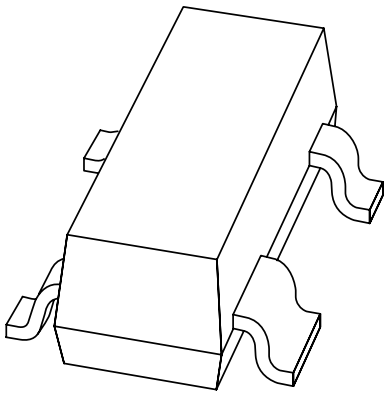
# DATA SHEET



# BAW101
## High voltage double diode

Product data sheet

2003 May 13

NXP founded by Philips

# High voltage double diode BAW101

## FEATURES

- Small plastic SMD package
- High switching speed: max. 50 ns
- High continuous reverse voltage: 300 V
- Electrically insulated diodes.

## APPLICATIONS

- High voltage switching
- Automotive
- Communication.

## DESCRIPTION

The BAW101 is a high-speed switching diode array with two separate dice, fabricated in planar technology and encapsulated in a small SOT143B plastic SMD package.

## MARKING

| TYPE NUMBER | MARKING CODE(1) |
|---|---|
| BAW101 | ∗AB |

**Note**

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

## PINNING

| PIN | DESCRIPTION |
|---|---|
| 1 | cathode 1 |
| 2 | cathode 2 |
| 3 | anode 2 |
| 4 | anode 1 |

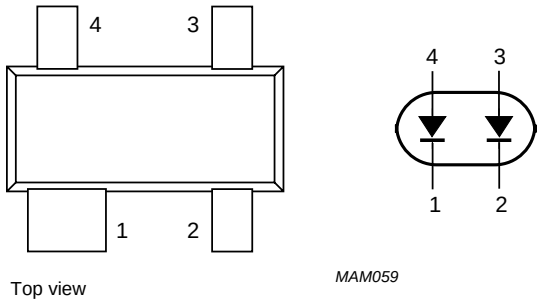



Fig.1 Simplified outline (SOT143B) and symbol.

## LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| **Per diode** | | | | | |
| $V_R$ | continuous reverse voltage | | – | 300 | V |
| | | series connection | – | 600 | V |
| $V_{RRM}$ | repetitive peak reverse voltage | | – | 300 | V |
| | | series connection | – | 600 | V |
| $I_F$ | continuous forward current | single diode loaded; note 1; see Fig.2 | – | 250 | mA |
| | | double diode loaded; note 1; see Fig.2 | – | 140 | mA |
| $I_{FRM}$ | repetitive peak forward current | | – | 625 | mA |
| $I_{FSM}$ | non-repetitive peak forward current | square wave; $T_j$ = 25 °C prior to surge; t = 1 μs | – | 4.5 | A |
| $P_{tot}$ | total power dissipation | $T_{amb}$ = 25 °C; note 1 | – | 350 | mW |
| $T_{stg}$ | storage temperature | | −65 | +150 | °C |
| $T_j$ | junction temperature | | – | 150 | °C |
| $T_{amb}$ | operating ambient temperature | | −65 | +150 | °C |

**Note**

1. Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 $cm^2$.

## ELECTRICAL CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| **Per diode** | | | | | |
| $V_{BR(R)}$ | reverse breakdown voltage | $I_R$ = 100 μA | 300 | – | V |
| $V_F$ | forward voltage | $I_F$ = 100 mA; note 1 | – | 1.1 | V |
| $I_R$ | reverse current | $V_R$ = 250 V | – | 150 | nA |
| | | $V_R$ = 250 V; $T_{amb}$ = 150 °C | – | 50 | μA |
| $t_{rr}$ | 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 | – | 50 | ns |
| $C_d$ | diode capacitance | $V_R$ = 0 V; f = 1 MHz | – | 2 | pF |

**Note**

1. Pulse test: pulse width = 300 μs; δ = 0.02.

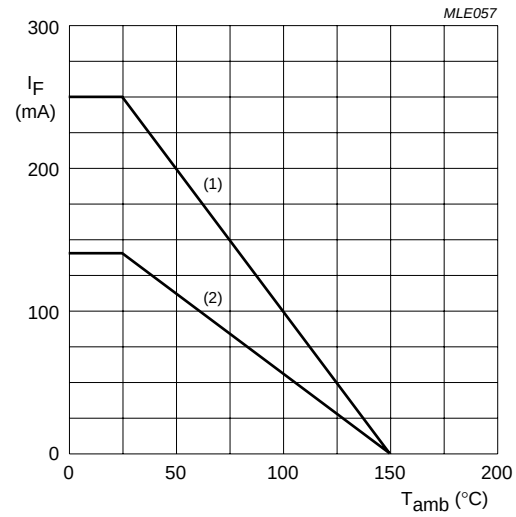
## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j\text{-}s}$ | thermal resistance from junction to soldering point | note 1 | 255 | K/W |
| $R_{th\ j\text{-}a}$ | thermal resistance from junction to ambient | note 2 | 357 | K/W |

**Notes**

1. One or more diodes loaded.
2. Device mounted on an FR4 printed-circuit board, cathode-lead mounting pad = 1 $cm^2$.

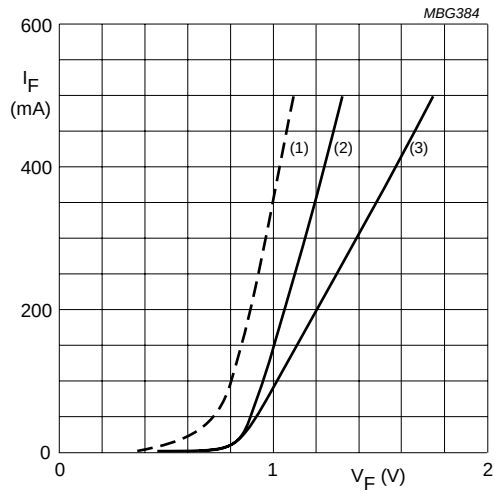
## GRAPHICAL DATA




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

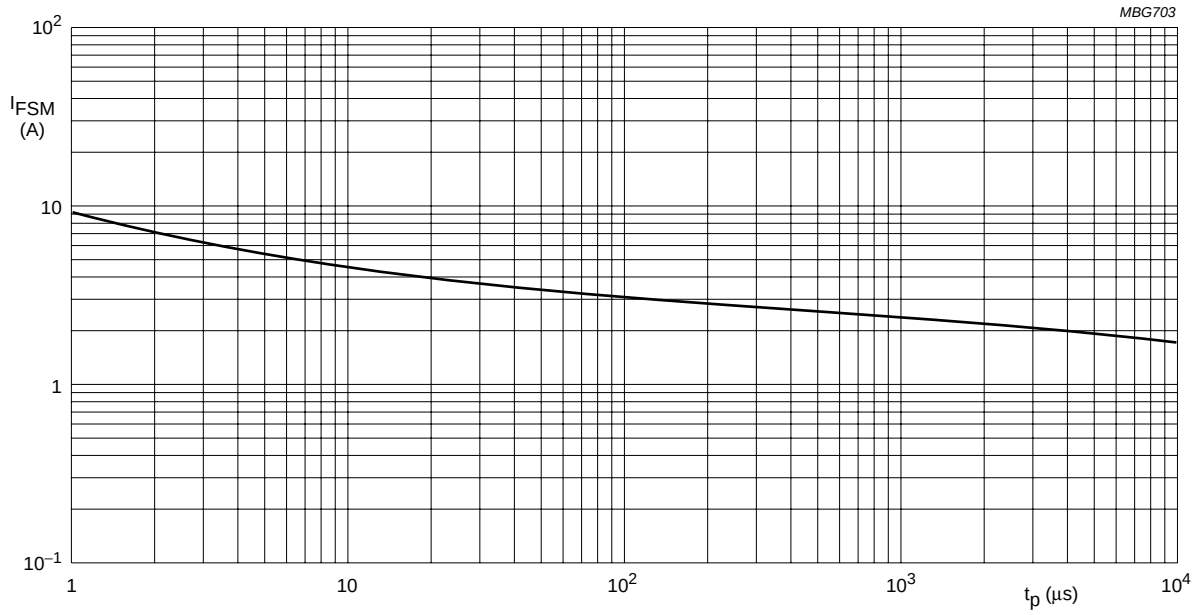
Device mounted on an FR4 printed-circuit board.
Cathode-lead mounting pad = 1 $cm^2$.

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



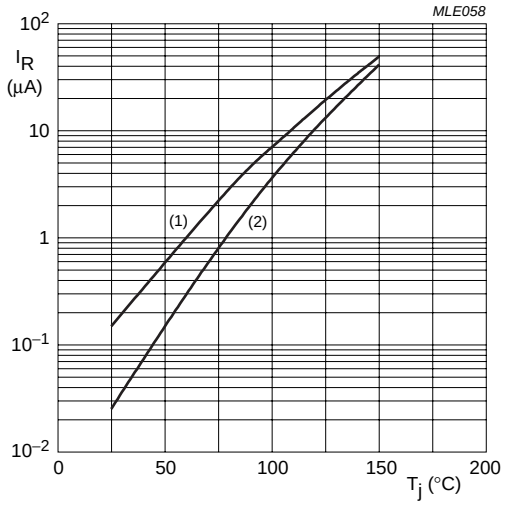

(1) $T_j$ = 150 °C; typical values.
(2) $T_j$ = 25 °C; typical values.
(3) $T_j$ = 25 °C; maximum values.

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



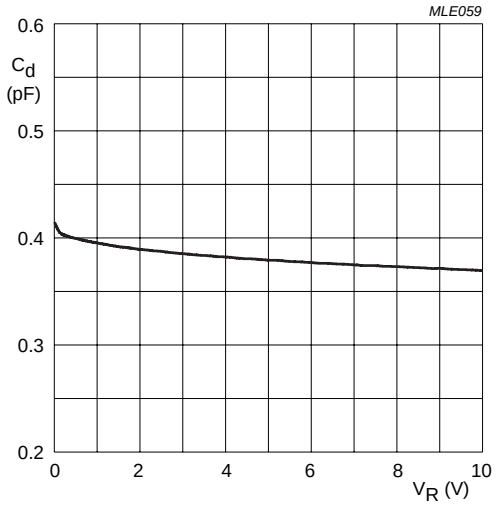

Based on square wave currents.
$T_j$ = 25 °C prior to surge.

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




(1) $V_R = V_{RMAX}$: maximum values.
(2) $V_R = V_{RMAX}$: typical values.

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




f = 1 MHz; $T_j$ = 25 °C.

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

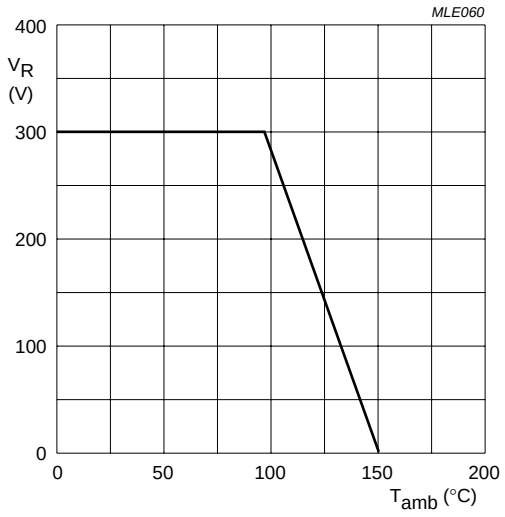
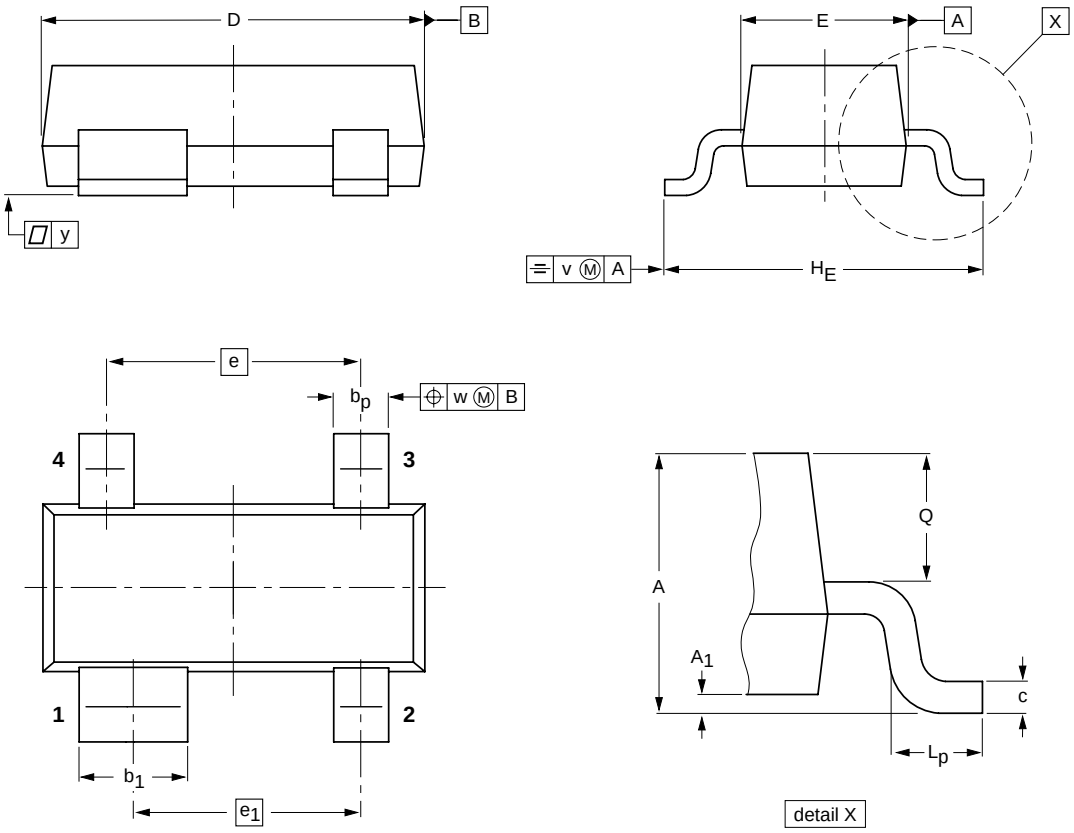



Fig.7 Maximum permissible continuous reverse voltage as a function of ambient temperature.

## PACKAGE OUTLINE

**Plastic surface mounted package; 4 leads** **SOT143B**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $A_1$ max | $b_p$ | $b_1$ | c | D | E | e | $e_1$ | $H_E$ | $L_p$ | Q | v | w | y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 1.1<br>0.9 | 0.1 | 0.48<br>0.38 | 0.88<br>0.78 | 0.15<br>0.09 | 3.0<br>2.8 | 1.4<br>1.2 | 1.9 | 1.7 | 2.5<br>2.1 | 0.45<br>0.15 | 0.55<br>0.45 | 0.2 | 0.1 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT143B | | | | | | 97-02-28 |

**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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