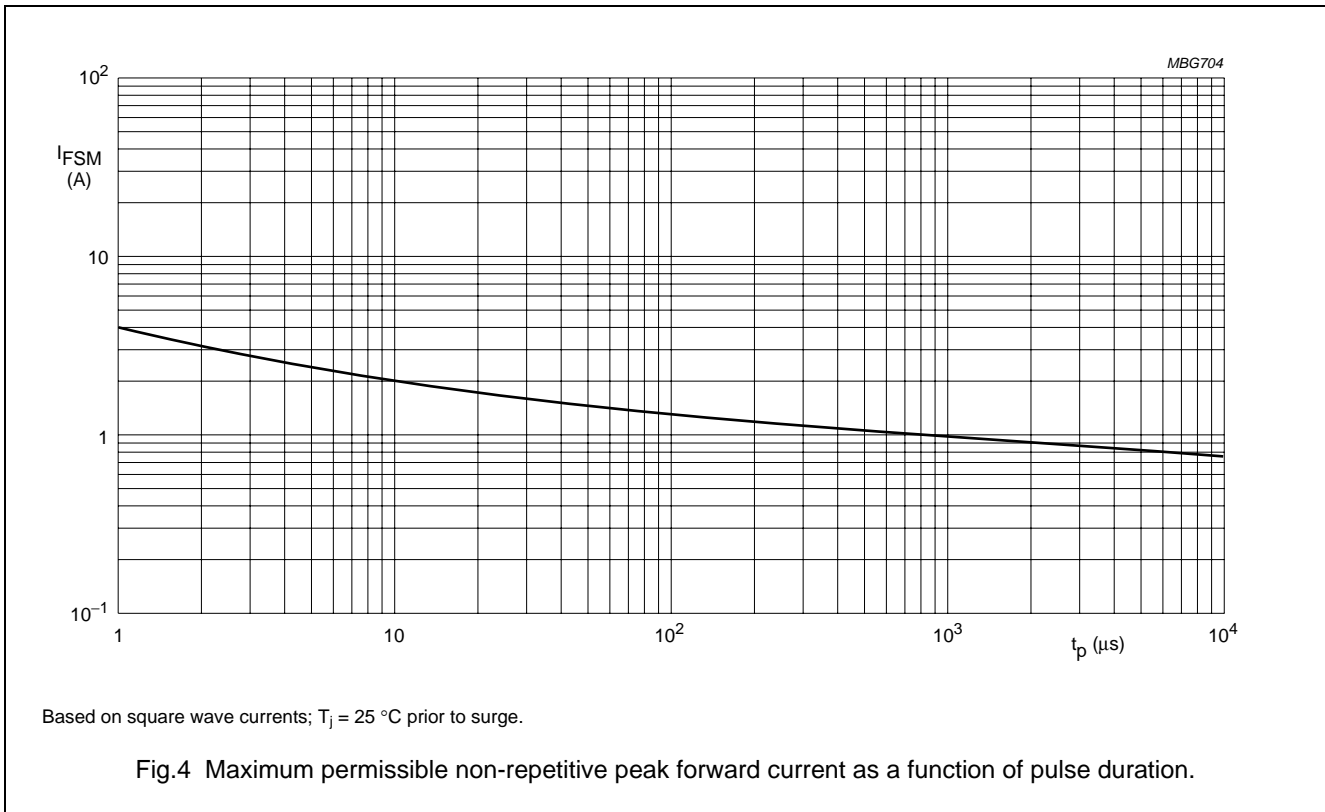
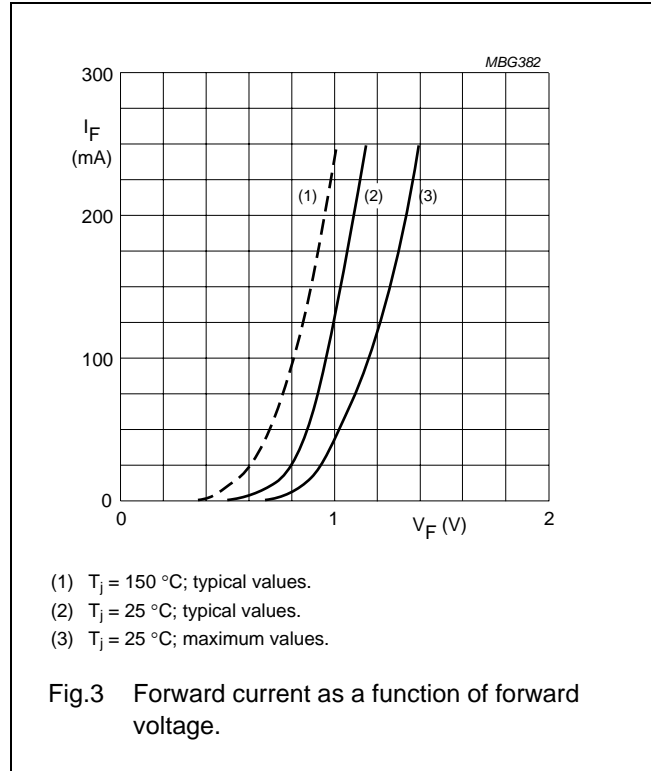
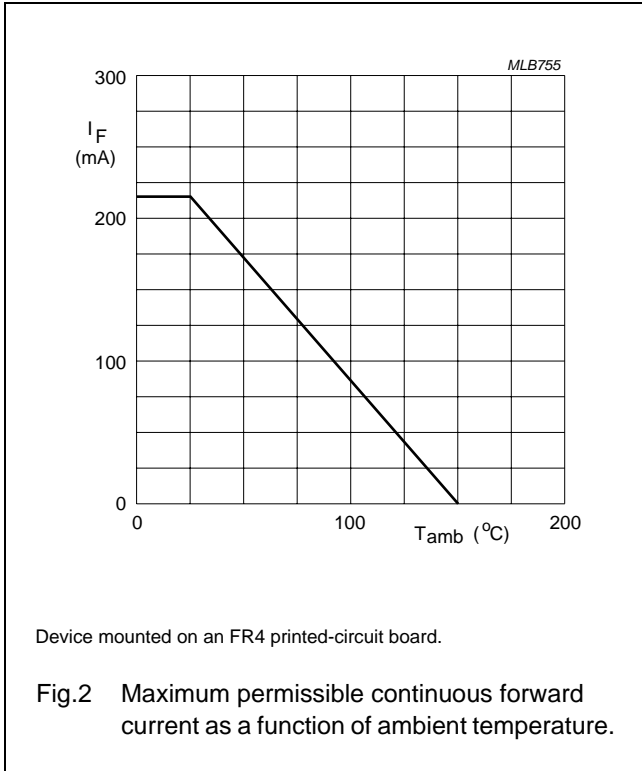
Note

- Device mounted on an FR4 printed-circuit board.

High-speed diode

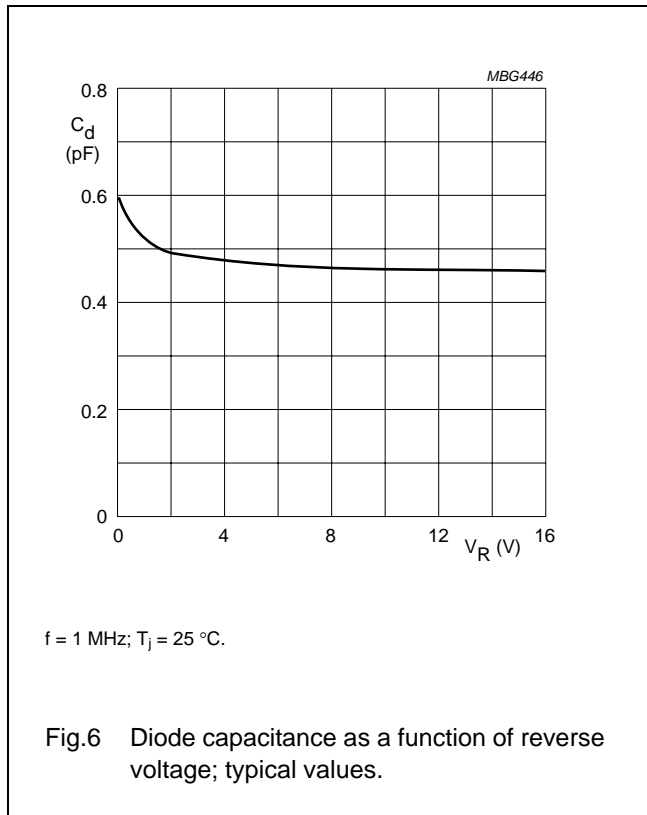
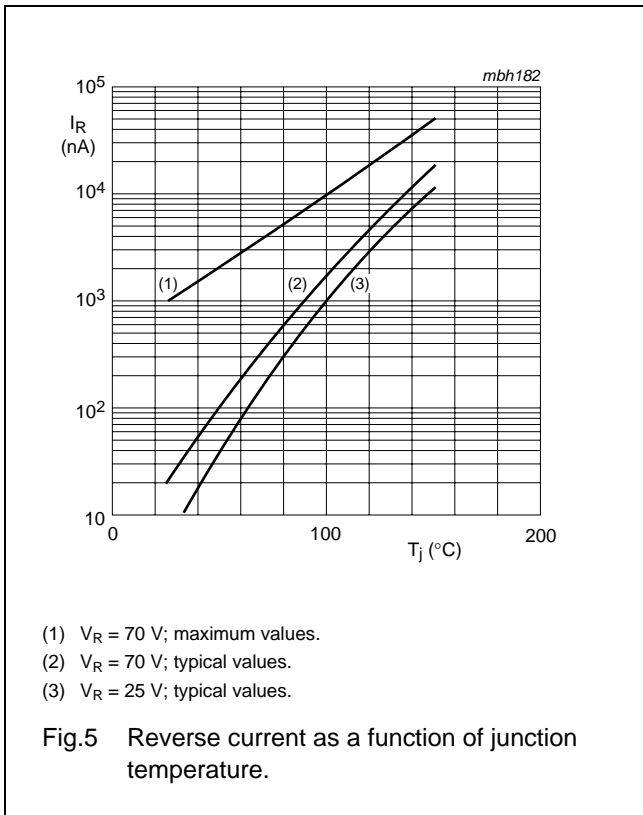
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GRAPHICAL DATA



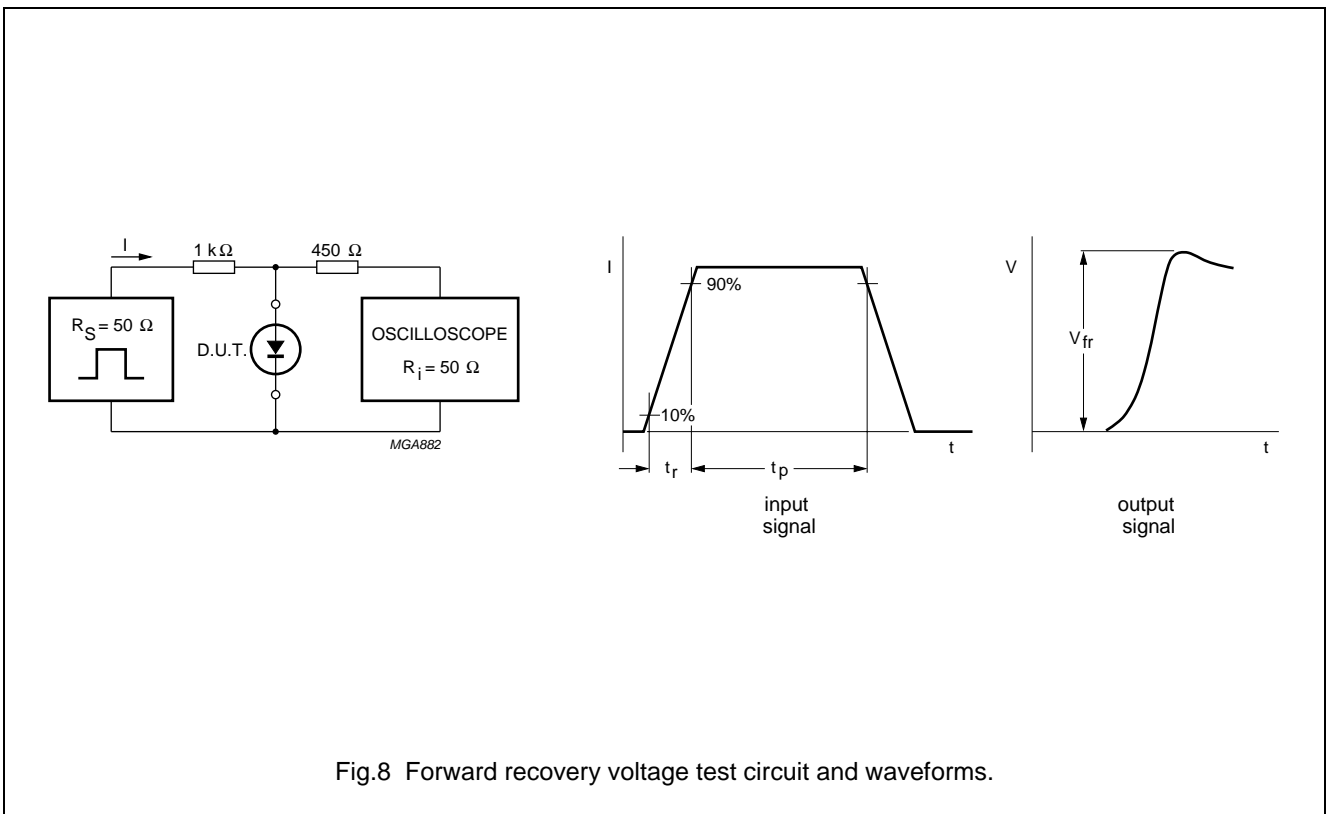
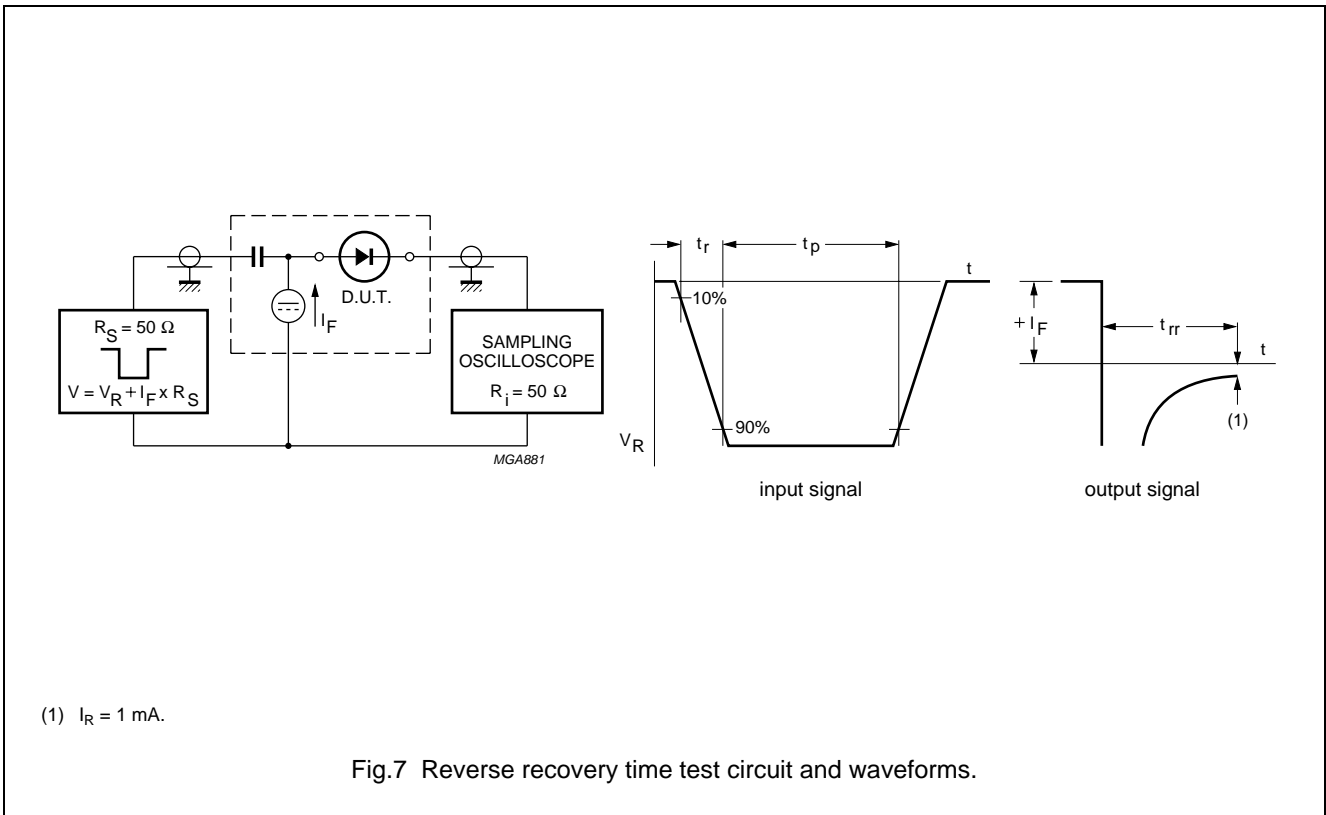
High-speed diode

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High-speed diode

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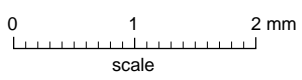
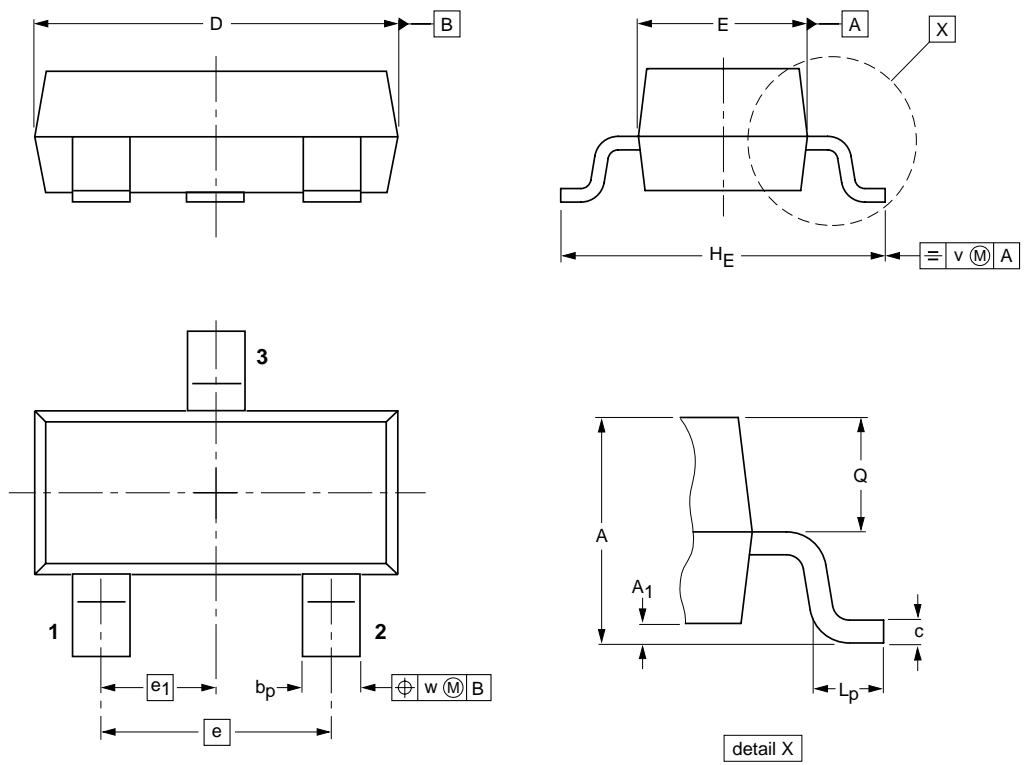
High-speed diode

BAL99

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads

SOT23



DIMENSIONS (mm are the original dimensions)

| UNIT | A | A ₁ max. | b _p | c | D | E | e | e ₁ | H _E | L _p | 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 | JEITA | | | |
| SOT23 | | TO-236AB | | | | 04-11-04 06-03-16 |

High-speed diode

BAL99

DATA SHEET STATUS

| DOCUMENT STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | 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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Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

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