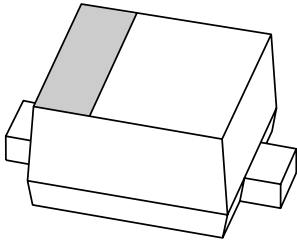


# DATA SHEET



## **BAP1321-01** Silicon PIN diode

Preliminary specification

2001 Nov 01

# Silicon PIN diode

# BAP1321-01

### 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

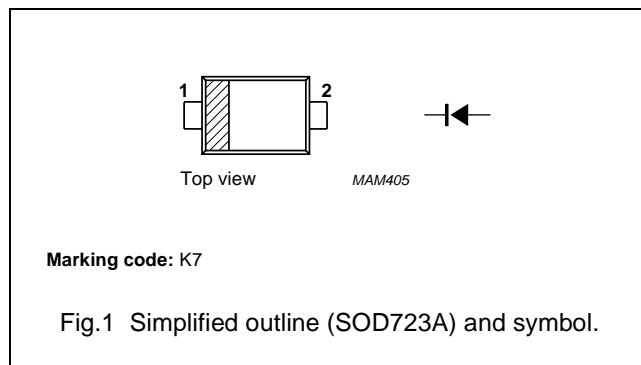
- RF attenuators and switches.

### DESCRIPTION

Planar PIN diode in a SOD723A ultra small plastic SMD package.

### PINNING

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



### 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    | $T_s = 90\text{ °C}$ | –    | 315  | mW   |
| $T_{stg}$ | storage temperature        |                      | –65  | +150 | °C   |
| $T_j$     | junction temperature       |                      | –65  | +150 | °C   |

## Silicon PIN diode

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**ELECTRICAL CHARACTERISTICS**T<sub>j</sub> = 25 °C unless otherwise specified.

| SYMBOL                                | PARAMETER                | CONDITIONS  | TYP.           | MAX.                                 | UNIT |
|---------------------------------------|--------------------------|---|----------------|--------------------------------------|------|
| V <sub>F</sub>                        | forward voltage          | I <sub>F</sub> = 50 mA  | 0.95           | 1.1                                  | V    |
| I <sub>R</sub>                        | reverse leakage current  | V <sub>R</sub> = 60 V   | –              | 0.1                                  | μA   |
|                                       |                          | V <sub>R</sub> = 20 V   | –              | tbd                                  | μA   |
| C <sub>d</sub>                        | diode capacitance        | V <sub>R</sub> = 0; f = 1 MHz   | 0.32           | –                                    | pF   |
|                                       |                          | V <sub>R</sub> = 1 V; f = 1 MHz   | 0.28           | –                                    | pF   |
|                                       |                          | V <sub>R</sub> = 20 V; f = 1 MHz  | 0.22           | 0.32                                 | pF   |
| r <sub>D</sub>                        | diode forward resistance | f = 100 MHz; note 1   |                |                                      |      |
|                                       |                          | I <sub>F</sub> = 0.5 mA   | 3.2            | 5.0                                  | Ω    |
|                                       |                          | I <sub>F</sub> = 1 mA   | 2.3            | 3.6                                  | Ω    |
|                                       |                          | I <sub>F</sub> = 10 mA  | 1.1            | 1.8                                  | Ω    |
| S <sub>21</sub>   <sup>2</sup>        | isolation                | V <sub>R</sub> = 0; f = 900 MHz   | 15.7           | –                                    | dB   |
|                                       |                          | V <sub>R</sub> = 0; f = 1800 MHz  | 10.8           | –                                    | dB   |
|                                       |                          | V <sub>R</sub> = 0; f = 2450 MHz  | 8.7            | –                                    | dB   |
|                                       |                          | S <sub>21</sub>   <sup>2</sup>  | insertion loss | I <sub>F</sub> = 0.5 mA; f = 900 MHz | 0.26 |
| I <sub>F</sub> = 0.5 mA; f = 1800 MHz | 0.28                     |   |                | –                                    | dB   |
| I <sub>F</sub> = 0.5 mA; f = 2450 MHz | 0.31                     |   |                | –                                    | dB   |
| S <sub>21</sub>   <sup>2</sup>        | insertion loss           | I <sub>F</sub> = 1 mA; f = 900 MHz  | 0.20           | –                                    | dB   |
|                                       |                          | I <sub>F</sub> = 1 mA; f = 1800 MHz   | 0.23           | –                                    | dB   |
|                                       |                          | I <sub>F</sub> = 1 mA; f = 2450 MHz   | 0.25           | –                                    | dB   |
| S <sub>21</sub>   <sup>2</sup>        | insertion loss           | I <sub>F</sub> = 10 mA; f = 900 MHz   | 0.15           | –                                    | dB   |
|                                       |                          | I <sub>F</sub> = 10 mA; f = 1800 MHz  | 0.18           | –                                    | dB   |
|                                       |                          | I <sub>F</sub> = 10 mA; f = 2450 MHz  | 0.21           | –                                    | dB   |
| S <sub>21</sub>   <sup>2</sup>        | insertion loss           | I <sub>F</sub> = 100 mA; f = 900 MHz  | 0.10           | –                                    | dB   |
|                                       |                          | I <sub>F</sub> = 100 mA; f = 1800 MHz   | 0.13           | –                                    | dB   |
|                                       |                          | I <sub>F</sub> = 100 mA; f = 2450 MHz   | 0.16           | –                                    | dB   |
| τ <sub>L</sub>                        | charge carrier life time | when switched from I <sub>F</sub> = 10 mA to I <sub>R</sub> = 6 mA; R <sub>L</sub> = 100 Ω; measured at I <sub>R</sub> = 3 mA | 0.5            | –                                    | μs   |
| L <sub>S</sub>                        | series inductance        | I <sub>F</sub> = 100 mA; f = 100 MHz  | 0.6            | –                                    | nH   |

**Note**

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

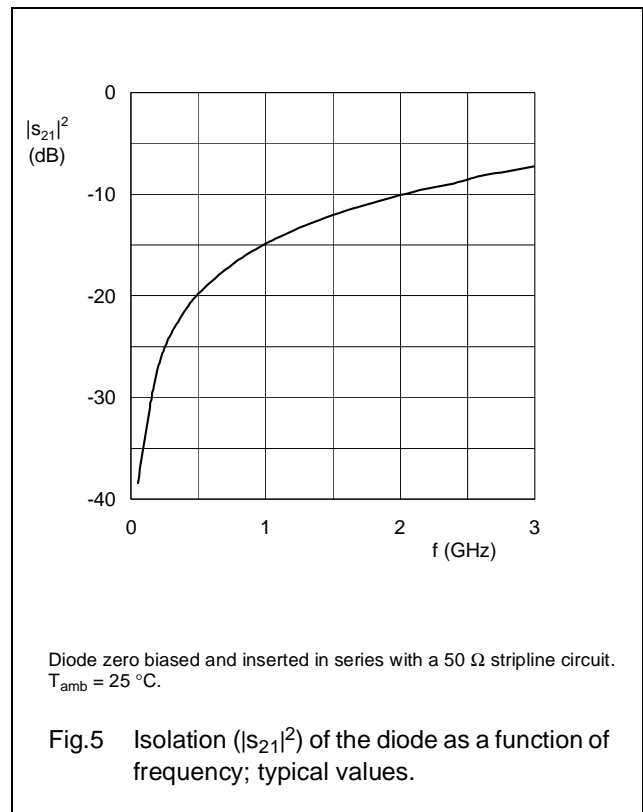
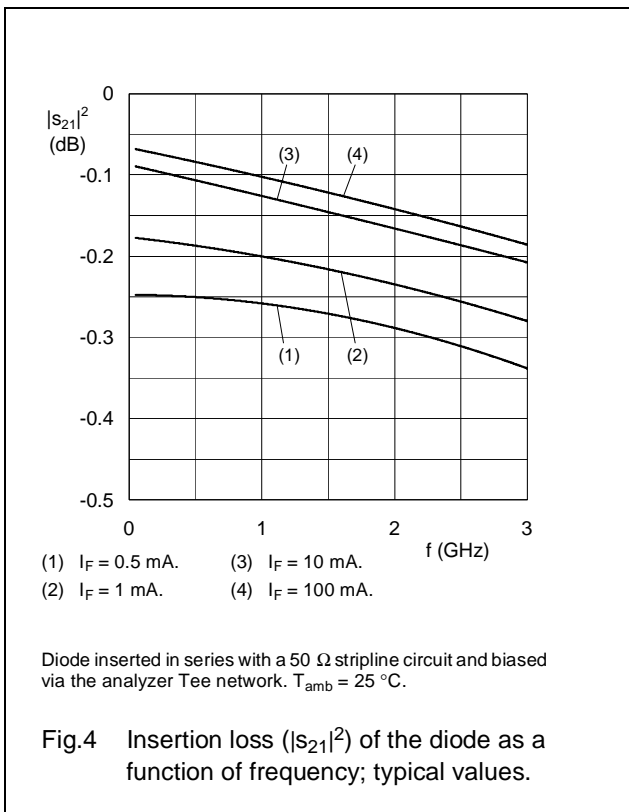
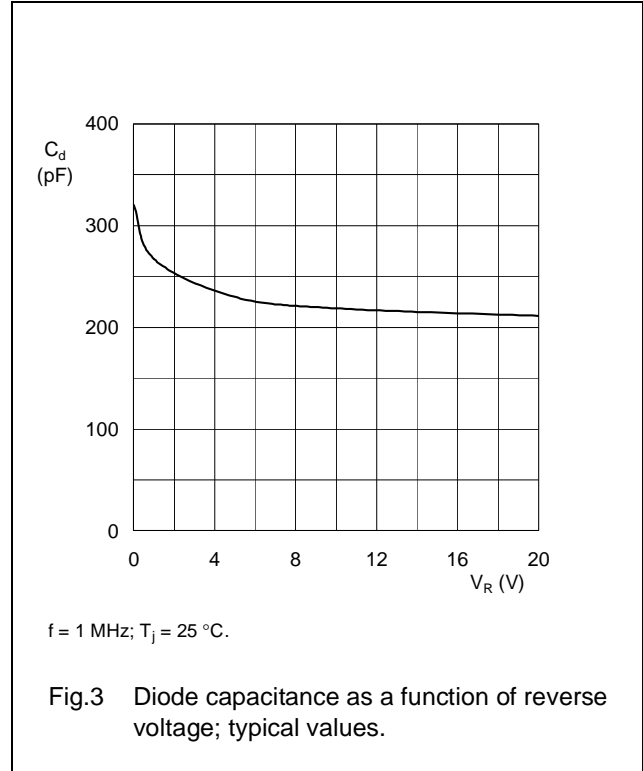
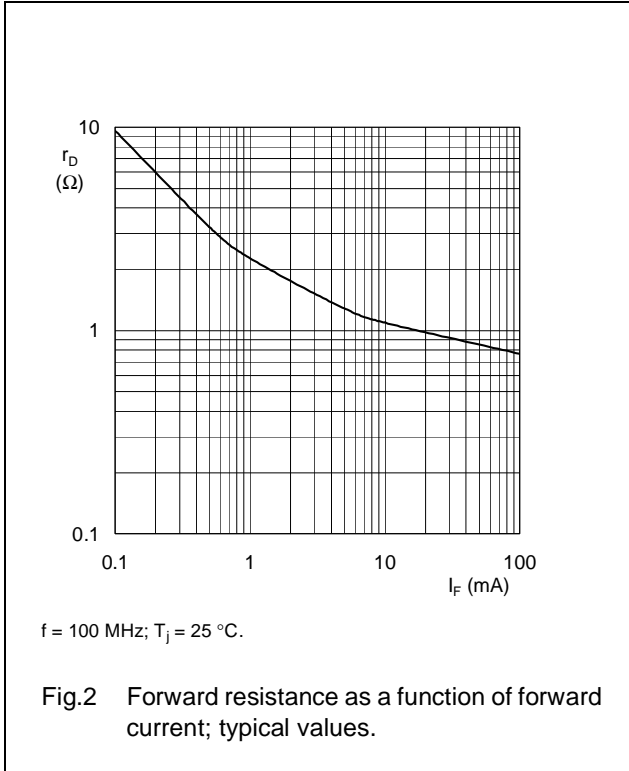
**THERMAL CHARACTERISTICS**

| SYMBOL              | PARAMETER   | VALUE | UNIT |
|---------------------|---|-------|------|
| R <sub>th j-s</sub> | thermal resistance from junction to soldering point | 190   | K/W  |

Silicon PIN diode

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GRAPHICAL DATA



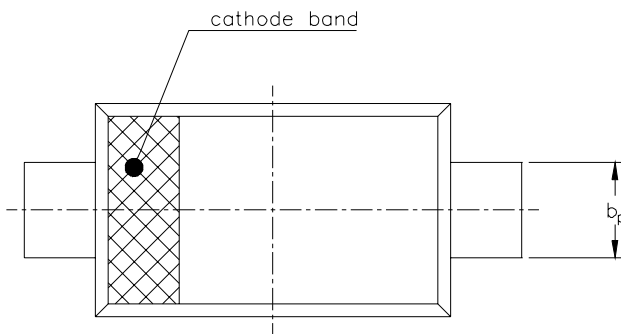
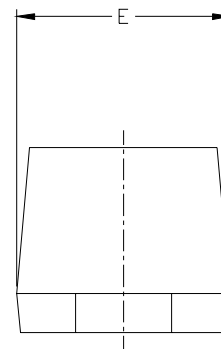
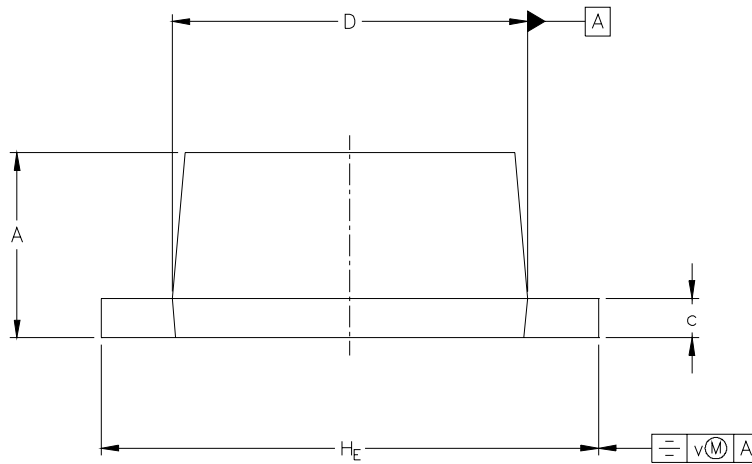
Silicon PIN diode

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PACKAGE OUTLINE

SOD723A

Plastic surface mounted package; 2 leads



| UNIT | A            | $b_p$        | c            | D            | E            | $H_E$        | v   |
|------|--------------|--------------|--------------|--------------|--------------|--------------|-----|
| mm   | 0.49<br>0.55 | 0.25<br>0.32 | 0.08<br>0.15 | 0.95<br>1.05 | 0.55<br>0.65 | 1.35<br>1.45 | 0.1 |

| PACKAGE OUTLINE<br>VERSION  | REFERENCES |       |      | EUROPEAN<br>PROJECTION | ISSUE DATE |
|-----------------------------|------------|-------|------|------------------------|------------|
|                             | IEC        | JEDEC | EIAJ |                        |            |
| SOD723A PUBLICATION DRAWING |            |       |      |                        | 01-09-06   |

UNDER DEVELOPMENT

## Silicon PIN diode

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## DATA SHEET STATUS

| DATA SHEET STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | DEFINITIONS  |
|----------------------------------|-------------------------------|--|
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