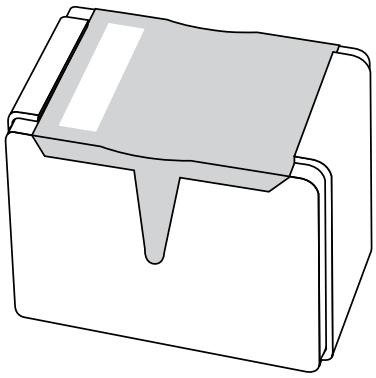
# DATA SHEET



# BAS216
## High-speed switching diode

Product data sheet
Supersedes data of 1999 Apr 22

2002 May 28

NXP founded by Philips

# High-speed switching diode BAS216

## FEATURES

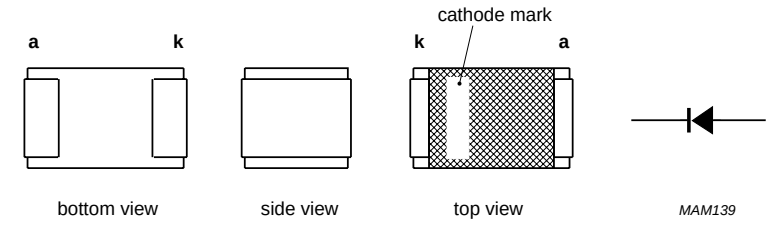
- Small ceramic SMD package
- High switching speed: max. 4 ns
- Continuous reverse voltage: max. 75 V
- Repetitive peak reverse voltage: max. 85 V
- Repetitive peak forward current: max. 500 mA.

## APPLICATIONS

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

## DESCRIPTION

The BAS216 is a high-speed switching diode fabricated in planar technology, and encapsulated in the SOD110 very small rectangular ceramic SMD package.




**Marking code:** A6.

Fig.1 Simplified outline (SOD110) and symbol.

## LIMITING VALUES

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_{RRM}$ | repetitive peak reverse voltage | | – | 85 | V |
| $V_R$ | continuous reverse voltage | | – | 75 | V |
| $I_F$ | continuous forward current | note 1 | – | 250 | mA |
| $I_{FRM}$ | repetitive peak forward current | | – | 500 | mA |
| $I_{FSM}$ | non-repetitive peak forward current | square wave; $T_j$ = 25 °C prior to surge; see Fig.4 | | | |
| | | t = 1 μs | – | 4 | A |
| | | t = 1 ms | – | 1 | A |
| | | t = 1 s | – | 0.5 | A |
| $P_{tot}$ | total power dissipation | $T_{amb}$ = 25 °C; see Fig.2; note 1 | – | 400 | mW |
| $T_{stg}$ | storage temperature | | −65 | +150 | °C |
| $T_j$ | junction temperature | | – | 150 | °C |

**Note**

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

## ELECTRICAL CHARACTERISTICS

$T_j$ = 25 °C unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| $V_F$ | forward voltage | see Fig.3 | | | |
| | | $I_F$ = 1 mA | – | 715 | mV |
| | | $I_F$ = 10 mA | – | 855 | mV |
| | | $I_F$ = 50 mA | – | 1 | V |
| | | $I_F$ = 150 mA | – | 1.25 | V |
| $I_R$ | reverse current | see Fig.5 | | | |
| | | $V_R$ = 25 V | – | 30 | nA |
| | | $V_R$ = 75 V | – | 1 | μA |
| | | $V_R$ = 25 V; $T_j$ = 150 °C | – | 30 | μA |
| | | $V_R$ = 75 V; $T_j$ = 150 °C | – | 50 | μA |
| $C_d$ | diode capacitance | f = 1 MHz; $V_R$ = 0; see Fig.6 | – | 1.5 | pF |
| $t_{rr}$ | reverse recovery time | when switched from $I_F$ = 10 mA to $I_R$ = 10 mA; $R_L$ = 100 Ω; measured at $I_R$ = 1 mA; see Fig.7 | – | 4 | ns |
| $V_{fr}$ | forward recovery voltage | when switched from $I_F$ = 10 mA; $t_r$ = 20 ns; see Fig.8 | – | 1.75 | V |

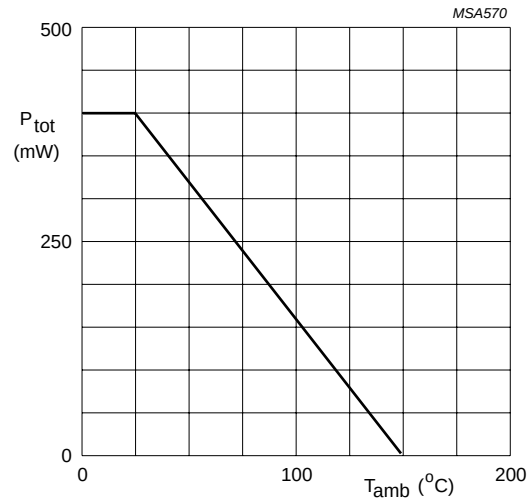
## THERMAL CHARACTERISTICS

| SYMBOL | PARAMETER | CONDITIONS | VALUE | UNIT |
|---|---|---|---|---|
| $R_{th\ j\text{-}tp}$ | thermal resistance from junction to tie-point | | 200 | K/W |
| $R_{th\ j\text{-}a}$ | thermal resistance from junction to ambient | note 1 | 315 | K/W |

**Note**

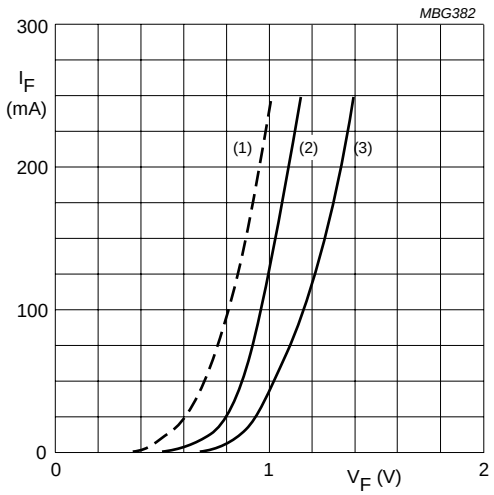
1. Device mounted on an FR4 printed-circuit board.

## GRAPHICAL DATA



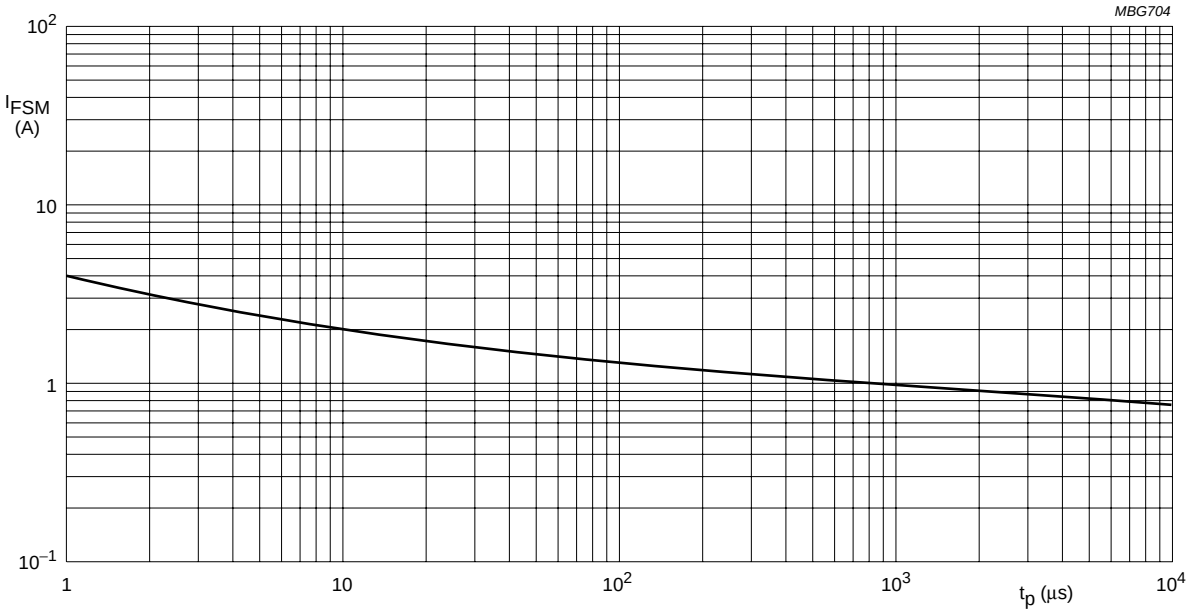

Device mounted on an FR4 printed-circuit board.

Fig.2 Maximum permissible total power dissipation as a function of ambient temperature.



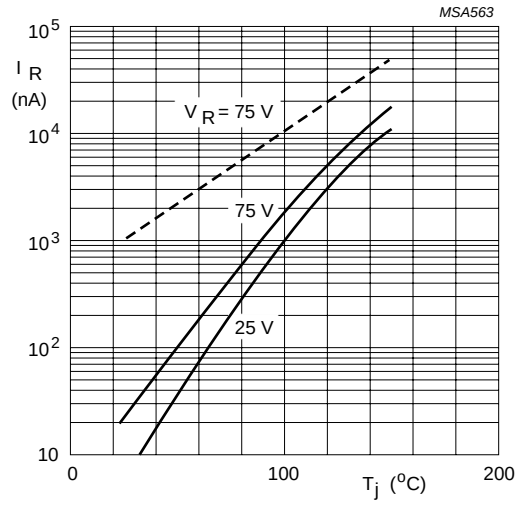

(1) $T_j$ = 150 °C; typical values.
(2) $T_j$ = 25 °C; typical values.
(3) $T_j$ = 25 °C; maximum values.

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



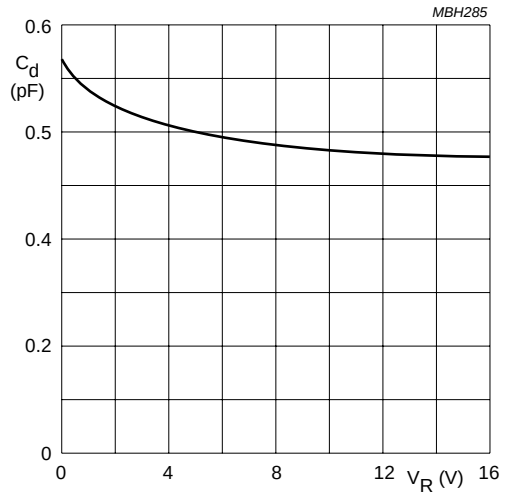

Based on square wave currents.
$T_j$ = 25 °C prior to surge.

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



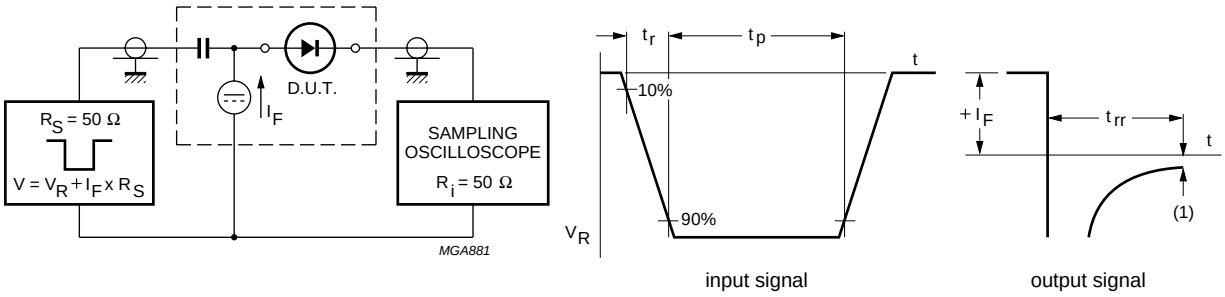

Dotted line: maximum values.
Solid lines: typical values.

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.




(1) $I_R$ = 1 mA.

Fig.7 Reverse recovery voltage test circuit and waveforms.

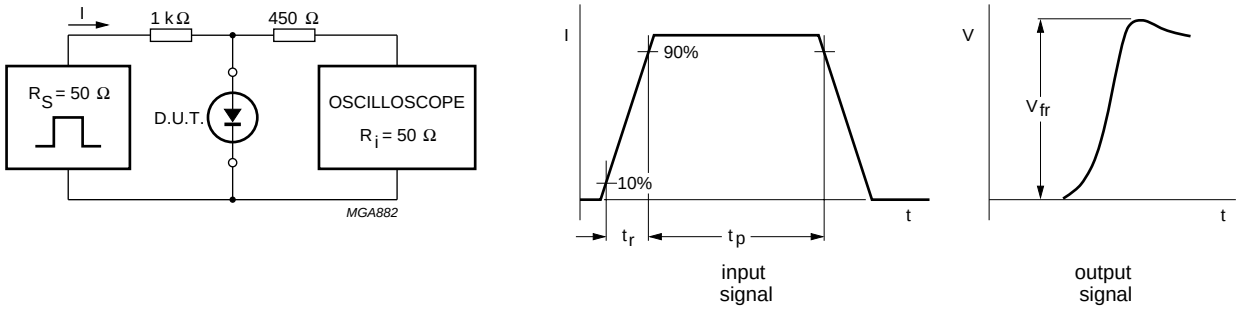
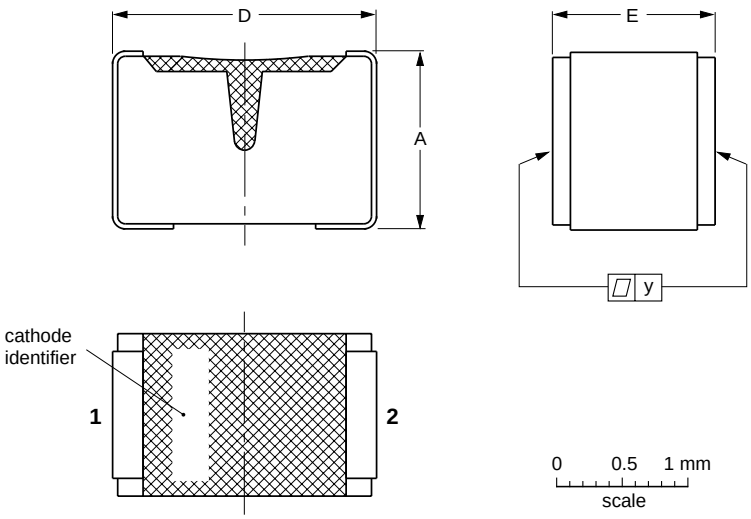



Fig.8 Forward recovery voltage test circuit and waveforms.

## PACKAGE OUTLINE

**Very small ceramic rectangular surface mounted package** **SOD110**




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

| UNIT | A max. | D | E | y |
|---|---|---|---|---|
| mm | 1.6 | 2.10<br>1.90 | 1.40<br>1.10 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOD110 | | | | | | 97-04-14 |

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| 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. |
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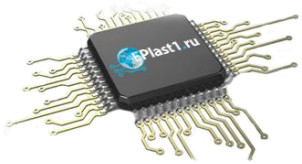


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