



# BAP70-03

Silicon PIN diode

Rev. 6 — 7 March 2014

Product data sheet

## 1. Product profile

### 1.1 General description

Planar PIN diode in a SOD323 (SC-76) small SMD plastic package.

### 1.2 Features and benefits

- High voltage current controlled RF resistor for attenuators
- Low diode capacitance
- Very low series inductance

### 1.3 Applications

- RF attenuators
- (SAT) TV
- Car radio

## 2. Pinning information

Table 1. Discrete pinning

| Pin | Description | Simplified outline | Graphic symbol |
|-----|-------------|--------------------|----------------|
| 1   | cathode     |                    | <br>sym006     |
| 2   | anode       |                    |                |

## 3. Ordering information

Table 2. Ordering information

| Type number | Package |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | Name    | Description                              | Version |
| BAP70-03    | -       | plastic surface-mounted package; 2 leads | SOD323  |

## 4. Marking

Table 3. Marking

| Type number | Marking code |
|-------------|--------------|
| BAP70-03    | A9           |



## 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 | $T_{sp} = 90\text{ °C}$ | -   | 500  | mW   |
| $T_{stg}$ | storage temperature     |                         | -65 | +150 | °C   |
| $T_j$     | junction temperature    |                         | -65 | +150 | °C   |

## 6. Thermal characteristics

**Table 5. Thermal characteristics**

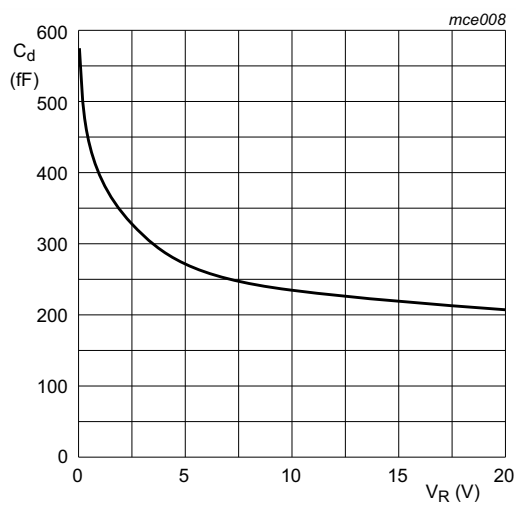
| Symbol         | Parameter                                        | Conditions | Typ | Unit |
|----------------|--------------------------------------------------|------------|-----|------|
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |            | 120 | K/W  |

## 7. Characteristics

**Table 6. Characteristics**

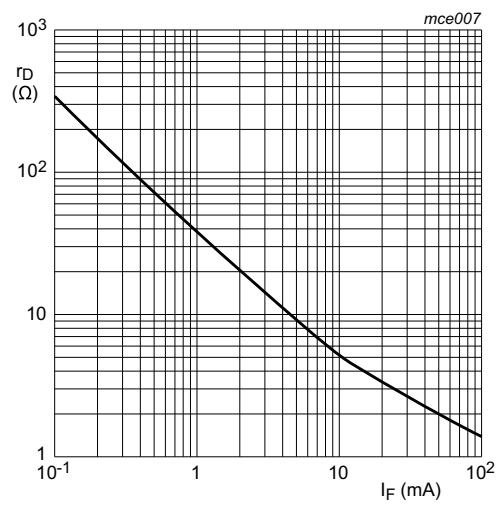
$T_{amb} = 25\text{ °C}$  unless otherwise specified.

| Symbol   | Parameter                | Conditions                                                                                                                   | Min | Typ  | Max | Unit          |
|----------|--------------------------|------------------------------------------------------------------------------------------------------------------------------|-----|------|-----|---------------|
| $V_F$    | forward voltage          | $I_F = 50\text{ mA}$                                                                                                         | -   | 0.9  | 1.1 | V             |
| $I_R$    | reverse current          | $V_R = 50\text{ V}$                                                                                                          | -   | -    | 100 | nA            |
| $C_d$    | diode capacitance        | see <a href="#">Figure 1</a> ; $f = 1\text{ MHz}$ ;                                                                          |     |      |     |               |
|          |                          | $V_R = 0\text{ V}$                                                                                                           | -   | 570  | -   | fF            |
|          |                          | $V_R = 1\text{ V}$                                                                                                           | -   | 400  | -   | fF            |
|          |                          | $V_R = 5\text{ V}$                                                                                                           | -   | 270  | -   | fF            |
|          |                          | $V_R = 20\text{ V}$                                                                                                          | -   | 200  | 250 | 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   | $\Omega$      |
|          |                          | $I_F = 100\text{ mA}$                                                                                                        | -   | 1.4  | 1.9 | $\Omega$      |
| $\tau_L$ | charge carrier life time | 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        | $I_F = 100\text{ mA}$ ; $f = 100\text{ MHz}$                                                                                 | -   | 1.5  | -   | 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

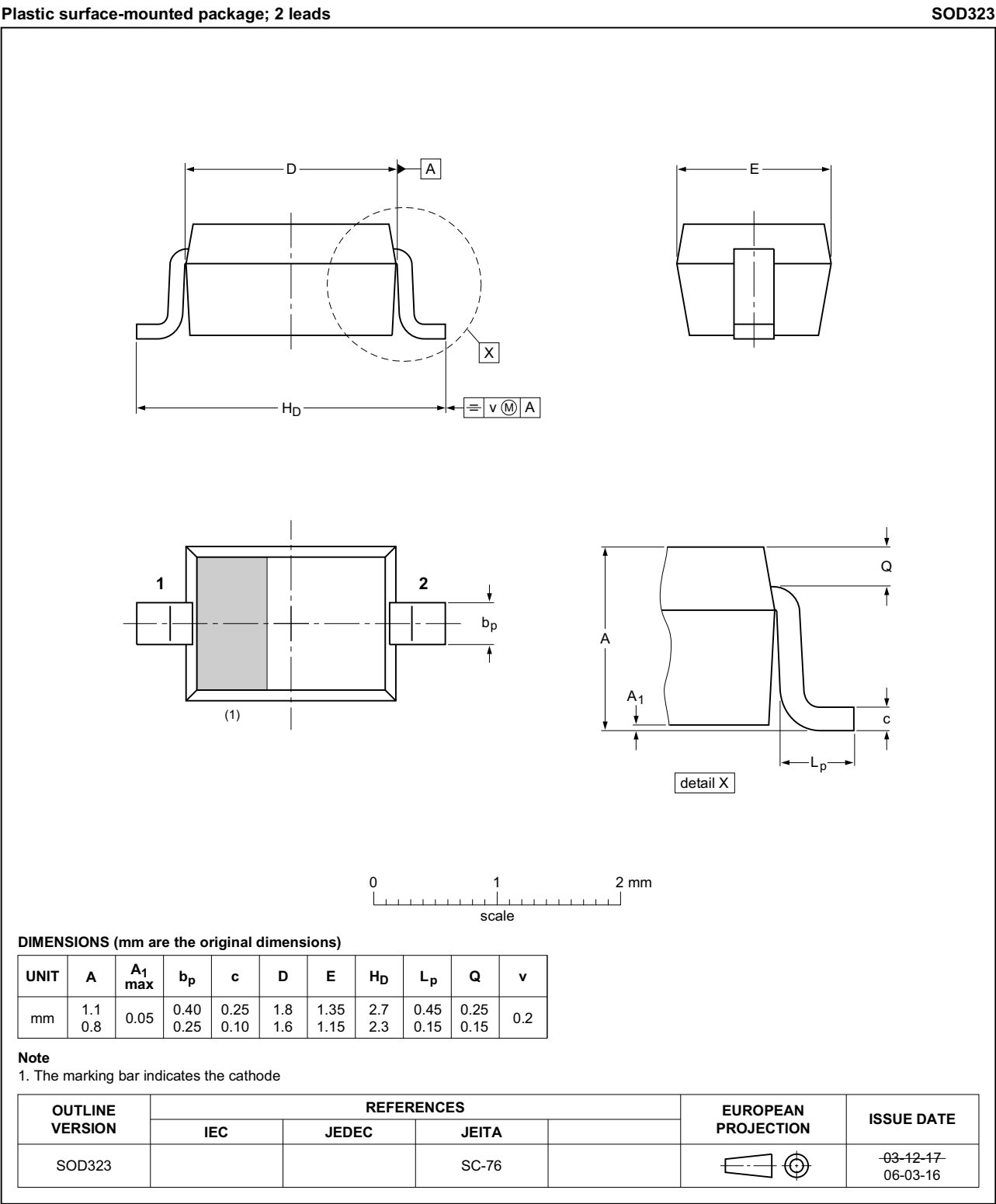


Fig 3. Package outline SOD323

## 9. Abbreviations

Table 7. Abbreviations

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

## 10. Revision history

Table 8. Revision history

| Document ID                        | Release date                                                                                                                                                                                                                                         | Data sheet status      | Change notice | Supersedes     |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|----------------|
| BAP70-03 v.6                       | 20140307                                                                                                                                                                                                                                             | Product data sheet     | -             | BAP70-03_N v.5 |
| Modifications:                     | <ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>Legal texts have been adapted to the new company name where appropriate.</li></ul> |                        |               |                |
| BAP70-03_N v.5                     | 20070327                                                                                                                                                                                                                                             | Product data sheet     | -             | BAP70-03 v.4   |
| BAP70-03 v.4<br>(9397 750 12636)   | 20040210                                                                                                                                                                                                                                             | Product data sheet     | -             | BAP70-03 v.3   |
| BAP70-03 v.3<br>(9397 750 10094)   | 20020806                                                                                                                                                                                                                                             | Product data sheet     | -             | BAP70-03_N v.2 |
| BAP70-03_N v.2<br>(9397 750 10081) | 20020702                                                                                                                                                                                                                                             | Preliminary data sheet | -             | BAP70-03_N v.1 |
| BAP70-03_N v.1<br>(9397 750 09579) | 20020402                                                                                                                                                                                                                                             | Preliminary data sheet | -             | -              |

## 11. Legal information

### 11.1 Data sheet status

| 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.                                     |

[1] Please consult the most recently issued document before initiating or completing a design.

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

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