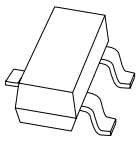


# BAP70-05

## Silicon PIN diode

Rev. 01 — 5 April 2004 Product data sheet

## 1. Product profile

### 1.1 General description

Two planar PIN diodes in common cathode configuration in a SOT23 small SMD plastic package.

### 1.2 Features

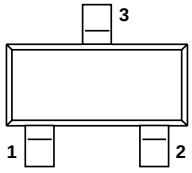
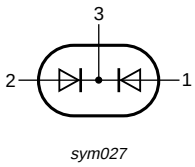
- High voltage; current controlled
- Low diode capacitance
- Low series inductance.

### 1.3 Applications

- RF attenuators and switches.

## 2. Pinning information

**Table 1: Discrete pinning**

| Pin | Description | Simplified outline | Symbol |
|---|---|---|---|
| 1 | anode (a1) |  Top view |  sym027 |
| 2 | anode (a2) | | |
| 3 | common cathode | | |

## 3. Ordering information

**Table 2: Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| BAP70-05 | - | plastic surface mounted package; 3 leads | SOT23 |

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## 4. Marking

**Table 3: Marking**

| Type number | Marking code |
|---|---|
| BAP70-05 | 8Kp |

## 5. Limiting values

**Table 4: 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 | | - | 50 | V |
| $I_F$ | continuous forward current | | - | 100 | mA |
| $P_{tot}$ | total power dissipation | $T_s$ = 90 °C | - | 250 | mW |
| $T_{stg}$ | storage temperature | | –65 | +150 | °C |
| $T_j$ | junction temperature | | –65 | +150 | °C |

## 6. Thermal characteristics

**Table 5: Thermal characteristics**

| Symbol | Parameter | Conditions | Typ | Unit |
|---|---|---|---|---|
| $R_{th(j-s)}$ | thermal resistance from junction to soldering point | | 220 | K/W |

## 7. Characteristics

**Table 6: Electrical characteristics**

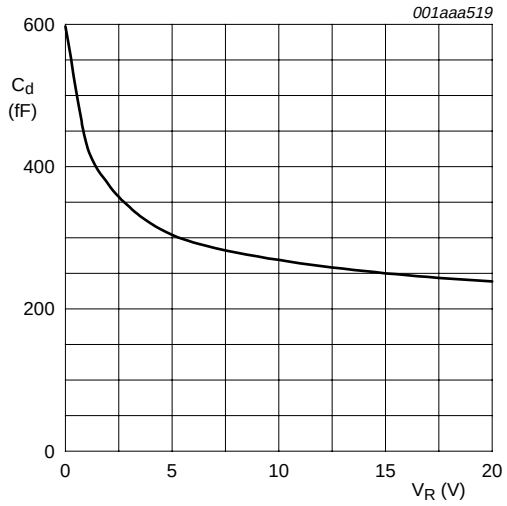
*$T_j$ = 25 °C unless otherwise specified.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Per diode** | | | | | | |
| $V_F$ | forward voltage | $I_F$ = 50 mA | - | 0.95 | 1.1 | V |
| $I_R$ | reverse current | $V_R$ = 50 V | - | - | 20 | nA |
| $C_d$ | diode capacitance | f = 1 MHz; see Figure 1 | | | | |
| | | $V_R$ = 0 V | - | 600 | - | fF |
| | | $V_R$ = 1 V | - | 430 | - | fF |
| | | $V_R$ = 20 V | - | 250 | 300 | fF |

**Table 6: Electrical characteristics** *...continued*

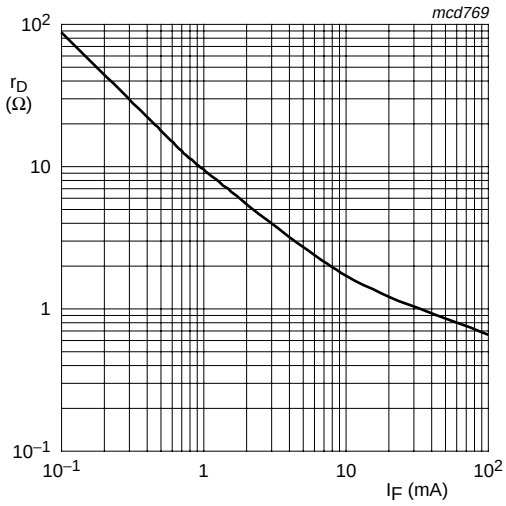
*$T_j$ = 25 °C unless otherwise specified.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $r_D$ | diode forward resistance | f = 100 MHz; see Figure 2 | | | | |
| | | $I_F$ = 0.5 mA | - | 77 | 100 | Ω |
| | | $I_F$ = 1 mA | - | 40 | 50 | Ω |
| | | $I_F$ = 10 mA | - | 5.4 | 7 | Ω |
| | | $I_F$ = 100 mA | - | 1.4 | 1.9 | Ω |
| $\tau_L$ | charge carrier life time | when switched from $I_F$ = 10 mA to $I_R$ = 6 mA; $R_L$ = 100 Ω; measured at $I_R$ = 3 mA | - | 1.25 | - | µs |
| $L_S$ | series inductance | $I_F$ = 100 mA; f = 100 MHz | - | 1.4 | - | nH |




f = 1 MHz; $T_j$ = 25 °C.

**Fig 1. Diode capacitance as a function of reverse voltage; typical values.**

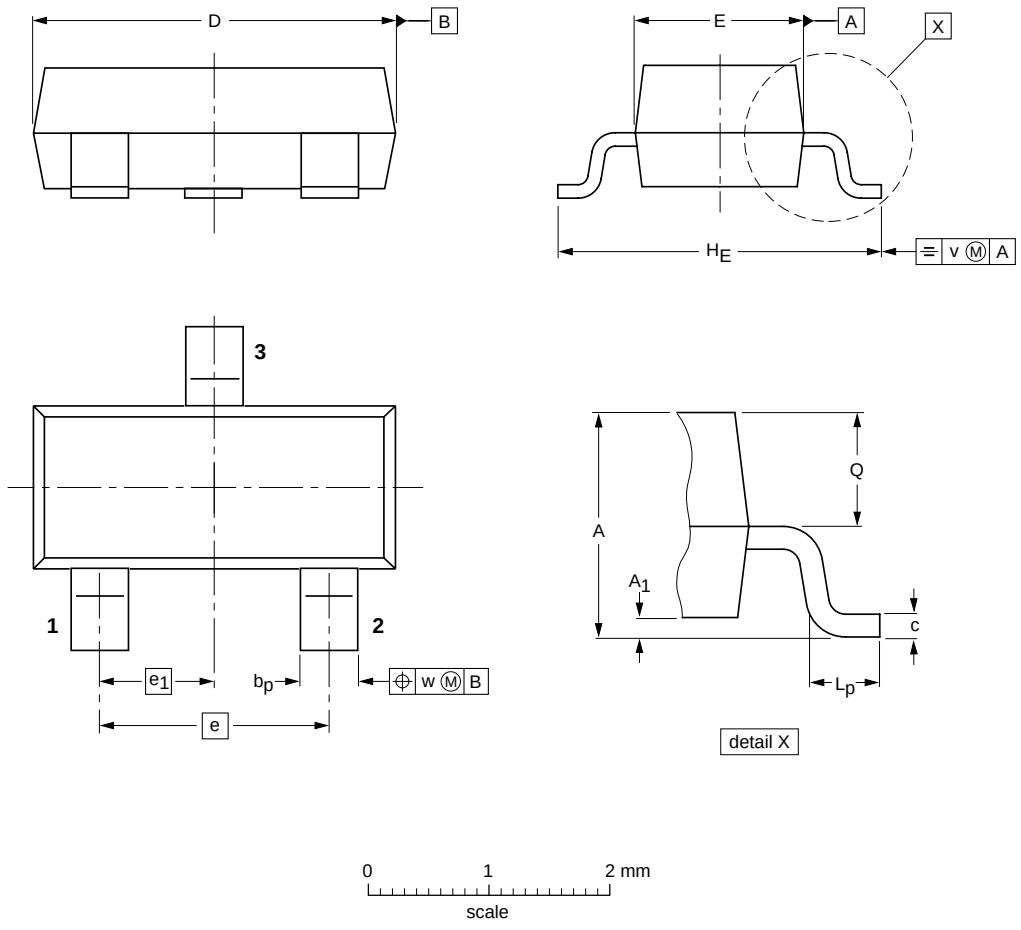



f = 100 MHz; $T_j$ = 25 °C.

**Fig 2. Diode forward resistance as a function of forward current; typical values.**

## 8. 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<br>0.9 | 0.1 | 0.48<br>0.38 | 0.15<br>0.09 | 3.0<br>2.8 | 1.4<br>1.2 | 1.9 | 0.95 | 2.5<br>2.1 | 0.45<br>0.15 | 0.55<br>0.45 | 0.2 | 0.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT23 | | TO-236AB | | | | ~~97-02-28~~<br>99-09-13 |

**Fig 3. Package outline.**

## 9. Revision history

**Table 7: Revision history**

| Document ID | Release date | Data sheet status | Change notice | Order number | Supersedes |
|---|---|---|---|---|---|
| BAP70-05_1 | 20040405 | Product data | - | 9397 750 12811 | - |

## 10. Data sheet status

| Level | Data sheet status [1] | Product status [2] [3] | Definition |
|---|---|---|---|
| I | Objective data | Development | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice. |
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[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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**Limiting values definition —** Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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.

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## 14. Contents





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