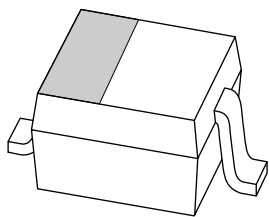


# DATA SHEET

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## **BAP1321-03** Silicon PIN diode

Product specification  
Supersedes data of 2001 May 11

2004 Feb 17

# Silicon PIN diode

# BAP1321-03

### FEATURES

- High voltage, current controlled
- RF resistor for RF attenuators and switches
- Low diode capacitance
- Low diode forward resistance
- Very low series inductance
- For applications up to 3 GHz.

### APPLICATIONS

- RF attenuators and switches.

### DESCRIPTION

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

### PINNING

| PIN | DESCRIPTION |
|-----|-------------|
| 1   | cathode     |
| 2   | anode       |

Top view

Marking code: V8.  
The marking bar indicates the cathode.

Fig.1 Simplified outline (SOD323; SC-76) and symbol.

### ORDERING INFORMATION

| TYPE NUMBER | PACKAGE |                                          |         |
|-------------|---------|------------------------------------------|---------|
|             | NAME    | DESCRIPTION                              | VERSION |
| BAP1321-03  | -       | plastic surface mounted package; 2 leads | SOD323  |

### LIMITING VALUES

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

| SYMBOL    | PARAMETER                  | CONDITIONS              | MIN. | MAX. | UNIT |
|-----------|----------------------------|-------------------------|------|------|------|
| $V_R$     | continuous reverse voltage |                         | -    | 60   | V    |
| $I_F$     | continuous forward current |                         | -    | 100  | mA   |
| $P_{tot}$ | total power dissipation    | $T_s \leq 90\text{ °C}$ | -    | 500  | mW   |
| $T_{stg}$ | storage temperature        |                         | -65  | +150 | °C   |
| $T_j$     | junction temperature       |                         | -65  | +150 | °C   |

## Silicon PIN diode

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## CHARACTERISTICS

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

| SYMBOL       | PARAMETER                | CONDITIONS                                 | TYP.                     | MAX.                                                                                                                      | UNIT     |
|--------------|--------------------------|--------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------|----------|
| $V_F$        | forward voltage          | $I_F = 50\text{ mA}$                       | 0.95                     | 1.1                                                                                                                       | V        |
| $I_R$        | reverse leakage current  | $V_R = 60\text{ V}$                        | –                        | 100                                                                                                                       | nA       |
| $C_d$        | diode capacitance        | $V_R = 0; f = 1\text{ MHz}$                | 0.4                      | –                                                                                                                         | pF       |
|              |                          | $V_R = 1\text{ V}; f = 1\text{ MHz}$       | 0.35                     | 0.45                                                                                                                      | pF       |
|              |                          | $V_R = 20\text{ V}; f = 1\text{ MHz}$      | 0.25                     | 0.32                                                                                                                      | pF       |
| $r_D$        | diode forward resistance | $f = 100\text{ MHz}$ ; note 1              |                          |                                                                                                                           |          |
|              |                          | $I_F = 0.5\text{ mA}$                      | 3.4                      | 5.0                                                                                                                       | $\Omega$ |
|              |                          | $I_F = 1\text{ mA}$                        | 2.4                      | 3.6                                                                                                                       | $\Omega$ |
|              |                          | $I_F = 10\text{ mA}$                       | 1.2                      | 1.8                                                                                                                       | $\Omega$ |
| $ S_{21} ^2$ | isolation                | $V_R = 0; f = 900\text{ MHz}$              | 16.6                     | –                                                                                                                         | dB       |
|              |                          | $V_R = 0; f = 1800\text{ MHz}$             | 11.6                     | –                                                                                                                         | dB       |
|              |                          | $V_R = 0; f = 2450\text{ MHz}$             | 9.2                      | –                                                                                                                         | dB       |
|              |                          | $I_F = 0.5\text{ mA}; f = 900\text{ MHz}$  | 0.26                     | –                                                                                                                         | dB       |
| $ S_{21} ^2$ | insertion loss           | $I_F = 0.5\text{ mA}; f = 1800\text{ MHz}$ | 0.35                     | –                                                                                                                         | dB       |
|              |                          | $I_F = 0.5\text{ mA}; f = 2450\text{ MHz}$ | 0.44                     | –                                                                                                                         | dB       |
|              |                          | $I_F = 1\text{ mA}; f = 900\text{ MHz}$    | 0.20                     | –                                                                                                                         | dB       |
| $ S_{21} ^2$ | insertion loss           | $I_F = 1\text{ mA}; f = 1800\text{ MHz}$   | 0.29                     | –                                                                                                                         | dB       |
|              |                          | $I_F = 1\text{ mA}; f = 2450\text{ MHz}$   | 0.38                     | –                                                                                                                         | dB       |
|              |                          | $I_F = 10\text{ mA}; f = 900\text{ MHz}$   | 0.13                     | –                                                                                                                         | dB       |
| $ S_{21} ^2$ | insertion loss           | $I_F = 10\text{ mA}; f = 1800\text{ MHz}$  | 0.22                     | –                                                                                                                         | dB       |
|              |                          | $I_F = 10\text{ mA}; f = 2450\text{ MHz}$  | 0.32                     | –                                                                                                                         | dB       |
|              |                          | $I_F = 100\text{ mA}; f = 900\text{ MHz}$  | 0.10                     | –                                                                                                                         | dB       |
| $ S_{21} ^2$ | insertion loss           | $I_F = 100\text{ mA}; f = 1800\text{ MHz}$ | 0.20                     | –                                                                                                                         | dB       |
|              |                          | $I_F = 100\text{ mA}; f = 2450\text{ MHz}$ | 0.29                     | –                                                                                                                         | dB       |
|              |                          | $\tau_L$                                   | charge carrier life time | when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$ ;<br>$R_L = 100\ \Omega$ ; measured at $I_R = 3\text{ mA}$ | 0.5      |
| $L_S$        | series inductance        | $I_F = 100\text{ mA}; f = 100\text{ MHz}$  | 1.5                      | –                                                                                                                         | nH       |

## Note

1. Guaranteed on AQL basis: inspection level S4, AQL 1.0.

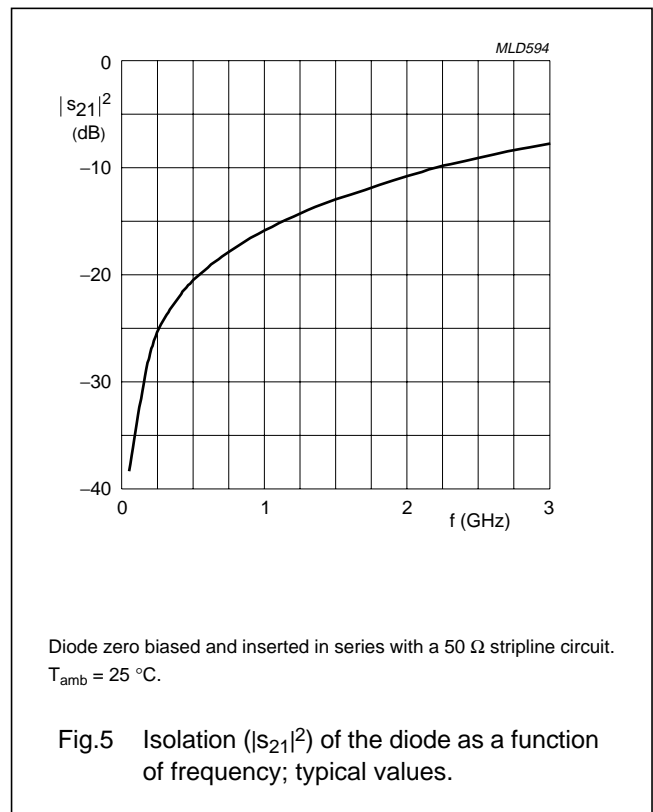
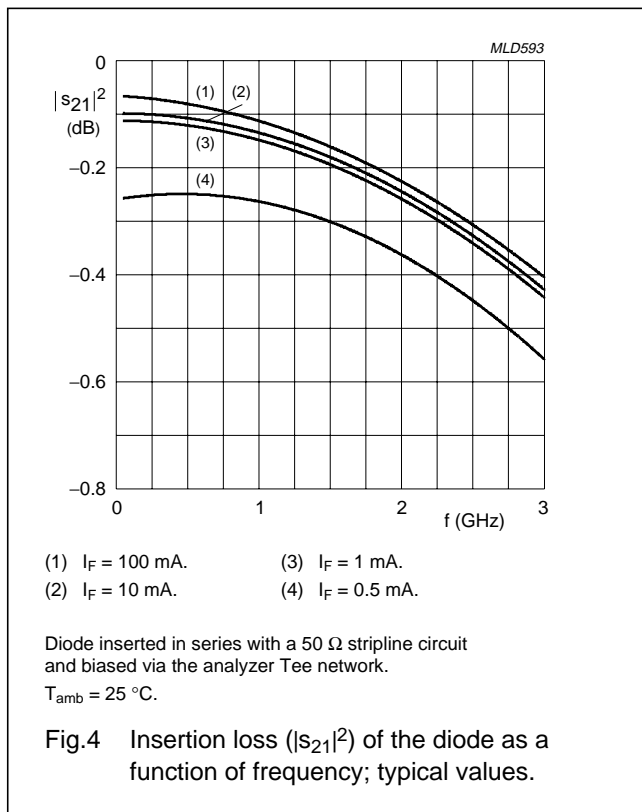
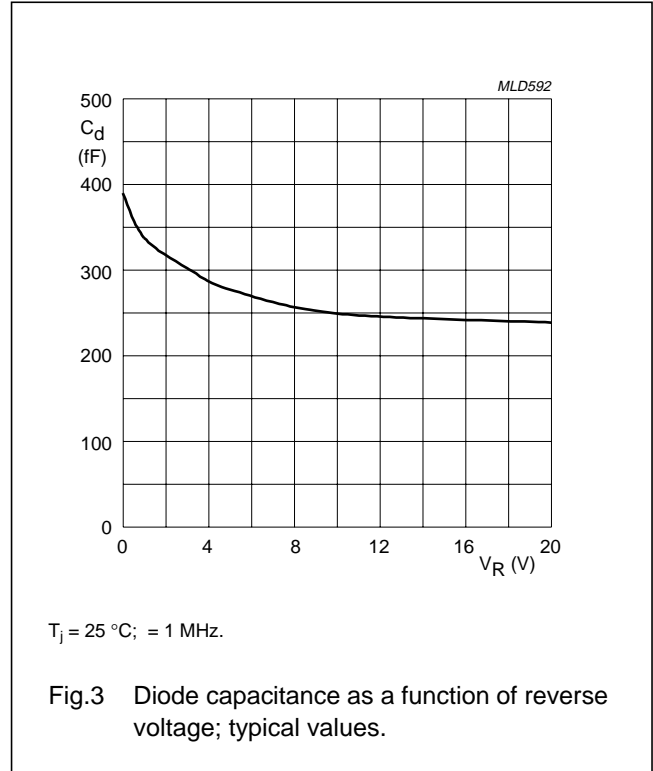
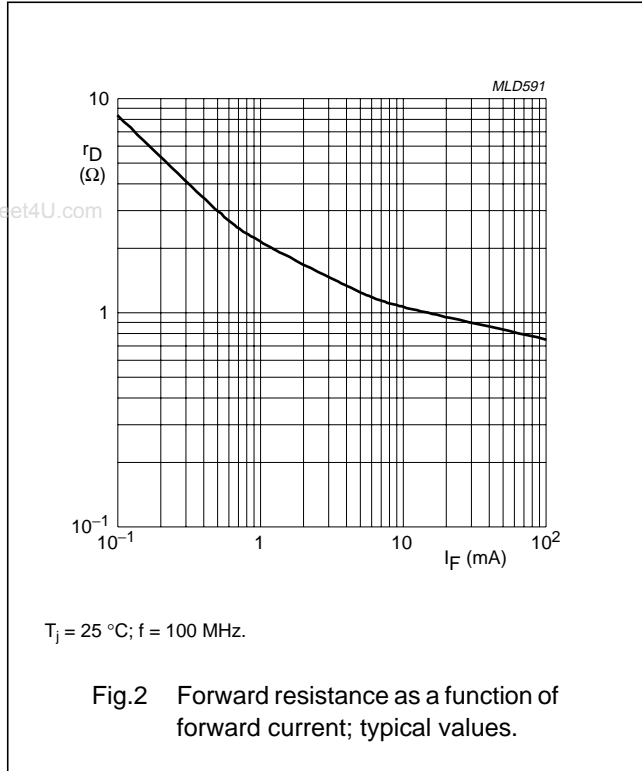
## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                           | VALUE | UNIT |
|---------------|-----------------------------------------------------|-------|------|
| $R_{th(j-s)}$ | thermal resistance from junction to soldering point | 120   | K/W  |

Silicon PIN diode

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GRAPHICAL DATA



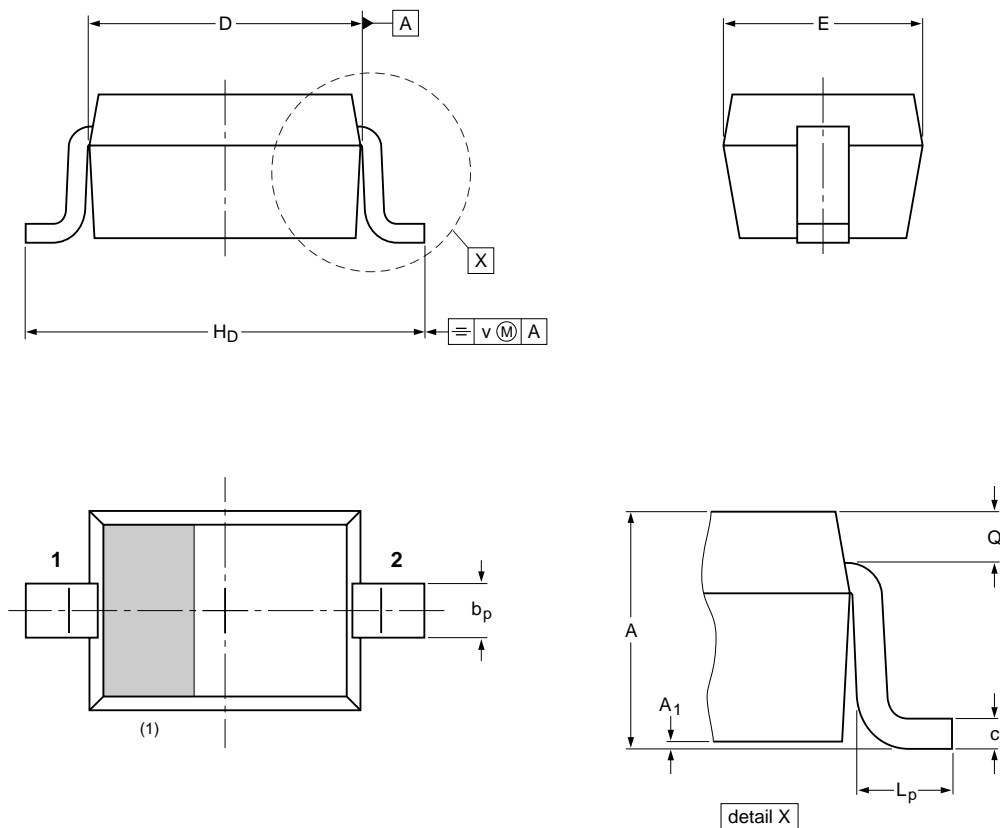
Silicon PIN diode

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PACKAGE OUTLINE

Plastic surface mounted package; 2 leads

SOD323



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | A <sub>1 max</sub> | b <sub>p</sub> | c            | D          | E            | H <sub>D</sub> | L <sub>p</sub> | Q            | v   |
|------|------------|--------------------|----------------|--------------|------------|--------------|----------------|----------------|--------------|-----|
| mm   | 1.1<br>0.8 | 0.05               | 0.40<br>0.25   | 0.25<br>0.10 | 1.8<br>1.6 | 1.35<br>1.15 | 2.7<br>2.3     | 0.45<br>0.15   | 0.25<br>0.15 | 0.2 |

Note

1. The marking bar indicates the cathode

| OUTLINE VERSION | REFERENCES |       |       |  | EUROPEAN PROJECTION | ISSUE DATE           |
|-----------------|------------|-------|-------|--|---------------------|----------------------|
|                 | IEC        | JEDEC | JEITA |  |                     |                      |
| SOD323          |            |       | SC-76 |  |                     | 99-09-13<br>03-12-17 |

## Silicon PIN diode

BAP1321-03

## DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)(3)</sup> | 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.                                                                                                    |
| II    | Preliminary data                 | Qualification                    | This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.             |
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