

# BAP55L

## Silicon PIN diode

Rev. 2 — 5 September 2011

Preliminary data sheet

## 1. Product profile

### 1.1 General description

Planar PIN diode in a SOD882 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	 Transparent top view	 <i>sym006</i>
2	anode		

[1] The marking bar indicates the cathode.

## 3. Ordering information

Table 2. Ordering information

Type number	Package		
	Name	Description	Version
BAP55L	-	leadless ultra small plastic package; 2 terminals; body 1.0 × 0.6 × 0.5 mm	SOD882



## 4. Marking

Table 3. Marking

Type number	Marking code
BAP55L	E6

## 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	$T_s = 90\text{ °C}$	-	500	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 soldering point		100	K/W

## 7. Characteristics

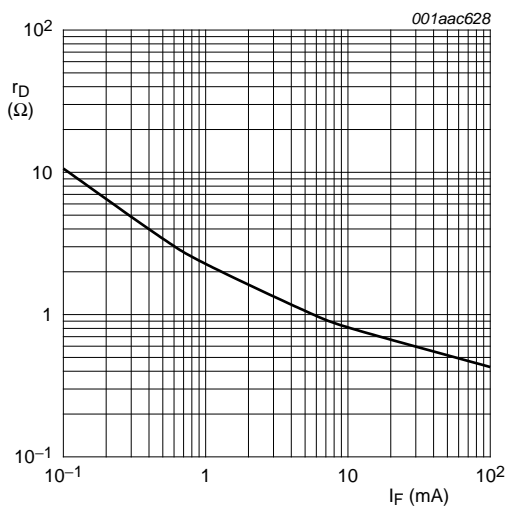
Table 6. Characteristics

$T_j = 25\text{ °C}$  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	$V_R = 20\text{ V}$	-	-	10	nA
		$V_R = 50\text{ V}$	-	-	0.1	μA
$C_d$	diode capacitance	$f = 1\text{ MHz}$ ; <a href="#">Figure 2</a>				
		$V_R = 0\text{ V}$	-	0.27	-	pF
		$V_R = 1\text{ V}$	-	0.23	-	pF
		$V_R = 20\text{ V}$	-	0.18	0.28	pF
$r_D$	diode forward resistance	$f = 100\text{ MHz}$ ; <a href="#">Figure 1</a>				
		$I_F = 0.5\text{ mA}$	-	3.4	4.5	Ω
		$I_F = 1\text{ mA}$	-	2.3	3.3	Ω
		$I_F = 10\text{ mA}$	-	0.8	1.2	Ω
		$I_F = 100\text{ mA}$	-	0.4	0.7	Ω

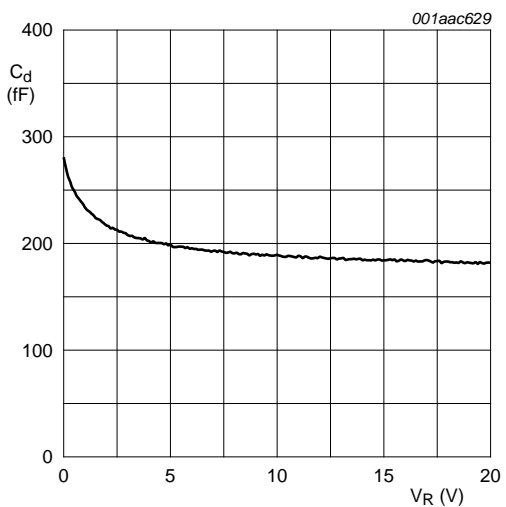
**Table 6. Characteristics ...continued** $T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$ S_{12} ^2$	isolation	$V_R = 0\text{ V}$ ; <a href="#">Figure 4</a>				
		$f = 900\text{ MHz}$	-	17.6	-	dB
		$f = 1800\text{ MHz}$	-	13	-	dB
		$f = 2450\text{ MHz}$	-	11.1	-	dB
$ S_{21} ^2$	insertion loss	$I_F = 0.5\text{ mA}$ ; <a href="#">Figure 3</a>				
		$f = 900\text{ MHz}$	-	0.25	-	dB
		$f = 1800\text{ MHz}$	-	0.27	-	dB
		$f = 2450\text{ MHz}$	-	0.29	-	dB
		$I_F = 1\text{ mA}$ ; <a href="#">Figure 3</a>				
		$f = 900\text{ MHz}$	-	0.17	-	dB
		$f = 1800\text{ MHz}$	-	0.19	-	dB
		$f = 2450\text{ MHz}$	-	0.21	-	dB
		$I_F = 10\text{ mA}$ ; <a href="#">Figure 3</a>				
		$f = 900\text{ MHz}$	-	0.07	-	dB
		$f = 1800\text{ MHz}$	-	0.09	-	dB
		$f = 2450\text{ MHz}$	-	0.12	-	dB
		$I_F = 100\text{ mA}$ ; <a href="#">Figure 3</a>				
		$f = 900\text{ MHz}$	-	0.05	-	dB
		$f = 1800\text{ MHz}$	-	0.07	-	dB
		$f = 2450\text{ MHz}$	-	0.09	-	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 $I_R = 3\text{ mA}$	-	0.28	-	$\mu\text{s}$
$L_S$	series inductance		-	0.6	-	nH



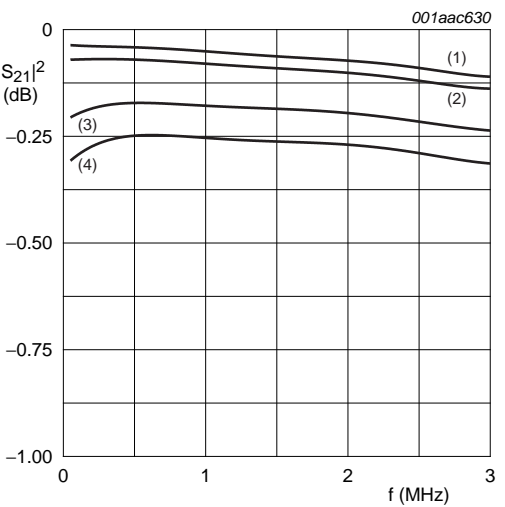
$f = 100\text{ MHz}$ ;  $T_j = 25\text{ }^{\circ}\text{C}$ .

Fig 1. Forward resistance as a function of forward current; typical values



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

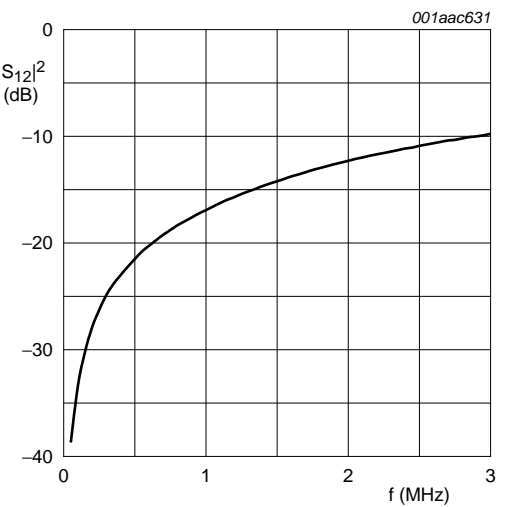
Fig 2. Diode capacitance as a function of reverse voltage; typical values



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

Fig 3. Insertion loss ( $|S_{21}|^2$ ) of the diode as a function of frequency; typical values



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

Fig 4. Isolation ( $|S_{12}|^2$ ) of the diode as a function of frequency; typical values

8. Package outline

Leadless ultra small plastic package; 2 terminals; body 1.0 x 0.6 x 0.5 mm

SOD882

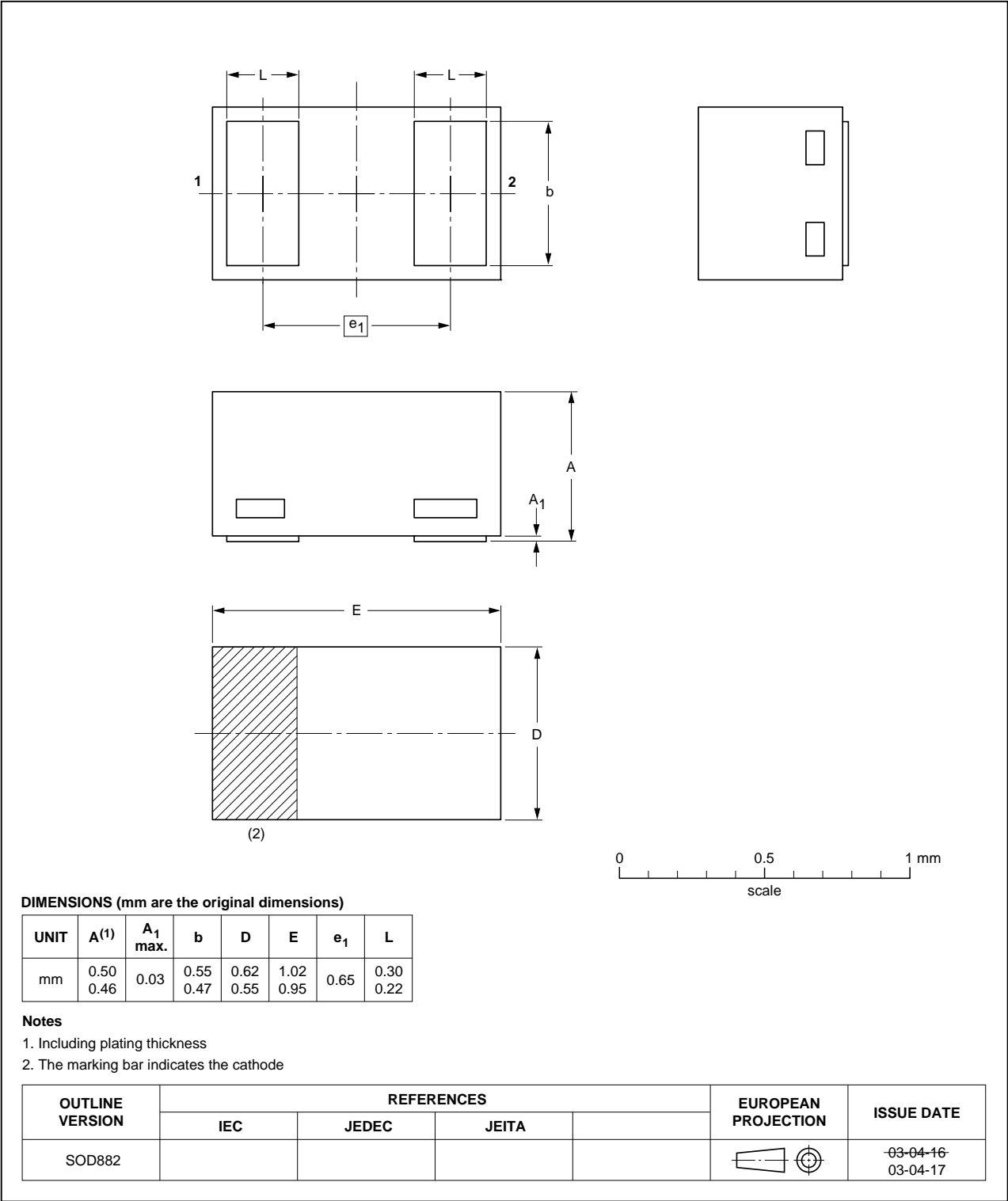


Fig 5. Package outline SOD882

## 9. Revision history

Table 7. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BAP55L v.2	20110905	Preliminary data sheet	-	BAP55L v.1
Modifications:	<ul style="list-style-type: none"><li>• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.</li><li>• Legal texts have been adapted to the new company name where appropriate.</li></ul>			
BAP55L v.1 (9397 750 14811)	20050405	Preliminary data sheet	-	-

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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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