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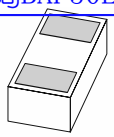


# BAP50LX

## Silicon PIN diode

Rev. 01 — 17 July 2007 Product data sheet

## 1. Product profile

### 1.1 General description

General purpose PIN diode in a SOD882T leadless ultra small plastic SMD package.

### 1.2 Features

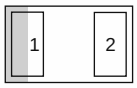
- Low diode capacitance
- Low diode forward resistance
- For applications up to 3 GHz

### 1.3 Applications

- General RF applications

## 2. Pinning information

**Table 1. Discrete pinning**

| Pin | Description | Simplified outline | Symbol |
|---|---|---|---|
| 1 | cathode [1] |   Transparent top view |  sym006 |
| 2 | anode | | |

[1] The marking bar indicates the cathode.

## 3. Ordering information

**Table 2. Ordering information**

| Type number | Package | | |
|---|---|---|---|
| | Name | Description | Version |
| BAP50LX | - | leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.4 mm | SOD882T |

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## 4. Marking

**Table 3. Marking**

| Type number | Marking code |
|---|---|
| BAP50LX | LB |

## 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 | - | 50 | V |
| $I_F$ | forward current | continuous | - | 50 | mA |
| $P_{tot}$ | total power dissipation | $T_{sp}$ = 90 °C | - | 150 | 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 | | 53 | K/W |

## 7. Characteristics

**Table 6. Characteristics**

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $V_F$ | forward voltage | $I_F$ = 50 mA | - | 0.95 | 1.1 | V |
| $V_R$ | reverse voltage | $I_R$ = 10 µA | 50 | - | - | V |
| $I_R$ | reverse current | $V_R$ = 50 V | - | - | 100 | nA |
| $C_d$ | diode capacitance | see Figure 1; f = 1 MHz; | | | | |
| | | $V_R$ = 0 V | - | 0.40 | - | pF |
| | | $V_R$ = 1 V | - | 0.28 | 0.55 | pF |
| | | $V_R$ = 5 V | - | 0.19 | 0.35 | pF |
| $r_D$ | diode forward resistance | see Figure 2; f = 100 MHz; | | | | |
| | | $I_F$ = 0.5 mA | - | 26 | 40 | Ω |
| | | $I_F$ = 1 mA | - | 14 | 25 | Ω |
| | | $I_F$ = 10 mA | - | 3 | 5 | Ω |
| ISL | isolation | see Figure 3; $V_R$ = 0 V; | | | | |
| | | f = 900 MHz | - | 20.3 | - | dB |
| | | f = 1800 MHz | - | 17.9 | - | dB |
| | | f = 2450 MHz | - | 16.5 | - | dB |


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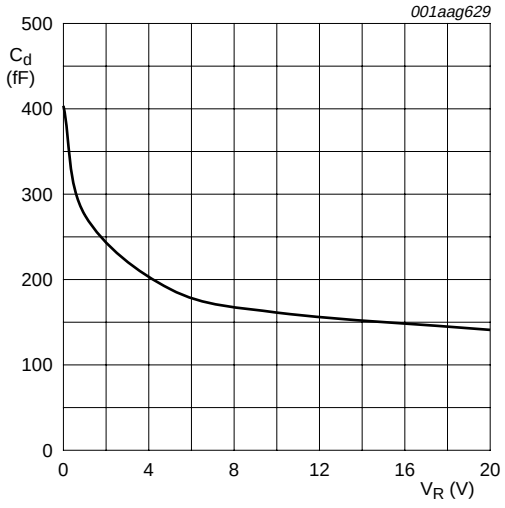
**Table 6. Characteristics** *...continued*

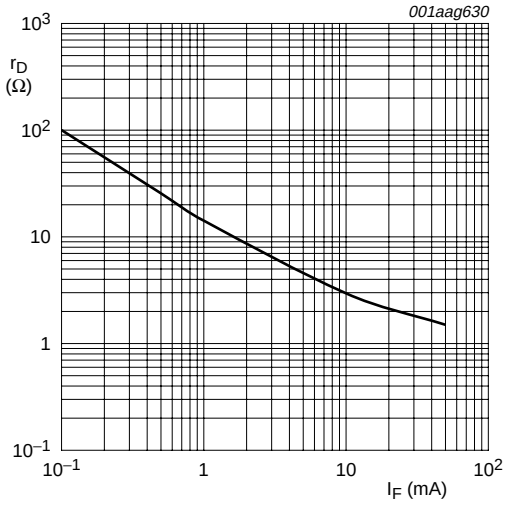
*$T_{amb}$ = 25 °C unless otherwise specified.*

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $L_{ins}$ | insertion loss | see Figure 4; $I_F$ = 0.5 mA; | | | | |
| | | f = 900 MHz | - | 1.82 | - | dB |
| | | f = 1800 MHz | - | 1.80 | - | dB |
| | | f = 2450 MHz | - | 1.81 | - | dB |
| $L_{ins}$ | insertion loss | see Figure 4; $I_F$ = 1 mA; | | | | |
| | | f = 900 MHz | - | 1.07 | - | dB |
| | | f = 1800 MHz | - | 1.06 | - | dB |
| | | f = 2450 MHz | - | 1.08 | - | dB |
| $L_{ins}$ | insertion loss | see Figure 4; $I_F$ = 10 mA; | | | | |
| | | f = 900 MHz | - | 0.25 | - | dB |
| | | f = 1800 MHz | - | 0.26 | - | dB |
| | | f = 2450 MHz | - | 0.27 | - | dB |
| $\tau_L$ | charge carrier life time | when switched from $I_F$ = 10 mA to $I_R$ = 6 mA; $R_L$ = 100 Ω; measured at $I_R$ = 3 mA | - | 1.0 | - | µs |
| $L_S$ | series inductance | $I_F$ = 100 mA; f = 100 MHz | - | 0.4 | - | nH |




f = 1 MHz; $T_j$ = 25 °C.

**Fig 1. Diode capacitance as a function of reverse voltage; typical values**




f = 100 MHz; $T_j$ = 25 °C.

**Fig 2. Forward resistance as a function of forward current; typical values**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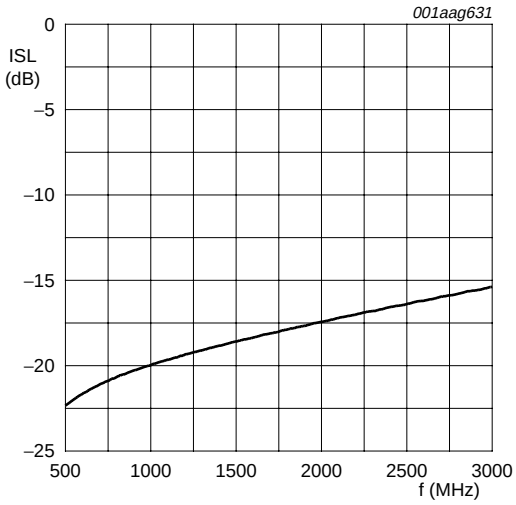
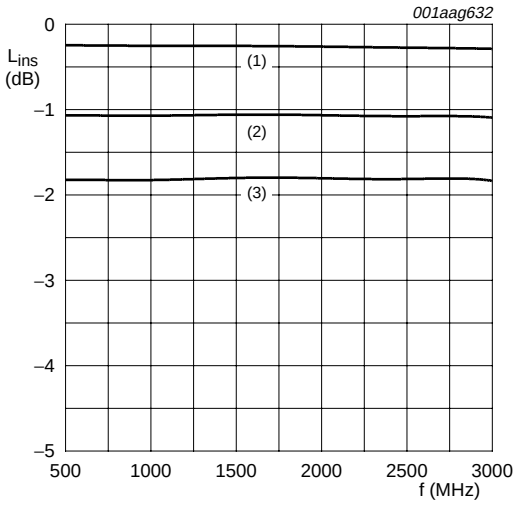



$T_{amb}$ = 25 °C

Diode zero biased and inserted in series with a 50 Ω stripline circuit.

**Fig 3. Isolation of the diode in off-state as a function of frequency; typical values**




$T_{amb}$ = 25 °C

(1) $I_F$ = 10 mA

(2) $I_F$ = 1 mA

(3) $I_F$ = 0.5 mA

Diode inserted in series with a 50 Ω stripline circuit and biased via the analyzer Tee network.

**Fig 4. Insertion loss of the diode as a function of frequency; typical values**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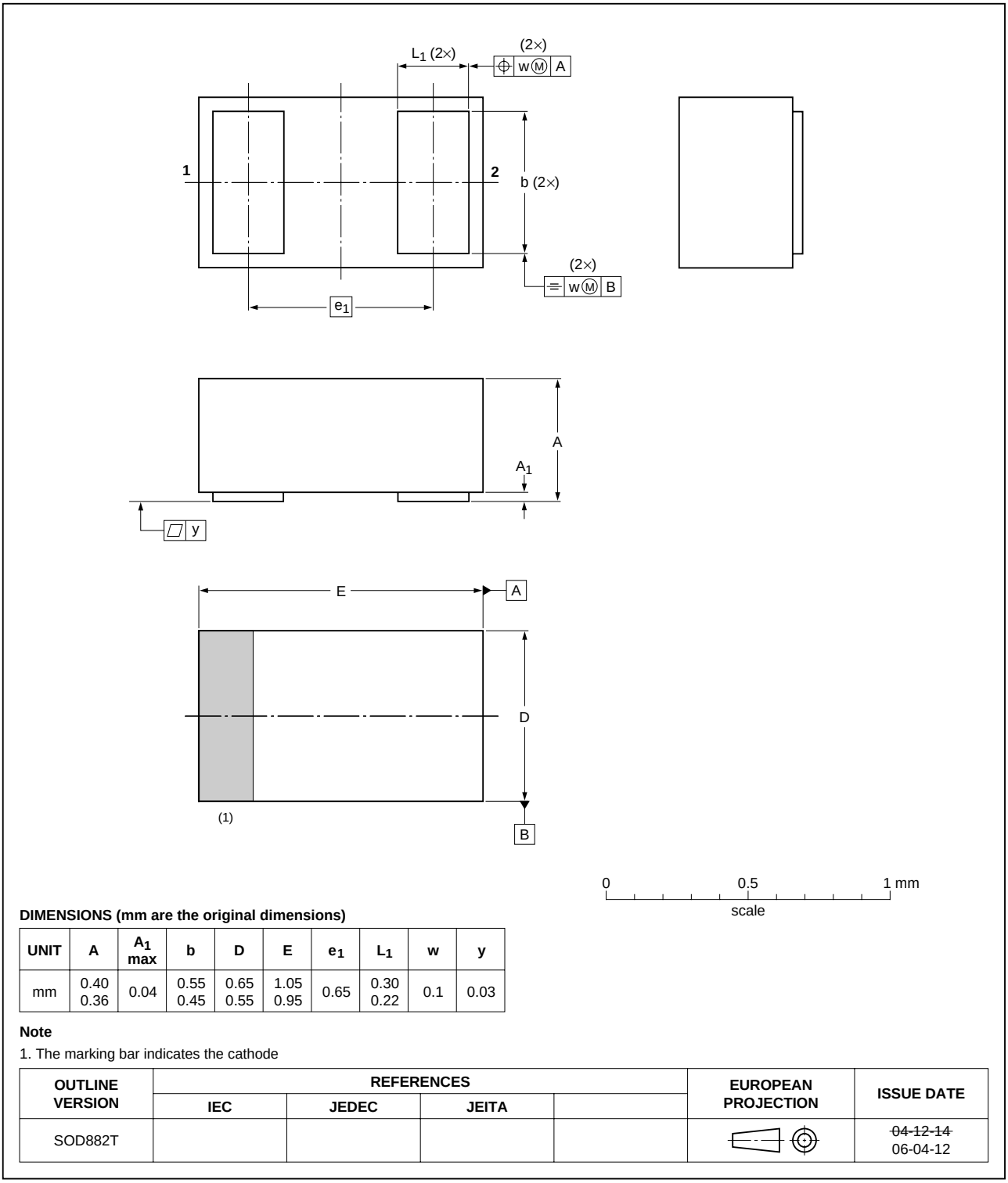
## 8. Package outline

**Leadless ultra small plastic package; 2 terminals; body 1 x 0.6 x 0.4 mm** **SOD882T**




**DIMENSIONS (mm are the original dimensions)**

| UNIT | A | $A_1$ max | b | D | E | $e_1$ | $L_1$ | w | y |
|---|---|---|---|---|---|---|---|---|---|
| mm | 0.40<br>0.36 | 0.04 | 0.55<br>0.45 | 0.65<br>0.55 | 1.05<br>0.95 | 0.65 | 0.30<br>0.22 | 0.1 | 0.03 |

**Note**

1. The marking bar indicates the cathode

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | JEITA | | | |
| SOD882T | | | | | | ~~04-12-14~~<br>06-04-12 |

**Fig 5. Package outline SOD882T**



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## 9. Abbreviations

Table 7. Abbreviations

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

## 10. Revision history

Table 8. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|---|---|---|---|---|
| BAP50LX_1 | 20070717 | Product data sheet | - | - |


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# 11. Legal information

## 11.1 Data sheet status

| Document status[1][2] | Product status[3] | 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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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