

# BAP51LX

Silicon PIN diode

Rev. 01 — 26 June 2007

Product data sheet

## 1. Product profile

### 1.1 General description

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

### 1.2 Features

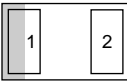

- High speed switching for RF signals
- Low diode capacitance
- Low forward resistance
- Very low series inductance
- For applications up to 3 GHz

### 1.3 Applications

- RF attenuators and switches

## 2. Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	cathode	<a href="#">[1]</a>	
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	-	leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.4 mm	SOD882T

## 4. Marking

**Table 3. Marking**

Type number	Marking code
BAP51LX	L2

## 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

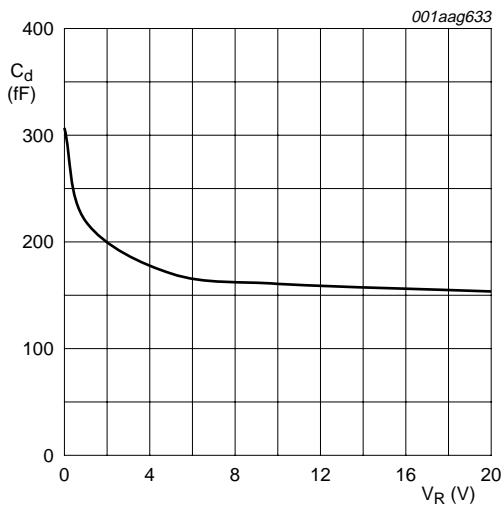
**Table 6. Characteristics**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 50\text{ mA}$	-	0.95	1.1	V
$I_R$	reverse current	$V_R = 50\text{ V}$	-	-	100	nA
$C_d$	diode capacitance	see <a href="#">Figure 1</a> ; $f = 1\text{ MHz}$ ;				
		$V_R = 0\text{ V}$	-	0.30	-	pF
		$V_R = 1\text{ V}$	-	0.22	0.40	pF
		$V_R = 5\text{ V}$	-	0.17	0.30	pF
$r_D$	diode forward resistance	see <a href="#">Figure 2</a> ; $f = 100\text{ MHz}$ ;				
		$I_F = 0.5\text{ mA}$	-	4.9	9	$\Omega$
		$I_F = 1\text{ mA}$	-	3.2	6.5	$\Omega$
		$I_F = 10\text{ mA}$	-	1.4	2.5	$\Omega$
		$I_F = 100\text{ mA}$	-	0.9	1.5	$\Omega$
ISL	isolation	see <a href="#">Figure 3</a> ; $V_R = 0\text{ V}$ ;				
		$f = 900\text{ MHz}$	-	19	-	dB
		$f = 1800\text{ MHz}$	-	15	-	dB
		$f = 2450\text{ MHz}$	-	13	-	dB

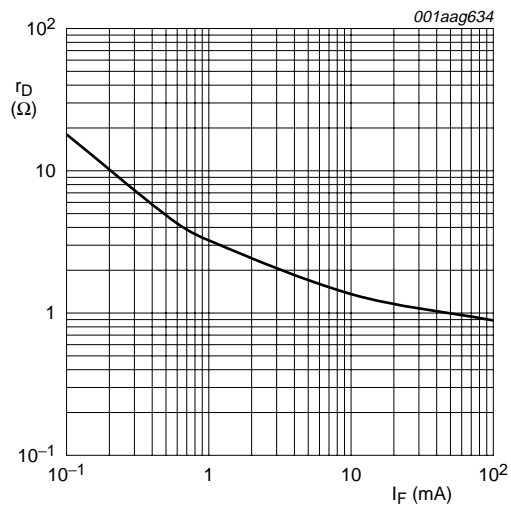
**Table 6. Characteristics ...continued**  
 $T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 0.5\text{ mA}$ ;				
		$f = 900\text{ MHz}$	-	0.36	-	dB
		$f = 1800\text{ MHz}$	-	0.36	-	dB
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 1\text{ mA}$ ;				
		$f = 900\text{ MHz}$	-	0.25	-	dB
		$f = 1800\text{ MHz}$	-	0.26	-	dB
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 10\text{ mA}$ ;				
		$f = 900\text{ MHz}$	-	0.12	-	dB
		$f = 1800\text{ MHz}$	-	0.14	-	dB
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 100\text{ mA}$ ;				
		$f = 900\text{ MHz}$	-	0.09	-	dB
		$f = 1800\text{ MHz}$	-	0.10	-	dB
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 100\text{ mA}$ ;				
		$f = 1800\text{ MHz}$	-	0.10	-	dB
		$f = 2450\text{ MHz}$	-	0.12	-	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 $I_R = 3\text{ mA}$	-	0.55	-	$\mu\text{s}$
$L_S$	series inductance	$I_F = 100\text{ mA}$ ; $f = 100\text{ MHz}$	-	0.4	-	nH



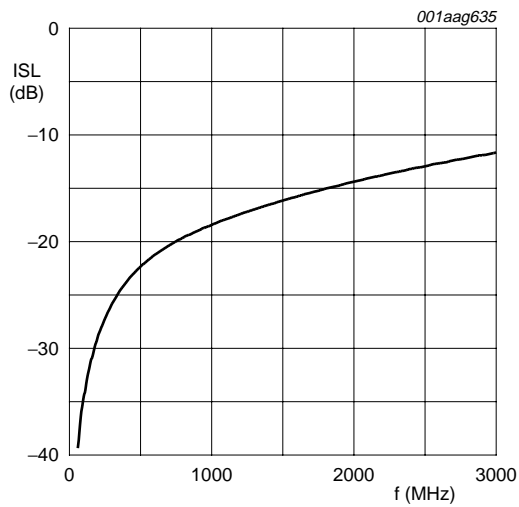
$f = 1\text{ MHz}$ ;  $T_j = 25\text{ }^{\circ}\text{C}$ .

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



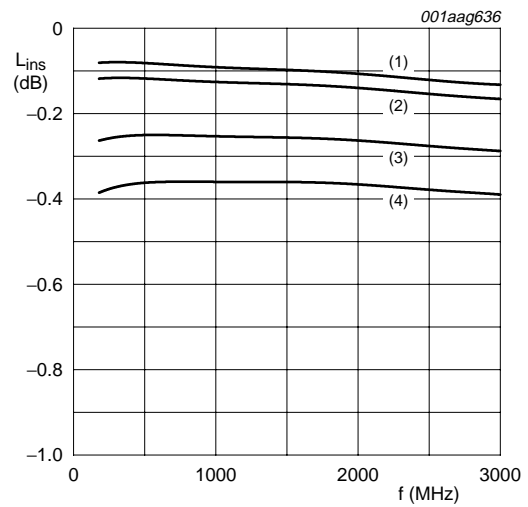
$f = 100\text{ MHz}$ ;  $T_j = 25\text{ }^{\circ}\text{C}$ .

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



$T_{amb} = 25\text{ }^{\circ}\text{C}$   
 Diode zero biased and inserted in series with a 50  $\Omega$  stripline circuit

**Fig 3. Isolation of the diode as a function of frequency; typical values**



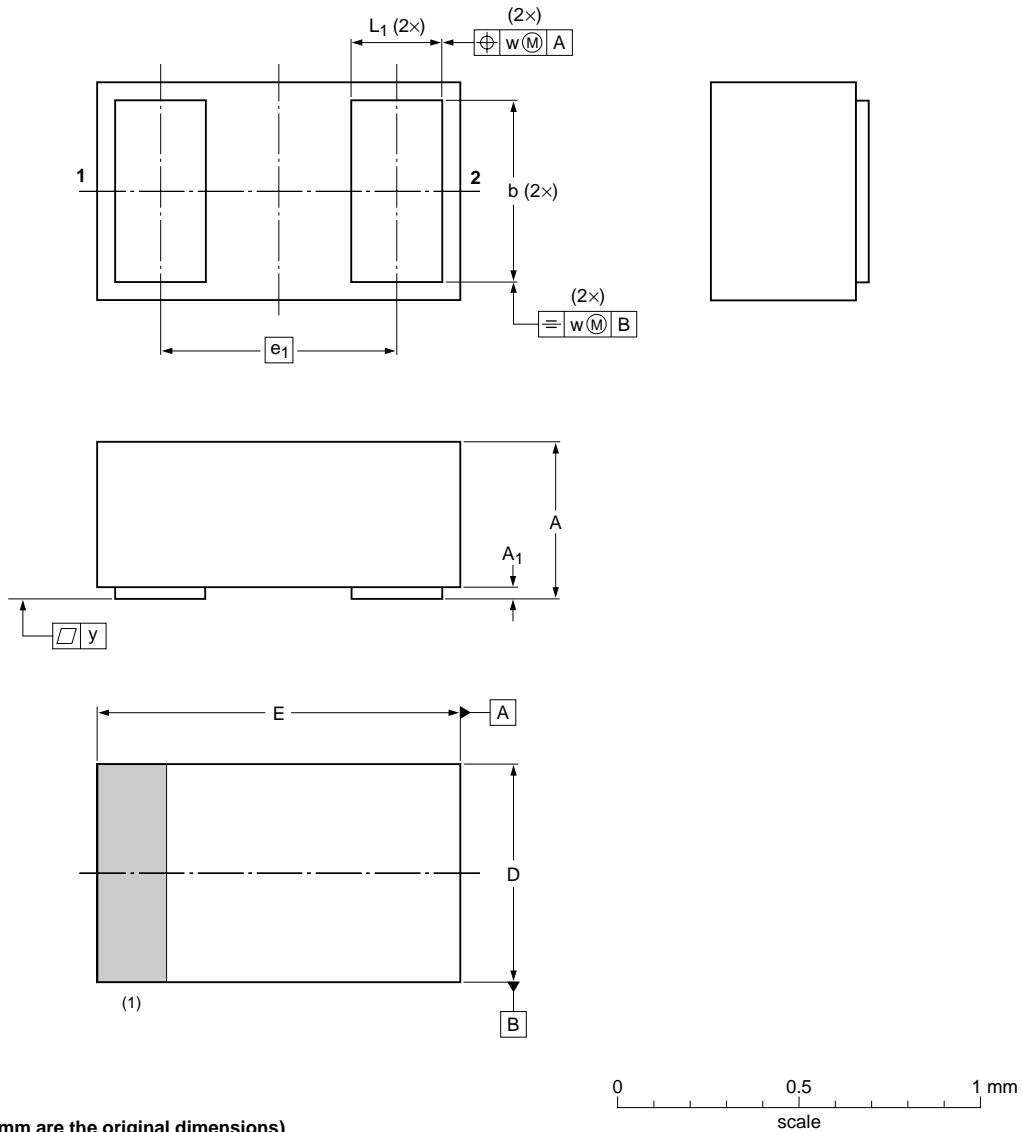
$T_{amb} = 25\text{ }^{\circ}\text{C}$   
 (1)  $I_F = 100\text{ mA}$   
 (2)  $I_F = 10\text{ mA}$   
 (3)  $I_F = 1\text{ mA}$   
 (4)  $I_F = 0.5\text{ mA}$   
 Diode inserted in series with a 50  $\Omega$  stripline circuit and biased via the analyzer Tee network

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

**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 <sub>1 max</sub>	b	D	E	e <sub>1</sub>	L <sub>1</sub>	w	y
mm	0.40 0.36	0.04	0.55 0.45	0.65 0.55	1.05 0.95	0.65	0.30 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 06-04-12

**Fig 5. Package outline SOD882T**

## 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_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.

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[2] The term 'short data sheet' is explained in section "Definitions".

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