



# BAP64LX

Silicon PIN diode

Rev. 6 — 11 December 2018

Product data sheet

## 1 Product profile

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### 1.1 General description

Planar PIN diode in a SOD882D leadless ultra small plastic SMD package.

### 1.2 Features and benefits

- High voltage, current controlled RF resistor for RF attenuators and switches
- Low diode capacitance
- Low forward resistance
- Very low series inductance
- For applications up to 3 GHz
- AEC-Q101 qualified

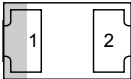
### 1.3 Applications

- RF attenuators and switches



2 Pinning information

Table 1. Discrete pinning

| Pin | Description | Simplified outline                                                                                          | Symbol                                                                                        |
|-----|-------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| 1   | cathode     | <br>Transparent top view | <br>sym006 |
| 2   | anode       |                                                                                                             |                                                                                               |

[1] The marking bar indicates the cathode.

3 Ordering information

Table 2. Ordering information

| Type number | Package    |                                                                          |         |
|-------------|------------|--------------------------------------------------------------------------|---------|
|             | Name       | Description                                                              | Version |
| BAP64LX     | DFN1006D-2 | leadless ultra small plastic package; 2 terminals; body 1 x 0.6 x 0.4 mm | SOD882D |

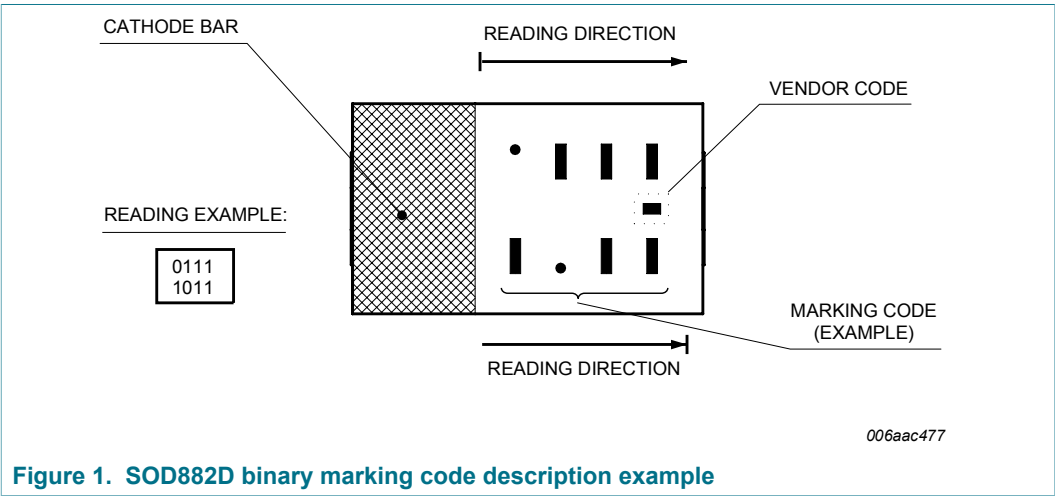
4 Marking

Table 3. Marking codes

| Type number | Marking code <sup>[1]</sup> |
|-------------|-----------------------------|
| BAP64LX     | 1111<br>1111                |

[1] For SOD882D binary marking code description, see [Figure 1](#).

4.1 Binary marking code description



## 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         |                                          | -   | 60   | V                  |
| $I_F$     | forward current         |                                          | -   | 100  | mA                 |
| $P_{tot}$ | total power dissipation | $T_{sp} \leq 90\text{ }^{\circ}\text{C}$ | -   | 150  | mW                 |
| $T_{stg}$ | storage temperature     |                                          | -65 | +150 | $^{\circ}\text{C}$ |
| $T_j$     | junction temperature    |                                          | -65 | +150 | $^{\circ}\text{C}$ |

## 6 Thermal characteristics

**Table 5. Thermal characteristics**

| Symbol         | Parameter                                        | Conditions | Typ | Unit |
|----------------|--------------------------------------------------|------------|-----|------|
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point |            | 56  | K/W  |

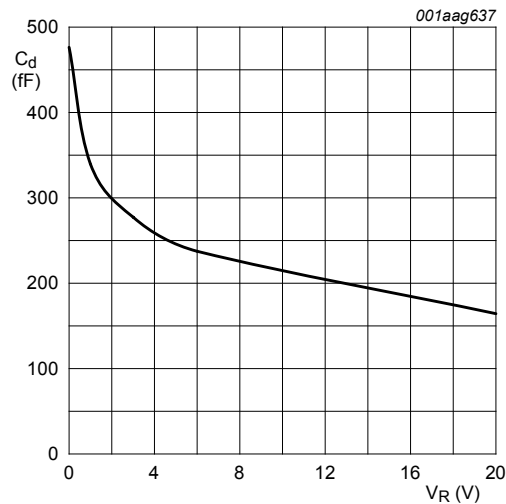
## 7 Characteristics

**Table 6. Characteristics**

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

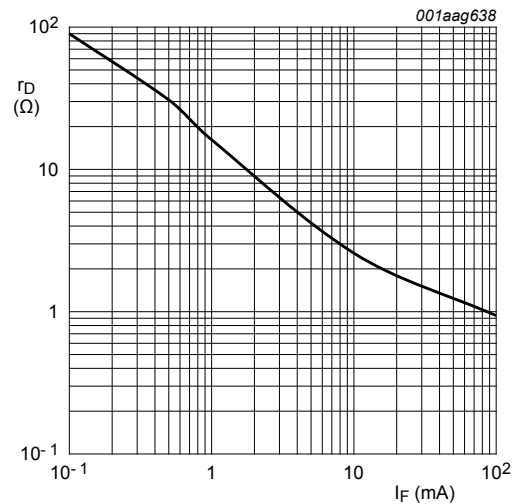
| Symbol    | Parameter                | Conditions                                                                                                                      | Min | Typ  | Max  | Unit          |
|-----------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----|------|------|---------------|
| $V_F$     | forward voltage          | $I_F = 100\text{ mA}$                                                                                                           | -   | 0.95 | 1.1  | V             |
| $I_R$     | reverse current          | $V_R = 60\text{ V}$                                                                                                             | -   | -    | 100  | nA            |
| $C_d$     | diode capacitance        | see <a href="#">Figure 2</a> ; $f = 1\text{ MHz}$ ;                                                                             |     |      |      |               |
|           |                          | $V_R = 0\text{ V}$                                                                                                              | -   | 0.48 | -    | pF            |
|           |                          | $V_R = 1\text{ V}$                                                                                                              | -   | 0.34 | -    | pF            |
|           |                          | $V_R = 20\text{ V}$                                                                                                             | -   | 0.17 | 0.30 | pF            |
| $r_D$     | diode forward resistance | see <a href="#">Figure 3</a> ; $f = 100\text{ MHz}$ ;                                                                           |     |      |      |               |
|           |                          | $I_F = 0.5\text{ mA}$                                                                                                           | -   | 31   | 50   | $\Omega$      |
|           |                          | $I_F = 1\text{ mA}$                                                                                                             | -   | 16   | 26   | $\Omega$      |
|           |                          | $I_F = 10\text{ mA}$                                                                                                            | -   | 2.6  | 4.4  | $\Omega$      |
| ISL       | isolation                | see <a href="#">Figure 4</a> ; $V_R = 0\text{ V}$ ;                                                                             |     |      |      |               |
|           |                          | $f = 900\text{ MHz}$                                                                                                            | -   | 22   | -    | dB            |
|           |                          | $f = 1800\text{ MHz}$                                                                                                           | -   | 16   | -    | dB            |
|           |                          | $f = 2450\text{ MHz}$                                                                                                           | -   | 14   | -    | dB            |
| $L_{ins}$ | insertion loss           | see <a href="#">Figure 5</a> ; $I_F = 0.5\text{ mA}$ ;                                                                          |     |      |      |               |
|           |                          | $f = 900\text{ MHz}$                                                                                                            | -   | 2.15 | -    | dB            |
|           |                          | $f = 1800\text{ MHz}$                                                                                                           | -   | 2.13 | -    | dB            |
|           |                          | $f = 2450\text{ MHz}$                                                                                                           | -   | 2.14 | -    | dB            |
| $L_{ins}$ | insertion loss           | see <a href="#">Figure 5</a> ; $I_F = 1\text{ mA}$ ;                                                                            |     |      |      |               |
|           |                          | $f = 900\text{ MHz}$                                                                                                            | -   | 1.21 | -    | dB            |
|           |                          | $f = 1800\text{ MHz}$                                                                                                           | -   | 1.21 | -    | dB            |
|           |                          | $f = 2450\text{ MHz}$                                                                                                           | -   | 1.22 | -    | dB            |
| $L_{ins}$ | insertion loss           | see <a href="#">Figure 5</a> ; $I_F = 10\text{ mA}$ ;                                                                           |     |      |      |               |
|           |                          | $f = 900\text{ MHz}$                                                                                                            | -   | 0.22 | -    | dB            |
|           |                          | $f = 1800\text{ MHz}$                                                                                                           | -   | 0.23 | -    | dB            |
|           |                          | $f = 2450\text{ MHz}$                                                                                                           | -   | 0.24 | -    | dB            |
| $L_{ins}$ | insertion loss           | see <a href="#">Figure 5</a> ; $I_F = 100\text{ mA}$ ;                                                                          |     |      |      |               |
|           |                          | $f = 900\text{ MHz}$                                                                                                            | -   | 0.09 | -    | dB            |
|           |                          | $f = 1800\text{ MHz}$                                                                                                           | -   | 0.1  | -    | dB            |
|           |                          | $f = 2450\text{ MHz}$                                                                                                           | -   | 0.11 | -    | dB            |
| $T_L$     | charge carrier life time | when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$ ;<br>$R_L = 100\text{ }\Omega$ ; measured at $I_R = 3\text{ mA}$ | -   | 1.0  | -    | $\mu\text{s}$ |
| $L_S$     | series inductance        | $I_F = 100\text{ mA}$ ; $f = 100\text{ MHz}$                                                                                    | -   | 0.4  | -    | nH            |

7.1 Graphics



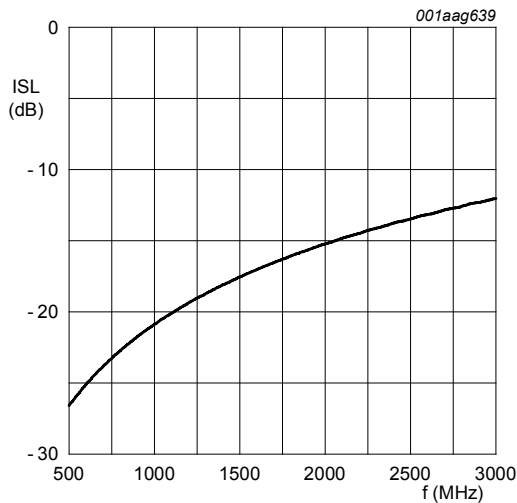
f = 1 MHz; Tj = 25 °C.

Figure 2. Diode capacitance as a function of reverse voltage; typical values



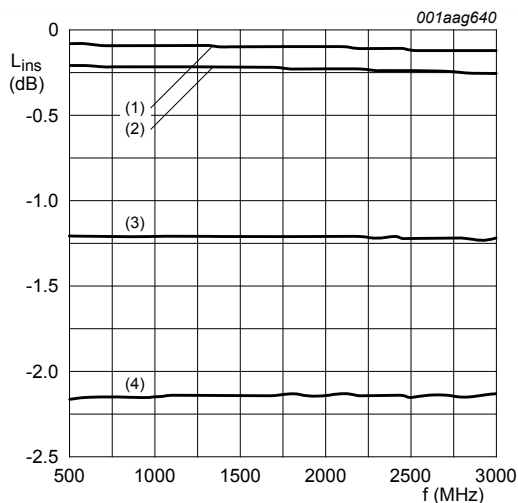
f = 100 MHz; Tj = 25 °C.

Figure 3. Forward resistance as a function of forward current; typical values



Tamb = 25 °C  
Diode zero biased and inserted in series with a 50 Ω stripline circuit

Figure 4. Isolation of the diode as a function of frequency; typical values



Tamb = 25 °C  
1. IF = 100 mA  
2. IF = 10 mA  
3. IF = 1 mA  
4. IF = 0.5 mA  
Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer Tee network

Figure 5. Insertion loss of the diode as a function of frequency; typical values



## 9 Abbreviations

Table 7. Abbreviations

| Acronym | Description                |
|---------|----------------------------|
| AQL     | acceptable quality level   |
| PIN     | P-type, intrinsic, N-type  |
| SMD     | surface mounted device     |
| S4      | special inspection level 4 |

## 10 Revision history

Table 8. Revision history

| Document ID    | Release date                                                                                                                                                                                                          | Data sheet status  | Change notice | Supersedes  |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|-------------|
| BAP64LX v.6    | 20181211                                                                                                                                                                                                              | Product data sheet | -             | BAP64LX v.5 |
| Modifications: | <ul style="list-style-type: none"><li>changed max value off <math>V_R</math> at limiting values</li><li>changed <math>I_R</math> conditions at characteristics</li><li>adapted the layout of the data sheet</li></ul> |                    |               |             |
| BAP64LX v.5    | 20150512                                                                                                                                                                                                              | Product data sheet | -             | BAP64LX v.4 |
| Modifications: | <ul style="list-style-type: none"><li>AEC-Q101 qualified</li></ul>                                                                                                                                                    |                    |               |             |
| BAP64LX v.4    | 20140416                                                                                                                                                                                                              | Product data sheet | -             | BAP64LX v.3 |
| BAP64LX v.3    | 20140211                                                                                                                                                                                                              | Product data sheet | -             | BAP64LX v.2 |
| BAP64LX v.2    | 20130807                                                                                                                                                                                                              | Product data sheet | -             | BAP64LX v.1 |
| BAP64LX v.1    | 20070629                                                                                                                                                                                                              | Product 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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