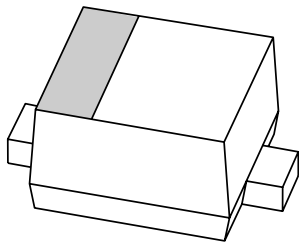


# DATA SHEET



## **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.

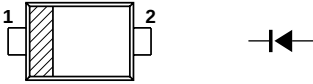
LIMITING VALUES

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

PINNING

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



Top view

MAM405

Marking code: K7

Fig.1 Simplified outline (SOD723A) and symbol.

## Silicon PIN diode

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## ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ }^{\circ}\text{C}$  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  | $V_R = 60\text{ V}$                                                                                                          | –    | 0.1  | $\mu\text{A}$ |
|              |                          | $V_R = 20\text{ V}$                                                                                                          | –    | tbd  | $\mu\text{A}$ |
| $C_d$        | diode capacitance        | $V_R = 0$ ; $f = 1\text{ MHz}$                                                                                               | 0.32 | –    | pF            |
|              |                          | $V_R = 1\text{ V}$ ; $f = 1\text{ MHz}$                                                                                      | 0.28 | –    | pF            |
|              |                          | $V_R = 20\text{ V}$ ; $f = 1\text{ MHz}$                                                                                     | 0.22 | 0.32 | pF            |
| $r_D$        | diode forward resistance | $f = 100\text{ MHz}$ ; note 1                                                                                                |      |      |               |
|              |                          | $I_F = 0.5\text{ mA}$                                                                                                        | 3.2  | 5.0  | $\Omega$      |
|              |                          | $I_F = 1\text{ mA}$                                                                                                          | 2.3  | 3.6  | $\Omega$      |
|              |                          | $I_F = 10\text{ mA}$                                                                                                         | 1.1  | 1.8  | $\Omega$      |
|              |                          | $I_F = 100\text{ mA}$                                                                                                        | 0.8  | 1.3  | $\Omega$      |
| $ S_{21} ^2$ | isolation                | $V_R = 0$ ; $f = 900\text{ MHz}$                                                                                             | 15.7 | –    | dB            |
|              |                          | $V_R = 0$ ; $f = 1800\text{ MHz}$                                                                                            | 10.8 | –    | dB            |
|              |                          | $V_R = 0$ ; $f = 2450\text{ MHz}$                                                                                            | 8.7  | –    | dB            |
| $ S_{21} ^2$ | insertion loss           | $I_F = 0.5\text{ mA}$ ; $f = 900\text{ MHz}$                                                                                 | 0.26 | –    | dB            |
|              |                          | $I_F = 0.5\text{ mA}$ ; $f = 1800\text{ MHz}$                                                                                | 0.28 | –    | dB            |
|              |                          | $I_F = 0.5\text{ mA}$ ; $f = 2450\text{ MHz}$                                                                                | 0.31 | –    | dB            |
| $ S_{21} ^2$ | insertion loss           | $I_F = 1\text{ mA}$ ; $f = 900\text{ MHz}$                                                                                   | 0.20 | –    | dB            |
|              |                          | $I_F = 1\text{ mA}$ ; $f = 1800\text{ MHz}$                                                                                  | 0.23 | –    | dB            |
|              |                          | $I_F = 1\text{ mA}$ ; $f = 2450\text{ MHz}$                                                                                  | 0.25 | –    | dB            |
| $ S_{21} ^2$ | insertion loss           | $I_F = 10\text{ mA}$ ; $f = 900\text{ MHz}$                                                                                  | 0.15 | –    | dB            |
|              |                          | $I_F = 10\text{ mA}$ ; $f = 1800\text{ MHz}$                                                                                 | 0.18 | –    | dB            |
|              |                          | $I_F = 10\text{ mA}$ ; $f = 2450\text{ MHz}$                                                                                 | 0.21 | –    | dB            |
| $ S_{21} ^2$ | insertion loss           | $I_F = 100\text{ mA}$ ; $f = 900\text{ MHz}$                                                                                 | 0.10 | –    | dB            |
|              |                          | $I_F = 100\text{ mA}$ ; $f = 1800\text{ MHz}$                                                                                | 0.13 | –    | dB            |
|              |                          | $I_F = 100\text{ mA}$ ; $f = 2450\text{ MHz}$                                                                                | 0.16 | –    | dB            |
| $\tau_L$     | 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 $I_R = 3\text{ mA}$ | 0.5  | –    | $\mu\text{s}$ |
| $L_S$        | series inductance        | $I_F = 100\text{ mA}$ ; $f = 100\text{ MHz}$                                                                                 | 0.6  | –    | nH            |

## Note

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

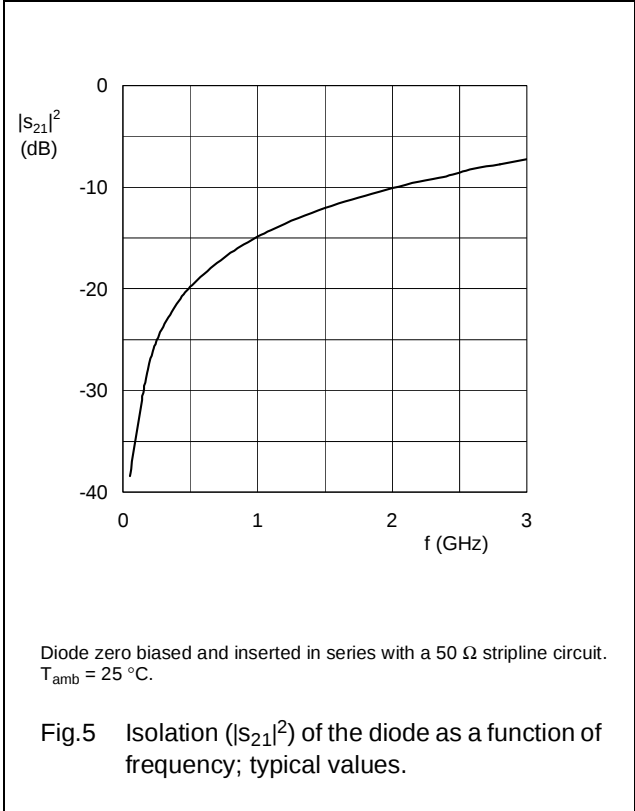
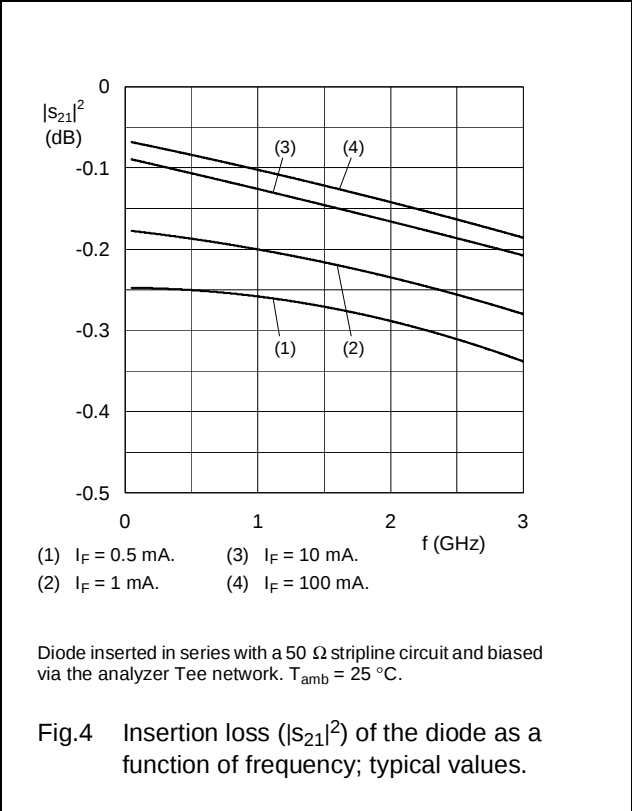
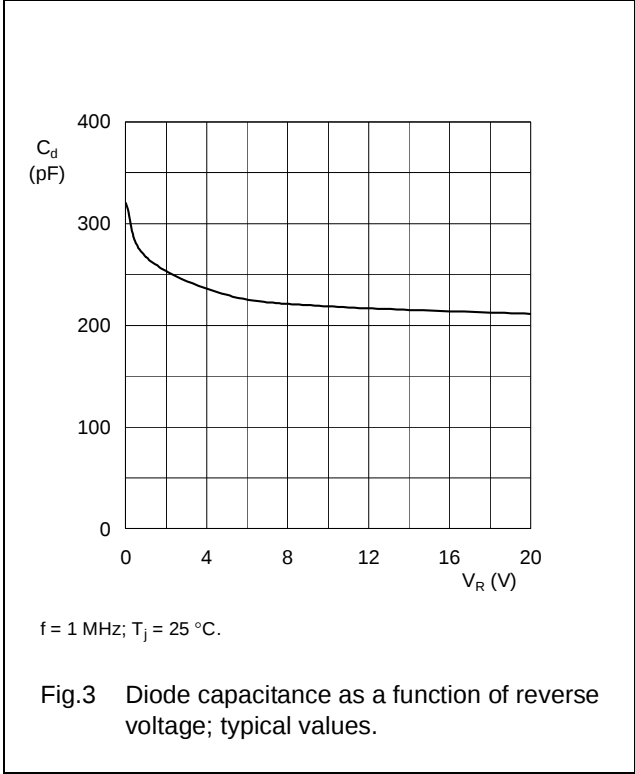
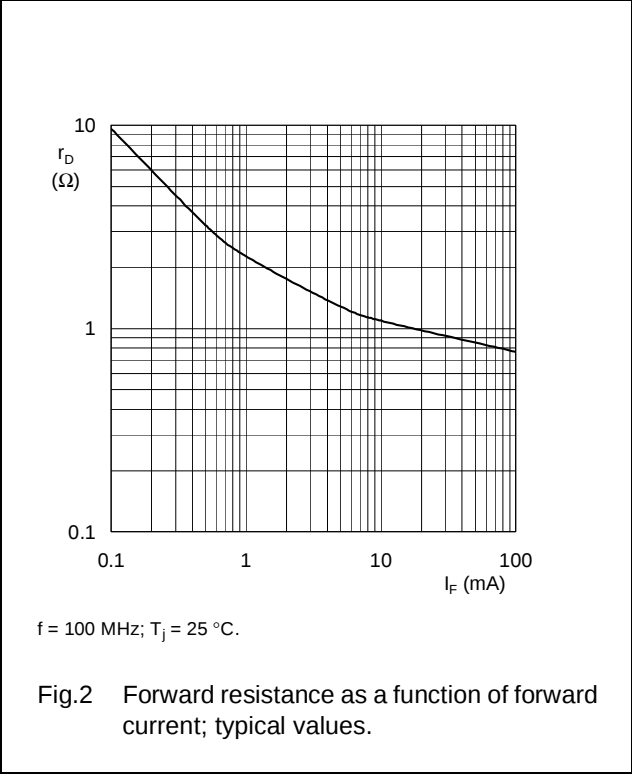
## THERMAL CHARACTERISTICS

| SYMBOL              | PARAMETER                                           | VALUE | UNIT |
|---------------------|-----------------------------------------------------|-------|------|
| $R_{th\text{ j-s}}$ | thermal resistance from junction to soldering point | 190   | K/W  |

Silicon PIN diode

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GRAPHICAL DATA



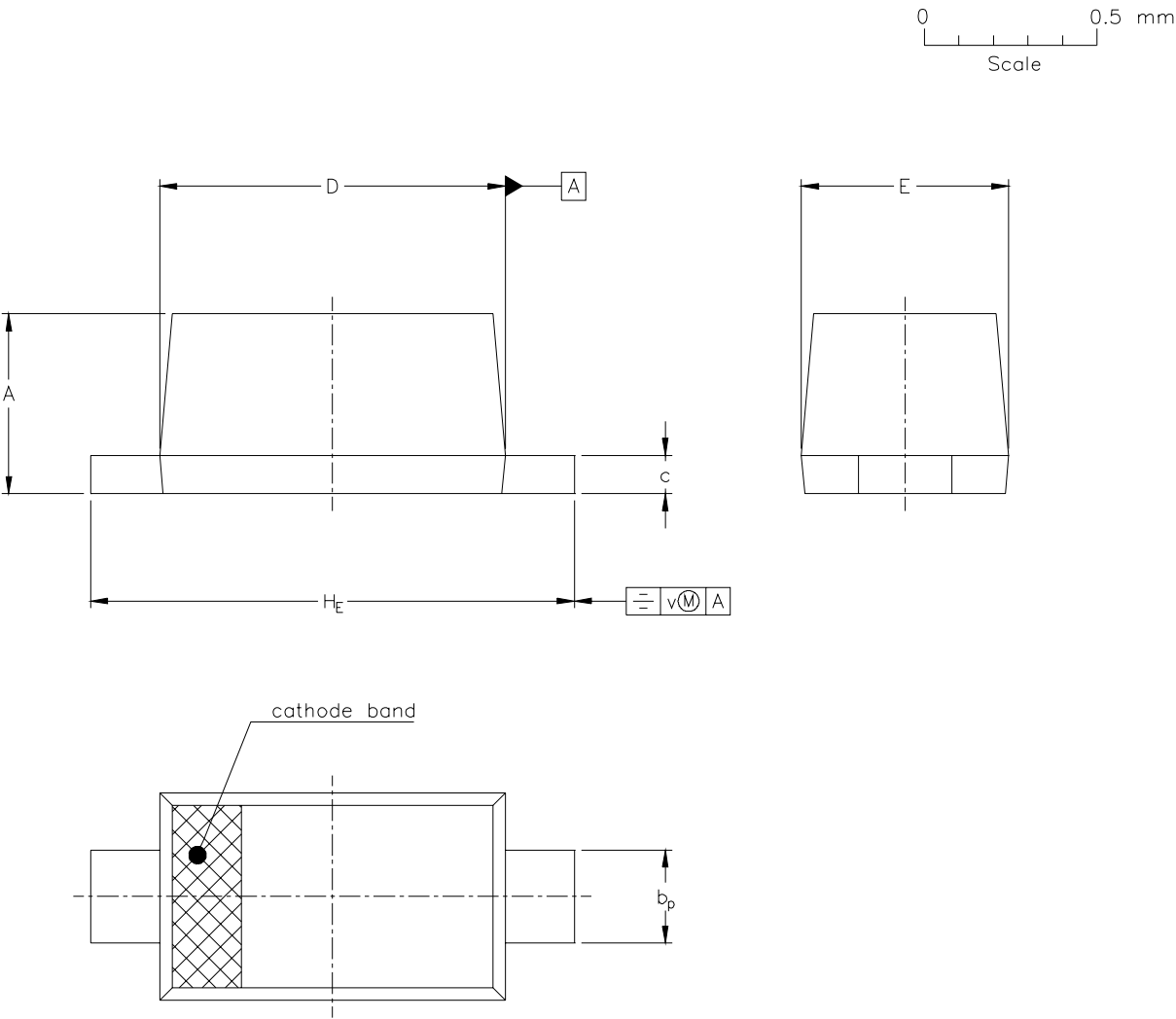
Silicon PIN diode

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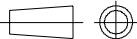
PACKAGE OUTLINE

SOD723A

Plastic surface mounted package; 2 leads



| UNIT | A            | b <sub>p</sub> | c            | D            | E            | H <sub>E</sub> | 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   |

## 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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