



# BAP51LX

Silicon PIN diode

Rev. 2 — 6 August 2013

Product data sheet

## 1. Product profile

### 1.1 General description

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

### 1.2 Features and benefits

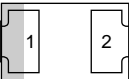

- High speed switching for RF signals
- Low diode capacitance
- Low forward resistance
- Very low series inductance
- For applications up to 3 GHz

### 1.3 Applications

- RF attenuators and switches

## 2. Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	cathode <sup>[1]</sup>		
2	anode		

Transparent top view

sym006

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP51LX	DFN1006D-2	leadless ultra small plastic package; 2 terminals; body 1 × 0.6 × 0.4 mm	SOD882D



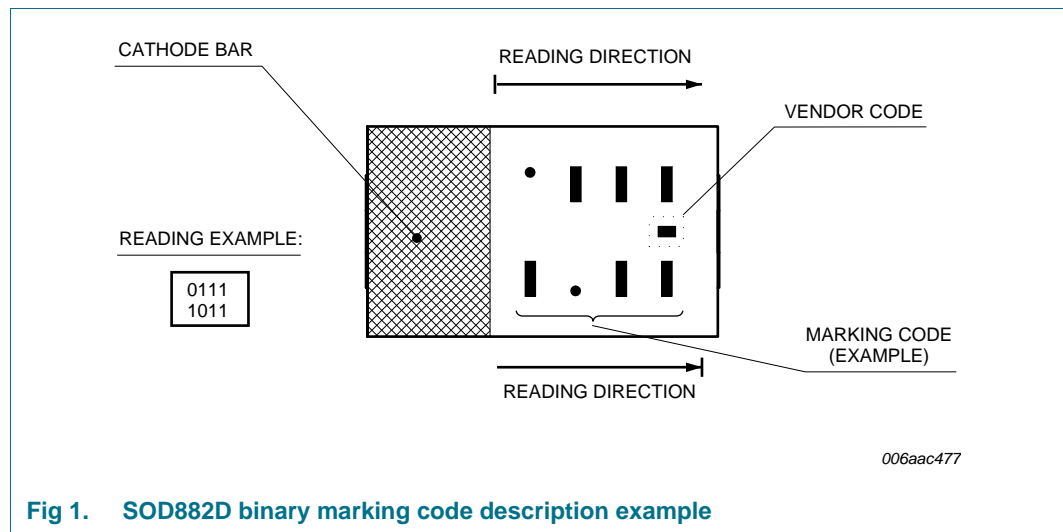
## 4. Marking

**Table 3. Marking codes**

Type number	Marking code <sup>[1]</sup>
BAP51LX	1001 0100

[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	$T_{sp} = 90\text{ °C}$	-	140	mW
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-65	+150	°C

## 6. Thermal characteristics

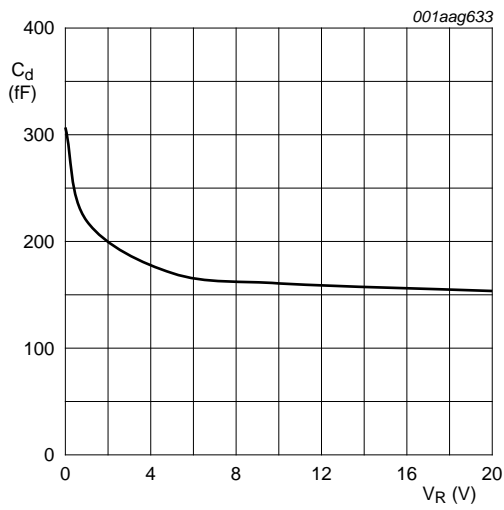
**Table 5. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-sp)}$	thermal resistance from junction to solder point		66	K/W

## 7. Characteristics

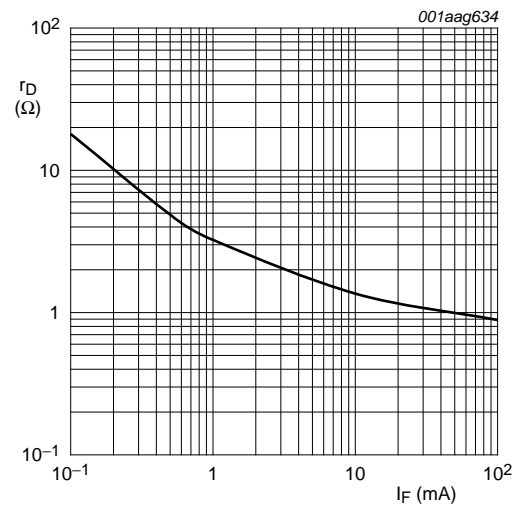
**Table 6. Characteristics**
*T<sub>amb</sub> = 25 °C unless otherwise specified.*

Symbol	Parameter	Conditions	Min	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 current	V <sub>R</sub> = 50 V	-	-	100	nA
C <sub>d</sub>	diode capacitance	see <a href="#">Figure 2</a> ; f = 1 MHz;				
		V <sub>R</sub> = 0 V	-	0.30	-	pF
		V <sub>R</sub> = 1 V	-	0.22	0.40	pF
		V <sub>R</sub> = 5 V	-	0.17	0.30	pF
r <sub>D</sub>	diode forward resistance	see <a href="#">Figure 3</a> ; f = 100 MHz;				
		I <sub>F</sub> = 0.5 mA	-	4.9	9	Ω
		I <sub>F</sub> = 1 mA	-	3.2	6.5	Ω
		I <sub>F</sub> = 10 mA	-	1.4	2.5	Ω
		I <sub>F</sub> = 100 mA	-	0.9	1.5	Ω
ISL	isolation	see <a href="#">Figure 4</a> ; V <sub>R</sub> = 0 V;				
		f = 900 MHz	-	19	-	dB
		f = 1800 MHz	-	15	-	dB
		f = 2450 MHz	-	13	-	dB
L <sub>ins</sub>	insertion loss	see <a href="#">Figure 5</a> ; I <sub>F</sub> = 0.5 mA;				
		f = 900 MHz	-	0.36	-	dB
		f = 1800 MHz	-	0.36	-	dB
		f = 2450 MHz	-	0.38	-	dB
L <sub>ins</sub>	insertion loss	see <a href="#">Figure 5</a> ; I <sub>F</sub> = 1 mA;				
		f = 900 MHz	-	0.25	-	dB
		f = 1800 MHz	-	0.26	-	dB
		f = 2450 MHz	-	0.27	-	dB
L <sub>ins</sub>	insertion loss	see <a href="#">Figure 5</a> ; I <sub>F</sub> = 10 mA;				
		f = 900 MHz	-	0.12	-	dB
		f = 1800 MHz	-	0.14	-	dB
		f = 2450 MHz	-	0.15	-	dB
L <sub>ins</sub>	insertion loss	see <a href="#">Figure 5</a> ; I <sub>F</sub> = 100 mA;				
		f = 900 MHz	-	0.09	-	dB
		f = 1800 MHz	-	0.10	-	dB
		f = 2450 MHz	-	0.12	-	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	-	0.55	-	μs
L <sub>S</sub>	series inductance	I <sub>F</sub> = 100 mA; f = 100 MHz	-	0.4	-	nH



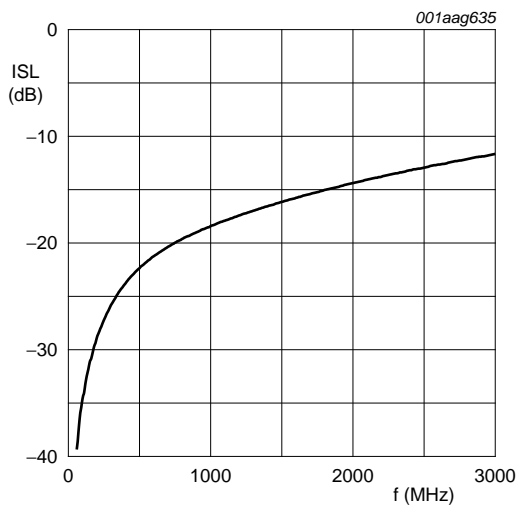
$f = 1 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

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



$f = 100 \text{ MHz}; T_j = 25 \text{ }^\circ\text{C}.$

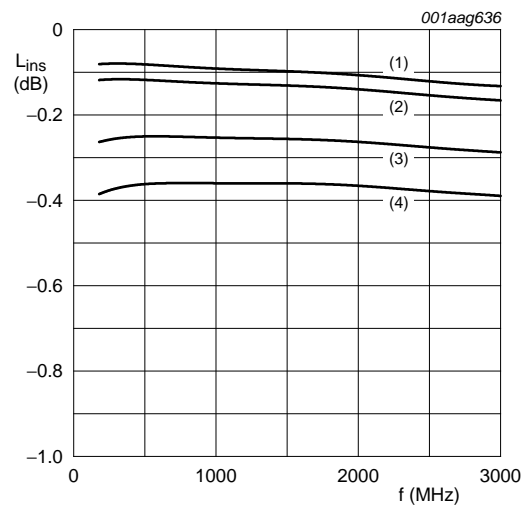
**Fig 3. Forward resistance as a function of forward current; typical values**



$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$

Diode zero biased and inserted in series with a  $50 \text{ } \Omega$  stripline circuit

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



$T_{\text{amb}} = 25 \text{ }^\circ\text{C}$

- (1)  $I_F = 100 \text{ mA}$
- (2)  $I_F = 10 \text{ mA}$
- (3)  $I_F = 1 \text{ mA}$
- (4)  $I_F = 0.5 \text{ mA}$

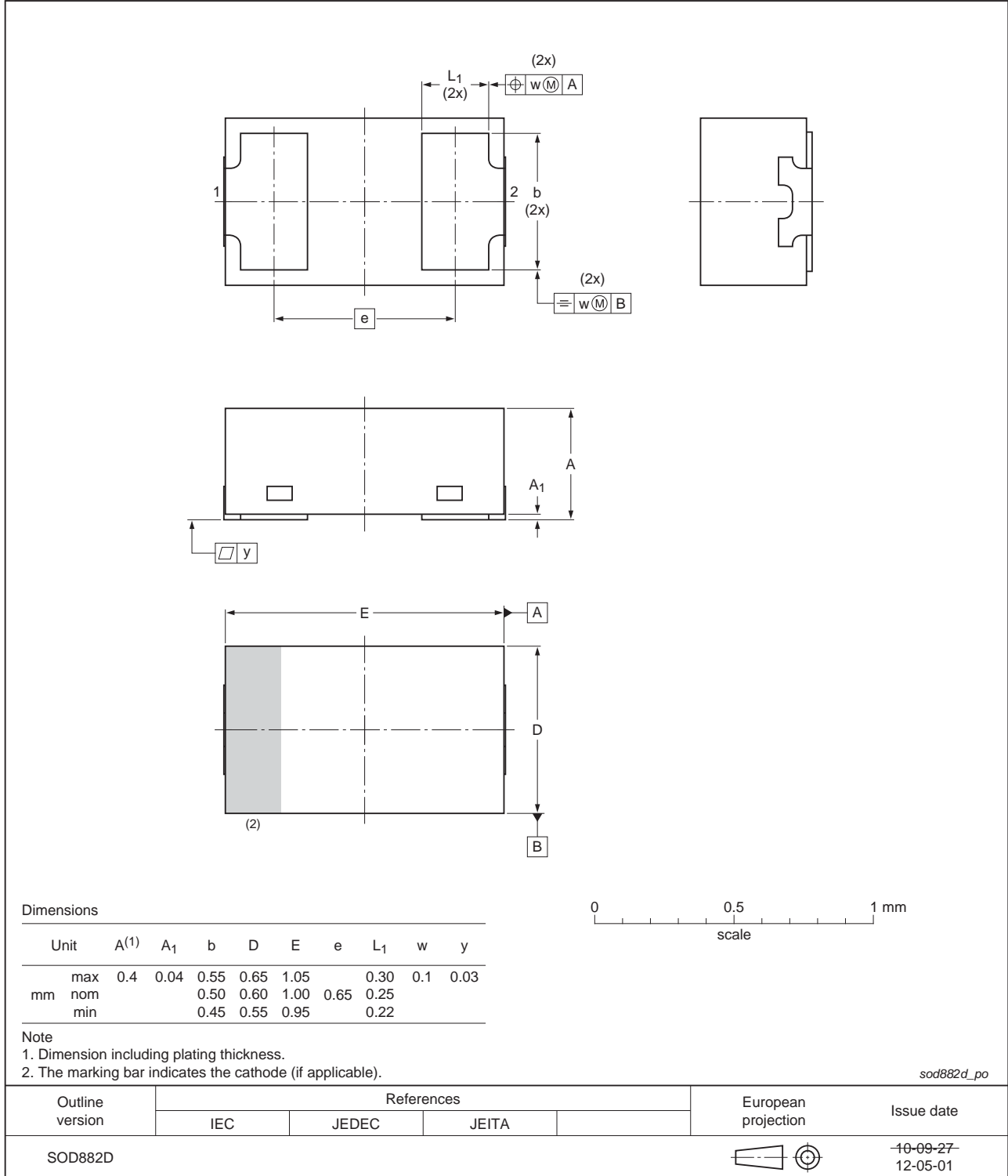
Diode inserted in series with a  $50 \text{ } \Omega$  stripline circuit and biased via the analyzer Tee network

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

**8. Package outline**

DFN1006D-2: Leadless ultra small plastic package; 2 terminals; body 1 x 0.6 x 0.4 mm

SOD882D



**Fig 6. Package outline SOD882D (DFN1006D-2)**

## 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
BAP51LX v.2	20130806	Product data sheet	-	BAP51LX v.1
Modifications:	<ul style="list-style-type: none"><li>• <a href="#">Section 1.1 on page 1</a>: Changed package to SOD882D</li><li>• <a href="#">Table 1 on page 1</a>: Changed simplified outline to SOD882D</li><li>• <a href="#">Table 2 on page 1</a>: Changed package to SOD882D</li><li>• <a href="#">Section 4 on page 2</a>: Update 'Marking' section</li><li>• <a href="#">Section 8 on page 5</a>: Changed package to SOD882D</li></ul>			
BAP51LX v.1	20070626	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.

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## 13. Contents

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<b>1</b>	<b>Product profile</b> . . . . .	<b>1</b>
1.1	General description . . . . .	1
1.2	Features and benefits . . . . .	1
1.3	Applications . . . . .	1
<b>2</b>	<b>Pinning information</b> . . . . .	<b>1</b>
<b>3</b>	<b>Ordering information</b> . . . . .	<b>1</b>
<b>4</b>	<b>Marking</b> . . . . .	<b>2</b>
4.1	Binary marking code description . . . . .	2
<b>5</b>	<b>Limiting values</b> . . . . .	<b>2</b>
<b>6</b>	<b>Thermal characteristics</b> . . . . .	<b>2</b>
<b>7</b>	<b>Characteristics</b> . . . . .	<b>3</b>
<b>8</b>	<b>Package outline</b> . . . . .	<b>5</b>
<b>9</b>	<b>Abbreviations</b> . . . . .	<b>6</b>
<b>10</b>	<b>Revision history</b> . . . . .	<b>6</b>
<b>11</b>	<b>Legal information</b> . . . . .	<b>7</b>
11.1	Data sheet status . . . . .	7
11.2	Definitions . . . . .	7
11.3	Disclaimers . . . . .	7
11.4	Trademarks . . . . .	8
<b>12</b>	<b>Contact information</b> . . . . .	<b>8</b>
<b>13</b>	<b>Contents</b> . . . . .	<b>9</b>

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Date of release: 6 August 2013

Document identifier: BAP51LX

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