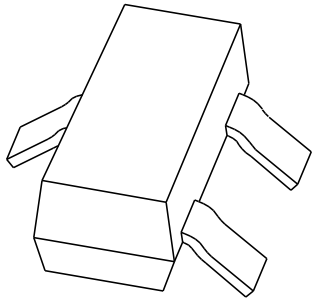


# DATA SHEET



## **PMBD914** High-speed diode

Product specification  
Supersedes data of November 1993  
File under Discrete Semiconductors, SC01

1996 Apr 04

# High-speed diode

# PMBD914

## FEATURES

- Small plastic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 70 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA
- Forward voltage: max. 1 V
- Reverse recovery time: max. 4 ns.

## APPLICATIONS

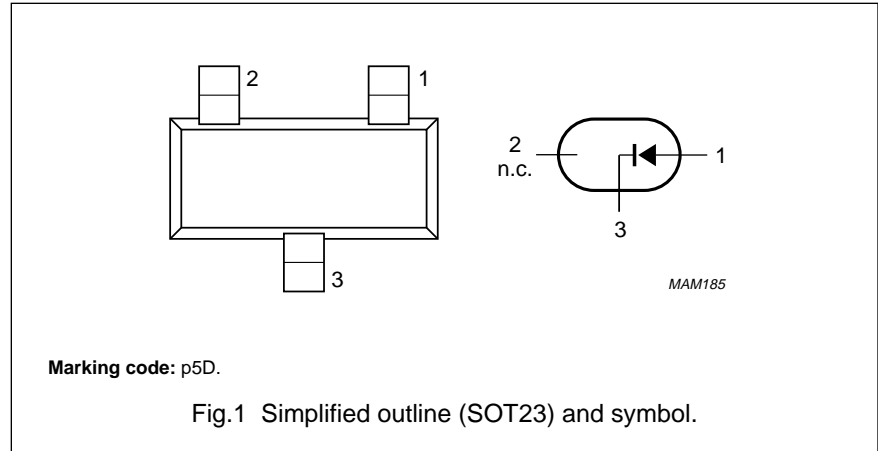
- High-speed switching in thick and thin-film circuits.

## DESCRIPTION

The PMBD914 is a high-speed switching diode fabricated in planar technology, and encapsulated in the small plastic SMD SOT23 package.

## PINNING

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



## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL    | PARAMETER                           | CONDITIONS   | MIN. | MAX.          | UNIT        |
|-----------|-------------------------------------|--|------|---------------|-------------|
| $V_{RRM}$ | repetitive peak reverse voltage     |  | –    | 85            | 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<br>$t = 1\ \mu\text{s}$<br>$t = 1\ \text{ms}$<br>$t = 1\ \text{s}$ | –    | 4<br>1<br>0.5 | A<br>A<br>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** $T_j = 25\text{ }^\circ\text{C}$ ; unless otherwise specified.

| SYMBOL   | PARAMETER                | CONDITIONS  | MIN.             | MAX.                      | UNIT  |
|----------|--------------------------|---|------------------|---------------------------|---|
| $V_F$    | forward voltage          | see Fig.3<br>$I_F = 1\text{ mA}$<br>$I_F = 10\text{ mA}$<br>$I_F = 50\text{ mA}$<br>$I_F = 150\text{ mA}$   | –<br>–<br>–<br>– | 715<br>855<br>1.0<br>1.25 | mV<br>mV<br>V<br>V                                    |
| $I_R$    | reverse current          | see Fig.5<br>$V_R = 25\text{ V}$<br>$V_R = 75\text{ V}$<br>$V_R = 25\text{ V}; T_j = 150\text{ }^\circ\text{C}$<br>$V_R = 75\text{ V}; T_j = 150\text{ }^\circ\text{C}$ | –<br>–<br>–<br>– | 25<br>1.0<br>30<br>50     | nA<br>$\mu\text{A}$<br>$\mu\text{A}$<br>$\mu\text{A}$ |
| $C_d$    | 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 |            | 330   | K/W  |
| $R_{th\ j-a}$  | thermal resistance from junction to ambient   | note 1     | 500   | K/W  |

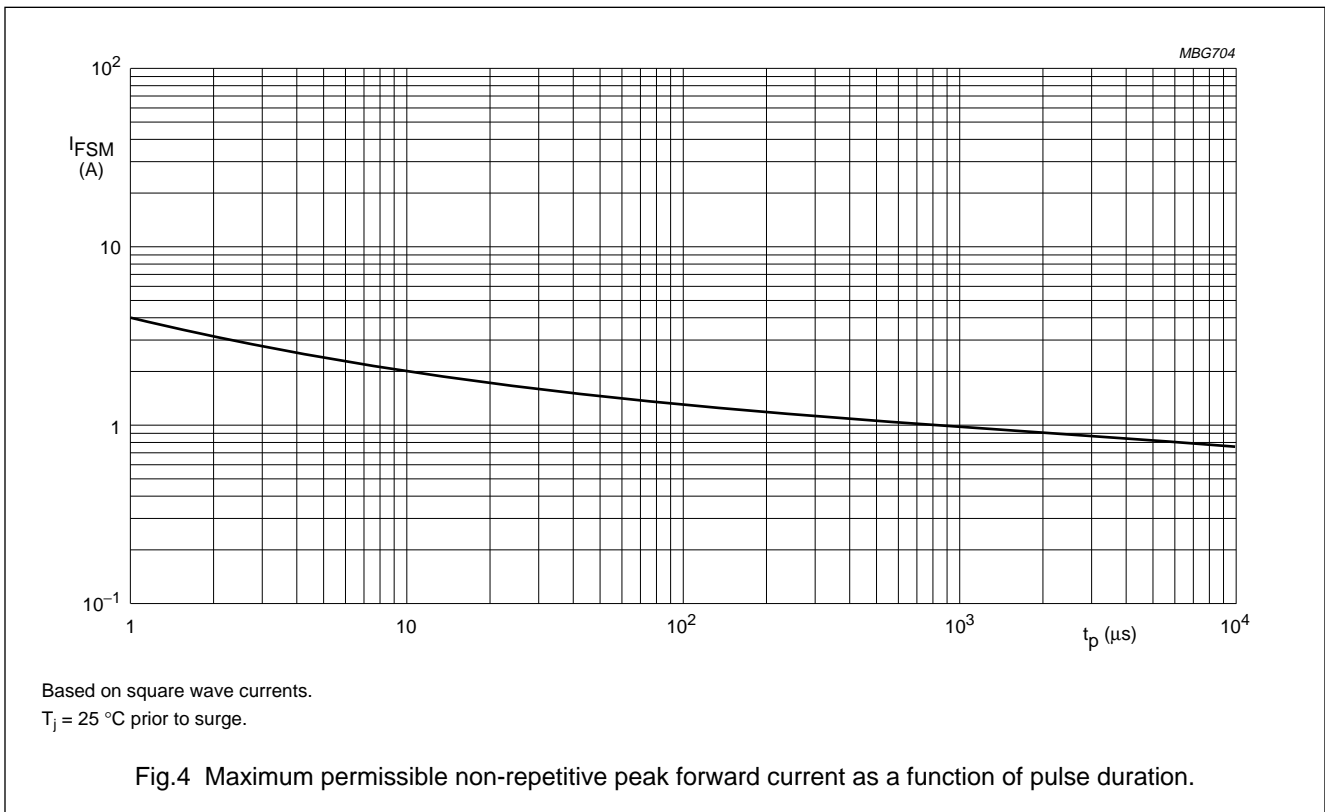
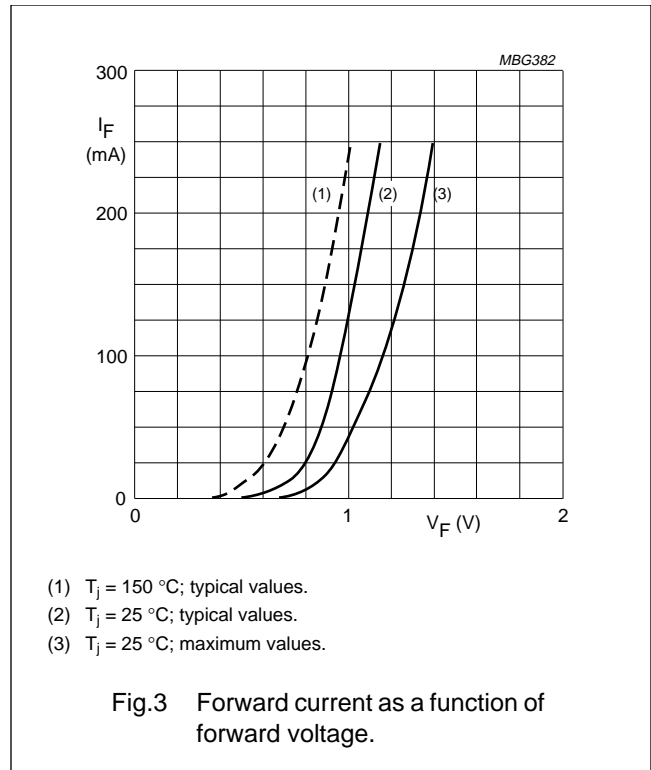
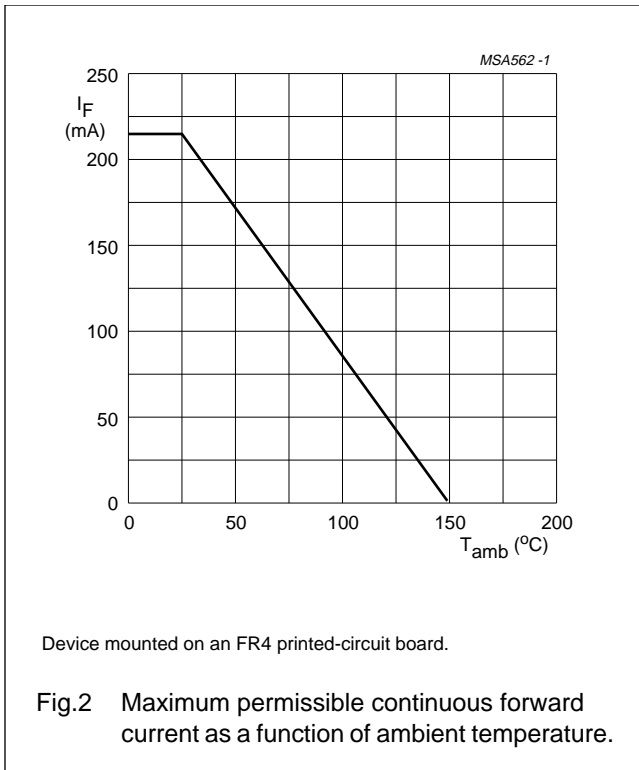
**Note**

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

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## GRAPHICAL DATA



High-speed diode

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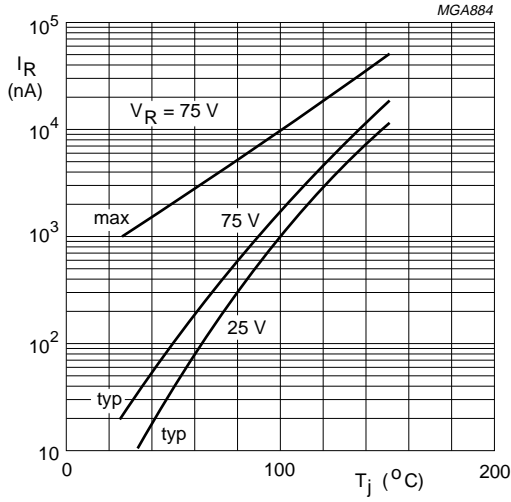
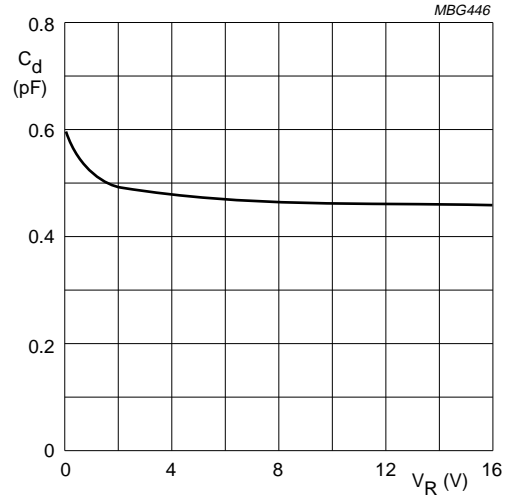


Fig.5 Reverse current as a function of junction temperature.

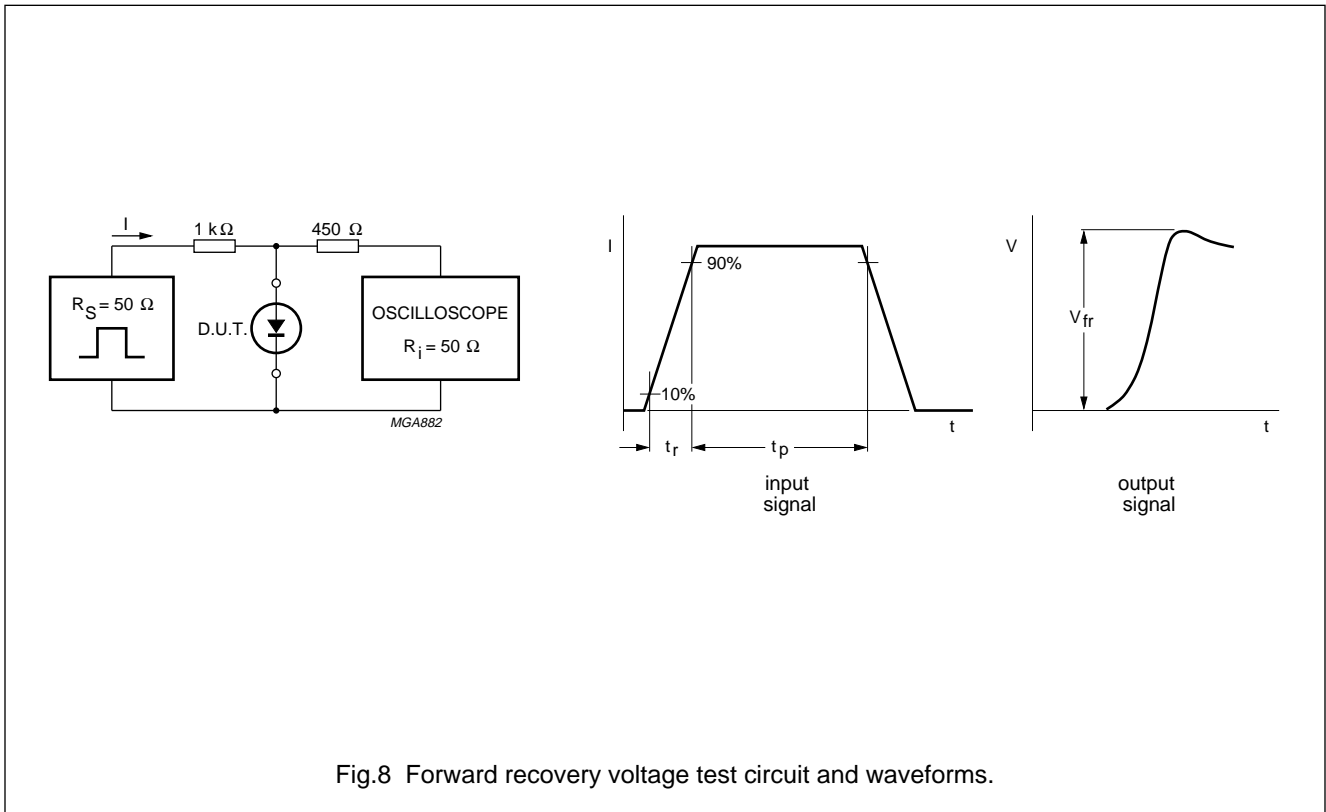
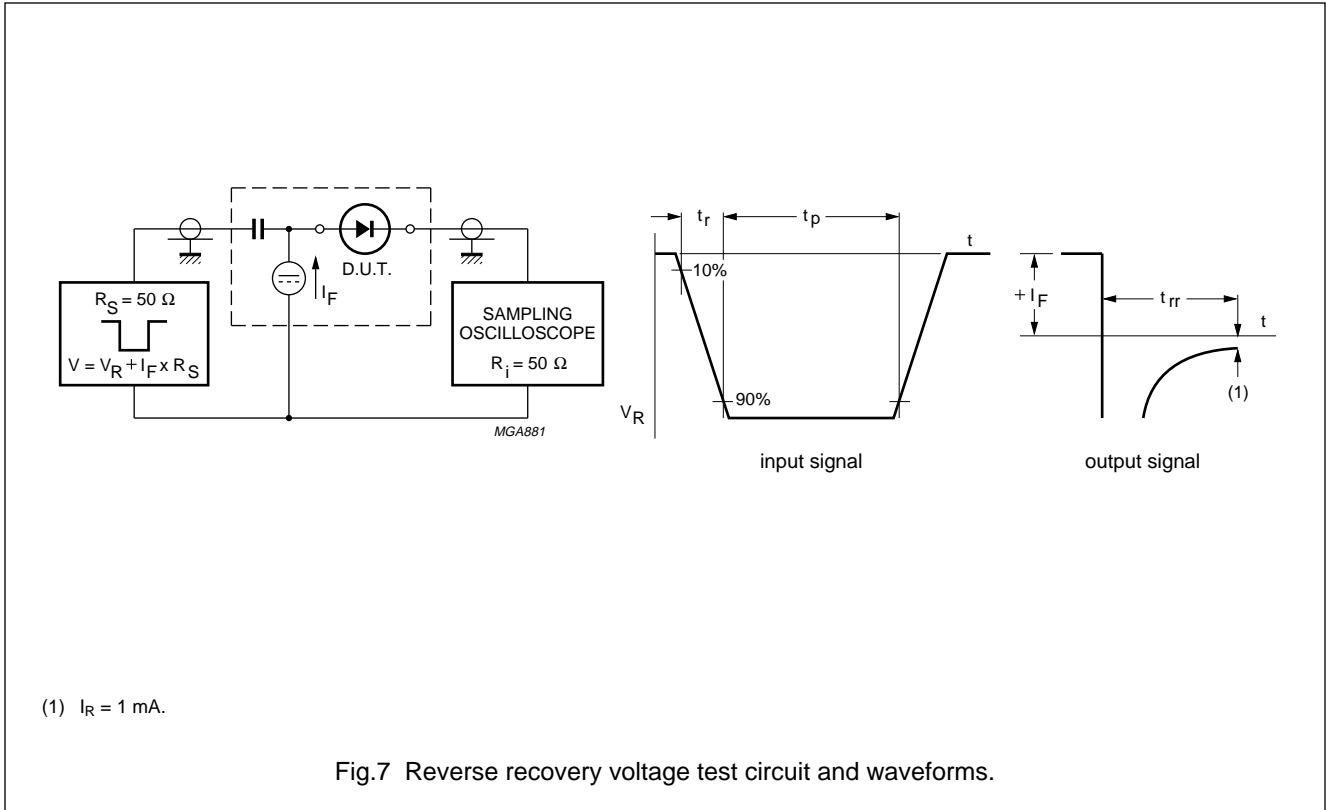


$f = 1$  MHz;  $T_j = 25$  °C.

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

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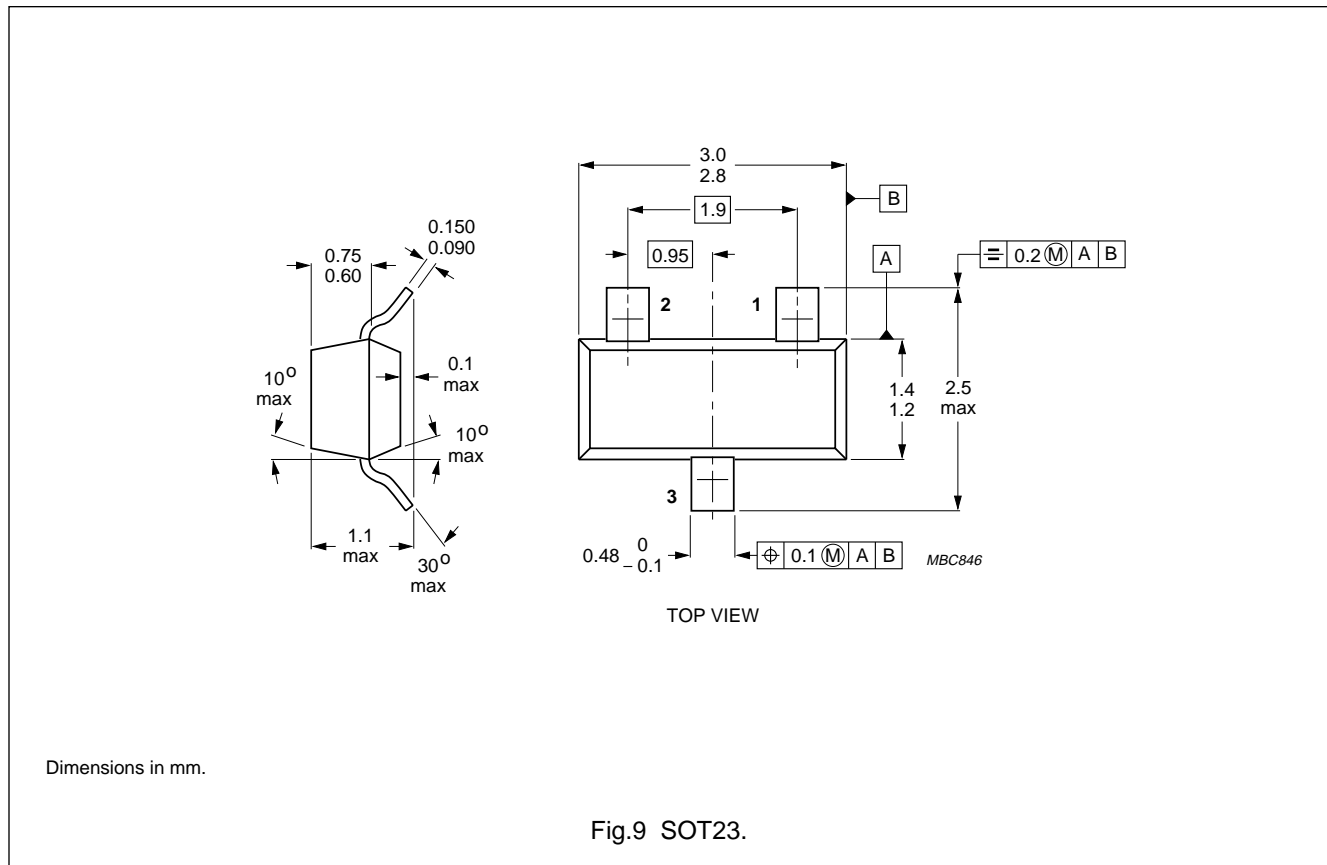
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# High-speed diode

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## PACKAGE OUTLINE



## 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.   |   |

## LIFE SUPPORT APPLICATIONS

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