

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

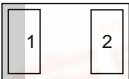

- High voltage, current controlled RF resistor
- Low diode capacitance
- Low losses at very low currents
- Very low series inductance
- For applications up to 3 GHz

1.3 Applications

- RF attenuators and switches

2. Pinning information

Table 1. Discrete pinning

Pin	Description	Simplified outline	Symbol
1	cathode		
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

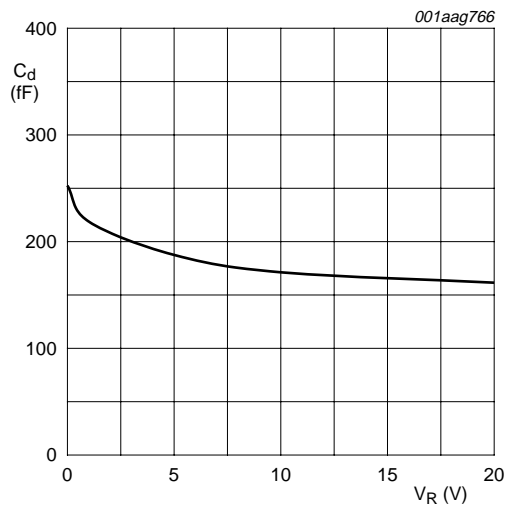
Table 6. Characteristics

$T_{amb} = 25\text{ °C}$ 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 Figure 1 ; $f = 1\text{ MHz}$;				
		$V_R = 0\text{ V}$	-	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 Figure 2 ; $f = 100\text{ MHz}$;				
		$I_F = 0.5\text{ mA}$	-	3.3	5.0	Ω
		$I_F = 1\text{ mA}$	-	2.4	3.6	Ω
		$I_F = 10\text{ mA}$	-	1.0	1.8	Ω
		$I_F = 100\text{ mA}$	-	0.7	1.3	Ω

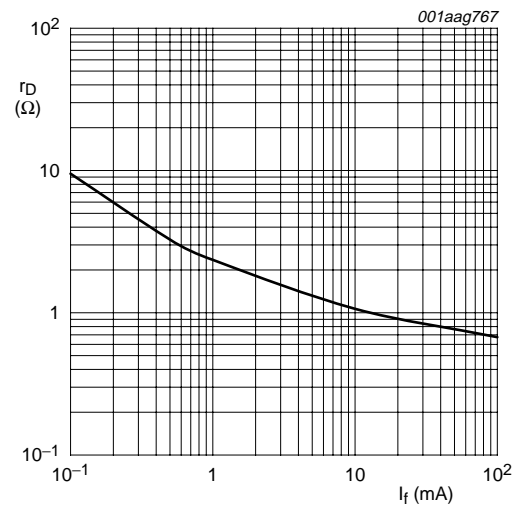
Table 6. Characteristics ...continued
 $T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
ISL	isolation	see Figure 3 ; $V_R = 0\text{ V}$;				
		$f = 900\text{ MHz}$	-	18	-	dB
		$f = 1800\text{ MHz}$	-	13	-	dB
		$f = 2450\text{ MHz}$	-	11	-	dB
L_{ins}	insertion loss	see Figure 4 ; $I_F = 0.5\text{ mA}$;				
		$f = 900\text{ MHz}$	-	0.24	-	dB
		$f = 1800\text{ MHz}$	-	0.24	-	dB
		$f = 2450\text{ MHz}$	-	0.25	-	dB
L_{ins}	insertion loss	see Figure 4 ; $I_F = 1\text{ mA}$;				
		$f = 900\text{ MHz}$	-	0.18	-	dB
		$f = 1800\text{ MHz}$	-	0.19	-	dB
		$f = 2450\text{ MHz}$	-	0.25	-	dB
L_{ins}	insertion loss	see Figure 4 ; $I_F = 10\text{ mA}$;				
		$f = 900\text{ MHz}$	-	0.10	-	dB
		$f = 1800\text{ MHz}$	-	0.11	-	dB
		$f = 2450\text{ MHz}$	-	0.12	-	dB
L_{ins}	insertion loss	see Figure 4 ; $I_F = 100\text{ mA}$;				
		$f = 900\text{ MHz}$	-	0.07	-	dB
		$f = 1800\text{ MHz}$	-	0.09	-	dB
		$f = 2450\text{ MHz}$	-	0.10	-	dB
τ_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	-	μs
L_S	series inductance	$I_F = 100\text{ mA}$; $f = 100\text{ MHz}$	-	0.4	-	nH



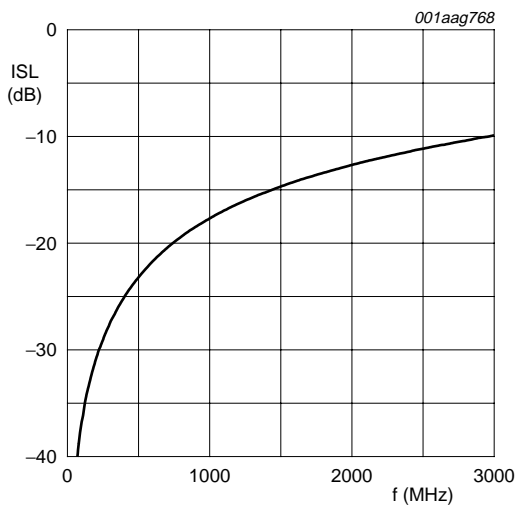
$f = 1 \text{ MHz}$; $T_j = 25 \text{ }^{\circ}\text{C}$.

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



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

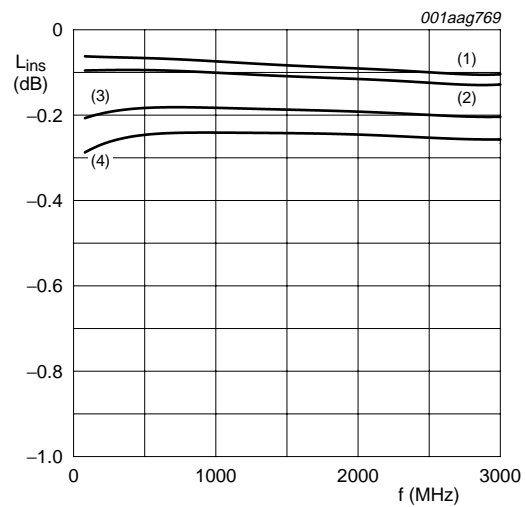
Fig 2. Forward resistance as a function of forward current; typical values



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

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



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

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

8. Package outline

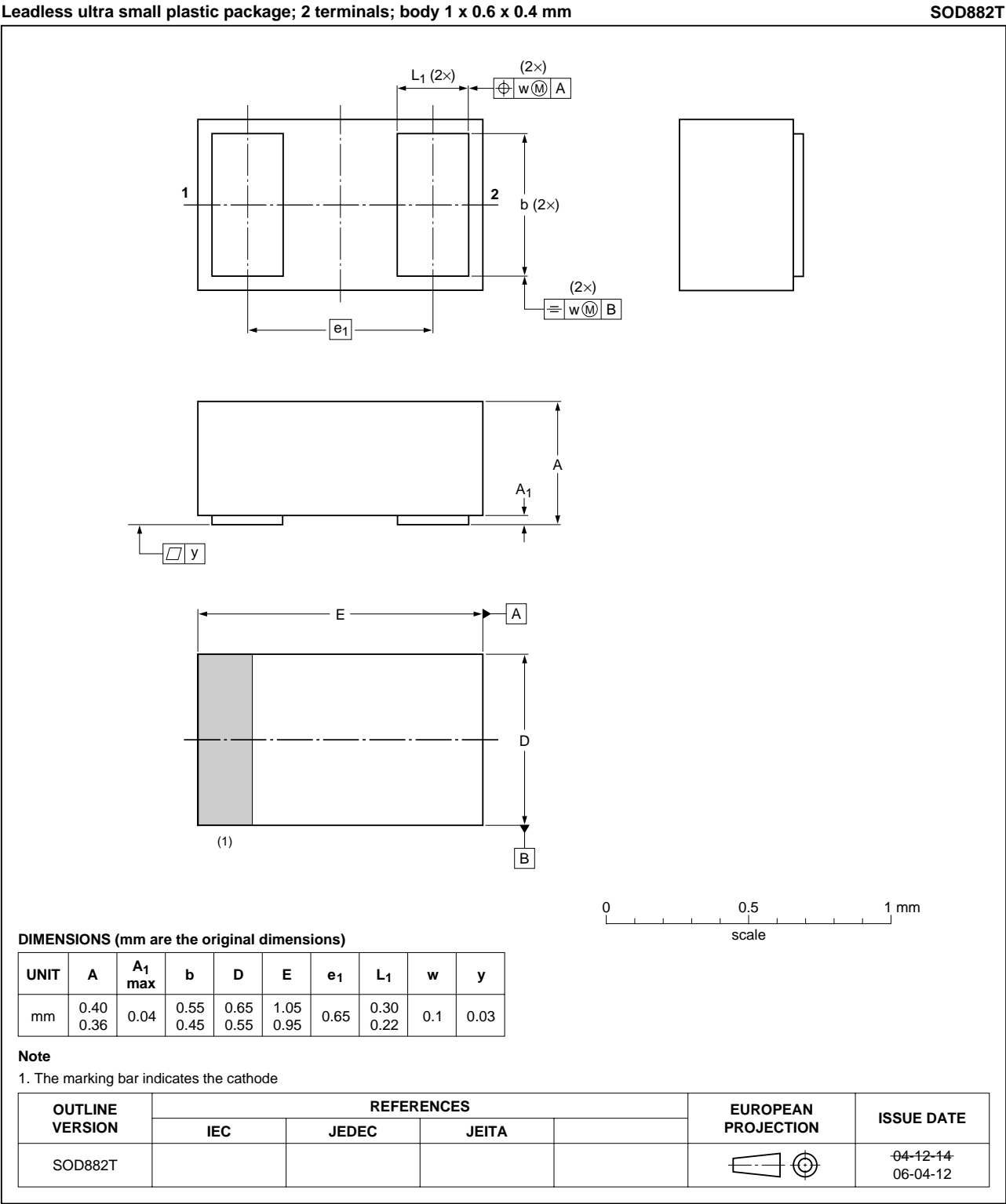


Fig 5. Package outline SOD882T

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 ^{[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".

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13. Contents

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

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