



# BAP70-05

Silicon PIN diode

Rev. 5 — 7 March 2014

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 and benefits

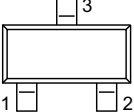
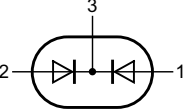
- High voltage; current controlled
- Low diode capacitance
- Low series inductance

### 1.3 Applications

- RF attenuators and switches

## 2. Pinning information

Table 1. Discrete pinning

| Pin | Description    | Simplified outline  | Symbol   |
|-----|----------------|---|--|
| 1   | anode (a1)     |  | <br><i>sym027</i> |
| 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   |

## 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 |
|-----------|-------------------------|-------------------------|-----|------|------|
| $V_R$     | reverse voltage         | continuous voltage      | -   | 50   | V    |
| $I_F$     | forward current         | continuous current      | -   | 100  | mA   |
| $P_{tot}$ | total power dissipation | $T_{sp} = 90\text{ °C}$ | -   | 250  | mW   |
| $T_{stg}$ | storage temperature     |                         | -65 | +150 | °C   |
| $T_j$     | junction temperature    |                         | -65 | +150 | °C   |

## 6. Thermal characteristics

**Table 5. Thermal characteristics**

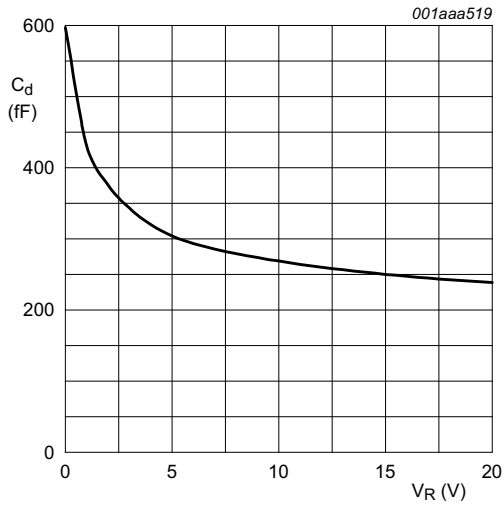
| Symbol         | Parameter  | Conditions | Typ | Unit |
|----------------|--|------------|-----|------|
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |            | 220 | K/W  |

## 7. Characteristics

**Table 6. Characteristics**

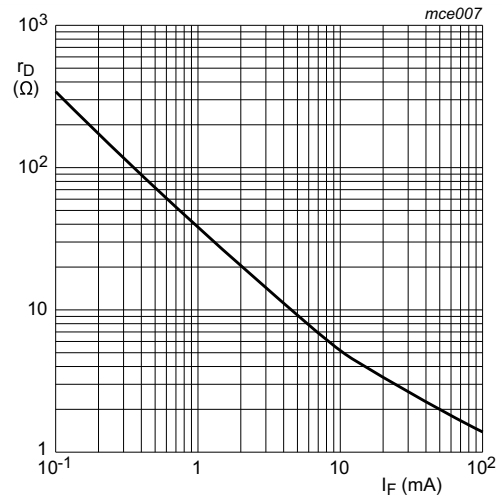
$T_{amb} = 25\text{ °C}$  unless otherwise specified.

| Symbol   | Parameter                | Conditions   | Min | Typ  | Max | Unit          |
|----------|--------------------------|--|-----|------|-----|---------------|
| $V_F$    | forward voltage          | $I_F = 50\text{ mA}$   | -   | 0.95 | 1.1 | V             |
| $I_R$    | reverse current          | $V_R = 50\text{ V}$  | -   | -    | 100 | nA            |
| $C_d$    | diode capacitance        | see <a href="#">Figure 1</a> ; $f = 1\text{ MHz}$ ;  |     |      |     |               |
|          |                          | $V_R = 0\text{ V}$   | -   | 600  | -   | fF            |
|          |                          | $V_R = 1\text{ V}$   | -   | 430  | -   | fF            |
|          |                          | $V_R = 20\text{ V}$  | -   | 250  | 300 | fF            |
| $r_D$    | diode forward resistance | see <a href="#">Figure 2</a> ; $f = 100\text{ MHz}$ ;  |     |      |     |               |
|          |                          | $I_F = 0.5\text{ mA}$  | -   | 77   | 100 | $\Omega$      |
|          |                          | $I_F = 1\text{ mA}$  | -   | 40   | 50  | $\Omega$      |
|          |                          | $I_F = 10\text{ mA}$   | -   | 5.4  | 7   | $\Omega$      |
| $\tau_L$ | charge carrier life time | $I_F = 100\text{ mA}$  | -   | 1.4  | 1.9 | $\Omega$      |
|          |                          | when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$ ; $R_L = 100\text{ }\Omega$ ; measured at $I_R = 3\text{ mA}$ | -   | 1.25 | -   | $\mu\text{s}$ |
| $L_S$    | series inductance        | $I_F = 100\text{ mA}$ ; $f = 100\text{ MHz}$   | -   | 1.4  | -   | nH            |



$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



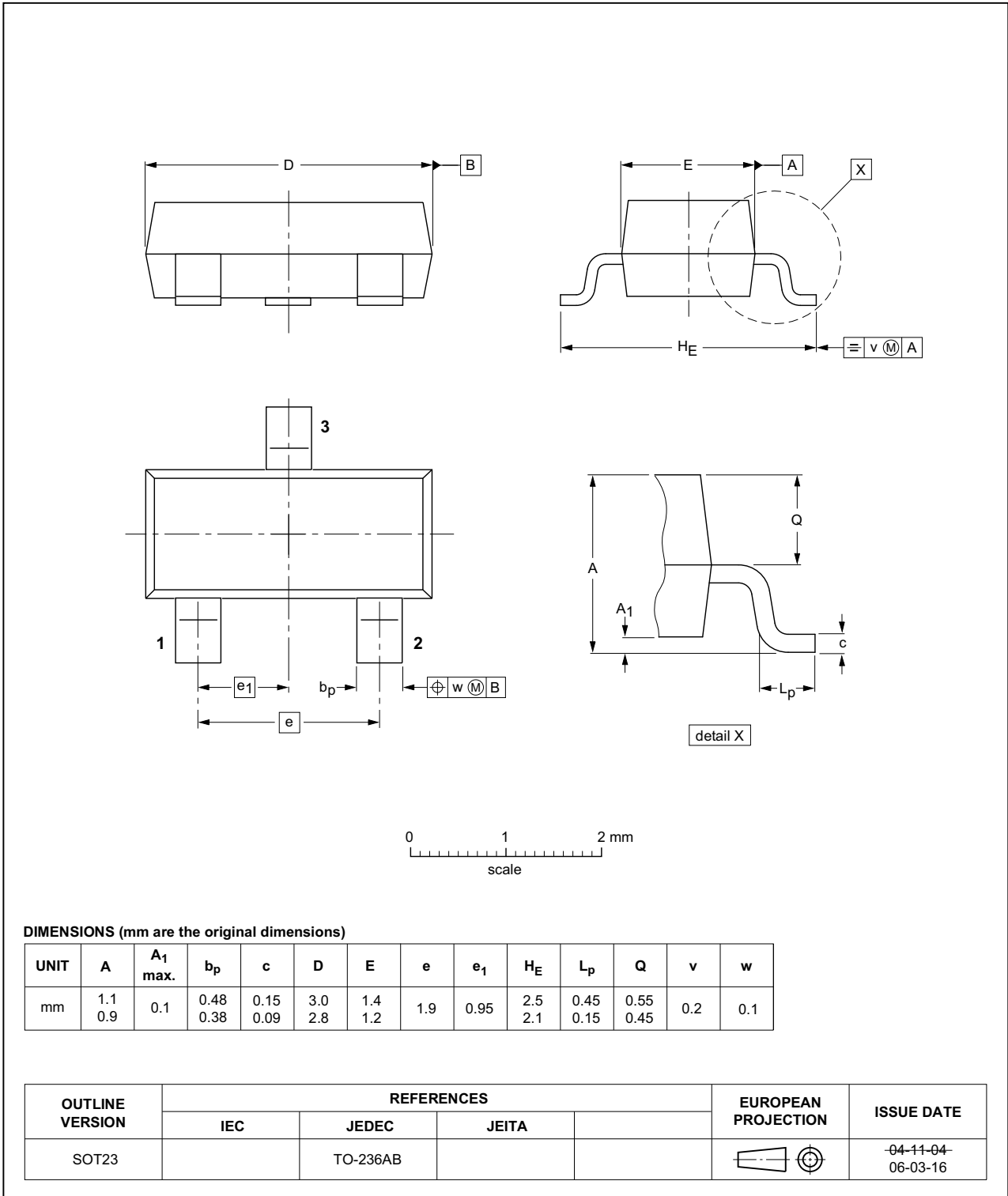
$f = 100 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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

**8. Package outline**

Plastic surface-mounted package; 3 leads

SOT23



**Fig 3. Package outline SOT23**

## 9. Abbreviations

Table 7. Abbreviations

| Acronym | Description               |
|---------|---------------------------|
| PIN     | P-type, Intrinsic, N-type |
| SMD     | Surface Mounted Device    |
| RF      | Radio Frequency           |

## 10. Revision history

Table 8. Revision history

| Document ID                      | Release date                   | Data sheet status  | Change notice | Supersedes   |
|----------------------------------|--------------------------------|--------------------|---------------|--------------|
| BAP70-05 v.5                     | 20140307                       | Product data sheet |               | BAP70-05 v.4 |
| Modifications:                   | • Rollback to previous version |                    |               |              |
| BAP70-05 v.4                     | 20140127                       | Product data sheet | -             | BAP70-05 v.3 |
| BAP70-05 v.3                     | 20070405                       | Product data sheet | -             | BAP70-05 v.2 |
| BAP70-05 v.2                     | 20061221                       | Product data sheet | -             | BAP70-05 v.1 |
| BAP70-05 v.1<br>(9397 750 12811) | 20040405                       | Product data sheet | -             | -            |

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| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | Definition  |
|-----------------------------------|-------------------------------|---|
| Objective [short] data sheet      | Development                   | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet    | Qualification                 | This document contains data from the preliminary specification.                       |
| Product [short] data sheet        | Production                    | This document contains the product specification.                                     |

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[2] The term 'short data sheet' is explained in section "Definitions".

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