

# BAP142LX

Silicon PIN diode

Rev. 01 — 30 July 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

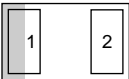

- High voltage, current controlled RF resistor
- Low diode capacitance
- Low losses at very low currents
- Very low series inductance
- For applications up to 3 GHz

### 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
BAP142LX	-	leadless ultra small plastic package; 2 terminals; body 1 × 0.6 × 0.4 mm	SOD882T

## 4. Marking

Table 3. Marking

Type number	Marking code
BAP142LX	LG

## 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		-	50	V
$I_F$	forward current		-	100	mA
$P_{tot}$	total power dissipation	$T_{sp} = 90\text{ °C}$	-	130	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		83	K/W

## 7. Characteristics

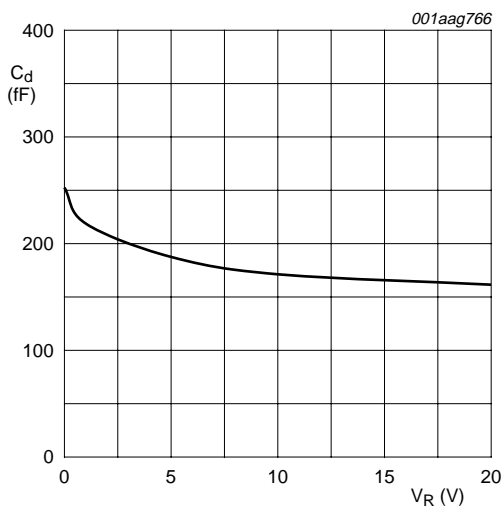
Table 6. Characteristics

$T_{amb} = 25\text{ °C}$  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	$V_R = 20\text{ V}$	-	-	20	nA
		$V_R = 50\text{ V}$	-	-	100	nA
$C_d$	diode capacitance	see <a href="#">Figure 1</a> ; $f = 1\text{ MHz}$ ;				
		$V_R = 0\text{ V}$	-	0.25	-	pF
		$V_R = 1\text{ V}$	-	0.22	-	pF
		$V_R = 20\text{ V}$	-	0.16	0.26	pF
$r_D$	diode forward resistance	see <a href="#">Figure 2</a> ; $f = 100\text{ MHz}$ ;				
		$I_F = 0.5\text{ mA}$	-	3.3	5.0	$\Omega$
		$I_F = 1\text{ mA}$	-	2.4	3.6	$\Omega$
		$I_F = 10\text{ mA}$	-	1.0	1.8	$\Omega$
		$I_F = 100\text{ mA}$	-	0.7	1.3	$\Omega$

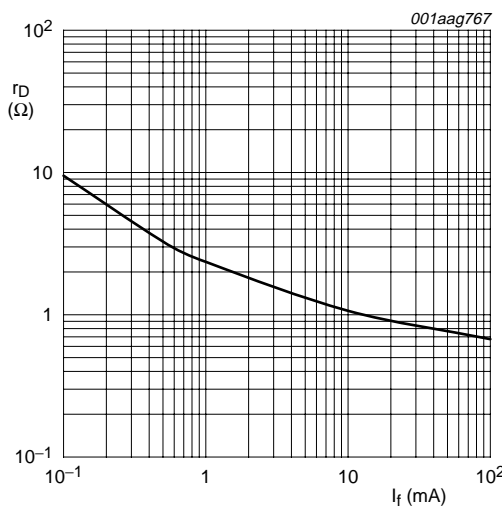
**Table 6. Characteristics ...continued**  
 $T_{amb} = 25^{\circ}\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
ISL	isolation	see <a href="#">Figure 3</a> ; $V_R = 0\text{ V}$ ;				
		$f = 900\text{ MHz}$	-	18	-	dB
		$f = 1800\text{ MHz}$	-	13	-	dB
		$f = 2450\text{ MHz}$	-	11	-	dB
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 0.5\text{ mA}$ ;				
		$f = 900\text{ MHz}$	-	0.24	-	dB
		$f = 1800\text{ MHz}$	-	0.24	-	dB
		$f = 2450\text{ MHz}$	-	0.25	-	dB
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 1\text{ mA}$ ;				
		$f = 900\text{ MHz}$	-	0.18	-	dB
		$f = 1800\text{ MHz}$	-	0.19	-	dB
		$f = 2450\text{ MHz}$	-	0.25	-	dB
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 10\text{ mA}$ ;				
		$f = 900\text{ MHz}$	-	0.10	-	dB
		$f = 1800\text{ MHz}$	-	0.11	-	dB
		$f = 2450\text{ MHz}$	-	0.12	-	dB
$L_{ins}$	insertion loss	see <a href="#">Figure 4</a> ; $I_F = 100\text{ mA}$ ;				
		$f = 900\text{ MHz}$	-	0.07	-	dB
		$f = 1800\text{ MHz}$	-	0.09	-	dB
		$f = 2450\text{ MHz}$	-	0.10	-	dB
$\tau_L$	charge carrier life time	when switched from $I_F = 10\text{ mA}$ to $I_R = 6\text{ mA}$ ; $R_L = 100\ \Omega$ ; measured at $I_R = 3\text{ mA}$	-	0.11	-	$\mu\text{s}$
$L_S$	series inductance	$I_F = 100\text{ mA}$ ; $f = 100\text{ MHz}$	-	0.4	-	nH



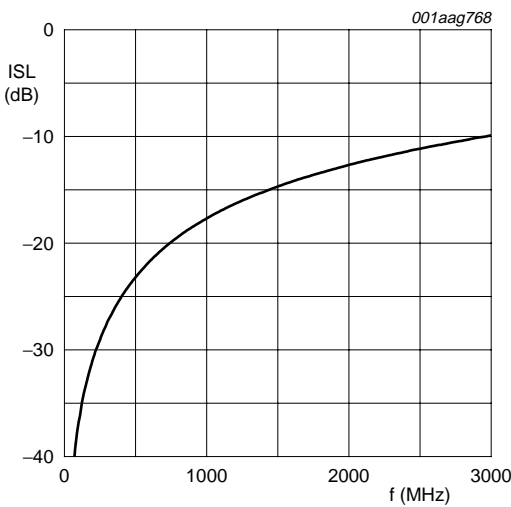
$f = 1\text{ MHz}$ ;  $T_j = 25\text{ }^\circ\text{C}$ .

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



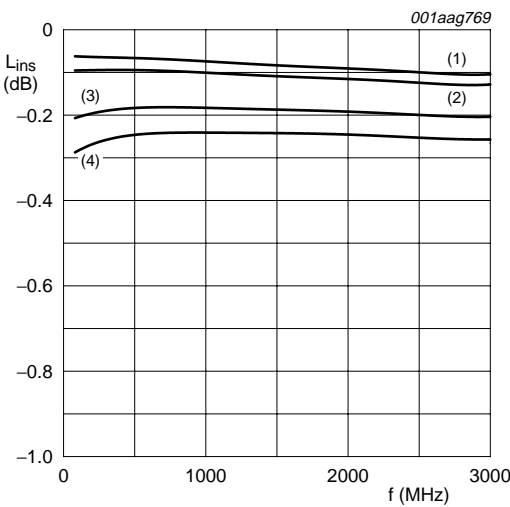
$f = 100\text{ MHz}$ ;  $T_j = 25\text{ }^\circ\text{C}$ .

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  $50\text{ }\Omega$  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  $50\text{ }\Omega$  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

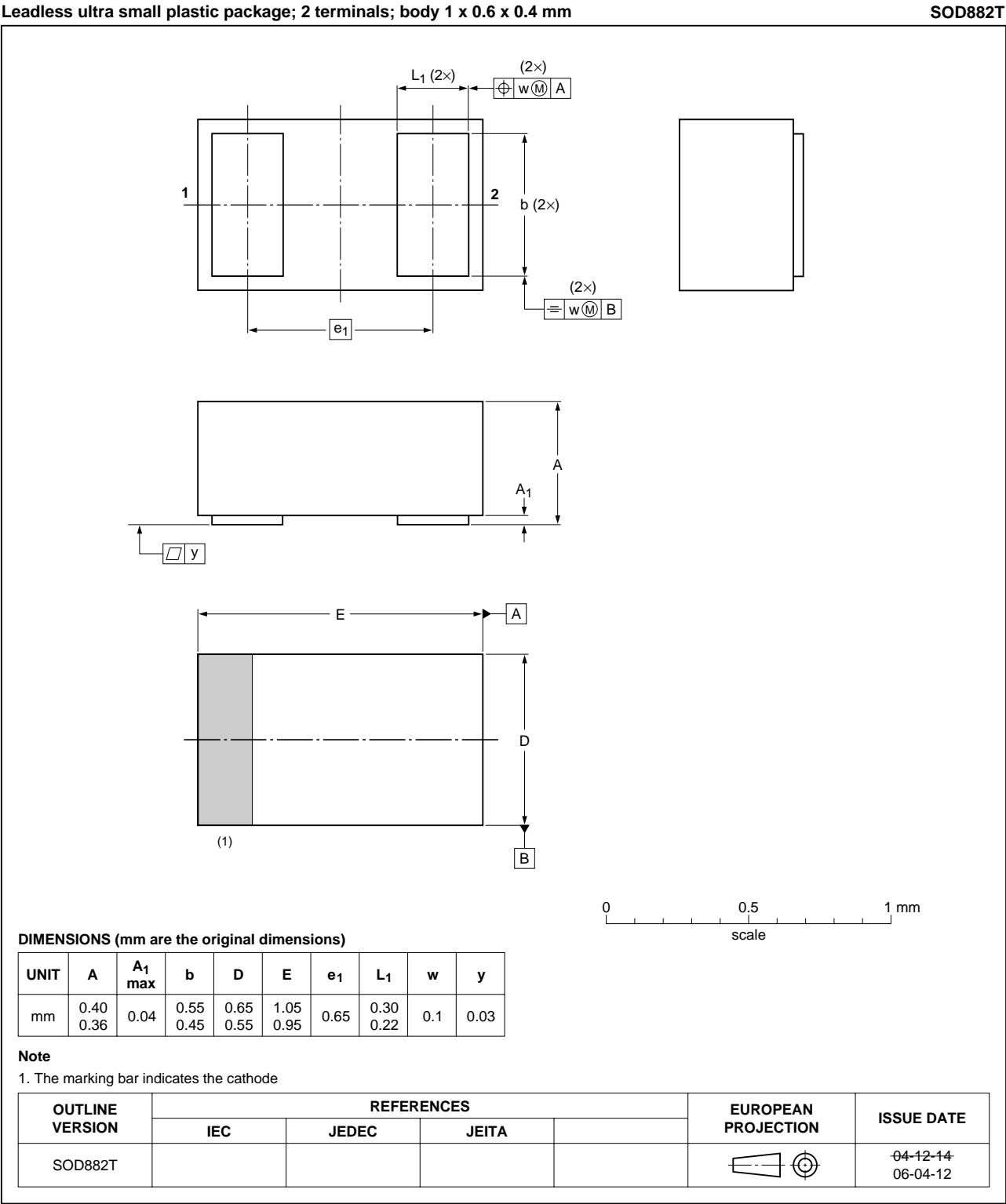


Fig 5. Package outline SOD882T

## 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
BAP142LX_1	20070730	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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